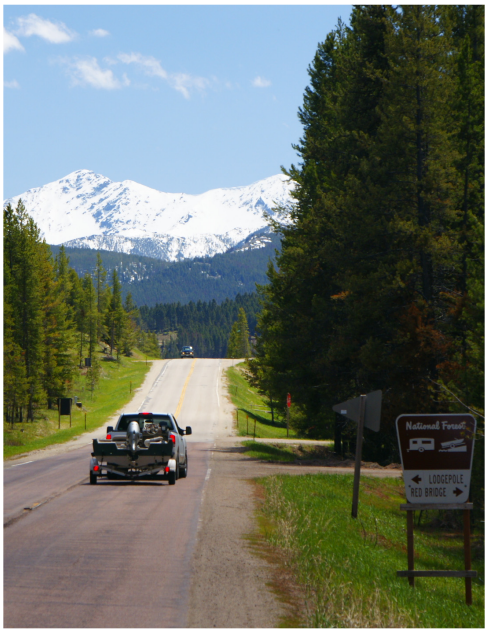
Existing and Projected Conditions

MT 1—ANACONDA TO GEORGETOWN LAKE

Corridor Planning Study



MT-1 WEST OF ANACONDA
TO GEORGETOWN LAKE
CORRIDOR PLANNING STUDY

August 2011

MONTANA
MDT
DEPARTMENT OF TRANSPORTATION

Abbreviations and Acronyms

AADT	Average Annual Daily Traffic
ADLC	Anaconda – Deer Lodge County
ARCO	Atlantic Richfield Company
BA&P	Butte Anaconda & Pacific Railway
DEQ	Department of Environmental Quality
ENN	Exotic Species not Native to Montana
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
GIS	Geographic Information Systems
LOS	Level of Service
LWQD	Local Water Quality District
mph	Miles per Hour
MDT	Montana Department of Transportation
MEPA	Montana Environmental Policy Act
MFISH	Montana Fisheries Information System
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
RP	Reference Post
SOC	Species of Concern
TMDL	Total Maximum Daily Loads
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
vpd	Vehicles per Day
WMA	Wildlife Management Area

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1.0 Existing and Projected Conditions

1.1 Introduction

This report documents the existing and projected roadway conditions and environmental factors for Montana Highway 1 (MT-1) between Anaconda and Georgetown Lake in Deer Lodge County. The purpose of this report is to portray the existing and projected conditions throughout the corridor utilizing technical and environmental factors such that known issues and/or areas of concern may be identified via a high-level of planning analysis.

MT-1 is functionally classified as a Rural Minor Arterial on the Primary Highway System and is designated as Primary Route 19 (P-19). MT-1 serves as an east-west corridor between Anaconda and the eastern shore of Georgetown Lake.

The study area consists of 17.29 miles along MT-1 beginning at the Linden Street / North Cable Road intersection (Reference Post (RP) 10.06) and ending at the intersection with Georgetown Lake Road (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 study area boundary is shown in **Figure 1**.

The information provided herein is the product of a high-level baseline scan. This general information may be used to guide future "project level" analysis if projects are forwarded from this study.

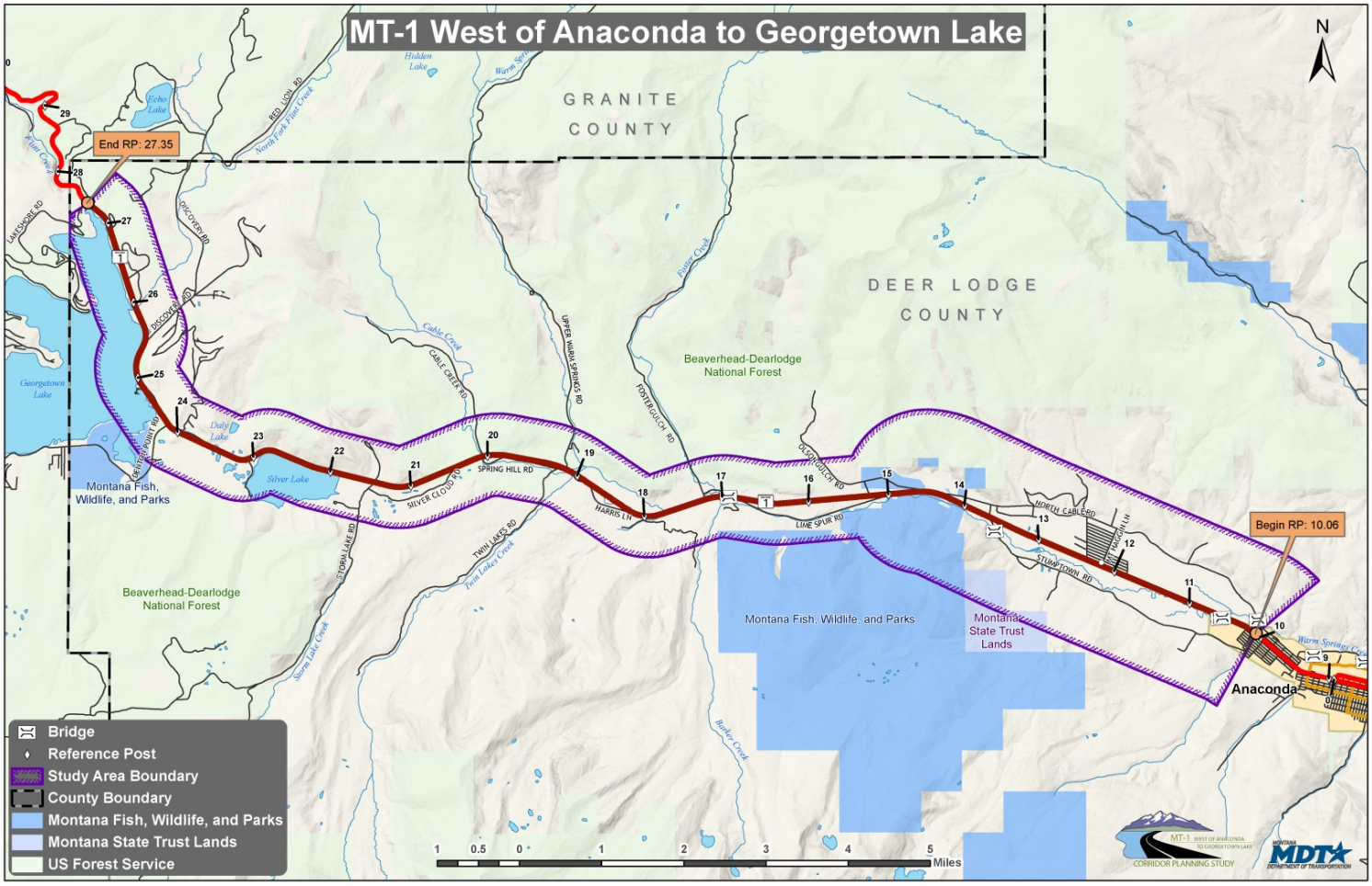

Figure 1.1: Study Area Boundary

1.2 Area Description and Demographics

Anaconda – Deer Lodge County (ADLC) is one of two consolidated City-County local governments in Montana. The core of Deer Lodge County's population is located in the original town site of Anaconda, established in 1883 by one of the famous Montana copper barons, Marcus Daly.[1] Deer Lodge County is located in the southwest part of the state and shares borders with Powell, Jefferson, Butte-Silver Bow, Beaverhead, Granite and Ravalli Counties. Deer Lodge County encompasses 741 square miles. At 5,280 feet, Anaconda, the county seat, is one of the nations "Mile-High" cities. The Beaverhead – Deer Lodge National Forest and the Anaconda – Pintler Wilderness Area encompass a large portion of the county area. Georgetown Lake, Silver Lake, the Big Hole River and Warm Springs Creek are major water features in the County. The city of Butte is the nearest urban center and is located about 27 miles south-east of Anaconda.

[1] Anaconda Deer Lodge County Growth Policy – Public Hearing Draft – 2010, Local Services Section

The major transportation route in the county is Interstate 90 (I-90), which runs along the county's eastern boundary. I-90 is a major east-west travel corridor through the state, but in Deer Lodge County, it is aligned in a north-south direction. MT-1, which runs east-west through Anaconda, is another major travel corridor in the area. MT-1 was designated as the Pintler Veterans' Memorial Scenic Highway by the 2011 Montana Legislature.

Deer Lodge County is the smallest county in land area and ranks 22nd in population out of the 56 counties in Montana. The total population of the county was estimated in 2010 at 9,298[2], which is a 1.3% drop in population from the 2000 Census total population of 9,415 people. The county has an average of 12.6 persons per square mile compared to the State average of 6.8 persons per square mile. Most of the population is concentrated in the Anaconda urban area. Population in the county has historically been linked to the level of operation of the copper smelter run by the Anaconda Mining Company. The county population peak occurred in 1960 at 18,640 people and since the smelter closed in 1980, the county has seen a steady decline in population. From 1970 to 2010 the county population has declined over 40%. According to the 2010 census, population in the county is concentrated around Anaconda and smaller pockets of population occur at Galen, Warm Springs, Georgetown Lake and the West Valley area.[3]

The County population is projected to continue to decline through the year 2025. Population projections estimate approximately 7,860 people for the year 2030[4]. Future population projections are generally based on existing and historic trends. Changes in trends due to economic development, changes in the economy, or other factors can result in a change in population trends.

The median household income in 2009 for the county was $32,173 compared to the state median household income of $42,222 and the nation's median household income of $50,221.

1.3 PHYSICAL CHARACTERISTICS

MT-1 runs east/west between I-90 and Philipsburg. MT-1 then runs north/south to connect back with I-90 at Drummond. I-15 runs north/south and connects to I-90 approximately 10 miles east of the MT-1 / I-90 junction. MT-1 provides users of these interstates access to Anaconda and the surrounding area. At the east end of the corridor (RP 10.06), MT-1 transitions from the four-lane roadway that traverses through Anaconda, to a two-lane roadway section that travels the length of the study area. 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] US Census Bureau http://quickfacts.census.gov/qfd/states/30/30023.html
[3] Anaconda Deer Lodge County Growth Policy – Public Hearing Draft – 2010, Population Economy Section
[4] Montana Census and Economic Information Center, Dept. of Commerce & NPA Data Services

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.

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 1.2** shows the existing posted speed limits for the study area.

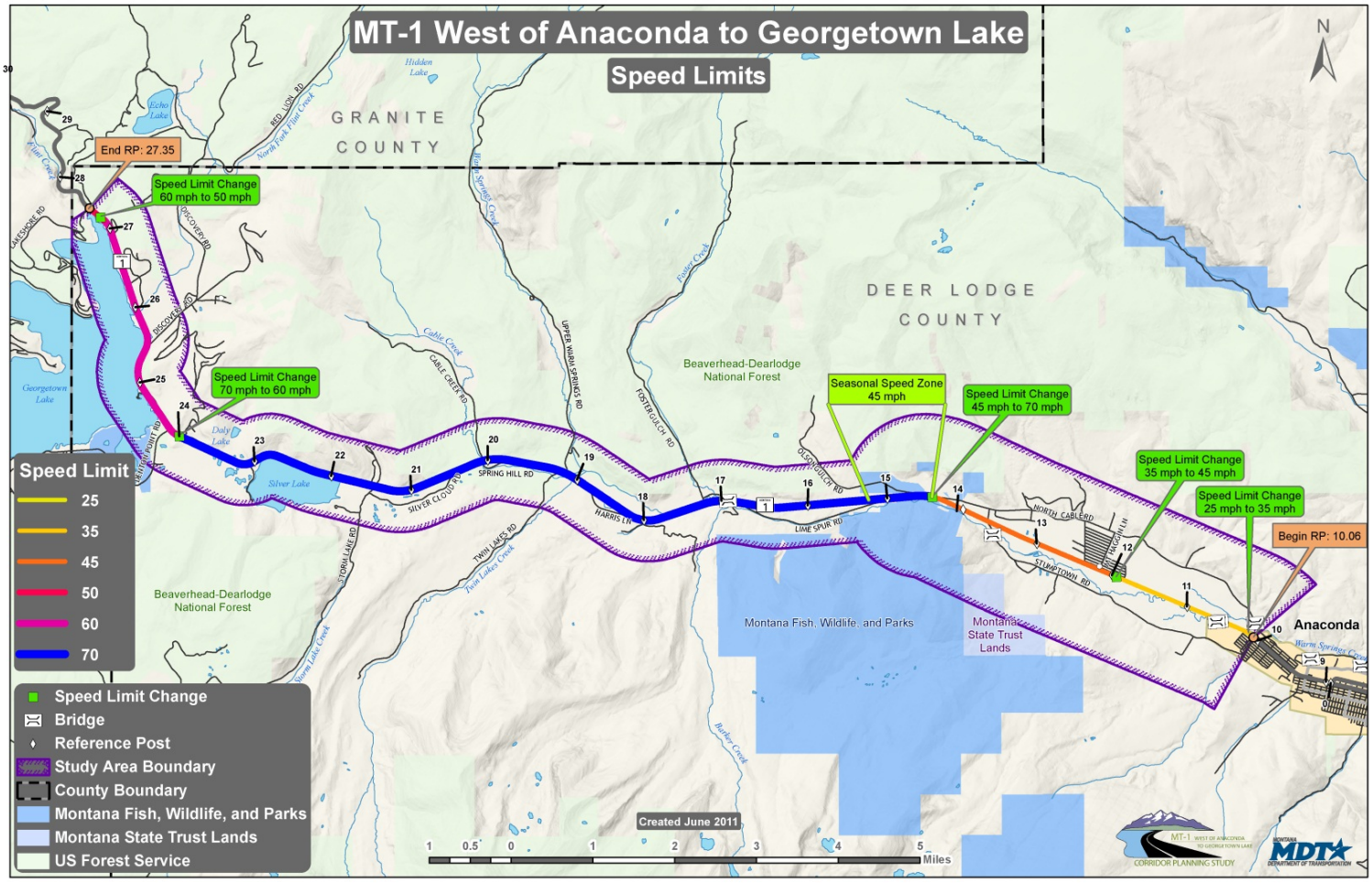

Figure 1.2: Posted Speed Limits

1.4 Roadway Users and Traffic Volumes

Primary users of the roadway consist of local residents from the community of Anaconda at the eastern end of the corridor and commercial 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, other recreational opportunities along the corridor, and Georgetown Lake.

1.4.1 Traffic Data

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 1.1** below 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 decline in traffic volumes over the last 20 years.

Table 1.1: Average Annual Daily Traffic Data[5]

Site	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	**Location**	**2001**	**2002**	**2003 [(1)]**	**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

[(1)] Short-term factoring process was changed in 2003 resulting in higher than usual traffic volume increases.[6]

The volumes shown in **Table 1.1** are representative of yearly average traffic volumes. It is likely that peaks in traffic volumes occur due to recreational use in the area. Vehicles traveling along the corridor currently do not encounter delay or congestion during peak travel periods, however. Trucks and recreational vehicles are common modes of transportation through the corridor, which may slow the flow of traffic in areas with steep grades.

[5] MDT Data and Statistics Bureau, Traffic Data Collection Section, 2011
[6] MDT VMT Increase Documentation, 2003

1.4.2 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 2005. 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. **Table 1.2** shows future projected traffic values based on the assumed growth rate.

Table 1.2: Future Projected Traffic Data

Site	Location	2010	2030 (1)
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

(1) *Projection was based on an annual growth rate of 1.0%.*

1.4.3 Speed Data Collection

Speed data was collected at four locations along MT-1 in June 2011. The speed data was collected to help determine the effectiveness of existing posted speed limits. Posted speed limits are based on a number of factors including speed data, Montana Code, roadside development, functional classification, crash experience, road surfacing, and context. The effort completed as part of this *Corridor Planning Study* only addresses the speed data factor.

Table 1.3 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 1.3: Speed Data Collection

Location	Posted Speed Limit (mph)	ADT (vpd)	Average Speed (mph)	85th Percentile Speed (mph)
RP 11.2	**35**	**3902**	**37.8**	**42.2**
EB	*35*	*1937*	*37.8*	*42.3*
WB	*35*	*1964*	*37.7*	*42.1*
RP 14.0	**45**	**2333**	**46.7**	**51.9**
EB	*45*	*1165*	*45.6*	*49.8*
WB	*45*	*1168*	*47.8*	*53.3*
RP 15.3	**70**	**2145**	**59.9**	**68.5**
EB	*70*	*1079*	*56.3*	*64.2*
WB	*70*	*1065*	*63.5*	*71.0*
RP 24.4	**60**	**1539**	**57.0**	**65.4**
EB	*60*	*757*	*57.2*	*66.2*
WB	*60*	*781*	*56.9*	*64.9*

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 was found between weekend and weekday traffic relating to vehicle speeds. This indicates that speeding found along 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. MDT recommended from the report that the 45 mph speed zone be implemented "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."

1.4.4 Level of Service

The current Level of Service (LOS) for the corridor on MT-1 was obtained from the MDT *Congestion Management System*. This section of MT-1 is currently operating at congestion indices of 71 out of 100, which is a LOS of B. A LOS of B indicates the ability of vehicles to maneuver within the traffic stream is slightly restricted and the general level of physical and psychological comfort provided to drivers is still high. Minor disruptions are still easily absorbed at this level.

A LOS of B indicates that the corridor does not currently experience delays or congestion during peak travel periods. However, the LOS is forecasted to degrade to a C in five years and remain there for the projected 20 years if improvements are not implemented in the corridor. **Table 1.4** shows the various congestion indices and their corresponding LOS.

Table 1.4: Congestion Index / LOS Scale

Congestion Index Range	LOS
85 - 100	A
70 - 84	B
55 - 69	C
40 - 54	D
25 - 39	E
0 - 24	F

1.5 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 1.5** gives the right-of-way widths for the study area along with the adjacent land ownership information.

Table 1.5: Right-of-Way Widths

Begin RP	End RP	R/W Width (approx.)	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, 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 increases the potential improvement options, and may increase opportunities to improve safety through access control. The values shown in **Table 1.5** include the recently acquired right-of-way.

1.6 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 the MT-1 *Corridor Planning 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 1.6** lists the current design standards for Rural Minor Arterials according to MDT design criteria.

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:

- 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).

Table 1.6: Geometric Design Criteria[7]

Design Element			Design Criteria		
Design Controls	Design Forecast Year (Geometrics)		20 Years		
	Design Speed [(1)]	Level	60 mph		
		Rolling	55 mph		
		Mountainous	45 mph		
	Level of Service [(1)]		Level/Rolling: B Mountainous: C		
Roadway Elements	Travel Lane Width [(1)]		12'		
	Shoulder Width [(1)]		Varies		
	Cross Slope	Travel Lane [(1)]	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 [(1)]		360'	495'	570'
	Passing Sight Distance		1625'	1885'	2135'
	Minimum Radius (e=8.0%) [(1)]		590'	960'	1200'
	Superelevation Rate [(1)]		e_{max} = 8.0%		
	Vertical Curvature (K-value) [(1)]	Crest	61	114	151
		Sag	79	115	136
	Maximum Grade [(1)]	Level	3%		
		Rolling	4%		
		Mountainous	7%		
	Minimum Vertical Clearance [(1)]		17.0'		

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

[7] MDT Road Design Manual – Chapter 12, Figure 12-4 "Geometric Design Criteria for Rural Minor Arterials (Non-NHS – Primary)", 2008

1.7 Roadway Geometrics

Existing roadway geometrics were evaluated for MT-1 within the study area to identify areas of concern 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.

1.7.1 Horizontal Alignment

Elements comprising horizontal alignment include curvature, superelevation, and sight distance which have an influence on traffic operation and safety. These parameters define horizontal alignment and are directly related to the design speed of the corridor.

Table 1.7 provides a summary of the horizontal curves present along the study area. Included in the table is the approximate center RP for the curve, length of curve, radius, and highest standard met based on the MDT *Road Design Manual*. For example, if a curve is listed as meeting "Rolling" standards, the controlling design elements (in this case curve radius) meet standards at or below rolling terrain levels, but do not meet level terrain standards. Four horizontal curves do not meet MDT's level terrain standards based on radius values. All four curves do, however, meet rolling terrain standards.

Table 1.7: Horizontal Curves

Center RP	Length (ft)	Radius (ft)	Standard Met
10.193	893.3	2865.0	Level
13.193	236.6	5730.0	Level
14.408	2007.8	3820.0	Level
16.331	940.0	3820.0	Level
17.024	1796.8	3737.0	Level
17.933	2098.0	2292.0	Level
19.087	2356.7	5730.0	Level
19.984	2205.0	3820.0	Level
21.129	1813.8	2865.0	Level
22.259	890.8	5730.0	Level
22.860	1050.3	1146.0 [(1)]	Rolling
23.185	1093.5	1146.0 [(1)]	Rolling
24.019	630.2	1146.0 [(1)]	Rolling
25.095	1988.9	1909.9	Level
25.528	1243.2	1432.4	Level
25.953	580.0	5729.6	Level
27.055	821.7	1432.4	Level
27.077	718.7	1145.9 [(1)]	Rolling

[(1)] Values in red do not meet current MDT design standards for level terrain (see Table 1.6 for standards).

1.7.2 Vertical Alignment

Vertical alignment is a measure of elevation change of a roadway. The length and steepness of grades directly affects the operational characteristics of the roadway. 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%). This information is shown in **Table 1.8**.

In addition to roadway grades, **Table 1.8** shows curve information for all the vertical curves along the study area. The controlling design factors for vertical curves are the rate of vertical curvature, or K-value, and stopping sight distance. K-values are a function of the length of the curve compared to the algebraic change in grade which comprises either a sag or a crest vertical curve. This controlling design criterion is directly dependent on the design speed of the study area. Within the study area, there are five vertical curves that do not meet K-value 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 1.8: Vertical Curves

Center RP	Length (ft)	G1	G2	Type	K-Value	SSD	Standard Met
10.762	200.0	1.01%	1.57%	Sag	355.2	-	Level
10.929	100.0	1.57%	0.83%	Crest	134.6 [(1)]	1502.2	Rolling
11.024	200.0	0.83%	1.02%	Sag	1041.7	-	Level
11.104	100.0	1.02%	1.73%	Sag	140.6	-	Level
11.254	200.0	1.73%	1.36%	Crest	536.2	2992.8	Level
11.369	200.0	1.36%	1.22%	Crest	1428.6	7807.1	Level
11.484	400.0	1.22%	1.60%	Sag	1052.6	-	Level
11.677	200.0	1.60%	1.10%	Crest	400.0	2258.0	Level
11.964	200.0	1.10%	1.44%	Sag	588.2	-	Level
12.070	300.0	1.44%	0.75%	Crest	434.8	1713.8	Level
12.251	800.0	0.75%	1.35%	Sag	1333.3	-	Level
12.808	200.0	1.45%	0.51%	Crest	212.8	1247.9	Level
12.884	300.0	0.51%	2.12%	Sag	186.3	-	Level
13.000	200.0	2.12%	1.38%	Crest	270.3	1558.1	Level
13.077	200.0	1.38%	2.70%	Sag	151.5	-	Level
13.174	400.0	2.70%	1.05%	Crest	242.4	853.9	Level
13.519	100.0	1.25%	1.71%	Sag	217.4	-	Level
13.596	200.0	1.71%	1.34%	Crest	540.5	3016.2	Level
13.884	300.0	1.34%	0.15%	Crest	252.1	1056.7	Level

[(1)] Values in red do not meet current MDT design standards for level terrain (see Table 1.6 for standards).
[(2)] Values in blue do not meet current MDT design standards for rolling terrain standards (see Table 1.6 for standards).

Center RP	Length (ft)	G1	G2	Type	K-Value	SSD	Standard Met
13.998	500.0	0.15%	3.16% (1)	Sag	166.1	-	Rolling
14.115	550.0	3.16% (1)	1.48%	Crest	327.4	917.3	Rolling
14.884	1000.0	1.48%	2.23%	Sag	1333.3	-	Level
15.349	400.0	2.23%	5.52% (2)	Sag	121.6 (1)	-	Mountainous
15.490	900.0	5.52% (2)	1.52%	Crest	225.0	696.8	Mountainous
15.624	400.0	1.52%	6.00% (2)	Sag	89.3 (2)	-	Mountainous
15.825	1600.0	6.00% (2)	-1.21%	Crest	221.8	691.9	Mountainous
16.256	500.0	-1.21%	0.57%	Sag	280.4	-	Level
16.867	300.0	0.06%	1.47%	Sag	213.1	-	Level
16.961	300.0	1.47%	1.80%	Sag	895.5	-	Level
17.147	400.0	1.80%	1.44%	Crest	1095.9	3156.2	Level
17.502	400.0	1.44%	1.75%	Sag	1290.3	-	Level
17.892	600.0	1.44%	0.82%	Crest	975.6	2054.5	Level
18.493	600.0	0.82%	2.19%	Sag	439.2	-	Level
18.919	600.0	2.19%	4.16% (2)	Sag	304.0	-	Mountainous
19.501	400.0	4.16% (2)	5.50% (2)	Sag	298.5	-	Mountainous
20.076	1400.0	5.50% (2)	0.96%	Crest	308.4	815.8	Mountainous
20.451	400.0	0.96%	1.50%	Sag	740.7	-	Level
20.693	400.0	1.50%	1.98%	Sag	840.3	-	Level
20.898	600.0	1.98%	1.03%	Crest	630.9	1434.6	Level
21.123	400.0	1.03%	1.50%	Sag	842.1	-	Level
21.626	800.0	1.50%	0.19%	Crest	612.6	1226.2	Level
22.101	400.0	0.19%	1.04%	Sag	472.8	-	Level
22.476	800.0	1.04%	-0.24%	Crest	625.0	1243.0	Level
22.931	800.0	-0.24%	-1.44%	Crest	666.7	1299.2	Level
23.393	400.0	-1.44%	-0.70%	Sag	543.5	-	Level
23.774	600.0	-0.70%	1.36%	Sag	290.7	-	Level
23.922	400.0	1.36%	-2.86%	Crest	94.8 (2)	455.7 (2)	Mountainous
24.455	400.0	-2.86%	-0.38%	Sag	161.3	-	Level
24.749	1200.0	-0.38%	1.54%	Sag	625.0	-	Level
24.995	800.0	1.54%	-2.00%	Crest	226.0	698.3	Level
25.128	600.0	-2.00%	0.30%	Sag	260.9	-	Level
25.308	700.0	0.30%	-1.06%	Crest	514.7	1143.4	Level
25.431	600.0	-1.06%	0.00%	Sag	566.0	-	Level
25.885	400.0	0.00%	2.00%	Sag	200.0	-	Level
26.132	1400.0	2.00%	-1.00%	Crest	466.7	1003.5	Level
26.302	400.0	-1.00%	3.00%	Sag	100.0	-	Level
26.586	1400.0	3.00%	-4.54% (2)	Crest	185.7	633.0	Mountainous
26.794	800.0	-4.54% (2)	-0.50%	Sag	198.0	-	Mountainous
26.984	400.0	-0.50%	1.20%	Sag	235.3	-	Level
27.268	600.0	1.20%	-5.83% (2)	Crest	85.3 (2)	429.1 (2)	Mountainous

(1) Values in red do not meet current MDT design standards for level terrain (see Table 1.6 for standards).
(2) Values in blue do not meet current MDT design standards for rolling terrain standards (see Table 1.6 for standards).

1.7.3 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, and roadside geometry. Clear zones are evaluated individually based on the roadside cross section. According to MDT, 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 designated, to a practical extent, to meet current MDT design standards.

A list of roadside clear zone areas of concern was developed based on information obtained during field reviews. Features looked at during the field reviews were sight distances, side slopes, and roadside hazards. A table of roadside clear zone observations is presented in **Table 1.9**.

Table 1.9: Roadside Clear Zones

Approximate Location (RP)	Feature	Description	Comments
12.4 - 13.4	Clear Zone	Cut slope with fallen rock	South side
13.9 - 14.2	Clear Zone	Heavy vegetation	Area with high rate of animal crashes
16.4	Slope	Steep fill slope	Noted fatality at this location
16.5 - 16.8	Slope	Steep fill slope	
21.1 - 21.4	Slope	Cut slope with fallen rock	North Side
21.7 - 21.8	Slope	Cut slope with fallen rock	North Side
22.1 - 22.6	Slope	Cut slope with fallen rock	North Side
22.9 - 23.1	Slope	Cut slope with fallen rock	North Side
24.2	Horizontal Curve	Poor sight distance	Steep cut slope at Georgetown Lake Rd intersection
24.8	Slope	Steep fill slope	Culvert location
25.0	Slope	Sharp drop-off into water	Signed "no parking" area by lake
25.0 - 25.3	Horizontal Curve	Poor sight distance	Due to cut slope on north side
25.4 - 25.6	Slope	Shoulder and side slope to water	
25.5	Slope / Intersection	Steep slope into water at intersection	Noted fatality at this location
25.9	Bridge ends	Blunt concrete bridge ends	
26.1	Slope	Steep fill slope	Culvert location
26.2 - 26.8	Slope	Steep fill slope	South side

1.8 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 1.10** shows the existing roadway width and surface thickness.

Table 1.10: Existing Roadway Surfacing[8]

			Width (ft)			Thickness (inches)	
Begin (RP)	End (RP)	Lanes	Surface	Lane	Shoulder	Surfacing	Base
10.060	10.076	2	28	12	2	5	12
10.076	10.202	2	32	12	4	5	12
10.202	10.496	2	32	12	4	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	26.851	2	24	12	0	4	4
26.851	27.350	2	24	12	0	6	4

The MDT *Road Design Manual* requires a minimum travel lane width of 12 feet. A surface width of 28 feet is recommended for a Rural Minor Arterial. However, the MDT Road Width Committee would ultimately determine the appropriate width during future project development.

1.9 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 1.11** provides a summary of access points grouped in incremental segments along the study area.

[8] Values from MDT *Road Log* and field data collection.

Table 1.11: 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**

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.

1.10 Turn Lanes

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.

1.11 Hydraulics

1.11.1 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.

1.11.2 Structures

Table 1.12 lists the hydraulic structures located on the roadway throughout the study area. 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 report, irrigation ditches, culverts and bridges are hydraulically adequately sized.

Table 1.12: Existing Hydraulic Structures

RP	Diameter	Comments
10.189	24"	
10.278	48"	
10.520	24"	
11.037	24"	
12.364	24"	
12.990	30"	Irrigation
13.017	24"	Irrigation
13.672	24"	Irrigation
14.530	24"	
14.749	24"	
14.849	24"	
15.155	24"	
15.617	24"	
15.786	24"	
16.269	24"	
16.526	24"	
17.240	30"	
17.678	60"	
18.225	60"	Beaver Pond
18.455	24"	
18.537	24"	
18.581	36"	
18.775	24"	
18.903	11'5"x7'3"x80'	Pipe Arch - Twin Lakes Creek
18.996	108"x112'	Cable Creek
19.100	24"	
19.409	36"	
19.497	24"	
19.797	24"	
20.095	108"x152'	Cable Creek
20.536	36"	
20.770	72"	Storm Lake Creek
21.019	24"	
21.342	36"	
21.405	36"	
21.767	24"	
22.204	24"	
22.252	8"x50' & 12"x50'	"T" Shaped Perforated Pipe Drain
22.498	24"	
22.725	48"	
22.895	24"	
23.143		Concrete Box Culvert
23.170	36"	
23.350	24"	
23.653	24"	
23.738	24"	
23.909	48"	
24.503	18"	
24.635	18"	
24.804	24"	
25.014	18"	
25.213	18"	
25.516	18"	
25.582	36"	
25.909		Concrete Box Culvert
26.084	18"	
26.283	24"	
26.539	18"	
27.077	24"	

1.11.3 Bridge Crossings

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 to determine the sufficiency rating while the bridge located at RP 16.92 was assessed in 2009. The sufficiency rating formula is a method of evaluating highway bridge data to obtain a numeric value indicating the sufficiency of the bridge to remain in service. The result of this method is the percentage in which 100 is an entirely sufficient bridge and 0 is an entirely deficient bridge. In order to receive funding through the *Highway Bridge*

Replacement and Rehabilitation Program, structures must be "Structurally Deficient" or "Functionally Obsolete" and have a sufficiency rating of 80 or below. Structures with a sufficiency rating of 0 to 49.9 are eligible for replacement, and structures at 50 to 80 are eligible for rehabilitation unless otherwise approved by the Federal Highway Administration (FHWA).

The following criteria determine whether or not a structure is structurally deficient or functionally obsolete:

Structurally Deficient

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

- Deck Rating
- Superstructure Rating
- Substructure Rating

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

- Structure Rating
- Waterway Adequacy

Functionally Obsolete

An appraisal of 3 or less for the following:

- Deck Geometry
- Under Clearance
- Approach Roadway Alignment

Or, an appraisal of 3 for the following:

- Structure Rating
- Waterway Adequacy

Both bridge structures are determined to be not structurally deficient and not functionally obsolete at the present time. The design loadings meet current MDT standards which require a minimum design loading of MS 13.5 (metric) / HS 15 (English) for bridges to remain in place.[9] **Table 1.13** shows the sufficiency ratings of the two bridge crossings.

[9] MDT Bridge Design Standards

Table 1.13: Bridge Sufficiency Rating (SR)[10]

Structurally Deficiency SR Criteria		Bridge at RP 10.57	Bridge at RP 16.92
Deck Rating	≤ 4	6	7
Superstructure Rating	≤ 4	7	6
Substructure Rating	≤ 4	7	6
Structure Rating	≤ 2	7	6
Waterway Adequacy	≤ 2	8	8
Functionally Obsolete SR Criteria			
Structure Rating	= 3	7	6
Deck Geometry	≤ 3	5	6
Under Clearance	≤ 3	-	-
Waterway Adequacy	= 3	8	8
Approach Roadway Alignment	≤ 3	7	8
Design Loading		5 MS 18 (HS 20)	3 MS 13.5 (HS 15)
Sufficiency Rating		97.2	88.1
Structure Status		Not Deficient	Not Deficient

1.12 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 from January 1, 2005 and December 31, 2009. The analysis compared the study area with the average crash rates on statewide rural minor arterials.

Crash rates are defined as the number of crashes per million vehicle miles. 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 this time period. 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 records shows 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 20 crashes were a wild animal-vehicle collision. 18 crashes involved two or more vehicles. Just to the west of Anaconda, in a segment with numerous approaches, there

[10] MDT Bridge Management System, Initial Assessment Form, 2011

were seven multi-vehicle collisions; however, these crashes were not concentrated in one location. Lane departure crashes were spread over the entire length of the corridor. There is a concentration of wild animal-vehicle collisions, 9 reported, between RP 14.7 and 15.7. The run-off-the-road crashes were spread over the corridor. Based on the crash data reviewed for the study area, crash clusters 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

The 20 reported incidences that included collisions with wild animals mostly included single animal collisions; however, one crash involved eight bighorn sheep that were killed at RP 14.4. Carcass data for the corridor indicates 87 total carcasses recovered along the corridor in the time period from 2006-2010. The 87 carcasses does not indicate 87 crashes, as four crashes killed two animals each, and one crash included the eight bighorn sheep as discussed previously. According to the carcass data, 71 wild animal-vehicle collisions occurred along the corridor.

A cluster of wild animal-vehicle collisions has been identified between reference points 11.2 and 17, as almost 50% of the wild animal-vehicle collisions occurring in this corridor have occurred through this 5.8 mile stretch, according to the carcass data. In the fall of 2010, eight bighorn sheep, including two trophy 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 also reference points 21 to 22.1, with 9 crashes (13%).

1.13 TRANSPORTATION SERVICES

Railroad – Butte, Anaconda & Pacific Railway (BA&P), formerly referred to as the Rarus Railway, connects Butte and Anaconda, intersecting the Union Pacific line at Silver Bow. The short-line railroad currently is owned by Patriot Rail Corp. While an excursion train also operates on the line between June and September, the principal commodities hauled on the line include copper concentrate and mine tailings.[11] Between Butte and Garrison, BNSF operates 51.1 miles of track with stations in Silver Bow, Warm Springs, and Deer Lodge. The Port of Montana, a 55-acre facility located in Silver Bow, provides a strategic gateway to rail and highway connections.

Bus – Commercial interstate bus service is available in Butte, located 27 miles east of Anaconda. This service is provided by Rimrock Stages, the bus service provider that picked up former Greyhound routes

[11] MDT Montana State Rail Plan, 2010

between Billings and Missoula on June 21, 2011. Local bus carriers are Karst Stage and Tucker Transportation.

Motor Freight – Numerous trucking firms serve Anaconda and Deer Lodge County, including, but not limited to, Andy's Motor Freight, Yellow Freight System Inc., Ravalli Motor Freight, Montana Express Inc., Molerway Freight Lines, Boka Freight Line, Watkins Shepard and Ambrose Distributing Company. These firms may change over time, however statewide it is estimated that over 1,000 motor freight carriers serve Montana and have access to the Anaconda area.

Air Service – A non-commercial airport is located three miles northeast of Anaconda. This is a basic utility airport, able to accommodate 95% of all general aviation equipment (larger twin engine and small corporate jets).

Commercial Airport – Bert Mooney Airport is a public airport located in Butte (27 miles). SkyWest Airlines, a subsidiary of Delta, is the only air carrier serving the Bert Mooney Airport.

1.14 UTILITIES

Public utilities available in Deer Lodge County[12] and particularly the Anaconda area include electrical service from Northwestern Energy and Vigilante Electric Co-op (serving some rural areas). Northwestern Energy supplies natural gas to the county through 12 inch supply lines.

Garbage removal services are through the Anaconda-Deer Lodge Solid Waste District contracts with Butte-Silver Bow for Class II solid waste disposal at a landfill located in Butte-Silver Bow (Rocker). Anaconda Disposal provides garbage collection service for Anaconda-Deer Lodge County. A Class III landfill is located in Deer Lodge County (east of Anaconda).

The primary water source for drinking water for the city of Anaconda is operated by the local government. Six, twelve-inch wells with a four million gallon storage tank serve approximately 6,224 users. Average consumption is 3.7 million gallons per day. Maximum capacity is 4 million gallons per day. Water temperature ranges from 49 - 54 degrees with moderate hardness. Hearst Lake and Fifer Creek Reservoir are secondary, developable sources with a combined storage capacity of 315 million gallons. Areas outside of the city limits are served by individual wells, with the exception of Warm Springs and Galen which are managed by the State of Montana.

Industrial Water – Silver Lake has the capacity of more than 2 million gallons per day.

Waste Water – The City of Anaconda is served by a tertiary treatment, public wastewater system operated by the City and County governments. Outside the city limits, domestic and commercial wastewater is treated by onsite disposal (septic tank/drain field system).

[12] http://www. anacondamt.org/utilities.htm

2.0 Local Planning

2.1 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."*[13]

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.

2.2 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 mode of travel opportunities and connectivity between communities. 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.

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

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.

2.3 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, 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.

3.0 Environmental Scan

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. 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.

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, however, 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)

3.2.1 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 area 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.

3.2.2 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 is accessed off Georgetown Lake Road just north of RP 24.0.

3.3 Cultural and Archaeological Resources

The corridor contains many cultural resources, including the Anaconda to Phillipsburg Power Line (24DL0496), a pumping station (24DL0425), the Silver Lake Water System (24DL0691), the National Register of Historic Places – listed Butte, Anaconda and Pacific Railroad Historic District (24DL0211), a railroad spur line (24DL0425), and the Malvey Cabin (24DL0427). Cultural resources may be a significant issue and is an important consideration 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).

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. Project activities associated with any proposed construction of the MT-1 Anaconda to Georgetown Lake corridor will likely create impacts to the soil map units with prime and important farmland status, thus it is likely required that a CPA-106 Farmland Conversion Impact Rating Form for Linear Projects would be completed.

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 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 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 documented 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.

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 bighorn sheep are attracted to the salt in de-icing material used on the highway in the winter season. The use of de-icing material may cause bighorn sheep to concentrate on and adjacent to the roadway, increasing the incidents of vehicle collisions with bighorn sheep. Bighorn frequently graze alongside the roadway in this area and lick the salt from the roadway during the winter months. The herd has also experienced fatal pneumonia outbreaks, which MFWP has managed with some culling of the herd to prevent spread of the disease. It is estimated by MFWP that of the 300 animals currently inhabiting the area, only about 1/3 of the herd may survive the winter.

Other species present in the study area are noted in the Environmental Scan.

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.

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 the protection of these species and compliance with the *Act* would need to be carefully considered with any planned project resulting from this study.

MFWP manage a wildlife area adjacent to both sides of the highway in the vicinity of Garrity Mountain.

3.9 Aquatic Resources

3.9.1 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, but not node 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 fisher resource by MFWP. There are several access roads from the highway into adjacent public lands as well.

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 3.1** lists the threatened, endangered or candidate species occurring in the study area according to the USFWA.

Table 3.1: Threatened and Endangered Species[14]

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.

3.11 Species of Concern

Montana SOC are native animals breeding in the state that are considered 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.

[14] 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.

Table 3.2: Species of Special Concern[15]

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

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.

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.

[15] Montana Natural Heritage Program

3.12 Wildlife and Traffic Conflicts

A high number of animal / vehicle conflicts exist in the study area. As noted in section 1.12, there is a concentration of wild animal-vehicle collisions between RP 14.7 and 15.7. Reported incidences that included collisions with wild animals mostly included single animal collisions; however, one crash involved eight bighorn sheep that were killed at RP 14.4. Carcass data for the corridor indicates 87 total carcasses recovered along the corridor in the time period from 2006-2010. The 87 carcasses does not indicate 87 crashes, as four crashes killed two animals each, and one crash included the eight bighorn sheep as discussed previously. According to the carcass data, 71 wild animal-vehicle collisions occurred along the corridor.

A cluster of wild animal-vehicle collisions has been identified between reference points 11.2 and 17, as almost 50% of the wild animal-vehicle collisions occurring in this corridor have occurred through this 5.8 mile stretch, according to the carcass data. In the fall of 2010, eight bighorn sheep, including two trophy 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 also reference points 21 to 22.1, with 9 crashes (13%).

3.13 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 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. Total Maximum Daily Loads (TMDL) are not required as no pollutant-related impairment is identified. 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.

3.14 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.

3.15 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.

3.16 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.

3.17 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 FHWA's 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.

3.18 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.

3.19 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.

3.20 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.

4.0 Areas of Concern Summary

This section provides a summary of the areas of concern within the study area. These areas were identified through as-built drawings, field review, and other available data. A summary of the identified areas of concern are shown in **Table 4.1**. More discussion has been provided in the previous sections, and is reiterated here as appropriate. The order the areas of concern are listed do not imply importance or priority of one over the other.

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 4.1** by reference post. They are also shown graphically in **Figure 4.1**.

Table 4.1: Areas of Concern

Location (RP)	Feature	Cause		Description
10.9	Vertical Curve	K-Value	134.6	K-value is below standards for level terrain
12.4 - 13.4	Roadside Safety	Clear Zone		Cut slope with fallen rock
13.9 - 14.2	Roadside Safety	Clear Zone		Heavy vegetation
14.0 - 14.1	Grade	Grade	3.16%	Grade is greater than standards for level terrain
15.3 - 15.5	Grade	Grade	5.52%	Grade is greater than standards for rolling terrain
15.3	Vertical Curve	K-Value	121.6	K-value is below standards for level terrain
15.6 - 15.8	Grade	Grade	6.00%	Grade is greater than standards for rolling terrain
15.6	Vertical Curve	K-Value	89.3	K-value is below standards for rolling terrain
16.4	Roadside Safety	Slope		Steep fill slope
16.5 - 16.8	Roadside Safety	Slope		Steep fill slope
18.9 - 19.5	Grade	Grade	4.16%	Grade is greater than standards for rolling terrain
19.5 - 20.1	Grade	Grade	5.50%	Grade is greater than standards for rolling terrain
21.1 - 21.4	Roadside Safety	Slope		Cut slope with fallen rock
21.7 - 21.8	Roadside Safety	Slope		Cut slope with fallen rock
22.1 - 22.6	Roadside Safety	Slope		Cut slope with fallen rock
22.9 - 23.1	Roadside Safety	Slope		Cut slope with fallen rock
22.9	Horizontal Curve	Radius	1146'	Curve radius is below standards for level terrain
23.2	Horizontal Curve	Radius	1146'	Curve radius is below standards for level terrain
23.9	Vertical Curve	K-Value	94.8	K-value is below standards for rolling terrain
23.9	Vertical Curve	SSD	455.7'	Stopping sight distance is below standards for rolling terrain
24.0	Horizontal Curve	Radius	1146'	Curve radius is below standards for level terrain
24.2	Roadside Safety	Horizontal Curve		Poor sight distance
24.8	Roadside Safety	Slope		Steep fill slope
25.0 - 25.3	Roadside Safety	Horizontal Curve		Poor sight distance

25.0	Roadside Safety	Slope		Sharp drop-off into water
25.4 - 25.6	Roadside Safety	Slope		Shoulder and side slope to water
25.5	Roadside Safety	Slope / Intersection		Steep slope into water at intersection
25.9	Roadside Safety	Bridge ends		Concrete bridge ends
26.1	Roadside Safety	Slope		Steep fill slope
26.2 - 26.8	Roadside Safety	Slope		Steep fill slope
26.6 - 26.8	Grade	Grade	4.54%	Grade is greater than standards for rolling terrain
27.1	Horizontal Curve	Radius	1146'	Curve radius is below standards for level terrain
27.3 - 27.4	Grade	Grade	5.83%	Grade is greater than standards for rolling terrain
27.3	Vertical Curve	K-Value	85.3	K-value is below standards for rolling terrain
27.3	Vertical Curve	SSD	429.1'	Stopping sight distance is below standards for rolling terrain

4.2 SPEEDS

Vehicle speed data was collected at 4 locations along the corridor. As shown in **Table 4.2**, 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.

Table 4.2: Speed Data

Location (RP)	Posted Speed Limit (mph)	ADT (vpd)	85th Percentile Speed (mph)
11.2	35	3902	42.2
14.0	45	2333	51.9
15.3	70	2145	68.5
24.4	60	1539	65.4

4.3 Access Density

A high concentration of approaches exists in the first five miles west of Anaconda, with over 16 approaches per mile. The most dense concentration 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 5.5 and 6.6 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. As roadway width is limited in this area, there is no "widened" shoulder available to exit the traffic stream.

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 bighorn sheep are attracted to the salt in de-icing material used on the highway in the winter season. The use of de-icing material may cause bighorn sheep to concentrate on and adjacent to the roadway, increasing the incidents of vehicle collisions with bighorn sheep.

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.

4.5 Alternative Use Facilities

Local planning objectives include the future extension of 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.

4.6 Local Infrastructure Expansion

Local planning efforts have included the future extension of wastewater system infrastructure west of Anaconda to the West Valley area in the near future. The locating of this future infrastructure in the corridor is important to optimize service to areas residents and ensure that maintenance and access to the infrastructure is allowed.

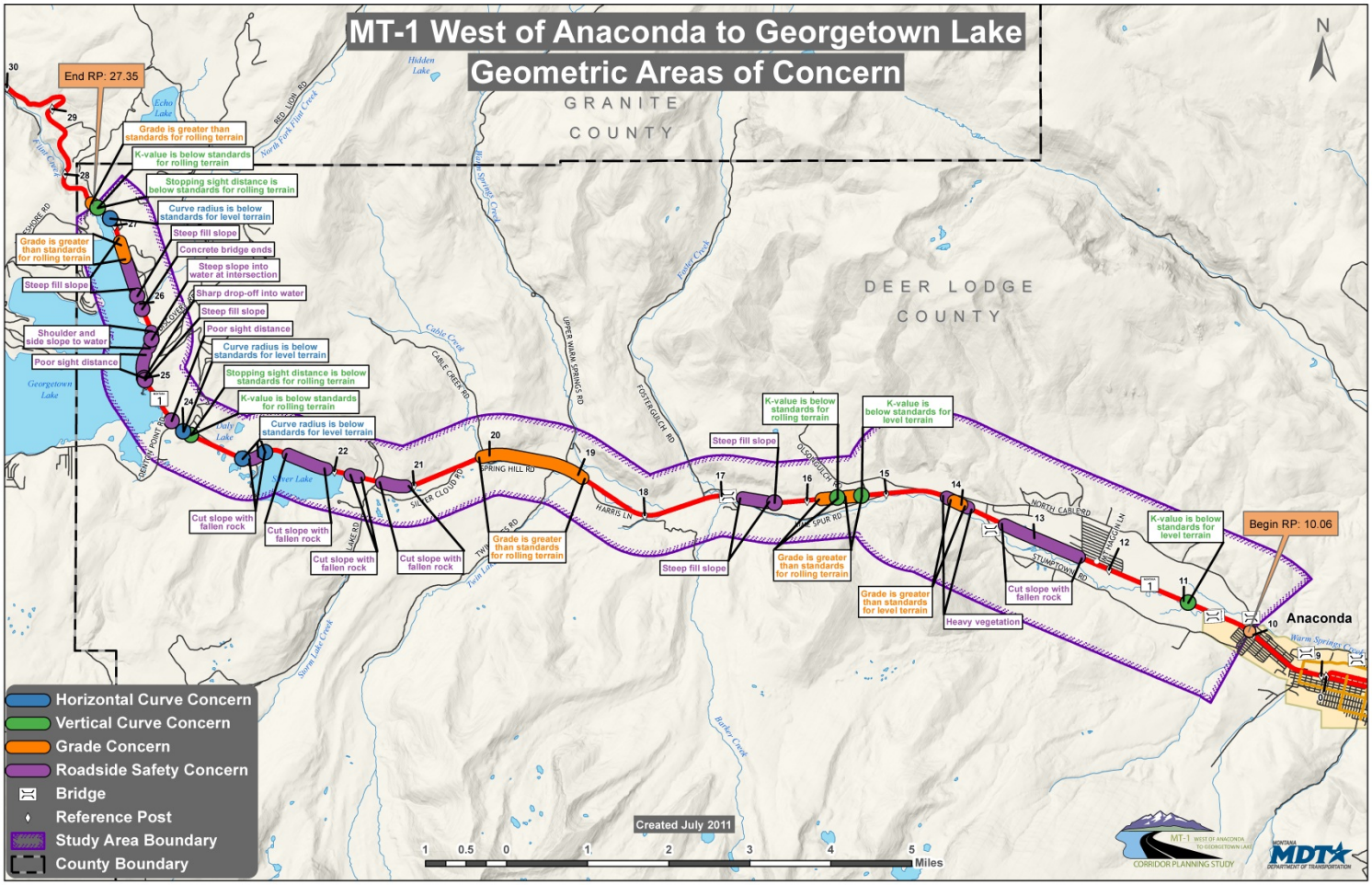

Figure 4.1: Geometric Areas of Concern