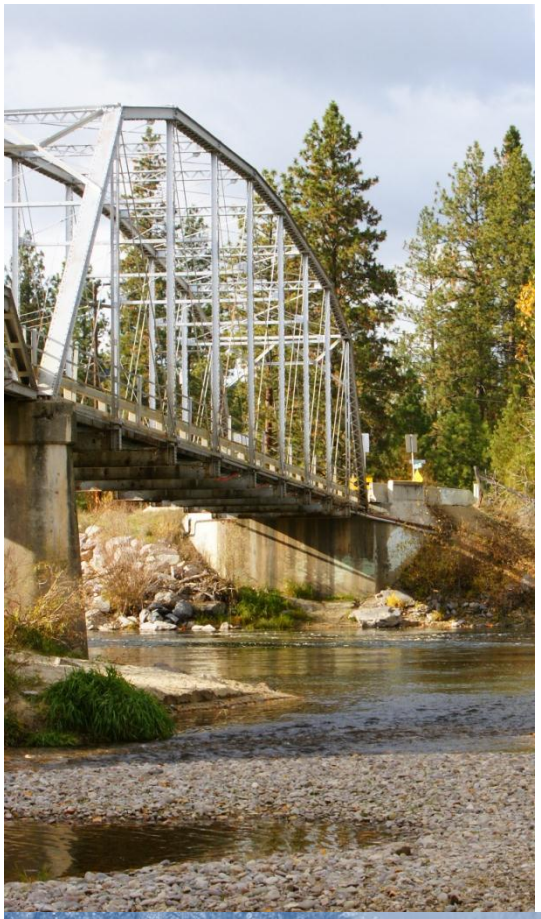
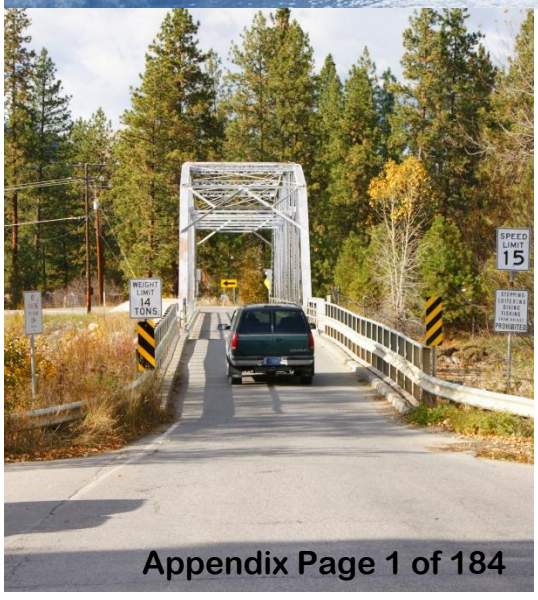


Appendix 3

PLANNING STUDY DOCUMENTATION



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COMMUNITY AND AGENCY PARTICIPATION PLAN (CAPP)

Maclay Bridge Planning Study

Prepared for:
Montana Department of Transportation
Helena, Montana

Prepared by:
Robert Peccia & Associates
Helena, Montana
March 23, 2012

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ABBREVIATIONS / ACRONYMS

ADA	Americans with Disabilities Act
CAPP	Community and Agency Participation Plan
EA	Environmental Assessment
MDT	Montana Department of Transportation
MEPA	Montana Environmental Policy Act
NEPA	National Environmental Policy Act
RP	Reference Post
RPA	Robert Peccia and Associates
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users

COMMUNITY AND AGENCY PARTICIPATION PLAN (CAPP)

1.0 INTRODUCTION

Missoula County, in partnership with the Montana Department of Transportation (MDT) and the Federal Highway Administration, has initiated a *Planning Study* for the North Avenue Bridge west of Missoula, locally known as the Maclay Bridge. The bridge is a single-lane structure that crosses the Bitterroot River and provides access to residential and recreational areas on the west side of the river. A vicinity map is shown in **Figure 1**.

Referred to as the *Maclay Bridge Planning Study*, the study will determine the necessity and/or feasibility of replacing, upgrading or reconstructing the Maclay Bridge based on needs presented by the community, the study partners, and resource agencies. The study will examine geometric characteristics, crash history, and existing and projected operational characteristics within the study area. Existing and projected physical constraints, land uses, and environmental resources will also be analyzed. The study is expected to be completed by the end of February 2013.

MDT has established the planning study process in order to investigate needs and improvement options for the area via a Pre-National Environmental Policy Act (NEPA) / Montana Environmental Policy Act (MEPA) study, as provided for in the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). If improvement options are forwarded into project development, the planning study process will inform the NEPA / MEPA process with analysis of existing data to determine current and future deficiencies and needs within the study area, and identification of potential environmental issues and mitigation opportunities.

An initial step in the planning study process is to develop a *Community and Agency Participation Plan (CAPP)* that provides for and identifies activities needed to communicate information about existing and future study area needs. The purpose of the *CAPP* is to establish a process that presents opportunities for participation in all phases of the planning study process. This is accomplished by providing complete information, timely notices, opportunities to make comments, and ensuring transparency to key decisions.

1.1. PLANNING STUDY PROCESS

The pre-NEPA/MEPA planning study process involves early communication with interested parties to help identify needs, constraints and opportunities to determine if there are implementable improvements given available resources and local support. The planning study does not commit the participants to a particular course of action or replace the formal environmental review process (NEPA / MEPA), rather it complements NEPA / MEPA and ensures important decisions are made at the appropriate level and considers all major issues including available funding sources should a project be advanced.

Community, stakeholder, resource agency and interested party involvement are important components in any successful planning study process. For this study, a number of strategies are proposed to disseminate information and elicit meaningful participation. These opportunities will include:

- Providing information on the critical elements included in the Pre-NEPA/MEPA Planning Study process for the Maclay Bridge study area;
- Providing input and asking questions throughout the planning study; and

- Presenting findings and recommendations.

1.2. Study Area

A vicinity map showing the location of the Maclay Bridge and the surrounding area is shown as **Figure 1**. An Environmental Assessment (EA) was completed in 1994 which identified a number of alternative options for the Maclay Bridge. For the purposes of the *Environmental Scan*, an "Environmental Scan Boundary" was established to include the alternative options identified in the previous EA.

Areas outside the Environmental Scan Boundary will also be analyzed during the development of the *Maclay Bridge Planning Study*. The study area will include areas most likely to be affected by the potential replacing, upgrading, or reconstruction of the Maclay Bridge.

1.3. Goals of Community Involvement and Outreach Effort

The goal of the study partners and the consultant is to have ongoing involvement throughout the planning study process. Education and outreach are an essential element in successfully informing individuals about the planning study process.

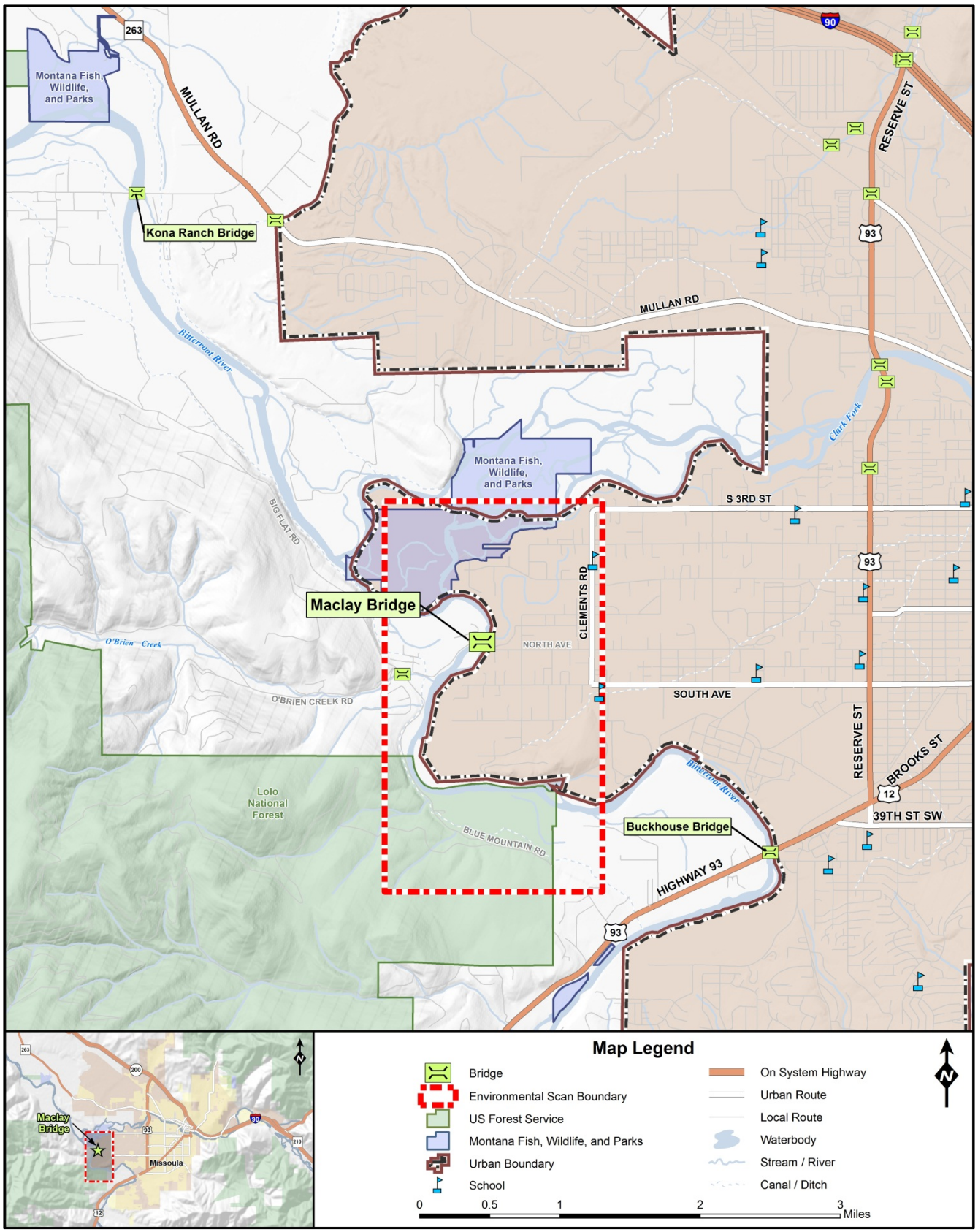

Figure 1: Vicinity Map

2.0 PARTICIPATION PROCEDURES

The *CAPP* describes the information and input opportunities that will be provided as part of the development of the *Maclay Bridge Planning Study*. This plan encourages active participation in identifying and commenting on study issues at every stage of the planning process. Participant involvement includes:

- The general community – residents of Missoula County, the City of Missoula, and adjacent areas;
- Landowners and business owners within the study area boundary;
- Resource agencies;
- Stakeholders and outreach groups; and
- Other interested parties.

Methods for notification of informational meetings, and other information are detailed in this document. The community and interested parties will be kept informed of all aspects of the planning study, and their input will be sought throughout the process by Missoula County, MDT and the Consultant via the methods detailed herein.

2.1. STUDY CONTACTS

Contact information for MDT, Missoula County, and the Consultant will be provided in all information that is published. This information is provided below.

- **Missoula County** – Office of Planning and Grants
  435 Ryman Street, Missoula, MT 59802
  Contact: **Lewis YellowRobe** – *Urban Initiatives*
  (406) 258-4651
  lyellowrobe@co.missoula.mt.us

- **Missoula County** – Department of Public Works
  6089 Training Drive, Missoula, MT 59808
  Contact: **Erik Dickson, PE** – *Transportation Engineer*
  (406) 258-4822
  edickson@co.missoula.mt.us

- **Montana Department of Transportation (MDT)** – Statewide and Urban Planning
  2960 Prospect Avenue (PO Box 201001), Helena, MT 59620-1001
  Contact: **Sheila Ludlow** – *MDT Project Manager*
  (406) 444-9193
  sludlow@mt.gov

- **Montana Department of Transportation (MDT)** – Missoula District Office
  2100 W Broadway, Missoula, MT 59807-7039
  Contact: **Shane Stack, PE –** *MDT Missoula Project Engineer*
  (406) 523-5830
  sstack@mt.gov

- **Robert Peccia and Associates (RPA)** – Consultant
  825 Custer Avenue (PO Box 5653), Helena, MT 59604
  Contact: **Jeff Key, PE** – *RPA Project Manager*
  (406) 447-5000
  jeff.key@rpa-hln.com

2.2. Publications

Meeting announcements will be developed jointly by RPA and MDT, and advertised by MDT at least three weeks prior to informational meetings. The ads will announce the meeting location, time, and date, the format and purpose of the meeting, and the locations where documents may be reviewed (if applicable). The following print newspaper will carry the display ads:

- Missoulian – print and online: www.missoulian.com
- Missoula Independent – print and online: www.missoulanews.com

In addition, newsletters and/or flyers will be made available one month prior to each informational meeting. The newsletters will describe work in progress, results achieved, preliminary recommendations, and other related topics. Each newsletter and flyer will be delivered to Missoula County, MDT, and select stakeholders for their use in distribution and posting to their individual internet sites.

2.3. Radio and Television

Meetings may also be announced on local radio and/or television stations. Input from the Planning Team will identify the most popular radio and television stations on which announcements will be made.

2.4. Stakeholder Contact List

A stakeholder contact list will be produced that will include individuals, businesses, or groups identified by Missoula County and MDT. The intent of developing the stakeholder list is to identify individuals and groups with likely project interests and to actively seek out and engage them in all phases of the study process. Individuals who attend informational meetings will also be added to the stakeholder list. The groups or businesses (at a minimum) listed below will be included in the initial list, providing that addresses and/or emails are obtainable from each respective group for these purposes.

- Missoula County Commission
- Montana Fish, Wildlife, and Parks
- US Forest Service
- Missoula Rural Fire District
- Community Medical Center
- Missoula Emergency Services Incorporated
- Missoula County Public Schools
- Target Range School District #23
- Mountain Home Montana
- Maclay Bridge Alliance
- Target Range Homeowners Association
- Hidden Heights Homeowners Association
- Target Range Water and Sewer District

2.5. Document Availability

Electronic copies of study deliverables and technical memorandums will be posted on the study website at the following address shown:

www.mdt.mt.gov/pubinvolve/maclay/

Hard copy materials may also be made available at the following locations:

- Missoula County Office of Planning and Grants (435 Ryman Street, Missoula, MT 59802)
- Missoula County Department of Public Works (6089 Training Drive, Missoula, MT 59808)
- MDT Missoula District Office (2100 W Broadway, Missoula, MT 59807-7039)
- Big Sky High School Library (3100 South Avenue W., Missoula, MT 59804)

The following Americans with Disabilities Act (ADA)-required statement will be included on all published materials:

> *"Missoula County, MDT, and RPA attempt to provide accommodations for any known disability that may interfere with a person participating in any service, program, or activity associated with this study. Alternative accessible formats of this information will be provided upon request. For further information, call (406) 447-5000 or TTY (800) 335-7592, or call Montana Relay at 711. Accommodation requests must be made at least 48 hours prior to the scheduled activity and / or meeting."*

3.0 MEETINGS

3.1. Planning Team Meetings

Planning Team meetings will be scheduled every three weeks for the duration of the twelve-month study period for a total of 18 Planning Team meetings. Individual groups included in the meetings will be Missoula County, MDT, the Consultant, and others as needed. The meetings are intended to track progress and address study development issues and questions. The meetings are considered an important aspect for the exchange of technical information and ideas during the development of the study. Throughout the meetings, the issues, problems, and possible solutions will be identified and discussed.

3.2. Informational Meetings

Four formal informational meetings will be held throughout the study period. The first informational meeting will be held early in the study process and will serve as a "kick-off" meeting. This meeting will also be used to receive information from interested parties about the study. The second informational meeting will discuss the existing and projected conditions within the study area. Informational meeting number three will take place during the identification of improvement options. The last community meeting will occur after the draft *Maclay Bridge Planning Study* has been completed. The purpose of this meeting will be to present the types of recommended improvements, and to receive feedback. Comments and concerns will be recorded at all meetings.

3.3. Resource Agency Meeting / Involvement

A meeting will be scheduled and held with Resource Agencies. The meeting will be organized by MDT and facilitated by RPA with assistance from the study partners as necessary.

3.4. Consideration for Traditionally Underserved Populations

It is recognized that additional efforts must be made to involve traditionally underserved segments of the population, including the disabled, minorities, and low-income residents. Including these groups helps to ensure planning that reflects the needs of everyone. The steps listed below will help with these efforts.

- **Plan Meeting Locations Carefully** – Informational meetings will be held in locations that are accessible and compliant with the ADA. If a targeted population is located in a certain geographic part of a City or County, then the meeting location should be in the proximity of the area for convenience.
- **Seek Help from Community Leaders and Organizations** – To facilitate involvement of traditionally underserved populations, community leaders and organizations that represent these groups will be consulted about how to most effectively reach their members.
- **Be Sensitive to Diverse Audiences** – At informational meetings, study partner staff and the Consultant will attempt to communicate as effectively as possible. Technical jargon will be avoided and appropriate dress and conduct will be adhered to.

3.5. Study Schedule

Adherence to the study schedule is important to stay on track and to keep all participating parties engaged. The study schedule for the Maclay Bridge Planning Study is shown in **Figure 2**. It is RPA's intent to adhere to this schedule.

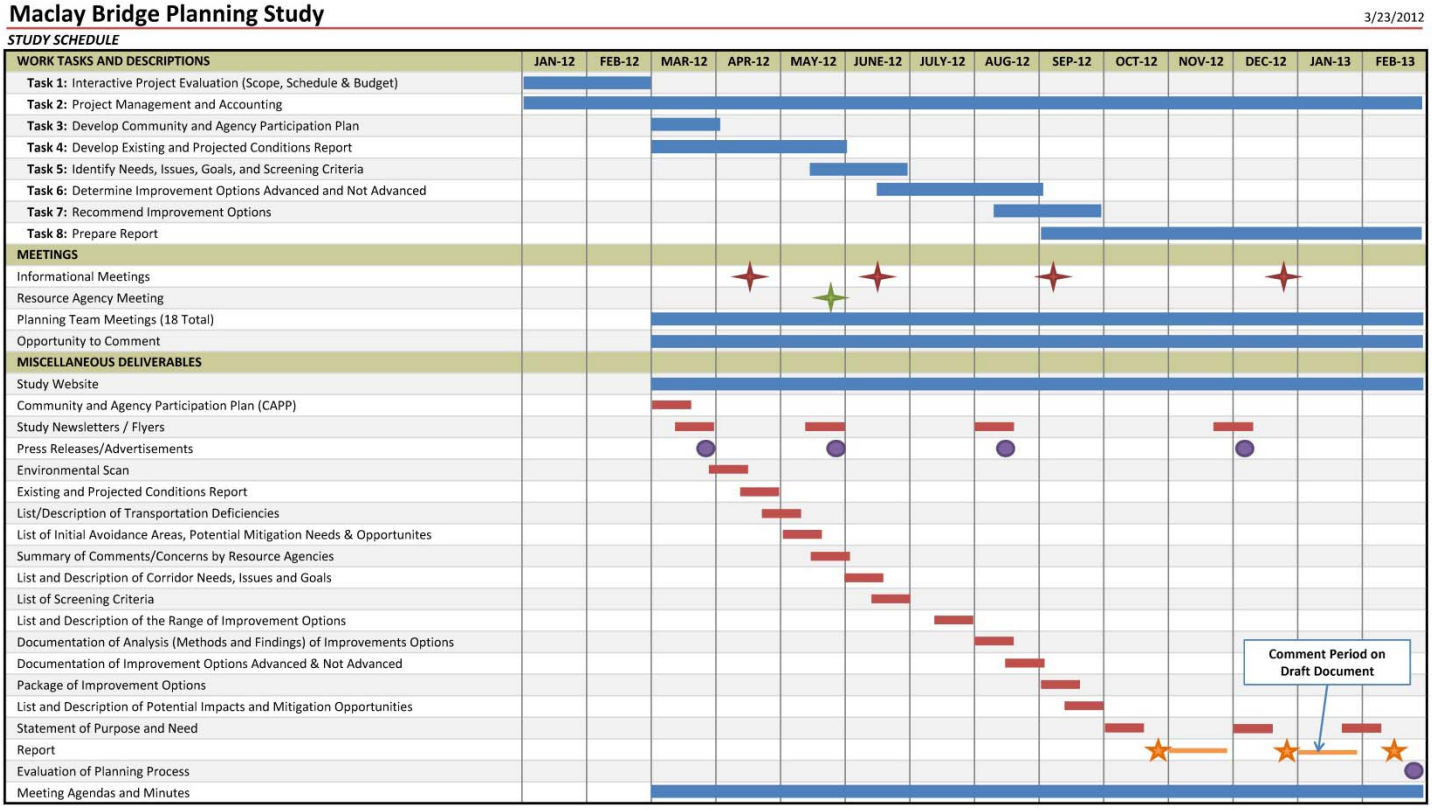

Figure 2: Study Schedule

4.0 OVERALL STUDY COMMUNICATION

The *CAPP* establishes guidelines and procedures for encouraging participation. The following communication strategies and techniques will be used to distribute study information to the community at large and seek a higher level of engagement. The Consultant will utilize the techniques that best suit the *Maclay Bridge Planning Study* development.

- All relevant deliverables and associated materials will be posted on the study website at the following address:
  - www.mdt.mt.gov/pubinvolve/maclay/
- Public service announcements and interviews on radio and television may be conducted to explain the subject matter and promote participation.
- Newsletters will be provided at least one month prior to each informational meeting, with the exception of the first informational meeting in which a flyer will be provided.
- Press releases for the newspaper or other widely circulated publications will be developed.
- Technical memorandums will be provided to the MDT for posting to the study's internet site, and will also be distributed to the Planning Team, to provide a better understanding of proposed issues and recommendations and, in return, to provide the study partners with feedback and an opportunity for continual comment. Hard copies of all materials will be made available at the MDT Statewide and Urban Planning Section (2960 Prospect Avenue).
- Special presentations may be made, upon request, to groups and organizations.
- Fact sheets may be developed to help explain or describe study-related issues.
- Special issues documents may be announced or reported at meetings and/or via email.

Questions and comments from the interested parties concerning the participation process, working draft technical memorandums, the draft *Maclay Bridge Planning Study* documents, and other work products will be addressed via written response and included in an Appendix to the actual documents.

EXISTING AND PROJECTED CONDITIONS

Maclay Bridge Planning Study

FINAL

Prepared for:
Montana Department of Transportation
Helena, Montana

Prepared by:
Robert Peccia & Associates
Helena, Montana
November 1, 2012

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FIGURES

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ABBREVIATIONS / ACRONYMS

AASHTO	American Association of State Highway Transportation Officials
ADT	Average Daily Traffic
AADT	Average Annual Daily Traffic
AAGR	Average Annual Growth Rate
APE	Area of Potential Effect
CFR	Code of Federal Regulations
cfs	Cubic Feet per Second
CLOMR	Conditional Letter of Map Revision
CRABS	Cultural Resources Annotated Bibliography Search
CRIS	Cultural Resources Information System
DHV	Design Hourly Vehicle
DNRC	Department of Natural Resources and Conservation
DOI	Department of Interior
EA	Environmental Assessment
ESA	Endangered Species Act
FAS	Fishing Access Site
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Maps
FIS	Flood Insurance Study
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
GIS	Geographic Information System
LOMR	Letter of Map Revision
LRTP	Long Range Transportation Plan
LUST	Leaking Underground Storage Tank
LWCF	Land and Water Conservation Funds
MAAQS	Montana Ambient Air Quality Standards
MATP	Missoula Active Transportation Plan
MDEQ	Montana Department of Environmental Quality
MDT	Montana Department of Transportation
MEPA	Montana Environmental Policy Act
MFWP	Montana Department of Fish, Wildlife, and Parks

MNHP	Montana Natural Heritage Program
mph	Miles per Hour
MPO	Metropolitan Planning Organization
MSAT	Mobile Source Air Toxics
mton	Metric Ton
MUTD	Missoula Urban Transportation District
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NPL	National Priority List
NPS	National Park Service
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NRIS	Natural Resource Information System
OPG	Office of Planning and Grants
PM	Particulate Matter
RDM	Road Design Manual
TDM	Travel Demand Model
TDP	Transit Development Plan
TIP	Transportation Improvement Program
TMDL	Total Maximum Daily Load
TPCC	Transportation Policy Coordinating Committee
USACOE	U.S. Army Corps of Engineers
UFDA	Urban Fringe Development Area
UPN	Uniform Project Number
UPWP	Unified Planning Work Program
URSA	Urban Service Area
USACOE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Service
UST	Underground Storage Tank
vpd	Vehicles per Day
Section 4(f)	Section 4(f) of the 1966 Department of Transportation Act
Section 6(f)	Section 6(f) of the National Land and Water Conservation Funds Act

EXISTING AND PROJECTED CONDITIONS

1.0 INTRODUCTION

The North Avenue Bridge, known locally and referred to hereafter as the Maclay Bridge, is a single-lane structure located west of the City of Missoula. The Maclay Bridge crosses the Bitterroot River approximately 2.75 miles west of Reserve Street. North Avenue connects to the existing bridge as the eastern approach, and River Pines Road serves as its western approach.

The intent of the *Existing and Projected Conditions* report is to identify existing and projected conditions associated with the Maclay Bridge and surrounding area and to highlight relevant environmental factors with the potential to influence the development of improvement options. This report is a high-level planning analysis aimed at identifying constraints and opportunities related to the potential rehabilitation, reconstruction or replacement of the Maclay Bridge.

1.1. PREVIOUS PLANNING AND MAINTENANCE EFFORTS

In 1994, an Environmental Assessment (EA) for the *Maclay Bridge Site Selection Study*[1] was completed defining the purpose and need for a project at the Maclay Bridge, identifying potential alternatives, and assessing impacts of the various alternatives identified to address the project's purpose and need. Sixteen (16) alternatives were initially considered in the EA including:

- Bridge rehabilitation or bridge replacement (one-lane structure) at the current location;
- Numerous alternatives that would provide a new two-lane bridge elsewhere; and
- A "No Build" alternative.

Through a screening process, four alternatives were advanced for further consideration and a "Preferred Alternative" was identified. The Preferred Alternative was described in the EA as follows:

> *"A new two-lane (one lane for each direction of traffic) bridge constructed over the Bitterroot River which connects River Pines Road on the west side to South Avenue West on the east side. The Preferred Alternative includes increasing the number of lanes on the bridge from one lane (existing) to two lanes (proposed). The bridge cross section includes adequate shoulders for bicycle travel and a separated pedestrian walkway."*

A Finding of No Significant Impact (FONSI) on the 1994 EA was never issued by the Federal Highway Administration (FHWA) and the Preferred Alternative from the EA was not advanced due to lack of funding. Even though the 1994 EA was completed and approved for circulation, a decision document (i.e. FONSI) was not issued, rendering the NEPA process incomplete. FHWA views a signed FONSI as the NEPA decision document for a project evaluated and advanced with an EA. Missoula County had intended to use special project demonstration funds from Congress to implement the project but was unsuccessful in obtaining the funding. The Maclay Bridge replacement project was inactive until the County nominated it to receive funding from MDT's off-system bridge program in 2002.

Minor maintenance activities have been performed on the bridge at various times since the completion of the 1994 EA. These have included the following:

[1] Maclay Bridge Site Selection Study Environmental Assessment, Carter & Burgess Inc., April 1994

- The west bridge abutment was armored with material in anticipation of high water conditions during Spring run-off (April, 1997);
- The existing timber deck was replaced with corrugated steel decking and an asphalt overlay. In addition, bearings were replaced and/or added, and steel curbing was placed to prevent vehicular damage to pedestrian rail and truss elements (2003);
- The expansion joints at the west abutment were modified, as the expansion joint installed with the 2003 deck replacement were found to be inadequate and in need of mitigation (2004); and
- The expansion joint between the main truss and the pony truss was modified, as the expansion joint installed with the 2003 deck replacement were found to be inadequate and in need of mitigation (2005).

Many of the underlying issues previously identified as deficiencies (and reasons for proposing transportation improvements) in the 1994 EA and subsequent safety inspections remain. This, coupled with the community's ongoing interest in the Maclay Bridge and possible changes in traffic patterns resulting from potential improvements, served as the reason for initiating the *Maclay Bridge Planning Study*.

1.2. Maclay Bridge Project Nomination

Missoula County has nominated the Maclay Bridge for replacement under the Montana Department of Transportation Off-System Bridge Program (formerly known as the *Highway Bridge Replacement and Rehabilitation Program*). Funds for the program are derived from the Federal gas tax, which is outside Federal general revenue sources and doesn't impact or add to the Federal deficit. Funds are Federally apportioned to Montana under the provisions of the current highway bill, MAP-21. MAP-21 requires a minimum percentage of the funding be used for off-system bridges. In general, projects are funded with 86.58% Federal and the State is responsible for the remaining 13.42%. The State share is funded through the Highway State Special Revenue Account. Because the Maclay Bridge is an "off-system" facility, it falls under the category of the "Off-System Bridge Program".

MDT conducts a condition inspection of off-system bridges on a two-year cycle. The condition inspection provides information used to calculate the Sufficiency Rating (SR). The SR formula is the industry standard method of evaluating bridge data to obtain a numeric value indicating the sufficiency of the bridge to remain in service. The sufficiency rating is expressed by a value ranging from 0 to 100 with 100 being an entirely sufficient bridge and 0 being an entirely deficient bridge.

The condition inspection information is also used to classify the bridges as either "Not Deficient", Structurally Deficient" or "Functionally Obsolete" (further explained in Section 4.8.1).

Procedures for selecting bridges for inclusion into this program are based on a ranking system that weighs various elements of a structure condition, usage alternate routes, and considers local priorities. Safety and economic impacts are considerations in the selection process.

MDT periodically asks each county for Off-System bridge nominations. In 2006, the Maclay Bridge was Missoula County's number one priority.

1.3. Analysis Area

Existing and projected conditions were analyzed in the greater area west of Reserve Street which is most likely to be affected by a potential upgrade, reconstruction or replacement of the Maclay Bridge. For the purposes of the *Environmental Scan*, an "Environmental Scan Boundary" was established to encompass

an expanded area around the Maclay Bridge to include the areas potentially affected by the alternative options considered in the 1994 EA.

A vicinity map showing the location of the Maclay Bridge, the Environmental Scan Boundary, and the surrounding area is shown as **Figure 1**.

1.4. History of Westside Bypass

Several studies and resultant documents have been prepared over the last five decades relative to a potential bypass route west of Missoula. This route, commonly referred to as the Westside Bypass, has been the subject of much interest and debate. The studies and discussions concluded that the Westside Bypass is not feasible due to a variety of factors. In terms of this specific planning study, the Westside Bypass concept is not a consideration nor is it a factor in this study's development. Planning exercises and their brief highlights are listed below:

1965 Missoula Area Transportation Plan

This planning document included the first presentation of a Westside Bypass. The general route identified included a route proceeding south from the Wye area across the Harper's Bridge site, and then follow Big Flat and Blue Mountain Roads to US Highway 93 southwest of Missoula.

1980 Reserve Street Plan

The Reserve Street Plan concluded that a Westside Bypass would not serve local traffic very well, and would add additional miles of travel and generate impacts on the rural character of Grass Valley and Big Flat. Accordingly, the Westside Bypass was dismissed as a feasible route, and efforts were placed on expansion of Reserve Street.

2007 Feasibility Workshop

A feasibility workshop was held in 2007 at the request of the community and came out of the MPO. A consultant was hired to examine a Westside Bypass and it was concluded not to be feasible due to the presence of 4(f) and 6(f) properties.

1.5. Committed and Planned Improvements

There are currently three committed and planned improvements designated within the general vicinity of the Maclay Bridge. They are in varying stages of development, and are summarized as follows:

River Pines Road HSIP 32(80) - MDT has a planned safety improvement project at the intersection of River Pines Road and Riverside Drive on the western side of the Maclay Bridge. The project is intended to address an existing crash trend identified by MDT Safety Engineering and includes 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) - MDT is developing this safety improvement project that involves the reconstruction and re-alignment, with a larger radius, 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. The project will involve environmental documentation, right-of-way acquisition, utility relocation, and potential geotechnical considerations to mitigate the crash trends relative to the horizontal alignment.

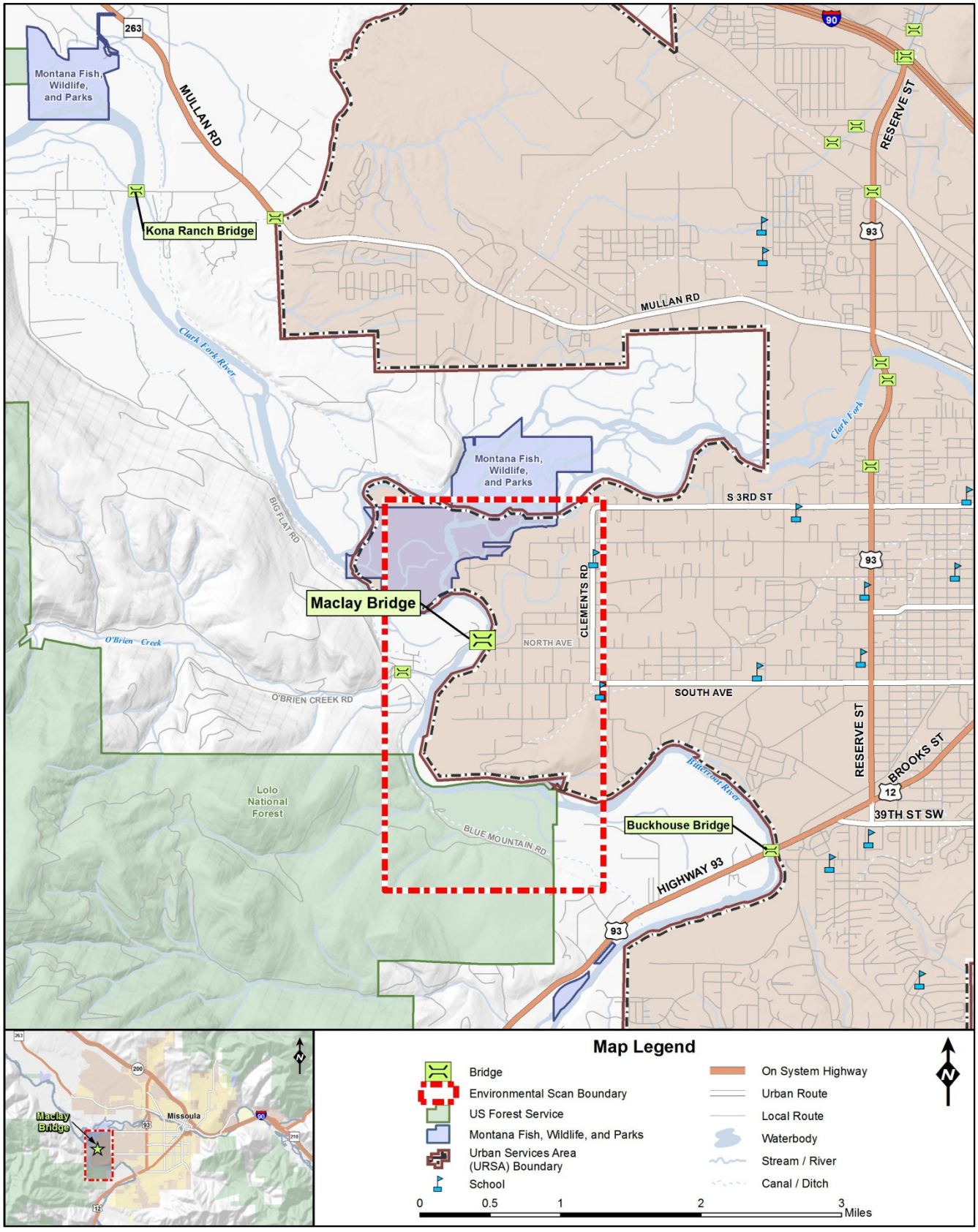


Figure 1: Vicinity Map

Clements Road and 3rd Street UPP 8199(99) – MDT is developing this pavement preservation project to extend the service life of Clements Road. Clements Road will be milled and given an asphalt overlay, between South Avenue and Seventh Street. The remainder of Clements Road will be chip sealed. Replacement of the pavement markings and signing will also be included.

2.0 DEMOGRAPHICS

This section provides an overview of social, economic, and land use characteristics for the area. Historic and recent trends in area demographics help define existing conditions and aid forecasting techniques as there is a direct correlation between motor vehicle travel and socio-economic indicators.

Demographic and socio-economic information was reviewed to help understand recent trends in population, age distribution, employment, economic status, and commuting for area residents. Note that socio-economic data sources often lag considerably behind the actual years of interest. This analysis presents the most recent data and statistics available and describes recent and potential changes in the area.

2.1. POPULATION CHARACTERISTICS

Over the last decade, the population in Missoula County has increased by more than 14 percent and the City of Missoula's population has grown by 17 percent. This is in contrast to the 9.7 percent growth experienced over the same period in the State of Montana and the entire United States. According to the 2010 Census, Missoula County has a density of 42.1 persons per square mile. This is well above the population density for the State of Montana as a whole. **Table 1** presents population and growth statistics for Missoula County and the City of Missoula compared to the State of Montana and the United States.

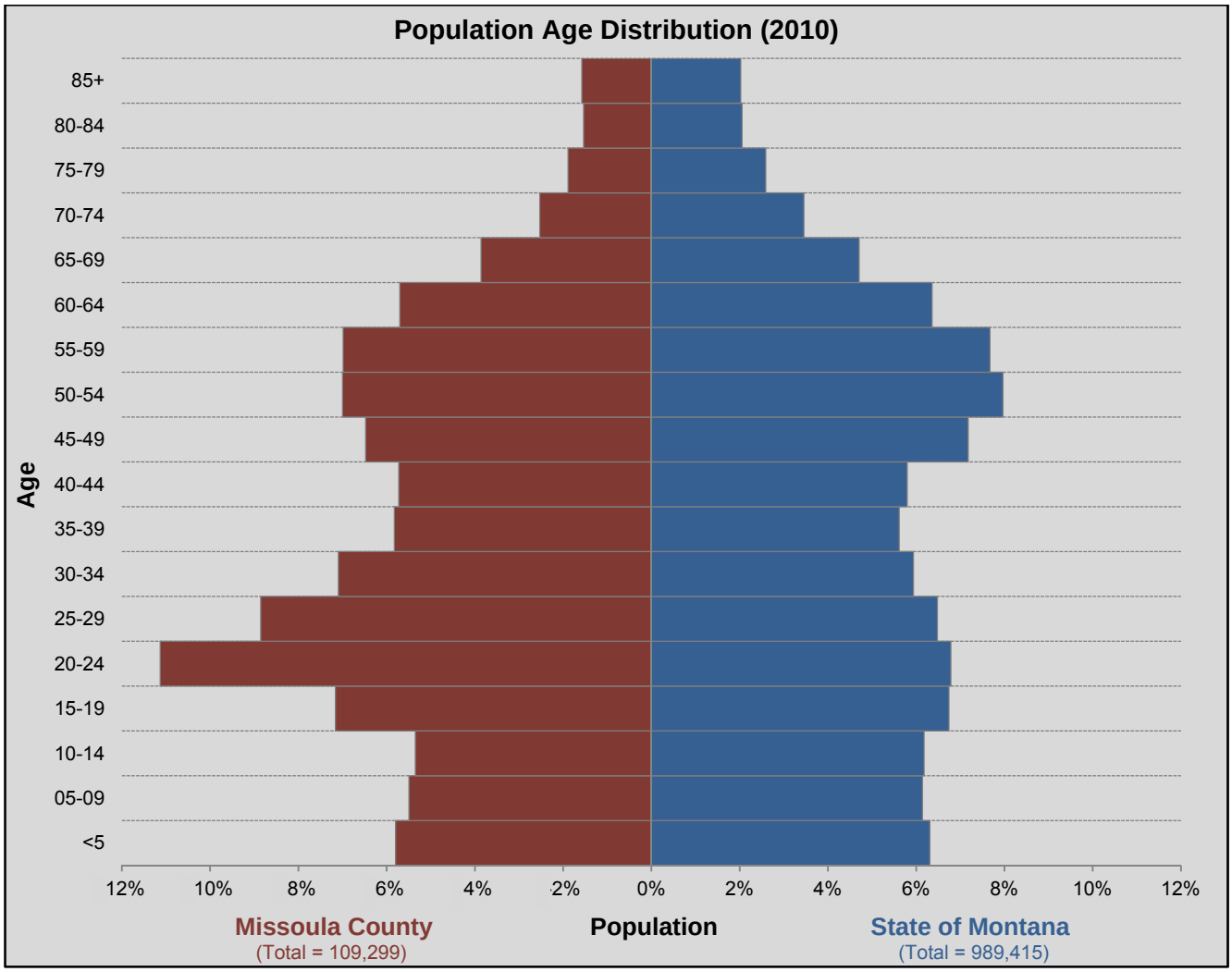
Table 1: Population Growth Trends and Density

Area	Population (2010)	Population (2000)	Percent Growth	Average Annual Growth	Persons per Square Mile (2010)
Missoula County	109,299	95,799	14.1%	1.3%	42.1
City of Missoula	66,788	57,053	17.1%	1.6%	2,427.6
State of Montana	989,415	902,195	9.7%	0.9%	6.8
United States	308,745,538	281,421,906	9.7%	0.9%	87.4

Source: US Bureau of the Census, http://quickfacts.census.gov

Figure 2 shows the age distribution for residents of Missoula County and the State of Montana. The figure illustrates the population of Missoula County is notably younger than that of the State of Montana. Specifically, Missoula County has a higher percentage of population between 20 and 29 than the State of Montana. In Missoula County, 20.0 percent of the population is between 20 and 29 years old; for the State of Montana 13.3 percent of the population is in the 20 to 29 age group. This trend is likely influenced by to the presence of the University of Montana in Missoula.

Figure 2: Population by Age – Missoula County and State of Montana (2010)



Source: US Census Bureau, 2010 Demographic Profile, http://factfinder2.census.gov

2.2. Employment and Income Characteristics

Employment statistics from the Montana Department of Labor and Industry for Missoula County, the State of Montana, and the United States as of March 2012 are shown in **Table 2**. Missoula County has a slightly lower unemployment rate (6.9 percent) than the State of Montana (7.0 percent). Both Missoula County and the State of Montana have unemployment rates lower than that of the United States (8.4 percent).

Table 2: Employment Statistics (March 2012)

Location	Civilian Labor Force	Employed	Unemployed	Unemployment Rate
Missoula County	58,198	54,182	4,016	6.9%
State of Montana	503,012	467,981	35,031	7.0%
United States	154,316,000	141,412,000	12,904,000	8.4%

Source: MT Department of Labor and Industry, Employment Information, March 2012, http://www.ourfactsyourfuture.org
Note: Data non-seasonally adjusted

According to the 2006 – 2010 American Community Survey five-year estimates, median household income levels for Missoula County and City of Missoula residents were below those for the State of Montana and the United States. Per capita income levels for Missoula County were higher than the State of Montana and lower than the United States. Missoula County and the City of Missoula have a higher percentage of persons living below poverty than the State of Montana and United States. The income statistics data is summarized in **Table 3**.

Table 3: Income Statistics (2006 – 2010)

Area	Median Household Income	Per Capita Income	Persons Below Poverty Level (%)
Missoula County	$42,887	$24,343	17.30%
City of Missoula	$36,547	$22,543	22.10%
State of Montana	$43,872	$23,836	14.50%
United States	$51,914	$27,334	13.80%

Source: US Bureau of the Census, American Community Survey 2006-2010, http://factfinder2.census.gov

Table 4 presents 2010 commuting statistics from the American Community Survey. According to the data, Missoula County residents are more likely to walk or commute to work by other means than are residents of the State of Montana or nation. Mean travel time to work is lower for Missoula County residents than for residents of the State of Montana and United States as a whole.

Table 4: Commuting Statistics (2010)

Subject	Missoula County		City of Missoula		State of Montana		United States	
Workers 16 years and over	56,103		35,430		459,904		136,941,010	
Car, truck, or van -- drove alone	41,152	73.4%	24,157	68.2%	347,835	75.6%	104,857,517	76.6%
Car, truck, or van -- carpooled	4,795	8.5%	3,284	9.3%	44,652	9.7%	13,266,356	9.7%
Public transportation (excluding taxicab)	1,168	2.1%	1,090	3.1%	3,856	0.8%	6,768,661	4.9%
Walked	3,181	5.7%	2,579	7.3%	23,813	5.2%	3,797,048	2.8%
Other means	2,423	4.3%	2,094	5.9%	9,636	2.1%	2,327,228	1.7%
Worked at home	3,384	6.0%	2,226	6.3%	30,112	6.5%	5,924,200	4.3%
Mean travel time to work (minutes)	18.0		16.3		18.6		25.3	

Source: US Census Bureau, 2010 American Community Survey, http://factfinder2.census.gov

3.0 LOCAL PLANNING

Missoula County and the City of Missoula have a cooperative agreement in place to conduct planning based on the shared environmental, economic, aesthetic, and social values of city and county residents. The agreement created a City-County Office of Planning and Grants (OPG) which is responsible for land use permitting, long range planning, transportation planning, historic preservation, housing, and a variety of other programs.

3.1. TRANSPORTATION PLANNING

When Missoula's urbanized area population exceeded 50,000, a Metropolitan Planning Organization (MPO) was created and designated to oversee the regional transportation planning and federal transportation funding within the area. The Missoula Transportation Policy Coordinating Committee (TPCC) is the policy making body for the MPO. The Transportation Division of the OPG performs transportation planning functions for the MPO.

The MPO is responsible for transportation planning and programming through the following federally required activities:

- Unified Planning Work Program (UPWP);
- Transportation Improvement Program (TIP); and
- Long Range Transportation Plan (LRTP).

The UPWP is a document prepared each year by the MPO describing transportation planning activities to be conducted during the Federal fiscal year. The Missoula TIP, also updated annually, contains a five-year program of transportation projects and programs to be carried out within the Missoula MPO planning area. The TIP lists projects according to amount and source of funds to be spent for each project within the planning boundary. The Missoula Federal Fiscal Year 2011-2015 TIP includes a project named "Bitterroot River W of MSL" on the list of Bridge Replacement and Bridge Rehab projects within the MPO planning area; however, the project does not have an assigned estimated cost or program schedule.

The LRTP is a planning document intended to establish a vision of transportation investments and how future spending should be allocated over the long term within the planning area. Missoula's MPO updates the LRTP every four years, based on a 20+-year projection of transportation conditions and needs in the MPO planning area. The current version of the LRTP is discussed below.

3.1.1. 2008 Missoula Long Range Transportation Plan

The *2008 Missoula Long Range Transportation Plan*, adopted in November 2008, contains a list of projects and programs representing all modes of surface transportation through 2035. The LRTP is "fiscally constrained" meaning the total estimated cost of the planned improvements cannot exceed anticipated levels of Federal, state and local funding for the planning period. The LRTP also contains "illustrative projects" that are unfunded but have been included by state or local partners for future consideration if and when funding becomes available.

The *2008 Missoula Long Range Transportation Plan* reflects the results of an extensive community visioning process (known as "Envision Missoula") designed to link transportation and land use planning within the urban area. The process identified several future growth scenarios for an area population of 200,000 with different associated patterns of regional development and supporting transportation infrastructure to the year 2035. The preferred growth scenario—designated as the "Focus Inward Scenario"—reflects a community vision to manage travel demand by bringing together activities into one highly concentrated downtown area linked by a multi-modal corridor from Lolo to downtown Missoula. The scenario was based on the assumption that the number of households in the urban area will increase by 37% between 2007 and 2035 and that the majority of new trips in the Missoula area would occur in pockets of growth either downtown, or in other existing areas of Missoula.[2]

The 2008 LRTP analyzes the performance of the existing transportation system and identifies a package of improvements intended to meet Missoula's existing and projected transportation needs. Projects included in the plan are categorized into Committed (those with obligated funds), Recommended (funded) and Illustrative (unfunded potential future projects). The LRTP identifies the North Avenue Bridge Replacement (Maclay Bridge) as a "Recommended Roadway Capacity Project" (LRTP, page 4-13) to be funded by State/Federal Off-System Bridge Funds.

[2] Missoula 2008 Long Range Transportation Plan, December 18, 2008, page 3-4 & Envision Missoula Planning Summit Report, September 2008, page 37.

3.1.2. 2012 Missoula Long Range Transportation Plan

An updated LRTP should be finalized by the end of 2012. LSA Associates—in partnership with Cambridge Systematics and Crandall Arambula—was retained by the MPO to help update the 2008 LRTP.

3.2. Non-Motorized Transportation Planning

3.2.1. Missoula 2011 Active Transportation Plan (MATP)

The *2011 Missoula Active Transportation Plan* (MATP) replaces the 2001 Non-Motorized Transportation Plan and was adopted by the Missoula City Council and the Missoula County Commissioners in June 2011. The MATP presents a long-term vision for the bicycle and pedestrian components of the community's multi-modal transportation system. The document recommends new policies and designs and provides a list of proposed projects from which the MPO can draw from for bicycle and pedestrian infrastructure in the MPO planning area.

The MATP acknowledges use of the Maclay Bridge crossing by pedestrians and bicyclists and notes existing multi-use trails along North Avenue, South Avenue, Humble Road (between North and South Avenues) Clements and Spurgin Roads, and South 7th Street West. The document identifies a desirable future trail corridor for pedestrians and bicyclists across the Bitterroot River along South Avenue.

3.3. Transit Planning

3.3.1. Missoula Transit Development Plan

The Missoula Urban Transportation District (MUTD), established in 1976, operates the Mountain Line bus system. A Transit Development Plan (TDP)—a strategic guide for public transportation in the MUTD—is prepared and annually updated by Mountain Line. The TDP describes existing facilities and transit projects needed over a five-year planning horizon and relevant projects and activities are incorporated into the Missoula TIP. Mountain Line also operates para-transit service, a Senior Van, and provides transportation for special events.

The Mountain Line operates twelve fixed routes within the Missoula area. Mountain Line's Route 9 includes portions of South Avenue, Clements Road, and South 7th Avenue in the Study Area. Public transit service to and from downtown Missoula is available from 7:00 am to 7:30 pm Monday through Friday and from 10:00 am to 6:00 pm on Saturdays. A designated bus stop exists at the Target Range School near the intersection of South Avenue and Clements Road.

The TDP for Fiscal Years 2010-2014 does not identify any specific projects in the Study Area. The document does note the potential for service improvements in the Lower Miller Creek and Lolo areas.

3.4. Parks and Recreation Planning

3.4.1. 2012 Missoula County Parks and Trails Master Plan

The *Missoula County Parks and Trails Master Plan* guides the administration and management of park and recreational lands in Missoula County. The County recently completed an update to the 1997 County Parks and Conservation Land Plan. The updated plan was adopted by the Missoula County Park Board in early 2012.

The Master Plan includes a trails component and reflects broad community support for development of natural surface hiking and bicycle trails, paved commuter trails, river access sites, and preservation of natural areas and wildlife habitats.

3.4.2. Missoula Urban Area Open Space Plan 2006 Update

This plan was first adopted by the City and County of Missoula in 1995 and was updated in 2006. The plan envisions a trail system "to provide recreational opportunities and help further facilitate non-motorized transportation as a viable option for more people in and around the City." The priorities listed include extending and filling in gaps for existing trails and extending commuter/recreational trails in various portions of the Missoula Valley.

The document identifies the presence of important conservation and recreational lands in the Target Range area including the Bitterroot and Clark Fork Rivers, the Kelly Island Fishing Access Site, and the Blue Mountain Recreation Area.

3.4.3. 2004 Master Parks and Recreation Plan for the Greater Missoula Area

The *Master Parks and Recreation Plan for the Greater Missoula Area*, adopted in May 2004, was intended to provide a long-term vision for land use as it relates to parks, trails, open spaces, conservation lands, urban forest, and recreation facilities in the Missoula Urban Area. The area covered by the plan included the City of Missoula and an area approximately 3 miles beyond the City limits. The plan establishes the desired Level of Service for parkland acreage, sets forth standards for developed parks, and adopts numerous goals, policies, and action items to increase the quantity and quality of parks.

The plan acknowledged the public parklands, recreation sites, and conservation lands in the general area but did not make specific recommendations that would be relevant to the planning study. The plan also supported recommendations made in other planning documents of the time regarding non-motorized transportation in the urban area.

3.5. Land Use Planning

Land use planning within the area is guided by several plans including the *Target Range Neighborhood Plan*, the *Missoula Urban Area Comprehensive Plan: 1998 Update*, and the *Missoula County Growth Policy, 2005 Update* (amended in March 2010). Areas outside the designated Target Range Neighborhood Plan boundary are governed by the Comprehensive Plan and the Growth Policy. These documents are discussed in the following sections.

3.5.1. Missoula County Growth Policy

A growth policy is an official public document adopted and used by Montana local governments as a general guide for decisions about the community's physical development. The document is not regulatory; it serves as an official statement of public policy to guide growth and manage change for the betterment of the community. It establishes the legal and philosophical foundation upon which future plans and regulations will be based. State law requires growth policies contain several notable elements including:

- Community goals and objectives;
- Information about existing conditions and trends;
- A description of the policies, regulations, and other tools to be implemented in order to achieve the identified goals and objectives; and
- A strategy for development, maintenance, and replacement of public infrastructure.

Missoula County first adopted its Growth Policy in 2002 and an update to the document was subsequently made in 2005. Most recently, the *Missoula County Growth Policy* was amended by the Board of County Commissioners in March 2010. A prevalent theme of the most recent update was identifying actions and strategies to address the effects of rapid community growth and development. The Growth Policy notes that "a primary objective of managing growth is to ensure the availability and affordability of infrastructure such as sewer, water, transportation, public safety, health and social services, public lands, parks, and other open spaces, cultural resources, and education. Adequate infrastructure is essential to a healthy, natural, economic, and social environment in Missoula County."

Long-range transportation planning is recognized as one of many important implementation tools for helping to meet the goals and objectives outlined in the Growth Policy.

3.5.2. Missoula Urban Comprehensive Plan: 1998 Update

The *Missoula Urban Comprehensive Plan: 1998 Update*, is a policy document that provides the Missoula County and the City of Missoula and other agencies and districts with a coordinated guide for managing long-term growth and development. The urban area as defined by the Plan includes the Missoula Valley and the Lolo area. The plan recommends the development of planning policies, programs and regulatory tools in response to a "Growth Management Themes Document" for the urban area adopted in 1994 and revised in 1996. The growth management themes, developed by a Growth Management Task Force formed in 1994, are intended to help guide and manage growth in the Missoula urban area and address a range of identified urban growth issues.

Land uses identified in the *Missoula Urban Comprehensive Plan: 1998 Update* for the Maclay Bridge and Target Range area are residential (2 dwelling units per acre) and parks and open space along the Bitterroot and Clark Fork river corridors.

3.5.3. Missoula Urban Fringe Development Area (UFDA) Project

The Missoula OPG Urban Initiatives Division undertook its Urban Fringe Development Area (UFDA) Project during 2007 to provide City and County governments with a regional context for making decisions about residential growth on the edges of the City of Missoula. Growth trends suggest that the Missoula Urban Service Area (URSA) could see as many as 15,000 new residential units by 2030. The Missoula Urban Service Area is the same in geographic extent as the Missoula City Waste Water Service Boundary and includes lands in the City of Missoula and unincorporated Missoula County land. The Target Range Neighborhood lies within the URSA.

The goal of the project was to identify how an estimated 15,000 new residential units can be accommodated within the URSA and develop implementation strategies for addressing growth in accordance with adopted policies applicable to the areas. Four growth scenarios were prepared by OPG to describe the number and locations of anticipated new dwelling units, including already entitled lots. Each scenario presented varying growth plans in fourteen "neighborhoods" within the URSA.

OPG staff ultimately recommended the "Focus Inward Scenario" in response to the Growth Policy goals, public comments and agency input, existing zoning, constrained lands, changing market/demographics, entitled lots, and probable infrastructure investments. In November 2008, the UFDA was adopted as an amendment to the 2005 Missoula County Growth Policy. The amendment includes a map showing the preferred residential development allocation within the URSA. The UFDA study forecasted 400 new residential units in the Target Range neighborhood over the next 20-30 years. OPG provides an annual update of the supporting data in the Urban Fringe Development Area (UFDA) Growth Policy Amendment. The most recent update, distributed in May 2012, provides information about community growth during calendar year 2011 and indicates the following:

For the second consecutive year the number of new residential construction building permits increased within the Urban Services Area (URSA). Only 8 of the 538 new residential building permits were for new dwelling units in Target Range/Orchard Homes subarea within the URSA. Overall, the number of new residential construction building permits inside the URSA during 2011 increased by 1.4%. OPG indicates this is within the expected 1 to 2% Annual Adjusted Growth Rate, based on 50 years of census data.

Subdivision activity within the URSA remained slow. There were no major subdivisions approved in the Target Range/Orchard Homes subarea within the URSA during 2011.[3]

3.5.4. Target Range Neighborhood Plan

Growth Policies may include neighborhood plans as long as the plans are consistent with the Growth Policy. A neighborhood plan is a plan for a geographic area within the boundaries of the jurisdictional area that addresses one or more of the elements of the growth policy in more detail. The Missoula Growth Policy includes the following types of plans – regional, neighborhood, vicinity, and issue plans. These smaller scale plans are developed to be consistent with broader county-wide objectives, but are specific enough to address issues unique to individual neighborhoods.

Residents of the Target Range neighborhood initiated the process of creating a neighborhood plan in late 2008. This citizen-based planning effort, facilitated by the Missoula OPG, resulted in the development of the *Target Range Neighborhood Plan* which was adopted by Missoula County in June 2010. The *Target Range Neighborhood Plan* is intended to:

- Identify and document the neighborhood's values, interests and goals;
- Make recommendations to achieve identified goals and help guide future development;
- Determine the ability of the area to accommodate future growth;
- Identify, preserve and protect the resources most valued by the neighborhood; and
- Establish goals and priorities that will shape the future of the area.

The Residential Development Allocation Map developed through the UFDA project allocates an additional 1000 new dwellings in the combined Target Range and Orchard Homes neighborhoods by the year 2030, with approximately 400 dwellings in the Target Range neighborhood. Using the Institute of Transportation Engineers (ITE) trip generation rate of 9.57 trips per dwelling unit, the addition of 400 dwelling units alone could result in 3,828 additional vehicle trips per day in the Target Range area. The *Target Range Neighborhood Plan* recommends a residential development density of 1 dwelling unit per acre over most of the neighborhood but identifies a density of 2 dwelling units per acre for the area that lies between Clements Road and the Bitterroot River and between Mount and South Avenues.

The neighborhood plan includes a section devoted to transportation infrastructure and emphasizes that efforts should be taken to mitigate growth in motorized traffic while enhancing the traditional lifestyle and safety of citizens living within the Target Range area. The plan advocates the implementation of transportation alternatives that offset potential negative impacts associated with future development, including expansion of the walking and biking paths to reduce the number of miles traveled to improve air quality. Recommendations and strategies are offered on topics such as speed limits and speed zones, development of bike paths and trails, traffic calming, public transit, and intersection improvements.

The plan also includes the Maclay Bridge. The document emphasizes the importance of continued County maintenance of the structure to help preserve access for local and Missoula Valley residents

[3] UFDA Yearbook 2011, released by Missoula OPG on May 16, 2012

seeking recreational opportunities on nearby lands. The *Target Range Neighborhood Plan* does not identify the need for a new bridge.

3.6. Lolo National Forest Plan

Lolo National Forest lands exist south and west of the Bitterroot River. These lands are administered by the U.S. Forest Service (USFS) Missoula Ranger District according to the management direction established in the *1986 Lolo National Forest Plan*. The current Forest Plan indicates the lands are managed for concentrated public use and dispersed recreation opportunities.

The Forest Plan is being revised to reflect new scientific information and natural and social changes that have occurred since its publication. Preliminary USFS documents for the Forest Plan revision show the forest lands in the area may be designated as "Management Area 6.1— High Use Recreation Complexes or Use Areas." Mapping indicates these forest lands are part of the Blue Mountain Recreation Area located southwest of Missoula.

4.0 ROADWAY, BRIDGE AND PHYSICAL CHARACTERISTICS

4.1. Existing Roadway Users

Primary users of the Maclay Bridge consist of local residents from the Target Range and Orchard Homes neighborhoods (east of the Bitterroot River), land owners west of the Bitterroot River, and city and county residents accessing recreational uses along the Bitterroot River and USFS lands. Additionally, the Maclay Bridge is used by pedestrians, bicyclists, emergency response providers, and school buses.

4.2. Existing Traffic Data

Historic traffic data for area roadways was obtained from MDT's Bureau of Data & Statistics. **Table 5** shows the most recent 20 years of traffic data for two count stations in the area: one located on River Pines Road just west of the Maclay Bridge and one located on North Avenue just west of Clements Road. The traffic data in **Table 5** is representative of the average annual daily traffic (AADT) volume, in vehicles per day (vpd). AADT volumes account for seasonal and daily travel variations and represent an average number of vehicles to be expected on an average day over the course of a year. The AADT volume is based on adjustments from the ADT (Average Daily Traffic) volume which is a traffic count taken at a specific location during a time period greater than one day but less than 365 days.

Table 5: Average Annual Daily Traffic

Street	Location	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
River Pines Rd	300 ft W of Maclay Bridge	1610	1580	1840	2060	2190	2230	(a)	(a)	(a)	2230
North Ave	300 ft W of Clements Rd	1610	(a)	2200	(a)	1960	(a)	1980	(a)	1790	(a)

Street	Location	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
River Pines Rd	300 ft W of Maclay Bridge	2300	2060	2300	2130	2410	2460	(a)	2380	2610	2360
North Ave	300 ft W of Clements Rd	1660	(a)	2010	(a)	2140	(a)	(a)	(a)	2000	(a)

Source: MDT Data and Statistics Bureau, Traffic Data Collection Section, 2012
(a) Data unavailable

Table 5 shows the 2010 AADT volumes are 2,610 vpd (on River Pines Road) and 2,000 vpd (on North Avenue. The year 2010 is the most recent year for which traffic count data is available for both locations shown in **Table 5**. Based on field observations, the majority of traffic is automobiles accessing either adjacent properties or recreational destinations on the west side of the Bitterroot River. The area

roadways are also used by school buses and emergency response vehicles. Vehicles traveling along these two roadways currently do not experience vehicle delay or congestion. However, at the single-lane Maclay Bridge, there can be some delay associated with vehicles waiting to cross the structure. Field observations have shown this delay to take up to 30 seconds during peak hour periods. Delay times will increase with future traffic projections. Travel routes to reach the Maclay Bridge include a network of various local and collector roadways. These include South Avenue, Clements Road, Woodlawn Avenue, North Avenue, and River Pines Road.

Subsequent to the second informational meeting held on July 10, 2012, it was decided to collect additional traffic data on River Pines Road to get an idea of when the hourly peak traffic volumes occur. Missoula County placed automatic hose counters on River Pines Road, just west of the Maclay Bridge, to collect hourly traffic volumes by time of day and by direction. The counter was set up to collect data on Wednesday, October 3, 2012. The peak twelve hours of data, by direction, is shown below in **Table 6**. These are raw traffic volumes in that no adjustments to the data were made for time of week, month of year, etc. **Appendix D** contains the raw data output file.

Table 6: River Pines Road Hourly Traffic Volumes – Twelve Hour Period (10/03/2012)

Time Period	Southbound Traffic Volume (vph)	Northbound Traffic Volume (vph)	Total Hourly Traffic Volume (vph)
7-8 AM	19	151	170
8-9 AM	50	91	141
9-10 AM	31	66	97
10-11 AM	47	58	105
11 AM - NOON	48	64	112
NOON - 1 PM	66	55	121
1 - 2 PM	57	32	89
2 - 3 PM	58	64	122
3 - 4 PM	115	52	167
4 - 5 PM	127	64	191
5 - 6 PM	143	95	238
6 - 7 PM	127	54	181
7 - 8 PM	73	47	120

Source: Missoula County Public Works Department.

4.3. Future Traffic Projections

Projected transportation conditions were analyzed to estimate how traffic volumes and transportation characteristics may change compared to existing conditions. The analysis was based on existing volumes projected out to the year 2040. Two methods were examined. The first method analyzed historic traffic counts from the most recent 20-year period to arrive at an average annual growth rate (AAGR) that could be used to project traffic volumes forward. The second relied on the adopted *TransCad* travel demand model used by the Missoula County OPG and MDT. The *TransCad* model incorporates land use planning found within the Missoula County Growth Policy, including zoning, and also reflects the preferred growth scenario found within the Urban Fringe Development Area (UFDA). Additionally, the *TransCad* model is the tool utilized for the Missoula Area Transportation Plan (2008 and 2012 Updates). Both methods are explained in further detail below.

4.3.1. Historic Traffic Growth Rates

Historic traffic data was analyzed to determine traffic growth patterns near the Maclay Bridge. AAGR's were calculated at known traffic count locations. As is evident from **Table 5**, traffic volumes have fluctuated along River Pines Road and North Avenue. For the purposes of projecting traffic growth, AAGR's were calculated for each count site based on the most recent 20 years of traffic data. In addition to the AAGR's, **Table 7** shows year 2030 and 2040 AADT projections at the two traffic count sites.

Table 7: Historic Traffic Growth Rates and Projected AADT (Straight-line)

Road	Location	2010 AADT	AAGR (1992 - 2011)	Projected 2030 AADT [(a)]	Projected 2040 AADT [(a)]
River Pines Rd	300 ft W of Maclay Bridge	2610	1.88%	3,800	4,550
North Ave	300 ft W of Clements Rd	2000	0.51%	2,200	2,350

Source: MDT Data and Statistics Bureau, Traffic Data Collection Section, 2012.
[(a)] Projected AADT's rounded to nearest 50 vpd.

4.3.2. Future Traffic Modeling

A Travel Demand Model (TDM) was utilized as a tool to help predict future traffic growth. The TDM was developed using year 2010 information to determine baseline conditions. Estimated future land use was applied to the model to project year 2040 conditions.

For the purposes of this study, a percent difference in year 2010 and year 2040 traffic volumes from the TDM was calculated to determine a percent growth rate at various locations. Year 2010 and year 2040 TDM traffic volumes are a product of intensive land use and transportation planning exercises that are undertaken by the Missoula County OPG via regular planning exercises. The TDM model is the best tool for forecasting potential traffic given land use plans and the transportation network. However model traffic volumes cannot be construed as being 100 percent accurate. Standard practice is to calculate the percent difference in the model, and apply that percentage to actual, known traffic volumes on the transportation system. Accordingly, the percent growth rate at various locations from the TDM was applied to known AADT traffic count locations to project 2040 AADT values. **Table 8** provides a summary of traffic count locations within the study analysis area. These results are also shown graphically in **Figure 3**.

The results provided in **Table 8** and **Figure 3** differ from earlier results presented to the public at the second informational meeting held on July 10, 2012. At the second informational meeting, the results of the TransCad travel demand model were questioned as some members of the public believed the land use inputs did not represent the adopted land use strategies in place through Missoula County planning documents. Accordingly, the TransCad model input, and corresponding output, was further reviewed by Missoula County and MDT and updated. The model results shown in **Table 8** and **Figure 3** are from the most current TransCad model that is being used - not only for this planning study, but also the regional transportation plan update currently in process by Missoula OPG.

Table 8: 2040 AADT Traffic Modeling Projections

Street	Location	2010 AADT	2010 TDM	2040 TDM	TDM % Diff	Projected 2040 AADT [a]
Big Flat Rd	100 ft W of O'Brian Ck Rd	1,870	2,199	7,691	249.7%	6,550
Blue Mountain Rd	500 ft N of Hwy 93	2,360	2,628	6,091	131.8%	5,450
Blue Mountain Rd	S of South Side Rd	1,370	1,674	5,346	219.4%	4,400
Brooks St	Bitterroot River Bridge	26,530	26,157	45,368	73.4%	46,000
Clements Rd	300 ft N of North Av	3,140	2,615	4,914	87.9%	5,900
Clements Rd	300 ft S of North Av	2,750	1,811	2,549	40.8%	3,850
Clements Rd	500 ft S of S 3rd W	2,350	1,914	3,677	92.1%	4,500
Kona Ranch Rd	Kona Ranch Bridge	[b]	1,723	6,471	275.6%	[b]
Mullan Rd	E of Snowdrift Ln	3,950	4,284	9,870	130.4%	9,100
North Av	300 ft W of Clements Rd	2,000	1,318	3,118	136.6%	4,750
Reserve St	Between Dearborn & South Av	33,580	32,617	45,425	39.3%	46,750
Reserve St	Between Olofson Dr & S 3rd W	38,010	38,985	51,443	32.0%	50,150
Reserve St	Between South Av & Central Av	36,740	36,953	47,510	28.6%	47,250
Reserve St	S of Larkenwood Dr	37,930	39,255	52,411	33.5%	50,650
River Pines Rd	300 ft W of Maclay Bridge	2,610	2,779	6,039	117.3%	5,650
S 3rd W	W of Reserve	7,620	6,690	11,596	73.3%	13,200
S 7th W	150 ft W of Reserve	1,320	1,901	4,664	145.3%	3,250
S 7th W	300 ft E of Clements Rd	350	345	699	102.6%	700
South Av	Between 31st and 33rd	6,610	6,491	8,187	26.1%	8,350
South Av	Between Humble & Pleasant	1,770	2,210	3,638	64.6%	2,900
South Av	Between Reserve & 26th	15,010	14,914	16,255	9.0%	16,350
South Av	E of Clements Rd	4,350	4,952	6,141	24.0%	5,400
South Av	W of Clements Rd	4,710	5,379	7,453	38.6%	6,550
Spurgin Rd	250 ft W of Reserve	2,000	2,401	3,086	28.5%	2,550
Spurgin Rd	300 ft E of Clements Rd	980	1,033	1,285	24.4%	1,200

Source: MDT Multi Modal Planning Bureau, Statewide & Urban Planning Section, 2012; Missoula Office of Planning and Grants, Transportation Division.

[a] Projected AADT's rounded to nearest 50 vpd.

[b] Data unavailable

Both projection methods yield different results. For example, for a straight-line growth based on historical data for 20 years (see **Table 7**), the count location just west of the Maclay Bridge (i.e. River Pines Road) yields a future year 2040 estimated AADT of 4,550 vpd, while the *TransCad* travel demand model (**Table 8**) yields a future year 2040 estimated AADT of 5,650 vpd. The North Avenue count location yields an estimated AADT of 2,350 vpd as compared to a *TransCad* estimated AADT value of 4,750 vpd.

For planning purposes, the *TransCad* travel demand model was used for future year projections and improvement option analysis. The *TransCad* model incorporates land use planning found within the Missoula County Growth Policy, including zoning, and also reflects the preferred growth scenario found within the Urban Fringe Development Area (UFDA). Additionally, the *TransCad* model is the tool utilized for the Missoula Area Transportation Plan (2008 and 2012 Updates). The *TransCad* model utilizes existing housing and employment data, with the existing transportation network, to represent the "built environment" found within the area.

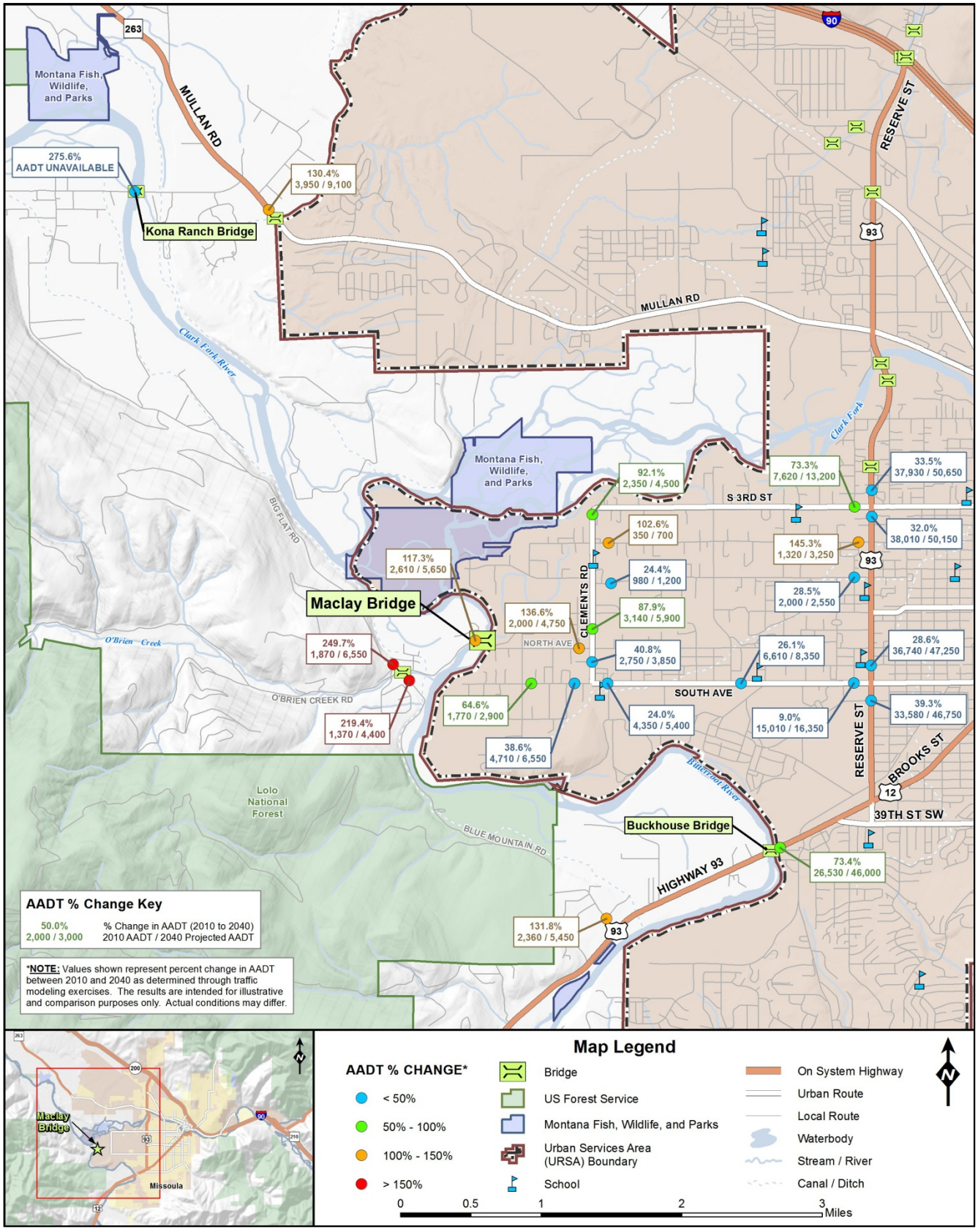


Figure 3: Percent Change in AADT

4.4. CRASH ANALYSIS

The MDT Traffic and Safety Bureau provided crash data for the ten-year period from January 1, 2002 to December 31, 2011. The crash data was provided for the following locations:

- Township 13 North, Range 20 West, Section 26 (T13N R20W S26)
- Township 13 North, Range 20 West, Section 27 (T13N R20W S27)
- Township 13 North, Range 20 West, Section 34 (T13N R20W S34)
- Township 13 North, Range 20 West, Section 35 (T13N R20W S35)

According to the MDT crash database, there were 131 total crashes reported within these identified locations during the ten-year time period. Reportable crashes are defined as those with a fatality, an injury, or property damage only with a minimum of $1,000 in damages.

As part of the crash analysis, crash investigation reports were reviewed to help identify specific locations and contributing factors. Based on the information provided in the crash reports, trends and contributing factors for the crashes, along with characteristics of the drivers and vehicles involved, were identified. The information and analysis provided herein is a summary of the data as contained in the reports.

A location map of the reported crashes is shown in **Figure 4**. Based on the crash data, a number of crash clusters and trends were identified and are discussed further below. The crash trends and locations presented below comprise a total of 95 of the 131 reported crashes. The remaining crashes are scattered throughout the four sections of land queried for crashes.

BIG FLAT ROAD

Six crashes were reported along Big Flat Road at or near the horizontal curve located approximately 0.15 miles northwest of the intersection with River Pines Road. All 6 involved single vehicles with 5 occurring during “dark not lit” conditions and two resulting in injuries. The most common contributing circumstance for the crashes was driving too fast for conditions.

BLUE MOUNTAIN ROAD

Blue Mountain Road had two separate crash clusters noted within the analysis area. A crash cluster was noted approximately 0.3 miles south of the intersection with River Pines Road along a sharp horizontal curve. A total of 16 crashes were reported at this location. Of the 16 crashes, 15 involved a single vehicle. Five crashes resulted in a total of 10 injuries. Eight crashes occurred during “dark not lit” conditions. The most common contributing circumstances reported were driving too fast for conditions and careless driving. In addition, alcohol was listed as a contributing factor in 4 crashes. As noted previously in **Section 1** of this report, MDT currently has a planned safety project for this location to address the identified crash trends.

A second crash cluster was noted along the horizontal curves located approximately 0.5 to 0.9 miles south of the intersection with River Pines Road. There were 13 reported crashes along the 0.4 mile segment of Blue Mountain Road. All 13 crashes were single-vehicle crashes with 4 occurring during “dark not lit” conditions. Two crashes resulted in a total of two injuries. Driving too fast for conditions and/or careless driving were listed as the most common contributing circumstances. Alcohol was a contributing factor in 4 of the crashes in this cluster.

NORTH AVENUE

There were 12 crashes reported along the 0.25 mile segment of North Avenue between Humble Road and the Maclay Bridge. Seven of the 12 crashes involved more than one vehicle. The most common contributing circumstances were inattentive driving and failure to yield. Alcohol was listed as a factor in one crash.

RIVER PINES DRIVE

A total of 18 crashes were reported between Maclay Bridge and Riverside Drive. These crashes resulted in a total of 12 injuries. Of the 18 crashes, 12 occurred under "dark not lit" conditions and three involved multiple vehicles. Alcohol involvement was a factor in 8 of the 18 crashes. Inattentive driving, driving too fast for conditions, and careless driving were other common contributing circumstances for crashes occurring in this area of River Pines Drive. In addition, a "head-on" crash was located in this area. As noted previously in **Section 1** of this report, MDT currently has a planned safety project for this location to address the identified crash trends.

A second crash cluster was noted along the horizontal curves located approximately 0.15 to 0.30 miles southwest of the intersection with Riverside Drive. Eight crashes were reported along the 0.15 mile stretch of River Pines Drive, 3 of which occurred under "dark not lit" conditions. Seven of the 8 reported crashes involved a single vehicle and none of the crashes resulted in injuries. Careless driving and driving too fast for conditions were the most common contributing circumstances. Alcohol involvement was a contributing factor in 1 crash at this location.

Another crash cluster was noted between the intersection with Big Flat Road and the sharp horizontal curve located approximately 0.25 miles east of Big Flat Road. A total of 12 crashes were reported at this location, eight of which involved a single vehicle. Five crashes occurred under "dark not lit" conditions. Three crashes resulted in a total of 4 injuries. Alcohol involvement was a factor in 5 of the 12 crashes. Careless driving and driving too fast for conditions were the most common contributing circumstances.

SOUTH AVENUE

A crash cluster was noted along South Avenue between the intersections with Pauline Drive and Woodlawn Avenue. Ten crashes were reported here, with 7 occurring under "dark not lit" conditions. Eight of the 10 reported crashes involved a single vehicle, while 4 crashes resulted in a total of 5 injuries Alcohol was a contributing factor in 4 crashes.

4.4.1. Identifiable Crash Trends and Areas of Concern

A number of crash trends and areas of concern were identified within the crash analysis area. The following crash trends and areas of concern were identified based on MDT-supplied crash data and field investigators reports:

- Big Flat Road
    - Single vehicle crashes along the horizontal curve approximately 0.15 miles north of the intersection with River Pines Road.
- Blue Mountain Road
    - Single vehicle crashes along the sharp horizontal curve approximately 0.3 miles south of the intersection with River Pines Road.
    - Single vehicle crashes along the horizontal curves located approximately 0.5 to 0.9 miles south of the intersection with River Pines Road.
- North Avenue
    - Crashes with inattentive driving and failure to yield listed as contributing circumstances between Humble Road and the Maclay Bridge.

- River Pines Drive
    - Single vehicle crashes at or near the intersection with Riverside Drive under “dark not lit” conditions.
    - Single vehicle crashes along the horizontal curves located approximately 0.15 to 0.30 miles southwest of the intersection with Riverside Drive.
    - Crashes between the intersection with Big Flat Road and the sharp horizontal curve located approximately 0.25 miles east of Big Flat Road.
- South Avenue
    - Single vehicle crashes between the intersections with Pauline Drive and Woodlawn Avenue under “dark not lit” conditions.

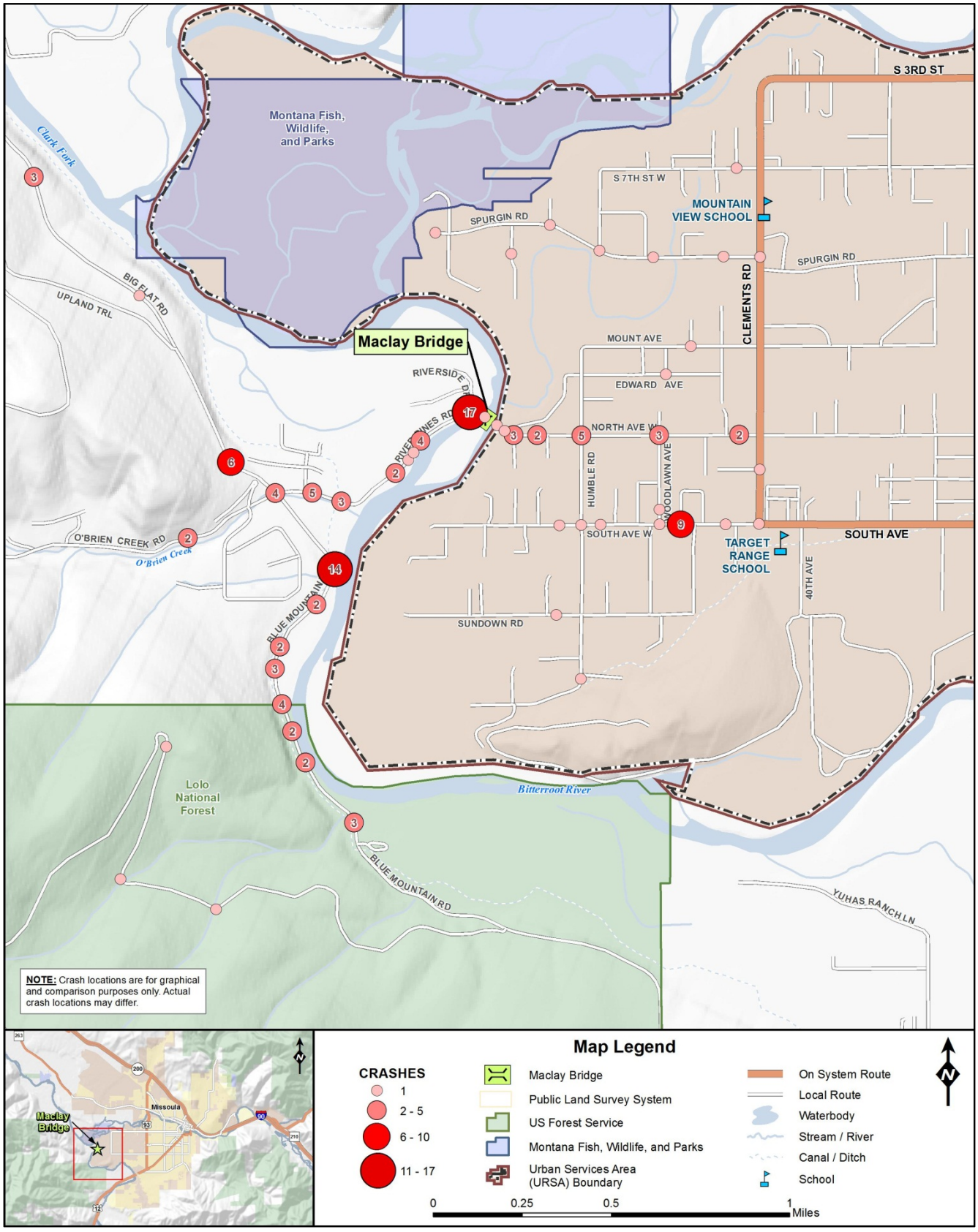


Figure 4: Crash Locations (01/01/2002 – 12/31/2011)

4.5. Existing Travel Times

A "travel time" evaluation was conducted to determine the approximate time it would take to travel within the Maclay Bridge area. The travel time evaluation was completed during the middle of a weekday, during off-peak travel hours. Although this evaluation was performed under "normal" driving conditions in a private automobile, it is acknowledged that in an emergency response situation that responders may likely travel faster and have the ability to "pre-empt" traffic signals on certain roadways. Although there are no traffic signals in the immediate vicinity of the Maclay Bridge area, for purposes of alternate routes traffic signals may influence travel times. Travel times along three distinct routes from east of the Bitterroot River to the intersection of Big Flat Road/Blue Mountain Road/O'Brien Creek Road/River Pines Road were calculated. Each route crossed the Bitterroot River using one of three crossings: the Maclay Bridge, the Kona Ranch Bridge, or the Buckhouse Bridge.

The three origins that were identified for this analysis included the following:

- Missoula Rural Fire Station #1 – Located on South Avenue
- Community Medical Center – Located on South Avenue
- Missoula Rural Fire Station #6 – Located on Mullan Road

Table 9 shows the travel times from these origins to the intersection of Big Flat Road/Blue Mountain Road/O'Brien Creek Road/River Pines Road using the three routes that cross the Bitterroot River on a typical weekday. Trips to and from each location were performed to help establish typical travel times.

Table 9: Travel Time Evaluation

Route [a]	Maclay Bridge		Kona Bridge		Buckhouse Bridge	
	Baseline Travel Time	Distance Travelled	Additional Travel Time if Maclay Bridge Out of Service	Distance Travelled	Additional Travel Time if Maclay Bridge Out of Service	Distance Travelled
Fire Station #1 to/from Intersection	6.52 minutes	3.65 miles	17.64 minutes	13.74 miles	3.36 minutes	5.87 miles
Community Medical Hospital to/from Intersection	6.17 minutes	3.41 miles	18.58 minutes	13.98 miles	4.47 minutes	6.11 miles
Fire Station #6 to/from intersection	19.61 minutes	10.05 miles	(8.09 minutes) [b]	7.34 miles	2.62 minutes	12.14 miles

Source: RPA field data collection during normal weekday, off-peak hours.
[a] Each route was driven once in each direction, and results were averaged to arrive at noted travel time.
[b] Travel time is reduced by 8.09 minutes from baseline travel time measurement.

The table shows if the Maclay Bridge is inaccessible, the time it would take to reach the intersection of Big Flat Road/Blue Mountain Road/O'Brien Creek Road from most of the locations of interest increases. For example, if the Maclay Bridge was out of service, it would be expected to take approximately 18.58 minutes longer using the Kona Bridge or 4.47 minutes longer using the Buckhouse Bridge when travelling between Community Medical Hospital and the subject intersection. In terms of emergency service, this means that travel times would likely be longer if the Maclay Bridge is out of service. During the field work, it was noted that many intersections located on Reserve Street are large, with traffic and congestion on Reserve Street increasing during the daytime business hours. This may cause an even greater delay for the emergency respondents needing to access the intersection using a route that includes Reserve Street. Comments provided by the Missoula Rural Fire Department state that 5 minutes or more are added to their response times when using the Buckhouse Bridge in lieu of the Maclay Bridge.

4.6. Design Standards

Design standards are an important consideration when assessing existing areas of concern, as well as for planning new infrastructure. Depending on funding source, different sets of design standards may be applicable to the Maclay Bridge. One set of standards are the design standards in place by Missoula County. These standards are found via the Missoula County *Public Works Manual 2010*, and set forth road design considerations for various roadway classifications. **Table 10** depicts the roadway design considerations adopted by Missoula County, along with select subdivision standards that establish minimum surface widths for various road classifications. According to the data in **Table 10**, a collector roadway built to Missoula County standards would have a surface width of 44 feet. The County's standards for collector roadways were used as a basis to evaluate existing design concerns on River Pines Road and North Avenue in section 4.7. Vertical grades and horizontal curvature were of primary importance in evaluating consistency with design standards.

Roadway functional classifications are typically defined as arterials, collector routes and local streets. These road types can apply to both an urban and a rural area, with slight modifications. Missoula County defines roads within their jurisdiction as presented in the Missoula County *Public Works Manual*. For the roadway classifications found within the immediate vicinity of the Maclay Bridge, the following definitions apply:

- **Arterial** – A street or road having the primary function of moving traffic and the secondary function of providing access to adjacent land. Arterials generally carry relatively large volumes of traffic. Characteristics of an arterial are two to four lanes of traffic with limited access to abutting property.
- **Collector** – A street or road having the equally important functions of moving traffic and providing access to adjacent land. General characteristics of collector streets are two traffic lanes and two parking lanes serving more than 200 lots. Residential collectors serve only residential neighborhoods; non-residential collectors serve other land uses.
- **Minor Collector** – A street or road having the equally important functions of moving traffic and providing access to adjacent land. General characteristics of collector streets are two traffic lanes and one or two parking lanes serving between 40 and 199 lots.
- **Local Streets** – A street or road having the primary function of serving abutting properties and the secondary function of moving traffic. Local streets generally consist of two traffic lanes, may include one or two parking lanes and provide access to abutting properties. Local streets shall be designed to discourage future use as collector streets. Residential local streets serve individual residential areas; non-residential local streets serve nonresidential land uses.

It is also important to note there is a difference between a facility's design speed and its operating speed. The design speed is a selected speed used to determine the various geometric design features of the roadway. The operating speed is the highest overall speed at which a driver can travel on a given section of roadway under favorable weather conditions and under prevailing traffic conditions without at any time exceeding the safe speed as determined by the design speed. The operating speed is different than the posted speed. Posted speed limits are typically accomplished by measuring the speeds at which 85 percent of the drivers are travelling at or below, and signing for that speed within 5 mph of the result. This is typically referred to as the 85th percentile speed. Posted speeds are commonly set at 25 mph on local urban roads.

Table 10: Missoula County Roadway Design Considerations

Design Parameter	Road Classification			
	Local	Minor Collector	Collector	Arterial
Design Speed (mph)	25-35	25-35	25-45	35-55
Maximum Vertical Grade (%)	10	8	6	6
Minimum Horizontal Curve Radius (ft)	150	200	525	900
Return Radius Between Intersecting Streets [(a)] (ft)	25	35	50	50
Horizontal Clearance (ft)	20	20	20	20
Vertical Clearance (ft)	14	14	14	14
Surface Width (ft)	24-32	32	44	44
Right-of-Way Width (ft)	40-60	60-70	60-80	60-80

Source: Table 6.1, "Road Design Considerations" and Table 6.2, "Minimum Surface Widths Required for Road Improvements", Missoula County Public Works Manual, 2010
[(a)] Based on road with higher classification

AASHTO design standards may be applicable since Missoula County does not have any specific "bridge related" standards to measure against. AASHTO bridge width standards allow a single-lane bridge only for very low volume roads in which traffic is less than 100 vpd. In those cases, the minimum single-lane bridge width must be no less than 15 feet in width (see AASHTO's *Guidelines for Geometric Design of Very Low-Volume Local Roads, 2001*). Since existing, and projected traffic volumes, are much higher than this threshold (2,610/5,650 respectively), applicable AASHTO design standards are found in AASHTO's *A Policy on Geometric Design of Highways and Streets, 2011*. For "local" and "collector" road classifications, the minimum clear width for a bridge carrying over 2,000 vpd is equal to 30 feet (two 12-foot driving lanes plus 3-foot shoulders on each side).

An additional set of design standards, and those that may be considered in design if Federal or State funds were used for any type of project identified through this planning effort, are the standards and guidelines found in MDT's *Road Design Manual (*RDM*)*. The RDM specifies general design principles and controls which determine the overall operational characteristics of the roadway and enhance the aesthetic appearance of the roadway. If a new bridge results from the study, either at its present location or an alternate location, it would connect to roadways currently classified as rural roads or streets. The RDM geometric design criteria would be reviewed in the context of the adjacent land use, topography, and function, and compared to existing Missoula County design criteria.

Using the National Bridge Inspection (NBI) Coding Guide, the minimum bridge "curb-to-curb" width needed to eliminate the "Functionally Obsolete" designation is 28 feet and applies to an ADT range of 2,001 to 5,000 vpd. If the bridge length is greater than 200 feet, then the 28 feet width could be applied to an ADT greater than 5,000 vpd. The 28 feet would allow for two 12-foot lanes, and a 2-foot shoulder on each side. Accordingly, it is likely that the minimum bridge width, "curb-to-curb", would need to be at least 28 feet.

For most "off-system" locations such as the Maclay Bridge (i.e. not on a State-highway), local conditions and context to the surrounding land uses would be considered in developing geometric features such as road width, acceptable curves, and the need for non-motorized facilities.

4.7. Roadway Geometrics

Existing roadway geometrics were evaluated and compared to current Missoula County standards. The analysis was conducted based on a review of public information, bridge drawings, Geographic Information Systems (GIS) data, and field observations. As-built drawings for area roadways were not available. As such, a field review was conducted in April 2012 to confirm and supplement information, as

well as to identify additional areas of concern within the Maclay Bridge area. **Appendix A** provides a log of some of the photos taken during the field review.

4.7.1. Horizontal Alignment

Elements comprising horizontal alignment include curvature, superelevation (i.e. the "bank" on the road), and sight distance. These horizontal alignment elements influence traffic operation and safety. As mentioned in section 4.6, Missoula County roadway standards for a collector roadway were used as a basis to evaluate existing design concerns along River Pines Road and North Avenue. Missoula County's standards for horizontal curves are defined in terms of curve radius, and for a collector roadway, the minimum required radius is 525 feet.

Horizontal curve radii were evaluated based on field review and aerial photography. Three horizontal curves were identified that do not meet current Missoula County standards. These three curves also do not meet current MDT design standards. **Table 11** provides a summary of the three substandard horizontal curves. The presence of sub-standard curvature may contribute to crash numbers and severity.

Table 11: Horizontal Alignment Areas of Concern

Location		Feature	Value [(a)]	Standard
North Ave W / Edward Ave Intersection	450' SE of Maclay Bridge	Horizontal Curve	175'	525'
River Pines Rd / Riverside Dr	50' NW of Maclay Bridge	Horizontal Curve	125'	525'
River Pines Rd	2300' SW of Maclay Bridge	Horizontal Curve	125'	525'

[(a)] Estimated based on aerial photography

4.7.2. Vertical Alignment

Vertical alignment is a measure of elevation change of a roadway. The length and steepness of grades directly affects the operational characteristics of the roadway. In addition, the available stopping sight distance (SSD) for the vertical alignment, and specifically the vertical curvature, also directly affects the operational characteristics of the roadway.

Missoula County roadway standards for a collector roadway define a maximum allowable vertical grade of 6.0 percent. As-built drawings were not available for River Pines Road or North Avenue, thus field observations were made and noted pertinent to vertical grades. Both roadways connecting to the Maclay Bridge were estimated to have grades that do not exceed the Missoula County standard of 6.0 percent for a collector roadway or the current MDT design standards.

4.7.3. Roadside Clear Zone

The roadside clear zone, starting at the edge of the traveled way, is the total roadside border area available for safe use by errant vehicles. This area may consist of a shoulder, a recoverable slope, a non-recoverable slope, and/or recovery area. The desired clear zone width varies depending on traffic volumes, speeds, and roadside geometry. Clear zones are evaluated individually based on the roadside cross section.

Clear zones should be attained by removing or shielding obstacles if costs are reasonable. In certain instances, it may be impractical to protect or remove certain obstacles within the clear zone. As improvement options develop, roadside clear zones should be designated, to a practical extent, to meet current design standards to improve safety deficiencies to reduce the likelihood of crashes. The presence of unshielded obstacles and/or non-recoverable slopes may contribute to crash numbers and severity.

Within the area, there were locations identified that do not meet the Missoula County horizontal clearance requirement as listed in **Table 10** for a collector roadway. The most notable area is located along River Pines Road, just southwest of the existing bridge. At this location, the top of roadway fill slope is between 2 and 4 feet from the edge of the travel lane. In addition, trees and utility poles are found within this area. The roadway fill slope in this area is steep and lined with riprap to the river.

4.8. Bridge Considerations

The dominant transportation feature located within the study area is the Maclay Bridge. It has been the subject of past technical and planning level analysis, and was analyzed in detail during the development of the 1994 Maclay Bridge Site Selection Study EA. **Table 12** shows the bridge number, date of most recent inspection, type, size, and year constructed (or reconstructed). A copy of the most recent Bridge Inspection Report completed by MDT is included in **Appendix B**. **Table 13** presents both the operating and inventory rating load for the structure, correlated to different truck sizes. Design loads are expressed in metric tons (mton), which represents the total mass of the entire vehicle, while ratings are expressed in tons, which is more common for posting.

Table 12: Bridge Location and Type

Number	Structure Name	Date of Last Inspection	Type of Bridge (Dimensions)	Year Constructed (Reconstructed)	Waterbody Traversed
L32101000+01001	Maclay Bridge	10/31/2011	4-span structure (16' wide x 346' long)	1935 (1964)	Bitterroot River

Source: MDT Bridge Management System, 2012

The three rating vehicles include Type 3 (single truck), Type 3-S3 (semi-truck and trailer) and Type 3-3 (truck and "pup"). **Figure 5** shows truck schematics for the three rating vehicles. For a short-span bridge such as the Maclay Bridge, the Type 3 (single truck) vehicle would be the likely unit for design purposes.

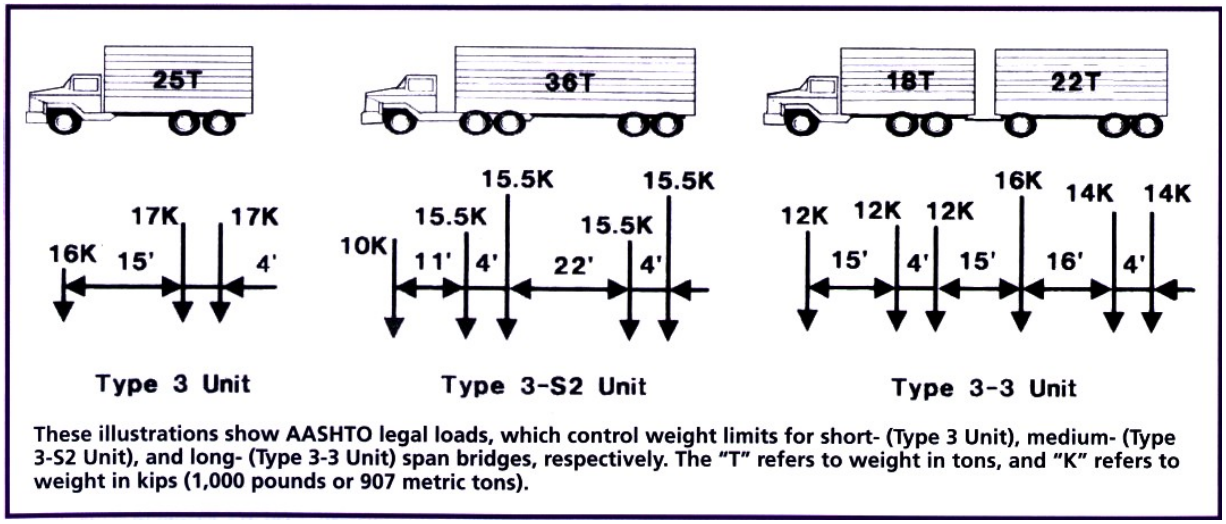


Figure 5: Typical Rating Vehicles for Bridge Design

Table 13: Bridge Design Loads and Ratings

Rating / Truck Type	Maclay Bridge
Operating Load (Design)	**(20.9 mton)**
Truck 1 Type 3 [(a)] Rating	*19 ton*
Truck 2 Type 3-S3 Rating	*29 ton*
Truck 3 Type 3-3 Rating	*37 ton*
Inventory Load (Design)	**(12.7 mton)**
Truck 1 Type 3 [(a)] Rating	*11 ton*
Truck 2 Type 3-S3 Rating	*17 ton*
Truck 3 Type 3-3 Rating	*22 ton*

Source: MDT Bridge Management System, 2012

[(a)] Posted at 11 tons

- The operating rating defines the absolute maximum permissible load level to which the structure may be subjected for the vehicle type used in the rating. This rating determines the capacity of the bridge for occasional use. Allowing unlimited numbers of vehicles at the operating level will compromise the bridge life.

- The inventory rating defines the load level which can safely use an existing structure for an indefinite period of time.

- The posting rating results in a load level which may safely use an existing structure on a routine basis for a limited period of time. When a bridge is not able to safely carry the loads allowed, it is posted for its inventory rating.

Since the 2011 Bridge Inspection Report was prepared, there has been further analysis of the bridge that resulted in the posted load limit being reduced from 14 tons to 11 tons. This reduction was based on analysis by MDT engineers. The two primary vehicles impacted by this reduction are school buses and fire trucks. School buses are generally within the 11 ton limit, as they weigh approximately 19,000 pounds when empty and 22,000 pounds when loaded. Fully loaded school buses are near or at the 11 tons limit. School buses are thus allowed across the bridge, as long as they do not exceed the posted 15 mph speed limit.

An agreement exists that allows the local rural fire department to operate their Type I fire engines (i.e. overweight vehicles) across the bridge, as long as they straddle the centerline of the bridge and travel no more than 5 mph.

The 2011 Bridge Inspection Report also noted some areas of concern related to a variety of bridge features. Some of these are reiterated below (see **Appendix B** for further detail).

- Transverse cracking in deck asphalt surfacing;
- Paint loss and rusting on various features, such as floor beams, bottom chords, and steel stringers;
- Minor cracking and spalling on concrete pier wall and abutments; and
- Moveable roller bearings are not functional and are out of alignment.

Residents reaffirmed those findings during the public process and RPA staff reviewed these areas of concern in the filed for validity. These areas of concern are listed below (select photographs of some of these concerns are included in **Appendix A)**.

- The current structure exhibits spalling and cracked concrete and exposed rebar;
- Rust and steel pitting is observed under the bridge on some load bearing members and the deck;
- The bridge is a composite of varying ages and types of load-bearing steel used throughout the structure; and
- The strength of the steel is unknown in much of the bridge, as it has never been tested.

4.8.1. Sufficiency Rating

An important consideration in the evaluation of roadway bridges is the sufficiency rating associated with the structure. The sufficiency rating formula is the industry standard of evaluating highway bridge data to obtain a numeric value indicating the sufficiency of the bridge to remain in service. The sufficiency rating is expressed by a value ranging from 0 to 100 with 100 being an entirely sufficient bridge and 0 being an entirely deficient bridge. To receive funding through the Off-System Bridge Program, structures must be classified as "Structurally Deficient" or "Functionally Obsolete" and have a sufficiency rating of 80 or below. Structures with a sufficiency rating of 0 to 49.9 are eligible for replacement, and structures at 50 to 80 are eligible for rehabilitation unless otherwise approved for replacement by the FHWA. The following criteria determine whether or not a structure is structurally deficient or functionally obsolete:

STRUCTURALLY DEFICIENT

A condition of 4 or less for any of the following:

- Deck Rating
- Superstructure Rating
- Substructure Rating

Or, an appraisal of 2 or less for the following:

- Structure Rating
- Waterway Adequacy

FUNCTIONALLY OBSOLETE

An appraisal of 3 or less for the following:

- Deck Geometry
- Under Clearance
- Approach Roadway Alignment

Or, an appraisal of 3 for the following:

- Structure Rating
- Waterway Adequacy

According to the National Bridge Inspection Standards (NBIS), condition ratings are used to describe an existing bridge compared with its condition if it were new. The ratings are based on the materials, physical condition of the deck (riding surface), the superstructure (supports immediately beneath the driving surface), and the substructures (foundation and supporting posts and piers). General condition ratings range from 0 (failed condition) to 9 (excellent condition). This differs from appraisal ratings, which are usually done in the office where access to all necessary information and specifications is available, and consider the field condition, waterway adequacy, geometric and safety configurations, structural evaluation, and safe load capacity of the bridge.

Based on the most recent Bridge Inspection Report, the Maclay Bridge was determined to be functionally obsolete, but not structurally deficient. Its sufficiency rating is calculated to be 27.3, which is less than 49.9, thereby making the bridge eligible for replacement.

A functionally obsolete bridge is one that was built to standards that are not used today. Functionally obsolete bridges are those that do not have adequate lane widths, shoulder widths, or vertical clearances to serve current traffic demand, or those that may be occasionally flooded. Functionally obsolete bridges are not automatically rated as structurally deficient, nor are they inherently unsafe. American Association of State Highway Transportation Officials (AASHTO) standards specify single-lane bridges are appropriate on routes with AADT volumes less than 50 vpd. For the Maclay Bridge, the appraisal values for the "Deck Geometry" and the "Approach Roadway Alignment" are such that the bridge is categorized as being functionally obsolete. This is based on the single-lane width of the bridge being sub-standard for the current traffic volumes, and the sub-standard curves on both approaches to the bridge.

Table 14 shows the sufficiency rating for the Maclay Bridge. For the "Under Clearance" criteria, a notation of "N" means that the structure does not pass over a highway or railroad and is not relevant to the functionally obsolete sufficiency rating criteria. Off-system bridge data statewide suggests that 98.3 percent of all off-system bridges have a sufficiency rating higher than the Maclay Bridge health index.

Table 14: Bridge Sufficiency Rating for Maclay Bridge

Criteria		Maclay Bridge
Structurally Deficiency Sufficiency Rating Criteria		
Deck Rating	≤ 4	6
Superstructure Rating	≤ 4	6
Substructure Rating	≤ 4	5
Structure Rating	≤ 2	4
Waterway Adequacy	≤ 2	8
Functionally Obsolete Sufficiency Rating Criteria		
Structure Rating	3	4
Deck Geometry	≤ 3	3
Under Clearance	≤ 3	N
Waterway Adequacy	3	8
Approach Roadway Alignment	≤ 3	3
Sufficiency Rating		27.3
Structure Status		**Functionally Obsolete / Not Structurally Deficient**

Source: MDT Bridge Management System, 2012. Calculations for Sufficiency Ratings utilize a formula that includes various factors determined during the bridge field inspection and evaluation.

4.8.2. Bridge Health Index

The "Health Index" is a variable based on "weighting" bridge components to establish a clear, dependable communication of bridge performance information to management, elected officials, and the public. The Bridge Health Index is a 0-100 ranking system for bridge maintenance with 100 being a "best" condition and 0 indicating a "worst" condition. The health index provides an indication of how individual bridge components rank on the 0-100 condition scale. To generate a health index rating for the entire bridge, weighted values are assigned to the individual bridge components according to the economic consequences of their failure. Thus, components whose failure has relatively little economic effect, such as railings, receive less weight than those whose failure could close the bridge, such as girders. The Health Index number provides a performance measure and management tool for bridge maintenance.

The health index is not an FHWA directive for assessing bridges, rather, it was developed by the California Department of Transportation (Caltrans) and its computations are now included in bridge management software. Guidance provided by Caltrans suggests that the health index concept for a single bridge be evaluated in context with a statewide network of bridges. Based on the recent October 31, 2011

bridge inspection, the Maclay Bridge was given a health index of 89.91. Montana's statewide off-system bridge data indicates that 72.9 percent of all off-system bridges have a health index higher than the Maclay Bridge health index. This health index value places the Maclay Bridge near the bottom quartile of all off-system bridges.

4.8.3. Fracture Critical Status

The Maclay Bridge is fracture critical. Truss bridges are typically fracture critical. If one part of the truss should fail, the entire bridge span may fail. As a bridge ages and traffic increases the steel in the truss may begin to weaken because of fatigue. The bridge requires special "fracture critical" inspections to reduce the chance of failure. With proper inspection and maintenance, the bridge is considered safe. An inspection that shows a problem could result in immediate closure.

4.9. Parking Considerations

Over the past 30 years, Missoula County has passed numerous resolutions that restrict parking within the vicinity of the Maclay Bridge. Although comments made at the first informational meeting do not indicate parking is an issue, research of past resolutions indicates that parking concerns have existed since at least 1979. Copies of various parking resolutions are included in **Appendix C**. **Table 15** identifies the resolution number, title, passage date, and summarizes their content.

Table 15: Missoula County Parking Resolutions

Resolution Number	Resolution Title	Passage Date	Summary Description
79-128	REGULATION OF PARKING, CONGREGATING, ETC. ON MACLAY BRIDGE	24-Jul-79	• Prohibits parking on the Maclay Bridge and the road right-of-way leading to it for 500 yards • Prohibits loitering on, fishing from, diving or jumping from, and climbing or congregating on the Maclay Bridge • Requires signing on the Maclay Bridge and approaches prohibiting parking • Allows Missoula County Sheriff to take action to ensure compliance
90-064	A RESOLUTION CREATING A RESIDENTIAL ON-STREET PARKING PERMIT REGULATION PROGRAM IN THE MACLAY BRIDGE AREA	18-Jul-90	• Established the Maclay Bridge On-Street Parking Permit Regulation Program • Between June 1st and September 30th • Between 3:00 pm and 6:00 am • Created boundary of program – just east of Humble Road & west to Blue Mountain Road
91-067	A RESOLUTION SUPERCEDING RESOLUTION NO. 90-064, A RESOLUTION CREATING A RESIDENTIAL ON-STREET PARKING PERMIT REGULATION PROGRAM IN THE MACLAY BRIDGE AREA, SIGNED JULY 18, 1990 (AMENDING SECTION 1, PARAGRAPH A)	17-Jul-91	• Added clarification to "Section 1, Paragraph A" of resolution 90-064
99-003	REGULATING PARKING, CONGREGATING, ETC. ON MACLAY BRIDGE AND AMENDING RESOLUTION 79-128	7-Jan-99	• Amended resolution 79-128
2011-073	REGULATING PARKING, CONGREGATING, ETC. ON MACLAY BRIDGE AND AMENDING RESOLUTION NO. 91-067	7-Jun-11	• Amended resolution 91-067 • Extends the parking district boundary further to the east along North Avenue, past Humble Road, by 300 feet • At the request of landowners

Source: Missoula County Public Works Department, 2012

In addition, a review of Missoula County "911 Calls" was completed. In a search of the call records for the Orchard Homes and Target Range areas for June, July and August of 2010 and 2011, numerous citations were issued (see **Figure 6**) in response to activities near the bridge. These citations included the following categories:

- Criminal Mischief, Curfew and Loitering, Disorderly Conduct, Disturbance, Suspicious Activity
- Extra Patrol
- Hazardous Vehicle
- Other Hazard

During this time period, there were 109 calls made for the area located at the east end of the existing bridge (4680 North Avenue West). Of these calls, 42 were for "hazardous vehicle", which is primarily related to parking concerns. The review of the provided 911 calls, coupled with the many parking resolutions passed over the four decades by Missoula County, indicate parking is a concern in the vicinity of the Maclay Bridge.

Figure 6: Crime Locations in General Vicinity

4.10. Roadway Surfacing

Existing roadway surfacing characteristics were determined through field measurements for River Pines Road, the Maclay Bridge, and North Avenue. Items measured included the surface width, lane width, shoulder width, and the presence of non-motorized features. **Table 16** shows the existing roadway and bridge widths.

Table 16: Existing Road and Bridge Surfacing

Location		Lanes	Surface Width (ft)	Lane Width (ft)	Shoulder Width (ft)
North Ave W	Clements Rd to Maclay Bridge	2	31	11	1 (north) / 8 (south)
Maclay Bridge	On Bridge	1	14	14	0
River Pines Rd	Maclay Bridge to Blue Mountain Road	2	22	11	0

Source: Estimated based on field measurements

The MDT *Road Design Manual* indicates a top width of 40 feet is appropriate. This roadway width would accommodate two 12-foot travel lanes and two 8-foot shoulders. The MDT RDM is a guideline only, and due to the approach roadways being under County jurisdiction, close coordination with Missoula County would be necessary to define the appropriate roadway width that is context sensitive to the community and still meets Missoula County requirements for safe and efficient travel. Missoula County standards (**Table 10**) indicate the required surfacing width would be 44 feet for a collector roadway. Neither the Missoula County nor MDT standard widths are attained on the bridge or its approaches.

4.11. Access Points

Access points were identified through a review of available GIS data, aerial photography and field observation. There are approximately 47 access points along River Pines Road and North Avenue. The vast majority of the access points are private approaches. There are 10 public approaches along these two segments within the study area. The prevalence of access points along a roadway can contribute to decreased safety as turning movements into and out of the access points may create conflict points. On high volume roadways it is generally desirable to attempt access management to reduce conflict points caused by turning traffic. Depending on the type of improvement options identified through this study, access management may be considered for some facilities within the vicinity of the Maclay Bridge.

Table 17 provides a summary of access points along River Pines Road and North Avenue.

Table 17: Access Points

Location		Distance (mi)	Public	Private	Access / mi
North Ave W	Clements Rd to Maclay Bridge	0.78	7	31	48.7
River Pines Rd	Maclay Bridge to Blue Mountain Road	0.67	3	6	13.4
Total		**1.45**	**10**	**37**	**32.4**

Source: Estimated based on aerial photography

4.12. Right-of-Way

Existing right-of-way widths along River Pines Road and North Avenue are between 60 and 80 feet. New right-of-way, easements and/or construction permits from adjoining landowners will be required if improvement options extend beyond existing right-of-way limits based on legal land survey.

Also, a Montana Department of Natural Resources and Conservation (DNRC) land use license or easement would be required between the low water marks of the river for improvement options involving the construction of a bridge at a new location.

4.13. Hydraulics

The Bitterroot River is the primary surface water feature within the study area. Any improvement option(s) identified will require an assessment of impacts to the Bitterroot River. If a project is developed that impacts the Bitterroot River, mitigation will be required depending on the type of impacts and permitting

requirements. Although the Bitterroot River joins the Clark Fork River about 3,500 feet downstream from the bridge, it is unlikely any potential improvement options would affect the Clark Fork River. O'Brien Creek parallels River Pines Road and joins the Bitterroot River southwest of the existing bridge. A section of O'Brien Creek was recently restored by Montana Fish Wildlife & Parks (MFWP).

The Big Flat Irrigation Ditch crosses River Pines Road west of the Maclay Bridge and could be impacted depending of the type of improvement options identified through this study. A small Missoula Irrigation District ditch parallels South Avenue and the ditch crosses South Avenue west of Humble Road and west of Clements Road.

4.13.1. Floodplain Considerations

The Maclay Bridge is located within a detailed delineated floodplain (FIRM panel 30063C1455). Accordingly, any bridge rehabilitation, reconstruction, or relocation would require a formal floodplain permit. There may be concerns pertinent to increases to the Flood Insurance Study (FIS) 100-year flood elevation. Missoula County floodplain regulations require the low chord of any "new" bridge to be 2 feet above the 100-year flood elevation. At its present North Avenue location, this would likely necessitate the bridge and associated road grade, to be raised. The existing bridge in its present condition would not be subject to the "no increase" requirement. This discussion is relevant for a future reconstruction or relocation option, and not applicable to a rehabilitation option.

Any identified improvement options, would need to be developed and analyzed to ensure impacts to the floodplain and river would be minimized. However, Federal Emergency Management Agency (FEMA) regulations require that if a project results in an increase of the published base flood elevation, a conditional letter of map revision (CLOMR) must be approved.

A CLOMR requires that FEMA approve the hydraulic model and revisions to the base flood elevation. A detailed floodplain model would be required to determine the proposed bridge opening and the effect on the base floodplain elevation. The existing FIS model would be obtained and used, however some new river cross sections would be required. This process can take a year or more.

4.13.2. Preliminary Hydrology

The Bitterroot River at the Maclay Bridge drains 2,814 square miles of area and consists mostly of forested mountainous terrain within a wide populated valley. The design flood for a reconstruction or relocation improvement option would likely be the 100-year event due to the delineated floodplain and the risk to adjacent landowners. The 10, 50 and 500 year floods would also need to be modeled to meet CLOMR requirements. **Table 18** contains preliminary hydrology values as computed by MDT. This information is useful to identify general "order of magnitude" flows and compare the published FIS values against USGS calculated results.

Table 18: Preliminary Hydrology for Bitterroot River

Source	Area (sq mi)	Q2 (cfs)	Q5 (cfs)	Q10 (cfs)	Q25 (cfs)	Q50 (cfs)	Q100 (cfs)	Q500 (cfs)
USGS [a]	2,814	14,500	20,000	23,400	27,300	30,000	32,500	38,000
FIS [b]	2,842			20,900		29,700	31,800	42,000

[a] *USGS gage number 12352500*

[b] *The Flood Insurance Study (FIS) flows would likely be used for future design // Q = Flood flow in cubic feet per second (cfs)*

4.13.3. Channel Characteristics

The Bitterroot River is meandering near the existing bridge, even though aerial photographs show that the banks have moved very little since the 1976 flood event, which was considered a historic flood year across Montana. The existing bridge has washed out at least two times since 1935. River Pines Road, located on the west side of the Bitterroot River, has rock riprap on its fill slope for approximately 750 feet upstream of the bridge. The FIS shows a 5-foot deep scour hole at the bridge, and about a foot of backwater for the base flood. Based on review of four aerial photographs from the years 1935 and 1961 (USFS), and 2003 and 2011 (USDA), it appears the scour hole has grown westward towards the west bank of the river. Scour holes can develop for a variety of reasons (i.e. poor angle of attack of the stream on the bridge, inadequate waterway opening under the bridge, etc.) and are of concern in that scour holes can eventually reach the bottom of footings and undermine bridge supports (columns and/or abutments). Channel scour was not part of the original design in the 1940's, and the existing bridge piers are located in the river channel on unknown materials.

Gravel and sand bar development has been observed but not adequately studied both upstream and below the existing bridge. It appears the channel has been altered with the deposition of material upstream of the bridge (changing the shape of the channel changes stream flow). Increased water velocities also remove material from the stream bed. If too much material is washed away, the piers in the channel may become unstable.

Backwater is a concern as it can flood adjacent properties and change the flow regime just upstream of the bridge. There is a large island upstream from the existing bridge that has been there for a long time due to the size of the trees. Ice is considered to be light and debris is moderate at this location on the Bitterroot River. Although not properly studied, it appears that the existing bridge configuration has constricted the Bitterroot River when compared to its normal, free flow natural state. If a project is developed, this should be analyzed via detailed hydrologic and hydraulic modeling effort at some future time, if a project is developed.

4.14. Transit Service

Transit service is currently provided by Mountain Line Transit via Route 9, which travels within the study area along South Avenue, Clements Road and Seventh Street, but does not cross the Maclay Bridge.

4.15. Utilities

The existing Maclay Bridge carries an eight-inch natural gas line. There are overhead utility lines along the south side of South Avenue and along River Pines Road. There are also buried phone lines along both roads. Near the easterly bridge approach, there is a NorthWestern Energy natural gas substation that serves as a primary feeder hub for gas facilities on both sides of the Bitterroot River.

5.0 ENVIRONMENTAL SETTING

This section provides a summary of the *Environmental Scan*. The primary objective of the Environmental Scan is to determine the potential constraints and opportunities within the Environmental Scan boundary. As a planning level scan, the information is obtained from various reports, websites and other documentation. This scan is not a detailed environmental investigation. Refer to the Environmental Scan for more detailed information.

5.1. Geographic Setting

The Maclay Bridge is located at the western end of the Missoula Valley at the confluence of the Clark Fork and Bitterroot Rivers and encompasses lands in both the City of Missoula and Missoula County, Montana. The topography east of the Bitterroot River is generally level, while the area west of the Bitterroot River is comprised of foothills for the Bitterroot Mountains. Surface elevations over most of the area average about 3,120 feet above sea level with elevations exceeding 3,500 feet in the McCauley Butte area and in foothill areas.

5.1.1. Land Ownership and Land Management

Most of the lands in the vicinity of the Maclay Bridge are privately owned with the exception of the Kelly Island Fishing Access Site, located near the confluence of the Clark Fork and Bitterroot Rivers, which is state-owned and managed by the MFWP. Some county-owned parcels and Lolo National Forest lands also exist in the area. Both the Five Valleys Land Trust and Rocky Mountain Elk Foundation hold conservation easements on some private lands within the general vicinity.

5.1.2. Land Use

Land use in the area consists mostly of suburban residential properties on one-half acre or larger parcels, a few commercial uses, two schools and recreational/open spaces. The area also contains agricultural uses on irrigated lands ranging in size from one acre to 50 acres.

5.2. Physical Resources

5.2.1. Geologic Resources

According to Montana Bureau of Mines and Geology mapping, the area contains alluvial materials associated with modern channels and floodplains along with glacial lake deposits and volcanic bedrock in some portions. The foothills and mountains in the area are comprised mainly of Precambrian rocks of various formations.

5.2.2. Soils and Prime Farmland

Information regarding areas of prime farmland in the area was compiled from the US Department of Agriculture, Natural Resource Conservation Service (NRCS). Using the NRCS's Web Soil Survey website, several soil map units in the area have been classified as prime farmland if irrigated and farmland of local importance.

If a project is advanced using federal or state funds, coordination with the NRCS will be required to determine if the Farmland Protection Policy Act (FPPA) of 1981 (Title 7 United States Code, Chapter 73, Sections 4201-4209) applies and necessary NRCS processing requirements. Projects planned and completed without the assistance of a Federal agency are not subject to the FPPA.

5.2.3. Water Resources

Surface Waters

Surface waters in the area include the Bitterroot River, the Clark Fork River, and O'Brien Creek. Information on these surface waters within the area was obtained from the Montana Department of Environmental Quality's (MDEQ) website. Section 303, subsection "d" of the Clean Water Act requires the State of Montana develop a list, subject to U.S. Environmental Protection Agency (USEPA) approval, of water bodies that do not meet water quality standards. When water quality fails to meet state water

quality standards, MDEQ determines the causes and sources of the pollutants in a sub-basin assessment and sets maximum pollutant levels, called total maximum daily loads (TMDL).

A TMDL sets maximum pollutant levels in a watershed. The TMDLs become the basis for implementation plans to restore the water quality to a level that supports its designated beneficial uses. The implementation plans identify and describe pollutant controls and management measures to be undertaken (such as best management practices), the mechanisms by which the selected measures would be put into action, and the individuals and entities responsible for implementation projects.

The Bitterroot River and the Clark Fork River are both listed as a 303(d) water body within the area. Probable causes of impairment include nutrients, siltation/sediment, and thermal modification.

Placement of fill or excavation within these surface waters would be subject to regulation by the U.S. Army Corps of Engineers (USACOE) under Section 404 of the Clean Water Act and the Montana Stream Protection Act (SPA). Other water-related permits may also be necessary.

IRRIGATION FEATURES

The area contains irrigation features and infrastructure associated with the Big Flat Irrigation District and the Missoula Irrigation District. Any potential impacts to irrigation facilities will need to be examined to determine if the irrigation facilities are considered waters of the U.S. and subject to jurisdiction by the U.S. Army Corps of Engineers (USACOE) or need approvals from the U.S. Department of the Interior Bureau of Reclamation

GROUNDWATER

The Missoula aquifer, which most of the urban area population relies on, is a shallow unconfined aquifer formed in coarse alluvial material (sands and gravels) extending from the Clark Fork River at Hellgate Canyon westward across the valley to the Bitterroot River. The Missoula aquifer was designated as a Sole Source Aquifer by the USEPA in 1988. Following the designation, the Missoula Valley Water Quality District was formed in 1993. An Aquifer Protection Ordinance, administered by the Water Quality District, was adopted in 1994.

5.2.4. Wetlands

The USACOE defines wetlands as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marches, bogs, and similar areas.

A wetlands survey was conducted for the Maclay Bridge EA in 1993 which identified riverine and areas of emergent and forested/shrub wetlands along the Bitterroot River. However, this survey is outdated and new wetland impact evaluation must be conducted if a project is forwarded. Wetland impacts should be avoided to the greatest extent practicable. All unavoidable wetland impacts would need to be mitigated as required by the USACOE.

5.2.5. Floodplains (EO 11988) and Floodways

Executive Order (EO) 11988, Floodplain Management, requires federal agencies to avoid direct or indirect support of floodplain development whenever a practicable alternative exists. EO 11988 and 23 CFR 650 Part A requires an evaluation of project alternatives to determine the extent of any encroachment into the base floodplain. The base flood (100-year flood) is the regulatory standard used by federal agencies and most states to administer floodplain management programs. A “floodplain” is defined as lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone

areas of offshore islands, with a one percent or greater chance of flooding in a given year. As described in the Federal Highways Administration's (FHWA) floodplain regulation (23 CFR 650 Part A), floodplains provide natural and beneficial values serving as areas for fish, wildlife, plants, open space, natural flood moderation, water quality maintenance, and groundwater recharge.

A FEMA delineated floodplain exists along the Bitterroot and Clark Fork Rivers in the Maclay Bridge area.

5.2.6. Hazardous Material

The Montana Natural Resource Information System (NRIS) database was searched for underground storage tank (UST) sites, leaking underground storage tank (LUST) sites, abandoned mine sites, remediation response sites, landfills, National Priority List (NPL) sites, hazardous waste, crude oil pipelines, and toxic release inventory sites in the area.

The following sites where initially identified as locations with potential contamination impacts:

- Eight underground storage tank locations;
- One leaking underground storage tank locations; and
- One petroleum release compensation site.

Further evaluation may be needed at specific sites to determine the potential for encountering contamination if a project requiring soil excavation is forwarded. This evaluation may include reviewing MDEQ files for specific sites and/or conducting subsurface investigation activities to determine the extent of soil and groundwater contamination at locations of interest. If contaminated soils or groundwater is encountered during construction, handling and disposing of the contaminated material would need to be conducted in accordance with State, Federal, and local laws and rules.

5.2.7. Air Quality

EPA designates communities that do not meet National Ambient Air Quality Standards (NAAQS) as "non-attainment areas". "Nonattainment areas" are localities where air pollution levels persistently exceed the NAAQS or MAAQS (Montana Ambient Air Quality Standards), or that contribute to ambient air quality in a nearby area that fails to meet standards. States are then required to develop a plan to control source emissions and ensure future attainment of NAAQS. An area that has been designated as non-attainment in the past, but now complies with the NAAQS is classified as a "maintenance" area.

The Maclay Bridge area is located in a non-attainment area for PM-10 and a maintenance area for carbon monoxide.

Transportation conformity considerations will apply in this area if projects forwarded use federal or state funds to help ensure that any proposed activities will not cause or contribute to any new violations of the NAAQS; increase the frequency or severity of NAAQS violations; or delay timely attainment of the NAAQS or any required interim milestone.

If a project forwarded uses federal of state funds, an evaluation will also be required to determine if there is any potential for Mobile Source Air Toxics Rule (MSAT) effects.

5.2.8. Noise

Should a project be advanced with federal or state funds, it will be necessary to establish whether the project is a "Type I Project" as defined in 23 CFR 772.5(h). Type I projects involve:

- Construction of a highway on a new location;

- The physical alteration of an existing highway which significantly changes either the horizontal or vertical alignment or increases the number of through-traffic lanes; or
- The potential for creating a traffic noise impact (e.g., idling vehicles at rest areas, weigh stations).

A detailed noise analysis would be required for a Type I project. If it is determined that the project is not Type I, it is then considered a Type III project which does not require a noise analysis or consideration of noise abatement. Type II projects are retrofit noise abatement projects.

If a project is forwarded, future construction activities may cause localized, short-duration noise impacts. These impacts would need to be.

5.3. Visual Resources

Visual resources refer to the landscape character (what is seen), visual sensitivity (human preferences and values regarding what is seen), scenic integrity (degree of intactness and wholeness in landscape character), and landscape visibility (relative distance of seen areas) of a geographically defined view shed. The landscape throughout the area contains an array of biological, scientific, historic, wildlife, ecological, and cultural resources mixed with a remote location.

The Bitterroot River riparian corridor, the Kelly Island Fishing Access Site, Lolo National Forest land, and a large conservation easement in the McCauley Butte area provide areas of natural open space and add to the visual resources present in the area.

5.4. Biological Resources

Existing information on wildlife, fisheries and special status species known to occur or that may potentially occur in the area was reviewed from a variety of sources including the U.S. Fish and Wildlife Service (USFWS), the MFWP, the Montana Natural Heritage Program (MNHP), and other resource documents. This limited survey is in not intended to be a complete and accurate biological survey of the study area. A complete biological survey of the area would be needed before potential selection of a specific project site, if a project is forwarded.

5.4.1. Wildlife and Fish

General fish and wildlife resources would need to be surveyed during any future project development process. MFWP should be contacted during the project development process for local expertise regarding the wildlife and fisheries resources of the area. If a project is forwarded from the improvement option(s), encroachment into the waterway and the associated riparian habitat should be minimized to the extent practicable.

Wildlife Resources

The most common forms of wildlife found on the developed lands in the area include species adapted to suburban life and some level of human disturbance as well as other species that make use of river and its riparian areas as permanent habitat and movement corridors. These include mule and white-tailed deer, small mammals (like coyote, red fox, squirrels, raccoons, skunks, beaver, mink), and a variety of rodents. Additionally, there are areas of winter range for elk, mule deer, and white-tailed deer located in the mountains and foothills in the area. Other species like moose, black bear, and mountain lion may occasionally pass through the riparian corridors and forested lands in the area.

Numerous species of birds occur in this portion of the Missoula area including ospreys, sandhill cranes, wild turkey, ringed-neck pheasant, a variety of raptors (osprey, bald eagles, falcons, and hawks), owls,

woodpeckers, migratory waterfowl, and many neo-tropical migratory birds (flycatchers, warblers, vireos, grosbeaks, and orioles).

Amphibians and reptiles occurring in the area include spotted frog, leopard frog, bull frog, western yellow-bellied racer, western garter snake, and western painted turtle.

AQUATIC RESOURCES

The major surface waters found within the area include the Bitterroot River, Clark Fork River, O'Brien Creek, and the Big Flat Ditch. All of these waters, except for the Big Flat Ditch, are managed as fisheries by the MFWP. The Bitterroot and Clark Fork Rivers have been rated as Outstanding for their fisheries resource value by MFWP. Both streams receive recreational angler use year-round for sport fishing although restrictions exist relative to fishing for certain species. O'Brien Creek has a Moderate rating for its fisheries resource value and is open to use by anglers on a seasonal basis.

According to maps developed by the USFWS, the Bitterroot and Clark Fork Rivers and O'Brien Creek are designated as Bull Trout Critical Habitat (BTCH).

5.4.2. Threatened and Endangered Wildlife Species

The federal list of endangered and threatened species is maintained by the USFWS. Species on this list receive protection under the Endangered Species Act (ESA). An 'endangered' species is one that is in danger of extinction throughout all of a significant portion of its range. A 'threatened' species is one that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. The USFWS also maintains a list of species that are candidates or proposed for possible addition to the federal list.

The endangered, threatened, proposed, and candidate species list for Montana Counties (March 2012) was obtained from the USFWS website. This list generally identifies the counties where one would reasonably expect the species to occur, not necessarily every county where the species is listed. **Table 19** shows the listed species that could potentially occur within Missoula County and provides information about habitats where these species typically occur.

Table 19: USFWS Endangered, Threatened, Proposed, and Candidate Wildlife Species

Common Name	Scientific Name	USFWS Status	Habitat Requirements
Bull Trout	*Salvelinus confluentus*	Threatened, Critical Habitat Designated	Bull trout are found in the Clark Fork and Flathead drainages of western Montana. Sub-adult and adult fluvial bull trout reside in larger streams and rivers and spawn in smaller tributary streams, whereas adfluvial bull trout reside in lakes and spawn in tributaries. Within the Maclay Bridge area, the Bitterroot River, Clark Fork River, and O'Brien Creek are designated as Critical Habitat for bull trout.
Grizzly Bear	*Ursus arctos horribilus*	Threatened	In Montana, Grizzly Bears primarily use meadows, seeps, riparian zones, mixed shrub fields, closed timber, open timber, sidehill parks, snow chutes, and alpine slabrock habitats. Grizzly bear habitat and recovery zones in Missoula County include the Seeley, Swan, and Jocko Valleys, lower Mission Valley, and portions of the upper Rattlesnake watershed.
Canada Lynx	*Lynx Canadensis*	Threatened, Critical Habitat Designated	West of the Divide, Canada Lynx generally occur in subalpine forests at elevations between 4,000 to 7,000 feet in stands composed of pure lodgepole pine but also mixed stands of fir, pine, larch, and hardwoods. Habitat for the species does not exist in the Maclay Bridge area.
Wolverine	*Gulo gulo luscus*	Candidate	Wolverines live in remote and inhospitable places away from human populations. In the northern Rocky Mountains, wolverines are restricted to high mountain environments near the treeline, where conditions are cold year-round and snow cover persists well into the month of May. Habitat for the species does not exist in the Maclay Bridge area.
Yellow Billed Cuckoo (Western Population)	*Coccyzus americanus*	Candidate	Western cuckoos breed in large blocks of riparian habitats, particularly woodlands with cottonwoods and willows. This candidate species requires patches of at least 25 acres of dense, riparian forest with a canopy cover. This habitat may be present in the Maclay Bridge area.

Source: USFWS, List of Endangered, Threatened, Proposed and Candidate Species Montana Counties.

An evaluation of potential impacts to all endangered, threatened, proposed, or candidate species will need to be completed during the project development process.

5.4.3. Montana Animal Species of Concern

Wildlife species of concern are native Montana animals that are considered to be "at risk" due to declining population trends, threats to their habitats, and/or restricted distribution. Designation of a species as a Montana Animal Species of Concern (or Potential Species of Concern) is not a statutory or regulatory classification. The designation as a Species of Concern provides a basis for resource managers and decision-makers to make proactive decisions regarding species conservation and data collection priorities. Each Species of Concern is assigned a state numeric rank ranging from S1 (highest risk, greatest concern) to S5 (demonstrably secure, least concern) reflecting the degree of risk to each species based on available information. Other state ranks applied to Species of Concern include: SU (unrankable due to insufficient information), SH (historically occurred), and SX (believed to be extinct). State ranks may be followed by modifiers, such as B (breeding), N (non-breeding), or M (migratory).

Table 20 lists the animal species of special concern by the Montana Heritage Program in the study area. The results of the data search reflect the current status of their data collection efforts. These results are not intended as a final statement on sensitive species within a given area, or as a substitute for on-site surveys. If a project is forwarded from the improvement option(s), on-site surveys will need to be completed during the project development process.

Table 20: Montana Animal Species of Concern

Common Name	Scientific Name	State Rank	MNHP Occurrences in General Area by Township and Range	MNHP Known Occurrences in Maclay Bridge Area
Westslope Cutthroat Trout	*Oncorhynchus clarkia lewisi*	S2	T13N, R20W T12N, R20W	Yes
Hoary Bat	*Laslurus cinereus*	S3	T13N, R20W T12N, R20W	Yes
Fisher	*Martes pennanti*	S3	T13N, R20W	Possible on Lolo National Forest
Black-backed Woodpecker	*Picoides arcticus*	S3	T13N, R20W T12N, R20W	Yes
Western Skink	*Eumeces skiltonianus*	S3	T13N, R20W	Yes
Fringed Myotis	*Myotis thysanodes*	S3	T12N, R20W	Yes
Grasshopper Sparrow	*Ammodramus savannarum*	S3B	T12N, R20W	Yes
Cassin's Finch	*Carpodacys cassinii*	S3	T12N, R20W	Yes
Pileated Woodpecker	*Dryocopus pileatus*	S3	T12N, R20W	Yes
Lewis's Woodpecker	*Melanerpes lewis*	S2B	T12N, R20W	Yes
Flammulated Owl	*Otus flammeolus*	S3B	T12N, R20W	No
Bald Eagle	*Halieetus leucocephalus*		T13N, R20W T12N, R20W	Yes
Great Blue Heron	*Ardea herodias*	S3	T13N, R20W T12N, R20W	Yes

Source: Montana Natural Heritage Program, Animal and Plant Species of Concern Searchable Database.

5.4.4. Vegetation

This portion of the Missoula Valley contains isolated remnants of native vegetation. Areas of native dry grasslands, open ponderosa pine forest, and riparian deciduous forests and associated wetlands exist along the Bitterroot and Clark Fork Rivers. Vegetation in developed areas consists of ornamental trees and shrubs, lawns, and flowerbeds associated with residential landscapes. The area also contains areas of cultivated lands.

THREATENED AND ENDANGERED PLANT SPECIES

The online database of threatened, endangered, proposed, and candidate plant species maintained by the USFWS identifies two plants—Water Howellia and Whitebark Pine—as potentially occurring in Missoula County. Water Howellia is a threatened plant species and the Whitebark Pine is a candidate species for listing. **Table 21** presents habitat requirements for each of these species. Known occurrences and habitat requirements suggest these plants are unlikely to occur in the area.

Table 21: USFWS Endangered, Threatened, Proposed, and Candidate Plant Species

Common Name	Scientific Name	USFWS Status	Habitat Requirements
Water Howellia	*Howellia aquaticus*	Threatened	Water howellia is a winter annual aquatic plant that grows in small, vernal, freshwater wetlands that have an annual cycle of filling up with water over the fall, winter and early spring, followed by drying during the summer. The wetlands typically consist of small shallow ponds within a matrix of forest vegetation and are usually bordered in part by deciduous trees. Known occurrences of the species in Montana are all within the Swan River drainage in the northeastern portion of Missoula County.
Whitebark Pine	*Pinus albicaulis*	Candidate	Whitebark pine typically occurs in isolated stands on cold and windy high-elevation or high-latitude sites in western North America. This habitat does not exist in the Maclay Bridge area.

Source: USFWS, List of Endangered, Threatened, Proposed and Candidate Species Montana Counties.

As with listed wildlife species, consultation with the USFWS will be necessary and an evaluation of potential impacts to all listed, candidate, and proposed plant species must be completed if a project is forwarded.

PLANT SPECIES OF CONCERN

The file search of the MNHP database lists one plant species of concern—Toothcup (*Rotala ramosior*)—in the area. Toothcup is a rare plant identified from only a limited number of wetland sites in western Montana.

The results of the MNHP database search are not intended as a final statement on sensitive species within a given area, or as a substitute for on-site surveys. If a project is forwarded, a determination will need to be made if there is a need for any on-site surveys for plant species of concern during the project development process.

NOXIOUS WEEDS

Noxious weeds degrade habitat, choke streams, crowd native plants, create fire hazards, poison and injure livestock and humans, and fouls recreation sites. Areas with a history of disturbance are at particular risk of weed encroachment. There are 32 noxious weeds in Montana, as designated by the Montana Statewide Noxious Weed List (effective April 15, 2008). According to the Montana Invaders Database, there are documented occurrences of 20 noxious weed species in Missoula County since 1875. The area will need to be surveyed for noxious weeds. County Weed Control Supervisors should be contacted regarding specific measures for weed control during project development.

5.5. CULTURAL AND ARCHAEOLOGICAL RESOURCES

Section 106 of the National Historic Preservation Act (36 CFR 800) 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 Information System (CRIS) and Cultural Resources Annotated Bibliography (CRABS) file search was conducted for the area. The CRABS file search indicates 26 cultural resource surveys have been conducted on lands within or near the area between 1978 and 2010. The CRIS file search identified 28 recorded properties within the area including one National Register-listed site—the Fort Missoula Complex (24MO0266).

Table 22 lists the site name (where known), assigned Smithsonian Site Number, resource type, and National Register of Historic Places (NRHP) eligibility status for previously recorded cultural resource sites within the study area. There may be additional unknown cultural sites located within the area have not been identified and recorded.

Table 22: Summary of Cultural Resources

Resource Name	Smithsonian Site #	Type of Resource	National Register Eligibility Status
Stettler Property	24MO05I6	Historic Residence	Ineligible
Rice Property	24MO05I7	Historic Residence and Outbuildings	Consensus determination of eligibility
Maxwell Property	24MO05I8	Historic Residence and Outbuildings	Ineligible
Maclay Property	24MO0519	Historic Residence and Outbuildings	Recommended as eligible for National Register
Missoula Irrigation District Ditches	24MO0520	Historic Irrigation System	Consensus determination of eligibility
Maclay Bridge	24MO0521	Historic Vehicular/Foot Bridge	Determined eligible for National Register
Big Flat Ditch	24MO0587	Historic Irrigation System	Consensus determination of eligibility
Maclay Ditch	24MO0954	Historic Irrigation System	Undetermined
Target Range Elementary School	24MO0589	Historic School	Listed on the National Register
Site in T13N, R20W, Sec. 35	24MO0209	Lithic Material Concentration	Undetermined
Site in T13N, R20W, NW 1/4 Sec. 35	24MO1388	Historic Residence	Undetermined

Source: Montana Historical Society, CRIS File Search Results, 3/21/2102.

If a project is forwarded from the Planning Study, a cultural resource survey of the Area of Potential Effect (APE) for the project as specified in Section 106 of the National Historic Preservation Act would need to be conducted. Section 106 outlines a process to identify historic properties that could be affected by the undertaking, assess the effects of the project and investigate methods to avoid, minimize or mitigate any adverse effects on previously recorded and newly discovered historic or archaeological resources.

5.5.1. 4(f) Resources

A review was conducted to determine the presence of Section 4(f) properties along the corridor. Section 4(f) refers to the original section within the Department of Transportation Act of 1966 (49 U.S.C. 303), which sets the requirements for consideration of park and recreational lands, wildlife and waterfowl refuges, and historic sites in transportation project development. **Table 23** lists resources within the Maclay Bridge area that may potentially be subject to Section 4(f). A graphic showing 4(f) resources is included in the Environmental Scan, a separate document prepared for the Maclay Bridge Planning Study.

Table 23: Summary of Potential Section 4(f) Resources

Name	Type of 4(f) Resource	Comments /Location
Kelly Island FAS	Public Recreation Site	666-acre site located at confluence of Bitterroot and Clark Fork Rivers, owned and managed by MFWP
Rosecrest Park [(a)]	Neighborhood Park	9.6 acres located south Spurgin Road between Clement Road and 37th Avenue. County ownership
Schmautz Park [(a)]	Neighborhood Park	4.2 acres, undeveloped parcel located north of North Avenue and west of 42nd Avenue. County ownership
Target Range School Playground Target Range School (24MO0589)	Neighborhood Park Historic School	10-acre area containing sports fields, basketball courts, and play equipment. Target Range School is listed on National Register.
Dinsmore River Four	Conservation Park	Bitterroot River island habitat located south of existing Maclay Bridge County ownership
Double R Acres	Conservation Park	Clark Fork River riparian habitat adjoining Kelly Island FAS. County ownership
O'Brien Cr. Meadows Common Area	Conservation Park	O'Brien Creek riparian area located near intersection of Big Flat Road and O'Brien Creek Road. County ownership. Identified in Missoula County Parks and Conservation Lands Plan (1997)
Capi Court Park [(a)]	Unimproved County Park	North of Spurgin Road and east of Sierra Drive
Five Valley Land Trust Conservation Easements	Wildlife Habitat/Public Use	Various locations along Bitterroot River
Lolo National Forest Lands	Public Multiple-use Property	South and west of Maclay Bridge area, part of Blue Mountain Recreation Area
Rice Property (24MO05I7)	Historic Residence and Outbuildings	Consensus determination of eligibility for National Register
Maclay Property (24MO05I9)	Historic Residence and Outbuildings	Recommended as eligible for National Register
Maclay Bridge (24MO052I)	Historic Vehicular/Foot Bridge	Determined eligible for National Register. Owned by Missoula County
Big Flat Ditch (24MO0587) Missoula Irrigation District Ditches (24MO0520)	Historic Irrigation Systems	Consensus determination of eligibility for National Register

Sources: 1) Montana Historical Society, CRIS File Search Results, 3/21/2102; 2) Missoula County Parks and Conservation Lands Plan, 1997.; 3) Missoula County, Final Draft Parks and Trails Master Plan, 2012.

[(a)] Capi Court, Rosecrest Park, and Schmautz Park are county parks that are the result of subdivision park and open spaces requirements from the Missoula County Subdivision Regulations, section 3-080.

Prior to approving a project that "uses" a Section 4(f) resource, FHWA must find that there is no prudent or feasible alternative that completely avoids 4(f) resources. "Use" can occur when land is permanently incorporated into a transportation facility or when there is a temporary occupancy of the land that is adverse to a 4(f) resource. Constructive "use" can also occur when a project's proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under 4(f) are "substantially impacted".

Section 4(f) does not apply to projects that do not use federal transportation funding.

5.5.2. 6(f) Resources

Section 6(f) of the Land and Water Conservation Fund Act (LWCF) (16USC, Section 4601 et. seq.) provides funds for buying or developing public use recreational lands through grants to local and state governments. Section 6(f)(3) of the Act prevents conversion of lands purchased or developed with LWCF funds to non-recreation uses, unless the Secretary of the Department of Interior (DOI), through the National Park Service (NPS), approves the conversion.

A review of the LWCF grants in Missoula County maintained by MFWP shows that Kelly Island Fishing Access Site (FAS) is the only property in the area acquired/improved under Section 6(f) of the LWCF.

6.0 CONCLUSION

This section provides a list and description of areas of concern and other consideration within the vicinity of the Maclay Bridge. These areas were identified through review of available reports, field review, public databases, and other resources.

6.1. TRANSPORTATION SYSTEM

The following transportation system areas of concern were noted:

Traffic Volumes

- Existing and projected traffic volumes (2,610 vpd and 5,650 vpd, respectively) exceed the AASHTO standard for a single-lane bridge (traffic volume < 100 vpd).

Safety

- A number of crash trends and areas of concern were identified within the crash analysis area. Specific areas of concern identified are located on the following roadways:
  - Big Flat Road
  - Blue Mountain Road
  - North Avenue
  - River Pines Drive
  - South Avenue

Travel Time

- Without the existing Maclay Bridge in service, it would be expected to take approximately 18.58 minutes longer using the Kona Bridge or 4.47 minutes longer using the Buckhouse Bridge when travelling between Community Medical Hospital to the intersection of Big Flat Road/Blue Mountain Road/O'Brien Creek Road/River Pines Road. In terms of emergency service, this means that travel times would likely be longer if the Maclay Bridge is out of service.

  - Any delay in emergency response travel time, typically measured in seconds, is an important consideration within the planning area. Comments provided by the Missoula Rural Fire Department state that 5 minutes or more are added to their response times when using the Buckhouse Bridge in lieu of the Maclay Bridge.

Horizontal Alignment

- Three horizontal curves do not meet current Missoula County or MDT standards.
  - Two of the sub-standard horizontal curves lead into and out of each side of the existing bridge.
  - A crash trend has been identified at the west end of the bridge (intersection of River Pines Road & Riverside Drive).

Clear Zones

- Numerous locations have features within the horizontal clear zone and are unprotected. Primary concern is located along River Pines Road adjacent to the Bitterroot River, where the top of fill slope is within 2 to 4 feet of the edge of the travel lane.

Bridge

- The existing bridge is “functionally obsolete” due to the approach geometry on both ends of the bridge, and the narrow single lane bridge width.
- The existing bridge is “load restricted” due to its present condition, which prevents some vehicles from crossing.
- The Maclay Bridge has a Bridge Health Index that suggests its individual components are in good condition.
- The Maclay Bridge is fracture critical, indicating if one part of the truss should fail, the entire bridge span may fail. With proper inspection and maintenance, the bridge is considered safe.
- There are no bicycle or pedestrian features on the bridge.
- The current structure exhibits spalling and cracked concrete and exposed rebar.
- Rust and steel pitting is observed under the bridge on some load bearing members and the deck.
- The bridge is a composite of varying ages and types of load-bearing steel used throughout the structure.
- The strength of the steel is unknown in much of the bridge, as it has never been tested.
- Channel scour was not part of the original design in the 1940’s, and the existing bridge piers are located in the river channel on unknown materials.

Parking

- Parking concerns are evident based on numerous resolutions passed by the Missoula County Commission, and also based on numerous “911 calls” to the area.

Widths

- The single lane bridge width of 14 feet does not meet current AASHTO, Missoula County or MDT standards for width given existing and projected traffic volumes.
- Roadway widths on River Pines Road do not incorporate shoulders.
- Bicycle and pedestrian facilities are absent on River Pines Road.

6.2. Environmental Considerations Within Environmental Scan Boundary

The following environmental considerations were noted. They are referenced herein for completeness, and do not necessarily point to a defined area of concern. In some instances, the included language is intended to bring attention to unique permitting requirements if and when a project is developed. Environmental considerations are more fully described in the Environmental Scan document, a separate memorandum prepared as part of the Maclay Bridge Planning Study.

Prime Farmland

- Areas of prime farmland, farmland of statewide importance, and farmland of local importance are located within the area.

Water Resources

- The Bitterroot River, Clark Fork River, and O’Brien Creek are located within the area. The Bitterroot River and Clark Fork River are listed as 303(d) water bodies, which do not meet water quality standards.
- Irrigation facilities exist within the area.
- Numerous private groundwater wells are in the area, along with on-site wastewater systems.

Wetlands

- Wetlands are located within the area.

Floodplains and Floodway

- FEMA-delineated floodplains exist along the Bitterroot and Clark Fork Rivers, and at the confluence of O'Brien Creek and the Bitterroot River.
- Missoula County would have a "no increase" requirement for the 100-year base flood elevation measured against the existing FEMA base flood elevations.
- Based on field review, it appears that the existing bridge configuration has constricted the Bitterroot River when compared to its normal, free flow natural state. This should be analyzed via detailed hydrologic and hydraulic modeling effort at some future time, if a project is developed.
- Although not properly studied, it appears the Bitterroot River channel has been altered with the deposition of material upstream of the bridge.
- Although not properly studied, it appears that increased water velocities have removed material from the stream bed. If too much material is washed away, the piers in the channel may become unstable.
- Based on an initial review, but not properly studied, of four aerial photographs from the years 1935 and 1961 (USFS), and 2003 and 2011 (USDA), it appears the scour hole has grown westward towards the west bank of the river.

Hazardous Substances

- There are eight underground storage tank (UST) locations.
- There is one leaking underground storage tank (LUST) location.
- There is one petroleum release compensation site.

Air Quality

- Transportation conformity analysis would be required regardless of funding sources, via the MPO's regional emissions analysis, should an improvement option be forwarded.

Fish and Wildlife

- Five endangered, threatened, proposed, or candidate species are listed for Missoula County. Of the five, two may be likely to occur within the area. These are the Bull Trout (threatened, critical habitat designated) and the Yellow Billed Cuckoo (candidate species).
- 13 animal species of concern are listed for Missoula County.

Vegetation

- No endangered, threatened, proposed, or candidate plant species are expected to occur within the area.
- One plant species of concern may potentially be found within the area – Toothcup (Rotala ramosior).

Cultural and Archaeological Resources

- Eleven separate cultural resources are known to exist within the area.
- Fourteen 4(f) resources are located within the area. One of the fourteen is also a 6(f) site.

6.3. Other Considerations

The following other considerations were noted:

Neighborhood residents have expressed concern over:

- Speeds being an issue on North Avenue, River Pines Road and South Avenue.
- Traffic Growth through the neighborhood in recent years, and the potential for that to continue.
- Safety and the potential for increased vehicle crashes.
- Noise impacts due to increasing vehicular traffic through the area.
- Livability and the desire to maintain the rural character of the area and limit traffic growth.
  - The Target Range Neighborhood Plan emphasizes the importance of continued County maintenance of the structure to help preserve access for local and Missoula Valley residents seeking recreational opportunities on nearby lands.
  - The Target Range Neighborhood Plan does not identify the need for a new bridge.
- Unreported behavior related to individuals jumping off the bridge structure and/or recreating on the river islands, sand bars, and bridge scour hole.

Project Nomination

- Missoula County has nominated the existing Maclay Bridge for replacement using funding from FHWA's Off-System Bridge Program (formerly known as the *Highway Bridge Replacement and Rehabilitation Program)*, pending the outcome of this planning study.

APPENDIX A

FIELD REVIEW PHOTO LOG

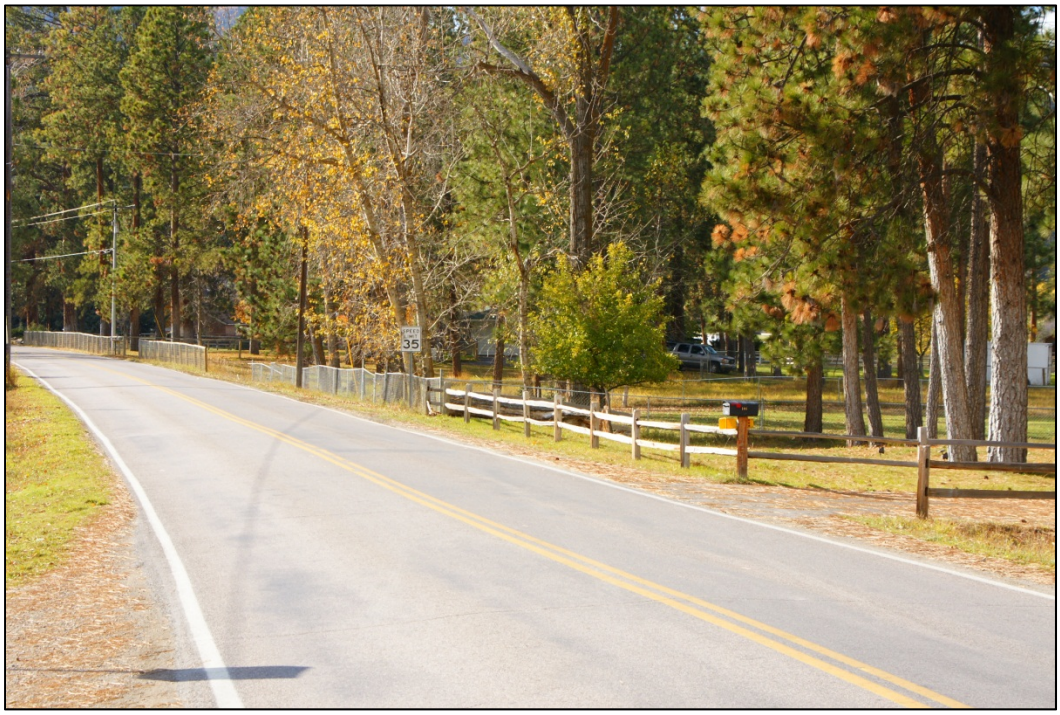


PHOTO 1: LOOKING SOUTHWEST - RIVER PINES ROAD (NOTE POSTED SPEED LIMIT OF 35 MPH)

PHOTO 2: LOOKING NORTHEAST – UPSTREAM FACE OF EXISTING BRIDGE

PHOTO 3: LOOKING SOUTHEAST ON ALIGNMENT – 14 TON POSTED WEIGHT LIMIT WAS REDUCED TO 11 TONS AFTER THIS IMAGE WAS TAKEN

PHOTO 4: LOOKING NORTHEAST – UPSTREAM FACE OF EXISTING BRIDGE

PHOTO 5: LOOKING SOUTHEAST ON NORTH AVENUE – AFTER CROSSING THE EXISTING BRIDGE

PHOTO 6: LOOKING NORTHWEST ON ALIGNMENT – 14 TON POSTED WEIGHT LIMIT WAS REDUCED TO 11 TONS AFTER THIS IMAGE WAS TAKEN

PHOTO 7: LOOKING WEST – NOTE RIPRAP ARMORED FILL SLOPE ON RIVER PINES ROAD

PHOTO 8: LOOKING WEST FROM EAST BANK OF BITTERROOT RIVER

PHOTO 9: NORTHWESTERN ENERGY NATURAL GAS SUBSTATION – ON SOUTH SIDE OF NORTH AVENUE JUST BEFORE CROSSING EXISTING BRIDGE

PHOTO 10: PERMIT AREA PARKING SIGNS ARE PREVALENT ALONG MANY ROADWAYS PER VARIOUS MISSOULA COUNTY PARKING RESOLUTIONS

PHOTO 11: LOOKING NORTHWEST ON ALIGNMENT AS TRUCK TRAVERSES EXISTING BRIDGE – 14 TON POSTED WEIGHT LIMIT WAS REDUCED TO 11 TONS AFTER THIS IMAGE WAS TAKEN

PHOTO 12: LOOKING EAST ON RIVER PINES ROAD AT HORIZONTAL CURVE

PHOTO 13: LOOKING SOUTHWEST ALONG RIVER PINES ROAD – NOTE RIPRAP ARMORING ALONG FILL SLOPE AND POWER POLE NEXT TO ROADWAY

PHOTO 14: LOOKING WEST FROM NORTH AVENUE – NOTE 11 TON POSTED WEIGHT LIMIT

PHOTO 15: LOOKING EAST ALONG NORTH AVENUE – NOTE WIDE SHOULDER ON SOUTH SIDE (RIGHT) FOR PEDESTRIANS/BICYCLES

PHOTO 16: AFTER THE POSTED WEIGHT LIMIT WAS REDUCED FROM 14 TO 11 TONS, NEW SIGNS WERE PLACED AT VARIOUS LOCATIONS

PHOTO 17: BICYCLIST ON RIVER PINES ROAD TRAVELLING SOUTHWEST IN DRIVING LANE

PHOTO 18: LOOKING WEST THROUGH THE INTERSECTION OF NORTH AVENUE AND HUMBLE ROAD

PHOTO 19: LOOKING WEST THROUGH THE INTERSECTION OF NORTH AVENUE AND HUMBLE ROAD

PHOTO 20: DEGRADED JOINT BETWEEN TWO CONCRETE SPANS (NOTE HIGH PRESSURE NATURAL GAS LINE)

PHOTO 21: EXPOSED RUSTED REBAR AND CONCRETE SPALLING (ON EAST BRIDGE ABUTMENT)

PHOTO 22: MISSING GROUT AND SKEWED JOINT (EAST BRIDGE SPAN)

PHOTO 23: BROKEN CONCRETE, EXPOSED RUSTING REBAR, AND WOODEN SHIM (UNDER EAST SPAN)

PHOTO 24: WOODEN SHIM UNDER CONCRETE SPAN

PHOTO 25: CRACKS IN CONCRETE PIER

PHOTO 26: CLOSE UP OF CRACKS IN CONCRETE PIER

PHOTO 27: RUST ON STEEL MEMBERS (UNDER THE BRIDGE)

PHOTO 28: STEEL MEMBERS OF VARYING AGES AND CONDITION

APPENDIX B

MACLAY BRIDGE INSPECTION REPORT

Montana Department of Transportation

INITIAL ASSESSMENT FORM FOR STRUCTURE :

L32101000+01001

Location : W MISSOULA Structure Name: LB-01 MACLAY BRIDGE

General Location Data

District Code, Number, Location : **01 Dist 1 MISSOULA**
Division Code, Location : **11 MISSOULA**
County Code, Location : **063 MISSOULA**
City Code, Location : **00000 RURAL AREA**
Kind fo Hwy Code, Description : **4 4 County Hwy**
Signed Route Number : **32101**
Str Owner Code, Description : **2 County Highway Agency**
Maintained by Code, Description : **2 County Highway Agency**
Intersecting Feature : **BITTERROOT RIVER 010**
Kilometer Post, Mile Post : **0.16 km 0.10**
Structure on the State Highway System : ☐ Latitude : **46°51'11"**
Structure on the National Highway System : ☐ Longitude : **114°05'52"**
Str Meet or Exceed NBIS Bridge Length : ☒

Traffic Data

Current ADT : **2,774** ADT Count Year : **2006** Percent Trucks : **3 %**

Construction Data

Construction Project Number : **-1**
Construction Station Number : **0+00.00**
Construction Drawing Number : **RECORDSE**
Construction Year : **1935**
Reconstruction Year : **1964**

Structure Loading, Rating and Posting Data

Loading Data :

Design Loading :		**0 Unknown**
Inventory Load, Design :	**12.7 mton**	**1 LF Load Factor**
Operating Load, Design :	**20.9 mton**	**1 LF Load Factor**
Posting :		**5 At/Above Legal Loads**

Rating Data :

	Operating	Inventory	Posting
Truck 1 Type 3 :	**19**	**11**	**11**
Truck 2 Type 3-S3 :	**29**	**17**	
Truck 3 Type 3-3 :	**37**	**22**	

Structure, Roadway and Clearance Data

Structure Deck, Roadway and Span Data :

Structure Length : **105.46 m**
Deck Area : **515.00 m sq**
Deck Roadway Width : **4.27 m**
Approach Roadway Width : **6.10 m**
Median Code, Description : **0 No median**

Structure Vertical and Horizontal Clearance Data :

Vertical Clearance Over the Structure : **4.32 m**
Reference Feature for Vertical Clearance : **N Feature not hwy or RR**
Vertical Clearance Under the Structure : **0.00 m**
Reference Feature for Lateral Underclearance : **N Feature not hwy or RR**
Minimum Lateral Under Clearance Right : **0.00 m**
Minimum Lateral Under Clearance Left : **0.00 m**

Span Data

Main Span

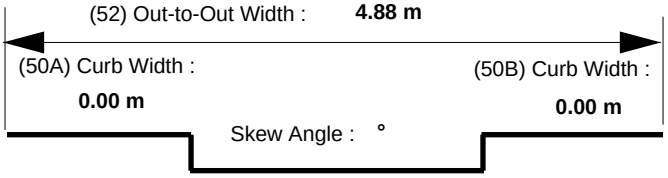
Number Spans : **2**
Material Type Code, Description : **3 Steel**
Span Design Code, Description : **10 Truss - Thru**

Deck

Deck Structure Type : **6 Corrugated Steel**
Deck Surfacing Type : **6 Bituminous**
Deck Protection Type : **0 None**
Deck Membrain Type : **0 None**

Approach Span

Number of Spans : **2**
Material Type Code, Description : **5 Prestressed concrete**
Span Design Code, Description : **4 Tee Beam**



Structure Vertical and Horizontal Clearance Data Inventory Route :

Over / Under Direction Name	Inventory Route	South, West or Bi-directional Travel			North or East Travel		
		Direction	Vertical	Horizontal	Direction	Vertical	Horizontal
Route On Structure	L32101	Both	4.32 m	4.27 m	N/A		
NORTH AVE WEST							

INITIAL ASSESSMENT FORM FOR STRUCTURE :

L32101000+01001

Continue

Inspection Data

Sufficiency Rating : **27.3**
Health Index : **89.91**
Structure Status :**Func Obs - Elg Repl**

Inspection Due Date : 31 October 2013
(91) Inspection Fequency (months) : **24**
Next Fracture Critical Due Date : **31 Oct 2013**
Fracture Critical Detail : **Steel trusses**

NBI Inspection Data

(90) Date of Last Inspection : 31 October 2011
Last Inspected By : Darrel Reich - 2051
(90) Inspection Date :
Inspected By :

(58) Deck Rating :	6	(68) Deck Geometry :	3	(36C) Approach Rail Rating :	N	(62) Culvert Rating :	N
(59) Superstructure Rating :	6	(67) Structure Rating :	4	(36A) Bridge Rail Rating :	0	(61) Channel Rating :	7
(60) Substructure Rating :	5	(69) Under Clearance :	N	(36B) Transition Rating :	0	(71) Waterway Adequacy :	8
(72) App Rdwy Align :	3	(41) Posting Status :	P	(36D) End Rail Rating :	0	(113) Scour Critical :	7

Unrepaired Spalls : - 1 m sq
Deck Surfacing Depth : 2.00 in

Inspection Hours

Crew Hours for inspection :	2	Snooper Required :	N
Helper Hours :	2	Snooper Hours for inspection :	-1
Special Crew Hours :	-1	Flagger Hours :	-1
Special Equipment Hours :	1		

Inspection Work Candidates

Candidate ID	Date Requested	Status	Priority	Effected Structure Unit	Scope of Work	Action	Covered Condition States				
D11-FY2003-000007	20 November 2002	Not Approved	Low	All Spans	311 Moveable Bearing	Rehab Elem	X	X	X	X	X

Clean wet soil and moss off of all the bearings and clean nest area on West end of main span 1 truss, see pic..

Still needs maintenance work performed ... 2007.

09' ... still ....

Same for 2011 inspection.

L32101000+01001
Continue

Element Inspection Data

********** Span : **Main-0 - -1** **********

Element Description										
Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 30 - Corrug/Orthotpc Deck										
	1	3	268	sq.m.	X	0	0	0	100	0
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - Asphalt overlay has transverse cracking with some patched areas. The corrugated steel soffit shows coating loss with small spots of incidental 100 percent section loss. Most of the soffit coating is in good shape. The steel transition plate sections at bent 5 has some loose bolts and clatters under traffic. The left corner of the steel plate on the right side is bent up and could be a hazard. EUMZ

10/13/2009 - Asphalt overlay shows some transverse cracking at floorbeam locations and approach span joint location with minor potholes forming. Approach transitions fairly smooth. Soffit of corrugated decking shows some coating loss and rusting about stringer connection locations. NZDZ

09/25/2007 - Asphalt deck surface shows some minor transverse cracking. Steel shows some minor rusting. ZZDW

11/17/2005 - Deck surface is Ok. Decking shows some minor rusting. Element changed from Steel Grid to Corrugated. No problems noted. (54.86 * 4.88 = 267.72) SPGZ

Inspection Notes:

Element 112 - Unpnt Stl Stringer										
	1	3	110	m.		90	10	0	0	
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - Unpainted steel stringers show some surface rust with some minor surface pitting. EUMZ

Inspection Notes:

Element 113 - Paint Stl Stringer										
	1	3	329	m.		80	10	5	5	0
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - Changed the condition state back to 80-10-5-5 because of the 2002 and 2003 inspection notes. In 2002 the planks were pulled up and replaced and minor to moderate section loss was observed. In 2003 21 stringers were replaced. All the stringers were inspected at arms length when the timber deck was removed. Minor areas of section loss with minor to moderate paint loss was observed in the stringers that were not replaced. Changed quantity from 439 meters to 329 meters because the replaced stringers were replaced with unpainted steel stringers. EUMZ

10/13/2009 - No significant changes noted. NZDZ

09/25/2007 - Rusting appears mostly unchanged. No problems noted. ZZDW

11/17/2005 - Stringers show some paint loss with minor rusting basically throughout. No problems noted. (8 * 54.86 = 438.88) SPGZ

08/25/2003 - 21 stringers were replaced in August 2003. There is no change in the condition of the remaining existing stringers, they have minor section loss in areas where there is minor to moderate paint loss. All stringers were inspected at arms length when the timber deck was removed. KHDZ

11/19/2002 - Top flanges of stringers have minor to moderate section loss. This was observed during the summer of 2002 when planks were pulled up and replaced. The paint system on the tops of the stringers is no longer effective. UZLZ

08/15/2000 - Top flanges of stringers have isolated areas of minor section loss. HADW

12/09/1998 - None TYYB

08/01/1995 - None UOTS

01/01/1995 - None UDLM

Inspection Notes:

INITIAL ASSESSMENT FORM FOR STRUCTURE :

L32101000+01001

Continue

*** * * * * * * * * *** Span : **Main-0 - -1 (cont.)** *** * * * * * * * * ***

Element Description

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 121 - P/Stl Thru Truss/Bot										
	1	3	110	m.		80	10	10	0	0
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - Bottom chord has some top coat loss with some areas of state 3 rust. Material accumulations needs to be cleaned off the bottom chord. No changes noted. EUMZ

10/13/2009 - No significant changes noted. NZDZ

09/25/2007 - Material accumulations are increasing and need cleaned periodically. No other significant changes noted. ZZDW

11/17/2005 - Lower chord shows some minor paint losses and minor rusting, with some minor pack rust at panel point locations. Some minor cracking of some tension members along the "forge" line of the forged eyebars. Some material accumulations about panel points. Needs cleaned periodically.. (54.86 * 2 = 109.72) SPGZ

08/25/2003 - No change KHDZ

11/19/2002 - None UZLZ

08/15/2000 - None HADW

12/09/1998 - None TYYB

08/01/1995 - None UOTS

01/01/1995 - None UDLM

Inspection Notes:

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 126 - P/Stl Thru Truss/Top										
	1	3	110	m.		90	10	0	0	0
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - No changes noted in the top truss. EUMZ

10/13/2009 - No significant changes noted. NZDZ

09/25/2007 - Some diagonals and other members show some minor deformation. No changes noted. Some additional rusting noted. ZZDW

11/17/2005 - No detected changes in any of prior damaged areas. Upper pins inspected. Some minor paint losses and minor rusting. A couple nuts appear to be "backed off" slightly but don't appear to be loosening. (54.86 * 2 = 109.72) SPGZ

08/25/2003 - No change KHDZ

11/19/2002 - Truss member U5 L6 downstream side is bent and non-functional. Truss member U1 L2 (interior member) upstream side is bowed upward. Spacer around pin at U1 upstream side has opened up but is still in place. UZLZ

08/15/2000 - Truss member U5 L6 downstream side is bent and non-functional. Truss member U1 L2 (interior member) upstream side is bowed upward. HADW

12/09/1998 - None TYYB

08/01/1995 - None UOTS

01/01/1995 - None UDLM

Inspection Notes:

*** * * * * * * * * *** Span : **Main-0 - -1 (cont.) * * * * * * * * * ***

Element Description

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 152 - Paint Stl Floor Beam										
	1	3	49	m.		80	10	5	5	0
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - The painted steel floor beams have areas of paint loss and rusting. The 2003 inspection report shows that the floor beams were inspected at arms length when the timber deck was removed and minor section loss was observed on top of the top flanges.	EUMZ
10/13/2009 - No significant changes noted.	NZDZ
09/25/2007 - No significant changes noted. Some additional rusting about panel points.	ZZDW
11/17/2005 - Floorbeams show paint losses and rusting about panel points. No problems noted. (10 * 4.88 = 48.80)	SPGZ
08/25/2003 - All floorbeams were inspected at arms length when timber deck was removed. There are areas of fleck rust, no paint, and minor section loss on the top of the top flanges. The paint on the rest of the beams is in faily good condition.	KHDZ
11/19/2002 - None	UZLZ
08/15/2000 - None	HADW
12/09/1998 - None	TYYB
08/01/1995 - None	UOTS
01/01/1995 - None	UDLM

Inspection Notes:

Element 181 - Pnt Vrt X-Frame

	1	3	83	m.		85	10	5	0	0
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - No changes noted with the X-Frame.	EUMZ
10/13/2009 - No significant changes noted.	NZDZ
09/25/2007 - Some minor damage to sway bracing. No changes noted.	ZZDW
11/17/2005 - Some frames show some minor paint loss and minor rusting with some collision damage - past. No significant changes noted.	SPGZ
08/25/2003 - No change	KHDZ
11/19/2002 - None	UZLZ
08/15/2000 - None	HADW
12/09/1998 - None	TYYB
08/01/1995 - None	UOTS
01/01/1995 - None	UDLM

Inspection Notes:

INITIAL ASSESSMENT FORM FOR STRUCTURE :

L32101000+01001

Continue

*** * * * * * * * * *** Span : **Main-0 - -1 (cont.)** *** * * * * * * * * ***

Element Description

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 210 - R/Conc Pier Wall										
	1	3	7	m.		90	10	0	0	
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - Some minor cracking with some minor edge spalling. No changes noted.	EUMZ
10/13/2009 - No significant changes noted.	NZDZ
09/25/2007 - No significant changes to wall at P3 and P4.	ZZDW
11/17/2005 - Wall shows some cracking. Some minor edge spalling. No changes noted. No problems noted.	SPGZ
08/25/2003 - No change	KHDZ
11/19/2002 - None	UZLZ
08/15/2000 - None	HADW
12/09/1998 - None	TYYB
08/01/1995 - None	UOTS
01/01/1995 - None	UDLM

Inspection Notes:

Element 215 - R/Conc Abutment B5

	1	3	7	m.		95	5	0	0	
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - No changes noted with the abutment at bent 5.	EUMZ
10/13/2009 - No additional deterioration noted.	NZDZ
09/25/2007 - Cracking and spalling appear unchanged. Material accumulations anout both sides of West abutment need cleaned from about bearing devices.	ZZDW
11/17/2005 - Abutment components show some minor cracking and edge spalling. Material accumulations along cap top and about roller nest bearings needs cleaned periodically. See pics..	SPGZ
08/25/2003 - No change	KHDZ
11/19/2002 - None	UZLZ
08/15/2000 - None	HADW
12/09/1998 - None	TYYB
08/01/1995 - None	UOTS
01/01/1995 - None	UDLM

Inspection Notes:

*** * * * * * * * * * Span : Main-0 - -1 (cont.) * * * * * * * * * ***

Element Description

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 311 - Moveable Bearing B5										
	1	3	2	ea.		0	100	0		
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - Section loss to the anchor bolts and the roller devices. The roller nest is twisted and the rollers are out of alignment. The roller devices are non functional. No changes from the last QA report.	EUMZ
10/13/2009 - Some material accumulation about devices needs cleaned.	NZDZ
09/25/2007 - Roller nest devices at West abutment totally non functional. Others ok.	ZZDW
11/17/2005 - Roller nest at West truss end is twisted in it's keeper and full of material, see pic.. Has not rolled in years but there is still movment in structure.	SPGZ
08/25/2003 - Non-functioning	KHDZ
11/19/2002 - Non-Functional covered w/ wet soil and moss.	UZLZ
08/15/2000 - Non-Functional	HADW
12/09/1998 - Moveable bearings are non-functional.	TYYB
08/01/1995 - None	UOTS
01/01/1995 - None	UDLM

Inspection Notes:

Element 313 - Fixed Bearing B4

	1	3	2	ea.		65	30	5		
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - No changes from the 2009 QA inspection report.	EUMZ
10/13/2009 - No significant changes noted.	NZDZ
09/25/2007 - No significant changes noted.	ZZDW
11/17/2005 - No significant changes noted. No problems noted.	SPGZ
08/25/2003 - No change	KHDZ
11/19/2002 - Paint is peeling, fleck rust and pitting evident.	UZLZ
08/15/2000 - None	HADW
12/09/1998 - None	TYYB
08/01/1995 - None	UOTS
01/01/1995 - None	UDLM

Inspection Notes:

INITIAL ASSESSMENT FORM FOR STRUCTURE :

L32101000+01001

Continue

*** * * * * * * * * * Span : Main-0 - -1 (cont.) * * * * * * * * * ***

Element Description

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 334 - Metal Rail Coated										
	1	3	110	m.		90	5	5	0	0
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - Minor damage with protective coating loss and minor rusting.	EUMZ
10/13/2009 - No significant changes noted.	NZDZ
09/25/2007 - No significant changes noted. Damage still remains.	ZZDW
11/17/2005 - Some minor collision dings and dents. No problems noted. Some minor paint spot losses and rusting. (54.86 * 2 = 109.72)	SPGZ
08/25/2003 - Timber curbs were replaced with tubular steel, and all handrail was straightened and painted with galv paint in August 2003.	KHDZ
11/19/2002 - None	UZLZ
08/15/2000 - Collision damage	HADW
12/09/1998 - Paint loss and vehicular damage.	TYYB
08/01/1995 - None	UOTS
01/01/1995 - None	UDLM

Inspection Notes:

Element 361 - Scour Smart Flag - -

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
X	1	1	1	ea.	X	100	0	0		
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - Countermeasures are in place.	EUMZ
10/13/2009 - None	NZDZ
09/25/2007 - None	ZZDW

Inspection Notes:

Element 372 - CntrMesur SmFlag - -

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
X	1	1	1	ea.	X	0	100	0	0	
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - No changes noted.	EUMZ
10/13/2009 - Countermeasures in place and holding. Minor repair necessary.	NZDZ
09/25/2007 - None	ZZDW

Inspection Notes:

*** * * * * * * * * * Span : Appr-1 - -1 * * * * * * * * * ***

Element Description

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5

*** * * * * * * * * *** Span : **Appr-1 - -1 (cont.)** *** * * * * * * * * ***

Element Description

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 63 - Unp Top Flang/AC Ovl										
	1	3	182	sq.m.	X	100	0	0	0	0
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - Minor cracking of the asphalt. No other problems noted. EUMZ
10/13/2009 - Minor cracking of overlay. No significant changes noted. NZDZ
09/25/2007 - Some transverse cracking of asphalt. No problems noted. ZZDW

Inspection Notes:

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 110 - R/Conc Open Girder Tee Beams - Spans 1 and 2										
	1	3	149	m.		100	0	0	0	
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - No changes, no problems noted. EUMZ
10/13/2009 - No significant changes noted. NZDZ
09/25/2007 - Surface smooth with some transverse cracks in asphalt. Soffit appears unchanged. Some minor cracking and scaling. ZZDW
11/17/2005 - Surface shows fairly smooth. Minor Cracking at bridge end. Soffit appears unchanged. No problems noted. (37.34 * 4 = 149.36) SPGZ
08/25/2003 - Keyways repaired, petromat laid over them and a 2" asphalt overlay placed in August 2003. KHDZ

Inspection Notes:

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 205 - R/Conc Column										
	1	3	3	ea.		90	10	0	0	
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - Minor cracking with a spall near the top of the left column. No exposed rebar. No changes noted. EUMZ
10/13/2009 - No significant changes noted. NZDZ
09/25/2007 - Cracking and spalling appear unchanged. No problemsn noted. ZZDW
11/17/2005 - No significant changes noted. SPGZ
08/25/2003 - None KHDZ
11/19/2002 - Random cracks and minor spalling. UZLZ
08/15/2000 - Random cracks and minor spalling HADW
12/09/1998 - None TYYB
08/01/1995 - None UOTS
01/01/1995 - None UDLM

Inspection Notes:

INITIAL ASSESSMENT FORM FOR STRUCTURE :

L32101000+01001

Continue

*** * * * * * * * * *** Span : **Appr-1 - -1 (cont.)** *** * * * * * * * * ***

Element Description

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 215 - R/Conc Abutment B1										
	1	3	7	m.		95	5	0	0	
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - 3 exposed concrete columns at abutment 1. Minor cracking and minor edge spalling on the abutment.	EUMZ
10/13/2009 - No significant changes noted.	NZDZ
09/25/2007 - B1 shows some sloughing from under abutment. Some minor cracking and minor delamination at corners.	ZZDW
11/17/2005 - No changes noted. No problems noted.	SPGZ
08/25/2003 - None	KHDZ
11/19/2002 - None	UZLZ
08/15/2000 - None	HADW
12/09/1998 - None	TYYB
08/01/1995 - None	UOTS
01/01/1995 - None	UDLM

Inspection Notes:

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 234 - R/Conc Cap										
	1	3	4	m.		90	5	5	0	
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - No changes to the concrete cap noted.	EUMZ
10/13/2009 - No significant changes noted.	NZDZ
09/25/2007 - No significant chamges noted.	ZZDW
11/17/2005 - No significant changes noted.	SPGZ
08/25/2003 - None	KHDZ
11/19/2002 - Random cracks, minor spalling, and one spall area is .21 sq m x 3.8 cm deep.	UZLZ
08/15/2000 - Random cracks and minor spalling	HADW
12/09/1998 - Top of concrete parapet has areas of minor spalling but no exposed rebar.	TYYB
08/01/1995 - None	UOTS
01/01/1995 - None	UDLM

Inspection Notes:

INITIAL ASSESSMENT FORM FOR STRUCTURE :

L32101000+01001

Continue

*** * * * * * * * * * Span : Appr-1 - -1 (cont.) * * * * * * * * * ***

Element Description

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 334 - Metal Rail Coated										
	1	3	75	m.		90	5	5	0	0
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - Minor damage with protective coating loss and minor rusting. The 8 inch concrete curb has spalling with some exposed rebar.	EUMZ
10/13/2009 - None	NZDZ
09/25/2007 - See main span notes.	ZZDW
11/17/2005 - see main span element notes. (37.34 * 2 = 74.68)	SPGZ
08/25/2003 - Painted 2003	KHDZ
11/19/2002 - None	UZLZ
08/15/2000 - Collision damage	HADW
12/09/1998 - Minor paint loss.	TYYB
08/01/1995 - None	UOTS
01/01/1995 - None	UDLM

Inspection Notes:

*** * * * * * * * * * Span : Main-2 - -1 * * * * * * * * * ***

Element Description

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 30 - Corrug/Orthotpc Deck										
	1	3	58	sq.m.	X	0	0	100	0	0
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - Some transverse cracking of asphalt. The corrugated steel soffit shows coating loss with some rusting. Most of the corrugated steel soffit is in good condition.	EUMZ
10/13/2009 - None	NZDZ
09/25/2007 - Some transverse cracing of asphalt surface.	ZZDW
11/17/2005 - See main span element notes. Main span 2 similar. (11.96 * 4.88 = 58.36)	SPGZ

Inspection Notes:

Element 112 - Unpnt Stl Stringer

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
	1	3	16	m.		90	10	0	0	
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - Unpainted Steel stringers shows minor surface rusting and surface pitting. This quantity was added to this inspection for the stringers that were replaced in the summer of 2002.	EUMZ

Inspection Notes:

INITIAL ASSESSMENT FORM FOR STRUCTURE :

L32101000+01001

Continue

*** * * * * * * * * * *** Span : **Main-2 - -1 (cont.) * * * * * * * * * * ***

Element Description

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 113 - Paint Stl Stringer										
	1	3	80	m.		80	15	5	0	0
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - No changes noted from the 2003 inspection report. The deck was removed in 2003 and the stringers were inspected at arms length (as stated in element 113 for the main span). In the 2003 report the stringers with moderate section loss were replaced and the stringers left in place have isolated areas of minor section loss on the top flanges. The quanity was changed from 96 meters to 80 meters because the stringers that were replaced in 2002 were unpainted. EUMZ

10/13/2009 - None NZDZ

09/25/2007 - Minor rusting and coating loss appears unchanged. No problems noted. ZZDW

11/17/2005 - Stringer conditions appear unchanged. No problems noted. West end members sit on neoprene type pads eight total. Four each on East end sit on two tube pieces with a pad under each end of the tube, see pics.. SPGZ

08/25/2003 - Very minon section loss in isolated areas of top flange of stringers. Stringers with moderate section loss were replaced in August 2003. KHDZ

11/19/2002 - Top flanges of stringers have isolated areas of minor to moderate section loss and paint system is non-functional on top of flanges. UZLZ

08/15/2000 - Moderate loss of paint and isolated areas of minor section loss on top flanges HADW

12/09/1998 - 5 ea. timber nailers (60 m) set along side of painted steel stringers and deck is spiked to them. TYYB

08/01/1995 - None UOTS

01/01/1995 - None UDLM

Inspection Notes:

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 121 - P/Stl Thru Truss/Bot										
	1	3	24	m.		85	10	5	0	0
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - Minor paint loss with some minor state 3 rust in some areas. Some exposed metal but no section loss seen. No changes noted. EUMZ

10/13/2009 - None NZDZ

09/25/2007 - Material acumulations increasing. Rusting appears unchanged. ZZDW

11/17/2005 - All horizontal pieces have some material accumualtions. Some minor spot paint loss and minior rusting. No changes noted. No problems noted. (11.96 * 2 = 23.92) SPGZ

08/25/2003 - No change KHDZ

11/19/2002 - None UZLZ

08/15/2000 - None HADW

12/09/1998 - None TYYB

08/01/1995 - None UOTS

01/01/1995 - None UDLM

Inspection Notes:

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 126 - P/Stl Thru Truss/Top										
	1	3	131	m.		90	10	0	0	0
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - Paint system mostly in good shape. Minor paint loss with some minor rusting. EUMZ

10/13/2009 - None NZDZ

Inspection Notes:

INITIAL ASSESSMENT FORM FOR STRUCTURE :

L32101000+01001
Continue

*** * * * * * * * * *** Span : **Main-2 - -1 (cont.)** *** * * * * * * * * ***

Element Description

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 152 - Paint Stl Floor Beam										
	1	3	10	m.		80	10	5	5	0
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - The painted steel floor beam have areas of paint loss and rusting. The 2003 inspection report shows that the floor beams were inspected at arms length when the timber deck was removed and minor section loss was observed on top of the top flanges. EUMZ
10/13/2009 - None NZDZ
09/25/2007 - Panel points continue to show advancing rusting. No significant changes. ZZDW
11/17/2005 - Some minor paint loss and rusting. No problems noted. (4.88 * 2 = 9.76) SPGZ
08/25/2003 - Isolated areas of paint loss, fleck rust and minor section loss in top of top flange. KHDZ
11/19/2002 - None UZLZ
08/15/2000 - None HADW
12/09/1998 - None TYYB
08/01/1995 - None UOTS
01/01/1995 - None UDLM

Inspection Notes:

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 302 - Compressn Joint Seal Compression Joint Seal										
	1	3	5	m.		100	0	0		
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - No problems, no changes noted. EUMZ
10/13/2009 - None NZDZ
09/25/2007 - No problems noted. ZZDW
11/17/2005 - See main span element notes. (4.88 * 1 = 4.88) SPGZ
08/25/2003 - New in August 2003. KHDZ

Inspection Notes:

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 311 - Moveable Bearing										
	1	3	2	ea.		95	5	0		
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - No changes noted from the 2009 QA inspection report. EUMZ
10/13/2009 - None NZDZ
09/25/2007 - Some material accumulations about devices. Minor rusting and paint loss. ZZDW
11/17/2005 - Pony truss stringers have pads under each end on West end and one under each end of a pair of tube floorbeams on East end, see pics.. And then the original pony truss slotted plate movable and fixed plate at each corner. SPGZ
08/25/2003 - Non-functioning KHDZ
11/19/2002 - Non-functional UZLZ
08/15/2000 - Non functional HADW
12/09/1998 - Non-functional. TYYB
08/01/1995 - None UOTS
01/01/1995 - None UDLM

Inspection Notes:

INITIAL ASSESSMENT FORM FOR STRUCTURE :

L32101000+01001

Continue

*** * * * * * * * * *** Span : **Main-2 - -1 (cont.)** *** * * * * * * * * ***

Element Description

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 313 - Fixed Bearing										
	1	3	2	ea.		0	100	0		
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - No changes noted from the 2009 QA inspection report.	EUMZ
10/13/2009 - None	NZDZ
09/25/2007 - Some material accumulations about devices with minor paint loss and rusting. No significant changes noted.	ZZDW
11/17/2005 - Fixed plate at main pier with minor spot paint loss and minor rusting. No problems noted. Main span 2 pony truss only.	SPGZ
08/25/2003 - No change	KHDZ
11/19/2002 - None	UZLZ
08/15/2000 - None	HADW
12/09/1998 - None	TYYB
08/01/1995 - None	UOTS
01/01/1995 - None	UDLM

Inspection Notes:

Smart Flag	Scale Factor	Env	Quantity	Units	Insp Each	Pct Stat 1	Pct Stat 2	Pct Stat 3	Pct Stat 4	Pct Stat 5
Element 334 - Metal Rail Coated										
	1	3	24	m.		90	5	5	0	0
						%	%	%	%	%

Previous Inspection Notes :

10/31/2011 - Some coating loss with some minor rusting of rail.	EUMZ
10/13/2009 - None	NZDZ
09/25/2007 - See main span notes.	ZZDW
11/17/2005 - See main span element notes. (11.96 * 2 = 23.92)	SPGZ
08/25/2003 - New tubular steel curbs and pedestrin rail painted in Aust 2003	KHDZ
11/19/2002 - None	UZLZ
08/15/2000 - Collision damage	HADW
12/09/1998 - None	TYYB
08/01/1995 - None	UOTS
01/01/1995 - None	UDLM

Inspection Notes:

L32101000+01001
Continue

General Inspection Notes

10/31/2011 - None	EUMZ
10/13/2009 - None	NZDZ
09/25/2007 - None	ZZDW
11/17/2005 - Changed NBI item 41 to (B) because bridge is posted for more weight than what it is rated for. Nate.	SPGZ
08/25/2003 - None	KHDZ
11/19/2002 - Drift was removed and bearings were cleaned by Missoula County in Nov. 2002. The bearings are still non-functional. Deck plank repairs necessitated by mechanical wear were made on 3 different occasions during 2002 by the Missoula County. Missoula County is in the process of contracting design for repairs and redecking for this bridge for 2003. The ADTs continue to rise on this bridge yearly. This structure is Missoula County's current	UZLZ
08/15/2000 - Steve German, PE for MDOT Missoula and Barb Shubert, Missoula County performed a fracture critical inspection on 8/15/2000 on all of the tension members of the trusses. No evidence of cracking or section loss was detected.	HADW
12/09/1998 - MISCNTY1 inspection comments - Structure L32101000+01001 - Date 12/9/98 - Previous comments > Sufficiency Rating Calculation Accepted by ops$u5963 at 3/11/97 08:40:00 Sufficiency Rating Calculation Accepted by OPS$U9004 at 2/19/97 12:31:36	TYYB
08/01/1995 - Sufficiency Rating Calculation Accepted by ops$u5963 at 3/11/97 08:40:00 Sufficiency Rating Calculation Accepted by OPS$U9004 at 2/19/97 12:31:36	UOTS
01/01/1995 - Sufficiency Rating Calculation Accepted by pontis at 3/24/98 09:42:23 Sufficiency Rating Calculation Accepted by pontis at 3/23/98 14:45:24 MISCNTY1 inspection comments - Structure L32101000+01001 - Date 10/7/97	UDLM
12/01/1994 - Updated with tape 1995	NB95
08/01/1992 - Updated with tape 1994	NB94
06/01/1989 - Updated with tape 1992	NB92

APPENDIX C

MISSOULA COUNTY PARKING RESOLUTIONS

Resolution 79-128

REGULATION OF PARKING, CONGREGATING, ETC. ON MACLAY BRIDGE.

Whereas, vehicles parked on the approaches to the Maclay Bridge over the Bitterroot River West of Missoula are creating a hazard and rendering dangerous passage over the bridge; and

Whereas, persons loitering on, diving or jumping from, and climbing or congregating on the bridge structure are creating a hazard and rendering dangerous passage over the bridge; and

Whereas, the Board of County Commissioners is authorized by Section 61-12-101 M.C.A. to adopt regulations governing parking on county roads; and

Whereas, Section 61-8-705 M.C.A. authorizes the removal of illegally parked vehicles; and

Whereas, Section 45-8-107 M.C.A. specifies that rendering dangerous for passage a public right-of-way constitutes a public nuisance.

NOW THEREFORE BE IT RESOLVED that parking on Maclay Bridge and on the road right-of-way leading to it for distance of 500 yards be and same is hereby prohibited.

BE IT FURTHER RESOLVED, that loitering on, fishing from, diving or jumping from and climbing or congregating on Maclay Bridge be and the same is hereby prohibited.

BE IT FURTHER RESOLVED that the County Surveyor place appropriate signs on Maclay Bridge and its approaches with said signs, in addition to prohibiting parking, stating that illegally parked vehicles will be towed.

BE IT FURTHER RESOLVED that Missoula County Sheriff is hereby requested to take such action as is required to assure compliance with the parking and pedestrian regulations on Maclay Bridge and its approaches.

DATED this 24th day of July, 1979.

Jim Waltermire
Chairman

OUT OF OFFICE
Commissioner

Barbara Evans
Commissioner

ATTEST:
Clerk & Recorder

I received and filed this instrument for record on the 30 day of July 19 79 at 3:00 o'clock P.M. and it is recorded in Vol 143 of Micro Records of the County of Missoula, State of Montana, on page 982 Fee None
Witness my hand, Fern Hart, County Recorder
By Deputy
Paid ____ Return to ____
Address ____

451019

BCC 7-24
SWR
BRIDGES
MACLAY

RESOLUTION NO. 90-064

A RESOLUTION CREATING A RESIDENTIAL ON-STREET PARKING PERMIT REGULATION PROGRAM IN THE MACLAY BRIDGE AREA

WHEREAS, the Board of County Commissioners of Missoula County is authorized, pursuant to Section 7-14-2106 M.C.A., to establish parking regulations by resolution for the purpose of regulating the parking of motor vehicles in unincorporated towns and villages; and

WHEREAS, Section 61-12-101 M.C.A. provides that local authorities may regulate, within the reasonable exercise of police power, the standing or parking of vehicles on streets or highways under their jurisdiction; and

WHEREAS, the Board of County Commissioners has received a petition from residents living in the Maclay Bridge area requesting the establishment of a residential on-street parking permit regulation program; and

WHEREAS, the Board of County Commissioners of Missoula County, Montana, has determined after a Public Hearing on July 18, 1990, and public input that:

1. The area proposed for the parking permit regulation program, as outlined in the attached Exhibit "A", is predominantly residential in character;

2. The streets in the area near Maclay Bridge are regularly congested with vehicles parked by persons not residing in the area;

3. In order to better provide adequate motor vehicle parking for residents of the area, it is necessary to establish an area limiting the parking of vehicles along the public streets in the residential area to vehicles registered or controlled and exclusively used by persons residing in the residential area; and

WHEREAS, the Board of County Commissioners has deemed it a necessity to immediately address the problems of littering, noise and disruptive behavior through the adoption of a resolution creating a residential on-street parking permit regulation program in the Maclay Bridge area;

NOW, THEREFORE, BE IT RESOLVED that effective August 1, 1990, this Resolution shall be in full force and effect in Missoula County (7-5-123, M.C.A.).

SECTION 1: LIMITATIONS ON PARKING.

A. It shall be unlawful for any person to stop, stand or park a vehicle on any street included in the Maclay Bridge On-Street Parking Permit Regulation Program, as identified in Exhibit "A" of this resolution adopted by the Board of County Commissioners, during the months and hours set forth in this resolution, except in the following circumstances:

1. Those vehicles displaying a valid residential parking permit for the area.

2. An emergency vehicle, including but not limit to an ambulance, fire engine or other law enforcement vehicle.

3. A clearly marked business vehicle which is under the control of a person providing a service to persons or

property located in the designated residential permit only parking area, including but not limited to a delivery vehicle.

B. The months and hours during which the area is designated a residential permit only parking area shall be June 1st through September 30th during the hours of 3:00 p.m. to 6:00 a.m.

C. Anyone violating this section shall be subject to a fine of not less than twenty dollars ($20.00) and not more than forty dollars ($40.00) per ticket. Each day an offense exists constitutes a separate offense. Imprisonment may not be a part of any penalty imposed for a violation of this part.

SECTION 2: RESIDENTIAL PARKING PERMIT APPLICATION PROCEDURE.

Applications for residential parking permits shall be submitted to the Missoula Parking Commission on a form prescribed by the Missoula Parking Commission and shall be accompanied by proof in a form satisfactory to the Missoula Parking Commission of the applicant's place of residence within the residential parking permit only area, as well as proof of registration or use and control of each vehicle for which a residential parking permit is sought. Each application shall be accompanied by the appropriate fee of seven dollars ($7.00). No part of the parking permit fee shall be refundable. This fee is established at a level that covers the cost of administration and enforcement of the residential parking permit only regulations in the residential area.

SECTION 3: RESIDENTIAL PARKING PERMIT FORM AND ISSUANCE.

A. Upon approval by the Missoula Parking Commission of the application of any person residing in a residential parking permit only area, a residential parking permit shall be issued for each vehicle receiving approval. Approved residences may also purchase packets of fifteen (15) guest parking permits for a fee of five dollars ($5.00).

B. Each residential parking permit issued by the Missoula Parking Commission for a vehicle shall set forth the date of issuance and license number of the vehicles for which it is issued. Annual permits shall be required. A permit shall be valid for no longer than the permit year of issuance. The issuance of a residential parking permit does not serve as a guarantee that there will always be a parking space available for the permit holder on the public streets within the designated residential parking permit area.

SECTION 4: DISPLAY OF RESIDENTIAL PARKING PERMITS REQUIRED.

Residential parking permits shall be displayed on a vehicle in the place and in the manner prescribed by the Missoula Parking Commission. It is unlawful to either fail to display or improperly display a residential parking permit, or to attempt to use a residential parking permit from another area in a designated residential area. Anyone violating this section shall be subject to a minimum fine of twenty dollars ($20.00) and a maximum fine of forty dollars ($40.00). Each day an offense exists constitutes a separate offense. Imprisonment may not be a part of any penalty imposed for a violation of this section.

SECTION 5: SEVERABILITY.

If any section, subsection, sentence, clause, phrase or work of this resolution is for any reason held to be invalid or

unconstitutional, such decision shall not affect the validity of the remaining portions of this resolution.

DATED this 18th day of July, 1990.

BOARD OF COUNTY COMMISSIONERS

Janet Stevens, Chairman

Barbara Evans, Commissioner

Ann Mary Dussault, Commissioner

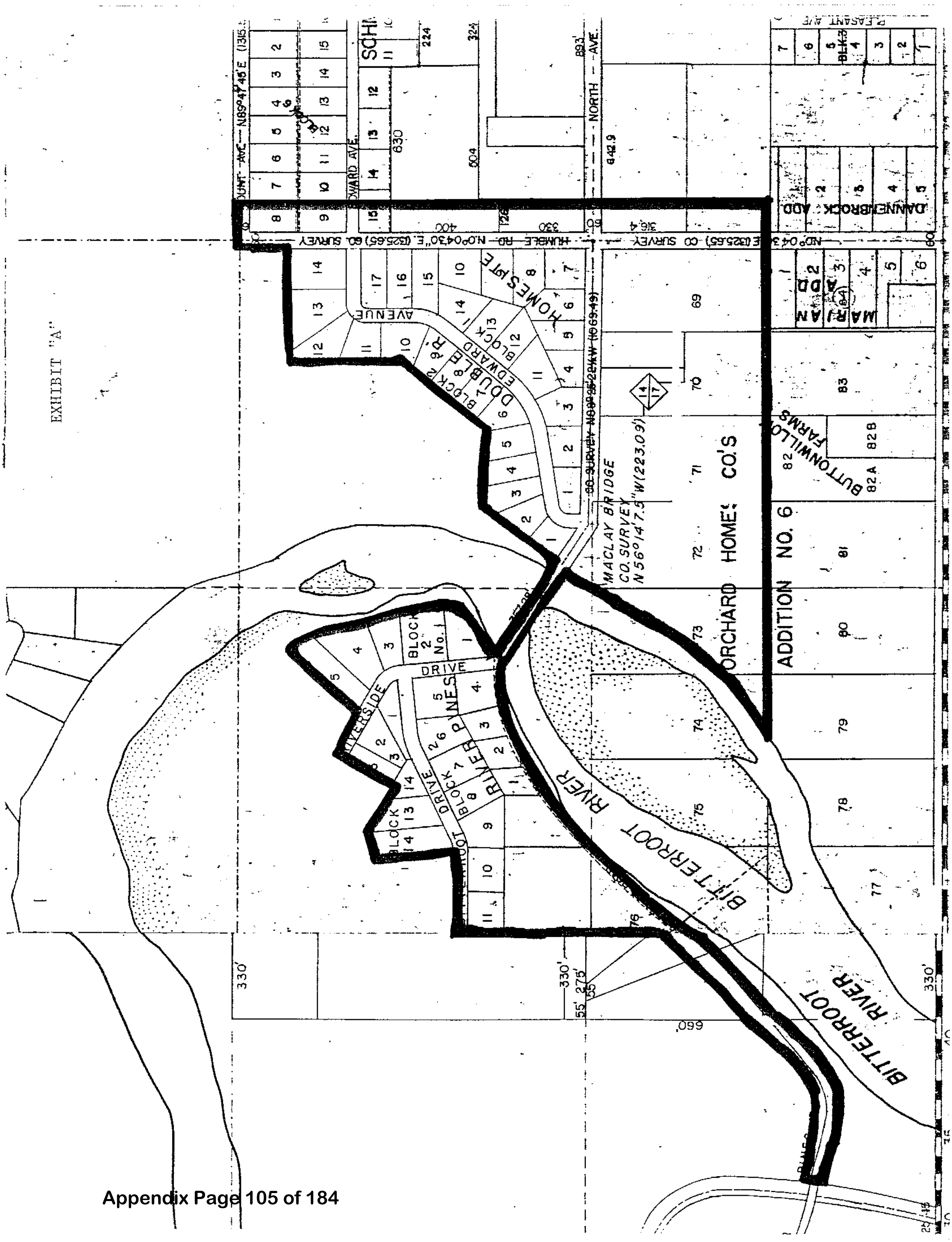
ATTEST:

Clerk & Recorder

APPROVED AS TO FORM AND CONTENT:

Deputy County Attorney

EXHIBIT "A"


BITTERROOT RIVER
BITTERROOT RIVER
ORCHARD HOMES CO'S
ADDITION NO. 6
RIVERSIDE DRIVE
RIVER PINES
DOUBLE R
EDWARD AVENUE
HOMESITE
NORTH AVE.
HUMBLE RD. N.0°04'30"E.(325.65) CO. SURVEY
MACLAY BRIDGE
CO. SURVEY
N 56°14'7.5"W(223.09')
BUTTONWILLOW FARMS
MARIJAN ADD.
DANNEMBROCK ADD.
PLEASANT AVE
330'
660'

RESOLUTION NO. 91-067

A RESOLUTION SUPERSEDING RESOLUTION NO. 90-064, A RESOLUTION CREATING A RESIDENTIAL ON-STREET PARKING PERMIT REGULATION PROGRAM IN THE MACLAY BRIDGE AREA, SIGNED JULY 18, 1990 (AMENDING SECTION 1, PARAGRAPH A)

WHEREAS, the Board of County Commissioners of Missoula County is authorized, pursuant to Section 7-14-2106 M.C.A., to establish parking regulations by resolution for the purpose of regulating the parking of motor vehicles in unincorporated towns and villages; and

WHEREAS, Section 61-12-101 M.C.A. provides that local authorities may regulate, within the reasonable exercise of police power, the standing or parking of vehicles on streets or highways under their jurisdiction; and

WHEREAS, the Board of County Commissioners has received a petition from residents living in the Maclay Bridge area requesting the establishment of a residential on-street parking permit regulation program; and

WHEREAS, the Board of County Commissioners of Missoula County, Montana, has determined after a Public Hearing on July 18, 1990, and public input that:

1. The area proposed for the parking permit regulation program, as outlined in the attached Exhibit "A", is predominantly residential in character;

2. The streets in the area near Maclay Bridge are regularly congested with vehicles parked by persons not residing in the area;

3. In order to better provide adequate motor vehicle parking for residents of the area, it is necessary to establish an area limiting the parking of vehicles along the public streets in the residential area to vehicles registered or controlled and exclusively used by persons residing in the residential area; and

WHEREAS, the Board of County Commissioners has deemed it a necessity to immediately address the problems of littering, noise and disruptive behavior through the adoption of a resolution creating a residential on-street parking permit regulation program in the Maclay Bridge area;

NOW, THEREFORE, BE IT RESOLVED that effective immediately, this Resolution shall be in full force and effect in Missoula County (7-5-123, M.C.A.).

SECTION 1: LIMITATIONS ON PARKING.

A. It shall be unlawful for any person, **or for the registered owner of a vehicle to permit any person**, to stop, stand or park a vehicle on any street included in the Maclay Bridge On-Street Parking Permit Regulation Program, as identified in Exhibit "A" of this resolution adopted by the Board of County Commissioners, during the months and hours set forth in this resolution except in the following circumstances:

1. Those vehicles displaying a valid residential parking permit for the area.

2. An emergency vehicle, including but not limited to an ambulance, fire engine or other law enforcement vehicle.

3. A clearly marked business vehicle which is under the control of a person providing a service to persons or property located in the designated residential permit only parking area, including but not limited to a delivery vehicle.

B. The months and hours during which the area is designated a residential permit only parking area shall be June 1st through September 30th during the hours of 3:00 p.m. to 6:00 a.m.

C. Anyone violating this section shall be subject to a fine of not less than twenty dollars ($20.00) and not more than forty dollars ($40.00) per ticket. Each day an offense exists constitutes a separate offense. Imprisonment may not be a part of any penalty imposed for a violation of this part.

SECTION 2: RESIDENTIAL PARKING PERMIT APPLICATION PROCEDURE.

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SECTION 3: RESIDENTIAL PARKING PERMIT FORM AND ISSUANCE.

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B. Each residential parking permit issued by the Missoula Parking Commission for a vehicle shall set forth the date of issuance and license number of the vehicles for which it is issued. Annual permits shall be required. A permit shall be valid for no longer than the permit year of issuance. The issuance of a residential parking permit does not serve as a guarantee that there will always be a parking space available for the permit holder on the public streets within the designated residential parking permit area.

SECTION 4: DISPLAY OF RESIDENTIAL PARKING PERMITS REQUIRED.

Residential parking permits shall be displayed on a vehicle in the place and in the manner prescribed by the Missoula Parking Commission. It is unlawful to either fail to display or improperly display a residential parking permit, or to attempt to use a residential parking permit from another area in a designated residential area. Anyone violating this section shall be subject to a minimum fine of twenty dollars ($20.00) and a maximum fine of forty dollars ($40.00). Each day an offense exists constitutes a separate offense. Imprisonment may not be a part of any penalty imposed for a violation of this section.

SECTION 5: SEVERABILITY.

If any section, subsection, sentence, clause, phrase or work of this resolution is for any reason held to be invalid or unconstitutional, such decision shall not affect the validity of the remaining portions of this resolution.

DATED THIS 17th day of July, 1991.

BOARD OF COUNTY COMMISSIONERS

Ann Mary Dussault, Chair

Barbara Evans, Commissioner

Janet Stevens, Commissioner

ATTEST:

County Clerk & Recorder

APPROVED AS TO FORM AND CONTENT:

Deputy County Attorney

Surveyor - Maclay Bridge File Copy

RESOLUTION NO. 99-003

**REGULATING PARKING, CONGREGATING, ETC.
ON MACLAY BRIDGE.
AND AMENDING RESOLUTION 79-128.**

WHEREAS, vehicles parked on the approaches to the Maclay Bridge over the Bitterroot River west of Missoula area are creating a hazard and rendering dangerous passage over the bridge; and

WHEREAS, persons standing on, diving or jumping from, and climbing or congregating on the bridge structure are creating a hazard and rendering dangerous passage over the bridge; and

WHEREAS, the Board of County Commissioners is authorized by Section 61-12-101, M.C.A., to adopt regulations governing parking on County roads; and

WHEREAS, Section 61-8-705, M.C.A., authorizes the removal of illegally parked vehicles; and

WHEREAS, Section 45-8-111, M.C.A., specifies that rendering dangerous for passage a public right-of-way constitutes a public nuisance.

NOW, THEREFORE, BE IT RESOLVED that parking on Maclay Bridge and on the road right-of-way leading to it for distance of 500 yards be and the same is hereby prohibited.

BE IT FURTHER RESOLVED, that standing on, fishing from, diving or jumping from and climbing or congregating on Maclay Bridge be and the same is hereby prohibited.

BE IT FURTHER RESOLVED that the County Surveyor place appropriate signs on Maclay Bridge and its approaches with said signs, in addition to prohibiting parking, stating that illegally parked vehicles will be towed.

BE IT FURTHER RESOLVED that Missoula County Sheriff is hereby requested to take such action as is required to assure compliance with the parking and pedestrian regulations on Maclay Bridge and its approaches.

DATED this 7th day of January, 1999.

BOARD OF COUNTY COMMISSIONERS
MISSOULA COUNTY

ATTEST:

Vicki M. Zeier
Clerk and Recorder

Michael Kennedy, Chair
Missoula County Commissioner

Bill Carey
Missoula County Commissioner

Barbara Evans
Missoula County Commissioners

APPROVED AS TO FORM
AND CONTENT:

Deputy County Attorney

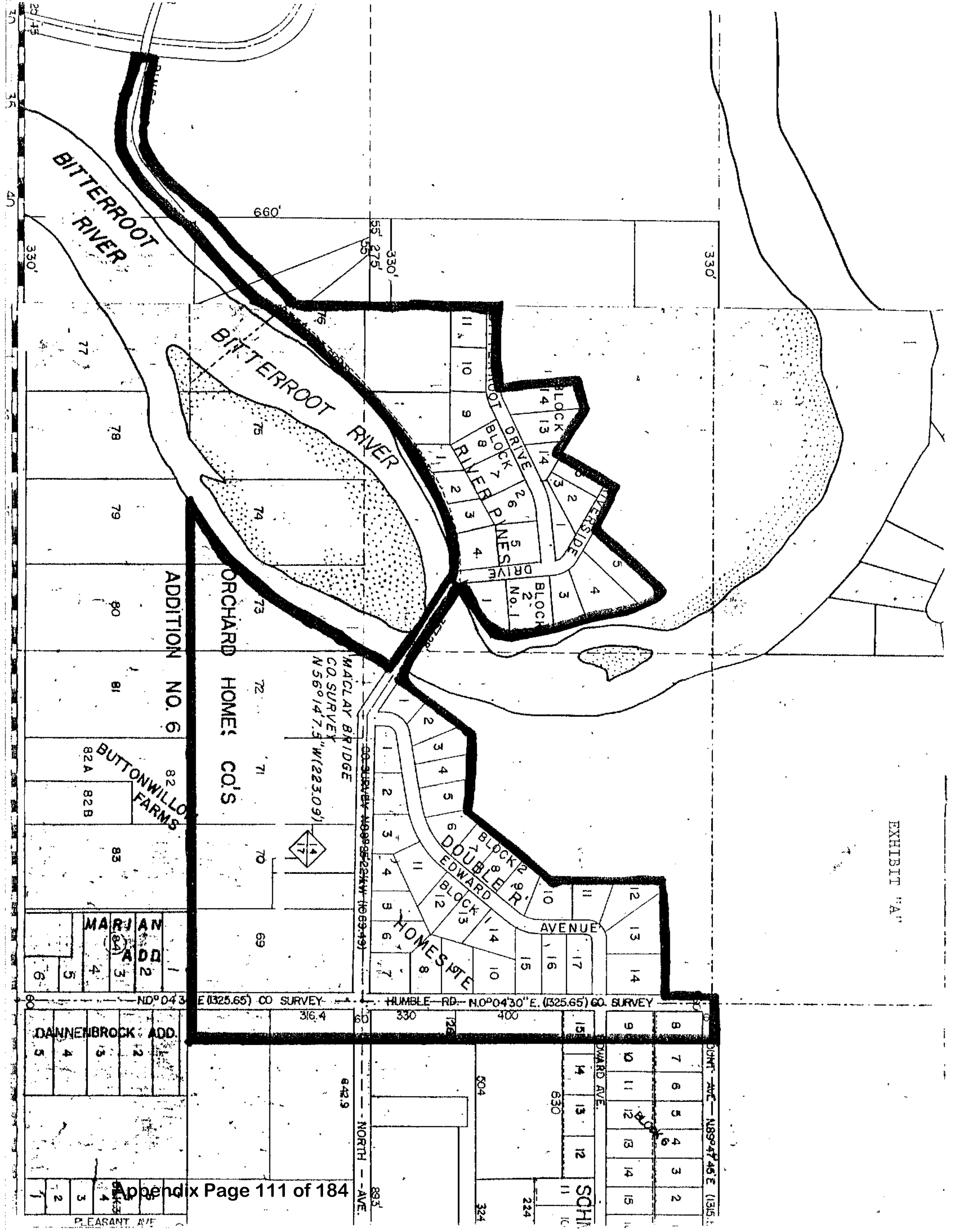


EXHIBIT "A"
BITTERROOT RIVER
BITTERROOT RIVER
RIVER PYNES
RIVERSIDE DRIVE
BLOCK 2 No. 1
ORCHARD HOMES CO'S ADDITION NO. 6
BUTTONWILLOW FARMS
MACLAY BRIDGE CO. SURVEY N 56°14'7.5"W (223.09')
DOUBLE 'R' HOMESITE
EDWARD AVENUE
MARIAN ADD
DANNENBROCK ADD.
HUMBLE RD. N.0°04'30"E. (1325.65') CO. SURVEY
NORTH AVE.
PLEASANT AVE
660'
330'
330'
330'

M E M O R A N D U M

DATE: August 31, 1998

TO: Acting Co. Attorney Mike Sehestadt

FROM: Capt. Don Morman

RE: MaClay Bridge

CC: Sheriff Chase, Undersheriff Weatherman

Attached you will find Resolution 79-128 that regulates Parking, Congregating, etc., on MaClay Bridge. Attached also is a Aug. 8, 1991 Memorandum from Karen Townsend. This year during discussions Karen requested that we write citations for Public Nuisance. I put out this memorandum. The only problem is that all Public Nuisance's should be written into Justice Court for Adults and Juvenile Courts for Juveniles. The obvious problem is that Youth Court can not levy fines(most violators are juveniles) so we are back to the old problem. Karen also requested that other remedies for Jumping, divng, climbing etc. Most of these again would be youth court citations.

I propose [redacted] you revising this resolution. Change the section for public nuisance to 45-8-111. Omit Loitering.

With these changes I would for 1999 again write all violators(adult and Juv.) into Justice Court. The bond presently is $50.

Please be advised this request should have no effect on 91-067 which is the residential on-street parking permit regulations.

12/28/98

MIKE COULD WE VISIT THIS BEFORE SPRING WE ARE PUTTING TOGETHER A NEW BOND Schedule

4/1/99

RESOLUTION NO. 2011- 073

REGULATING PARKING, CONGREGATING, ETC.
ON MACLAY BRIDGE
AND AMENDING RESOLUTION NO. 91-067

WHEREAS, Resolution No. 91-067 and were established to prohibit certain activities on Maclay Bridge and regulate parking in the general vicinity; and

WHEREAS, the Board of County Commissioners is authorized by MCA 61-12-101 to adopt regulations governing parking on County Roads; and

WHEREAS, MCA 61-8-705 authorizes the removal of illegally parked vehicles; and

WHEREAS, MCA 45-8-111(c) defines public nuisance as a condition that renders dangerous for passage any public highway or right of way or waters used by the public; and

WHEREAS, at the request of property owners to modify the parking district boundary;

NOW THEREFORE BE IT RESOLVED, that the parking district boundary be amended as represented in attached exhibit "A"; and

BE IT FURTHER RESOLVED, that all provisions of Resolution No. 91-067 remain in full force and effect.

Dated this 7th day of June, 2011

BOARD OF COUNTY COMMISSIONERS

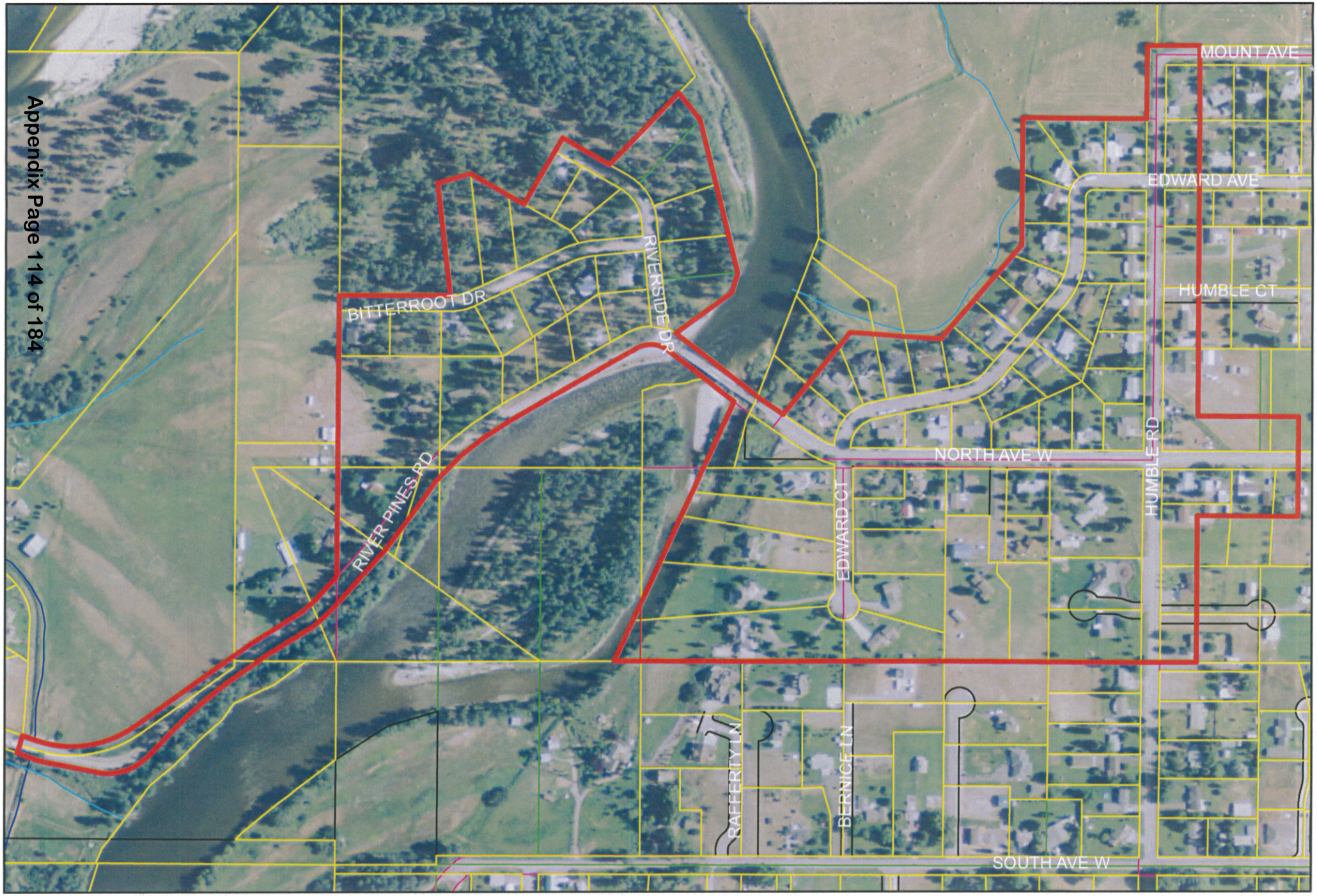
Jean Curtiss, Chair

Michele Landquist, Member

Bill Carey, Member

ATTEST:

Vicki M Zeier
Clerk & Recorder



Maclay Bridge Area
restricted parking zone

Exhibit 'A'

APPENDIX D

HOURLY TRAFFIC VOLUMES – RIVER PINES ROAD

Missoula County Public Works

Road: River Pines Road
Location: South of Maclay Bridge
Description 3:

Date: 10/3/2012
Wednesday

24 Hour Volume

Begin	South		North		Combined		Begin	South		North		Combined	
12:00 AM	0	1	0	1	0	2	12:00 PM	23	66	15	55	38	121
12:15 AM	1		1		2		12:15 PM	18		9		27	
12:30 AM	0		0		0		12:30 PM	7		16		23	
12:45 AM	0		0		0		12:45 PM	18		15		33	
1:00 AM	0	1	0	0	0	1	1:00 PM	14	57	10	32	24	89
1:15 AM	1		0		1		1:15 PM	10		5		15	
1:30 AM	0		0		0		1:30 PM	15		11		26	
1:45 AM	0		0		0		1:45 PM	18		6		24	
2:00 AM	0	2	2	2	2	4	2:00 PM	9	58	13	64	22	122
2:15 AM	2		0		2		2:15 PM	13		8		21	
2:30 AM	0		0		0		2:30 PM	18		22		40	
2:45 AM	0		0		0		2:45 PM	18		21		39	
3:00 AM	1	3	0	1	1	4	3:00 PM	22	115	12	52	34	167
3:15 AM	1		1		2		3:15 PM	24		12		36	
3:30 AM	1		0		1		3:30 PM	34		11		45	
3:45 AM	0		0		0		3:45 PM	35		17		52	
4:00 AM	0	1	0	2	0	3	4:00 PM	27	127	15	64	42	191
4:15 AM	1		2		3		4:15 PM	35		16		51	
4:30 AM	0		0		0		4:30 PM	36		16		52	
4:45 AM	0		0		0		4:45 PM	29		17		46	
5:00 AM	0	5	2	11	2	16	5:00 PM	33	143	27	95	60	238
5:15 AM	0		2		2		5:15 PM	33		23		56	
5:30 AM	2		3		5		5:30 PM	36		19		55	
5:45 AM	3		4		7		5:45 PM	41		26		67	
6:00 AM	0	9	2	31	2	40	6:00 PM	24	127	12	54	36	181
6:15 AM	4		6		10		6:15 PM	34		14		48	
6:30 AM	3		13		16		6:30 PM	37		9		46	
6:45 AM	2		10		12		6:45 PM	32		19		51	
7:00 AM	3	19	15	151	18	170	7:00 PM	24	73	12	47	36	120
7:15 AM	4		41		45		7:15 PM	20		10		30	
7:30 AM	2		45		47		7:30 PM	14		17		31	
7:45 AM	10		50		60		7:45 PM	15		8		23	
8:00 AM	11	50	36	91	47	141	8:00 PM	15	51	3	21	18	72
8:15 AM	18		14		32		8:15 PM	20		7		27	
8:30 AM	9		22		31		8:30 PM	6		6		12	
8:45 AM	12		19		31		8:45 PM	10		5		15	
9:00 AM	5	31	12	66	17	97	9:00 PM	8	27	4	13	12	40
9:15 AM	8		26		34		9:15 PM	5		1		6	
9:30 AM	9		15		24		9:30 PM	8		2		10	
9:45 AM	9		13		22		9:45 PM	6		6		12	
10:00 AM	11	47	16	58	27	105	10:00 PM	3	15	3	9	6	24
10:15 AM	14		11		25		10:15 PM	6		2		8	
10:30 AM	15		19		34		10:30 PM	4		1		5	
10:45 AM	7		12		19		10:45 PM	2		3		5	
11:00 AM	12	48	16	64	28	112	11:00 PM	0	8	1	3	1	11
11:15 AM	9		16		25		11:15 PM	0		2		2	
11:30 AM	9		20		29		11:30 PM	7		0		7	
11:45 AM	18		12		30		11:45 PM	1		0		1	

	South	North	Combined
24 Hour Volume	1084 (52.3%)	987 (47.7%)	2071

	12:00 AM - 12:00 PM			12:00 PM - 12:00 AM		
	South	North	Combined	South	North	Combined
Count	217	478	695	867	509	1376
	31.2 %	68.8 %		63.0 %	37.0 %	
Peak Hour	8:00 AM	7:15 AM	7:15 AM	5:00 PM	5:00 PM	5:00 PM
Volume	50	172	199	143	95	238
Factor	0.69	0.86	0.83	0.87	0.88	0.89

File: K:\Public Works\Road Department\Traffic Operations\ADT Counts\TMWin data\TMWin\Data-JDF\2012\River Pines_South Maclay_Oct 2012.rdf

NEEDS AND OBJECTIVES

Maclay Bridge Planning Study

FINAL

Prepared for:
Montana Department of Transportation
Helena, Montana

Prepared by:
Robert Peccia & Associates
Helena, Montana
September 13, 2012

1.0 NEEDS AND OBJECTIVES

Needs and objectives are derived based on a comprehensive review of existing data and input from resource agencies, stakeholders and the public and will be used to develop options. The following needs and objectives reflect the existing social, environmental, and engineering conditions described in the Existing and Projected Conditions Report and recognize the local and regional use of the bridge.

1.1. NEED NUMBER 1:

Improve the safety and operation of the river crossing and connecting roadway network.

The single-lane bridge on a two-way, two-lane roadway does not accommodate simultaneous travel in two directions. Several crash trends have been previously identified at the bridge or on roadways leading to the bridge. Trends relative to safety are caused by a variety of factors, including poor roadway alignment, inadequate sight distance, and illegally parked cars.

Objectives (To the Extent Practicable)

- Improve sub-standard elements of facilities to meet current applicable design standards.
- Reduce delay and vehicle restriction for emergency responders under existing and future traffic demands.
- Manage travel speeds and provide adequate clear zones to improve operations.

1.2. NEED NUMBER 2:

Provide a long-term river crossing and connecting roadway network that accommodates planned growth in the Maclay Bridge area.

The Maclay Bridge is used by local and regional travelers including pedestrians, bicyclists, emergency response providers, and school buses. Depending on future growth characteristics as depicted in local adopted planning documents, the Maclay Bridge will realize increased passenger and vehicular traffic.

Objectives (To the Extent Practicable)

- Accommodate existing and future capacity demands.
- Address non-motorized facilities consistent with local planning efforts.
- Provide connectivity to neighborhood residents, and regional users accessing recreational lands to the west of the Bitterroot River.

1.3. NEED NUMBER 3:

Minimize adverse impacts from options to the environmental, cultural, scenic and recreational characteristics of the study area.

The area around the Maclay Bridge provides access to residential, agricultural and recreational lands. Because of the location along the Bitterroot River, wildlife and aquatic connectivity are areas of concern. Improvements should be considered that provide both wildlife and aquatic connectivity. All improvements should be reviewed for their potential impact to the environmental, scenic, cultural, recreational and agricultural aspects of the corridor.

Objectives (To the Extent Practicable)

- Minimize adverse impacts to the Bitterroot River from potential options.
- Minimize adverse impacts to the wildlife and aquatic organisms from potential options.
- Provide reasonable access to recreational sites in the study area (Kelly Island Fishing Access Site, Lolo National Forest, and Missoula County Parks).
- Avoid or otherwise minimize adverse impacts to historic, cultural, and archaeological resources that may result from implementation of options.

1.4. Need Number 4:

Minimize adverse impacts from options to the neighborhood characteristics of the study area.

Objectives (To the Extent Practicable)

- Implement improvements with special sensitivity to area schools.
- Minimize impacts to existing residents and businesses in the area.
- Recognize the historic value of the Maclay Bridge to the community and the role it plays in local regional events.

1.5. Other Considerations (To the Extent Practicable)

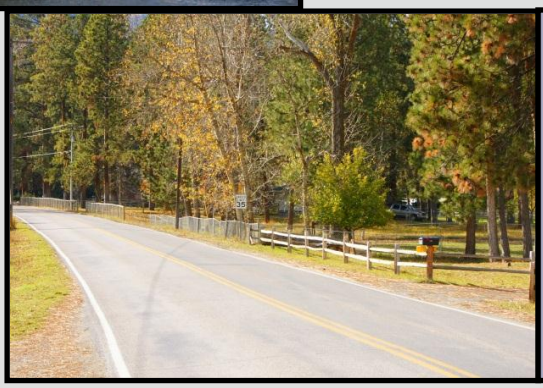
- Options should be sensitive to the availability of funding for recurring maintenance obligations or for the construction of new improvements.

The subject of parking, vandalism, illegal activity, and enforcement, along with perpetuating access to recreational sites directly adjacent to the Maclay Bridge, are areas of concern generally outside the scope of this Maclay Bridge Planning Study. However, they are areas of concern that have been documented and commented on by members of the public.

IMPROVEMENT OPTIONS UNDER CONSIDERATION

FINAL

Maclay Bridge Planning Study



MONTANA DEPARTMENT OF TRANSPORTATION

Prepared for:
Montana Department of Transportation
Helena, Montana

RPA

Prepared by:
Robert Peccia & Associates
Helena, Montana
September 24, 2012

TABLE OF CONTENTS

FIGURES

TABLES

ABBREVIATIONS / ACRONYMS

AASHTO	American Association of State Highway Transportation Officials
CE	Construction Engineering
EA	Environmental Assessment
HS (15)	Highway Semi (15 tons)
MDT	Montana Department of Transportation
MEPA	Montana Environmental Policy Act
NEPA	National Environmental Policy Act
PE	Preliminary Engineering
RDM	Road Design Manual
US	United States

IMPROVEMENT OPTIONS

1.0 PRELIMINARY IMPROVEMENT OPTIONS FOR MACLAY BRIDGE

This section identifies preliminary improvement options for the Maclay Bridge. Subsequent to this, the next step will be to identify potential benefits and impacts of each option and undertake a first-level screening process to determine if an improvement option should be carried forward. If an improvement option recommendation is forwarded, more study may be needed to determine potential impacts to any of the physical or social conditions in the Study Area.

A full range of preliminary improvement options were developed for analysis based on the identified transportation issues, needs and objectives, and public input. A no-build case, including transportation system management (TSM) strategies, is being considered as an alternative option. The preliminary improvement options were developed to meet the Needs and Objectives, which were developed through an evaluation of the information contained in the Existing and Projected Conditions Report. Areas of concern were identified in the Existing and Projected Conditions Report based on field review, engineering analysis, crash data analysis, consultation with resource agencies and information provided by the public. The corridor Needs and Objectives take into account the current social, environmental and engineering conditions described in the Existing and Projected Conditions Report.

Planning level cost estimates for the improvement options will be developed in the future. These costs will be for construction costs only in year 2012 dollars. The planning level costs will not include right-of-way acquisition, utility relocation, preliminary engineering (PE) or construction engineering (CE).

Broad categories of improvement options have been identified below. Each broad category has various types of improvement options and is discussed in more detail:

- Option 1 – Improve Safety and Operations on the Existing Bridge
- Option 2 - Rehabilitate the Existing Bridge
- Option 3 - Build New Bridge
- Option 4 – Do Nothing

1.1. OPTION 1: IMPROVE SAFETY AND OPERATIONS ON THE EXISTING BRIDGE

There are a range of improvement options that could be implemented that would improve safety and operations at the Maclay Bridge. These options include enhancing traffic operations and safety on and near the existing bridge, and implementing new restrictions on the use of the bridge. These options would not change the alignment of the approaches to the existing structure or the roadways leading to the Maclay Bridge.

Under this option Missoula County would continue to perform routine maintenance activities on the existing bridge to keep the structure in service under its load limitation for use by local residents, school buses, and emergency service vehicles. Some sub-options exist where the bridge is removed, or left for non-motorized uses, and in those cases maintenance may not be required with the same frequency as if the bridge was left in service for vehicular traffic.

1.1.1. OPTION 1A–Enhance Traffic Operations and Safety on and near the Existing Structure

This option would involve a variety of periodic maintenance activities to improve for use by local residents, school buses, and emergency vehicles. There would be no changes to the configuration or alignment of the approaches to the existing structure or roadways within the area beyond the safety improvements currently being implemented by the County and MDT.

To help manage traffic flows across the bridge, new metering devices would be installed along each approach to regulate traffic flows by direction and address vehicles having to back up so oncoming traffic can get off the bridge.

This option would include street lighting at the westerly approach to the bridge, with appropriate signage on both ends to warn of the change in roadway alignment.

Pedestrian and bicyclist travel through the area would continue to occur on the existing bridge and its adjoining roadways.

1.1.2. OPTION 1B–Maintain Current Usage and Add Pedestrian/Bicyclist Facilities

This option would construct a separated pedestrian/bicyclist facilities in the vicinity of Maclay Bridge and make limited improvements for non-motorized users on the approaches to the bridge to enhance safety for non-motorized users. These limited improvements could consist of shoulder widening on River Pines Road, signing and striping on both sides of the bridge, and pavement markings. A new, separated non-motorized bridge would be necessary adjacent to the existing Maclay Bridge.

1.1.3. OPTION 1C–Implement Additional Restrictions on Bridge Use

This option would involve placing additional operational restrictions on the use of the Maclay Bridge. These restrictions may include measures like:

- Restricting vehicle use of the structure to one travel direction (i.e. a one-way route);
- Further reducing travel speeds;
- Prohibition of use by all large trucks, school buses, and emergency vehicles; or
- Increased enforcement of parking ordinance (no tolerance policy)

There would be no changes to the alignment of the approaches or roadways within the area beyond the safety improvements currently being implemented by the County and MDT.

1.1.4. OPTION 1D–Close Bridge to Vehicles and Retain Use for Non-Motorized Travel Modes

This option would close the Maclay Bridge to vehicular traffic but allow the structure to remain in service as a river crossing for pedestrians and bicyclists and other non-motorized transportation modes. Vehicle access across the Bitterroot River would be accommodated by other existing bridges and roadways in the area—Kona Ranch Bridge via Mullen Road or Blue Mountain Road via US Highway 93. Further investment by the County in active transportation facilities in the Maclay Bridge area would likely be necessary on River Pines Road and North Avenue to provide system continuity.

The permanent closure of the bridge would eliminate through traffic on North Avenue and River Pines Road and inconvenience local residents and visitors seeking recreational opportunities on nearby public lands.

1.1.5. OPTION 1E–Retain Existing Bridge and Provide New Bridge Elsewhere

This option would involve keeping the existing bridge in service for vehicular traffic but providing another structure somewhere else in the area to help meet existing and projected travel demands.

1.1.6. OPTION 1F– New One-Lane Bridge at a New Location & Retain Existing Bridge for Non-Motorized Uses

During public outreach the concept of a new one-lane bridge at a South Avenue Extension was put forth by the public. The function of this bridge was presumed to be similar to that of the existing bridge on North Avenue, that is, carries two-way vehicular traffic across a new one-lane bridge at South Avenue. The existing Maclay Bridge could remain as an exclusive non-motorized facility.

1.1.7. OPTION 1G–New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel

Building upon the concept described above in section 1.1.6, the concept of a “one-way” couplet of roadways was discussed. In this concept, the existing Maclay Bridge would remain, be rehabilitated, and used for one-way travel only (i.e. westbound or eastbound travel only). In addition, a new single lane bridge at the extension of South Avenue would also be used for one-way travel (in the opposite direction from that of the existing Maclay Bridge).

1.1.8. OPTION 1H–Close Bridge and Remove Structure

This concept involves closing the Maclay Bridge and removing the structure. No replacement bridge would be provided in the area. With no access across the Bitterroot River in the vicinity of the Maclay Bridge, vehicles which currently use the bridge would be required to divert to Blue Mountain Road and US Highway 93 or to Mullan Road using the Kona Ranch Bridge. This would require roadway closures with barricades and the provision of adequate turnaround areas for vehicles near the ends of the existing bridge. Utilities installed on the bridge would need to be relocated. The river crossing would no longer be available to users of non-motorized transportation modes. Old easement area, particularly the area east of bridge, offers potential for providing parking area and enhancing river access.

Further investment by the County in active transportation facilities in the Maclay Bridge area would likely be necessary on River Pines Road and North Avenue to provide system continuity. The permanent closure of the bridge would eliminate through traffic on North Avenue and River Pines Road and inconvenience local residents and visitors seeking recreational opportunities on nearby public lands.

1.2. OPTION 2: REHABILITATE THE EXISTING BRIDGE

Rehabilitation options associated with the existing bridge focus exclusively on the structure. This option does nothing to address the approach roadways that tie-in to the bridge itself. This is due to the constraints of the two roadways, i.e. North Avenue and River Pines Road. These roadways cannot be reconstructed to fit within the constraints of the existing structure, so the rehabilitation option focuses solely on structure rehabilitation. This option also does not address the functionally obsolete or fracture critical status of the structure. For informational purposes only, it is noted that MDT guidelines for bridges suggest the following apply to truss rehabilitation:

- *Do not rehabilitate a truss that does not provide a roadway width of at least 16.0 feet.*
- *Widening a truss is seldom cost effective because it requires replacement of all floor beams and bracing. Do not consider widening a truss without specific approval from the Bridge Engineer.*
- *Do not rehabilitate a truss that cannot provide capacity for at least HS 15 loading when the work is complete.*
- *Do not rehabilitate a truss that cannot provide at least 14.0 feet vertical clearance.*
- *Historically significant structures require special consideration when determining whether to rehabilitate them.*

1.2.1. OPTION 2A–Minor Rehabilitation

The goal of a minor rehabilitation would be to extend the life of the bridge by performing minor upgrades and repairing deterioration and damage. Ongoing inspections and related maintenance activities would still be needed. Missoula County would continue to perform routine maintenance activities to keep the structure in service under its load limitation for use by local residents, school buses and emergency service vehicles. With repair and maintenance the bridge life could be extended depending on the rate of deterioration, aggressiveness of ongoing repair work, and barring major damage from flooding and/or vehicles. It would not eliminate inherent safety concerns. Maintenance and repair activities would probably increase over time. An engineering analysis may be appropriate to better understand the ability of the bridge to pass flood events. Minor rehabilitation would typically include rehabilitation work tasks such as follows:

- Tighten and/or replace loose bolts
- Spot painting of structural steel
- Upgrade bearings and expansion devices.
- Crack sealing of asphalt surfacing to prolong surface.
- Minor repairs and upgrades to the truss and floor system to increase load capacity
- Patch deteriorated or spalled concrete
- Safety improvements such as adding a pedestrian rail

Minor rehabilitation work is not a “one time only” application. Minor rehabilitation activities may be required on a frequency of every two-to-three years over the life of the bridge. Rehabilitation efforts on the existing bridge have been performed at least four times over the last 18 years (April, 1997 and during the summers of 2003, 2004 and 2005 – see *Existing and Projected Conditions Report*).

With minor rehabilitation, the posted vehicle weight limit restriction could be increased from the current 11 tons to around 13 tons.

1.2.2. OPTION 2B–Major Rehabilitation

The goal of a major rehabilitation would be to extend the life of the bridge to something similar to that of a new bridge. The scope of the rehabilitation would require a more in-depth engineering study. Major rehabilitation work could allow the bridge to handle full legal loads so that there would be no need for a load posting. Like minor rehabilitation, ongoing inspections and related maintenance activities would still be needed. This option requires a long term commitment to the existing bridge due to the increase in life span. The ultimate life span of the bridge would be dependent on the rate of deterioration, aggressiveness of ongoing repair work, and barring major damage from flooding and/or vehicles. Furthermore, a major rehabilitation does not eliminate the necessity for periodic maintenance.

Since the extent of the needed rehabilitation is unknown, major rehabilitation work requires an engineering study of the truss, floor system, abutments, and piers. This typically requires more engineering and plan development time. The cost of a major rehabilitation can be similar to the cost of a new bridge. An objective in major bridge rehabilitation is to bring all structural elements back to a condition rating of at least 7 (Good Condition) out of 9 (Excellent Condition).

Major rehabilitation of the existing bridge to attain longer life and higher load ratings would likely consist of the following specific work features:

- Sand blast rusted steel members and re-paint as needed
- Replace steel stringers and floor beams as determined necessary
- Upgrade truss members as determined necessary
- Evaluate abutments and piers for repair versus replacement
- Replace bearing devices
- Replace the short span pony truss with a new one lane truss
- Rehabilitating the main truss will likely require removing the main truss from the river, rebuilding or repairing offsite and installation
- Possibly remove and replace abutments and piers

1.3. OPTION 3: BUILD NEW BRIDGE

Options for a new bridge and associated roadway at all 14 locations were drawn on an aerial image using Google Earth mapping. An estimate of the length of new construction was made. For bridge, no estimate of the number of spans was made. The tables contained within each option's description lists the possible new construction length.

Depending on funding source, different sets of design standards may be applicable to the Maclay Bridge in a "replacement" scenario. One set of standards are the Missoula County *Public Works Manual 2010* design standards that have previously been described in the *Existing and Projected Conditions Report*. A collector roadway built to Missoula County standards would have a surface width of 44 feet. Pertinent to the actual bridge features, Missoula County would default to AASHTO standards for guidance.

An additional set of design standards, and those that may be considered in design if Federal or State funds were used for any type of project identified through this planning effort, are the standards and guidelines found in MDT's *Road Design Manual (*RDM*)*. The RDM specifies general design principles and controls which determine the overall operational characteristics of the roadway and enhance the aesthetic appearance of the roadway. If the recommendation for a new bridge results from the study, either at its present location or an alternate location, it would connect to roadways currently classified as rural roads or streets. The RDM geometric design criteria would be reviewed in the context of the adjacent land use, topography, and function, and compared to existing Missoula County design criteria.

For most "off-system" locations such as the Maclay Bridge (i.e. not on a State-highway), local conditions and context to the surrounding land uses would be considered in developing geometric features – which includes roadway width, travel lane width, and potential traffic calming features.

1.3.1. OPTION 3A - AT NORTH AVENUE

Option 3A includes options to build a new structure at or near the existing North Avenue alignment. Any new bridge would need to meet current design standards in place and recognized by the participating agencies.

1.3.1.1. OPTION 3A.1–BUILD ON EXISTING ALIGNMENT

One option for a replacement bridge would be to rebuild a 2-lane bridge on the present alignment. This option would not change the alignment of the approaches to the existing structure or the roadways leading to the Maclay Bridge. This option only envisions the construction of a new bridge at the present location of the existing bridge, with minimal roadway work.

Table 1: North Avenue on Existing Alignment

ALIGNMENT OPTION: ***North Avenue on Existing Alignment***	
	North Avenue on Existing Alignment
Overall Length	450 feet
Bridge Skew	20 degrees
Associated Infrastructure Improvements	Assumes minimal approach work on each side of the new bridge to tie-in existing roadways to new structure.

1.3.1.2. OPTION 3A.2–BUILD NEAR EXISTING ALIGNMENT

NORTH 1 ALIGNMENT

This option provides a new bridge parallel to and just upstream from the existing Maclay Bridge. The alignment begins on North Avenue at its intersection with Edward Avenue. The alignment of River Pines Road west of the river would be improved to eliminate the 90-degree curve at the west end of the existing bridge. Approach work on the west side of the river would extend for about 1030 feet beyond the west end of the current bridge.

NORTH 2 ALIGNMENT

This alignment extends North Avenue due west from Edward Avenue to River Pines Road about 825' southwest of the existing Maclay Bridge. The 0.25-mile-long alignment crosses the island in the Bitterroot River located upstream from the existing bridge.

These North Avenue alignments are shown on **Figure 1**.

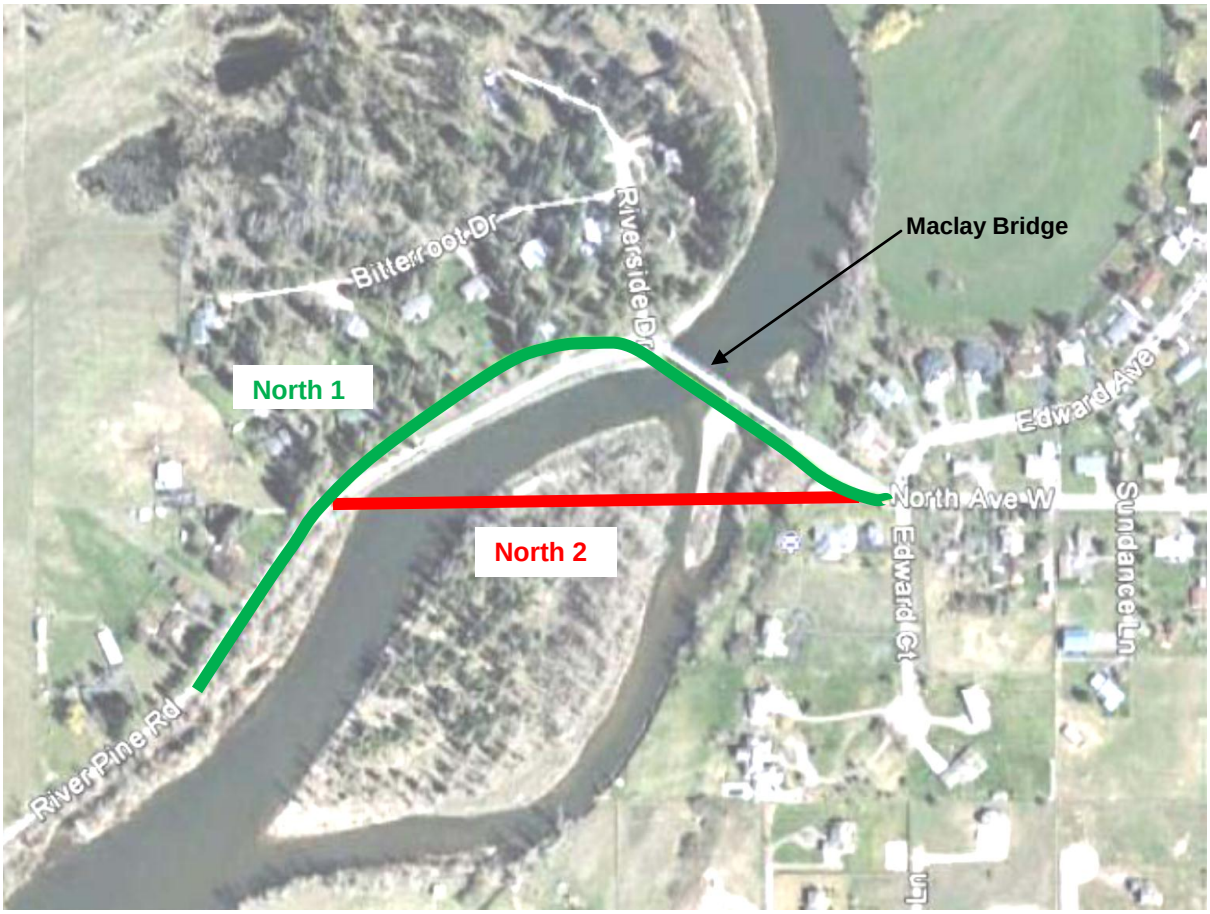


Figure 1: North Avenue Alignment Options

Table 2: North Avenue near Existing Alignment

ALIGNMENT OPTION: *North Avenue near Existing Alignment*		
	North 1	***North 2***
Overall Length	1,655 feet	1,300 feet
Bridge Skew	20 degrees	50 degrees
Associated Infrastructure Improvements	▪ Reconstruction of River Pines Road. ▪ Re-routing of utilities across the existing bridge. ▪ Relocation of gas sub-station ▪ Reconfiguration of North Avenue/Edward Court intersection.	▪ New intersection at River Pines Road. ▪ Re-routing of utilities across the existing bridge. ▪ Relocation of gas sub-station. ▪ Reconfiguration of North Avenue/Edward Court intersection.

1.3.2. OPTION 3B - AT A NEW LOCATION

A total of 16 alternatives were initially considered in the 1994 EA for the *Maclay Bridge Site Selection Study* including 13 locations for a bridge on a new alignment in the general area. The new bridge locations and associated alignments considered included:

- An alignment extending South 3rd Avenue across the river;
- An alignment extending Spurgin Road across the river;
- 2 alignments extending Mount Avenue across the river;
- 2 alignments extending Edwards Avenue across the river;
- 2 alignments along North Avenue near the existing bridge (described earlier in section 1.3.1.2);
- 2 alignments extending South Avenue across the river;
- 2 alignments extending Sundown Road across the river; and
- An alignment extending Humble Road across the river to Blue Mountain Road.

Figure 2 shows the locations of the alignments considered in the 1994 EA.

Figure 2: Bridge Alignments Considered in 1994 EA

The graphics from the 1994 EA illustrating these potential alignments were schematic in nature and were intended to illustrate the location concepts for a new bridge and roadway connections. With the exception of the Preferred Alternative identified in the EA, preliminary design drawings of the proposed roadway alignments showing associated bridge lengths and right-of-way needs are not available for the potential alignments. Therefore, each alignment was drafted on recent aerial photographs to better show its possible location and current setting. These graphics were used to help describe the overall location of the alignments.

The bridge alignments described in the 1994 EA are discussed in the following sections.

1.3.2.1. OPTION 3B.1–BUILD BRIDGE ON NORTHERN ALIGNMENT

SOUTH 3RD STREET WEST EXTENSION

This potential alignment extends from the intersection of South 3rd Street West and Clements Road west towards the Clark Fork River and continues southwesterly along the Clark Fork before turning to the south near the intersection of South 7th Street West and Humble Road. From this point, the alignment continues southwesterly across Spurgin Road and follows a tangent (straight) alignment across the Bitterroot River to end at the River Pines Road/O'Brien Creek Road/Big Flat Road/Blue Mountain Road intersection. This alignment is about 1.93 miles (10,190 feet) in length. **Figure 3** illustrates the South 3rd Street West alignment concept.

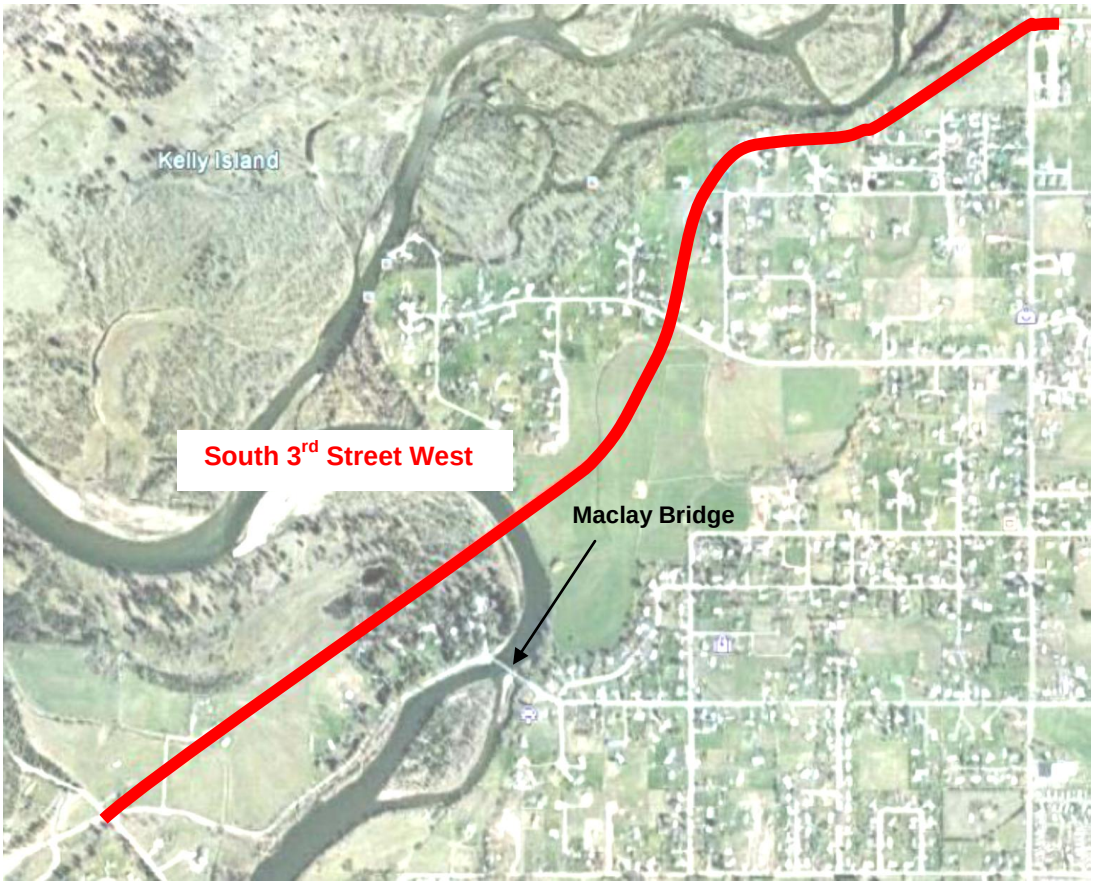


Figure 3: South 3rd Street West Alignment

Table 3: South 3rd Street West Alignment

ALIGNMENT OPTION: *South 3rd Street West Alignment*	
Overall Length	1.93 miles
Bridge Skew	0 degrees
Associated Infrastructure Improvements	▪ Intersection improvements at S 3rd/Clements, Spurgin Rd. and at River Pines Road/O'Brien Creek Road/Big Flat Road/Blue Mountain Road.

SPURGIN ROAD EXTENSION

This 1.25 mile long alignment begins near the intersection of Spurgin Road and Sierra Drive. After a long horizontal curve, the alignment continues southwesterly through agricultural lands before crossing the Bitterroot River on a tangent (straight) alignment that ends at the River Pines Road/O'Brien Creek Road/Big Flat Road/Blue Mountain Road intersection. This option would follow the same alignment as the South 3rd Street West alignment at the river crossing and west of river. **Figure 4** shows this potential alignment.

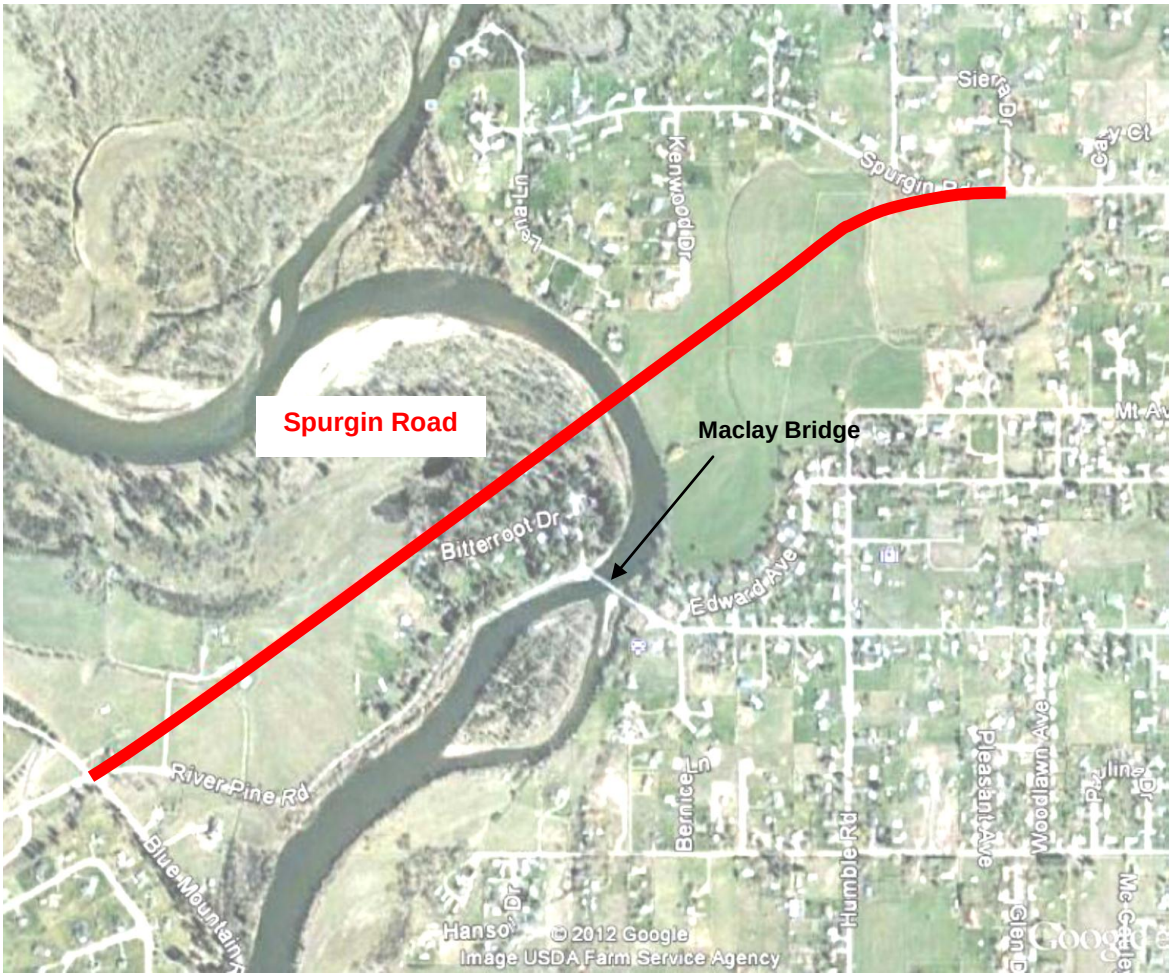


Figure 4: Spurgin Road Alignment

Table 4: Spurgin Road Alignment

ALIGNMENT OPTION: *Spurgin Road Alignment*	
Overall Length	1.25 miles
Bridge Skew	0 degrees
Associated Infrastructure Improvements	▪ Intersection improvements at Spurgin Road & Sierra Drive. ▪ Intersection improvements at River Pines Road/O'Brien Creek Road/Big Flat Road/Blue Mountain Road.

1.3.2.2. OPTION 3B.2–BUILD BRIDGE ON MOUNT AVENUE ALIGNMENT

MOUNT 1

This 1-mile long alignment begins near the intersection of Mount Avenue and Humble Road and continues west across the Bitterroot River. After crossing the river, this option follows a tangent alignment and ends at the River Pines Road/O'Brien Creek Road/Big Flat Road/Blue Mountain Road intersection.

MOUNT 2

This 0.38-mile long alignment begins at the same location as the Mount 1 alignment. However, the proposed alignment immediately proceeds in a southwesterly direction alternative across the Bitterroot River and joins River Pines Road at the west end of the existing Maclay Bridge.

Figure 5 shows both of the Mount Avenue alignment options.

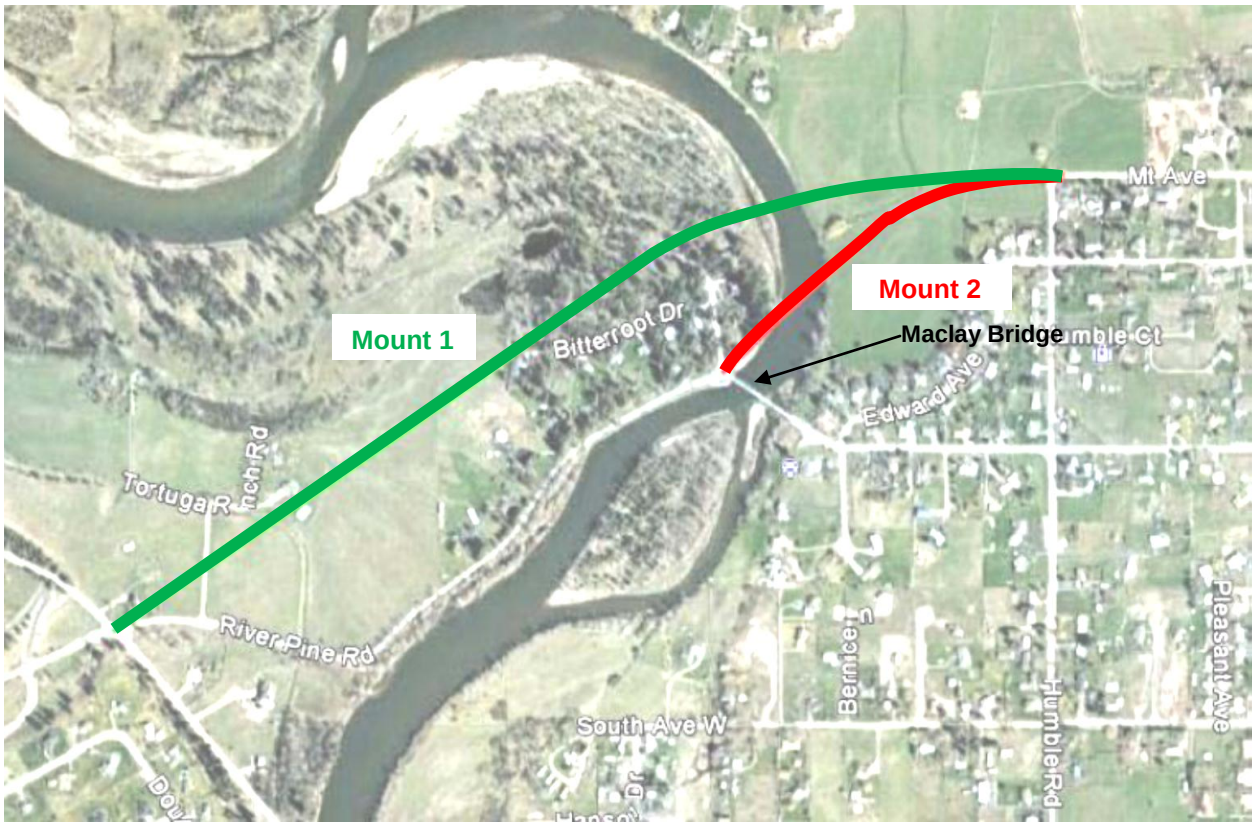


Figure 5: Mount Avenue Alignment Options

Table 5: Mount Avenue Alignments

ALIGNMENT OPTION: *Mount Avenue Alignments*		
	Mount 1	***Mount 2***
Overall Length	1.00 miles	0.38 miles
Bridge Skew	8 degrees	45 degrees
Associated Infrastructure Improvements	▪ Intersection improvements at Spurgin Road and Mount Drive. ▪ Intersection improvements at new alignment and Riverside Drive.	▪ Intersection improvements at Spurgin Road and Mount Drive. ▪ Intersection improvements at River Pines Road/O'Brien Creek Road/Big Flat Road/Blue Mountain Road.

1.3.2.3. OPTION 3B.3–BUILD BRIDGE ON EDWARD AVENUE ALIGNMENT

EDWARD 1

This alignment option begins near the intersection of Edwards Avenue and Humble Road and proceeds westerly across the Bitterroot River before turning southwesterly and continuing to the intersection of River Pines Road/O'Brien Creek Road/Big Flat Road/Blue Mountain Road. This alignment is about 0.95 miles in length.

EDWARD 2

This 0.33-mile-long alignment starts near the intersection of Edwards Avenue and Humble Road. After proceeding westerly for a short distance along an extension of Edwards Avenue, the alignment quickly transitions to a southwesterly direction across the Bitterroot River and joins River Pines Road at the west end of the existing Maclay Bridge.

The Edwards Avenue alignments are presented in **Figure 6**.

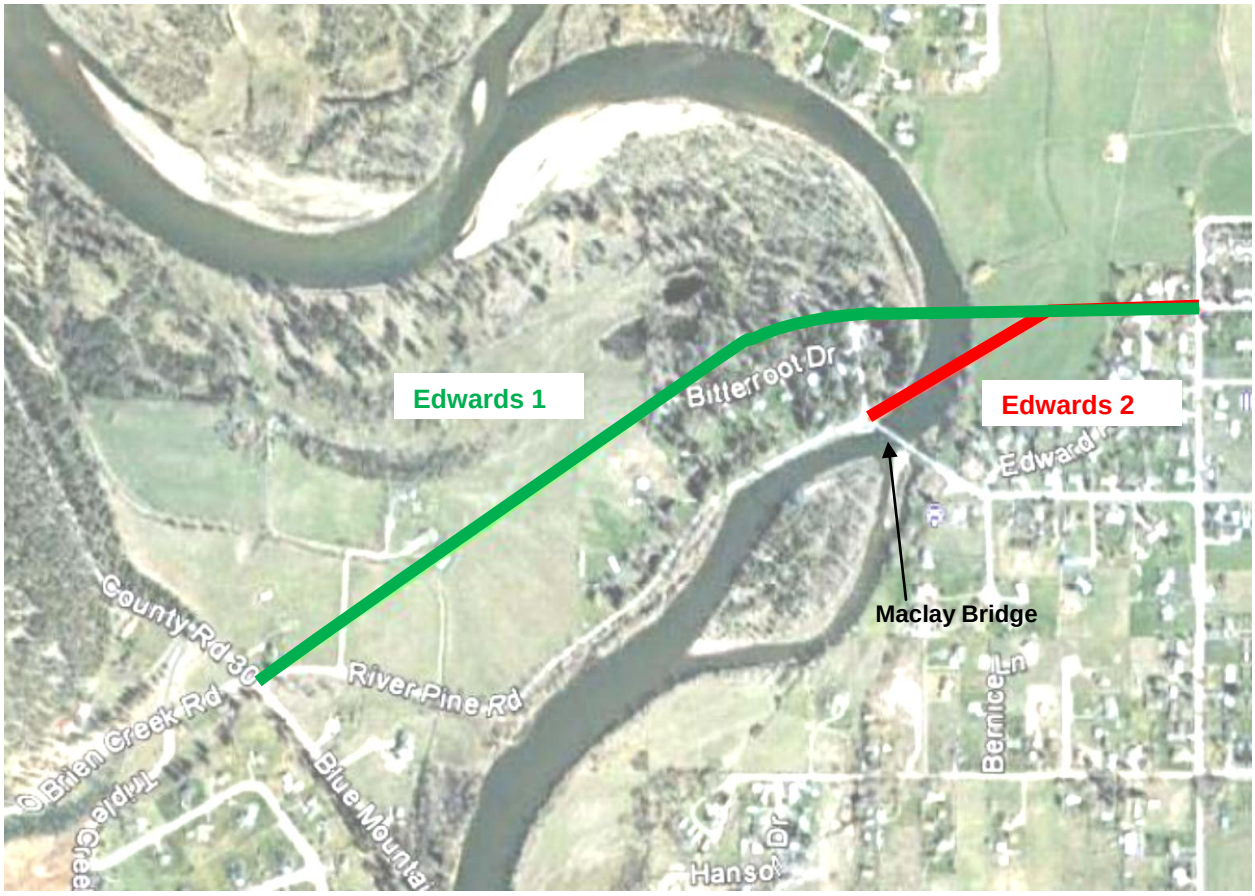


Figure 6: Edward Avenue Alignment Options

Table 6: Edward Avenue Alignments

ALIGNMENT OPTION: *Edward Avenue Alignments*		
	Edward 1	***Edward 2***
Overall Length	0.95 miles	0.33 miles
Bridge Skew	14 degrees	40 degrees
Associated Infrastructure Improvements	▪ Intersection improvements at Edwards Avenue and Humble Road. ▪ Intersection improvements at River Pines Road/O'Brien Creek Road/Big Flat Road/Blue Mountain Road.	▪ Intersection improvements at Edwards Avenue and Humble Road. ▪ Intersection improvements at new alignment and Riverside Drive.

1.3.2.4. OPTION 3B.4–BUILD BRIDGE ON SOUTH AVENUE ALIGNMENT

SOUTH 1

This alignment involves extending South Avenue northwesterly direction across the Bitterroot River to join with River Pines Road. This 0.25 mile-long alignment begins on South Avenue west of Hanson Drive (the current terminus) and continues northwesterly to join River Pines Road about 0.2 miles east of the River Pines Road/O'Brien Creek Road/Big Flat Road/Blue Mountain Road intersection.

SOUTH 2

This 0.36 mile long alignment would extend from South Avenue west of Hanson Drive (the current terminus) due west across the Bitterroot River to meet Blue Mountain Road at a location about 600 feet southeast of the River Pines Road/O'Brien Creek Road/Big Flat Road/Blue Mountain Road intersection.

Figure 7 shows both of the South Avenue alignments.

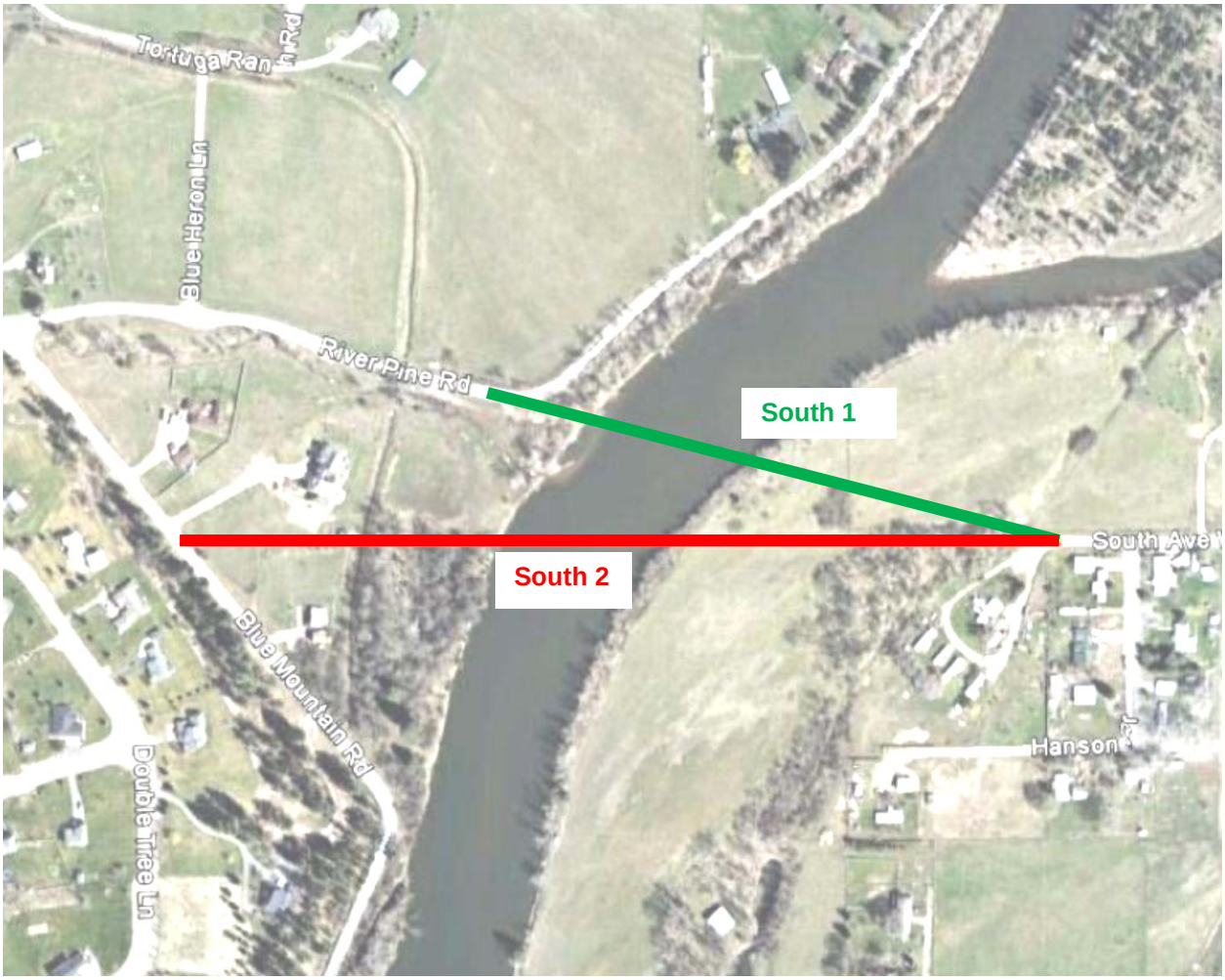


Figure 7: South Avenue Alignment Options

Table 7: South Avenue Alignments

ALIGNMENT OPTION: *South Avenue Alignments*		
	South 1	***South 2***
Overall Length	1,320 feet	1,900 feet
Bridge Skew	30 degrees	37 degrees
Associated Infrastructure Improvements	▪ Intersection improvements at South Avenue and new alignment (east of river). ▪ Intersection improvements at new alignment and River Pines Road (west of river).	▪ Intersection improvements at South Avenue and new alignment (east of river). ▪ Intersection improvements at new alignment and Blue Mountain Road.

1.3.2.5. OPTION 3B.5–BUILD BRIDGE ON SUNDOWN ROAD ALIGNMENT

SUNDOWN 1

This alignment begins at the existing western terminus of Sundown Road and extends northwesterly across the Bitterroot River to join Blue Mountain Road at the sharp curve located about 0.25 miles southeast of the River Pines Road/O'Brien Creek Road/Big Flat Road/Blue Mountain Road intersection. The total length of this alignment option is 0.26 miles.

SUNDOWN 2

This 0.30-mile-long alignment begins at the existing western terminus of Sundown Road and extends due west across the river to meet Blue Mountain Road at a location about 0.43 miles south of the River Pines Road/O'Brien Creek Road/Big Flat Road/Blue Mountain Road intersection.

The Sundown Road alignments are shown in **Figure 8**.

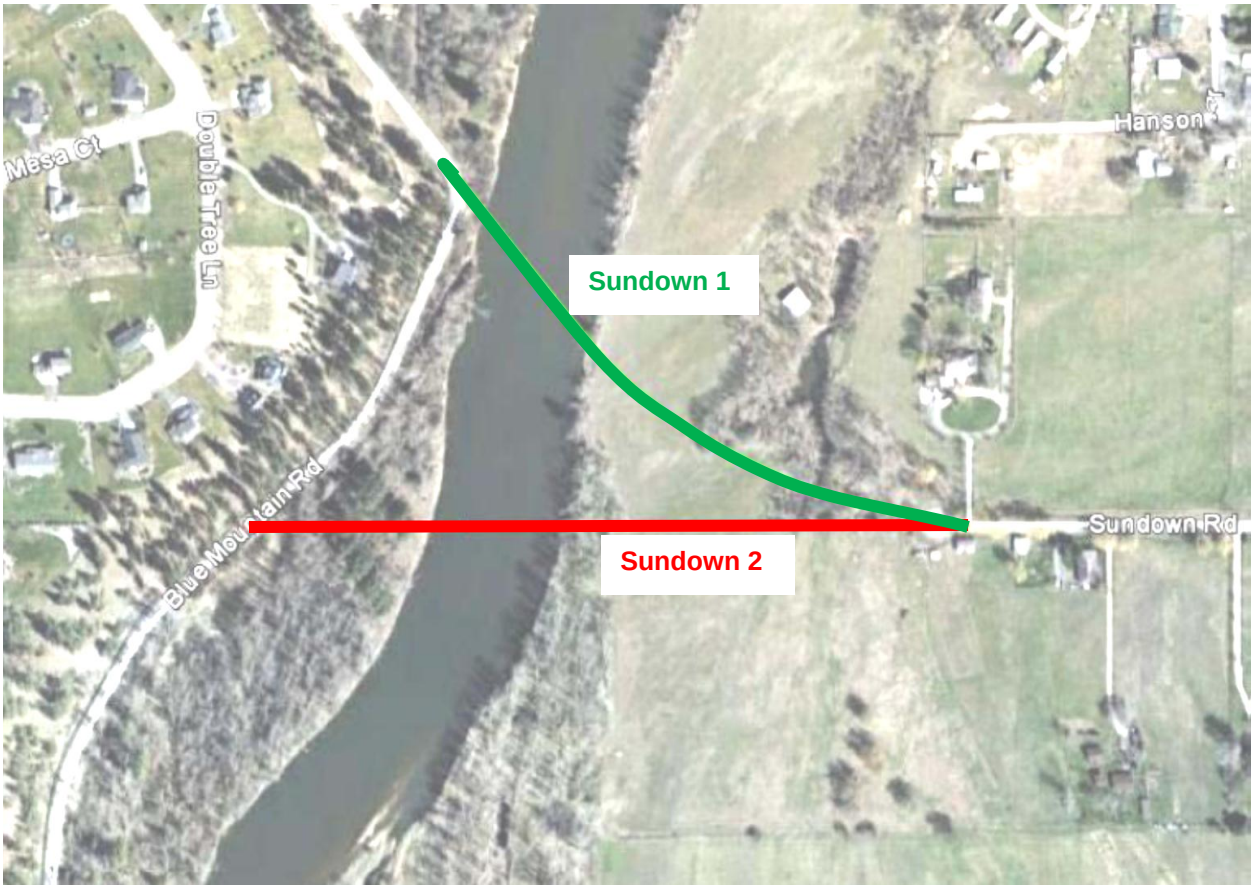


Figure 8: Sundown Road Alignment Options

Table 8: Sundown Road Alignment

ALIGNMENT OPTION: *Sundown Road Alignments*		
	Sundown 1	***Sundown 2***
Overall Length	1,375 feet	1,580 feet
Bridge Skew	37 degrees	15 degrees
Associated Infrastructure Improvements	▪ Intersection improvements at Sundown Road and new alignment (east of river). ▪ Intersection improvements at new alignment and Blue Mountain Road.	▪ Intersection improvements at Sundown Road and new alignment (east of river). ▪ Intersection improvements at new alignment and Blue Mountain Road.

1.3.2.6. OPTION 3B.6–BUILD BRIDGE ON SOUTHERN ALIGNMENT

HUMBLE ROAD-BLUE MOUNTAIN ROAD

This 1.03 mile-long alignment option begins at the current western terminus of Humble Road and continues west and south to cross the Bitterroot River to Maclay Flats. From that point, the alignment extends southeasterly across Maclay Flats before turning south to join a north-south section of Blue Mountain Road. The southern end of the alignment is located about 0.78 miles from the intersection of Blue Mountain Road and US Highway 93.

Figure 9 shows the potential Humble Road -Blue Mountain Road alignment option.

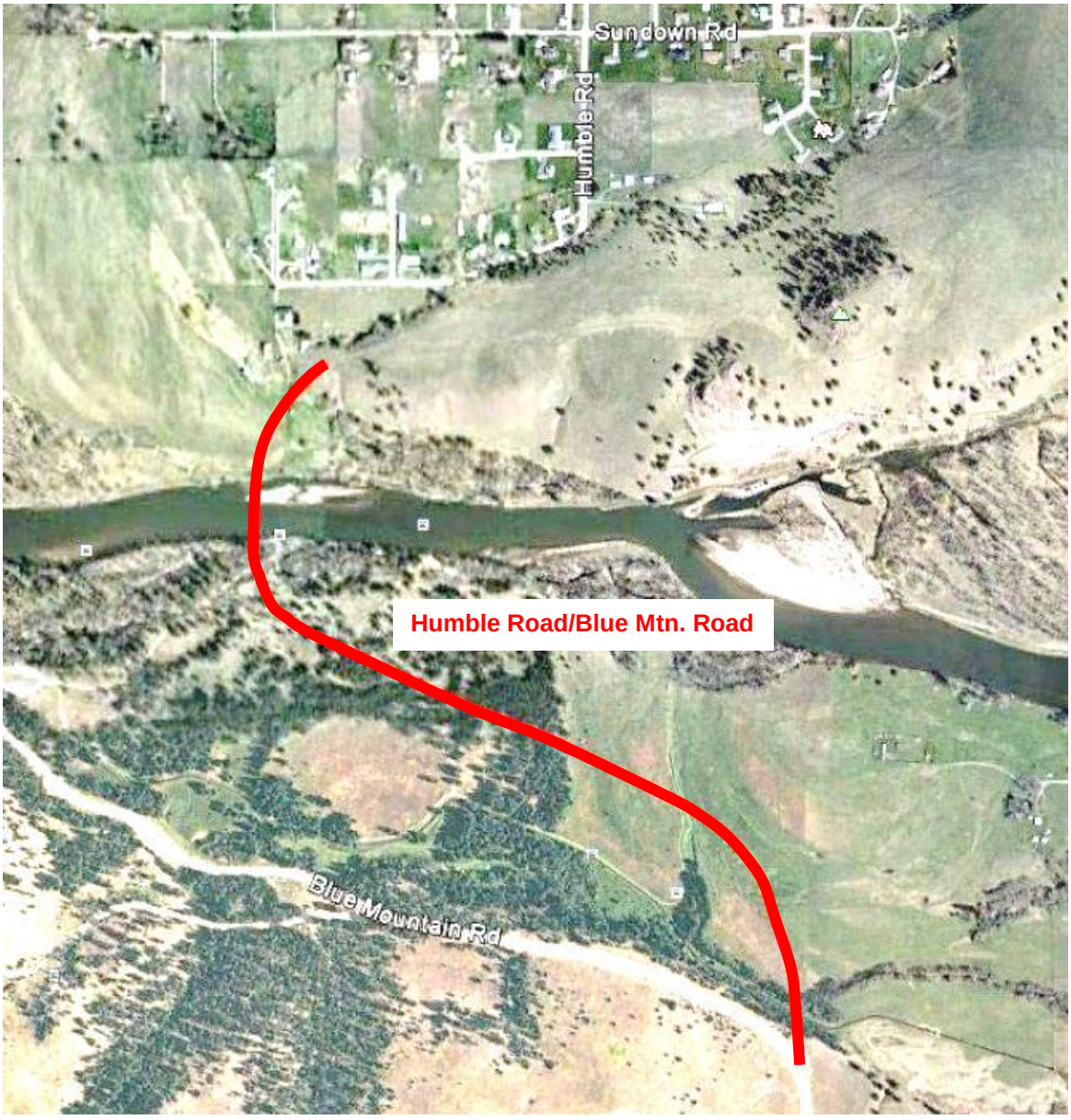


Figure 9: Humble Road-Blue Mountain Road Alignment

Table 9: Humble Road – Blue Mountain Road Alignment

ALIGNMENT OPTION: *Humble Road- Blue Mountain Road Alignment*	
Overall Length	1.03 miles
Bridge Skew	0 degrees
Associated Infrastructure Improvements	▪ Intersection improvements at Humble Road and new alignment (north of river). ▪ Intersection improvements at new alignment and Blue Mountain Road.

1.3.2.7. OPTION 3B.7– NEW BRIDGE AT A NEW LOCATION NOT IDENTIFIED IN THE 1994 EA

The study area was examined to determine if another, more suitable location could be identified for a new bridge crossing at a location other than those identified in the 1994 EA. It was concluded that no such location existed, and that those alignments identified in the original 1994 EA represented the complete array of possible new bridge locations. The alignments in the 1994 EA were determined to represent the complete array of possible locations for a new bridge crossing.

1.4. OPTION 4: DO NOTHING

1.4.1. OPTION 4A–Do Nothing

This option represents the current situation for the Maclay Bridge and its surroundings. The existing bridge is considered to be functionally obsolete and eligible for replacement based on MDT's bridge condition surveys. Missoula County would continue to perform routine maintenance activities to keep the structure in service under its load limitation, but would not complete many of the items proposed under Option 2A (Minor Rehabilitation). There would be no changes to the configuration or alignment of the approaches to the existing structure or roadways within the area beyond the safety improvements currently being implemented by the County and MDT. The bridge would remain in its present configuration and traffic operations at and near the Maclay Bridge would be unchanged. Pedestrian and bicyclist travel through the area would continue to occur on the existing roadway or other facilities in the Maclay Bridge area.

SCREENING ASSESSMENT

FINAL

Maclay Bridge Planning Study

Prepared for:
Montana Department of Transportation
Helena, Montana

Prepared by:
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Helena, Montana
December 14, 2012

TABLE OF CONTENTS

TABLES

SCREENING ASSESSMENT

Screening is used to describe the process for reviewing a range of conceptual options or strategies and deciding which ones to carry forward for more evaluation and study. The primary function of screening is to determine feasible and practicable options that address the identified needs and objectives (**Appendix C**).

Items or considerations used to evaluate options are referred to as **screening criteria**. Screening may be carried out through one or more iterations (levels) with the screening criteria for each level becoming more specific. Screening may rely upon qualitative or quantitative screening criteria. *Qualitative criteria* refer to subjective evaluations often based on ratings (yes/no, excellent to poor, high to low, or pass/fail). *Quantitative criteria* typically refer to items that can be readily calculated or quantified through analysis like construction costs, right-of-way needs/relocations, or general areas of impact.

First level screening is used to help identify options that fail to meet the critical aspects of the study's needs and objectives or that may have "fatal flaws" with respect to other key factors (i.e. a potential option may consist of a new roadway alignment that traverses directly through a conservation easement that is prohibited from development of any type). First level screening provides an initial evaluation of a wide range of potential options or strategies. The results of the first level screening assessment narrowed the set of options or strategies to those with the greatest capacity to address identified areas of concern and satisfy the study needs and objectives.

Second level screening builds upon the first level screening by taking the options that have been carried forward from the first level and performing an evaluation against certain needs and objectives. Second level screening is more advanced in that more elements can be utilized to screen the options based on parameters like cost, traffic, environmental impacts, etc.

1.1. FIRST LEVEL SCREENING CRITERIA

The first level screening criteria consists of two questions to generally establish how well potential options meet safety and connectivity needs. These screening questions focus on important considerations relating to the overall viability or reasonableness of the options or strategies.

- *Would the option improve safety on the bridge and its approaches?*
- *Does the option provide an efficient connection with the street network/road system in the area?*

This first level screening assessment allows for a simple YES or NO answer to the two questions. The analysis is qualitative and intended to help identify options that comply with the identified needs and objectives.

Table 1 summarizes the initial screening criteria, identifies why they are important screening considerations, and relates each consideration to a specific identified need for this planning study.

Table 1: First Level Screening – General Compliance with Identified Needs/Objectives

SCREENING ASSESSMENT	SCREENING QUESTION	CORRELATION TO NEED
SAFETY PERFORMANCE. *This criterion screens against the option's potential to improve the overall safety performance on the bridge and its approaches.*	*Q1. Would the option improve safety on the bridge and its approaches?*	***NEED #1***
CONNECTIVITY. *This criterion screens against whether or not the option provides an efficient connection to the transportation network within the area.*	*Q2. Does the option provide an efficient connection with the street network/road system in the area?*	***NEED #2***

To advance to the second screening level, an option must receive a 'YES' answer to the screening questions indicating the fundamental safety and connectivity needs required to serve the overall transportation system would be met.

1.2. FIRST LEVEL SCREENING ASSESSMENT AND RESULTS

1.2.1. SAFETY PERFORMANCE

This screening criterion screens against an option's potential to improve the overall safety performance on the bridge and its approaches by implementing measures to address identified deficiencies or safety concerns. The *Existing and Projected Conditions Report* highlighted a variety of safety concerns associated with the existing bridge, including substandard horizontal curves and the presence of unshielded obstacles and/or non-recoverable slopes on its approaches. The crash analysis conducted for this study identified several crash clusters on the road network in the Maclay Bridge area and highlighted common contributing circumstances at each location. For purposes of first level screening, safety relates to motorized uses such as vehicular traffic, motorcycles, and emergency response vehicles. It also relates to non-motorized users such as bicyclists and pedestrians. Although some public comments have correlated safety to swimmers, bridge jumpers, scour holes, etc., these are not explicitly tied to the features of the transportation system that can be documented and addressed through this planning study (i.e. geometrics, clear zones, travel speeds, etc.) and are therefore not included in the screening process.

The following screening question, which relates directly to Need Number 1, was asked:

Q1. Would the option improve safety on the bridge and its approaches?

In order to receive a YES answer to this question, options should address identified safety deficiencies and improve or correct sub-standard elements of the bridge and its approaches that pose safety concerns for the traveling public. It was assumed that options providing bridges on new locations would be engineered to design standards that would provide a desirable level of safety. Several questions inherent to improving safety were explored during the screening process. These questions helped inform whether question 1 received a YES or NO response. Note that each of the three sub-questions did not have to receive a YES answer in order to answer YES to the screening question. The sub-questions included the following:

- ***Would the option improve sub-standard elements [deficiencies] on the bridge?*** Sub-standard elements of the bridge include the bridge deck width and load-restricted condition. Options that would rectify or improve these conditions are considered desirable.

- ***Would the option reduce or remove vehicle restrictions on the bridge?*** Vehicle restrictions on the bridge presently include a posted load limit of 11 tons, one direction of travel at a time, and speed restrictions for larger emergency vehicles and school buses. Options that would eliminate the vehicle restrictions on the bridge are considered desirable.
- ***Would the option reduce crashes resulting from approaches to the bridge?*** Deficiencies on the approaches include horizontal alignment, lack of roadway shoulders, steep roadside slopes, obstructions in the clear zone, and lack of lighting. Crash clusters have been identified and documented previously. Improvements to the approaches leading in to and out of the bridge to meet current design standards are considered desirable and a positive step to reduce identified crash trends.

Table 2 shows how the options address the safety performance screening question.

Table 2: First Level Screen – Safety Performance

Option	*Q1. Would the option improve safety on the bridge and its approaches?*
OPTION 1 - IMPROVE SAFETY AND OPERATIONS ON THE EXISTING BRIDGE	
1A - Enhance Traffic Operations and Safety on and Near the Structure	**YES.** Management of traffic flows on bridge and lighting in area would benefit overall traffic safety. Although sub-standard elements of the bridge or approaches would not be rectified, increased signage and markings would heighten driver awareness of infrastructure conditions and potentially reduce crashes. Existing load limits and speed restrictions would remain in effect.
1B - Maintain Current Usage and Add Pedestrian/Bicyclist Facilities	**NO.** Separated facilities for non-motorized users and limited work on approaches would provide minor safety enhancements. However, major geometric changes on approaches and clear zone work are not included, thereby not improving the sub-standard conditions of the bridge and approaches. Existing load restrictions would remain in effect.
1C - Implement Additional Restrictions on Bridge Use	**NO.** Assumes measures implemented would not have overall benefits for safety Sub-standard elements of the bridge and approaches would not be addressed.
1D – Close Bridge to Vehicles and Retain Use for Non-Motorized Travel Modes	**YES.** Option would reduce vehicular traffic volumes in vicinity of bridge and eliminate vehicle traffic on the bridge. The potential for conflicts between motorized and non-motorized users on structure would be eliminated, The existing bridge would be designated for non-motorized uses only.
1E - Retain Bridge and Provide New Bridge Elsewhere	**NO.** Would not resolve safety issues at existing crossing and on approaches. Sub-standard elements would remain, as well as load restrictions.
1F - New One-Lane Bridge at a New Location & Retain Existing Bridge for Non-Motorized Uses	**NO.** New one-lane bridge for vehicles would have same inherent limitations as existing bridge due to width and lack of capacity to accommodate travel in two directions. Option would reduce vehicular traffic volumes in vicinity of existing bridge but introduce more traffic at new bridge location. The potential for conflicts between motorized and non-motorized users on existing structure would be eliminated, but would be re-introduced at the new location. Would eliminate load restrictions.
1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel	**YES.** Would resolve overall safety issues on bridge and approaches by reducing traffic and lowering conflict potential between motorized and non-motorized users. Traffic would be distributed further throughout the area between North and South Avenues. Load restrictions would not be resolved on the existing bridge but would be constructed to standards on new bridge.
1H - Close Bridge and Remove Structure	**YES.** Would eliminate all modes of travel at the existing crossing.
OPTION 2 - REHABILITATE THE BRIDGE	
2A - Minor Rehabilitation (Structure Only)	**NO.** Minor rehabilitation would include limited measures to improve the load-carrying capacity of the existing bridge and its physical condition. Such a project would not change geometric conditions on the approaches or the general configuration of the existing bridge. Potential to reduce

	crashes is minimal with no changes to geometrics of bridge or reconstruction of approaches.
2B - Major Rehabilitation (Structure Only)	**NO.** Major rehabilitation would include activities to substantially improve the load-carrying capacity of the existing bridge and its physical condition. Such a project would not change geometric conditions on the approaches or be likely to change the general configuration of the existing bridge. Existing sub-standard conditions would remain.
2C - Minor Rehabilitation (includes Approaches)	**YES.** Minor rehabilitation would include limited measures to improve the load-carrying capacity of the existing bridge and its physical condition. Approaches leading into and out of the bridge would be improved to meet current design standards. Improvements to the approaches may reduce crashes and improve overall safety. Traffic management with improved signage and markings would also contribute to overall safety improvement.
2D - Major Rehabilitation (includes Approaches)	**YES.** Major rehabilitation would include activities to improve the load-carrying capacity of the existing bridge and its physical condition. Bridge approaches would be improved to meet current design standards. Improvements to the approaches may reduce crashes and improve overall safety. Traffic management with improved signage and markings would also contribute to overall safety improvement.
OPTION 3 - BUILD NEW BRIDGE	
3A.1- Existing Alignment on North Avenue	**NO.** Building a new bridge on the existing alignment would perpetuate substandard horizontal curves on the approaches to the structure, and would not eliminate many of the features that contribute to noted crash trends.
3A.2 - North 1 Alignment	**YES.** Assumes adequate alignment could be developed on west approach to new bridge. New bridge structure would meet current design standards, and eliminate conflicts and load restrictions.
3A.2 - North 2 Alignment	**NO.** The proposed alignment would likely create an undesirable approach at the west end of the new bridge by introducing a sub-standard horizontal curve to tie into River Pines Road.
3B.1 - South 3rd Street West Extension	**YES.** The proposed alignment would meet current road and bridge standards, thereby achieving safety objectives. No load restrictions would be required, allowing all currently restricted vehicles to safely cross the river. Motorized/non-motorized conflicts would be eliminated.
3B.1 - Spurgin Road Extension	**YES.** Same reasoning as 3B.1 (South 3rd Street West Extension).
3B.2 - Mount 1 Alignment	**YES.** Same reasoning as 3B.1 (South 3rd Street West Extension).
3B.2 - Mount 2 Alignment	**YES.** Same reasoning as 3B.1 (South 3rd Street West Extension).
3B.3 - Edward 1 Alignment	**YES.** Same reasoning as 3B.1 (South 3rd Street West Extension).
3B.3 - Edward 2 Alignment	**YES.** Same reasoning as 3B.1 (South 3rd Street West Extension).
3B.4 - South 1 Alignment	**YES.** Same reasoning as 3B.1 (South 3rd Street West Extension).
3B.4 - South 2 Alignment	**YES.** Same reasoning as 3B.1 (South 3rd Street West Extension).
3B.5 - Sundown 1 Alignment	**YES.** Same reasoning as 3B.1 (South 3rd Street West Extension).
3B.5 - Sundown 2 Alignment	**YES.** Same reasoning as 3B.1 (South 3rd Street West Extension).
3B.6 - Humble Road-Blue Mountain Road	**YES.** Same reasoning as 3B.1 (South 3rd Street West Extension).
3B.7 – New Bridge at a Location Not Identified in the 1994 EA	**YES.** However, no additional new locations for a bridge have been identified via the planning process with the public, stakeholders, or the planning team.
OPTION 4 -DO NOTHING	
4A – Do Nothing	**NO.** This option would not address or improve the conditions that pose safety concerns on or near the Maclay Bridge.

1.2.2. CONNECTIVITY CONSIDERATIONS

This screening criterion addresses whether or not the option provides an efficient connection to the existing and/or future road network within the area. Roadway connections that enhance the ability of the network to serve users and accommodate efficient travel through the community are desirable. The following screening question, which relates directly to Need Number 2, was asked:

Q2. Does the option provide an efficient connection with the street network/road system in the area?

Options that provide linkages to roadways with higher functional classifications (minor arterials, urban collectors, or rural major collectors) merited a YES response. A grid system of roadways is desirable, and the hierarchy of roadways in Missoula County encourages travel connectivity to reduce travel time and emissions, while at the same time recognizing that access needs vary between different users. Options that provided undesirable system linkages or result in long, out-of-direction travel to make network connections were given a NO response.

Table 3 shows how the options rate with respect to connectivity considerations.

Table 3: First Level Screen – Connectivity Considerations

Option	*Q2. Does the option provide an efficient connection with the street network/road system in the area?*
OPTION 1 - IMPROVE SAFETY AND OPERATIONS ON THE EXISTING BRIDGE	
1A - Enhance Traffic Operations and Safety on and Near the Structure	**YES.** Maintains current level of connectivity at North Avenue.
1B - Maintain Current Usage and Add Pedestrian/Bicyclist Facilities	**YES.** Maintains current level of connectivity and provides enhanced facilities for non-motorized users.
1C - Implement Additional Restrictions on Bridge Use	**YES.** Maintains current level of connectivity.
1D - Close Bridge to Vehicles and Retain Use for Non-Motorized Travel Modes	**NO.** Option eliminates an existing river crossing and would require use of other area crossing to provide east-west connection across Bitterroot River. Would continue to provide connectivity for non-motorized users.
1E - Retain Bridge and Provide New Bridge Elsewhere	**YES.** Maintains current level of connectivity on North, assumes new bridge would be sited to provide efficient connection.
1F - New One-Lane Bridge at a New Location & Retain Existing Bridge for Non-Motorized Uses	**YES.** Assumes new bridge would be sited to provide efficient connection. Would continue to provide connectivity for non-motorized users at present location.
1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel	**YES.** Maintains current level of connectivity on North, assumes new bridge would be sited to provide efficient connection for other travel direction.
1H - Close Bridge and Remove Structure	**NO.** Option eliminates an existing river crossing and would require use of other area crossing to provide east-west connection across Bitterroot River.
OPTION 2 - REHABILITATE THE BRIDGE	
2A - Minor Rehabilitation (Structure Only)	**YES.** Maintains current level of connectivity.
2B - Major Rehabilitation (Structure Only)	**YES.** Maintains current level of connectivity.
2C - Minor Rehabilitation (includes Approaches)	**YES.** Maintains current level of connectivity.
2D - Major Rehabilitation (includes Approaches)	**YES.** Maintains current level of connectivity.
OPTION 3 - BUILD NEW BRIDGE	
3A.1- Existing Alignment on North Avenue	**YES.** North Avenue is urban collector.
3A.2 - North 1 Alignment	**YES.** North Avenue is urban collector.
3A.2 - North 2 Alignment	**YES.** North Avenue is urban collector.
3B.1 - South 3rd Street West Extension	**NO.** Undesirable. Although S. 3rd Street is a minor arterial, the out-of-direction travel requirement, overall travel length, and lack of grid connection does not promote efficiency in travel system.
3B.1 - Spurgin Road Extension	**NO.** Undesirable new connection that departs from established grid system in area. Would result in lengthy out-of-direction travel and additional new roadway network construction.
3B.2 - Mount 1 Alignment	**NO.** This alignment deviates from the established grid system and does not promote any efficiency in the travel system. Would result in additional new roadway network construction.
3B.2 - Mount 2 Alignment	**YES.** This route would connect existing roads (i.e. Mount Avenue and River Pines Road) with relatively minimal amounts of new roadway

	required, and results in minimal out-of-direction travel.
3B.3 - Edward 1 Alignment	**NO.** Edward Avenue ends west of Clements Road and does not directly connect to the north-south route, which is a higher order route. This connection would result in additional out-of-direction travel.
3B.3 - Edward 2 Alignment	**NO.** Same as reasoning for Edward 1 above.
3B.4 - South 1 Alignment	**YES.** This route would connect existing roads (i.e. South Avenue and River Pines Road) with relatively minimal amounts of new roadway required, and results in minimal out of direction travel South Avenue east of Humble Road is an urban collector and a minor arterial west of Clements that provides a direct connection to Reserve Street.
3B.4 - South 2 Alignment	**YES.** Same as reasoning for South 1 above, but connects South Avenue with Blue Mountain Road.
3B.5 - Sundown 1 Alignment	**NO.** Option deviates from established east-west grid system and locates river crossing access farther south of neighborhood population center. Although the route may result in minimal new roadway work, topography and grade constraints will result in construction and operational issues (sight distance, etc.)
3B.5 - Sundown 2 Alignment	**NO.** Same as reasoning for Sundown 1 above.
3B.6 - Humble Road-Blue Mountain Road	**NO.** Undesirable. Option results in out-of-direction travel, additional length of new road, and lack of grid connection. Does not promote efficiency in travel system.
3B.7 – New Bridge at a Location Not Identified in the 1994 EA	**NO.** No additional new locations for a new bridge have been identified via the planning process with the public, stakeholders or the planning team.
OPTION 4 -DO NOTHING	
4A – Do Nothing	**YES.** Maintains current level of connectivity at North Avenue.

1.2.3. REMOVAL OF OPTION 1A FROM FURTHER SCREENING

Option 1A – Enhance Traffic Operations and Safety on and Near the Structure was removed from further screening after the completion of the first level screen. This was based on the option being primarily a "traffic management system (TSM)" strategy that could be applied as a component of all the other options being considered. In other words, as a TSM option, the scope of improvements are relatively minor in nature and are intended to provide subtle improvements to the transportation system that include signing, lighting, pavement markings, etc. These small scale improvements could be considered with any remaining options going forward.

Table 4: Summary of First Level Screening Assessment

First Level Screening Consideration		RANGE OF OPTIONS																											
		OPTION 1 - IMPROVE SAFETY AND OPERATIONS ON EXISTING BRIDGE								OPTION 2 - REHABILITATE THE BRIDGE				OPTION 3 - BUILD NEW BRIDGE															OPTION 4 DO NOTHING
		1A Enhance Operations and Safety on or near bridge	1B Maintain Vehicle Use & Add Ped/Bike	1C Add More Restrictions	1D Close Bridge Use for Ped/Bike	1E Retain & Add new bridge	1F Add new 1 –lane bridge Retain old for Ped/Bike	1G Add new 1 –lane bridge Retain old for 1-way travel	1H Close & Remove Bridge	2A Minor Rehab (Structure Only)	2B Major Rehab (Structure Only)	2C Minor Rehab (includes Approaches)	2D Major Rehab (includes Approaches)	3A.1 Exist Location	3A.2 North 1	3A.2 North 2	3B.1 S 3rd St W	3B.1 Spurgin Rd	3B.2 Mount 1	3B.2 Mount 2	3B.3 Edward 1	3B.3 Edward 2	3B.4 South 1	3B.4 South 2	3B.5 Sundown 1	3B.5 Sundown 2	3B.6 Humble Rd – Blue Mtn Rd	3B.7 Other Locations	4A Do Nothing
Q1. Would the option improve safety on the bridge and its approaches ?		NO	NO	YES	NO	NO	YES	YES	NO	NO	YES	YES	NO	YES	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO
Q2. Would the option provide an efficient connection with the street network/road system in the area?	REMOVED FROM FURTHER SCREENING	YES	YES	NO	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES	NO	NO	NO	YES	NO	NO	YES	YES	NO	NO	NO	NO	YES
ADVANCE TO SECOND LEVEL SCREENING? (See Note 1)		NO	NO	NO	NO	NO	YES	NO	NO	NO	YES	YES	NO	YES	NO	NO	NO	NO	YES	NO	NO	YES	YES	NO	NO	NO	NO	NO

NOTE 1: To advance to second level screening, option must (1) rate YES for both screening criteria.

1.3. OPTIONS CARRIED FORWARD FROM FIRST LEVEL SCREENING

Seven options were carried forward as a result of the first level screening process. All of the options considered during the first level screening process are shown below and are discussed in more detail in the *Options Under Consideration* memorandum previously developed for this study. The options being carried forward for the second level screening are shown in bold, shaded text below:

- **Option 1 – Improve Safety and Operations on the Existing Bridge**
  - 1A: Enhance Traffic Operations and Safety on and Near the Structure
  - 1B: Maintain Current Usage and Add Pedestrian/Bicyclist Facilities
  - 1C: Implement Additional Restrictions on Bridge Use
  - 1D: Close Bridge to Vehicles and Retain Use for Non-Motorized Travel Modes
  - 1E: Retain Bridge for Two-Way Travel and Provide New Bridge Elsewhere for Two-Way Travel
  - 1F: New One-Lane Bridge at a New Location and Retain Existing Bridge for Non-Motorized Uses
  - **1G: New One-Lane Bridge at a New Location for One-Way Travel and Retain Existing Bridge for One-Way Travel**
  - 1H: Close Bridge and Remove Structure

- **Option 2 - Rehabilitate the Existing Bridge**
  - 2A: Minor Rehabilitation (Structure Only)
  - 2B: Major Rehabilitation (Structure Only)
  - **2C: Minor Rehabilitation (includes Approaches)**
  - **2D: Major Rehabilitation (includes Approaches)**

- **Option 3 - Build New Bridge**
  - 3A.1: Build on Existing Alignment at North Avenue
  - **3A.2: Build Near Existing Alignment - North 1 Alignment**
  - 3A.2: Build Near Existing Alignment - North 2 Alignment
  - 3B.1: Build Bridge on Northern Alignment - South 3rd Street West Extension
  - 3B.1: Build Bridge on Northern Alignment - Spurgin Road Extension
  - 3B.2: Build Bridge on Mount Avenue - Mount 1 Alignment
  - **3B.2: Build Bridge on Mount Avenue - Mount 2 Alignment**
  - 3B.3: Build Bridge on Edward Avenue - Edward 1 Alignment
  - 3B.3: Build Bridge on Edward Avenue - Edward 2 Alignment
  - **3B.4: Build Bridge on South Avenue - South 1 Alignment**
  - **3B.4: Build Bridge on South Avenue - South 2 Alignment**
  - 3B.5: Build Bridge on Sundown Road - Sundown 1 Alignment
  - 3B.5: Build Bridge on Sundown Road - Sundown 2 Alignment
  - 3B.6: Build Bridge on Southern Alignment - Humble Road-Blue Mountain Road
  - 3B.7: New Bridge at a New Location Not Identified in the 1994 EA

- **Option 4 – Do Nothing**
  - 4A: Do Nothing

1.4. SECOND LEVEL SCREENING CRITERIA

Second level screening criteria were developed to evaluate and rank the seven options carried forward from the first level screening process. The criteria were generated to correlate to the identified needs and objectives previously articulated. Care was exercised to develop criteria that could be evaluated given the limited amount of information available. For example, developing a criterion that quantifies "acreage of potential wetland impacts" is only relevant if wetland delineations have occurred and the locations of wetlands are known. For the second level screening process, sixteen screening criteria were developed to evaluate and rank options. The criteria are listed in **Table 5**, and fall under the following major types:

- *Operational and Safety Screening Criteria (4 Total)*
- *Connectivity and Growth (3 Total)*
- *Constructability and Cost Screening Criteria (2 Total)*
- *Resource Impacts Screening Criteria (3 Total)*
- *Neighborhood/Social Screening Criteria (4 Total)*

Table 5 summarizes the second level screening criteria, identifies why they are important screening considerations, and relates each consideration to a specific identified need for this planning study.

Table 5: Second Level Screening – General Compliance with Identified Needs/Objectives

SCREENING CONSIDERATION	*REASON & SUPPORT FOR SCREENING CONSIDERATION*	*RELATES TO NEED #?*
OPERATIONAL AND SAFETY SCREENING CRITERIA		
OS1. Would the option improve sub-standard elements on the bridge?	***SAFETY & OPERATIONS.*** *This criterion determines the option's potential to address the substandard elements found on the bridge. A major substandard element of the existing bridge is the bridge deck width, which results in only one travel lane being available.*	***NEED #1***
OS2. Would the option improve vehicle load restrictions on the bridge?	***SAFETY & OPERATIONS.*** *This criterion determines whether or not the option improves or resolves load restrictions on vehicle use of the bridge. The existing bridge has a posted load limit of 11 tons, which prohibits some vehicles from crossing the bridge and requires restrictions on others.*	***NEED #1***
OS3. Would the option accommodate bicyclists/pedestrians on the bridge and its approaches?	***CONNECTIVITY & GROWTH.*** *This criterion indicates whether or not the option accommodates bicyclists and pedestrians on the bridge and its approaches. Safe bicycle and pedestrian facilities implies a space for bicyclist or pedestrian use.*	***NEED #2***
OS4. Would the option reduce crashes resulting from approaches to the bridge?	***SAFETY & OPERATIONS.*** *This criterion indicates whether or not the option would reduce crashes on the approaches to the bridge. A review of the crash history on area roadways shows substandard elements (deficiencies) on approaches contribute to the crashes. These substandard elements include horizontal alignment concerns, lack of road shoulders, steep roadside slopes, obstructions in clear zone, lack of lighting.*	***NEED #1***
OS5. Would the option accommodate future capacity demands?	***CONNECTIVITY & GROWTH.*** *This criterion determines whether or not the option would accommodate future capacity demands. Future capacity demands include things like providing a*	***NEED #2***

	roadway wide enough for simultaneous bi–direction travel, and offering a crossing without limitations or restrictions due to horizontal and vertical clearances.	
OS6. Would the option help reduce or eliminate vehicle delays at the river crossing?	***SAFETY & OPERATIONS.*** *This criterion determines whether or not the option would reduce or eliminate vehicle delays at the river crossing. The current bridge allows for traffic to cross the structure in one direction at a time. This delays vehicles waiting to cross in the opposing direction. These vehicles may occasionally include emergency responders.*	***NEED #1***
OS7. Does the option provide an efficient grid connection to the major road/street network in the Missoula area?	***CONNECTIVITY & GROWTH.*** *This criterion indicates whether or not the option would provide an efficient grid connection to the major road/street network in the Missoula area by measuring the total length of travel between two points (in both directions). An efficient connection to an established grid network is an important consideration of the transportation system in terms of reducing out-of-direction travel, thus reducing travel time, travel costs, and controlling emissions.*	***NEED #2***
CONSTRUCTABILITY AND COST SCREENING CRITERIA		
CC1. Planning level construction costs.	***COST.*** *This criterion details the option's high level planning costs to provide a reasonable measure of costs for comparison. Does not include highly variable costs like those associated with right-of-way acquisition, project development activities, environmental mitigation, or inflation.*	***N/A***
CC2. Annual maintenance costs.	***COST.*** *This criterion is intended to provide some indication of annual maintenance costs for each option, over a 20-year horizon.*	***N/A***
RESOURCE IMPACTS SCREENING CRITERIA		
R 1. Effects on aquatic resources?	***ENVIRONMENTAL IMPACTS.*** *This criterion differentiates between options based on their potential effects to aquatic resources by considering the extent of work in the delineated floodplain.*	***NEED #3***
R 2. Will the options have impacts to protected 4 (f) or Section 106 resources?	***SECTION 4(f) IMPACTS.*** *This criterion determines whether the options have the potential for impacting resources that are protected by Section 4(f) or fall under Section 106 of the National Historic Preservation Act (36 CFR 800).*	***NEED #3***
R 3. Will the options affect lands held under conservation easements?	***LAND IMPACTS.*** *This criterion determines whether the options have potential to affect lands held under conservation easements, and would require crossing those lands. Sizable areas of private land along the Bitterroot River are held under conservation easements by the Five Valleys Land Trust. Such easements may limit the ability to construct improvements on these protected lands.*	***NEED #3***
NEIGHBORHOOD/SOCIAL SCREENING CRITERIA		
NS1. Number of privately owned parcels	***NEIGHBORHOOD & SOCIAL.*** *This criterion assesses how many individual privately-owned parcels would be crossed or potentially impacted*	***NEED #4***

Impacted?	*by the alignment associated with each option. The criterion is suggestive of the potential extent of R/W acquisition associated with each option.*	
NS2. Number of structures impacted?	***NEIGHBORHOOD & SOCIAL.*** *This criterion identifies whether or not structures may be impacted by each option. For purposes of this criterion, structures only consist of residences. Impacts to existing structures helps assess the potential for relocations or right-of-way impact mitigations associated with the options.*	***NEED #4***
NS3. R/W needs?	***NEIGHBORHOOD & SOCIAL.*** *This criterion estimates how much new right-of-way may be required with each option. An assumed new right-of-way width was chosen for the option's alignments, and any known existing right-of-way is subtracted out, yielding a potential new right-of-way need.*	***NEED #4***
NS4. Does the option compare favorably with year 2040 "no action" model traffic volume increases in front of Target Range School?	***NEIGHBORHOOD & SOCIAL.*** *This criterion measures the potential for traffic volume changes in front of the Target Range School.*	***NEED #4***

1.5. SECOND LEVEL SCREENING CRITERIA RATING FACTORS

For some screening criteria, rating factors were developed to assist in evaluations and quantify how well an option may meet the identified question and thus, the corresponding need or objective. **Table 6** describes the impact rating factors. Low/high and yes/no rating factors were developed and assigned to those screening criteria as applicable. In some cases, the rating factors are not used as the type of screening criteria may better lend itself to an "order of ranking", between 1 and 7, due to there being seven options carried forward from the first level screening process. This is further defined in the following pages. The lower an individual or cumulative point value is, the more desirable or better the criterion (or option) is considered.

Table 6: Second Level Screening Criteria Rating Factors

Potential Influence (type of criteria)	*Rating (value)*	*Rating (value)*	*Screening Consideration*
Impact (non-quantitative)	LOW (assigned point value = 1)	HIGH (assigned point value = 7)	R2 (protected resources); R3 (conservation easements); NS2 (structures)
Improve / Accommodate / Reduce / Provide / Increase (non-quantitative)	YES (assigned point value = 1)	NO (assigned point value = 7)	OS1 (sub-standard elements); OS2 (vehicle load restrictions); OS3 (bicyclists/pedestrian); OS4 (reduce crashes); OS5 (future traffic); OS6 (reduce delay); NS4 (traffic volumes)
Impact / Accommodate (quantitative)	Order of Ranking (1 – 7)		OS7 (efficient connections); CC1 (construction costs); CC2 (maintenance costs); R1 (aquatic resources); NS1 (private parcels); NS3 (r/w)

1.6. SECOND LEVEL SCREENING ASSESSMENT AND RESULTS

1.6.1. OS1 – WOULD THE OPTION IMPROVE SUB-STANDARD ELEMENTS ON THE BRIDGE?

A major substandard element of the existing bridge is the bridge deck width, which results in only one travel lane being available. This screening criterion determines the option's potential to address the substandard elements found on the bridge. The 2011 Bridge Inspection Report and the public list other areas of concern as contained in the *Existing and Projected Conditions* Report (pages 26-30). Any option that results in two lanes (one lane for each direction) on the bridge would meet current design standards and would therefore not exhibit sub-standard elements, meriting a YES response to this criterion. Other options that retain a one-lane configuration or do not provide additional bridge width would not rectify the substandard bridge condition and would receive a NO answer.

Table 7 shows how the options address the substandard elements on the bridge screening question.

Table 7: Screening Results for Criterion OS1

Option ID	*Answer/Reasoning*	*Assigned Points*
OPTION 1 - IMPROVE SAFETY AND OPERATIONS ON THE EXISTING BRIDGE		
1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel	**NO.** Although a new one-way, one-lane bridge at a new location could be constructed to meet an appropriate width, the existing Maclay Bridge remaining in place is still substandard at 14' in width (16' required).	**7**
OPTION 2 - REHABILITATE THE BRIDGE		
2C - Minor Rehabilitation (includes Approaches)	**NO.** Minor rehabilitation would not address or improve the substandard bridge width.	**7**
2D - Major Rehabilitation (includes Approaches)	**NO.** Major rehabilitation would not address or improve the substandard bridge width.	**7**
OPTION 3 - BUILD NEW BRIDGE		
3A.2 - North 1 Alignment	**YES.** A new bridge can be built to meet current design standards, without any substandard bridge elements.	**1**
3B.2 - Mount 2 Alignment	**YES.** A new bridge can be built to meet current design standards, without any substandard bridge elements.	**1**
3B.4 - South 1 Alignment	**YES.** A new bridge can be built to meet current design standards, without any substandard bridge elements.	**1**
3B.4 - South 2 Alignment	**YES.** A new bridge can be built to meet current design standards, without any substandard bridge elements.	**1**

1.6.2. OS2 – WOULD THE OPTION IMPROVE VEHICLE LOAD RESTRICTIONS ON THE BRIDGE?

This screening criterion determines whether or not the option improves or resolves load restrictions on vehicle use of the bridge. The existing bridge has a posted load limit of 11 tons. Inherent to the load restrictions, there are also speed restrictions in place for some of the larger vehicles using the bridge, such as emergency vehicles and school buses (note that these vehicles must also travel in the center of the bridge deck as they cross). Options that could eliminate or improve the existing load restriction up to at least a 25-ton-limit would merit a YES answer. Those options that would result in something less than at least a 25-ton-limit would merit a NO answer.

Table 8 shows how the options rate with respect to eliminating or improving load restriction.

Table 8: Screening Results for Criterion OS2

Option ID	Answer/Reasoning	Assigned Points
OPTION 1 - IMPROVE SAFETY AND OPERATIONS ON THE EXISTING BRIDGE		
1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel	**NO.** Although a new one-way, one-lane bridge at a new location could be constructed to meet an appropriate loading, the existing Maclay Bridge remaining in place is still load restricted below 25 tons.	7
OPTION 2 - REHABILITATE THE BRIDGE		
2C - Minor Rehabilitation (includes Approaches)	**NO.** Minor rehabilitation would not address or improve the load limit up to 25 tons.	7
2D - Major Rehabilitation (includes Approaches)	**YES.** Major rehabilitation efforts could increase the load limit to 25 tons, thereby eliminating load restrictions.	1
OPTION 3 - BUILD NEW BRIDGE		
3A.2 - North 1 Alignment	**YES.** A new bridge can be built to meet at least a 25-ton-load standard.	1
3B.2 - Mount 2 Alignment	**YES.** A new bridge can be built to meet at least a 25-ton-load standard.	1
3B.4 - South 1 Alignment	**YES.** A new bridge can be built to meet at least a 25-ton-load standard.	1
3B.4 - South 2 Alignment	**YES.** A new bridge can be built to meet at least a 25-ton-load standard.	1

NOTE 1: Any new bridge would be built to current MDT loading standards, which incorporate a design loading greater than 25-tons.

1.6.3. OS3 – WOULD THE OPTION ACCOMMODATE BICYCLISTS/PEDESTRIANS ON THE BRIDGE AND ITS APPROACHES?

This screening criterion indicates whether or not the option accommodates bicyclists and pedestrians on the bridge and its approaches. Safe bicycle and pedestrian facilities implies a space for bicyclist or pedestrian use. Exact widths and types of space are unknown, as this is a design-level detail. However whether or not an option can provide bicycle/pedestrian mobility can be reasonably estimated for the options. Options that could provide space for bicycle and pedestrian travel would merit a YES answer. Those options that would not allow for provision of space for bicycle and pedestrian would merit a NO answer. If an option could provide space on the approaches, but not across the bridge, a NO response is given, as that scenario results in a discontinuous facility for non-motorized use. New structures could be designed to provide space for bicycle and pedestrians. **Table 9** shows how the options rate with respect to accommodating bicyclists/pedestrians on the bridge and its approaches.

Table 9: Screening Results for Criterion OS3

Option ID	Answer/Reasoning	Assigned Points
OPTION 1 - IMPROVE SAFETY AND OPERATIONS ON THE EXISTING BRIDGE		
1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel	**NO.** Although a new one-way, one-lane bridge at a new location could be constructed to accommodate bicyclists and pedestrians, the existing bridge conditions still exhibit conflicts on the bridge, as well as on River Pines Road.	7
OPTION 2 - REHABILITATE THE BRIDGE		
2C - Minor Rehabilitation (includes Approaches)	**NO.** Minor rehabilitation would not address conflicts on the existing bridge between motorized & non-motorized travel. Approach conflicts could be eliminated with	7

	approach work.	
2D - Major Rehabilitation (includes Approaches)	**NO.** Major rehabilitation would not address conflicts on the existing bridge between motorized & non-motorized travel. Approach conflicts could be eliminated with approach work.	**7**
OPTION 3 - BUILD NEW BRIDGE		
3A.2 - North 1 Alignment	**YES.** A new bridge with associated approach work can be built to accommodate bicyclists and pedestrians.	**1**
3B.2 - Mount 2 Alignment	**YES.** A new bridge with associated approach work can be built to accommodate bicyclists and pedestrians.	**1**
3B.4 - South 1 Alignment	**YES.** A new bridge with associated approach work can be built to accommodate bicyclists and pedestrians.	**1**
3B.4 - South 2 Alignment	**YES.** A new bridge with associated approach work can be built to accommodate bicyclists and pedestrians.	**1**

1.6.4. OS4 – WOULD THE OPTION REDUCE CRASHES RESULTING FROM APPROACHES TO THE BRIDGE?

This screening criterion indicates whether or not the option would reduce crashes on the approaches to the bridge. A review of the crash history on area roadways shows substandard elements (deficiencies) on approaches contribute to the crashes. These substandard elements include horizontal alignment concerns, lack of road shoulders, steep roadside slopes, obstructions in clear zone, lack of lighting. Crash clusters have been identified on: North Avenue near the existing bridge, the intersection of River Pines Road/Riverside Drive, on Blue Mountain and Big Flat Roads, and on South Avenue (east of Woodlawn). Options that could reduce crashes resulting on approaches to the bridge, whether existing or new, would merit a YES answer. Those options that would not reduce crashes on approaches to the bridge would merit a NO answer.

Table 10 shows how the options rate with respect to the potential to reduce crashes resulting from deficiencies on the approaches to the bridge.

Table 10: Screening Results for Criterion OS4

Option ID	*Answer/Reasoning*	*Assigned Points*
OPTION 1 - IMPROVE SAFETY AND OPERATIONS ON THE EXISTING BRIDGE		
1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel	**NO.** A new one-way, one-lane bridge at a new location could be constructed to current standards, thus reducing the potential for crashes. However, the existing bridge still would remain in its current configuration with no approach reconstruction, thus existing crash trends are still unresolved.	**7**
OPTION 2 - REHABILITATE THE BRIDGE		
2C - Minor Rehabilitation (includes Approaches)	**YES.** Minor rehabilitation on the existing bridge includes revising the approaches to meet current standards. Elimination of substandard approaches to meet current standards may reduce crashes.	**1**
2D - Major Rehabilitation (includes Approaches)	**YES.** Major rehabilitation on the existing bridge includes revising the approaches to meet current standards. Elimination of substandard approaches to meet current standards may reduce crashes.	**1**
OPTION 3 - BUILD NEW BRIDGE		
3A.2 - North 1 Alignment	**YES.** A new bridge crossing with approaches would be built to current design standards, thus limiting the potential	**1**

	for crashes on the approaches.	
3B.2 - Mount 2 Alignment	**YES.** A new bridge crossing with approaches would be built to current design standards, thus limiting the potential for crashes on the approaches.	**1**
3B.4 - South 1 Alignment	**YES.** A new bridge crossing with approaches would be built to current design standards, thus limiting the potential for crashes on the approaches.	**1**
3B.4 - South 2 Alignment	**YES.** A new bridge crossing with approaches would be built to current design standards, thus limiting the potential for crashes on the approaches.	**1**

1.6.5. OS5 – WOULD THE OPTION ACCOMMODATE FUTURE CAPACITY DEMANDS?

This screening criterion determines whether or not the option would accommodate future capacity demands. Future capacity demands include things like providing a roadway wide enough for simultaneous bi–direction travel, and offering a crossing without limitations or restrictions due to horizontal and vertical clearances. The idea is to provide a facility that will readily accommodate increasing traffic demands due to area growth over the next 20-plus years. Traffic is expected to increase on River Pines Road from the year 2010 count volume of 2,610 vehicles per day (vpd) to 5,650 vpd (year 2040 projected volume). North Avenue traffic will increase from the year 2010 count volume of 2,000 vpd to 4,750 vpd (year 2040 projected volume). These projected future year volumes exceed the planning level capacity threshold of a one-lane, two-directional road facility. Providing sufficient capacity is important to the development of an efficient future transportation network in Missoula area. Options that would accommodate future capacity demands on the bridge would merit a YES answer. Those options that would maintain the status quo, or would not accommodate future capacity demands, would merit a NO answer.

Table 11 shows how the options rate with respect to the potential to accommodate future capacity demands.

Table 11: Screening Results for Criterion OS5

Option ID	*Answer/Reasoning*	*Assigned Points*
OPTION 1 - IMPROVE SAFETY AND OPERATIONS ON THE EXISTING BRIDGE		
1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel	**YES.** A new one-way, one-lane bridge at a new location, coupled with the existing bridge reconfigured as one-way, could provide the needed capacity – similar to that of a two-lane, two-way bridge.	**1**
OPTION 2 - REHABILITATE THE BRIDGE		
2C - Minor Rehabilitation (includes Approaches)	**NO.** Minor rehabilitation of the existing bridge and approaches does not improve capacity limitations of the one-lane, two-direction configuration.	**7**
2D - Major Rehabilitation (includes Approaches)	**NO.** Major rehabilitation of the existing bridge and approaches does not improve capacity limitations of the one-lane, two-direction configuration.	**7**
OPTION 3 - BUILD NEW BRIDGE		
3A.2 - North 1 Alignment	**YES.** A new two-lane, two-way bridge crossing with approaches would be built to current design standards, and provide future capacity for the foreseeable future.	**1**
3B.2 - Mount 2 Alignment	**YES.** A new two-lane, two-way bridge crossing with approaches would be built to current design standards, and provide future capacity for the foreseeable future.	**1**

3B.4 - South 1 Alignment	**YES.** A new two-lane, two-way bridge crossing with approaches would be built to current design standards, and provide future capacity for the foreseeable future.	**1**
3B.4 - South 2 Alignment	**YES.** A new two-lane, two-way bridge crossing with approaches would be built to current design standards, and provide future capacity for the foreseeable future.	**1**

1.6.6. OS6 – WOULD THE OPTION HELP REDUCE OR ELIMINATE VEHICLE DELAYS AT THE RIVER CROSSING?

This screening criterion determines whether or not the option would reduce or eliminate vehicle delays at the river crossing. The current bridge allows for traffic to cross the structure in one direction at a time. This delays vehicles waiting to cross in the opposing direction. These vehicles may occasionally include emergency responders. Options that provide a new bridge crossing with two lanes would reduce or eliminate vehicle delays, and would merit a YES answer. Those options that would retain the one-lane, two-way bridge, or consist of two one-way bridges (existing bridge and new location), would not reduce or eliminate vehicle delays and would merit a NO answer.

Table 12 shows how the options rate with respect to reducing or eliminating vehicle delays at the river crossing.

Table 12: Screening Results for Criterion OS6

Option ID	*Answer/Reasoning*	*Assigned Points*
OPTION 1 - IMPROVE SAFETY AND OPERATIONS ON THE EXISTING BRIDGE		
1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel	**NO.** This option does not reduce or eliminate vehicle delays for all users. The existing bridge reconfigured as one-way would still have load restrictions under the 25-ton-limit. Emergency responders would still have restrictions leading to additional delay for travel.	**7**
OPTION 2 - REHABILITATE THE BRIDGE		
2C - Minor Rehabilitation (includes Approaches)	**NO.** Minor rehabilitation of the existing bridge and approaches would still have load restrictions under the 25-ton-limit. Emergency responders would still have restrictions leading to additional delay.	**7**
2D - Major Rehabilitation (includes Approaches)	**NO.** Major rehabilitation of the existing bridge and approaches would likely remove the current load restrictions and achieve a 25-ton design loading, but the one-lane, two-way configuration does not eliminate or reduce delay to the travelling public or emergency service responders.	**7**
OPTION 3 - BUILD NEW BRIDGE		
3A.2 - North 1 Alignment	**YES.** A new two-lane, two-way bridge crossing with approaches would be built to current design standards, and reduce delay over that experienced at the existing bridge.	**1**
3B.2 - Mount 2 Alignment	**YES.** A new two-lane, two-way bridge crossing with approaches would be built to current design standards, and reduce delay over that experienced at the existing bridge.	**1**
3B.4 - South 1 Alignment	**YES.** A new two-lane, two-way bridge crossing with approaches would be built to current design standards, and reduce delay over that experienced at the existing bridge.	**1**
3B.4 - South 2 Alignment	**YES.** A new two-lane, two-way bridge crossing with approaches would be built to current design standards, and reduce delay over that experienced at the existing bridge.	**1**

1.6.7. OS7 – DOES THE OPTION PROVIDE AN EFFICIENT GRID CONNECTION TO THE MAJOR ROAD/STREET NETWORK IN THE MISSOULA AREA?

This screening criterion indicates whether or not the option would provide an efficient grid connection to the major road/street network in the Missoula area by measuring the total length of travel between two points (in both directions). For each of the seven options, the length of travel between the intersections of South Avenue/Clements Road and Big Flat Road/ River Pines Road/Blue Mountain Road/O'Brien Creek Road was measured. This screening consideration gets at whether the option provides a relatively direct linkage to the roadway grid system, and whether the length of travel with each option is less or more, for comparison purposes. An efficient connection to an established grid network is an important consideration of the transportation system in terms of reducing out-of-direction travel, thus reducing travel time, travel costs, and controlling emissions. A point ranking system is used where the option exhibiting the longest length of travel between the two subject intersections, in both directions, receives the highest number of points (7 possible) and the shortest length of travel between the two subject intersections, in both directions, receives the lowest number of points (1 possible). Since options 2.C, 2.D, and 3A.2 all potentially could realize similar lengths of travel, (i.e. 18,600 feet), they were given an equal ranking of 5 points (rather than 4, 5, and 6 points, respectively) as shown in **Table 9**. The value of 5 points is an average obtained by summing the position of the three options in the ranking (i.e. 4, 5 and 6) and dividing the total by 3.

Table 13 shows how the options rate with respect to providing an efficient grid connection to the major road/street network in the Missoula area.

Table 13: Screening Results for Criterion OS7

Option ID	*Answer/Reasoning*	*Assigned Points*
OPTION 1 - IMPROVE SAFETY AND OPERATIONS ON THE EXISTING BRIDGE		
1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel	Total travel length = 16,275 feet. *(This includes 7,225 feet in eastbound direction and 9,150 feet in westbound direction).*	**3**
OPTION 2 - REHABILITATE THE BRIDGE		
2C - Minor Rehabilitation (includes Approaches)	Total travel length = 18,600 feet. *(This includes 9,300 feet in eastbound direction and 9,300 feet in westbound direction).*	**5**
2D - Major Rehabilitation (includes Approaches)	Total travel length = 18,600 feet. *(This includes 9,300 feet in eastbound direction and 9,300 feet in westbound direction).*	**5**
OPTION 3 - BUILD NEW BRIDGE		
3A.2 - North 1 Alignment	Total travel length = 18,600 feet. *(This includes 9,300 feet in eastbound direction and 9,300 feet in westbound direction).*	**5**
3B.2 - Mount 2 Alignment	Total travel length = 21,200 feet. *(This includes 10,600 feet in eastbound direction and 10,600 feet in westbound direction).*	**7**
3B.4 - South 1 Alignment	Total travel length = 14,450 feet. *(This includes 7,225 feet in eastbound direction and 7,225 feet in westbound direction).*	**1**
3B.4 - South 2 Alignment	Total travel length = 14,750 feet. *(This includes 7,375 feet in eastbound direction and 7,375 feet in westbound direction).*	**2**

1.6.8. CC1 – PLANNING LEVEL CONSTRUCTION COSTS?

High level planning cost estimates provide a reasonable measure to help compare the general magnitude of capital construction costs among the options under consideration, or against typical construction costs associated with similar projects. The estimates reflect only the cost of construction and do not include highly variable costs like those associated with right-of-way acquisition, project development activities (preliminary engineering, indirect and incidental costs, etc.), environmental mitigation, or inflation. Necessary items that were considered to arrive at the high level planning cost included the following:

- Approximate bridge length (assumes bridge would have to be longer than the river's edge bank width)
- Approximate bridge width (assumes minimum width of 28 feet for two-way / 16 feet for one-way)
- Degree of skew of the bridge crossing (higher skew is more difficult to design, construct, and permit)
- Approximate bridge approach (i.e. road) length
- Approximate bridge approach width (assumes 40 feet minimum)

A minimum "new" width for bridge construction was assumed to be 28 feet, as this is the narrowest typical section that can be utilized (as discussed in the Existing and Projected Conditions Report). For the one-way new bridge option, the minimum bridge width would be 16 feet. For bridge lengths, it was assumed that any new bridge would have to be longer than the bank widths by 20 feet on each side. This assumption is considered realistic and allows for a reasonable comparison of similar potential bridge lengths. Design or rehabilitation details are not known as this time, including the number of piers in river, maximum span length, steel vs. reinforced concrete substructure, rehabilitation of existing bridge on-site or off-site, etc. This criterion also relies on the potential length of new approach road required for each option, and makes a determination of whether or not a substantial upgrade to approaches is required.

A point ranking system is used where the option exhibiting the highest planning level cost receives the most points (7 possible) and the option exhibiting the lowest planning level cost receives the fewest points (1 possible). **Appendix A** contains information on assumptions relative to planning level cost determination.

Table 14 shows how the options rate with respect to the planning level constructions costs.

Table 14: Screening Results for Criterion CC1

Option ID	*Answer/Reasoning*	*Assigned Points*
OPTION 1 - IMPROVE SAFETY AND OPERATIONS ON THE EXISTING BRIDGE		
1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel	Estimated planning cost = $3,210,000.	**3**
OPTION 2 - REHABILITATE THE BRIDGE		
2C - Minor Rehabilitation (includes Approaches)	Estimated planning cost = $776,000 (~$125k bridge).	**1**
2D - Major Rehabilitation (includes Approaches)	Estimated planning cost = $1,760,000 (~$850k bridge).	**2**
OPTION 3 - BUILD NEW BRIDGE		

3A.2 - North 1 Alignment	Estimated planning cost = $3,650,000.	4
3B.2 - Mount 2 Alignment	Estimated planning cost = $6,410,000.	7
3B.4 - South 1 Alignment	Estimated planning cost = $5,210,000.	5
3B.4 - South 2 Alignment	Estimated planning cost = $5,290,000.	6

NOTE 1: Option 2C bridge costs range from $50k to $200k, thus an average of $125k was used in the estimate.
NOTE 2: For option 2D bridge costs range from $200k to $1,500k, thus an average of $850k was used.
*NOTE 3: Planning level costs are developed for comparison purposes only to accomplish screening. While every effort is made to forecast reasonable costs, the costs in **Table 14** may ultimately be greater or lesser during project development activities.*

1.6.9. CC2 – ANNUALIZED MAINTENANCE COSTS?

This criterion provides some indication of annual maintenance costs for each option. The potential maintenance costs for the approach roads have been calculated as an annual maintenance cost in present day dollars (2012) by using an average maintenance cost of $4,300 per lane mile (based on query of statewide average maintenance costs). For bridge maintenance costs, a review of past expenditures provided by Missoula County for the Maclay Bridge over a twenty-year period was completed. During the time period between 1993 and 2013, $147,000 will have been expended on the Maclay Bridge. This equals approximately $7,350 per year, or $1.50 per square foot, for bridge maintenance activities on the existing Maclay Bridge. Potential bridge maintenance costs were developed based on this cost per square foot, and applied to those options that retain the existing bridge as part of the option (i.e. options 1.G and 2.C). Option 2.D is assumed to have no 20-year bridge maintenance need since a major rehabilitation effort inherently would bring the condition of the bridge up to a standard that is similar to a new bridge.

A point ranking system is used where the option exhibiting the highest annualized maintenance cost receives the highest number of points (7 possible) and the option exhibiting the lowest annualized maintenance cost receives the lowest number of points (1 possible) as shown in **Table 15**. **Appendix B** contains information on assumptions relative to annualized maintenance cost determination.

Table 15 shows how the options rate with respect to the annualized maintenance costs.

Table 15: Screening Results for Criterion CC2

Option ID	*Answer/Reasoning*	*Assigned Points*
OPTION 1 - IMPROVE SAFETY AND OPERATIONS ON THE EXISTING BRIDGE		
1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel	Estimated maintenance cost = $10,000. Includes bridge maintenance cost. Road maintenance costs are based on "lane-miles", so with this configuration the option length is not "doubled" (see **Appendix B**).	6
OPTION 2 - REHABILITATE THE BRIDGE		
2C - Minor Rehabilitation (includes Approaches)	Estimated maintenance cost = $10,400. Includes bridge maintenance cost.	7
2D - Major Rehabilitation (includes Approaches)	Estimated maintenance cost = $3,100. Includes bridge maintenance cost same as option 2C due to uncertainties over scope of rehabilitation.	3
OPTION 3 - BUILD NEW BRIDGE		

3A.2 - North 1 Alignment	Estimated maintenance cost = $3,300.	5
3B.2 - Mount 2 Alignment	Estimated maintenance cost = $3,000.	2
3B.4 - South 1 Alignment	Estimated maintenance cost = $2,100.	1
3B.4 - South 2 Alignment	Estimated maintenance cost = $3,200.	4

1.6.10. R1 – EFFECTS ON AQUATIC RESOURCES?

This criterion differentiates between options based on their potential effects to aquatic resources by considering the extent of work in the delineated floodplain. Information on the delineated floodplain is available via DFIRM maps (draft digital FIRM [DFIRM] panel 1455E) in a GIS database format, and was previously shown in the study's *Environmental Scan*. National Wetland Inventory (NWI) wetlands are identified in the area; however, detailed wetland delineations are not completed for a planning study and therefore are not available to consider as a screening mechanism. If a project is forwarded a detailed wetland delineation would be completed. A point ranking system is used where the option exhibiting the longest crossing of the delineated 100-year floodplain receives the highest number of points (7 possible) and the shortest crossing of the 100-year delineated floodplain receives the lowest number of points (1 possible). Since options 2.C, 2.D, and 3A.2 all potentially could impact the same length of floodplain (i.e. 1,725 feet), they were given an equal ranking of 5 points (rather than 4, 5, and 6 points, respectively) as shown in **Table 16**. The value of 5 points is an average obtained by summing the position of the three options in the ranking (i.e. 4, 5 and 6) and dividing the total by 3.

Note that each option when analyzed also includes existing infrastructure and corresponding lengths within the floodplain. As an example, a rehabilitation option may only include work to the existing Maclay Bridge, however that option is still part of a road system that includes North Avenue and River Pines Road that collectively falls within and potentially impacts the floodplain form and function.

Table 16 shows how the options rate with respect to the effects on aquatic resources.

Table 16: Screening Results for Criterion R1

Option ID	*Answer/Reasoning*	*Assigned Points*
OPTION 1 - IMPROVE SAFETY AND OPERATIONS ON THE EXISTING BRIDGE		
1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel	Estimated length of floodplain encroachment = 2,910 feet.	7
OPTION 2 - REHABILITATE THE BRIDGE		
2C - Minor Rehabilitation (includes Approaches)	Estimated length of floodplain encroachment = 1,730 feet.	5
2D - Major Rehabilitation (includes Approaches)	Estimated length of floodplain encroachment = 1,730 feet.	5
OPTION 3 - BUILD NEW BRIDGE		
3A.2 - North 1 Alignment	Estimated length of floodplain encroachment = 1,730 feet.	5
3B.2 - Mount 2 Alignment	Estimated length of floodplain encroachment = 700 feet.	1

3B.4 - South 1 Alignment	Estimated length of floodplain encroachment = 1,180 feet.	2
3B.4 - South 2 Alignment	Estimated length of floodplain encroachment = 1,270 feet.	3

1.6.11. R2 – WILL THE OPTIONS HAVE IMPACTS TO PROTECTED 4 (F) OR SECTION 106 RESOURCES?

This criterion determines whether the options have the potential for impacting resources that are protected by Section 4(f) or fall under Section 106 of the National Historic Preservation Act (36 CFR 800). Section 4(f) resources include public parks, recreation areas, or wildlife and waterfowl refuges of national, State, or local significance, or land from a historic site of national, State, or local significance. Section 106 of the National Historic Preservation Act (36 CFR 800) 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). For the Maclay Bridge Planning Study, these resources include historic residences/outbuildings, a historic school building, and historic irrigation features. Section 4(f) and 106 resources were identified in the study's *Environmental Scan*.

Options that would have the potential for impacting 4(f) or Section 106 resources would merit a HIGH answer. Those options that would not have the potential for impacting 4(f) or Section 106 resources would merit a LOW answer.

Table 17 shows how the options rate with respect to the potential for impacting 4(f) or Section 106 resources.

Table 17: Screening Results for Criterion R2

Option ID	*Answer/Reasoning*	*Assigned Points*
OPTION 1 - IMPROVE SAFETY AND OPERATIONS ON THE EXISTING BRIDGE		
1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel	**LOW.** Assumes activities to the existing Maclay Bridge would be minor in nature to accommodate one-way travel, and new South Avenue location for opposing one-way direction does not impact Section 4(f) resources or any known cultural, historic or archaeological resources.	1
OPTION 2 - REHABILITATE THE BRIDGE		
2C - Minor Rehabilitation (includes Approaches)	**LOW.** Minor rehabilitation activities are not expected to impact the aesthetic and visual characteristics of the existing Maclay Bridge.	1
2D - Major Rehabilitation (includes Approaches)	**HIGH.** Major rehabilitation activities would potentially alter characteristics of the existing Maclay Bridge. It is likely that the truss appearance and other bridge member appearance could change. Such effects could be a Section 4(f) use and affect the structure's eligibility for the National Register.	7
OPTION 3 - BUILD NEW BRIDGE		
3A.2 - North 1 Alignment	**HIGH.** A new bridge slightly upstream of the existing Maclay Bridge, a Section 4(f) resource (24MO0521), would necessitate removal of the existing bridge. This would be a 4(f) use, and an adverse effect under section 106.	7
3B.2 - Mount 2 Alignment	**HIGH.** This route would cross a Missoula Irrigation District Ditch (24MO0520) that was given a consensus determination of eligibility for the National Register. This would be a minor 4(f) use and a minor impact under	7

	section 106.	
3B.4 - South 1 Alignment	**LOW.** This route does not directly impact any identified Section 4(f) resources, nor does it directly impact any identified cultural, historic or archaeological resources.	**1**
3B.4 - South 2 Alignment	**LOW.** Same as reasoning for South 1 above.	**1**

1.6.12. R3 – WILL THE OPTIONS AFFECT LANDS HELD UNDER CONSERVATION EASEMENTS?

This criterion determines whether the options have potential to affect lands held under conservation easements, and would require crossing those lands. Sizable areas of private land along the Bitterroot River are held under conservation easements by the Five Valleys Land Trust. Conservation easements exist for the purposes of preserving open space, protecting fish or wildlife habitat, or limiting the extent and density of development. Options that would have the potential for crossing lands held under conservation easements would merit a HIGH answer. Those options that would not have the potential for crossing lands held under conservation easements would merit a LOW answer.

Table 18 shows how the options rate with respect to the potential for affecting lands held under conservation easements.

Table 18: Screening Results for Criterion R3

Option ID	*Answer/Reasoning*	*Assigned Points*
OPTION 1 - IMPROVE SAFETY AND OPERATIONS ON THE EXISTING BRIDGE		
1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel	**LOW.** Option does not affect or cross lands held under conservation.	**1**
OPTION 2 - REHABILITATE THE BRIDGE		
2C - Minor Rehabilitation (includes Approaches)	**LOW.** Option does not affect or cross lands held under conservation.	**1**
2D - Major Rehabilitation (includes Approaches)	**LOW.** Option does not affect or cross lands held under conservation.	**1**
OPTION 3 - BUILD NEW BRIDGE		
3A.2 - North 1 Alignment	**LOW.** Option does not affect or cross lands held under conservation.	**1**
3B.2 - Mount 2 Alignment	**LOW.** Option does not affect or cross lands held under conservation.	**1**
3B.4 - South 1 Alignment	**LOW.** Option does not affect or cross lands held under conservation.	**1**
3B.4 - South 2 Alignment	**LOW.** Option does not affect or cross lands held under conservation.	**1**

1.6.13. NS1 – NUMBER OF PRIVATELY OWNED PARCELS IMPACTED?

This criterion assesses how many individual privately-owned parcels would be crossed or potentially impacted by the alignment associated with each option. The criterion is suggestive of the potential extent of R/W acquisition associated with each option. The number of privately-owned parcels crossed by an alignment was based on review of the Montana Cadastral Mapping database (accessed November 12, 2012 at http://giscoordination.mt.gov/cadastral/msdi.asp). Parcels crossed by the proposed alignment and falling within an assumed, standard 80' R/W width were counted. An exception to this is option 1.G. For option 1.G it was assumed that the new one-way configuration would necessitate a 60' R/W width.

A point ranking system is used where the option exhibiting the most number of privately owned parcels impacted receives the highest number of points (7 possible) and the least number of privately owned parcels impacted receives the lowest number of points (1 possible). Since options 2.C, 2.D, and 3A.2 all potentially could impact 12 private parcels, they were given an equal ranking of 6 points (rather than 5, 6 and 7 points, respectively) as shown in **Table 19**. The value of 6 points is an average obtained by summing the position of the three options in the ranking (i.e. 5, 6 and 7) and dividing the total by 3.

Table 19 shows how the options rate with respect to the potential number of privately owned parcels impacted.

Table 19: Screening Results for Criterion NS1

Option ID	*Answer/Reasoning*	*Assigned Points*
OPTION 1 - IMPROVE SAFETY AND OPERATIONS ON THE EXISTING BRIDGE		
1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel	Potentially affects 3 privately owned parcels.	**1**
OPTION 2 - REHABILITATE THE BRIDGE		
2C - Minor Rehabilitation (includes Approaches)	Potentially affects 12 privately owned parcels.	**6**
2D - Major Rehabilitation (includes Approaches)	Potentially affects 12 privately owned parcels.	**6**
OPTION 3 - BUILD NEW BRIDGE		
3A.2 - North 1 Alignment	Potentially affects 12 privately owned parcels.	**6**
3B.2 - Mount 2 Alignment	Potentially affects 6 privately owned parcels.	**4**
3B.4 - South 1 Alignment	Potentially affects 4 privately owned parcels.	**2**
3B.4 - South 2 Alignment	Potentially affects 5 privately owned parcels.	**3**

1.6.14. NS2 – NUMBER OF STRUCTURES IMPACTED?

This criterion identifies whether or not structures may be impacted by each option. For purposes of this criterion, structures only consist of residences. Impacts to existing structures helps assess the potential for relocations or right-of-way impact mitigations associated with the options. The number of structures potentially impacted was based on review of recent aerial photography (BingMapsAerial - © 2012 Microsoft Corporation, accessed November 12, 2012 at http://www.bing.com/maps/#). Structures are assumed to be impacted if they occur within a typical 80' wide R/W corridor. An exception to this is option

1.G. For option 1.G it was assumed that the new one-way configuration would necessitate a 60' R/W width.

Options that would potentially impact structures given the assumptions above would merit a HIGH answer, while those that would not potentially impact structures are given a LOW answer.

Table 20 shows how the options rate with respect to the number of structures impacted.

Table 20: Screening Results for Criterion NS2

Option ID	*Answer/Reasoning*	*Assigned Points*
OPTION 1 - IMPROVE SAFETY AND OPERATIONS ON THE EXISTING BRIDGE		
1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel	**LOW.** No structures impacted.	**1**
OPTION 2 - REHABILITATE THE BRIDGE		
2C - Minor Rehabilitation (includes Approaches)	**HIGH.** Potentially impacts one (1) structure.	**7**
2D - Major Rehabilitation (includes Approaches)	**HIGH.** Potentially impacts one (1) structure.	**7**
OPTION 3 - BUILD NEW BRIDGE		
3A.2 - North 1 Alignment	**HIGH.** Potentially impacts one (1) structure.	**7**
3B.2 - Mount 2 Alignment	**LOW.** No structures impacted.	**1**
3B.4 - South 1 Alignment	**LOW.** No structures impacted.	**1**
3B.4 - South 2 Alignment	**LOW.** No structures impacted.	**1**

1.6.15. NS3 – R/W NEEDS?

This criterion estimates how much new right-of-way may be required with each option. An assumed new right-of-way width of 80 feet is used for the option's alignments, and any known existing right-of-way is subtracted out, yielding a potential new right-of-way need. An exception to this is option 1.G. For option 1.G it was assumed that the new one-way configuration would necessitate a 60' R/W width. Existing available right-of-way was measured from the Montana Cadastral Mapping database (accessed November 12, 2012 at http://giscoordination.mt.gov/cadastral/msdi.asp). The area crossing the Bitterroot River was also subtracted out from each option, as that would require a permit for crossing navigable waters from the Montana Department of Natural Resources and Conservation (DNRC).

A point ranking system is used where the option exhibiting the most needed right-of-way receives the highest number of points (7 possible) and the option exhibiting the least needed right-of-way receives the lowest number of points (1 possible). Since options 2.C, 2.D, and 3A.2 all potentially have the same right-of-way needs, they were given an equal ranking of 2 points (rather than 1, 2 and 3 points, respectively) as shown in **Table 21**. The value of 2 points is an average obtained by summing the position of the three options in the ranking (i.e. 1, 2 and 3) and dividing the total by 3.

Table 21 shows how the options rate with respect to the new "net" right-of-way potentially required.

Table 21: Screening Results for Criterion NS3

Option ID	Answer/Reasoning	Assigned Points
OPTION 1 - IMPROVE SAFETY AND OPERATIONS ON THE EXISTING BRIDGE		
1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel	Potential new r/w needed = 1.1 acres.	4
OPTION 2 - REHABILITATE THE BRIDGE		
2C - Minor Rehabilitation (includes Approaches)	Potential new r/w needed = 0.4 acres.	2
2D - Major Rehabilitation (includes Approaches)	Potential new r/w needed = 0.4 acres.	2
OPTION 3 - BUILD NEW BRIDGE		
3A.2 - North 1 Alignment	Potential new r/w needed = 0.4 acres.	2
3B.2 - Mount 2 Alignment	Potential new r/w needed = 2.4 acres.	7
3B.4 - South 1 Alignment	Potential new r/w needed = 1.5 acres.	5
3B.4 - South 2 Alignment	Potential new r/w needed = 2.3 acres.	6

1.6.16. NS4 – DOES THE OPTION COMPARE FAVORABLY WITH YEAR 2040 "NO ACTION" MODEL TRAFFIC VOLUME INCREASES IN FRONT OF TARGET RANGE SCHOOL?

This criterion measures the potential for traffic volume changes in front of the Target Range School. Target Range School is located on South Avenue, just east of Clements Road. Public comments have expressed concerns about decreased safety in the vicinity of schools due to more traffic and increased travel speeds that could result from some options. The Missoula MPO travel demand model was reviewed used to compare future year 2040 "No Action" conditions to the options being considered that may affect traffic distribution. If the option resulted in no changes to traffic volumes in front of Target Range School, thus limiting or maintaining forecasted year 2040 traffic conditions, a YES answer was given. Those options that would have an increase in traffic in front of Target Range School, when compared to the year 2040 "No Action" condition, yielded a NO answer

Table 22 shows how the options rate with respect to ADT volume increases in front of the Target Range School.

Table 22: Screening Results for Criterion NS4

Option ID	Answer/Reasoning	Assigned Points
OPTION 1 - IMPROVE SAFETY AND OPERATIONS ON THE EXISTING BRIDGE		
1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel	**NO.** Traffic in front of Target Range School increases when compared to the future year 2040 "No Action" model volume.	7
OPTION 2 - REHABILITATE THE BRIDGE		
2C - Minor Rehabilitation (includes Approaches)	**YES.** Compared to future year 2040 "No Action" model volume, traffic does not increase in front of Target Range School.	1

2D - Major Rehabilitation (includes Approaches)	**YES.** Compared to future year 2040 "No Action" model volume, traffic does not increase in front of Target Range School.	**1**
OPTION 3 - BUILD NEW BRIDGE		
3A.2 - North 1 Alignment	**NO.** Traffic in front of Target Range School increases when compared to the future year 2040 "No Action" model volume.	**7**
3B.2 - Mount 2 Alignment	**YES.** Compared to future year 2040 "No Action" model volume, traffic does not increase in front of Target Range School.	**1**
3B.4 - South 1 Alignment	**NO.** Traffic in front of Target Range School increases when compared to the future year 2040 "No Action" model volume.	**7**
3B.4 - South 2 Alignment	**NO.** Traffic in front of Target Range School increases when compared to the future year 2040 "No Action" model volume.	**7**

1.7. SECOND LEVEL SCREENING RESULTS

Sixteen second level screening criteria were developed to assist in the evaluation of the seven options forwarded for consideration through the first level screening process. The sixteen second level criteria address each of the needs, and many of the objectives, previously identified during the course of the study. Efforts were made not to "double count" the particular item being screened, and all criteria were treated equal in that no "weighting" occurred – thus no one criterion is more important than the other.

The results of the second level screening criteria are shown in **Table 23**. The point ranking was developed such that those options with the fewest points rank the best and are considered desirable, while those with the most points rank the worst and are considered undesirable.

- 3B.4 - South 1 Alignment (32 POINTS)
- 3B.4 - South 2 Alignment (40 POINTS)
- 3B.2 - Mount 2 Alignment (44 POINTS)
- 3A.2 - North 1 Alignment (55 POINTS)
- 2D - Major Rehabilitation (includes Approaches) (69 POINTS)
- 1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel (70 POINTS)
- 2C - Minor Rehabilitation (includes Approaches) (72 POINTS)

Table 23: Summary of Second Level Screening Assessment

First Level Screening Consideration	RANGE OF OPTIONS						
	OPTION 1 - IMPROVE SAFETY AND OPERATIONS ON EXISTING BRIDGE	OPTION 2 - REHABILITATE THE BRIDGE		OPTION 3 - BUILD NEW BRIDGE			
	1G Add new 1 –lane bridge Retain old for 1-way travel	2C Minor Rehab (includes Approaches)	2D Major Rehab (includes Approaches)	3A.2 North 1	3B.2 Mount 2	3B.4 South 1	3B.4 South 2
OS1. Would the option improve sub-standard elements on the bridge?	7	7	7	1	1	1	1
OS2. Would the option improve vehicle load restrictions on the bridge?	7	7	1	1	1	1	1
OS3. Would the option accommodate bicyclists/pedestrians on the bridge and its approaches?	7	7	7	1	1	1	1
OS4. Would the option reduce crashes resulting from approaches to the bridge?	7	1	1	1	1	1	1
OS5. Would the option accommodate future capacity demands?	1	7	7	1	1	1	1
OS6. Would the option help reduce or eliminate vehicle delays at the river crossing?	7	7	7	1	1	1	1
OS7. Does the option provide an efficient grid connection to the major road/street network in the Missoula area?	3	5	5	5	7	1	2
CC1. Planning level construction costs?	3	1	2	4	7	5	6
CC2. Annualized maintenance costs?	6	7	3	5	2	1	4
R 1. Effects on aquatic resources?	7	5	5	5	1	2	3
R 2. Will the options have impacts to protected 4 (f) or Section 106 resources?	1	1	7	7	7	1	1
R 3. Will the options affect lands held under conservation easements?	1	1	1	1	1	1	1
NS1. Number of privately owned parcels impacted?	1	6	6	6	4	2	3
NS2. Number of structures impacted?	1	7	7	7	1	1	1
NS3. R/W needs?	4	2	2	2	7	5	6
NS4. Does the option compare favorably with year 2040 "no action" model traffic volume increases in front of Target Range School?	7	1	1	7	1	7	7
TOTAL TABULATED POINTS	70	72	69	55	44	32	40
RANKING	6	7	5	4	3	1	2

APPENDIX A

PLANNING LEVEL CONSTRUCTION COST ESTIMATES

Second Level Screening - Planning Level Cost Estimate

(11/20/2012)

Option 1 - Improve Safety and Operations on the Existing Bridge	Planning Level Cost (2012 Dollars)
1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel	$3,210,000

Option 2 - Rehabilitate the Bridge	Planning Level Cost (2012 Dollars)
2C - Minor Rehabilitation (includes Approaches)	$674,000
2D - Major Rehabilitation (includes Approaches)	$878,000

Option 3 - Build New Bridge	Planning Level Cost (2012 Dollars)
3A.2 - North 1 Alignment	$3,650,000
3B.2 - Mount 2 Alignment	$6,410,000
3B.4 - South 1 Alignment	$5,210,000
3B.4 - South 2 Alignment	$5,290,000

OPTION 1 - IMPROVE SAFETY AND OPERATION ON THE EXISTING BRIDGE
Planning Level Cost Estimates

Item Description	1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Tra
Estimated Bridge Length (FT)	650
Estimated Bridge Width (FT)	16
Estimated Bridge Area (SF)	10400
Estimated Bridge Skew (degrees)	30
Estimated Cost per SF	$200
Estimated Bridge Cost (SEE NOTE 1)	$2,080,000
Estimated Road Length (FT)	2312
Estimated Road Length (MILE)	0.44
Estimated Cost per MILE (SEE NOTE 2)	$600,000
Estimated Road Cost	$262,727
Bridge	$2,080,000
Road Work	$262,727
Traffic Control (SEE NOTE 3)	$21,018
Remove Structure	$0
Subtotal	$2,363,745
Mobilization (18%)	$425,474
Subtotal	$2,789,220
Contingencies (15%)	$418,383
Total Construction (CN) - ROUNDED	**$3,210,000**

NOTE 1:
Bridge skew 0 to 15 degrees - USE $165 per SF
Bridge skew 14 to 30 degrees - USE $200 per SF
Bridge skew greater than 30 degrees - USE $250 SF
Road widths 40 feet (two-way/two-lane); 20 feet (one-way/one-lane)

NOTE 2:
$1.2 million per mile obtained from from MDT PET spreadsheet tool (MSEXCEL) dated September 2011.
Assumes 40-foot top width, 0.3' pms, 2"cts, and 1-foot crushed aggregate base course.
Adjusted downward for one-way infrastructure (20 feet - $600,00)

NOTE 3:
Traffic control uses 8% of road cost

OPTION 2 - REHABILITATION
Planning Level Cost Estimates

Item Description	2C - Minor Rehabilitation (w/Approaches)	2D - Major Rehabilitation (w/Approaches)
Estimated Bridge Length (FT)		
Estimated Bridge Width (FT)		
Estimated Bridge Area (SF)		
Estimated Bridge Skew (degrees)		
Estimated Cost per SF		
Estimated Bridge Cost	$50,000	$200,000
Estimated Road Length (FT)	1642	1642
Estimated Road Length (MILE)	0.31	0.31
Estimated Cost per MILE (SEE NOTE 2)	$1,200,000	$1,200,000
Estimated Road Cost	$373,182	$373,182
Bridge	$50,000	$200,000
Road Work	$373,182	$373,182
Traffic Control (SEE NOTE 3)	$29,855	$29,855
Remove Structure (SEE NOTE 4)	$44,000	$44,000
Subtotal	$497,036	$647,036
Mobilization (18%)	$89,467	$116,467
Subtotal	$586,503	$763,503
Contingencies (15%)	$87,975	$114,525
Total Construction (CN) - ROUNDED	**$674,000**	**$878,000**

NOTE 1:
Bridge skew 0 to 15 degrees - USE $165 per SF
Bridge skew 14 to 30 degrees - USE $200 per SF
Bridge skew greater than 30 degrees - USE $250 SF

NOTE 2:
$1.2 million per mile obtained from from MDT PET spreadsheet tool (MSEXCEL) dated September 2011. Assumes 40-foot top width, 0.3' pms, 2"cts, and 1-foot crushed aggregate base course.

NOTE 3:
Traffic control uses 8% of road cost

NOTE 4:
Lump sum cost provided by MDT Bridge

OPTION 3 - BUILD NEW BRIDGE
Planning Level Cost Estimates

Item Description	3A.2 - North 1 Alignment	3B.2 - Mount 2 Alignment	3B.4 - South 1 Alignment	3B.4 - South 2 Alignment
Estimated Bridge Length (FT)	400	625	650	500
Estimated Bridge Width (FT)	28	28	28	28
Estimated Bridge Area (SF)	11200	17500	18200	14000
Estimated Bridge Skew (degrees)	20	45	30	37
Estimated Cost per SF	$200	$250	$200	$250
Estimated Bridge Cost (SEE NOTE 1)	$2,240,000	$4,375,000	$3,640,000	$3,500,000
Estimated Road Length (FT)	1642	1232	620	1431
Estimated Road Length (MILE)	0.31	0.23	0.12	0.27
Estimated Cost per MILE (SEE NOTE 2)	$1,200,000	$1,200,000	$1,200,000	$1,200,000
Estimated Road Cost	$373,182	$280,000	$140,909	$325,227
Bridge	$2,240,000	$4,375,000	$3,640,000	$3,500,000
Road Work	$373,182	$280,000	$140,909	$325,227
Traffic Control (SEE NOTE 3)	$29,855	$22,400	$11,273	$26,018
Remove Structure (SEE NOTE 4)	$44,000	$44,000	$44,000	$44,000
Subtotal	$2,687,036	$4,721,400	$3,836,182	$3,895,245
Mobilization (18%)	$483,667	$849,852	$690,513	$701,144
Subtotal	$3,170,703	$5,571,252	$4,526,695	$4,596,390
Contingencies (15%)	$475,605	$835,688	$679,004	$689,458
Total Construction (CN) - ROUNDED	**$3,650,000**	**$6,410,000**	**$5,210,000**	**$5,290,000**

NOTE 1:
Bridge skew 0 to 15 degrees - USE $165 per SF
Bridge skew 14 to 30 degrees - USE $200 per SF
Bridge skew greater than 30 degrees - USE $250 SF

NOTE 2:
$1.2 million per mile obtained from from MDT PET spreadsheet tool (MSEXCEL) dated September 2011. Assumes 40-foot top width, 0.3' pms, 2"cts, and 1-foot crushed aggregate base course.

NOTE 3:
Traffic control uses 8% of road cost

NOTE 4:
Lump sum cost provided by MDT Bridge

APPENDIX B

ANNUALIZED MAINTENANCE COST ESTIMATES

Second Level Screening - Annualized Maintenance Cost Estimate

(12/04/2012)

Potential Road Maintenance Costs (per year)

	Length of Bridge (ft)	Length of New Road (ft)	Total Length (ft)	Total Length (miles)	Total Length (lane-miles)	Annual Road Maintenance Cost
1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel	1000	2312	3312	0.627	0.627	$2,697
2C - Minor Rehabilitation (includes Approaches)	350	1692	2042	0.387	0.707	$3,041
2D - Major Rehabilitation (includes Approaches)	350	1692	2042	0.387	0.707	$3,041
3A.2 - North 1 Alignment	400	1642	2042	0.387	0.773	$3,326
3B.2 - Mount 2 Alignment	625	1232	1857	0.352	0.703	$3,024
3B.4 - South 1 Alignment	650	620	1270	0.240	0.481	$2,068
3B.4 - South 2 Alignment	500	1431	1931	0.366	0.731	$3,145

Potential Bridge Maintenance Costs (per year - assumes 20 year horizon)

	Length of Bridge (ft)	Length of Bridge to be Maintained (ft)	Width of Bridge to be Maintained (ft)	SF of Bridge to be Maintained (ft)	Cost of Bridge Maintenance (per year)	Annual Bridge Maintenance Cost
1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel	1000	350	14	4900	$7,350	$7,350
2C - Minor Rehabilitation (includes Approaches)	350	350	14	4900	$7,350	$7,350
2D - Major Rehabilitation (includes Approaches)	350	350	14	4900	$0	$0
3A.2 - North 1 Alignment	400	400	28	11200	$0	$0
3B.2 - Mount 2 Alignment	625	625	28	17500	$0	$0
3B.4 - South 1 Alignment	650	650	28	18200	$0	$0
3B.4 - South 2 Alignment	500	500	28	14000	$0	$0

Potential COMBINED Maintenance Costs (per year - assumes 20 year horizon)

	Annual Road Maintenance Cost	Annual Bridge Maintenance Cost	TOTAL ANNUAL MAINTENANCE COST
1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel	2,697	7,350	$10,047
2C - Minor Rehabilitation (includes Approaches)	3,041	7,350	$10,391
2D - Major Rehabilitation (includes Approaches)	3,041	0	$3,041
3A.2 - North 1 Alignment	3,326	0	$3,326
3B.2 - Mount 2 Alignment	3,024	0	$3,024
3B.4 - South 1 Alignment	2,068	0	$2,068
3B.4 - South 2 Alignment	3,145	0	$3,145

Based on Missoula County data, since the 1994 EA through 20-years a total expenditure of $147,081.79 will have been spent on Maclay Bridge maintenance activities. This equates to $7,350 per year for the 20-year period. On a square footage basis, this equals $7,350 divided by 4,900 square foot (existing bridge), for a cost of $1.50 per square foot.

For new bridges, it is assumed that there are no bridge maintenance needs required over a 20-year horizon, thus for this purpose the annual maintenance cost is assumed to be zero dollars.

Since these lengths represent two-lanes on the road, but one lane on the bridge, 350 feet is subtracted out of the "lane-miles" to account for the one-lane bridge.

It is assumed that after "major rehab" bridge will have no maintenance needs required over a 20-year horizon, thus for this purpose the annual maintenance cost is assumed to be zero dollars.

APPENDIX C

NEEDS AND OBJECTIVES

NEEDS AND OBJECTIVES (APPENDIX C)

The four major needs and associated objectives established for the Maclay Bridge Planning Study are listed below. The needs and objectives were derived from a comprehensive review of existing data and input from resource agencies, stakeholders and the public. The needs and objectives reflect the existing social, environmental, and engineering conditions described in the *Existing and Projected Conditions Report* and recognize the local and regional use of the bridge. They also provide a basic set of considerations to help evaluate potential options.

NEED NUMBER 1: Improve the safety and operation of the river crossing and connecting roadway network.

Objectives (To the Extent Practicable)

- Improve sub-standard elements of facilities to meet current applicable design standards.
- Reduce delay and vehicle restriction for emergency responders under existing and future traffic demands.
- Manage travel speeds and provide adequate clear zones to improve operations.

NEED NUMBER 2: Provide a long-term river crossing and connecting roadway network that accommodates planned growth in the Maclay Bridge area.

Objectives (To the Extent Practicable)

- Accommodate existing and future capacity demands.
- Address non-motorized facilities consistent with local planning efforts.
- Provide connectivity to neighborhood residents, and regional users accessing recreational lands to the west of the Bitterroot River.

NEED NUMBER 3: Minimize adverse impacts from options to the environmental, cultural, scenic and recreational characteristics of the study area.

Objectives (To the Extent Practicable)

- Minimize adverse impacts to the Bitterroot River from potential options.
- Minimize adverse impacts to the wildlife and aquatic organisms from potential options.
- Provide reasonable access to recreational sites in the study area (Kelly Island Fishing Access Site, Lolo National Forest, and Missoula County Parks).
- Avoid or otherwise minimize adverse impacts to historic, cultural, and archaeological resources that may result from implementation of options.

NEED NUMBER 4: Minimize adverse impacts from options to the neighborhood characteristics of the study area.

Objectives (To the Extent Practicable)

- Implement improvements with special sensitivity to area schools.
- Minimize impacts to existing residents and businesses in the area.
- Recognize the historic value of the Maclay Bridge to the community and the role it plays in local regional events.

PLANNING LEVEL COST ESTIMATES

Maclay Bridge Planning Study

FINAL

Prepared for:
Montana Department of Transportation
Helena, Montana

Prepared by:
Robert Peccia & Associates
Helena, Montana
December 27, 2012

Final Planning Level Cost Estimates

(12/27/2012)

Option 1 - Improve Safety and Operations on the Existing Bridge	Planning Level Cost (2012 Dollars)
1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Travel	$3,852,000

Option 2 - Rehabilitate the Bridge	Planning Level Cost (2012 Dollars)
2C - Minor Rehabilitation (includes Approaches)	$931,200
2D - Major Rehabilitation (includes Approaches)	$2,112,000

Option 3 - Build New Bridge	Planning Level Cost (2012 Dollars)
3A.2 - North 1 Alignment	$4,380,000
3B.2 - Mount 2 Alignment	$7,692,000
3B.4 - South 1 Alignment	$6,252,000
3B.4 - South 2 Alignment	$6,348,000

Rehab options show median range.

Minor rehab range is $810,000 to $1,100,000

Major rehab range is $1,100,000 to $3,200,000

OPTION 1 - IMPROVE SAFETY AND OPERATION ON THE EXISTING BRIDGE
Planning Level Cost Estimates

Item Description	1G - New One-Lane Bridge at a New Location & Retain Existing Bridge for One-Way Tra
Estimated Bridge Length (FT)	650
Estimated Bridge Width (FT)	16
Estimated Bridge Area (SF)	10400
Estimated Bridge Skew (degrees)	30
Estimated Cost per SF	$200
Estimated Bridge Cost (SEE NOTE 1)	$2,080,000
Estimated Road Length (FT)	2312
Estimated Road Length (MILE)	0.44
Estimated Cost per MILE (SEE NOTE 2)	$600,000
Estimated Road Cost	$262,727
Bridge	$2,080,000
Road Work	$262,727
Traffic Control (SEE NOTE 3)	$21,018
Remove Structure	$0
Subtotal	$2,363,745
Mobilization (18%)	$425,474
Subtotal	$2,789,220
Contingencies (15%)	$418,383
Total Construction (CN) - ROUNDED	**$3,210,000**
Preliminary Engineering Costs (10%)	**$321,000**
IDIC Costs (10%)	**$321,000**
TOTAL PLANNING LEVEL COSTS	**$3,852,000**

NOTE 1:
Bridge skew 0 to 15 degrees - USE $165 per SF
Bridge skew 14 to 30 degrees - USE $200 per SF
Bridge skew greater than 30 degrees - USE $250 SF
Road widths 40 feet (two-way/two-lane); 20 feet (one-way/one-lane)

NOTE 2:
$1.2 million per mile obtained from from MDT PET
spreadsheet tool (MSEXCEL) dated September 2011.
Assumes 40-foot top width, 0.3' pms, 2"cts, and
1-foot crushed aggregate base course.
Adjusted downward for one-way infrastructure (20 feet - $600,00)

NOTE 3:
Traffic control uses 8% of road cost

OPTION 2 - REHABILITATION
Planning Level Cost Estimates

Item Description	2C - Minor Rehabilitation (w/Approaches)	2D - Major Rehabilitation (w/Approaches)
Estimated Bridge Length (FT)		
Estimated Bridge Width (FT)		
Estimated Bridge Area (SF)		
Estimated Bridge Skew (degrees)		
Estimated Cost per SF		
Estimated Bridge Cost	$125,000	$850,000
Estimated Road Length (FT)	1642	1642
Estimated Road Length (MILE)	0.31	0.31
Estimated Cost per MILE (SEE NOTE 2)	$1,200,000	$1,200,000
Estimated Road Cost	$373,182	$373,182
Bridge	$125,000	$850,000
Road Work	$373,182	$373,182
Traffic Control (SEE NOTE 3)	$29,855	$29,855
Remove Structure (SEE NOTE 4)	$44,000	$44,000
Subtotal	$572,036	$1,297,036
Mobilization (18%)	$102,967	$233,467
Subtotal	$675,003	$1,530,503
Contingencies (15%)	$101,250	$229,575
Total Construction (CN) - ROUNDED	**$776,000**	**$1,760,000**
Preliminary Engineering Costs (10%)	**$77,600**	**$176,000**
IDIC Costs (10%)	**$77,600**	**$176,000**
TOTAL PLANNING LEVEL COSTS	**$931,200**	**$2,112,000**

NOTE 1:
Bridge skew 0 to 15 degrees - USE $165 per SF
Bridge skew 14 to 30 degrees - USE $200 per SF
Bridge skew greater than 30 degrees - USE $250 SF

NOTE 2:
$1.2 million per mile obtained from from MDT PET spreadsheet tool (MSEXCEL) dated September 2011. Assumes 40-foot top width, 0.3' pms, 2"cts, and 1-foot crushed aggregate base course.

NOTE 3:
Traffic control uses 8% of road cost

NOTE 4:
Lump sum cost provided by MDT Bridge

OPTION 3 - BUILD NEW BRIDGE
Planning Level Cost Estimates

Item Description	3A.2 - North 1 Alignment	3B.2 - Mount 2 Alignment	3B.4 - South 1 Alignment	3B.4 - South 2 Alignment
Estimated Bridge Length (FT)	400	625	650	500
Estimated Bridge Width (FT)	28	28	28	28
Estimated Bridge Area (SF)	11200	17500	18200	14000
Estimated Bridge Skew (degrees)	20	45	30	37
Estimated Cost per SF	$200	$250	$200	$250
Estimated Bridge Cost (SEE NOTE 1)	$2,240,000	$4,375,000	$3,640,000	$3,500,000
Estimated Road Length (FT)	1642	1232	620	1431
Estimated Road Length (MILE)	0.31	0.23	0.12	0.27
Estimated Cost per MILE (SEE NOTE 2)	$1,200,000	$1,200,000	$1,200,000	$1,200,000
Estimated Road Cost	$373,182	$280,000	$140,909	$325,227
Bridge	$2,240,000	$4,375,000	$3,640,000	$3,500,000
Road Work	$373,182	$280,000	$140,909	$325,227
Traffic Control (SEE NOTE 3)	$29,855	$22,400	$11,273	$26,018
Remove Structure (SEE NOTE 4)	$44,000	$44,000	$44,000	$44,000
Subtotal	$2,687,036	$4,721,400	$3,836,182	$3,895,245
Mobilization (18%)	$483,667	$849,852	$690,513	$701,144
Subtotal	$3,170,703	$5,571,252	$4,526,695	$4,596,390
Contingencies (15%)	$475,605	$835,688	$679,004	$689,458
Total Construction (CN) - ROUNDED	**$3,650,000**	**$6,410,000**	**$5,210,000**	**$5,290,000**
Preliminary Engineering Costs (10%)	**$365,000**	**$641,000**	**$521,000**	**$529,000**
IDIC Costs (10%)	**$365,000**	**$641,000**	**$521,000**	**$529,000**
TOTAL PLANNING LEVEL COSTS	**$4,380,000**	**$7,692,000**	**$6,252,000**	**$6,348,000**

NOTE 1:
Bridge skew 0 to 15 degrees - USE $165 per SF
Bridge skew 14 to 30 degrees - USE $200 per SF
Bridge skew greater than 30 degrees - USE $250 SF

NOTE 2:
$1.2 million per mile obtained from from MDT PET spreadsheet tool (MSEXCEL) dated September 2011. Assumes 40-foot top width, 0.3' pms, 2"cts, and 1-foot crushed aggregate base course.

NOTE 3:
Traffic control uses 8% of road cost

NOTE 4:
Lump sum cost provided by MDT Bridge