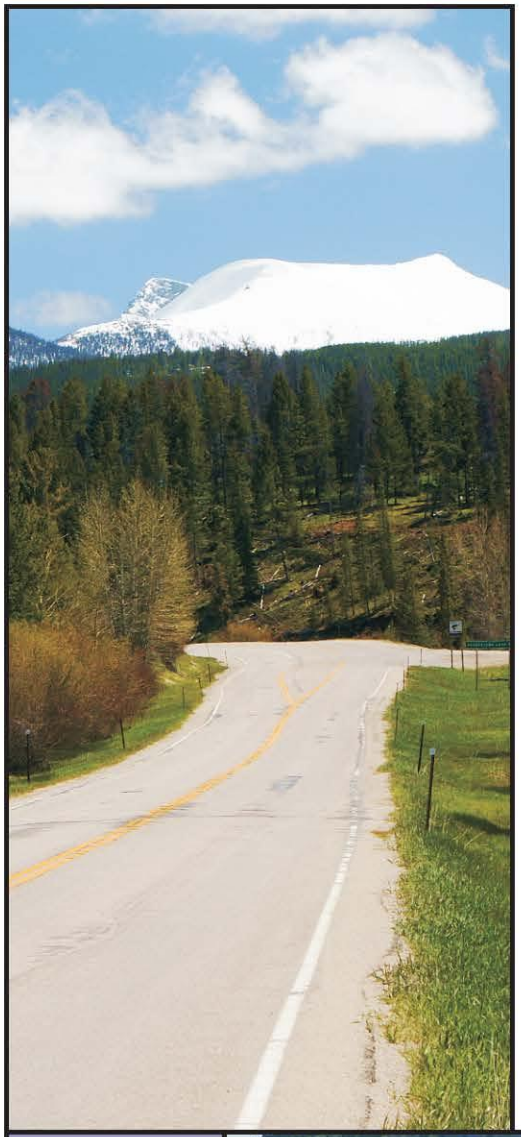


MT-1 WEST OF ANACONDA TO GEORGETOWN LAKE

CORRIDOR PLANNING STUDY

FINAL

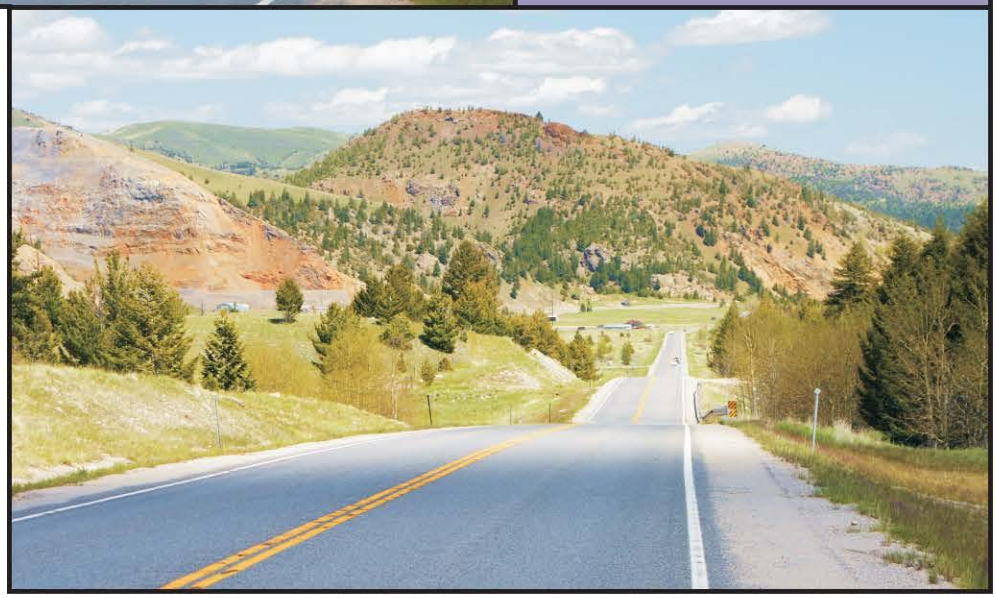
December 2011

prepared for:

Montana Department of Transportation

Helena, Montana

MONTANA MDT DEPARTMENT OF TRANSPORTATION



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Comments Received After Public Comment Period

Comments Received after November 25, 2011

Comments Received After Publication of the Draft Corridor Study

Comments Received from November 4, 2011 through November 25, 2011 (**also included in hard copy format**)

Comments Received Before Publication of the Draft Corridor Study

Comments Received from July 21, 2011 through November 3, 2011

Informational Meeting No. 1 (July 25, 2011)

Press Release Announcing Informational Meeting
Newspaper Advertisement
Sign-In Sheet
Welcome and Display Boards
Presentation
Summary of Meeting Notes

Informational Meeting No. 2 (November 7, 2011)

Press Release Announcing Informational Meeting
Newspaper Advertisement
Sign-In Sheet
Welcome and Display Boards
Presentation
Summary of Meeting Notes

Newsletter Issue 1 (July 2011)

Newsletter Issue 2 (October 2011)

Resource Agency Workshop (July 19, 2011)

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Agency Workshop Presentation
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Appendix C: Corridor Planning Study Documentation (on CD)

Community and Stakeholder Information Plan

Existing and Projected Conditions Report

Needs and Objectives

Improvement Options Memorandum

MT-1 Planning Level Cost Estimates

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Abbreviations and Acronyms

AADT	Average Annual Daily Traffic
ADLC	Anaconda – Deer Lodge County
BA&P	Butte Anaconda & Pacific Railway
CSIP	Community and Stakeholder Information Plan
CTEP	Community Transportation Enhancement Program
DEQ	Department of Environmental Quality
DNRC	Department of Natural Resources and Conservation
ENN	Exotic Species not Native to Montana
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FAS	Fishing Access Site
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FLHP	Federal Lands Highway Program
GIS	Geographic Information Systems
LWQD	Local Water Quality District
mph	Miles per Hour
MACO	Montana Association of Counties
MCA	Montana Code Annotated
MDT	Montana Department of Transportation
MEPA	Montana Environmental Policy Act
MFISH	Montana Fisheries Information System

MHP	Montana Highway Patrol
MNHP	Montana Natural Heritage Program
MFWP	Montana Fish Wildlife and Parks
NAAQS	National Ambient Air Quality Standards
NAIP	National Agricultural Imagery Program
NEPA	National Environmental Policy Act
NHS	National Highway System
NRCS	Natural Resource Conservation Service
NRIS	Natural Resource Information System
NWI	National Wetland Inventory
PLH	Public Lands Highway
RP	Reference Post
RSID	Rural Special Improvement District
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SOC	Species of Concern
STP	Surface Transportation Program
TIF	Tax Increment Financing
TMDL	Total Maximum Daily Loads
TWLTL	Two-Way Left-Turn Lane
USACE	United States Army Corps of Engineers
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
vpd	Vehicles per Day
WMA	Wildlife Management Area

Executive Summary

The Montana Department of Transportation (MDT) in cooperation with Anaconda – Deer Lodge County (ADLC) initiated a corridor planning study along MT-1 west of Anaconda, Montana, to assess and identify improvement options for the 17.3 mile segment, from Reference Post (RP) 10.06 to RP 27.35. The study area boundary includes a one mile buffer on each side of MT-1 from RP 10.06 to RP 14.50 and a 0.5 mile buffer on each side from RP 14.50 to RP 27.35.

The corridor study, intended as a planning study and not a design project, was developed through a collaborative process with MDT, ADLC, and the Federal Highway Administration (FHWA) and involved focused outreach to the community, key stakeholders, and resource agencies. An evaluation of known and publically available resource information was conducted. Activities that were completed for the development of the study include the following:

- Research and analysis of existing MT-1 roadway conditions;
- Research and synthesis of known environmental resources and applicable regulations in the study area;
- Identification and documentation of future conditions;
- Identification of corridor issues and areas of concern;
- Consultation and coordination with local officials, stakeholders, resource agencies, and the community;
- Identification of corridor needs and objectives;
- Development of corridor improvement options with consideration to costs, available funding, feasibility, community input, and known environmental resource constraints; and
- Documentation of potential funding mechanisms for improvement options.

ES.1. Corridor Issues

Based on the assessment of existing conditions within the study area and on community and stakeholder input, roadway issues and areas of concern were identified including existing roadway geometrics (widths, steepness of the road, sight distance at intersections, etc.), wildlife conflicts, vehicle speeds and speed limits, access density, and alternate use facilities. The major issues identified are presented below:

Roadway Geometrics

Geometric areas of concern include roadside safety and clear zones (including cut and fill slopes), sub-standard horizontal and vertical curvature, and sight distances. Four horizontal curves and five vertical curves were identified as not meeting current MDT standards. Multiple areas with roadside clear zone issues were also identified. Existing road surfacing between Denton Point Road (RP 24.15)

and Georgetown Lake Road (RP 27.35) was found to be in poor condition and too narrow to meet current standards.

Wildlife Connectivity and Wildlife – Vehicle Collisions

A bighorn sheep herd exists in this corridor study area. Bighorn sheep inhabit both sides of MT-1 throughout the corridor study area, especially near the Wildlife Management Area at Garrity Mountain. Wildlife connectivity is of concern along the corridor. The bighorn sheep herd has been characterized as vulnerable due to pneumonia outbreaks, vehicle collisions, subdivision encroachment, and natural attrition.

The entire corridor experiences animal-vehicle collisions as evidenced by crash reports and carcass removal data. Of particular concern is the occurrence of moose fatalities occurring in the last third of the corridor near Georgetown Lake. There is also a prevalence of deer collisions throughout the entire corridor.

Fish passage through culverts and bridges, and entrainment in irrigation canals, is also of concern throughout the corridor.

Vehicle Speeds and Speed Limits

Vehicle speed data was collected at 4 locations along the corridor. The results of the speed data collection indicate that the posted speed limits at RP 11.2 (35 mph), RP 14.0 (45 mph), and RP 24.4 (60 mph) may be low compared to the 85th percentile speeds. At RP 11.2, 85th percentile speeds are more than 7 mph higher than the 35 mph posted speed limit. Additionally at RP 14.0, 85th percentile speeds are almost 7 mph higher than the posted speed limit of 45 mph. Note that it is generally recommended by safety experts that the posted speed limit be within 5 mph of the 85th percentile speed.

Access Density

A high concentration of approaches exist in the first five miles west of Anaconda, with an average of over 16 approaches per mile. The highest density of approaches exists along the segment between RP 10.8 and 11.8 with 34 approaches. Access density decreases west of West Valley towards Georgetown Lake. Between West Valley and Georgetown Lake, access density ranges between approximately 5 and 7 access points per mile. The high density of accesses within the first five miles is a concern due to a variety of factors. The area is in a speed transition area from 25 mph to 45 mph. The acceleration and deceleration of vehicles turning into and out of the accesses cause operational concerns on the mainline of MT-1.

Access density is important because each access point creates potential conflicts between through traffic and traffic using the access. Access management techniques such as limiting access locations, increasing access spacing, using auxiliary turn lanes, and restricting turning movements reduce the number of conflict points. A reduction in conflict points can create a safer more efficient roadway.

Alternative Use Facilities

Local planning objectives include the extension of trail infrastructure west of Anaconda to the West Valley area in the near future. Long term objectives include the provision of trails the entire length of the corridor to Georgetown Lake to complement the scenic highway.

ES.2. Corridor Study Needs and Objectives

Based on the analyses of existing and future conditions of the MT-1 study area, the following needs and objectives were established for use in the development of improvement options identified later in this study. These needs and objectives will be met to the extent practicable given financial, community preference and environmental constraints within the corridor.

NEED #1: **IMPROVE SAFETY AND OPERATION OF MT-1 THROUGH THE CORRIDOR PLANNING STUDY AREA.**

Objectives:
- Improve geometric elements to meet current MDT design criteria.
- Accommodate existing and future capacity demands within the corridor.
- Minimize impacts caused by access density.
- Identify appropriate speeds within the study area.
- Provide adequate clear zones to meet current MDT design criteria.
- Review and implement innovative maintenance practices.

NEED #2: **PRESERVE THE ENVIRONMENTAL, SCENIC AND RECREATIONAL NATURE OF THE CORRIDOR.**

Objectives:
- Preserve the scenic nature of the corridor with respect to view sheds and landscape features.
- Avoid and minimize the environmental resource impacts of improvement options.
- Evaluate and incorporate “best practice” mitigation strategies as appropriate to promote wildlife connectivity across MT-1.
- Evaluate and incorporate “best practice” mitigation strategies as appropriate to reduce animal-vehicle conflicts.
- Evaluate fish (aquatic organism) passage issues and incorporate appropriate solutions to improve aquatic connectivity and stream function through structures and culverts.

Need #3: **COORDINATE WITH LOCAL PLANNING EFFORTS AND MINIMIZE CONFLICTS ALONG THE CORRIDOR.**

Objectives:
- Coordinate future infrastructure needs with ADLC.
- Support local planning efforts.
- Minimize impacts to existing residences and businesses along the corridor.
- Consider all modes of transportation.

ES.3. Improvement Options & Strategies

Corridor-wide improvements were identified to address corridor needs and objectives. Major reconstruction improvement options were identified between RP 10.06 and RP 13.8 and between RP 24.2 and RP 27.35. In addition, several smaller spot improvement options were recommended to address specific areas of concern throughout the study area. Improvement options for the MT-1 study area were evaluated by reviewing existing engineering and environmental data, soliciting input from the community, stakeholders, and resource agencies, and reviewing social, demographic, and economic influences relative to the study area. **Figure ES.1** provides a graphical summary of the recommended improvement options.

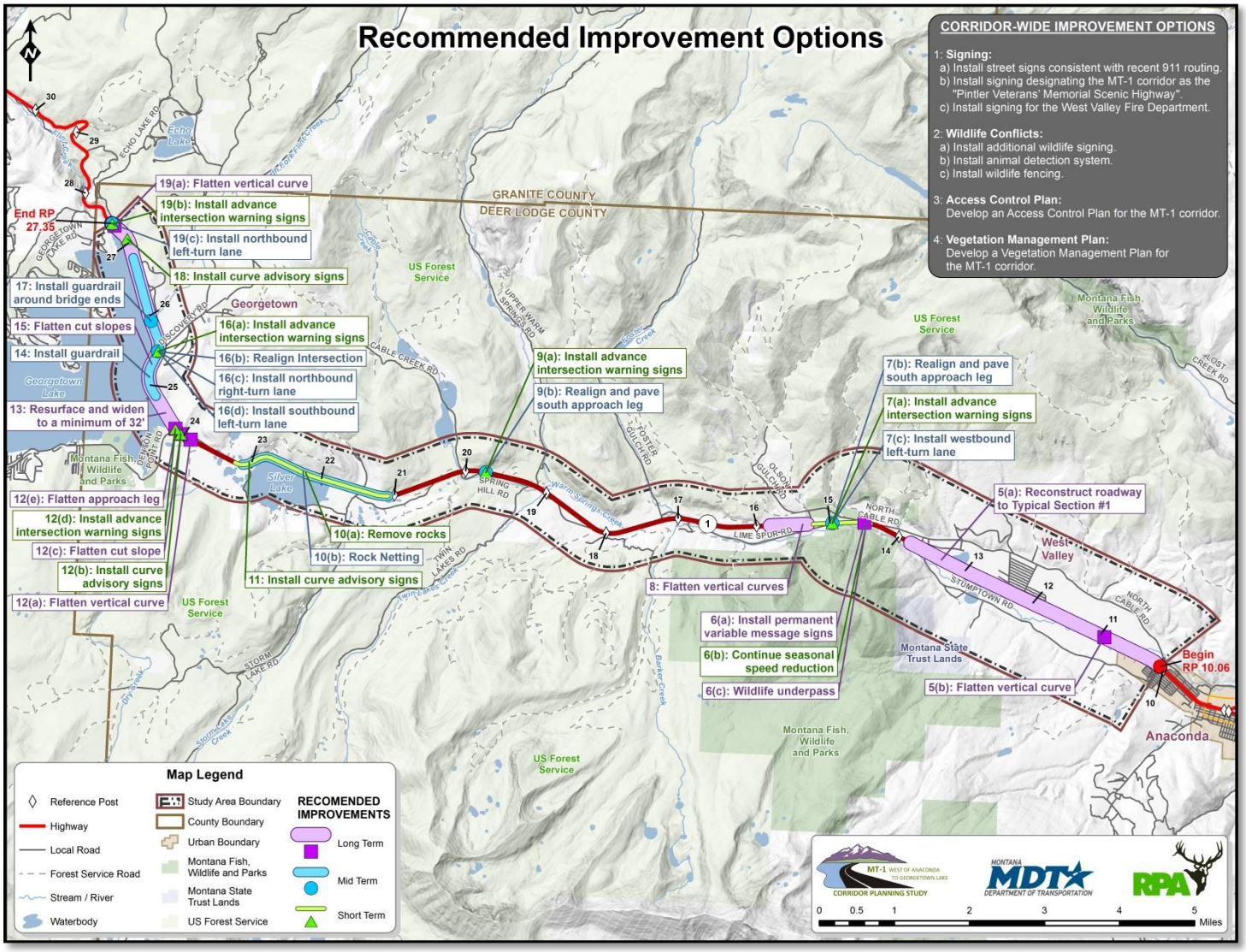


Figure ES.1: Recommended Improvement Options

ES.4. CONCLUSION

The results of the study suggest that once funding has been identified there are no major impediments to developing the recommended improvement options. This study provides a diverse array of improvement options and strategies that may be considered as funding becomes available.

The ability to develop projects based on the recommended improvement options for MT-1 is a function of the availability of existing and future federal, state, local, and private funding sources. At the current time there is no funding identified to complete any of the improvement options recommended in this study. Primary funds are the most logical source of funding for the major improvement options for the corridor. Several other funding source options are available for smaller improvements. To continue with the development of a project (or projects) the following steps are needed:

- Identify and secure a funding source or sources; and
- Follow MDT guidelines for project nomination and development, including public involvement process and environmental documentation.

Improvement options identified in this study may lead to future projects. The "Purpose and Need" statement for any future project should be consistent with the needs and objectives contained in this study. However, not all of the needs and objectives at the corridor level are required to be included in a particular project-level "Purpose and Need" statement. For example, a signing project may have little to no effect on aquatic connectivity objectives, thus rendering compliance with the intent of that particular objective unnecessary.

Chapter 1. Introduction

1.1. Purpose

The Montana Department of Transportation (MDT) and Anaconda – Deer Lodge County (ADLC) initiated the *MT-1 West of Anaconda to Georgetown Lake Corridor Planning Study* to assess needs and identify improvement options for the 17.3 mile segment of MT-1 from Reference Post (RP) 10.06 (Linden Street / North Cable Road intersection) to RP 27.35 (Georgetown Lake Road intersection). The study area boundary includes a one mile buffer on each side of MT-1 from RP 10.06 to RP 14.50 and a 0.5 mile buffer on each side from RP 14.50 to RP 27.35. The study area is shown in **Figure 1.1**.

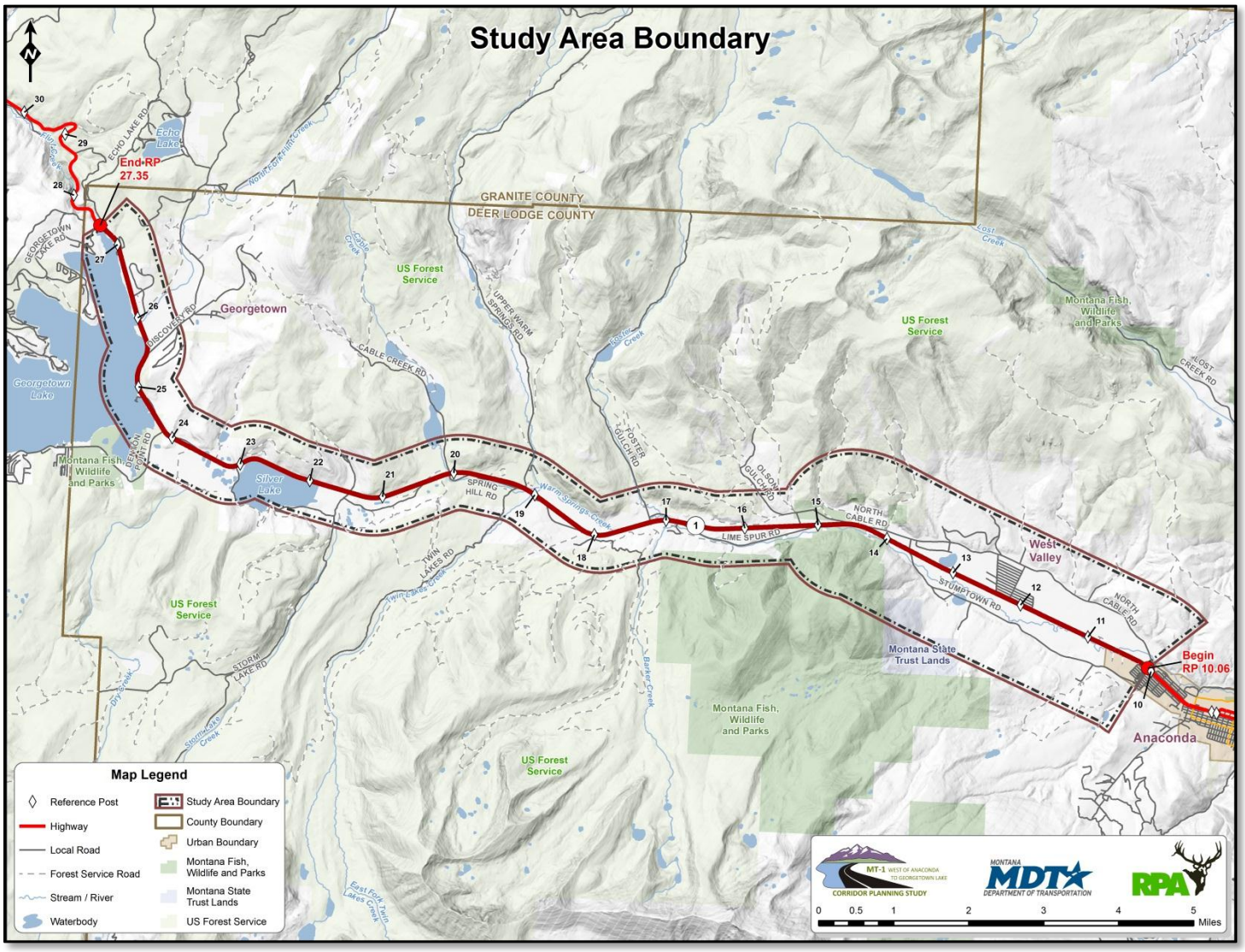


Figure 1.1: Study Area Boundary

The purpose of the study is to determine feasible improvement options to address concerns within the transportation corridor based on needs presented by the community, the study partners, and resource agencies. The study examines geometric characteristics, crash history, land uses, environmental resources, and existing and projected operational characteristics within the MT-1 study area.

1.2. Process

MDT has established the corridor planning process in order to investigate improvement options for a corridor or subarea via a Pre-National Environmental Policy Act (NEPA) / Montana Environmental Policy Act (MEPA) study. The NEPA/MEPA environmental review process is an approach to balance transportation decision making that takes into account the impacts on the human and natural environment with the need for safe and efficient transportation. The *Corridor Planning Study* is a pre-NEPA/MEPA process that allows for earlier planning-level coordination with the community, resource agencies, and other entities. The study does not replace the NEPA/MEPA process. The results of the study may be used to assist in determining the level and scope of environmental review required if a project is forwarded into a subsequent NEPA/MEPA process.

This study identifies both known technical issues and environmental conditions within the corridor, and identifies reasonable and feasible improvements to increase safety and efficiency for the traveling public. Additionally, it defines potential impacts to the surrounding environment resulting from various improvement options.

The pre-NEPA/MEPA process discloses potential environmental impacts and technical constraints, identifies potential mitigation measures that can be implemented, and documents the information for the community and decision makers before decisions are made and carried forward.

This *Corridor Planning Study* is developed as a planning study to determine the feasibility of various improvements options to MT-1 and does not include project level design.

1.3. Existing Plans and Policies

1.3.1. Growth Policy

The *Anaconda – Deer Lodge County Growth Policy, 2010* was developed as a guiding document for growth and development within ADLC. The *Growth Policy* is a decision making tool to help achieve the vision of ADLC citizens and to provide guidance to developers and investors in ADLC. The vision of the *Growth Policy* is as follows:

> *"Anaconda – Deer Lodge County will, as a community, preserve our rich heritage and common values while retaining and enhancing our turn-of-the century image. With long-range planning to direct growth and development, our community will continue to be a*

safe place where individuals and families can work, play, and learn based on a strong education, and mutual respect. The preservation and development of our resources will be for the betterment of all citizens, now and in the future." [1]

There are three goals related to transportation identified in the *Growth Policy:*

1. Provide a modern, efficient transportation system to support the County's economic development efforts and to meet the needs of present and future residents.
2. Integrate transportation considerations into the various land use and economic development planning processes.
3. Through integrated community planning, non-motorized system planning and transportation system enhancements provide the widest possible range of transportation choices for ADLC residents.

1.3.2. Trails Master Plan

Trails are an integral part of the transportation system in Anaconda and Deer Lodge County. A *Trails Master Plan* was recently developed for ADLC to provide safe alternative modes of travel opportunities and connectivity between communities. The ADLC *Trails Master Plan* includes a multiuse trail for bicycle, pedestrian and equestrians in the corridor study area. There is a desire to extend trail facilities west of Anaconda to the West Valley area and beyond. The primary goals of the *Trails Master Plan* are:

1. Design and construction of a new trailhead park at the existing Beaver Dam School site in Opportunity.
2. Design and construction of a multi-use trail system that will connect the communities of Anaconda, Opportunity, and Fairmont.
3. Provide a connection for the new trailhead park and interconnecting multi-use trail system to the proposed Greenway Trail System.
4. Provide for maintenance of the existing and proposed park and trail system components.

1.3.3. Water / Wastewater System

A wastewater system *Preliminary Engineering Report* was developed to address the needs of the wastewater system in Anaconda and the surrounding areas. Residents in the West Valley area have private water wells, but there is concern about potential contamination from area septic systems. The *West Valley Water and Sewer Feasibility Study, 2000* suggests that Anaconda's water and wastewater facilities could be expanded to serve the West Valley Area. Other potential additions,

[1] Anaconda – Deer Lodge County Growth Policy, 2010, http://www.anacondadeerlodge.mt.gov/departments/planning.aspx#growth_policy

relative to the water system on the west end of the city, include the Sunnyside Road area, the North Cable Road properties, and the Stump Town Road area.

The *Growth Policy* recommends that a central wastewater system for West Valley be constructed to provide long-term protection of the Anaconda Municipal well field. According to the *Growth Policy*, the system could connect to the existing Anaconda treatment facility.

1.3.4. Superfund Planning District

A portion of the MT-1 corridor, between Anaconda and the West Valley, is located within the ADLC Superfund Planning District (SPD). Work performed within the boundaries of the SPD may be subject to a development permit based on the type of activities pursued. There are exceptions granted to the requirement to obtain a development permit for certain activities. Future project level activities should be reviewed within the context of ADLC's development permit process to determine if a development permit is required.

Chapter 2. Existing and Projected Conditions

MT-1 is functionally classified as a Rural Minor Arterial on Montana's Primary Highway System and is designated as Primary Route 19 (P-19). The corridor serves as an east-west connection between Anaconda and Drummond. MT-1 was designated as the Pintler Veterans' Memorial Scenic Highway by the 2011 Montana Legislature. Sections of the roadway were constructed or improved at various times, as early as 1934 and as recently as 1995. Pavement preservation projects have been completed as recently as 2008.

This chapter portrays the existing and projected technical and environmental conditions throughout the corridor and is used to identify issues and/or areas of concern via a high-level planning analysis. This general information may be used to guide future, detailed "project level" analysis if projects are forwarded from this study to project development.

2.1. Existing Roadway Users and Traffic Volumes

Primary users of the roadway consist of local residents from West Valley and Anaconda at the eastern end of the corridor, commercial users, and recreational users. The road is used by local land owners for access to their property throughout the corridor and for recreational users accessing United States Forest Service (USFS) lands, Georgetown Lake, Discovery Ski Area, and other recreational opportunities along the corridor.

2.1.1. Existing Traffic Volumes

The Average Annual Daily Traffic (AADT) for the study area ranges from approximately 3800 vehicles per day (vpd) on the eastern end near Anaconda to 1300 vpd on the western end near Georgetown Lake. **Table 2.1** shows the most recent 20 years of AADT data for the corridor. A review of this traffic data shows that the corridor has experienced a general decline in traffic volumes over the last 20 years.

The volumes shown in **Table 2.1** are representative of yearly average traffic volumes. It is likely that seasonal peaks in traffic volumes occur due to recreational use in the area. Vehicles traveling along the corridor currently encounter little to no delay or congestion during peak travel periods. Trucks and recreational vehicles are common modes of transportation through the corridor, which may slow the flow of traffic in areas with steep grades.

Table 2.1: Average Annual Daily Traffic Data[2]

SITE ID	LOCATION	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
12-1C-43	E of Haufbrau Tavern Turnoff	4220	4030	4300	4280	3970	-	4230	-	3920	5140
12-1C-54	0.6 mi W of Bridge Ln - RP 11	3880	3650	3810	-	3160	-	3860	-	3490	4560
12-1C-44	W of Jones Ln - RP 13	2620	2450	2550	-	2860	-	2470	-	2580	2890
12-1C-45	W of MDT Gravel Stockpile - RP 15	1780	1640	2020	2220	1680	-	1720	-	1790	2120
12-1-4	W of Anaconda - RP 17	1740	1770	1850	1770	1980	-	1830	1820	-	2330
12-1-5	N of Silver Lake - RP 23	1120	1210	1490	-	1200	1370	1410	1470	1810	1690

SITE ID	LOCATION	2001	2002	2003 [(i)]	2004	2005	2006	2007	2008	2009	2010
12-1C-43	E of Haufbrau Tavern Turnoff	3150	3360	4110	3640	4130	4130	4140	3660	3730	3790
12-1C-54	0.6 mi W of Bridge Ln - RP 11	2700	3040	3690	3230	3820	3820	3830	3340	3400	3480
12-1C-44	W of Jones Ln - RP 13	2260	2460	2830	3080	2390	2470	2540	2490	2580	1960
12-1C-45	W of MDT Gravel Stockpile - RP 15	1380	1600	2100	1970	2140	2210	2270	1360	1410	1720
12-1-4	W of Anaconda - RP 17	1790	1970	-	1970	2140	2210	1310	1230	1270	1600
12-1-5	N of Silver Lake - RP 23	1630	1060	2080	1450	1620	1670	1090	1030	1070	1330

[(i)] Short-term factoring process was changed in 2003 resulting in higher than usual traffic volume increases.[3]

2.1.2. Future Traffic Projections

It is difficult to estimate future growth based on historical traffic counts due to recent economic conditions and other influences in Deer Lodge County. Historic traffic data shows a general increase in volumes between 1991 and 2000; however, a sharp decline occurred between 2000 and 2001. Based on the historical traffic data, and on expected conditions in the county, an assumed traffic growth rate of 1.0% for the corridor was utilized for planning purposes. While historic traffic data shows a negative trend, a positive growth rate was assumed to provide a conservative estimate for traffic characteristics within the study area, in alignment with ADLC's growth development strategy contained within the *Growth Policy*. **Table 2.2** shows future projected traffic values based on the assumed growth rate.

Table 2.2: Future Projected Traffic Data

SITE ID	LOCATION	2010	2030 [(i)]
12-1C-43	E of Haufbrau Tavern Turnoff	3790	4625
12-1C-54	0.6 mi W of Bridge Ln - RP 11	3480	4246
12-1C-44	W of Jones Ln - RP 13	1960	2392
12-1C-45	W of MDT Gravel Stockpile - RP 15	1720	2099
12-1-4	W of Anaconda - RP 17	1600	1952
12-1-5	N of Silver Lake - RP 23	1330	1623

[(i)] Projection was based on an average annual growth rate of 1.0%

[2] Montana Department of Transportation, Data and Statistics Bureau, Traffic Data Collection Section, 2011
[3] Montana Department of Transportation, *VMT Increase Documentation*, 2003

2.1.3. Vehicle Speeds

The posted speed limit along the MT-1 corridor varies from 25 mph to 70 mph. At the beginning of the study area (RP 10.06) the posted speed limit is 25 mph. The posted speed limit changes to 35 mph at approximately RP 10.15. The 35 mph speed limit continues to just before RP 12, where 45 mph is posted. The rural highway day/night speed limit of 70/65 mph for cars and light trucks and 65/55 for commercial trucks begins at approximately RP 14.3. During the winter and spring of 2011 a seasonal 45 mph speed zone was implemented between RP 14.3 and 15.3 as an effort to address animal / vehicle crashes at this location. The next change in speed is posted for 60 mph at RP 24 (Georgetown Lake Road turn off) and continues to approximately RP 27.15, where the speed is decreased to 50 mph as the road travels away from the lake and continues into mountainous terrain, with curves in the roadway, towards Philipsburg. The end of the corridor study (RP 27.35) is within this 50 mph section. **Figure 2.1** shows the existing posted speed limits in the study area.

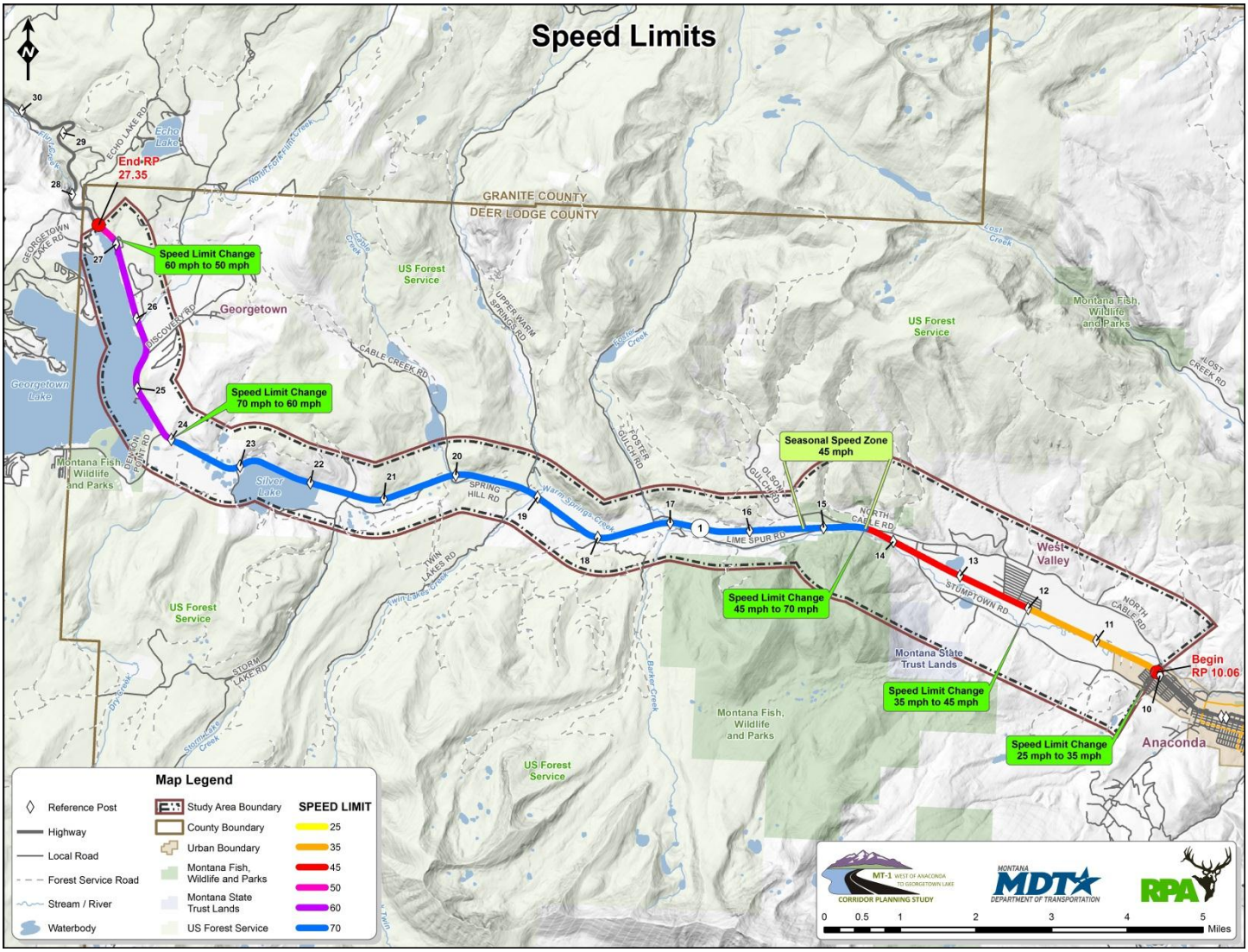


Figure 2.1: Existing Posted Speed Limits

Speed data was collected at four locations along MT-1 in June 2011. The speed data was collected to help determine the actual travel speed compared to the existing posted speed limits. Posted speed limits are based on a number of factors including speed data, Montana Code Annotated, roadside development, functional classification, crash experience, road geometrics and surfacing, and context. A speed data analysis was conducted as part of this *Corridor Planning Study*.

Table 2.3 shows the results from the speed data collection. The primary speed data factor for determining the validity of the posted speed limit is the 85th percentile speed. The 85th percentile speed is the speed at which 85 percent of vehicles travel at or below. For example, if the 85th percentile speed is 45 mph, it means 85 percent of vehicles are traveling at or below 45 mph. It is generally recommended that the posted speed limit be within 5 mph of the 85th percentile speed.

Table 2.3: Speed Data Collection

LOCATION	SPEED LIMIT	ADT (VPD)	85th PERCENTILE SPEED (MPH)
RP 11.2	35	3902	42.2
RP 14.0	45	2333	51.9
RP 15.3	70	2145	68.5
RP 24.4	60	1539	65.4

The results of the speed data collection indicate that the posted speed limits at RP 11.2 (35 mph), RP 14.0 (45 mph), and RP 24.4 (60 mph) may be low compared to the 85th percentile speeds. At RP 11.2, 85th percentile speeds are more than 7 mph higher than the 35 mph posted speed limit. Additionally at RP 14.0, 85th percentile speeds are almost 7 mph higher than the posted speed limit of 45 mph.

No discernible difference in vehicle speeds was found between weekend and weekday traffic. This indicates that speeding in the corridor is occurring by both local and recreational traffic. During several field reviews, heavy speed enforcement was witnessed; particularly throughout the 35 mph and 45 mph speed zones.

In addition to the speed data collection conducted for this study, MDT completed a *Speed Limit Investigation* in early June, 2011. During the MDT investigation, the seasonal 45 mph speed zone between RP 14.3 and RP 15.3 was in place. One of the recommendations was to implement the 45 mph speed zone "on a need only basis to assist in mitigating conflicts with Big Horn Sheep." It was also recommended that the duration of the 45 mph speed zone be set "annually based on observation and/or receiving reports from local governing or state wildlife officials."

2.1.4. Crash Analysis

The MDT Traffic and Safety Bureau conducted a crash analysis along MT-1 throughout the study area. The crash analysis included five years of crash data between January 1, 2005 and December 31, 2009. The analysis compared the study area with the average crash rates on similar statewide rural minor arterials.

Crash rates are defined as the number of crashes per million vehicle miles of travel. Severity index is defined as the ratio of the sum of the level of crash degree to the total number of crashes. Severity rate is defined as the crash rate multiplied by the severity index.

The crash rate for the corridor study segment is 1.16 crashes per million vehicle miles travelled for 2005-2009. By comparison, crash data indicates that the statewide rural minor arterial average crash rate is 1.22 for 2005-2009, which is higher than the corridor crash rate. The severity rate for this corridor segment is 2.44 weighed by severity crashes per million vehicle miles traveled, which is also below the statewide rural minor arterial average crash severity rate of 2.83.

For this period (2005-2009), the Montana Highway Patrol (MHP) records show 67 crashes, consisting of two fatal crashes (with two fatalities), 20 injury crashes and 45 property damage only crashes. The dominant crash type for the corridor is single vehicle crashes (49 out of 67), of which 28 crashes involved a single vehicle that ran off of the road and 21 crashes were a wild animal-vehicle collision. The remaining 18 crashes involved two or more vehicles. Just to the west of Anaconda, in a segment with numerous approaches, there were seven multi-vehicle collisions; however, these crashes were not concentrated in one location. Lane departure crashes including run-off-the-road crashes were spread over the entire length of the corridor. There is a concentration, 9 reported, of wild animal-vehicle collisions between RP 14.7 and 15.7. Based on the crash data reviewed for the study area, areas with multiple reported crashes were identified at the following locations:

- RP 13.2-13.6
- RP 16.8-17.1
- RP 21.4-21.8
- RP 22.8-23.3

Animal carcass data was provided by MDT for the time period from 2006 – 2010. The carcass data represents the number of animal carcasses recovered from the roadway and differs from the MHP crash records discussed previously. According to the carcass data, 87 total carcasses were recovered along the corridor during the analysis time period. The number of carcasses recovered is higher than the number of reported crashes involving animals as not all animal vehicle collisions are reported to MHP. The 87 carcasses does not indicate 87 crashes, as four crashes killed two animals each, and one crash included eight bighorn sheep. According to the carcass data, 71 wild animal-vehicle collisions occurred along the corridor.

According to the MDT carcass data almost 50% of the wild animal-vehicle collisions have occurred between reference points 11.2 and 17. In the fall of 2010, eight bighorn sheep, including two rams, were killed in a single incident on MT-1, approximately a half-mile after westbound travelers leave the 45 mph zone and enter the 70 mph zone (approximately RP 14.5). Other clusters have been identified between reference points 17.8 and 19.8, with 12 collisions (17%), and reference points 21 to 22.1, with 9 crashes (13%).

2.2. Physical Characteristics

MT-1 runs east/west between I-90 east of Anaconda and Georgetown Lake. MT-1 then runs north/south to connect back with I-90 at Drummond. At the east end of the corridor (RP 10.06), MT-1 transitions from a four-lane roadway that traverses through Anaconda, to a two-lane roadway section which is the predominant roadway characteristic through the corridor. The roadway expands to three lanes between RP 19 and RP 20.2 to provide a passing lane for westbound traffic. The corridor passes through the West Valley area, through areas of Beaverhead-Deer Lodge National Forest and past Silver Lake where the corridor curves slightly north and travels along Georgetown Lake. The study area ends at the intersection with Georgetown Lake Road (RP 27.35).

2.2.1. *Right-of-Way*

The existing road is located adjacent to a mixture of private and public lands, including land belonging to the USFS and also to Montana Fish Wildlife and Parks (MFWP). Right-of-way widths vary along the corridor from 275 feet to as little as 80 feet. **Table 2.4** gives the right-of-way widths for the study area along with the adjacent land ownership information.

Table 2.4: Approximate Existing Right-of-Way Widths

BEGIN RP	END RP	R/W WIDTH (FT)	ADJACENT OWNERSHIP
10.06	14.51	200	Private
14.51	16.42	160	Private and Public
16.42	17.06	180	Private
17.06	19.23	160	Private
19.23	21.16	180	Public
21.16	24.94	160 TO 275	Private and Public
24.94	27.35	80 TO 240	Public

MDT has recently acquired approximately four miles of railroad right-of-way property adjacent to MT 1 on the North, which runs parallel to MT-1 from just west of North Cable Road (RP 10.06) to the Quarry (approximately RP 14.0). The acquisition of this additional right-of-way may increase opportunities to improve safety through access control. The values shown in **Table 2.4** include the recently acquired right-of-way.

2.2.2. *Design Standards*

The MDT *Road Design Manual* specifies general design principles and controls which determine the overall operational characteristics of the roadway and enhance the aesthetic appearance of the roadway. The geometric design criteria for this study are based on the current MDT design criteria for a Non-National Highway System (NHS) Rural Minor Arterial. A Rural Minor Arterial road system links communities and provides service to corridors with trip lengths and travel density greater than those predominantly served by rural collector or local systems. **Table 2.5** lists the current design standards for Rural Minor Arterials according to MDT design criteria.

Table 2.5: Geometric Design Criteria[4]

DESIGN ELEMENT			DESIGN CRITERIA		
Design Controls	Design Forecast Year (Geometrics)		20 Years		
	Design Speed [(i)]	Level	60 mph		
		Rolling	55 mph		
		Mountainous	45 mph		
	Level of Service [(i)]		Level/Rolling: B Mountainous: C		
Roadway Elements	Travel Lane Width [(i)]		12'		
	Shoulder Width [(i)]		Varies		
	Cross Slope	Travel Lane [(i)]	2%		
		Shoulder	2%		
	Median Width		Varies		
Earth Cut Sections	Ditch	Inslope	6:1 (width: 10')		
		Width	10' Min.		
		Slope	20:1 towards back slope		
	Back Slope; Cut Depth at Slope Stake	0' - 5'	5:1		
		5' - 10'	Level/Rolling: 4:1; Mountainous: 3:1		
		10' - 15'	Level/Rolling: 3:1; Mountainous: 2:1		
		15' - 20'	Level/Rolling: 2:1; Mountainous: 1.5:1		
		> 20'	1.5:1		
Earth Fill Slopes	Fill Height at Slope Stake	0' - 10'	6:1		
		10' - 20'	4:1		
		20' - 30'	3:1		
		> 30'	2:1		
Alignment Elements	DESIGN SPEED		45 mph	55 mph	60 mph
	Stopping Sight Distance [(i)]		360'	495'	570'
	Passing Sight Distance		1625'	1885'	2135'
	Minimum Radius (e=8.0%) [(i)]		590'	960'	1200'
	Superelevation Rate [(i)]		e_{max} = 8.0%		
	Vertical Curvature (K-value) [(i)]	Crest	61	114	151
		Sag	79	115	136
	Maximum Grade [(i)]	Level	3%		
		Rolling	4%		
		Mountainous	7%		
	Minimum Vertical Clearance [(i)]		17.0'		

[(i)] Controlling design criteria (see Section 8.8 of the MDT Road Design Manual).

The design speed for a Rural Minor Arterial roadway ranges between 45 mph and 60 mph depending on terrain. MDT's *Road Design Manual* contains the following definitions for each terrain type:

[4] Montana Department of Transportation, *Road Design Manual*, Chapter 12, Figure 12-4, "Geometric Design Criteria for Rural Minor Arterials (Non-NHS – Primary)", 2008

- Level Terrain – The available stopping sight distances are generally long or can be made to be so without construction difficulty or major expense.
- Rolling Terrain – The natural slopes consistently fall below and rise above the roadway and occasional steep slopes offer some restriction to horizontal and vertical alignment.
- Mountainous Terrain – Longitudinal and traverse changes in elevation are abrupt and extensive grading is frequently needed to obtain acceptable alignments.

Based on these definitions, the majority of the study area appears to be level terrain (60 mph design speed) with some areas of rolling terrain (55 mph design speed).

2.2.3. Roadway Geometrics

Existing roadway geometrics were evaluated for MT-1 within the study area to identify areas that do not meet current MDT standards. This analysis was conducted based on information from as-built construction drawings and confirmed through field review. The findings of this analysis are discussed in the following sections.

Horizontal Alignment

Horizontal alignment elements which have an influence on traffic operation and safety include curvature, superelevation (i.e. the "bank" on the road), and sight distance. These parameters define horizontal alignment and are directly related to the design speed of the corridor. Four horizontal curves in the corridor do not meet MDT's level terrain standards based on radius values. All four curves do, however, meet rolling terrain standards. **Table 2.6** gives a summary of the horizontal curves that do not meet current MDT standards.

Table 2.6: Substandard Horizontal Curves

LOCATION (RP)	ELEMENT	VALUE (FT)
22.86	Radius	1146.00
23.19	Radius	1146.00
24.02	Radius	1146.00
27.08	Radius	1145.90

It should be noted that there may be additional horizontal curves that do not meet current MDT standards if they have inadequate superelevation. In addition, MDT requires transitional spirals for curves with radii less than 3820 feet.

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. The MDT *Road Design Manual* lists recommendations for maximum grades along with minimum values for vertical curvature (K-value) for Rural Minor Arterials according to the type of terrain in the area. According to the *Road*

Design Manual, the maximum allowable grade for level terrain is 3%, for rolling terrain is 4%, and for mountainous terrain is 7%.

The grades throughout the corridor are generally less than 3% and therefore meet level terrain standards. There are, however, twelve vertical curves that have grades greater than 3%, ten of which have grades exceeding rolling terrain standards (4%).

In addition to roadway grades, information for all the vertical curves along the study area was analyzed (see **Appendix C** for more detailed information). Within the study area, there are five vertical curves that do not meet standards for level terrain, three of which do not meet current standards for rolling terrain. In addition, two vertical curves do not meet standards for rolling terrain based on stopping sight distance, but do meet mountainous terrain standards. **Table 2.7** summarizes the vertical curves in the study area that do not meet current MDT standards.

Table 2.7: Substandard Vertical Curves

LOCATION (RP)	ELEMENT
10.93	Vertical Curvature
14.0 - 14.12	Grade
15.35	Vertical Curvature
15.35 - 15.49	Grade
15.62	Vertical Curvature
15.62 - 15.83	Grade
18.92 - 19.50	Grade
19.50 - 20.08	Grade
23.92	Vertical Curvature
	Stopping Sight Distance
26.59 - 26.79	Grade
27.27	Vertical Curvature
	Stopping Sight Distance
	Grade

2.2.4. *Roadside Clear Zones*

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, horizontal alignment, and roadside geometry. Clear zones are evaluated individually based on the roadside cross section. According to MDT, the desired clear zone should be attained by removing or shielding obstacles if costs are reasonable.

In certain instances along the study area it may be impractical to protect or remove certain obstacles within the clear zone. As improvement options develop, roadside clear zones should be enhanced, to a practical extent, to meet current MDT design standards.

Clear zone features evaluated during the field reviews were sight distances, side slopes, and roadside obstacles. Along the first four miles of the study area heavy vegetation was noted which limited sight distances and clear zones. Along Silver Lake multiple areas with steep rock cut slopes were present, many of which had fallen rocks inside the roadside clear zone. Along Georgetown Lake there were areas with steep fill slopes down to the water without guardrail.

2.2.5. Surfacing

Existing roadway surfacing characteristics were determined from MDT's 2011 *Montana Road Log*. The *Road Log* contains information for surface width, lane width, shoulder width, surfacing thickness, and base thickness. This information was supplemented through field data collection efforts. **Table 2.8** shows the existing roadway width and surfacing thickness according to the *Road Log*.

Table 2.8: Existing Roadway Surfacing[5]

			WIDTH (FT)			THICKNESS (IN)	
BEGIN RP	END RP	LANES	SURFACE	LANE	SHOULDER	SURFACE	BASE
10.06	10.076	2	28	12	2	5	12
10.076	10.496	2	32	12	4	5 - 6	12
10.496	10.565	2	36	12	6	6	12
10.565	19.066	2	32	12	4	6	12
19.066	20.246	3	44	12	4	6	12
20.246	24.148	2	32	13	3	6	12
24.148	27.35	2	24	12	0	4 - 6	4

The MDT *Road Design Manual* requires a minimum travel lane width of 12 feet. The *Route Segment Plan* recommends a roadway width, however, the MDT Road Width Committee would ultimately determine the appropriate width during future project development.

2.2.6. Access Points

Access points were identified through a review of available Geographic Information Systems (GIS) data and aerial photography. Based on this review, there are approximately 156 access points along the study area. **Table 2.9** provides a summary of access points along the study area.

Table 2.9: Access Points

BEGIN RP	END RP	LENGTH (MI)	ACCESS POINTS	DENSITY (ACCESS / MI)
10.06	15.00	4.94	80	16.19
15.00	20.00	5.00	33	6.60
20.00	24.00	4.00	22	5.50
24.00	27.35	3.35	21	6.27
Total		**17.29**	**156**	**9.02**

[5] Montana Department of Transportation, *Montana Road Log*, 2011

A high concentration of approaches exists in the first five miles west of Anaconda, with over 16 approaches per mile. Access density decreases west of West Valley (RP 15.00) towards Georgetown Lake. Between West Valley and Georgetown Lake, access density ranges between approximately 5.5 and 6.6 access points per mile.

2.2.7. Turn Lanes

Dedicated turn lanes allow turning traffic to be removed from the major traffic stream and allows through traffic to keep moving, thus avoiding some potential for rear-end collisions. There is currently a dedicated westbound left-turn lane located at the intersection with Georgetown Lake Road (RP 24.2) on the southeast side of Georgetown Lake. This is the only dedicated turn-lane within the study area. Future turn lane locations have been identified and are described in **Chapter 5**.

2.2.8. Hydraulics

Drainages

The study area is located within the Upper Clark Fork watershed, within the Columbia River basin. Warm Springs Creek parallels MT-1 throughout the study area. Numerous intermittent and ephemeral tributaries, including Cable Creek, Twin Lakes Creek, Storm Creek, Big Gulch, Olson Gulch, and Grays Gulch flow out of the mountains on either side of the highway. Silver Lake is south of the corridor between RP 22.0 and 23.0 while Georgetown Lake is west of the corridor between RP 24.5 and 27.0. Several irrigation ditches and canals exist within the corridor and consideration will be given to drainages during the project development process if an improvement option is deemed feasible. If the roadway is widened, pipe extension and/or replacement may be required to remove barriers and enhance fish passage.

Structures/Bridge Structures

There was heightened flooding throughout Montana in 2011 and no evidence of drainage issues was observed during the field review along the corridor. It is presumed, therefore, that for the purposes of this study, irrigation ditches, culverts and bridges are adequately sized for hydraulics.

Two bridge crossings are located within the study area boundary, one located at approximately RP 10.57 (P00019010+03321) and the other located approximately 7 miles west of Anaconda at RP 16.91 (P00019016+09111), each spanning Warm Springs Creek. The bridge located at RP 10.57 is a two lane, three-span concrete structure that was constructed in 1990. This bridge is 68.01 feet long and 39.4 feet wide. The bridge located at RP 16.92 is also a two lane structure spanning 42 feet, 36.4 feet in width and is a single span concrete design constructed in 1930.

The bridge located at RP 10.57 was assessed by MDT in 2010 while the bridge located at RP 16.92 was assessed in 2009. Both bridge structures were determined to be not structurally deficient and

not functionally obsolete at the present time. The design loadings were deemed to meet current MDT standards.

2.3. Environmental Setting

A high-level *Environmental Scan* was completed in January 2011 and covers the study area from west of Anaconda – RP 10.06 to Georgetown Lake RP 27.35. This section provides a summary of the scan. The full *Environmental Scan* document is contained in **Appendix B**.

2.3.1. Geographic Setting

The general topography of Deer Lodge County is mountainous in the extreme, the valleys being little more than depressions between mountain ranges. The average elevation is 6,000 feet, rising to over 10,500 feet on the mountain peaks. The land use within the corridor is predominantly for recreational and residential purposes. The majority of the land within the identified corridor is uninhabited.

2.3.2. Land Ownership

Land ownership within the study area was determined by reviewing GIS based information to assess the amount of area that is public versus privately owned. The land within the study area is predominately privately owned land (approximately 64%). There are no 6(f) resources in the study area. There are 4(f) resources present and are noted below:

- Pumping Station (historic site)
- BA&P Spur (railroad)
- Malvey Cabin (historic site)
- Anaconda-Philipsburg Power Line (historic site)
- Silver Lake Water System (historic site)
- Garrity Mountain WMA (wildlife management area)
- Blue Eyed Nellie WMA (wildlife management area)
- Stuart Mill Bay FAS (fishing access site)

Montana Fish, Wildlife & Parks Wildlife Management Areas

The Garrity Mountain Wildlife Management Area (WMA) covers 9,475 acres and is located near the mid-point and south of the study area. This public land is managed by MFWP. Just south of the highway, Garrity Mountain rises over 8,000 feet in elevation. The mountain's open grassy areas provide critical winter foraging for elk, deer, and bighorn sheep, while pockets of timber offer shelter and thermal cover. North of the highway in the same vicinity is the Blue Eyed Nellie WMA. The

management goal of this 164 acre area is to provide winter range for Bighorn Sheep and opportunities for wildlife observation.

Montana Fish, Wildlife & Parks Fishing Access Sites (FASs)

MFWP owns the Stuart Mill Bay Fishing Access Site (FAS). This FAS has a portion of its land within the corridor study area (roughly 20 percent of its total area). The FAS is not accessed directly from MT-1, rather it is accessed off Georgetown Lake Road just north of RP 24.0. In addition, MFWP owns a small 2-acre tract of land on the east side of MT-1 near RP 26.0.

2.3.3. Cultural and Archaeological Resources

The corridor contains many cultural resources, including the Anaconda to Phillipsburg Power Line (24DL0496), a pumping station (24DL0425), and the Silver Lake Water System (24DL0691).The National Register of Historic Places lists the Butte, Anaconda and Pacific Railroad Historic District (24DL0211), a railroad spur line (24DL0425), and the Malvey Cabin (24DL0427). Cultural resources must be considered as planning progresses on this study. Any further reconstruction of the highway infrastructure in this corridor would require a cultural resource survey of the "Area of Potential Effect" for this project as specified in Section 106 of the National Historic Preservation Act (36 CFR 800).

2.3.4. Soil Resources and Prime Farmland

Soil resource information was gathered through available soil surveys, while information regarding areas of prime farmland in the corridor area was compiled from the US Department of Agriculture, Natural Resource Conservation Service (NRCS). The agricultural soils of Deer Lodge County are confined chiefly to the terraces in the vicinity of Galen in the northern part of the county and to the benches north of the Big Hole River in the southwest part of the county.

The Farmland Protection Policy Act of 1981, which has as its purpose "to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses, and to assure that federal programs are administered in a manner that, to the extent practicable, will be compatible with State, unit of local government, and private programs and policies to protect farmland". Farmland is defined by the act in Section 420 as including prime farmland, unique farmland, and farmland, other than prime or unique, this is of statewide or local importance.

Soil map units found within the study area have been classified as prime and important farmland. Any proposed highway construction activities within the MT-1 Anaconda to Georgetown Lake corridor will likely create impacts to the soil map units with prime and important farmland status and require the completion of a CPA-106 Farmland Conversion Impact Rating Form for Linear Projects.

2.3.5. Vegetation

According to the Montana Natural Heritage Program (MNHP) report, seventy-five percent of the vegetative land cover in Deer Lodge County is comprised of a combination of the following:

- Rocky Mountain Lodgepole Pine Forest (23%);
- Rocky Mountain Lower Montane, Foothill, and Valley Grassland (14%);
- Montane Sagebrush Steppe (12%);
- Rocky Mountain Montane Douglas-fir Forest and Woodland (9%);
- Rocky Mountain Subalpine-Upper Montane Grassland (7%);
- Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland (6%); and
- Northern Rock Mountain Lower Montane Riparian Woodland and Shrubland (4%).

In the vicinity of the study area, a combination of lodge pole pine forest and grasslands dominate the hillsides and foothills. Riparian woodland and shrub land line the major drainage corridors, especially Warm Springs Creek. There are patches of previously harvested forest-tree, forest-shrub, and forest-grassland regeneration along the slopes within the higher mountain elevations. Adjacent to the highway, low intensity vegetation development has occurred.

Noxious weeds are present within Deer Lodge County. The Invaders Database System lists 60 exotic plant species and 18 noxious weed species in the County. ADLC has additional species that they consider to be noxious. The additional species considered noxious by ADLC were defined by ADLC Council Resolution 10-24, and include the following: Babysbreath, Common Mullein, Curley Dock, Kochia, Musk Thistle, and Sowthistle.

2.3.6. Wildlife

Wildlife species inhabiting or traversing the study area are typical of those in mixed forests and intermountain valley grasslands of south central Montana. Of the 108 mammal species known to occur in the state, 65 are known or suspected to occur in Deer Lodge County. Common mammals occupying habitats in, traversing, or having a distribution range that overlaps the study area are white-tail deer, mule deer, moose, red fox, black bear, elk, mountain lion, and coyote.

There is a large herd of bighorn sheep occupying habitat in the Flint, Anaconda, and Pintler mountains which are frequently observed on or adjacent to MT-1 in the study area, especially in the winter season. Bighorn sheep inhabit both sides of MT-1 throughout the corridor study area, but especially near the Wildlife Management Area at Garrity Mountain. The herd has experienced fatal pneumonia outbreaks, which MFWP has managed with some culling of the herd to prevent spread of the disease.

Historically, the use of deicing material on the highway in the winter season may have contributed to bighorn sheep concentration on and adjacent to the roadway, increasing the incidents of vehicle

collisions with bighorn sheep. Bighorn sheep would frequently graze alongside the roadway in this area and lick the salt from the roadway. Recent changes in maintenance practices have reduced frequency of bighorn sheep along the roadway, which reduces the potential for animal vehicle collisions. A longer monitoring period is required to determine the long term effectiveness of this measure and what type of additional mitigation may be warranted.

2.3.7. Amphibians and Reptiles

The species expected to occur in the corridor study area were extrapolated from "known" areas studied in the MNHP – *Natural Heritage Tracker* (2010) database. The species potentially occurring in the study area may include but are not limited to the Columbia spotted frog, Rocky Mountain tailed Frog, the long-toed salamander, and the Boreal (Western) Toad. Over a dozen invertebrate species, some listed as State Species of Concern (SOC) also have been observed in the project study area.

2.3.8. Birds

According to the MNHP – *Natural Heritage Tracker* (2009) database of documented observations of species, there are a few hundred different species of birds documented in Deer Lodge County, with the potential to occur and nest in the project area. These species include representative songbirds, birds of prey, waterfowl, owls, and shorebirds, including several State SOC. Most avian observations occur in the riparian draws and hillsides associated with the numerous drainages along the study area and surrounding lakes. Migratory birds and Golden and Bald Eagles are protected under the *Migratory Bird Treaty Act* and *Bald and Golden Eagle Protection Act*, and the protection of these species and compliance with the *Acts* would need to be carefully considered with any planned project resulting from this study.

2.3.9. Aquatic Resources

Fisheries

Warm Springs Creek parallels and is crossed by the highway in the study area. Multiple tributaries to Warm Springs Creek converge in the proximity of the study area, including Cable Creek, Twin Lakes Creek, and Storm Creek. The Stumptown Pond and the AMC Pond are near the highway just west of Anaconda in the study area while Silver Lake and Georgetown Lake are adjacent to the highway near the northern terminus in the study area. According to the MFWP *Montana Fisheries Information System* (MFISH) database (2010), fish species occurring in Warm Springs Creek within the study area are brown trout (ENN -Exotic Species – not native to Montana), longnose sucker, mottled sculpin, rainbow trout, slimy sculpin, brook trout (ENN), bull trout (SOC), mountain whitefish, and westslope cutthroat (SOC). The stream stretch between river miles 2.6 and 32.6 is considered bull trout core area. River miles from 24.2 to 32.6 are considered MFWP protected areas for big wintering/spring usage.

The tributaries and other drainages within the study area have the potential to support all or some of the fish species listed above. Fish passage and/or barrier opportunities must be considered at all affected drainages if a project is forwarded from this corridor study.

Warm Springs Creek is rated as an outstanding fisheries resource value by MFWP and receives recreational angler use year round. Ponds and lakes within the study area are also recreation destinations. Silver Lake and Georgetown Lake are managed as a recreational fishery resource by MFWP. There are several access roads from the highway into adjacent public lands as well.

2.3.10. Threatened and Endangered Species

The federal list of endangered and threatened species is maintained by the United States Federal Wildlife Service (USFWS). Species on the list receive protection under the Endangered Species Act (ESA). An 'endangered' species is one that is in danger of extinction throughout all or a significant portion of its range. A 'threatened' species is one that is likely to become endangered in the foreseeable future. The USFWS also keeps a list of species that are candidates or proposed for possible addition to the federal list. **Table 2.10** lists the threatened, endangered or candidate species occurring in the study area according to the USFWS.

Table 2.10: Threatened and Endangered Species[6]

COMMON NAME	SCIENTIFIC NAME	ESA STATUS
Bull Trout	Salvelinus confluentus	LT/CH/PCH
Wolverine	Gulo gulo	C

LT – Listed Threatened; CH – Critical Habitat; PCH – Potential Critical Habitat; C – Candidate

Warm Springs Creek is designated Bull Trout critical habitat. If a project is developed from the corridor study, an evaluation of potential effects to bull trout and wolverine will need to be completed during the project development process.

There are no endangered, threatened, proposed, or candidate plant species listed for Deer Lodge County in the USFWS database, and none are currently expected to occur in the study area.

2.3.11. Species of Concern

Montana SOC are native animals breeding in the state 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 SOC is not a statutory or regulatory classification. Instead, these designations provide a basis for resource managers and decision-makers to direct limited resources to priority data collection needs and address conservation needs proactively.

[6] US Fish and Wildlife Service

The MNHP maintains a *Sensitive Species Heritage Program Ranking* database. Each species is assigned a state rank that ranges from S1 (greatest concern) to S5 (least concern). Other state ranks include SU (un-rankable due to insufficient information), SH (historically occurred), and SX (believed to be extinct). State ranks may be followed by modifiers, such as B (breeding) or N (non-breeding).

A search of the MNHP species of special concern database revealed five mammal species and one bird species within the first four miles of the study area. Four mammal species have been documented in the remainder of the study area. Five bird species have documented breeding within the study area. Two fish species of concern occur within the study area drainages. One invertebrate species and three vascular plant species of concern have also been documented within the study area.

There are other sensitive species not listed that have the potential to be within the study area. A thorough field investigation for the presence and extent of these species should be conducted during the project design phase. If present, special conditions to the project design or construction should be considered to avoid or minimize impact to these species.

Table 2.11 summarizes the species of concern in the study area.

Table 2.11: Species of Special Concern[7]

COMMON NAME	SCIENTIFIC NAME
Dwarf shrew	Sorex nanus
Canada Lynx	Lynx Canadensis
Wolverine	Gulo gulo
Fisher	Martes pennant
Gray wolf	Canis Lupis
SPECIES OBSERVED BREEDING IN STUDY AREA	
Bald Eagle	Haliaeetus leucocephalus
Great Blue Heron	Ardea Herodias
Great Grey Owl	Strix nebulosa
Lewis's Woodpecker	Melanepes lewis
Northern Goshawk	Accipiter gentilis
Bull Trout	Saleevelinus confluentus
Westslope Cutthroat Trout	Onchorynchus clarkia lewisi

2.3.12. *Water Resources and Fisheries*

The Montana Department of Environmental Quality (DEQ), Clean Water Act Information Center website provides information for the study area. The study area is within the Upper Clark Fork watershed, in the Columbia basin. Warm Springs Creek parallels MT-1 throughout the study area. Numerous intermittent and ephemeral tributaries, including Cable Creek, Twin Lakes Creek, Storm

[7] Montana Natural Heritage Program

Creek, Big Gulch, Olson Gulch, and Grays Gulch flow out of the mountains on either side of the highway. Warm Springs Creek is considered to be in water quality category 4C where Total Maximum Daily Loads (TMDLs) are not required.

TMDLs are a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards. No pollutant-related impairment is identified; therefore, TMDLs are not required.

Warm Spring Creek fully supports beneficial uses including agriculture, industrial and primary contact recreation. The creek partially supports aquatic life and cold water fishery. Twin Lakes Creek also supports aquatic life and is an important cold water fishery.

Warm Springs Creek crosses the highway at approximately RP 10.5, near the beginning of the study area, and again at RP 17.0. The North Fork of Flint Creek crosses the highway at RP 25.9, joining Flint Creek in the vicinity of Georgetown Lake. Storm Lake Creek crosses the highway near RP 20.8 and joins Cable Creek just above its highway crossing at RP 20.1. Storm Lake Creek parallels the highway and joins Warm Springs Creek near RP 19.0. Foster Creek and Barker Creek join Warm Springs Creek near RP 17.0. Numerous intermittent and ephemeral drainages as well as irrigation ditches flow out of the mountains on either side of the highway within the study area. Georgetown Lake is immediately west of the highway between RP 22.0 and 23.0.

2.3.13. Water Quality

The Environmental Scan contains details regarding the water quality report available through the Montana DEQ on the Upper Clark Fork River tributaries. The Upper Clark Fork watershed is listed in the *2010 Integrated 303(d)/305(b) Water Quality Report for Montana* by the MDEQ. The water bodies within this watershed that are located in the study area are designated as Category 5 and Category 4C.

Category 5 water bodies are waters where one or more applicable beneficial use has been assessed as being impaired or threatened, and a TMDL of the pollutant is required to address the factors causing the impairment or threat. Warm Springs Creek (MT76G002_012) has probable cause of impairment from arsenic to aquatic life, cold water fishery, and drinking water and probable cause of impairment from cadmium, copper, lead zinc, and iron to aquatic life and cold water fishery.

Category 4C water bodies are waters where TDMLs are not required as no pollutant-related use impairment is identified. TMDLs have not yet been written for water bodies in this watershed.

2.3.14. Groundwater and Irrigation

Deer Lodge County does not currently have a Local Water Quality District (LWQD) which is a tool local governments can use to protect, preserve and improve the quality of surface water and groundwater within the district. If a LWQD is developed for the county, water quality protection measures may have to be addressed with any project that may develop from the corridor study.

Very little irrigated farm land exists in Deer Lodge County adjacent to the study area. Any impact to lateral and longitudinal irrigation facilities that may exist in the study area would need to be studied and mitigated for by MDT during project development; this could include such measures as relocation of canals and ditches in consultation with land owners and consideration of the impact to farming operations.

2.3.15. Wetlands

The majority of the wetlands are within the riparian bottom lands associated with the major drainages in the study area, especially Warm Springs Creek, its tributaries, and the major draws coming out of the mountains. A notable amount of potential wetland area occurs in the valley adjacent to the current highway alignment. Any project forwarded from this corridor study has the potential to impact wetland areas, riparian areas, and streams. Formal wetland delineations would be necessary for any proposed highway-related actions in the corridor, as required by Section 404 of the Clean Water Act and Executive Order 11990, Protection of Wetlands. Evaluation of stream impacts would need to be completed according to USACOE May, 2010 Stream Mitigation Procedure.

Mapping data for the study area was provided by the National Wetland Inventory (NWI). West Valley, Silver Lake, and Georgetown Lake area identified areas within the confines of the study. West Valley and Silver Lake mapping was completed from 2006 National Agricultural Imagery Program (NAIP) imagery and available from NWI or from the Montana Wetlands Map. The NWI maps are typically generated based on aerial and satellite imagery, and are not accurate or detailed enough for MDT project wetland determination and/or delineation.

2.3.16. Flood Plains and Floodways

Executive Order (EO) 11988, Floodplain Management, required federal agencies to avoid direct or indirect support of floodplain development whenever a practicable alternative exists. EO 11988 and 23 CFT 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 Highway Administration’s (FHWA) floodplain regulation (23 CFR 650 Part A), floodplains provide natural beneficial values serving as areas for fish, wildlife, plants, open space, natural flood moderation, water quality maintenance, and groundwater recharge.

Within most of the study area, there are 100-year floodplains delineated by the Federal Emergency Management Agency (FEMA). There are FEMA issued flood maps for the east end of the study area within Deer Lodge County, however no maps are available for the west end in the Georgetown Lake vicinity where the map index notes that it is in a Zone D – undetermined flood hazard. If a project is forwarded from the corridor study, coordination with Deer Lodge County should be conducted during the project development process to obtain necessary floodplain permits.

2.3.17. Air Quality

The MT-1 Anaconda to Georgetown Lake study area is not a designated "non-attainment" area which is defined as an area that does not meet the National Ambient Air Quality Standards (NAAQS) for PM 2.5, PM 10, or carbon monoxide (CO), nor is it near any area so designated as non-attainment, although Butte / Silverbow may be designated in the future.

2.3.18. Traffic Noise

Traffic noise may need to be evaluated for any planned improvements to the MT-1 Anaconda to Georgetown Lake corridor if a project is developed that involves a substantial shift in the horizontal or vertical alignments of the roadway, increasing the number of thru-lanes, or increasing the traffic speed and volume. If such improvements are planned then the project would be considered a Type I project. Type I projects require a detailed noise analysis, including measuring ambient noise levels at selected receivers and modeling design year noise levels using projected traffic volumes. Noise abatement measures would be considered for any project if noise levels *approach* or *substantially exceed* the noise abatement criteria. If traffic noise impacts are shown to exist on a project, possible abatement measures may be considered, but are not limited to:

- Altering the horizontal or vertical alignment;
- Constructing noise barriers such as sound walls or earthen berms; and/or
- Decreasing traffic speed limits.

2.3.19. Hazardous Substances

The Montana Natural Resource Information System (NRIS) database was searched for underground storage tank sites, leaking underground storage tank sites, abandoned mine sites, remediation response sites, landfills, National Priority sites, hazardous waste, crude oil pipelines, and toxic release inventory sites in the vicinity of the study area. The following sites within the corridor study area boundary were initially identified with potential contamination impacts:

- Several underground storage tank locations;
- Four leaking underground storage tank locations;
- Several abandoned and inactive mines sites; and
- One Federal Superfund program site (Georgetown Railroad).

Given the lack of location precision in the NRIS database, ground review along the corridor would be necessary to determine if any of these sites are in close proximity to the road and/or any proposed alignments. Further evaluation may be needed at specific sites to determine if contamination will be encountered during construction.

2.4. Areas of Concern And Consideration

This section provides a summary of the areas of concern and consideration within the study area. These areas were identified through review of as-built drawings, field review, and other available data. More discussion has been provided in the previous sections, and is reiterated here as appropriate. This listing of areas of concern and consideration is not in any priority order.

2.4.1. Geometrics

Geometric areas of concern include roadside safety (including cut and fill slopes), sub-standard horizontal and vertical curvature (including k-values and grades), and sight distance. The geometric areas of concern have been previously described and are summarized in tabular format in **Table 2.12** by reference post.

Table 2.12: Geometric Areas of Concern Summary

LOCATION (RP)	FEATURE	DESCRIPTION
10.9	Vertical Curve	Vertical curve does not meet existing standards
13.9 - 14.2	Roadside Safety	Heavy roadside vegetation
14.0 - 14.1	Grade	Grade exceeds existing standards
15.3 - 15.5	Grade	Grade exceeds existing standards
15.3	Vertical Curve	Vertical curve does not meet existing standards
15.6 - 15.8	Grade	Grade exceeds existing standards
15.6	Vertical Curve	Vertical curve does not meet existing standards
16.4	Roadside Safety	Steep roadside slope
16.5 - 16.8	Roadside Safety	Steep roadside slope
18.9 - 20.1	Grade	Grade exceeds existing standards
21.1 - 23.1	Roadside Safety	Steep rock slopes with fallen rock
22.9	Horizontal Curve	Horizontal curve does not meet existing standards
23.2	Horizontal Curve	Horizontal curve does not meet existing standards
23.9	Vertical Curve	Vertical curve does not meet existing standards
24.0	Horizontal Curve	Horizontal curve does not meet existing standards
24.2	Roadside Safety	Poor sight distance
24.8	Roadside Safety	Steep roadside slope
25.0 - 25.3	Roadside Safety	Poor sight distance
25.0	Roadside Safety	Steep roadside slope
25.4 - 25.6	Roadside Safety	Steep roadside slope
25.9	Roadside Safety	Concrete bridge ends inside clear zone
26.1	Roadside Safety	Steep roadside slope
26.2 - 26.8	Roadside Safety	Steep roadside slope
26.6 - 26.8	Grade	Grade exceeds existing standards
27.1	Horizontal Curve	Horizontal curve does not meet existing standards
27.3 - 27.4	Grade	Grade exceeds existing standards
27.3	Vertical Curve	Vertical curve does not meet existing standards

2.4.2. Speeds

Vehicle speed data was collected at 4 locations along the corridor. The results of the speed data collection indicate that the posted speed limits at RP 11.2 (35 mph), RP 14.0 (45 mph), and RP 24.4 (60 mph) may be low compared to the 85th percentile speeds. At RP 11.2, 85th percentile speeds are more than 7 mph higher than the 35 mph posted speed limit. Additionally at RP 14.0, 85th percentile speeds are almost 7 mph higher than the posted speed limit of 45 mph. The 85th percentile is an engineering parameter used by traffic engineers in determining roadway speeds. It is the speed at which 85 percent of vehicles travel at or below. For example, if the 85th percentile speed is 45 mph, it means 85 percent of vehicles are traveling at or below 45 mph. It is generally recommended that the posted speed limit be within 5 mph of the 85th percentile speed.

2.4.3. Access Density

A high concentration of approaches exist in the first five miles west of Anaconda, with over 16 approaches per mile. The highest density of approaches exists along the one segment between RP 10.8 and 11.8 with 34 approaches. Access density decreases west of West Valley towards Georgetown Lake. Between West Valley and Georgetown Lake, access density ranges between approximately 5 and 7 access points per mile. The high density of accesses within the first five miles is a concern due to a variety of factors. The area is in a speed transition area from 25 mph to 45 mph. The acceleration and deceleration of vehicles turning into and out of the accesses cause operational concerns on the mainline of MT-1.

Access density is important because each access point creates potential conflicts between through traffic and traffic using that access. Access management techniques such as limiting access locations, increasing access spacing, using auxiliary turn lanes, and restricting turning movements reduce the number of conflict points. A reduction in conflict points can create a safer more efficient roadway.

2.4.4. Wildlife Connectivity and Wildlife-Vehicle Collisions

A large bighorn sheep herd exists in this corridor study area. Bighorn sheep inhabit both sides of MT-1 throughout the corridor study area, but especially near the Wildlife Management Area at Garrity Mountain. Wildlife connectivity is a concern along the corridor as the bighorn sheep herd has been characterized as vulnerable by MFWP staff due to pneumonia outbreaks, vehicle collisions, subdivision encroachment, and natural attrition.

The entire corridor experiences animal-vehicle collisions as evidenced by crash reports and carcass removal data. Of particular concern is the occurrence of moose fatalities occurring in the last third of the corridor near Georgetown Lake. There is also the prevalence of deer collisions throughout the entire corridor.

Fish passage through culverts and bridges, and entrainment in irrigation canals, is also of concern throughout the corridor.

2.4.5. *Alternative Use Facilities*

Local planning objectives include the extension of multi-use trails infrastructure west of Anaconda to the West Valley area in the near future. Long term objectives include the provision of trails the entire length of the corridor to Georgetown Lake to complement the scenic highway.

2.4.6. *Local Infrastructure Expansion*

Local planning efforts have included the extension of wastewater system infrastructure west of Anaconda to the West Valley area in the near future. Depending on grant funding, wastewater infrastructure expansion is expected to occur within the next two years. The locating of this future infrastructure in the corridor is important to optimize service to area residents and ensure that maintenance and access to the infrastructure is provided. In addition, ADLC is looking to the West Valley for future growth particularly to supply work force housing.

Chapter 3. Community and Stakeholder Outreach

An important goal of the *Corridor Planning Study* process was to have ongoing community involvement. Education and community outreach were essential parts of achieving this goal. A *Community and Stakeholder Involvement Plan (CSIP)* was developed to identify community involvement activities needed to gain insight and build consensus about existing and future corridor needs. The purpose of the *Plan* was to ensure a proactive community involvement process that provided opportunities for the community to be involved in all phases of the corridor planning study process.

3.1. Community Involvement

3.1.1. Community Informational Meetings

Two formal community informational meetings were scheduled to be held over the course of the study process. Meeting announcements were advertised in the *Anaconda Leader*, *Montana Standard*, and *Philipsburg Mail* prior to each meeting. The ads announced the meeting location, time and date, purpose of the meeting, and the locations where documents may be reviewed.

The first informational meeting was held on July 25th, 2011, from 5:30 PM to 7:30 PM at Smitty's Barn west of Anaconda. The intent of the meeting was to inform the community on the purpose and scope of the *Corridor Planning Study*, present and discuss the existing conditions, and solicit input on the community's vision, goals and any concerns within the study area. A total of 63 members of the community signed in at the meeting, with others present who did not sign in. The meeting included a *PowerPoint* presentation about the study and question and answer session.

A second community informational meeting was held November 7th, 2011, from 6:00 PM to 8:00 PM in the Little Theatre Room at the Anaconda High School. The intent of the second informational meeting was to present the *Draft Corridor Planning Study*, discuss the recommended improvements, and to receive feedback from the community.

3.1.2. Other Public Involvement Efforts

Two newsletters were produced that described the work in progress, results achieved, preliminary recommendations, and other topics. The newsletters were made available at the community informational meetings and were posted to the project website. In addition, copies were mailed to the following identified stakeholders:

- ADLC Planning Department;
- ADLC Commission;
- ADLC Emergency Services;

- Anaconda Chamber of Commerce;
- Anaconda Saddle Club;
- Anaconda Sportsman's Club;
- Federal Highways;
- Montana Department of Transportation;
- Montana Highway Patrol; and
- US Forest Service.

A website was also developed to provide up-to-date information regarding the study as well as an opportunity to provide comments on the study. The website www.mdt.mt.gov/pubinvolve/mt1/ was maintained by MDT.

3.1.3. Comments from the Community

Comments were received from the community during informational meetings, through e-mail, telephone conversations, and standard postal mail. The following summarizes the public comments received during the development of this study:

- **Speeds** – Comments relating to vehicle speeds were generally split between those wishing to increase existing speed limits, particularly in the existing 35 mph and 45 mph zones west of Anaconda, and those wishing that existing speed limits remain in place.
- **Wildlife** – The community expressed a desire to protect wildlife in the area, particularly bighorn sheep. It suggested mitigation measures such as a wildlife overpass/underpass, fencing, and additional crossing areas.
- **Signage** – Multiple comments were made regarding additional signing being needed throughout the study area. In particular, street signing consistent with recent 911 routing, signing for the West Valley Fire Department, and signing designating the route as the Pintler Veterans' Memorial Scenic Highway were desired.
- **Access** – It was suggested that a frontage road between Anaconda and West Valley be considered to allow for the consolidation of access points.
- **Multi-Modal Use** – Comments expressing a desire for additional accommodation for bicyclists, pedestrians, and equestrians were made.
- **Additional Lanes** – The community expressed a desire for additional passing lanes and dedicated turn bays at major intersections.
- **Other** – The following additional comments were made: dense roadside vegetation limits sight distance, particularly near West Valley; ATV usage near West Valley poses safety hazards; and improvement options should be coordinated with proposed sewer line extension to West Valley.

3.2. Stakeholder Participation

A stakeholder contact list was developed to include individuals, businesses, or groups identified by ADLC, MDT, and/or the Consultant based on knowledge and usage of the study area. The intent of developing the stakeholder list was to identify those individuals and groups to actively seek out and engage in the various phases of the study.

3.3. Resource Agency Meeting

A resource agency meeting was held on July 19, 2011, at MDT. The resource agency meeting was held to provide an overview of the study and process as well as to confirm content and accuracy of the Environmental Scan document. Each agency was sent a draft *Environmental Scan* prior to the meeting in order to set the stage for further discussion. In addition to the Planning Team, the agencies involved in this study included the Montana Department of Natural Resources and Conservation (DNRC), MFWP, USFWS, DEQ, EPA, and Unites States Army Corps of Engineers (USACE).

The meeting consisted of a presentation providing an overview of the study and a summary of the pre-NEPA/MEPA corridor study process. Open discussion was gathered on various resource areas that the agencies felt needed to be further investigated and addressed. The following summarizes the comments made at the Resource Agency Meeting:

- **Wildlife** – Moose and bighorn sheep mortality and habitat connectivity are of concern in the study area. Special sensitivity is needed between RP 14 and RP 16. Deer collisions are very common throughout the corridor.
- **Fisheries / Water** – There are entrainment concerns that fish may get trapped in larger irrigation ditches / canals located in the corridor study area. There are also concerns about North Fork Flint Creek area relative to fish passage, the presence of spawning habitat, and overall impacts. Permanent sediment and erosion control should be utilized within the study area to prevent run-off into streams. Culverts on fish-bearing streams are generally in poor conditions. Improvements should be made to fish passage and stream processes through structures. Mitigation of stream and wetland impacts will need to be considered.
- **Other** – Butte-Silver Bow is replacing the Silver Lake Fume with culverts. The Superfund clean-up is complete; however, there may be remnant waste from Lime Quarry to Georgetown Lake Road along the railroad bed. Pine beetle hazard tree removal and fuel reduction efforts on private and USFS lands should be considered. Non-traffic related recreational use in the corridor along the railroad bed should be considered.

Chapter 4. Corridor Needs and Objectives

4.1. Corridor Needs and Objectives

Needs and Objectives for the MT-1 corridor within the study area were identified based on a comprehensive review of existing data, local plans, and input from resource agencies, stakeholders and the community. The needs and objectives are important in explaining why an improvement option, or options, may be necessary. The discussion and analysis leading to the development of these needs and objectives recognizes the diverse nature of the corridor and takes into account social, economic and environmental conditions.

The following needs and objectives were used in the development of improvement options. Note that needs and objectives will be met to the extent practicable given financial, community preference and environmental constraints within the corridor. Improvement options identified in this study may lead to future projects. The "Purpose and Need" statement for any future project should be consistent with the needs and objectives contained in this study. However, not all of the needs and objectives at the corridor level are required to be included in a project-level "Purpose and Need" statement. For example, a signing project may have little to no effect on aquatic connectivity objectives, thus rendering compliance with the intent of that particular objective unnecessary.

Need #1: Improve safety and operation of MT-1 through the Corridor Planning Study area.

The MT-1 corridor is crucial in serving traffic flows between Anaconda and Georgetown Lake, and even to locales beyond (Philipsburg, etc.). Need number 1 recognizes that the roadway must be safe and efficient to meet the travelling needs of the public, both for through traffic and local traffic. To address this need, improvement options and /or management strategies were developed for the corridor to achieve a higher level of safety and improve operations. This is achieved by improving the roadway to meet current design standards (to the extent practicable), managing access to properties, controlling speeds to meet driver expectations, providing adequate clear zones, and properly maintaining the roadway.

Objectives

- Improve geometric elements to meet current MDT design criteria.
- Accommodate existing and future capacity demands within the corridor.
- Minimize impacts caused by access density.
- Identify appropriate speeds within the study area.
- Provide adequate clear zones to meet current MDT design criteria.
- Review and implement innovative maintenance practices.

Need #2: Preserve the environmental, scenic and recreational nature of the corridor.

The MT-1 corridor is a scenic route, and provides access to a great variety of recreational lands. Because of the corridor's location, wildlife and aquatic connectivity is an area of concern. All improvements should be evaluated for their ability to reduce animal-vehicle collisions to the extent practicable. Improvements should be considered that provide both wildlife and aquatic connectivity. Numerous documented animal-vehicle collisions between vehicles and bighorn sheep, moose, deer and other wildlife have informed this need. All improvements were reviewed for their potential impact to the environmental, scenic and recreational aspects of the corridor.

Objectives

- Preserve the scenic nature of the corridor with respect to view sheds and landscape features.
- Avoid and minimize the environmental resource impacts of improvement options.
- Evaluate and incorporate "best practice" mitigation strategies as appropriate to promote wildlife connectivity across MT-1.
- Evaluate and incorporate "best practice" mitigation strategies as appropriate to reduce animal-vehicle conflicts.
- Evaluate fish (aquatic organism) passage issues and incorporate appropriate solutions to improve aquatic connectivity and stream function through structures and culverts.

Need #3: Coordinate with local planning efforts and minimize conflicts along the corridor.

The area immediately west of Anaconda, commonly referred to as the West Valley Planning Area, is a current and future growth area. As land develops in the area, more stress will be placed on the transportation system. This need recognizes that local planning efforts have occurred to a great extent, and several plans have been completed or underway. The desire of ADLC is to minimize impacts to existing residences and businesses along the corridor, not only in the West Valley area but also along the entire length of the route. Improvements should be sensitive to local planning efforts and coordinate with various proposed projects such as wastewater facility extension or development of a multi-use trail parallel to MT-1.

Objectives

- Coordinate future infrastructure needs with ADLC.
- Support local planning efforts.
- Minimize impacts to existing residences and businesses along the corridor.
- Consider all modes of transportation in the corridor.

Chapter 5. Improvement Options

The corridor needs and objectives described previously lead to the development of a range of improvement options that address the roadway issues and areas of concern. This chapter provides a description and evaluation of each recommended improvement option. For ease of identification, the improvement options have been given unique identifiers via a numbering scheme. Planning level cost estimates for the improvement options were also developed. These costs are for construction costs only in year 2011 dollars. The planning level costs do not include right-of-way acquisition, utility relocation, preliminary engineering or construction engineering.

Improvement options were categorized into implementation timeframes. Short term designated options could likely be implemented within 2 years, mid term options could likely occur within 3 to 5 years, and long term options would take 6 years or more for implementation. **Table 5.1** and **Figure 5.2** at the end of this chapter summarize the recommended improvement options based on implementation time frames. The implementation timeframes are dependent on project development timing and funding availability.

It should be noted that MT-1 is a state designated scenic highway. As such, sensitivity to the scenic nature of the corridor is necessary when developing any improvement options. As improvement options move forward opportunity exists to implement context sensitive solutions into implementation and design.

5.1. Improvement Strategies Explored

General improvement option "types" were considered and recommended to address previously defined areas of concern. The various improvement option types are discussed in the following sections.

5.1.1. Geometrics

Roadway geometrics were compared to current MDT standards. The analysis identified potential strategies that may help correct some of the identified issues, and/or minimize potential effects. Some of the strategies examined are:

- Expand roadway widths via shoulder widening and/or frontage roads.
- Modify sub-standard vertical curves to bring vertical curves up to current MDT standards.
- Improve deficient vertical grades entering or leaving sub-standard vertical curves to comply with current MDT standards.
- Install advisory signs at sub-standard horizontal curves.
- Improve clear zones by flattening slopes or installing guardrail.

- Improve intersections by realigning minor approach legs, adding turn bays, improving signage or reducing vegetation to benefit sight distance.

5.1.2. Speeds

Speed issues have been identified by the community as one of the most important concerns. The issue of speeds and whether speed limits can be raised (or lowered) ultimately depend on the local governing body, in this case the ADLC Board of County Commissioners. Any request for speed limit changes from local government would need to be approved by the Transportation Commission. In examining speed issues, the following strategies were reviewed:

- Modify the posted speed limit in conjunction with road improvements in the 35 mph zone (RP 10.1 – RP 12.0).
- Continue seasonal speed limit reduction as a strategy to mitigate bighorn sheep collisions near RP 14.5.

5.1.3. Wildlife / Aquatics

Mitigation strategies to reduce wildlife-vehicle collisions were assessed through a variety of measures. Corridor carcass data for the time period 1999-2010 was obtained and reviewed to identify areas that may indicate geographical clusters of animal deaths or collisions. This information was measured against formal crash report data provided by law enforcement agencies, via MDT. Comments received from the various resource agencies, along with targeted outreach to the MFWP wildlife biologist, were used to develop potential strategies to benefit wildlife and reduce collision potential for the travelling public. The publication titled *Wildlife-Vehicle Collision Reduction Study: Report to Congress (FHWA-HRT-08-034)*, dated August 2008, was reviewed for potential broad range mitigation strategies that could be considered. Wildlife connectivity was also reviewed, on a high level, by examining carcass locations and comparing them to available mapping of individual species ranges. Major improvement options, if implemented, should include a review of wildlife connectivity issues with project level design.

Mitigation strategies attempting to reduce wildlife-vehicle collisions can be grouped into four distinct categories, as follows:

- Influence driver behavior;
- Influence animal behavior;
- Reduce wildlife population size; and
- Physically separate animals from the roadway.

After a review of potential strategies, the following were identified as being most appropriate given the concerns regarding wildlife within the corridor:

- Monitor wildlife crossing areas and implement mitigation strategies to minimize animal-vehicle conflicts. The incorporation of animal-detection system technologies should also be considered among the wildlife mitigation strategies.
- Develop a *Vegetation Management Plan* – Site-specific implementation of vegetation management in combination with fencing, at-grade crossings and signage during project level design may be the most feasible and effective wildlife-vehicle collision mitigation strategies for the corridor.
- Consider a wildlife overpass / underpass with appropriate fencing near RP 14.5 for bighorn sheep and other wildlife if funding allows.

5.1.4. Alternative Travel Modes

Strategies examined within the corridor to accommodate potential alternative travel modes included signage, widened shoulders and separated paths. The ADLC *Trails Master Plan* provides a long term vision for trails in Anaconda and Deer Lodge County including a separated path between the west limit of Anaconda to the West Valley (approximately 4.2 miles). Strategies applicable to alternative travel modes included:

- Separated path for the first four miles of the corridor.
- Minimum shoulder widths along the roadway to Georgetown Lake of at least 4 feet (each side).
- Appropriate signage.

5.1.5. Approaches

The first four miles of the corridor has a much higher access density; almost twice the density as the remainder of the corridor. The potential to consolidate or eliminate approaches was reviewed through roadway typical section changes (i.e. two-way left-turn lane (TWLTL) or frontage roads).

5.2. CORRIDOR-WIDE IMPROVEMENTS

A number of improvement options have been identified for the entire MT-1 study corridor. These improvement options address common issues and areas of concern occurring throughout the corridor. Some of the options, however, are more relevant to specific areas of the corridor rather than the entire study area. In these cases, anticipated implementation locations were identified.

1. SIGNING

Additional signing is needed for various areas identified in the study area. Deficient signing can increase the chance of driver error and potential for crashes. Proper roadway signing provides guidance, navigation, and increases driver performance.

1(a). Street Signing

Existing street signing is inconsistent with recent 911 routing completed in the study area. Areas exist without street signing, making it difficult for emergency vehicles and daily drivers to find their destinations. It is recommended that new street signs be installed as needed throughout the study area for consistency with 911 routing. This improvement option would be implemented and funded at the local level.

Estimated Cost: $500 EA

1(b). Scenic Highway Designation

MT-1 is designated as the "Pintler Veterans' Memorial Scenic Highway". Signing designating the route as the "Pintler Scenic Route" presently exists along the corridor. New signing is needed to match the current corridor designation. It is recommended that new signing designating MT-1 as the "Pintler Veterans' Memorial Scenic Highway" be installed. Since the initiation of this study, this recommended improvement option has been implemented.

Estimated Cost: $750 EA

1(c). Fire Department Signing

The West Valley Fire Department is accessed via MT-1 near West Valley. There presently is no signing indicating the Fire Department. Signing is needed to caution drivers about the possibility of fire trucks entering or exiting the study area. It is recommended that new signing be installed indicating the West Valley Fire Department. This improvement option would be implemented and funded at the local level.

Estimated Cost: $500 EA

2. WILDLIFE CONFLICTS

Animal-vehicle conflicts commonly occur throughout the study area and present a danger to human safety as well as wildlife survival. A number of improvement options are recommended to help reduce the number of these types of collisions. In addition, Improvement Option 6 has specific recommendations relating to bighorn sheep conflicts. The strategies identified under Improvement Option 6 may also be appropriate in other areas of the corridor. Some of these are identified below.

As data is collected and issues are defined, mitigation strategies for other wildlife, such as moose or deer, may include identifying ways to physically separate vehicles from wildlife. There is a high occurrence of moose/vehicle collisions in the area between Silver Lake and Georgetown Lake. Fencing, advance animal detection, signing, or speed reduction strategies may have merit in this area, as well as other areas of the corridor. These should be explored further as project development activities commence.

2(a). Wildlife Signing

Signing indicating the regular presence of wildlife in the area is intended to alert drivers of potential animal conflicts. Deer frequently occur throughout the corridor while moose are commonly found near the Anaconda Saddle Club (RP 13), near RP 21.0, and along Georgetown Lake. It is recommended that additional wildlife signing be installed as needed.

Estimated Cost: $500 EA

2(b). Animal Detection System

Animal detection systems use sensors to detect animals near roadways. When an animal is detected, warning signals and/or signs are activated to alert drivers that an animal may be on or near the roadway. It is recommended that animal detection systems be installed as needed.

Estimated Cost: $400,000

2(c). Wildlife Fencing

Wildlife fencing is intended to facilitate wildlife connectivity and reduce animal-vehicle collisions. Barrier fencing is intended as a means to separate animals from the roadway and is commonly used with wildlife underpasses and overpasses to allow for safe animal crossings by channelizing wildlife to desired crossing areas. Barrier fencing should only be installed in small sections, or in combination with crossing opportunities. It is important to maintain connectivity through the landscape and access to resources. Wildlife friendly fencing is also a valuable tool which encourages animal movements in locations of easier driver detection. It is recommended that a wildlife fencing strategy be developed that combines barrier fence with crossing opportunities and facilitates at-grade crossings in desirable locations.

Estimated Cost: $600,000

3. ACCESS CONTROL PLAN

In advance of long term improvement options identified later in this study, an *Access Control Plan* should be developed to address the high density of accesses within the corridor, especially in the first four miles. The plan should explore ways to eliminate, reduce, or combine accesses to individual properties. It is recommended that an *Access Control Plan* be developed for MT-1.

Estimated Cost: $75,000

4. VEGETATION MANAGEMENT PLAN

Areas with dense vegetation were identified as areas of concern due to decreased sight distances and clear zones. The area of the corridor between RP 12.4 and RP 14.2, for example, includes willow stands and high grass clusters in the roadside ditches, which presents driver sight distance concerns.

Additionally, whitetail deer and moose movements are frequently observed along the road within these heavy vegetative areas.

Before any vegetation removal activities are initiated, a *Vegetation Management Plan* should be developed for the entire corridor. The goals of the *Vegetation Management Plan* include maintenance of quality wildlife habitat along the corridor, providing cover for animal movements across the highway in appropriate locations, improved sight distance for driver detection of animals in the clear zone, maintenance of riparian zone integrity and wetland function, sediment/runoff control along Warm Springs Creek adjacent to the highway, and improvement of scenic and aesthetic values. Note that changes to existing vegetation may impact wildlife habitat and connectivity. It is recommended that a *Vegetation Management Plan* be developed for the corridor.

Estimated Cost: $40,000

5.3. Spot Improvement Options

In addition to the corridor-wide improvements, spot improvements were identified to address specific areas of concern. The location and description of each spot improvement option is included. In some locations, multiple spot improvements were identified for the same area of concern. In these instances, short, mid, and/or long term options were developed with the assumption that less costly and/or easy to implement projects could be developed quickly to help address the area of concern.

5. URBAN INTERFACE (RP 10.06 – RP 13.8)

The urban interface is defined as the West Valley area between RP 10.06 and RP 13.8. This area has high access density and low speed limits and is a transitional area to the Anaconda urban area.

This option is envisioned as a long-term improvement that will modify the urban interface of the corridor. The intent of long-term changes in this section of the corridor is to improve roadway geometrics, better manage access and to establish a speed limit that matches the roadside environment and driver expectations.

The 35 mph posted speed limit between RP 10.1 and RP 12.0 results in driver frustration. Safety data shows that the crash rate and the severity rate along the corridor are both lower than the statewide average for roadways of similar type and function. Data collection shows that the 85th percentile speed for this section of road is 42.2 mph, which is 7.2 mph higher than the posted speed.

5(a). Urban Interface - Typical Section #1 (RP 10.06 – RP 13.8)

It is recommended that the roadway between RP 10.06 and RP 13.8 be modified to incorporate Typical Section #1 – Two-Way Left-Turn Lane (TWLTL) with Frontage Road as shown in **Figure 5.1**. This typical section will provide a center TWLTL to accommodate westbound and eastbound left turning traffic from MT-1. The development of a frontage road on the north side of MT-1 will allow the consolidation and/or closure of numerous private approaches. The typical section

can accommodate local infrastructure plans for wastewater facility extension and a multi-use trail. It is recommended that the multiuse trail be placed between the edge of MT-1 and the proposed frontage road. The potential also exists for adding right-turn lanes at appropriate major access points on the north side of MT-1. The need and location of right-turn lanes would be explored during project development activities. Pedestrian signage should be incorporated into future project implementation as appropriate.

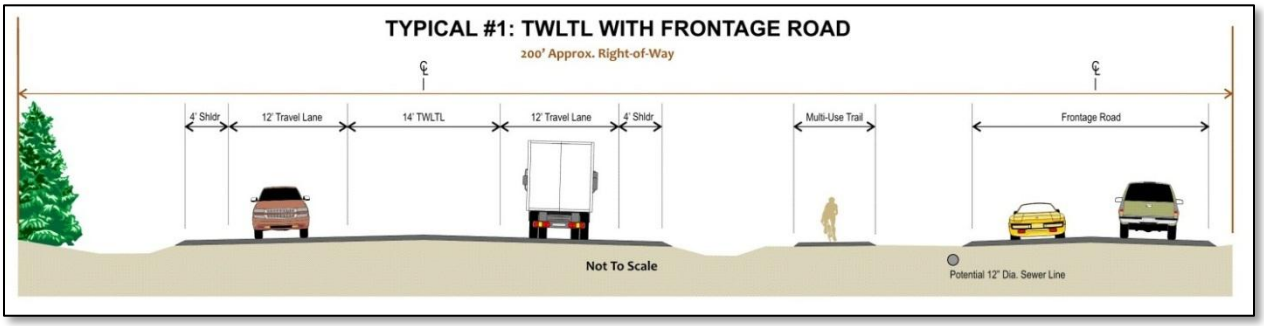


Figure 5.1: Typical Section #1 - TWLTL with Frontage Road

After the development of the TWLTL, it is recommended that the speed limit in the 35 mph posted speed limit area be increased to 45 mph with appropriate transitions. The speed limit can only be raised to 45 mph by petition of the ADLC Commissioners to the Montana Transportation Commission. Representatives of ADLC state that raising the speed limit in this segment will be supported if future improvements are implemented along the roadway as described under this improvement option.

The frontage road on the north side of MT-1, within the first 0.5 miles of the corridor (i.e. RP 10.06 to approximately RP 10.56), may not be necessary unless development occurs on currently vacant property to the north. The West Valley area is a designated growth area that likely will realize future development. If the undeveloped land in this area does develop, ADLC and MDT should review potential traffic impacts of the development(s) to identify the necessity and timing of frontage road implementation.

This improvement option may require wetland mitigation and may result in the removal of existing vegetation used by wildlife. The BA&P railroad spur on the north side of the road is a designated 4(f) property which may require additional environmental consideration.

Estimated Cost: $9,500,000

5(b). Vertical Curve Flattening (RP 10.9)

This area currently has a vertical curve that does not meet current MDT design standards. Substandard vertical curves can cause sight distance issues and decrease driver comfort levels. It is recommended that the vertical curve be modified to meet current MDT standards. This improvement option could be combined with Improvement Option 5(a) and implemented sooner if desired.

Estimated Cost: $25,000

6. BIGHORN SHEEP WILDLIFE CONFLICTS (RP 14.5)

A large bighorn sheep herd, known as the Lost Creek Herd, exists in this corridor study area. Bighorn sheep inhabit both sides of MT-1 throughout the corridor study area, but especially near the Wildlife Management Area at Garrity Mountain (approximately RP 14.5). Wildlife connectivity is a concern along the corridor as the bighorn sheep herd has been characterized as vulnerable by MFWP staff due to pneumonia outbreaks, vehicle collisions, subdivision encroachment, and natural attrition.

6(a). AT-GRADE WILDLIFE CROSSING AND SIGNAGE (RP 14.5)

A high concentration of bighorn sheep collisions have occurred near RP 14.5. Crash data analysis showed a high number of animal/vehicle collisions in this area. A wildlife crossing and additional signing would help facilitate at-grade crossing of bighorn sheep. An animal detection system is recommended under Improvement Option 2(b) and could be implemented in this area.

Temporary variable message signs have been used in the past to help warn drivers of potential bighorn sheep near the roadway. The temporary signs were used in conjunction with decreased speed limits and the removal of salt from roadway deicing in the area in response to the concentration of bighorn sheep collisions. It is recommended that permanent variable message signs be installed near RP 14.5.

Estimated Cost: $100,000 EA

6(b). SEASONAL SPEED REDUCTION (RP 14.3 – RP 15.3)

During the winter and spring of 2010 / 2011 a temporary speed zone of 45 mph was established between RP 14.3 and RP 15.3, in the 70 mph speed zone, to help address bighorn sheep conflicts in the area. The temporary speed zone was part of multiple measures, including changes in maintenance practices and seasonal variable message signing, aimed to decrease animal vehicle collisions. Crash data analysis resulted in an identifiable trend with animal vehicle collisions in this area.

It is recommended that the 45 mph seasonal speed zone be continued between RP 14.3 and RP 15.3 during winter and spring time periods when bighorn sheep are in the area. MFWP biologists have expressed that this mitigation measure has had positive results to date. Long term monitoring should be performed to evaluate the continued effectiveness of this strategy. The effectiveness of this strategy may be enhanced through the use of permanent variable message signs as described in Improvement Option 6(a).

Estimated Cost: LABOR – This improvement option is expected to require little financial costs; however, additional labor costs may be associated with this recommendation.

6(c). Wildlife Underpass (RP 14.5)

This improvement option pertains to a grade separated wildlife underpass crossing near RP 14.5 for the benefit of bighorn sheep and mule deer. Crash data analysis resulted in an identifiable trend with animal/vehicle collisions in this area. The feasibility of a wildlife underpass is advanced in this study. The use of wildlife underpasses depends on many parameters, including location in the landscape, dimensions, the habitat surrounding the structure, human co-use, and the time since installation (i.e. learning curve for animals).

There are notable potential constraints related to a wildlife underpass at this location. These constraints include close proximity to Warm Springs Creek, high groundwater in the immediate area, and lack of topographical relief in the general area. In addition, there may be concerns with wildlife fencing restricting connectivity to adjacent private and public lands. Although wildlife fencing has proven to be a successful mitigation strategy for wildlife, fencing in this area may impede local resident's movement across the highway via motorized and non-motorized modes.

The success of developing this type of wildlife mitigation strategy depends on the forming of partnerships between affected agencies, interest groups and the local community. As a long-term strategy, this improvement option should be evaluated in greater detail as monitoring data on short- and mid- term strategies is collected and analyzed to determine effectiveness and potential future need.

The planning level cost estimate for a wildlife underpass only includes the structure and changes to the road grade and other associated impacts (approach modifications, culvert extensions, etc.).

Estimated Cost: $810,000

7. LIME SPUR ROAD INTERSECTION (RP 15.0)

The intersection of Lime Spur Road with MT-1, located at RP 15.0, causes operational concerns due to its heavy skew angle to the highway. Lime Spur Road is the primary access to several residences, and is in an area where the posted speed is 70 mph, except during the seasonal speed reduction for bighorn sheep, when it becomes 45 mph. There are three recommended improvement options at this intersection which represent a range of improvement types. During project development activities, the opportunity may exist to combine one or more of these recommended improvements.

7(a). Lime Spur Road Intersection – Advance Warning Signs (RP 15.0)

This improvement is recommended as a short-term improvement for the intersection of Lime Spur Road and MT-1. It is recommended that advance intersection warning signs be installed in both directions along MT-1 at the intersection with Lime Spur Road.

Estimated Cost: $500 EA

7(b). LIME SPUR ROAD INTERSECTION – REALIGNMENT (RP 15.0)

The south leg of the intersection (i.e. Lime Spur Road) is heavily skewed to MT-1. The intersection should be aligned perpendicular with MT-1 to create a conventional "tee" intersection. It is recommended that Lime Spur Road be realigned and paved at the intersection with MT-1.

Additional environmental consideration may be necessary for this improvement option due to a leaking underground storage tank located in the area of potential realignment.

Estimated Cost: $50,000

7(c). LIME SPUR ROAD INTERSECTION – LEFT-TURN LANE (RP 15.0)

A westbound left-turn lane is recommended at the intersection of MT-1 and Lime Spur Road. This option would provide an opportunity for left-turning traffic to exit the mainline traffic stream. It is recommended that a westbound left-turn lane be constructed along MT-1 at the intersection with Lime Spur Road.

Estimated Cost: $100,000

8. VERTICAL CURVE FLATTENING (RP 15.3 – 15.8)

This improvement option has been identified between RP 15.3 and RP 15.8. This area, commonly referred to as the "camel humps", has two vertical curves that do not meet current MDT design standards. A long-term improvement option is to flatten and/or lengthen the vertical curves to bring the geometrics up to current standards.

It is recommended that the vertical curves be modified to meet current MDT standards. According to carcass reports for the time period 1999 to 2010, this area exhibits a high occurrence of mule deer collisions. During project development activities, specific mitigation measures to reduce mule deer collision occurrence should be examined.

Estimated Cost: $375,000

9. SPRING HILL ROAD INTERSECTION (RP 19.9)

The intersection of Spring Hill Road with MT-1, located at RP 19.9, causes operational concerns due to its heavy skew angle to the highway. The Spring Hill Road intersection provides access to recreational areas and to a local water spring. The intersection is in an area where the posted speed is 70 mph and there are two westbound travel lanes.

9(a). Spring Hill Road Intersection – Advance Warning Signs (RP 19.9)

This improvement is recommended as a short-term improvement for the intersection of Spring Hill Road and MT-1. It is recommended that advance intersection warning signs be installed in both directions along MT-1 at the intersection with Spring Hill Road.

Estimated Cost: $500 EA

9(b). Spring Hill Road Intersection – Realignment (RP 19.9)

The south leg of the intersection (i.e. Spring Hill Road) is heavily skewed to MT-1. The intersection should be aligned perpendicular with MT-1 to create a conventional "tee" intersection. It is recommended that Spring Hill Road be realigned and paved at the intersection with MT-1.

Impacts to existing streams and wetlands, particularly near Cable Creek, will need to be considered under this improvement option.

Estimated Cost: $100,000

10. ROCK CUT SLOPES (RP 21.1 – RP 23.1)

Multiple steep rock cut slopes exist within the MT-1 clear zone between RP 21.1 and RP 23.1. Multiple improvement options are identified to help mitigate fallen rocks and steep cut slopes in this area. During project development activities, the opportunity may exist to combine one or more of these recommended improvements.

10(a). Rockfall Maintenance (RP 21.1 – RP 23.1)

Rocks commonly fall into ditches and along the edge of roadway creating safety hazards. Rocks along the roadway within the clear zone should be removed. It is recommended that maintenance measures be taken to remove rock debris between RP 21.1 and RP 23.1.

Estimated Cost: LABOR – This improvement option is expected to require little financial costs; however, additional labor costs may be associated with this recommendation.

10(b). Rockfall Protection Netting (RP 21.1 – RP 23.1)

Rock fall protection netting provides a boundary between rock debris and the roadway to prevent rocks from falling onto the roadway and roadside ditches. It is recommended that rock fall protection netting be installed along rock cut slopes between RP 21.1 and RP 23.1.

Estimated Cost: $400,000

11. HORIZONTAL CURVE SIGNING (RP 22.9 – RP 23.2)

Two horizontal curves between RP 22.9 and RP 23.2 have been identified as having radii that do not meet current MDT design standards. Curves that do not meet current standards can cause potential safety hazards unless properly mitigated. Currently, advance signing warning of the curves is not present. It is recommended curve advisory signs be installed for the horizontal curves between RP 22.9 and RP 23.2 in accordance with current standards.

Estimated Cost: $500 EA

12. DENTON POINT ROAD INTERSECTION (RP 24.2)

The intersection of Denton Point Road (locally known as Georgetown Lake Road) with MT-1, located at RP 24.2, has poor sight distances and substandard geometrics. An existing westbound left-turn lane presently exists at the intersection along MT-1. Improvements for this intersection are recommended and consist of five separate recommendations. During project development activities, the opportunity may exist to combine one or more of these recommended improvements.

12(a). VERTICAL CURVE FLATTENING (RP 23.9)

This improvement option has been identified at RP 23.9. A vertical curve that does not meet current MDT design standards exists before the intersection with Denton Point Road. A long-term improvement option is to flatten or lengthen the vertical curve to bring the geometrics up to current standards. It is recommended that the vertical curve be modified to meet current MDT standards.

The Silver Lake irrigation system is a designated 4(f) property and may require additional environmental consideration under this improvement option.

Estimated Cost: $125,000

12(b). HORIZONTAL CURVE SIGNING (RP 24.0)

The horizontal curve located at RP 24.0 just before the intersection with Denton Point Road has a radius that does not meet current MDT design standards. Curves that do not meet current standards can cause potential safety hazards unless properly mitigated. Currently, advance signing warning of the curves is not present. Although the reconstruction of this curve as a stand-alone improvement was explored, the existing curve is very close to meeting the required standard and it was determined to install advance warning signs with an advisory speed. It is recommended curve advisory signs be installed for the horizontal curve at RP 24.0 in accordance with current standards.

Estimated Cost: $500 EA

12(c). Flatten Cut Slopes (RP 24.0)

Existing cut slopes along the inside of the horizontal curve located near the Denton Point Road intersection are steep. The existing cut slopes, combined with the substandard horizontal curve, limit sight distances and create potential safety hazards. It is recommended that cut slopes along the inside of the horizontal curve at RP 24.0 be flattened.

The Silver Lake irrigation system is a designated 4(f) property and may require additional environmental consideration under this improvement option.

Estimated Cost: $50,000

12(d). Denton Point Road Intersection – Advance Warning Signs (RP 24.2)

This improvement is recommended as a short-term improvement for the intersection of Denton Point Road and MT-1. It is recommended that advance intersection warning signs be installed in both directions along MT-1 at the intersection with Denton Point Road.

Estimated Cost: $500 EACH

12(e). Denton Point Road Intersection – Flatten Approach (RP 24.2)

The west leg of the intersection (i.e. Denton Point Road) has a steep approach grade which creates a potential safety hazard. The geometrics at this location should be improved to reduce grades and increase safety. It is recommended that the Denton Point Road approach be flattened at the intersection with MT-1.

The Silver Lake irrigation system is a designated 4(f) property and may require additional environmental consideration under this improvement option.

Estimated Cost: $50,000

13. ROADWAY WIDENING (RP 24.2 – RP 27.35)

MT-1 between RP 24.2 and RP 27.35 is only 24 feet wide between edges of pavement and has deteriorating surfacing. Current MDT standards call for a minimum roadway width of 28 feet for a Rural Minor Arterial roadway.

An improvement option was considered to simply construct 4-foot shoulders along the existing edge of roadway. However, due to the poor existing surfacing condition, as well as the potential impacts to the adjacent area, it was assumed that the entire roadway section would be reconstructed.

Opportunities should be explored to perpetuate animal and aquatic connectivity during reconstruction efforts. Based on a review of carcass reports for the time period of 1999 thru 2010, eleven moose carcasses were recovered between RP 23.2 and 26.2. Regarding fisheries, there is a pond located east of the roadway near RP 26.5 that serves as a rearing pond for fish. The potential exists to improve aquatic connectivity to this pond with this improvement option.

It is recommended that MT-1 be reconstructed to a minimum width of 32 feet between RP 24.2 and RP 27.35. Special consideration should be given to designing features that will better address the numerous informal recreational parking areas along the roadway.

Impacts to existing streams and wetlands, particularly along Georgetown Lake and near North Fork Flint Creek, will need to be considered under this improvement option. In addition, two 4(f) properties are present in the area (Silver Lake irrigation system and Malvey Cabin) and may require additional environmental consideration.

Estimated Cost: $3,750,000

14. GUARDRAIL (RP 24.8 – RP 26.8)

Multiple areas with steep fill slopes within the roadway clear zones exist between RP 24.8 and RP 26.8. These areas are potential safety hazards due to the steep slopes. Across from Georgetown Lake is an existing water feature (pond) which may also be a candidate for protection with guardrail. The pond is important for fish rearing and presents a clear zone concern. Total reconstruction of the roadway in these areas is included under Improvement Option 13; however, until which time this occurs a stand-alone option is to incorporate guardrail in this area. It is recommended the guardrail be installed along areas with steep fill slopes between RP 24.8 and RP 26.8.

Estimated Cost: $200,000

15. FLATTEN CUT SLOPES (RP 25.0 – RP 25.3)

Steep cut slopes along the horizontal curve between RP 25.0 and RP 25.3 limit sight distance and create potential safety hazards. This improvement option recommends that the cut slopes be flattened to increase sight distances and increase safety. It is recommended the cut slopes between RP 25.0 and 25.3 be flattened.

Estimated Cost: $50,000

16. DISCOVERY ROAD INTERSECTION (RP 25.5)

The intersection of Discovery Road with MT-1, located at RP 25.5, causes operational concerns due to poor intersection definition. Discovery Road provides access to multiple recreation areas, including Discovery Ski Area, as well as the Georgetown residential area. The speed limit at this location is 60 mph. There are three recommended improvement options at this intersection which represent a range of improvement types. During project development activities, the opportunity may exist to combine one or more of these recommended improvements.

16(a). Discovery Road Intersection – Advance Warning Signs (RP 25.5)

This improvement is recommended as a short-term improvement for the intersection of Discovery Road and MT-1. It is recommended that advance intersection warning signs be installed in both directions along MT-1 at the intersection with Discovery Road.

Estimated Cost: $500 EA

16(b). Discovery Road Intersection – Realignment (RP 25.5)

The northeast leg of the intersection (i.e. Discovery Road) has poor geometric definition and is skewed to MT-1. It is recommended that Discovery Road be realigned perpendicular with MT-1 to create a conventional "tee" intersection.

Estimated Cost: $50,000

16(c). Discovery Road Intersection – Right-Turn Lane (RP 25.5)

A northbound right-turn lane is recommended at the intersection of MT-1 and Discovery Road. This option would provide opportunity for right-turning traffic to exit the mainline traffic stream. It is recommended that a northbound right-turn lane be constructed along MT-1 at the intersection with Discovery Road.

Estimated Cost: $100,000

16(d). Discovery Road Intersection – Left-Turn Lane (RP 25.5)

A southbound left-turn lane is recommended at the intersection of MT-1 and Discovery Road. This option would provide opportunity for left-turning traffic to exit the mainline traffic stream. During high-use recreational times, particularly during the winter, vehicle stacking occurs at this intersection due to high volumes of southbound left-turning vehicles. It is recommended that a southbound left-turn lane be constructed along MT-1 at the intersection with Discovery Road.

Estimated Cost: $100,000

17. CONCRETE BRIDGE ENDS (RP 25.9)

An existing box culvert located at RP 25.9 has concrete bridge ends which are located close to the edge of roadway. There is currently no protection around the concrete ends which are within the roadway clear zone and are potential safety hazards. Total reconstruction of the roadway in this area is included under Improvement Option 13; however, until which time this occurs a stand-alone option is to incorporate guardrail around the concrete bridge ends. It is recommended that guardrail be installed around the concrete bridge ends at RP 25.9. Long term, improvements to the box culvert may be warranted in conjunction with Improvement Option 13.

Estimated Cost: $25,000

18. HORIZONTAL CURVE SIGNING (RP 27.1)

The horizontal curve located at RP 27.1 has a radius that does not meet current MDT design standards. Curves that do not meet current standards can cause potential safety hazards unless properly mitigated. Currently, advance signing warning of the curves is not present. Although the reconstruction of this curve as a stand-alone improvement was explored, the existing curve is very close to meeting the required standard and it was determined to install advance warning signs with an advisory speed. It is recommended curve advisory signs be installed for the horizontal curve at RP 27.1 in accordance with existing standards.

Estimated Cost: $500 EA

19. GEORGETOWN LAKE ROAD INTERSECTION (RP 27.35)

The intersection of Georgetown Lake Road with MT-1, located at RP 27.35, causes operational concerns due to roadway geometrics and limited sight distances. Georgetown Lake Road provides access to the west side of Georgetown Lake. Multiple recreation and residential areas are accessed from Georgetown Lake Road. There are three recommended improvement options at this intersection which represent a range of improvement types. During project development activities, the opportunity may exist to combine one or more of these recommended improvements. These improvement options could be combined with Improvement Option 13 which recommends full reconstruction between RP 24.2 and RP 27.35.

19(a). VERTICAL CURVE FLATTENING (RP 27.3)

A vertical curve exists at RP 27.3 just before the intersection with Georgetown Lake Road and does not meet current MDT design standards. The location of the vertical curve in relation to the intersection reduces sight distances and creates potential safety hazards. This long-term improvement option is to flatten or lengthen the vertical curve to bring the geometrics up to current standards. It is unknown how this improvement option would impact the Georgetown Lake Dam. It is recommended that the vertical curve be modified to meet current MDT standards.

Estimated Cost: $125,000

19(b). GEORGETOWN LAKE ROAD INTERSECTION – ADVANCE WARNING SIGNS (RP 27.35)

This improvement is recommended as a short-term improvement for the intersection of Georgetown Lake Road and MT-1. It is recommended that advance intersection warning signs be installed in both directions along MT-1 at the intersection with Georgetown Lake Road.

Estimated Cost: $500 EA

19(c). Georgetown Lake Road Intersection – Left-Turn Lane (RP 27.35)

A northbound left-turn lane is recommended at the intersection of MT-1 and Georgetown Lake Road. This option would provide opportunity for left-turning traffic to exit the mainline traffic stream. It is recommended that a westbound left-turn lane be constructed along MT-1 at the intersection with Georgetown Lake Road.

Estimated Cost: $100,000

5.4. Improvement Options Considered but Not Advanced

The following improvement options were considered but ultimately not advanced into recommended improvement options:

6(d). Wildlife Overpass (RP 14.5)

This improvement option pertains to a grade separated wildlife overpass crossing near RP 14.5 for the benefit of bighorn sheep and mule deer. Crash data analysis resulted in an identifiable trend with animal/vehicle collisions in this area. Although wildlife overpasses are increasingly being explored as a feasible strategy to physically separate animals from the road environment, there is not enough supporting data on the effectiveness of a wildlife overpass for bighorn sheep to date.

In addition, there are concerns with wildlife fencing restricting connectivity in this area. Although wildlife fencing has proven to be a successful mitigation strategy for other types of wildlife, fencing in this area may impede local resident's movement across the highway via motorized and non-motorized modes. MFWP biologists have expressed that the measures implemented over the last two years have had positive results. These measures have included the removal of salt in winter sand mixtures, and the use of a lower variable speed limit in winter. While these measures have been viewed as positive, long term monitoring is needed to evaluate their effectiveness over time.

The future feasibility of a wildlife overpass may be revisited over time as more data becomes available on their effectiveness for bighorn sheep. The success of developing this type of high cost strategy depends on the forming of partnerships between affected agencies, interest groups and the local community. As the management of the adjacent lands intensifies to protect this valuable resource, and more data becomes available on short term mitigation strategies, the issue of a wildlife overpass in this area should be reevaluated.

10(c). Flatten Cut Slopes (RP 21.1 – RP 23.1)

Steep cut slopes exist between RP 21.1 and RP 23.1 resulting in fallen rocks, decreased clear zones, and potential safety hazards.

The MDT Road Design Manual suggests that in areas of steep rock slopes maintenance activities (i.e. rock removal) and/or barriers be pursued as mitigation unless a potential hazard exists. In this area, sight distance is adequate and mitigation such as rock netting will prohibit rocks from falling on the roadway.

5.5. Improvement Options Summary and Implementation

The recommended improvement options identified in this chapter were based on the evaluation of several factors, including but not limited to field review, engineering analysis of as-built drawings, crash data analysis, consultation with various resource agencies, and information provided by the general public.

The improvement options identified for advancement are intended to offer a range of potential mitigation strategies for corridor issues and areas of concern. Small scale improvement options have been identified and may be as simple as adding advance warning signs at intersections or installing advisory speed limit signs. Larger, more complex improvements are also envisioned. These include complete roadway reconstruction between RP 10.06 and RP 13.8 (i.e. West Valley), and reconstruction of MT-1 near Georgetown Lake between RP 24.20 and RP 27.35. Intersection improvements have also been identified, and during project development activities the potential may exist to combine improvement options for ease of implementation and other efficiencies.

Wildlife and aquatic concerns are found throughout the entire corridor. The area near RP 14.5 is a known bighorn sheep area of concern, and the perpetuation of strategies currently ongoing may allow for the continued reduction in animal/vehicle collisions at this location. Collision occurrences with moose have been frequently documented near Georgetown Lake. The recommended improvement options recognize the impact of the roadway on wildlife resources, and offers potential mitigation strategies that may be candidates for further exploration during project development activities.

The improvement options have been categorized into implementation timeframes:

- **Short Term** – Designated to occur within a 0 to 2 year period.
- **Mid Term** – Improvements would occur in a 3 to 5 year period.
- **Long Term** – Improvements would occur during a time period of 6 years or more.

Tabular summaries of the recommended improvement options, broken out by implementation timeframe, are contained in **Table 5.1** and shown graphically in **Figure 5.2**.

5.5.1. Project Implementation

Project implementation is determined by a number of factors including need, funding, project timelines, and environmental factors. Roadway reconstruction and other costly improvement options are seen as long term recommendations and would likely take years before implemented. A

number of low cost short term improvement options have been identified, however, and would likely have a shorter project development time frame.

Improvement options may have several components that could be implemented with a phased approach. Specifically, Improvement Option 5 – Urban Interface recommends that MT-1 between RP 10.06 and RP 13.8 be reconstructed to include a center TWLTL, frontage road along the north side of the roadway, and a multi-use path. Opportunity exists to implement this recommendation in phases as need and funding becomes available. As development occurs in the area, ADLC and MDT should review potential traffic impacts to identify the necessity and timing of the improvements.

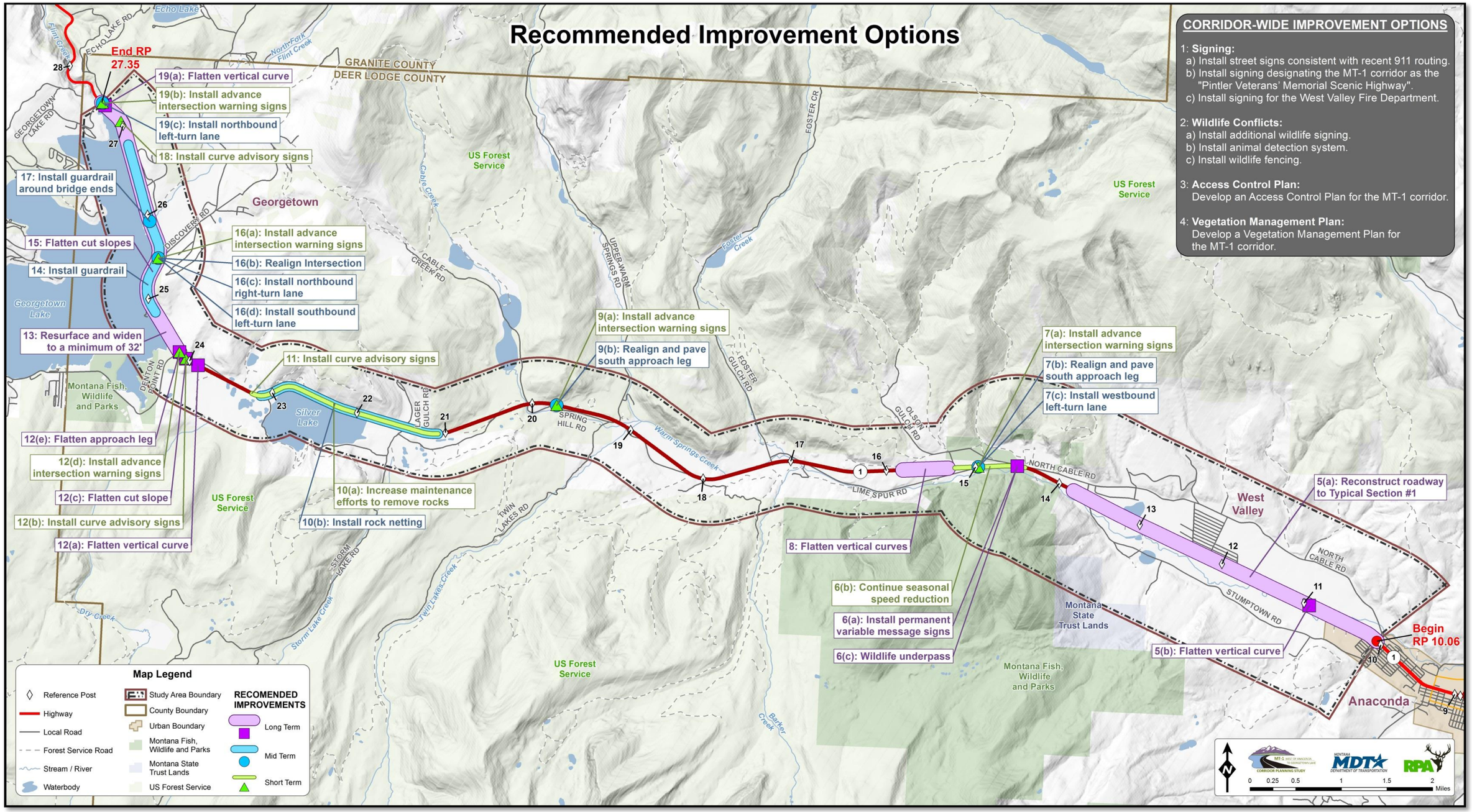


Figure 5.2: Recommended Improvement Options

Table 5.1: Recommended Short-Term Improvement Options

ID	NAME	LOCATION	IMPROVEMENT OPTION	ESTIMATED COST
1(a)	Street Signing	Corridor-Wide	Install street signs consistent with recent 911 routing	$500 EA
1(b)	Scenic Highway Designation	Corridor-Wide	Install signing designating the MT-1 corridor as the "Pintler Verterans' Memorial Scenic Highway"	$750 EA
1(c)	Fire Department Signing	Corridor-Wide	Install signing for the West Valley Fire Department	$500 EA
2(a)	Wildlife Signing	Corridor-Wide	Install signing warning of potential wildlife conflicts	$500 EA
4	Vegetation Management Plan	Corridor-Wide	Prepare Vegetative Management Plan	$40,000
6(b)	Seasonal Speed Reduction	14.3 - 15.3	Continue seasonal speed reduction	LABOR
7(a)	Lime Spur Road Intersection - Advance Warning Signs	15	Install advance intersection warning signs	$500 EA
9(a)	Spring Hill Road Intersection - Advance Warning Signs	19.9	Install advance intersection warning signs	$500 EA
10(a)	Rockfall Maintenance	21.1 - 23.1	Increase maintenance efforts to remove and clear rocks within the roadside clear zone	LABOR
11	Horizontal Curve Signing	22.9 - 23.2	Install curve advisory signs	$500 EA
12(b)	Horizontal Curve Signing	24	Install curve advisory signs	$500 EA
12(d)	Denton Point Road Intersection - Advance Warning Signs	24.2	Install advance intersection warning signs	$500 EA
16(a)	Discovery Road Intersection - Advance Warning Signs	25.5	Install advance intersection warning signs	$500 EA
18	Horizontal Curve Signing	27.1	Install curve advisory signs	$500 EA
19(b)	Georgetown Lake Road Intersection - Advance Warning Signs	27.35	Install advance intersection warning signs	$500 EA

Table 5.2: Recommended Mid-Term Improvement Options

ID	NAME	LOCATION	IMPROVEMENT OPTION	ESTIMATED COST
2(b)	Animal Detection System	Corridor-Wide	Install animal detection system	$400,000
2(c)	Wildlife Fencing	Corridor-Wide	Install wildlife fencing	$600,000
3	Access Control Plan	Corridor-Wide	Develop an Access Control Plan for the MT-1 corridor	$75,000
7(b)	Lime Spur Road Intersection - Realignment	15	Realign and pave south approach leg	$50,000
7(c)	Lime Spur Road Intersection - Left-Turn Lane	15	Install westbound left-turn lane	$100,000
9(b)	Spring Hill Road Intersection - Realignment	19.9	Realign and pave south approach leg	$100,000
10(b)	Rock Fall Protection Netting	21.1 - 23.1	Install rock netting	$400,000
14	Guardrail	24.8 - 26.8	Install guardrail	$200,000
16(b)	Discovery Road Intersection - Realignment	25.5	Realign Intersection	$50,000
16(c)	Discovery Road Intersection - Right-Turn Lane	25.5	Install northbound right-turn lane	$100,000
16(d)	Discovery Road Intersection - Left-Turn Lane	25.5	Install southbound left-turn lane	$100,000
17	Concrete Bridge Ends	25.9	Install guardrail around bridge ends	$25,000
19(c)	Georgetown Lake Road Intersection - Left-Turn Lane	27.35	Install northbound left-turn lane	$100,000

Table 5.3: Recommended Long-Term Improvement Options

ID	NAME	LOCATION	IMPROVEMENT OPTION	ESTIMATED COST
5(a)	Urban Interface - Typical Section #1	10.06 - 13.8	Reconstruct roadway to incorporate a TWLTL, frontage road, and multi-use path	$9,500,000
5(b)	Vertical Curve Flattening	10.9	Flatten vertical curve	$25,000
6(a)	At-Grade Wildlife Crossing and Signage	14.5	Install permanent variable message signs	$100,000 EA
6(c)	Wildlife Underpass	14.5	Install wildlife underpass crossing	$810,000
8	Vertical Curve Flattening	15.3 - 15.8	Flatten vertical curves	$375,000
12(a)	Vertical Curve Flattening	23.9	Flatten vertical curve	$125,000
12(c)	Flatten Cut Slopes	24	Flatten cut slope	$50,000
12(e)	Denton Point Road Intersection - Flatten Approach	24.2	Flatten approach leg	$50,000
13	Roadway Widening	24.2 - 27.35	Resurface and widen to a minimum of 32'	$3,750,000
15	Flatten Cut Slopes	25.0 - 25.3	Flatten cut slopes	$50,000
19(a)	Vertical Curve Flattening	27.3	Flatten vertical curve	$125,000

Chapter 6. Funding Mechanisms

MDT administers a number of programs that are funded from state and federal sources. Because MT-1 is on a designated federal-aid highway system, there are a number of potential funding programs that may be used to fund all or portions of any future improvements.

Each year, in accordance with 60-2-127, Montana Code Annotated (MCA), the Montana Transportation Commission allocates a portion of available federal-aid highway funds for construction purposes and for projects located on various systems in the state as described throughout this chapter.

6.1. Federal Funding Sources

The following summary of major Federal transportation funding categories received by the State through the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) enacted on August 10, 2005, includes state developed implementation / sub-programs that may be potential sources for any projects developed along MT-1 in the study area. In order to receive project funding under these programs, projects must be included in the State Transportation Improvement Program (STIP). This is the most likely source of funding for this corridor.

6.1.1. Surface Transportation Program (STP)

Surface Transportation Program (STP) funds are Federally apportioned to Montana and allocated by the Montana Transportation Commission to various programs.

Primary Highway System (STPP) [8]

The Federal and State funds available under this program are used to finance transportation projects on the state-designated primary highway system. The primary highway system includes highways that have been functionally classified by MDT as either principal or minor arterials and that have been selected by the Montana Transportation Commission to be placed on the primary highway system [MCA 60-2-125(3)]. MT-1 is a designated primary highway.

Allocations and Matching Requirements

Primary funds are distributed statewide (MCA 60-3-205) to each of five financial districts, including the Butte District. The Commission distributes STPP funding based on system performance. Of the total received, 86.58 percent is Federal and 13.42 percent is non-federal match. Normally, the match on these funds is from the Highway State Special Revenue Account.

[8] State funding programs developed to distribute Federal funding within Montana

Eligibility and Planning Considerations

Eligible activities for use of the primary funds include construction, reconstruction, resurfacing, restoration, and operational improvements. The Montana Transportation Commission establishes priorities for the use of primary funds and projects are let through a competitive bidding process.

The Butte District, which includes the MT-1 corridor, is anticipated to receive an average annual STPP funding level of about $23 million during the next five years. Current Butte District priorities already under development total an estimated construction cost of about $125 million. Given the estimated range of planning level costs of improvement options to MT-1, STPP funding for the improvement options is highly unlikely over the short term, but may be available in seven years depending on other STPP needs within the Butte District.

Community Transportation Enhancement Program (CTEP) [9]

Federal law requires that at least 10 percent of STP funds be spend on transportation enhancement projects. The Montana Transportation Commission created CTEP in cooperation with the Montana Association of Counties (MACO) and the League of Cities and Towns to comply with this Federal requirement.

Allocations and Matching Requirements

CTEP is a unique program that distributes funding to local and tribal governments based on a population formula and provides project selection authority to local and tribal governments. The Transportation Commission provides final approval to CTEP projects within the State's right-of-way. The Federal share for CTEP projects is 86.58 percent with local and tribal governments being responsible for the remaining 13.42 percent.

Eligibility and Planning Considerations

Eligible CTEP categories include:

- Pedestrian and bicycle facilities
- Historic preservation
- Acquisition of scenic easements and historic or scenic sites
- Archeological planning and research
- Mitigation of water pollution due to highway runoff or reduce vehicle-caused
- Wildlife mortality while maintaining habitat connectivity

[9] State funding programs developed to distribute Federal funding within Montana

- Scenic or historic highway programs including provisions of tourist and welcome center facilities
- Landscaping and other scenic beautification
- Preservation of abandoned railway corridors (including the conversion and use for bicycle or pedestrian trails)
- Control and removal of outdoor advertising
- Establishment of transportation museums
- Provisions of safety and educational activities for pedestrians and bicyclists.

Projects addressing these categories and that are linked to the transportation system by proximity, function or impact, and where required, meet the "historic" criteria, may be eligible for enhancement funding.

Projects must be submitted by the local government to MDT, even when the project has been developed by another organization or interest group. Project proposals must be evidence of public involvement in the identification and ranking of enhancement projects. Local governments are encouraged to use their planning boards, where they exist, for the facilitation of public participation; or a special enhancement committee. MDT staff reviews each project proposal for completeness and eligibility and submits them to the Transportation Commission and the FHWA for approval.

6.1.2. Highway Bridge Replacement and Rehabilitation Program (HBRRP)

Allocations and Matching Requirements

HBRRP funds are Federally apportioned to Montana and allocated to two programs by the Montana Transportation Commission. 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. The Montana Transportation Commission approves projects which are then let to contract through a competitive bidding process.

On-System Bridge Replacement and Rehabilitation Program

The On-System Bridge Program receives 65% percent of the Federal HBRRP funds. Projects eligible for funding under the On-System Bridge Program include all highway bridges on the State system. The bridges are eligible for rehabilitation or replacement. In addition, painting and seismic retrofitting are also eligible under this program. MDT's Bridge Bureau assigns a priority for replacement or rehabilitation of structurally deficient and functionally obsolete structures based upon sufficiency ratings assigned to each bridge. A structurally deficient bridge is eligible for rehabilitating or replacement; a functionally obsolete bridge is eligible only for rehabilitation; and a bridge rated as sufficient is not eligible for funding under this program.

6.1.3. Discretionary Funds

Discretionary funds may be received through either highway program authorization or annual appropriations processes. These funds are generally described as "demonstration" or "earmark" funds. Receiving Discretionary funds has been a viable mechanism for local governments to secure federal funding for projects. If a local sponsored project receives these types of funds, MDT will administer the funds in accordance with the Montanan Transportation Commission Policy #5 – "*Policy resolution regarding Congressionally directed funding: including Demonstration Projects, High Priority Projects, and Project Earmarks.*"

6.1.4. Federal Lands Highway Program (FLHP)

FLHP is a coordinated Federal program that includes several funding categories; MT-1 may be eligible for some of these categories.

Public Lands Highways (PLH)

Discretionary

The PLH Discretionary Program provides funding for projects on highways that are within, adjacent to, or provide access to Federal public lands. As a discretionary program, the project selection authority rests with the Secretary of Transportation. However, this program has been earmarked by Congress under SAFETEA-LU. There are no matching fund requirements.

Forest Highway

The Forest Highway Program provides funding to projects on routes that have been officially designated as Forest Highways. Projects are selected through a cooperative process involving FHWA, the US Forest Service and MDT. Projects are developed by FHWA's Western Federal Lands Office. There are no matching fund requirements.

6.2. STATE FUNDING SOURCES

State Funded Construction (SFC)

Allocations and Matching Requirements

The State Funded Construction Program, which is funded entirely with state funds from the Highway State Special Revenue Account, typically provides funding for projects that are not eligible for Federal funds. This program is totally State funded, requiring no match.

Eligibility and Planning Considerations

This program funds projects to preserve the condition and extend the service life of highways. Eligibility requirements are that the highways be maintained by the State. MDT staff nominates the projects based on pavement preservation needs. The District's establish priorities and the Transportation Commission approves the program. Funding for this corridor from this source would depend on availability and need.

6.3. LOCAL / PRIVATE FUNDING SOURCES

Local governments generate revenue through a variety of funding mechanisms. Typically, several local programs related to transportation exist for budgeting purposes and to disperse revenues. These programs are tailored to fulfill specific transportation functions or provide particular services.

6.3.1. Deer Lodge County

Road Fund

The County Road Fund provides for the construction, maintenance, and repair of all county roads outside the corporate limits of cities and towns in Deer Lodge County. Revenue for this fund comes from intergovernmental transfers (i.e., State gas tax apportionment and motor vehicle taxes), and a mill levy assessed against county residents living outside cities and towns. The county mill levy has a ceiling limit of 15 mills.

County Road Fund monies are primarily used for maintenance with little allocated for new road construction. It should be noted that only a small percentage of the total miles on the county road system are located in the study area. Projects eligible for financing through this fund will be competing for available revenues on a county-wide basis.

Special Revenue Funds

Special revenue funds may be used by the county to budget and distribute revenues legally restricted to a specific purpose. Several such funds that benefit the transportation system are discussed briefly in the following paragraphs.

Capital Improvements Fund

This fund is used to finance major capital improvements to county infrastructure. Revenues are generated by loans from other county funds, and must be repaid within ten years. Major road construction projects are eligible for this type of financing.

Rural Special Improvement District (RSID) Revolving Fund

This fund is used to administer and distribute monies for specified RSID projects. Revenue for this fund is generated primarily through a mill levy and through motor vehicle taxes and fees. A mill levy is assessed only when delinquent bond payments dictate such an action.

Special Bond Funds

A fund of this type may be established by the county on an as-needed basis for a particularly expensive project. The voters must approve authorization for a special bond fund. The county is not currently using this mechanism.

6.3.2. Private Funding Sources and Alternatives

Private financing of highway improvements, in the form of right-of-way donations and cash contributions, has been successful for many years. In recent years, the private sector has recognized that better access and improved facilities can be profitable due to increases in land values and commercial development possibilities. Several forms of private financing for transportation improvements used in other parts of the United States are described in this section.

Development Financing

The developer provides the land for a transportation project and in return, local government provides the capital, construction, and necessary traffic control. Alternatively, developer constructs necessary roadway improvements as a condition for access approval. Such a financing measure can be made voluntary or mandatory for developers.

Cost Sharing

The private sector pays some of the operating and capital costs for constructing transportation facilities required by development actions.

Transportation Corporations

These private entities are non-profit, tax exempt organizations under the control of state or local government. They are created to stimulate private financing of highway improvements.

Road Districts

These are areas created by a petition of affected landowners, which allow for the issuance of bonds for financing local transportation projects.

Private Donations

The private donation of money, property, or services to mitigate identified development impacts is the most common type of private transportation funding. Private donations are very effective in areas where financial conditions do not permit a local government to implement a transportation improvement itself.

General Obligation (G.O.) Bonds

The sale of general obligation bonds could be used to finance a specific set of major highway improvements. A G.O. bond sale, subject to voter approval, would provide the financing initially required for major improvements to the transportation system. The advantage of this funding method is that when the bond is retired, the obligation of the taxpaying public is also retired. State statutes limiting the level of bonded indebtedness for cities and counties restrict the use of G.O. bonds. The present property tax situation in Montana, and recent adverse citizen responses to proposed tax increases by local government, would suggest that the public may not be receptive to the use of this funding alternative.

Development Exactions/Impact Fees

As mentioned in the section on city funding sources, exaction of fees or other considerations from developers in return for allowing development to occur can be an excellent mechanism for improving the transportation infrastructure. Developer exactions and fees allow growth to pay for itself. The developers of new properties should be required to provide at least a portion of the added transportation system capacity necessitated by their development, or to make some cash contribution to the agency responsible for implementing the needed system improvements.

Establishment of an equitable fee structure would be required to assess developers based upon the level of impact to the transportation system expected from each project. Such a fee structure could be based upon the number of additional vehicle trips generated, or upon a fundamental measure such as square footage of floor space. Once the mechanism is in place, all new development would be reviewed by the local government and fees assessed accordingly.

Tax Increment Financing (TIF)

Increment financing has been used in many municipalities to generate revenue for public improvements projects. As improvements are made within the district, and as property values increase, the incremental increases in property tax revenue are earmarked for this fund. The fund is then used for improvements within the district. Expenditures of revenue generated by this method are subject to certain spending restrictions and must be spent within the district. Tax increment districts could be established to accomplish transportation improvements in other areas of the community where property values may be expected to increase.

Local Improvement District

This funding option is only applicable to counties wishing to establish a local improvement district for road improvements. While similar to an RSID, this funding option has the benefit of allowing counties to initiate a local improvement district through a more streamlined process than that associated with the development of an RSID.

Chapter 7. Conclusions and Next Steps

The segment of MT-1 from RP 10.06 to RP 27.35 was evaluated at a planning level to obtain an understanding of corridor needs, objectives, constraints and opportunities, funding availability, and to plan for long term corridor needs and develop a package of improvement options to address those needs. MDT initiated the development of this pre-NEPA/MEPA corridor planning study, with the cooperation of ADLC, to identify and evaluate improvement options to address the needs on this segment of MT-1.

After a comprehensive review of publically available information relative to environmental resources and existing infrastructure, coupled with focused outreach with the public, stakeholders, and various resource agencies, multiple improvement options were developed under varying implementation time frames. Several corridor-wide improvements are recommended to address corridor needs and objectives. Major reconstruction improvement options were identified between RP 10.06 and RP 13.8 and between RP 24.2 and RP 27.35. In addition, several smaller spot improvement options were developed to address specific areas of concern throughout the study area.

The results of the study suggest that once funding has been identified there are no major impediments to developing the recommended improvement options. This study provides a diverse list of improvement options and strategies that may be considered as funding becomes available.

Primary funds are the most likely source for improvements in this corridor. However, priorities have been established for the next five years for Butte District primary funds.

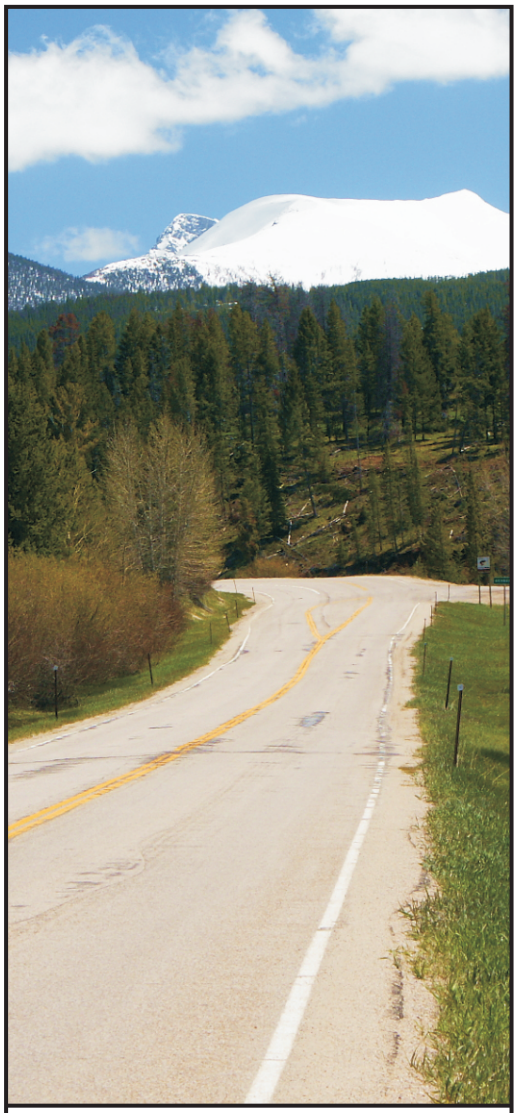
7.1. Next Steps

The ability to develop projects based on the recommended improvement options to MT-1 is dependent on the availability of existing and future federal, state, local, and private funding sources. At the current time there is no funding identified to complete any of the recommended improvement options contained in this study. To continue with the development of a project (or projects) the following steps are needed:

- Identify and secure a funding source or sources; and
- Follow MDT guidelines for project nomination and development, including a public involvement process and environmental documentation.

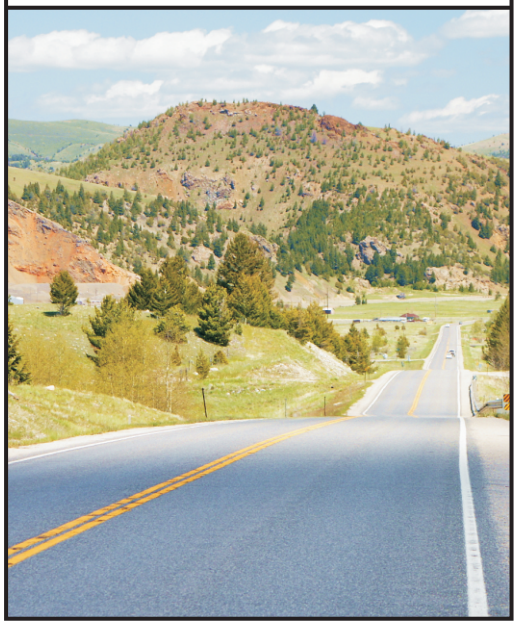
Improvement options identified in this study may lead to future projects. The “Purpose and Need” statement for any future project should be consistent with the needs and objectives contained in this study. However, not all of the needs and objectives at the corridor level are required to be included in a project-level “Purpose and Need” statement. For example, a signing project may have little to no effect on aquatic connectivity objectives, thus rendering compliance with the intent of that particular objective unnecessary. Should this corridor study lead to a project or projects, compliance with NEPA (if federal funding is utilized) and MEPA (regardless of funding source) will be required.

Further, this *Corridor Planning Study* will be used as the basis for determining the impacts and subsequent mitigation for the improvement options in future NEPA documents. Any project developed will need to be in compliance with CRF Title 23 Part 771 and ARM 18, sub-chapter 2 which sets forth the requirements for documenting environmental impacts on highway projects.



MT-1 WEST OF ANACONDA TO GEORGETOWN LAKE

CORRIDOR PLANNING STUDY



APPENDIX A

CONSULTATION, COORDINATION AND COMMUNITY INVOLVEMENT

DATE	COMMENT	RESPONSE
11/06/11	A question, comment or request has been submitted via the "Contact Us" web page. Action Item: Comment on a Project Submitted: 11/06/2011 13:23:04 Project Commenting On: MT-1 West of Anaconda to Georgetown Lake Corridor Planning Study Project State Highway No.: MT-1 Nearest Town/City to Project: Anaconda Name: Judy Fink Email Address: bjfinko5@yahoo.com <u>Comment or Question</u>: I would like to express my concerns regarding MT 1 from Anaconda to Georgetown Lake. We have lived at Georgetown Lake for the last 12 years and 8 of those I drove to Anaconda to work. I believe the speed limit should be 65 mph from Anaconda to Georgetown Lake. With the speed limit at 70 mph people are driving 75 and 80. I have encountered every animal on the road and have seen deer get hit. I have even encountered sheep on the highway just below Silver Lake and at Spring Hill. Some people do not drive with caution, whether it is summer or winter. There are a lot of trailers in the summer and skiers in the winter on the road. People get in a hurry and drive too fast. Also, I have suggested to the highway department over 10 years ago that there should be signs from Anaconda to Drummond that say "Please drive with your headlights on". You cannot believe how many people drive at dusk without headlights on. I could not attend the meeting, but I hope you will consider these two requests: 1. Changing the speed limit 2. Drive with headlights on Thank you for your time. Judy Fink Submitter's IP address: 166.250.3.11 Reference Number = picomment_944000244140625	Thank you for your comment. Speed data was collected at four locations along MT-1 during this study. Section 2.1.3 “Vehicle Speeds” in the corridor study report contains the results of the speed data collection. The collected data does not support a 65 mph speed limit between Anaconda and Georgetown Lake. Speed limits can only be modified by petition of the Anaconda-Deer Lodge County (ADLC) Commissioners to the Montana Transportation Commission. The issue of drivers exceeding the posted speed limit is an enforcement issue that falls under the responsibility of the city of Anaconda, Deer Lodge County, and the Montana Highway Patrol. Crash trends within the corridor are slightly lower than similar corridors in the State of Montana. Special safety signing for full time headlight use is not warranted at this time.

DATE	COMMENT	RESPONSE
11/07/11	**Georgetown Lake Home Owners' Association, Inc.** November 7, 2011 Department of Transportation Dear Sir: Re: Montana Route 1 Public Hearing The following comments reflect issues raised by the Georgetown Lake Homeowner's Association Board of Directors in the summer of 2011 regarding Montana Route 1 near Georgetown Lake. The intersection of route 1 and the road across the dam is unsafe. A number of accidents have been recorded here. Visibility is poor. The residents in the area of Pintlar Vista subdivision and also Lodge Pole campground users have requested slower vehicle speeds in this area as pedestrians cross the highway in these areas. The intersection at the Seven Gables turnout is indefinite. Lanes for right and left turns should be identified so traffic can proceed smoothly. There needs to be more enforcement of parking along the Pump House area. When entering the highway from the Georgetown Lake Road from Denton's Point there is a highway sign that obstructs visibility to the north. The curve at Silver Lake is hazardous in poor weather conditions. Steps need to be implemented to make this area safer. The Georgetown Lake Homeowner's Association thanks you for considering our comments. Sincerely, Chuck Stokke, President Georgetown Lake Homeowner's Association	Thank you for your comment. Three improvement projects have been identified to improve the intersection of MT-1 and Georgetown Lake Road near the dam. These are noted in the corridor study report as improvement options 19(a), 19(b) and 19(c). A speed study was performed on MT-1 at several locations during the summer of 2011. Section 2.1.3 "Vehicle Speeds" in the corridor study report contains the results of the speed data collection. Near Georgetown Lake, the posted speed limit is 60 mph. The 85th percentile speeds (i.e. the speed at which 85% of the vehicles are travelling at or under) was 65.4 mph. As the posted speed limit is very close to within 5 mph of the 85th percentile speeds, no changes to the posted speed limit are proposed. Speed limits can only be modified by petition of the Anaconda-Deer Lodge County (ADLC) Commissioners to the Montana Transportation Commission. Improvements to the intersection of MT-1 and Discovery Basin Road (i.e. Seven Gable area) are recommended and are noted in the corridor study report as improvement options 16(a thru d). Short-term, parking enforcement is a local law enforcement issue. Long-term, improvement option 13 recommends reconstructing MT-1 between Denton Point Road and Georgetown Lake Road near the dam. During this development parking mitigation design strategies would be considered. Additionally, improvements to address pedestrian concerns would be addressed at that time. Improvement options have been identified at the Denton Point Road intersection to mitigate the grade issues on Denton Point Road and are referred to as improvement option 12 (a thru f). If these

DATE	COMMENT	RESPONSE
		improvements are implemented – specifically number 12(e) - the sight obstruction and visibility concerns will be alleviated. The horizontal curve referred to is identified for higher visibility signing with an advisory speed plate in the corridor study report (improvement option 11).

DATE	COMMENT	RESPONSE
11/07/11	RECEIVED 7-11 NOV 10 2011 TRANSPORTATION PLANNING CORAL STRIZICH I'd LIKE TO COMMENT ON THE DRAFT STUDY CONCERNING HIGHWAY 1 FROM ANACONDA TO GEORETOWN LAKE THE RACONDA SPORTSMEN WOULD LIK TO REQUEST TO HAVE A UNDER PASS FOR THE SAFETY OF PEOPLE DRIVING AND ALSO FOR BIG HORN SHEEP AS WELL AS OTHER WILDLIFE TO GET ACROSS THE HIGHWAY. THE UNDERPASS SHOULD BE SOMEWHERE UP AROUND THE LIME-QUERY WEST OF ANACONDA. WE KNOW THIS IS GONG TO BE EXPENSIVE JOB TO DUE. IF WE COULD GET KEY-PLAYERS TO HELP WITH EXPENSES OF THIS PROJECT. SUCH AS, BIG HORN SHEEP ROCKY MT. SHEEP FOUNDATION, FISH WILD LIFE AND PARKS, AND NRD MONEY IS THERE TO HELP WITH SUCH PROJECTS. THIS IS VERY IMPORTANT FOR EVERYONE.	Thank you for your comment. The potential usage of a wildlife underpass was reviewed within the scope of this planning study. The conclusion reached by the planning team was to advance a wildlife underpass near RP 14.5 as a long-term improvement option. A wildlife underpass would be evaluated further if project development activities are initiated. The corridor study report describes this in further detail under improvement option 6(c). Since there is presently not enough data available to measure the success of wildlife underpasses specific to Bighorn Sheep, the recommendations contained in the corridor study report also set forth a range of wildlife mitigation measures to implement while conditions are monitored and more data becomes available regarding Bighorn Sheep usage of wildlife underpasses.

DATE	COMMENT	RESPONSE
	THANKS FOR LETTING ME RESPOND. THANKS, LORRY THOMAS PRES. OF SPORTSMAN 2 CHERRY ST. ANACONDA, MT 59711 1-406-563-7992 Lorry Thomas P.S. Attended the meeting on Highway 1 and we were told the Department wasn't thinking about a underpass for the Big Horned sheep or other wildlife. So bad you didn't give this better attention. I think we could have gotten enough help.	Thank you for your comment. Attention was given to this matter throughout the development of this study.

DATE	COMMENT	RESPONSE
11/09/11	Jeff, Kristie Vauthier from the Anaconda Saddle Club. I liked all the proposals in the study. Most of it sounds like general repairs. I really like the turning lane and I'm OK with that speed increase to make the Georgetown people happy. I am against putting in an Animal crossing over/under pass. I feel that would allow people to drive 70 along the corridor and the 12 foot game fence would cut all access to any kind of access to the opposite side of the highway. Thanks for your time. Kristie Vauthier Glacier Bank 307 East Park Avenue Anaconda, MT 59711 (406) 497-7111 kvauthier@glacierbank.com	Thank you for your comment.
11/10/11	I have down loaded the draft study. Just a side note, when I went to the site for the corridor draft study, I was totally confused. I did finally get the right report, but there were so many side links, with huge files, wow!! Just a couple of items that have popped up so far. Georgetown Fire department has their number three fire house at the NRD location. Some special consideration should be given to that site. Denton Point road shows up several places in the report, should all be Georgetown Lake Road. I am still reviewing the study. Jerome Jenson	Thank you for your comment. Signage currently exists along MT-1 for the DNRC fire operations center, at which the Georgetown Lake Fire Station No. 3 is co-located. This roadway is officially labeled as Denton Point Road in the County map index and GIS database, although locally it is known as Georgetown Lake Road. In the corridor study report changes were made to acknowledge that some in the local community refer to Denton Point Road as Georgetown Lake Road.
11/10/11	A question, comment or request has been submitted via the "Contact Us" web page. Action Item: Comment on a Project Submitted: 11/10/2011 21:09:00 Project Commenting On: montana hwy 1 Nearest Town/City to Project: Anaconda Name: Becky Finnegan Address Line 1: 421 Willow Street City: Anaconda State/Province: mt Postal Code: 59711	

DATE	COMMENT	RESPONSE
	Email Address: bfinnegan02@msn.com Comment or Question: I was unable to attend the meeting in Anaconda but feel strongly about adding a bike trail west of town. Will there be a bike path included in the plans for Hwy 1, West of Anaconda? For safety reasons I feel that this is a priority when planning for future recreation in the area. Submitter's IP address: 69.146.211.149 Reference Number = picomment_116973876953125	Thank you for your comment. A separated multi-use trail is part of improvement option 5 as referenced in the corridor study report. The trail is consistent with the ADLC trails plan and will accommodate pedestrians and bicyclists. The trail is recommended to be placed on the north side of MT-1 for the first four miles west of Anaconda.
11/11/11	A question, comment or request has been submitted via the "Contact Us" web page. Action Item: Comment on a Project Submitted: 11/11/2011 22:03:44 Project Commenting On: MT1 Name: Jerome Jenson Address Line 1: 15 Lodgepole Lane West City: Anaconda State/Province: MT Postal Code: 59711 Email Address: JerryJenson62 @msn.com Phone Number: 406-563-3471 Comment or Question: Comments about the MT1 corridor study I live in the Georgetown Lake area and I frequently use MT1 to go to Anaconda and Butte. There is only one Georgetown Lake Road that intersects at approx. MP 22. There is a Georgetown Lake fire station #3 at about MP 18 that should receive special signing and a larger intersection. The intersection at Georgetown Lake Road and also at Discovery Road (?) should have a street light for safety.	Thank you for your comment. The intersecting roadway near MP 22 is officially labeled as Denton Point Road in the County map index and GIS database, although locally it is known as Georgetown Lake Road. Furthermore, the intersecting roadway near the dam is officially recorded as Georgetown Lake Road. In the corridor study report changes were made to acknowledge that some in the local community refer to Denton Point Road as Georgetown Lake Road. Signage currently exists along MT-1 for the DNRC fire operations center, at which the Georgetown Lake Fire Station No. 3 is co-located. Several improvements are recommended at this intersection that will improve operations. These are

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	Georgetown Lakeshore (about MP 25.5) that abuts to the highway should have a special design. Winter snow drifts along with the berm created from the snowplows pose a winter driving hazard. Many cars slide into the east side ditch. Delineators prevent snowplows from slinging the snow into the ditch in that area. Inslopes of 3:1 or flatter would slow up a lot of the snow drifting. The typical section that exists at the beginning of the project (MP 10) should be continued to about MP14.5. There should be five lanes consisting of 12 foot driving lanes and a 14 foot left turn lane with 4 foot shoulders on each side. That typical section would occupy 70 feet of road way which consists of 200 feet, which would leave plenty of room for a trailway. By widening the road would allow a safer driving condition as well as prevent traffic backups. Summer traffic as well as weekend skiers back up traffic frequently. Has the subgrade and road fill of the present road been tested for contaminates? It would be discouraging to discover contaminates and then have to redo the whole road. The present road has been very stable in the past ten years. Better intersections in the dense area should be designed. The present frontage road intersections seem to be doing their job alright, as noted by the low frequency of accidents in that area. The striping pattern and no-pass zones should be reevaluated. There are several sections that have clear visibility of over one half mile that have no-pass striping. The intersection densities are no worse than several other rural Montana areas that allow passing on rural roads. New cut rock slopes should not have fencing to catch fallen rock, they are ugly. There have not been any rock slides nor do the glacial rock deposits slough down on any portion of the highway. The water rights for the pump house at Georgetown Lake are no longer valid. It has been reported that the water rights have been given back to DNRC. The pump house as a roadside hazard could be dismantled, and removed from the hazard zone. Submitter's IP address: 75.249.182.73 Reference Number = picomment_231170654296875	identified as improvement options 16 (a thru d). Installation of a street light would normally not be considered at a rural intersection location unless there was raised median on one or more leg(s) of the intersection. In the future, the local community/residents could approach the MDT and propose a street light at this location. Installation and continued maintenance of the street light would need to be funded by the local community/residents. A long-term recommendation is described in the corridor study report, improvement option 13, which recommends reconstructing MT-1 between Denton Point Road and Georgetown Lake Road near the dam. During the project development process, special design considerations would be evaluated. The continuation of a five-lane roadway through the first four miles of the project is not consistent with the needs and objectives defined by the planning team, resource agencies and community stakeholders. Traffic volumes do not warrant this type of section, nor does it fit within the context of the adjacent land use. As this is a high level planning study, the existing road subgrade and fill has not been tested for contamination. This would be completed during the project development process. Intersection design and pavement marking modifications would be completed during the project development process. Rock fencing is one type of rockfall mitigation allowed by the MDT. Increased maintenance activities are also suggested. Both of these strategies are contained in the corridor study report.

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11/21/11	A question, comment or request has been submitted via the "Contact Us" web page. Action Item: Comment on a Project Submitted: 11/21/2011 15:26:41 Project Commenting On: MT1 Project State Highway No.: MT-1 Nearest Town/City to Project: Anaconda Project Milepost: 14.5 Name: Brian Solan, PE Address Line 1: 116 Sandpiper Loop City: Helena State/Province: MT Postal Code: 59602 Email Address: bsolan.bs@gmail.com Phone Number: 406-461-7432 Comment or Question: I am writing to comment on the Draft Corridor Study Report of MT-1 West of Anaconda to Georgetown Lake. As an Anaconda native and current owner of property at Georgetown Lake I support the majority of the corridor study recommendations with one exception. I would strongly encourage the final study of the draft to ADVANCE the Long Term Improvement 6(c) Wildlife Underpass at location 14.5. While I agree with the assessment that an overpass crossing is not feasible given the site challenges and costs, an underpass crossing coupled with wildlife fencing and non-salt roadway de-icing solution is the best long term solution for the bighorn sheep and wildlife in this area. Underpass crossings are less expensive to build and have proven effective in different areas of the country including Arizona and Highway 93 in Western Montana. Submitter's IP address: 107.0.10.2 Reference Number = picomment_353363037109375	Thank you for your comment. The potential usage of a wildlife underpass was reviewed within the scope of this planning study. The conclusion reached by the planning team was to advance a wildlife underpass near RP 14.5 as a long-term improvement option. A wildlife underpass would be evaluated further if project development activities are initiated. The corridor study report describes this in further detail under improvement option 6(c). Since there is presently not enough data available to measure the success of wildlife underpasses specific to Bighorn Sheep, the recommendations contained in the corridor study report also set forth a range of wildlife mitigation measures to implement while conditions are monitored and more data becomes available regarding Bighorn Sheep usage of wildlife underpasses.

DATE	COMMENT	RESPONSE
11/21/11	RECEIVED NOV 23 2011 TRANSPORTATION PLANNING November 21, 2011 Carol Strizich Project Manager MDT Statewide and Urban Planning Section PO Box 201001 Helena, MT 59620-1001 Subject: Draft Corridor Study Report – MT-1 West of Anaconda to Georgetown Lake Dear Carol, I am writing to comment on the Draft Corridor Study Report of MT-1 West of Anaconda to Georgetown Lake. As an Anaconda native and current owner of property at Georgetown Lake I support the majority of the corridor study recommendations with one exception. I would strongly encourage the final study of the draft to **ADVANCE** the Long Term Improvement **6(c) Wildlife Underpass at location 14.5.** While I agree with the assessment that an overpass crossing is not feasible given the site challenges and costs, an underpass crossing coupled with wildlife fencing and non-salt roadway de-icing solution is the best long term solution for the bighorn sheep and wildlife in this area. Underpass crossings are less expensive to build and have proven effective in different areas of the country including Arizona (see photo below) and Highway 93 in Western Montana. *Bighorn Sheep using bridge underpass in Arizona.* *Photo credit: K. Morgan, Arizona Game and Fish* Sincerely, Brian A. Solan, P.E. bsolan.bs@gmail.com 406-461-7432 Home Address: 116 Sandpiper Loop Helena, MT 59602 Georgetown Lake Address: #7 Wild Geese Lane Georgetown Lake, MT	Thank you for your comment. The potential usage of a wildlife underpass was reviewed within the scope of this planning study. The conclusion reached by the planning team was to advance a wildlife underpass near RP 14.5 as a long-term improvement option. A wildlife underpass would be evaluated further if project development activities are initiated. The corridor study report describes this in further detail under improvement option 6(c). Since there is presently not enough data available to measure the success of wildlife underpasses specific to Bighorn Sheep, the recommendations contained in the corridor study report also set forth a range of wildlife mitigation measures to implement while conditions are monitored and more data becomes available regarding Bighorn Sheep usage of wildlife underpasses. The image provided shows a Desert Bighorn Sheep crossing underneath an Arizona highway. This image is located on the website www.wildlifeandroads.org and is related to the Decision Guide Process contained in *NCHRP Report 615: Evaluation of the Use and Effectiveness of Wildlife Crossings*. The image and circumstance of this underpass are vastly different than the conditions experienced along MT-1 west of Anaconda. A report prepared by the Arizona Game and Fish Department titled *Evaluation of Distribution and Trans-Highway Movement of Desert Bighorn Sheep: Arizona Highway 68* (August 2008) examined three wildlife underpasses along State Route (SR) 68 between 2006 and 2007. In the study, less than 32 Desert Bighorn Sheep utilized an underpass crossing – out of three studied. Eighty-eight percent of the sheep underpass crossings were through the underpass with

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		the most topographical relief and rugged terrain. Only three crossings were noted at the underpass that was relatively flat with no topographical relief. A summary statement contained in the report was that "*…the presence of ungulates and humans may preclude Bighorn use of underpasses*." Comparisons to U.S. Highway 93 (US 93) in Montana may be difficult as US 93 has much higher traffic volumes than MT-1, and at most underpass locations topographical relief is available.

DATE	COMMENT	RESPONSE
11/25/11	MONTANA WILD SHEEP FOUNDATION Box 17731 • Missoula, MT 59808 November 25, 2011 Carol Strizich Project Manager MDT Statewide and Urban Planning Section PO Box 201001 Helena, MT 59620-1001 RE: MT-1 West of Anaconda to Georgetown Lake Draft Corridor Study Dear Ms. Strizich: The Montana Wild Sheep Foundation (MTWSF) appreciates this opportunity to submit its comments and concerns with the above referenced draft corridor study. MWSF is a nonprofit organization that works to enhance bighorn sheep populations in the state of Montana. Our organization has spent numerous hours and dollars in the immediate vicinity of this project to provide a corridor and winter habitat for bighorn sheep. Together with the Montana Department of Fish Wildlife and Parks (FWP) and other conservation organizations over $1,500,000 has been spent to purchase property to expand the Blue Eyed Nellie Wildlife Management Area in the past 5 years. These acquisitions have prevented residential development and insured over 1.5 miles of frontage along Montana Highway 1 provides a permanent corridor at the location of historical use by bighorn sheep, mule deer and other wildlife. The Public Lands map in Appendix A of the Environmental Scan is incomplete as it fails to show the last 29 acre land purchase on the north side of Highway 1 that was purchased by FWP, MTWSF and other conservation groups. This purchase eliminated the last private ownership between Blue Eyed Nellie WMA and Highway 1. The current wildlife corridor near Mile Post 14.5 is located totally within land owned by the US Forest Service and the State of Montana to insure passage for wildlife in perpetuity. While the bighorn sheep in the plan area are currently experiencing a dieoff similar to the 1991 dieoff the sheep numbers will improve and are expected to approach the predieoff numbers up to 300 sheep as they did in 1991 and 2009. The habitat is available due to past efforts of the community, wildlife enthusiasts and the State of Montana provided a wildlife crossing of Highway 1 can be maintained for the sheep.	Thank you for your comment. Thank you for bringing the 29 acre land purchase to our attention. The Blue Eyed Nellie WMA map was accessed on the MFWP website on December 7, 2011 at the following address: http://fwp.mt.gov/habitat/siteDetail.html?id=1130750 The current map on the MFWP website is the same as contained in Appendix A and does not reflect the 29 acre public parcel referred to. At the time the maps were created (January 2011) for Appendix A, the NRIS database showed the 29 acre parcel as being "private" and under the ownership of the Five Valleys Land Trust. Accordingly, this parcel was not coded as "public". MT-1 is not an "officially" designated wildlife corridor.

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	We appreciate the recent elimination of deicer on the highway in bighorn sheep areas and the flashing lights which warn motorists when bighorn sheep are near the highway. These are good short term solutions as long as everyone involved is proactive. During the past two weeks we had to request the flashing lights be activated because the sheep had moved onto the winter range next to the highway. As proven with the flashing lights on Montana Highway 200 near Thompson Falls tourists decrease their speed because they hope to see sheep while the locals ignore the signs because of their familiarity with the driving conditions. Again these are good short term solutions to the sheep on the highway. We agree the animal actuated flashing lights, designated wildlife crossings and 45 mph seasonal speed limits as proposed in the draft plan are a good attempt to protect motorists and animals if no other solutions are available. We believe the cost of these solutions, the partial effectiveness and the irritability of motorists with several miles of decreased speed limits require the department further evaluate grade separated crossings for bighorn sheep. The plan indicates an overpass for wildlife may not be effective and it would cost $1,250,000. Recent studies indicate overpasses for bighorn sheep do work when they are located along ridge lines traditionally used by wild sheep. The bighorn sheep cross Highway 1 in a level terrain area. A more effective solution for Highway 1 with less impact on the scenic corridor is the use of an underpass for bighorn sheep. The effectiveness of underpasses for bighorn sheep is verified by the following: A personal communication with Paul Krausman, Certified Wildlife Biologist, University of Montana indicates "I worked with desert bighorn sheep in the Southwest for years and did some work with underpasses. In my experience, those that worked were high (>3m) and relatively short (~35 m). They were also effective when associated with natural travel routes." A personal communication with Jon Jorgenson with the Alberta government indicates "Just east of Banff National Park along the Trans Canada Highway near Canmore we have two wildlife underpass structures. One of these structures is used regularly by bighorn sheep. The structures were not built specifically for bighorn sheep rather they were intended to accommodate safe passage across the highway by all range of ungulates and carnivores. The sheep used to come down near to the highway to lick salt and they have continued to do so but are now using the crossing structure to access salt that drips down from the highway and leaches into the soil under the crossing structure. There is no longer any access to the highway surface because of exclusionary fencing. The sheep readily go under the highway via the structure and lick salt on the ground. They do not really use the structure to access range on both sides of the highway the structure has become a destination but they readily walk back and forth through it and spend time milling around in the underpass. The 2 underpasses are the same but only one gets regular use by sheep - the one not used much, is in an area where there is no history of sheep use near the highway." An Arizona study determined that rams readily used underpasses especially during the rut in a study "Evaluation of Distribution and Trans Highway Movement of Desert Bighorn Sheep Arizona Highway 68 (August 2008)	The potential usage of a wildlife underpass was reviewed within the scope of this planning study. The conclusion reached by the planning team was to advance a wildlife underpass near RP 14.5 as a long-term improvement option. A wildlife underpass would be evaluated further if project development activities are initiated. The corridor study report describes this in further detail under improvement option 6(c). Since there is presently not enough data available to measure the success of wildlife underpasses specific to Bighorn Sheep, the recommendations contained in the corridor study report also set forth a range of wildlife mitigation measures to implement while conditions are monitored and more data becomes available regarding Bighorn Sheep usage of wildlife underpasses.

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	An Alberta study on bighorn sheep titled "Highway Research, Monitoring, and Adaptive Mitigation Study – Banff, Yoho & Kootenai National Parks (March 31, 2003) indicates sheep use underpasses. An underpass with 3 meters of clearance and an invert 1 or more meters below the existing ground surface depending on water table levels and appropriate fencing would be much less intrusive then a wildlife overpass which would be more then 7 meters above the surrounding terrain. A low wildlife underpass would require some adjustments to the final road grade to accommodate visual sight distances and highway safety however the cost and visual impact would be much less than an overpass. The plan indicates fencing associated with a wildlife overpass would restrict some pedestrian movements in the area. We question the Montana Department of Transportations desire to increase pedestrian movements in a designated wildlife corridor. We appreciate your review of our comments and your reconsideration of the recommended improvements for the Final Corridor Study documents. Please contact us if we can provide any additional information as you finalize this study. Sincerely Montana Wild Sheep Foundation, James Weatherly Executive Director Cc: Board of Directors Department of Fish, Wildlife & Parks	For planning and cost estimating purposes, the underpass was assumed to be 16 feet high, 45 feet wide and 60 feet long. MT-1 is not an "officially" designated wildlife corridor. There are existing non-vehicular uses between Anaconda and Georgetown Lake. Federal and State transportation guidance requires all travel modes be evaluated in planning studies and project development activities.

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