CULBERTSON CORRIDOR PLANNING STUDY

AUGUST 2012

Culbertson Corridor Planning Study

Public Draft Corridor Study Report

Prepared for:

MONTANA MDT DEPARTMENT OF TRANSPORTATION

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Abbreviations and Acronyms

AADT	Annual Average Daily Traffic
ATR	Automatic Traffic Recorder
BBER	Bureau of Business and Economic Research
CFR	Code of Federal Regulations
CIP	Capital Improvements Plan
CTEP	Community Transportation Enhancement Program
DEQ	Montana Department of Environmental Quality
DNRC	Montana Department of Natural Resources and Conservation
EA	Environmental Assessment
EB	eastbound
EO	Executive Order
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
GIS	geographic information system
HPP	High Priority Projects
HSIP	Highway Safety Improvement Program
LOS	Level of Service
MACO	Montana Association of Counties
MCA	Montana Code Annotated
MDT	Montana Department of Transportation
MEPA	Montana Environmental Policy Act
MFISH	Montana Fisheries Information System
MFWP	Montana Department of Fish, Wildlife & Parks
MNHP	Montana Natural Heritage Program
mph	miles per hour
MT 16	Montana Highway 16
MT 16 (north)	Montana Highway 16 north of US 2
MT 16 (south)	Montana Highway 16 south of US 2
NB	northbound
NEPA	National Environmental Policy Act
NHS	National Highway System
NINHS	Non-Interstate National Highway System
NRCS	National Resource Conservation Service
NRIS	Natural Resource Information System
NWI	National Wetland Inventory
RID	Rural Improvement Districts
ROW	Right-of-Way
RP	Reference Post
RRFB	Rectangular Rapid Flashing Beacon
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equality Act: A Legacy of Users

SB	southbound
SFC	State Funded Construction
SHPO	Montana State Historic Preservation Office
SID	Special Improvement Districts
SR	Sufficiency Rating
SRTS	Safe Routes To School
STIP	State Transportation Improvement Program
STP	Surface Transportation Program
STPP	Surface Transportation Program Primary Highways
STPS	Surface Transportation Program Secondary Highways
STPU	Surface Transportation Program Urban Highways
TCSP	Transportation & Community System Preservation Discretionary Program
TIF	Tax Increment Financing
TMDL	Total Maximum Daily Load
TRED	Transportation Regional Economic Development
US 2	US Highway 2
USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WB	westbound
WIM	Weigh-in-Motion

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Executive Summary

The Montana Department of Transportation (MDT) conducted a Corridor Planning Study at the request of local officials from the Town of Culbertson. Considerable growth in the oil industry in Western North Dakota and associated impacts to Northeastern Montana substantially increased truck traffic through the Town of Culbertson and surrounding area. This Study, which includes US Highway 2 (US 2) and Montana Highway 16 (MT 16) within and near Culbertson, provided cost-effective ways to address transportation needs and concerns within the Study area boundary.

This Corridor Study is intended as a planning tool and not a design or construction project. The study process involved proactive outreach to the public, stakeholders, local government, and resource agencies. Known and publicly available resource and technical information was evaluated. Activities completed for the development of the study included the following:

- Research and analysis of existing US 2 and MT 16 roadway conditions;
- Research and synthesis of known environmental resources and applicable regulations in the Study area;
- Documentation of projected future conditions;
- Identification of community, stakeholder, local government, and resource agency concerns;
- Identification of corridor needs and objectives;
- Development of improvement options, including alternate truck routes, with consideration to costs, feasibility, environmental resource impacts, and community input, and finally
- Documentation of potential funding mechanisms for improvement options.

ES.1 Corridor Concerns

Based on evaluation of existing conditions of US 2 and MT 16 within the Study area and on analysis of input from the public, from stakeholders, and from local government -- roadway issues and areas of concern were identified. These concerns include limited non-motorized infrastructure, substandard geometrics, inadequate sight distance, deteriorating pavement conditions, increased truck traffic, and multiple access points.

ES.2 Corridor Study Needs and Objectives

Needs and objectives for the Culbertson Corridor Planning Study have been identified on the basis of information contained both in the *Existing and Projected Conditions* and *Environmental Scan* reports and input from the community, from local government, from resource agencies, and from an oversight committee. The following needs and objectives guided the development of potential improvement options within the Study area:

Need Number 1: Improve Safety of US 2 and MT 16

Objectives

- Improve pedestrian crossing safety near the school.*
- Enhance pedestrian movements along US 2 and MT 16, to the extent practicable.
- Improve intersection sight distance, to the extent practicable.

Need Number 2: Improve Operations of US 2 and MT 16

Objectives

- Improve geometric elements to provide for semi-trucks and recreational vehicles, to the extent practicable.
- Accommodate current and future capacity demands for US 2 and MT 16, to the extent practicable.
- Accommodate unique turning movements for wide and over length loads, to the extent practicable.

Need Number 3: Minimize Environmental and Transportation Impacts

Objectives

- Minimize impacts to the social, economic, and natural environment, to the extent practicable.*
- Minimize impacts associated with access points and roadside parking, to the extent practicable.
- Minimize the impacts of increased truck traffic through Study area.

Other Objectives

- Construction feasibility
- Availability and feasibility of funding

ES.3 Improvement Options

Various improvement options were developed to address corridor needs and objectives. These ranged from major reconstruction projects along US 2 and MT 16 to small spot improvement projects to address safety and operational issues. Twenty-five improvement options within the Culbertson Study area were carefully analyzed. Improvement options within the Culbertson Study area were carefully analyzed, went through a high-level screening process, and were finally recommended for future consideration.

ES.3.1 Improvement Options on the Existing Network

Of the 25 improvement options, 19 options were identified on the existing network for further analysis. Through a high-level analysis, 14 of the 19 improvement options were recommended for future

consideration. The options were grouped into short-term options that could be implemented within two years, mid-term options that could be implemented between two and five years, and finally long-term options that may be implemented beyond five years.

ES.3.2 Alternate Truck Route Improvement Options

As part of the transportation improvement options to address traffic issues in and around Culbertson, a number of alternate truck routes were also analyzed. A screening process was developed to determine which alternate route improvement option would best meet the needs of the community in effectively reducing truck traffic through the center of town. Screening criteria allowed for a qualitative and quantitative analysis to reduce the number of potential alignments which could be carried forward for further consideration if a project moves forward.

Because of the accessibility to the weigh scale and the current truck traffic patterns, only alternate route improvement options on the east side of MT 16 were analyzed. Six improvement options were developed due to their potential to divert truck traffic around Culbertson's downtown area. The study's screening process and resulting analysis selected a single alternate route which would connect US 2 and MT 16 in the southeastern region of the Corridor Study area. This potential alternate route would meet the long term needs and objectives of the community and best address the issue of increased truck traffic within the corridor. An exact alignment and additional avoidance and minimization measures would be determined in a project development phase, if a project is forwarded from this Study.

ES.4 Conclusion

Considerable growth in the oil industry, from the Bakken Shale Formation, in Western North Dakota and associated impacts to Northeastern Montana have substantially increased truck traffic through the Town of Culbertson and surrounding area. At the present time, the Bakken is considered to be the fastest growing economic area in the United States, and analysts expect oil exploration and development to continue over the next ten to twenty years. Currently, the Culbertson area has experienced a considerable increase in truck traffic through town due to the rise in oil production and operations. The purpose of this Corridor Study was to identify cost-effective ways to address both transportation needs and safety concerns within the Study area.

Existing data was analyzed to determine current and future needs, potential environmental constraints, and mitigation opportunities. As a result, a variety of improvement options were developed to address corridor needs and objectives. The options ranged from major reconstruction projects along US 2 and MT 16 to small spot improvement projects to address safety and operational issues. Based on implementation timeframes from short-term to long-term, 14 improvement options on the existing networks of US 2 and MT 16 were recommended to be carried forward for further consideration. Additionally, a single alternate truck route improvement option was advanced for future consideration, which would alleviate truck traffic through downtown Culbertson.

The ability to develop projects based on the recommended improvement options for the Culbertson area 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. National Highway System 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 required:

- 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 in this Study.

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Chapter 1 Introduction

1.1 *Study Purpose*

The Montana Department of Transportation (MDT) initiated the Culbertson Corridor Planning Study at the request of local officials from the Town of Culbertson. Considerable growth in the oil industry in Western North Dakota and associated impacts to Northeastern Montana substantially increased truck traffic through the Town of Culbertson and surrounding area. The purpose of the Corridor Study is to identify cost-effective ways to address both transportation needs and safety concerns within the Study area boundary. This Study analyzes existing data to determine current and future needs, potential environmental constraints, and mitigation opportunities. Specifically, this Study addresses traffic and safety concerns on US Highway 2 (US 2) and Montana Highway 16 (MT 16) within and near Culbertson which have resulted from increased truck traffic from the recent boom in the oil industry in the region.

The Study area encompasses a rectangular area around the Town of Culbertson. More specifically, the boundary includes a 4-mile segment of US 2 (between Reference Post (RP) 642.8 and RP 646.8) and a 5-mile segment of MT 16 (between RP 86.6 and RP 88.6 on N-22 and between RP 0 and RP 3 on N-62). Physical features within the Study area include Clover Creek, BNSF Railway, the airport, public school, parks, the medical facility, and numerous other public and private properties. The Study area boundary for the Culbertson Corridor Planning Study and the Town of Culbertson city limits are shown in Figures 1-1 and 1-2, respectively.

Figure 1-1 Study Area Boundary

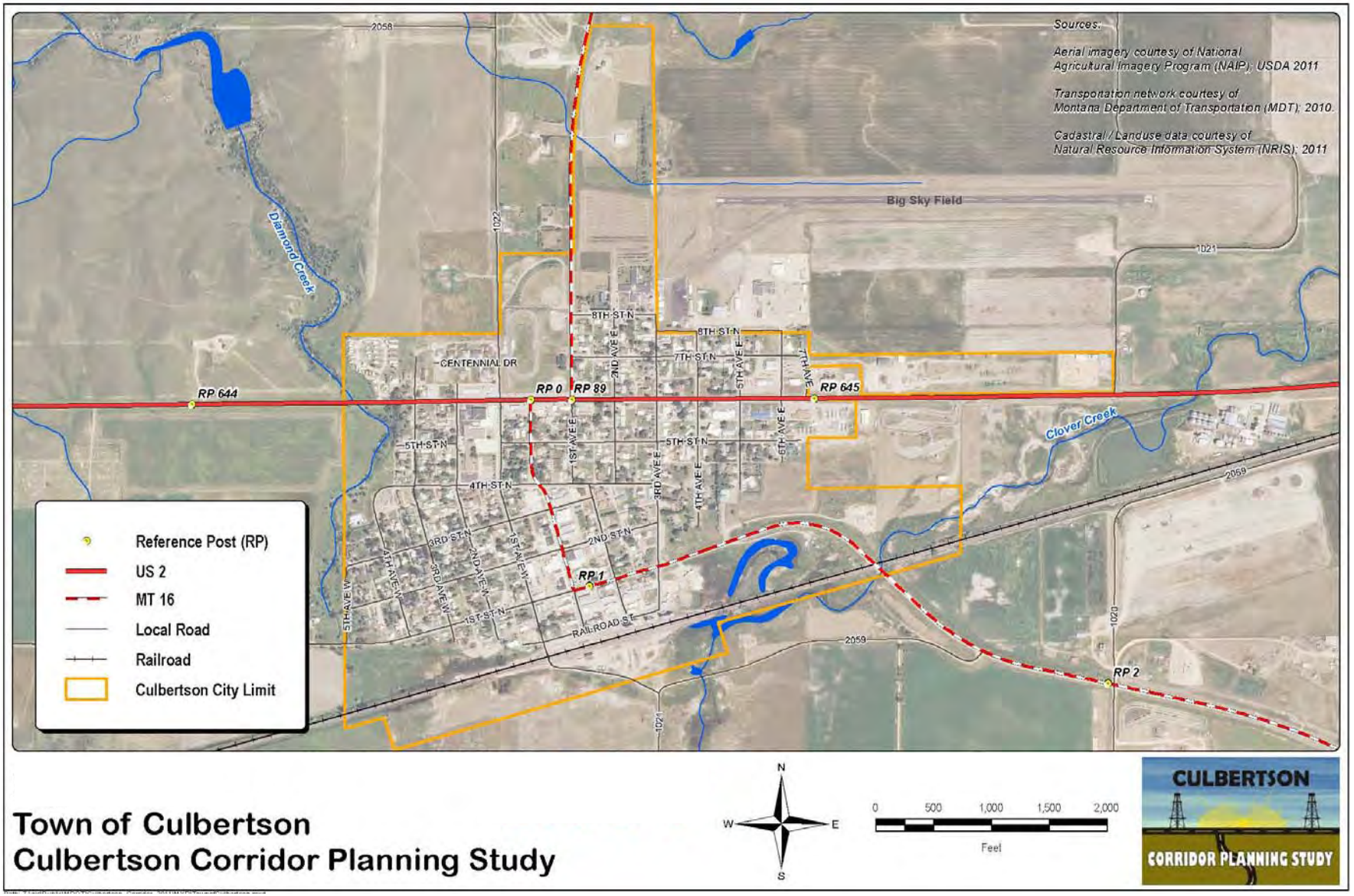


Figure 1-2 Town of Culbertson

1.2 *Corridor Study Process*

MDT established the corridor planning process to link transportation planning and the pre-National Environmental Policy Act (NEPA)/Montana Environmental Policy Act (MEPA). The NEPA/MEPA environmental review process helps balance transportation decision making that takes into account the impacts on the human and natural environment with the needs for a safe and efficient transportation system. The Corridor Planning Study process is a pre-NEPA/MEPA process that allows for earlier planning-level coordination with the public, with resource agencies, and with other designated entities. Through the Corridor Study process, both data and analyses are developed early on to be used later in the environmental review process if a project (or projects) is forwarded from the study. The study process discloses the environmental, social, and economic impacts; it identifies potential mitigation measures that can be implemented; and it documents the information for decision makers before projects are carried forward.

This Corridor Planning Study is developed as a planning tool to determine potential improvement options and does not include project level design. Results of the study may be used to determine the level and scope of environmental review required if a project is forwarded into project development.

Thus, this report not only identifies the technical and known environmental conditions and issues that exist within the corridor but it also identifies reasonable and feasible improvement options which are designed to increase safety and efficiency for the traveling public. Additionally, it defines potential impacts to the surrounding social, economic, and environmental resources which would result from the improvement options.

1.3 *Other Planning Documents*

Existing planning documents are important to consider when evaluating existing and projected corridor conditions because these documents identify what is planned for the area. It is also important to ensure consistency with the community planning documents and any improvement options that are developed through the corridor planning study process. Thus, four planning documents were consulted and are summarized in this section.

1.3.1 Growth Policy

In 2011, the Town of Culbertson updated their Growth Policy which included the following goals: attracting air traffic to the Big Sky Field, providing areas for pedestrians to travel that promote health and safety, alerting motorists of the school, and minimizing potential vehicle/pedestrian accidents.

1.3.2 Capital Improvements Plan

The Town of Culbertson Capital Improvements Plan (CIP), adopted on December 5, 2011, contains detailed strategies for funding priority roadway infrastructure projects for a total of $1,727,300. In addition to roadway improvements, the CIP addresses improvements to the Big Sky Field for a total of $1,202,300.

1.3.3 Transportation Regional Economic Development Study

Although the US 2/MT 16 Transportation Regional Economic Development (TRED) Study is not specific to the community of Culbertson, it discusses regional economic issues which are directly related to two main arterials entering/exiting the town of Culbertson. The purpose of the original TRED Study was to identify those economic, regulatory, or operational changes that would cause traffic and safety conditions, which in turn would warrant building a four-lane highway on the Montana portion of the Theodore Roosevelt Expressway.

1.3.4 Culbertson – East to North Dakota Environmental Assessment

The *Culbertson – East to North Dakota Environmental Assessment* (EA) was reviewed as part of the current Culbertson Corridor Planning Study because this earlier study proposed reconfiguration of US 2 within the Study area. US 2 from the North Dakota State Line to the intersection of MT 16 (north) is part of the Theodore Roosevelt Expressway. As stated in the *Culbertson – East to North Dakota EA*, the primary purpose of this project was to ensure system continuity and roadway configuration consistency with existing segments of the Theodore Roosevelt Expressway and north/south connecting corridors. The Finding of No Significant Impact (FONSI) was signed August 2008. The Preferred Alternative identified was a four-lane highway from the North Dakota State line to the intersection of US 2 and MT 16 (north), which is located in the Study area. Portions of this roadway within the Culbertson city limits would be designated to consist of 5-foot sidewalks with curb and gutter, 5-foot shoulders, two 12-foot outside travel lanes, and two 11-foot inside travel lanes. As US 2 leaves the city limits the curb and gutter and sidewalks would be terminated, but the roadway would remain in a four-lane undivided configuration with four 12-foot travel lanes and 8-foot shoulders. Finally, just west of Clover Creek the roadway would transition to a divided roadway.

Chapter 2 Existing and Projected Conditions of US 2 and MT 16

This chapter reviews the existing and projected roadway conditions and environmental factors throughout the Corridor Study area for US 2 and MT 16. The findings identify areas of concern and constraints which are used to frame the needs and objectives for this Study area. Further detailed analysis can be found in Appendix C.

Both US 2 and MT 16 are functionally classified as Rural Principal Arterials on the National Highway System (NHS) Non-Interstate which covers two distinct sections of MT 16 through the Corridor Study area. Here, the southern section of MT 16 enters the south side of the Study area at RP 3 and continues northwest over the BNSF Bridge, heads west along 1st Street, turns north on Broadway Avenue, and intersects US 2 at RP 0. MT 16 then continues east and is concurrent to US 2 for one block before heading north to begin the northern portion of MT 16 at RP 88.6 and to continue north to RP 86.6. US 2 enters the west side of the Study area at RP 642.8 and continues east to RP 646.8 where it exits the east side of the Study area.

Information in this chapter is based on a high-level scan obtained from publicly available sources and as-built construction drawings. Thus, if a future project is forwarded from this Study, the information presented herein may be used to inform future project level analysis.

2.1 *Existing Socio-Economic Conditions*

In recent years, Culbertson, Roosevelt County, and surrounding communities have experienced socio-economic impacts because of the increase in the oil industry. More specifically, the Study area is part of the Bakken Shale Formation which is currently experiencing a boom in oil development. The Bakken region, which includes Northeastern Montana, Northwest North Dakota, and Southern Saskatchewan in Canada, is considered the fastest growing economic area in the United States at the present time. For the record, the Bakken is the largest known reserve of light sweet crude oil in North America.

Analysts expect oil exploration and development to continue in the Bakken region over the next ten to twenty years. Existing socio-economic data are mostly out of date in relation to the recent oil boom activity. Although projections are made to the 20-year planning horizon, current economic changes add uncertainty to the social and economic projections. This section highlights the most recent socio-economic statistics available and describes the recent rapid changes in the area, most notably in the energy industry. More detailed socio-economic conditions and statistics can be found in the *Existing and Projected Conditions Report* in Appendix C.

2.1.1 Regional Population and Demographics

In recent decades, the region has been somewhat depressed economically and has experienced negative population growth. However, the current oil activity has brought more people and traffic to the region. Based on the 2010 Census data, Table 2.1 summarizes basic population information for

Roosevelt and Richland Counties. Richland County is located south of Roosevelt County and includes Sidney and Fairview.

Table 2.1 Regional 2010 Census Data

	Roosevelt	Richland
County Population	10,425	9,746
Wolf Point	2,621	
Poplar	810	
Culbertson	714	
Sidney		5,191
Fairview		840
Race		
White	39%	97%
American Indian	63%	3%
Ethnicity: Hispanic or Latino	2%	3%
Housing		
Total housing units	4,063	4,550
Owner-occupied	54%	64%
Renter-occupied	34%	28%
Vacant	13%	8%

Field reports indicated that the influx of workers has put pressure on housing markets in the Bakken region since the 2010 Census counts were taken. Accounts of housing shortages have become regular, and although the reports are not systematic enough to include in this section, the accounts are consistent with more frequent data reports such as traffic counts and unemployment rates, which are addressed in Appendix C. Currently in the Culbertson area, hotels are fully booked, rental properties are occupied, and a future man camp is being planned to house oil workers. Communities throughout the region, including Culbertson, are unable to handle the infrastructure (water, sewer, etc.) demand due to the rise in oil production and operations. The 2010 Census data can be used as a baseline in comparison against more current information as it becomes available.

Figure 2-1 shows the population of the two regional counties from 2000 to 2010 (shown in green) and projections out to year 2030 (shown in orange) based on NPA Data Services, Inc. through the Department of Commerce. Moreover, these general trends have been confirmed by the Montana Census and Economic Information Center.

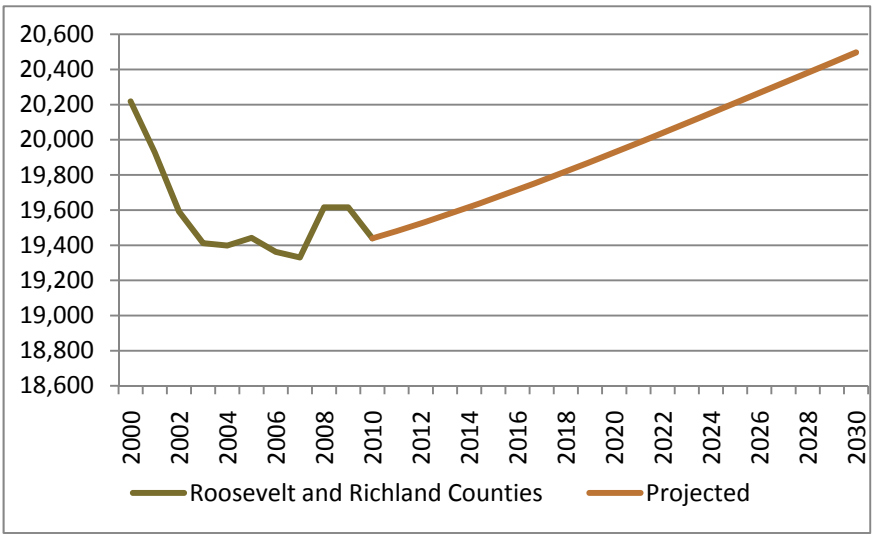


Figure 2-1 Total Observed and Projected Population in the Study Counties

Between 2000 and 2004, Roosevelt and Richland counties experienced a population decline of nearly 600 people. There was a slight rebound in 2008 and 2009; however, the area still had a net negative population growth for the decade. Population projections suggest that the population of the two counties will rebound slowly and that by 2030 the counties will reach populations slightly higher than in 2000. The long-term population trend in much of Eastern Montana indicates a general expectation that population growth will be limited in the 20-year planning horizon. These projections are from before the current oil boom; therefore, growth rates may actually be higher over the 20-year planning horizon. However, the current projections represent a baseline against which future estimates may be measured.

2.1.2 Regional Economy and Employment

The Bakken region shows a direct link between national and global conditions and those in rural economic markets, particularly in natural resource-based economies. Industry and transportation changes beyond the control of local regions can experience shifts in investment and income as a result of the overall changing industry.

The discovery of more readily accessible oil pockets of the Bakken within North Dakota has led recent energy development activity to concentrate in that state. This overall region is now expanding and is currently bustling with explorers, drillers, workers, drivers, and suppliers. Railroads are making improvements, and new pipelines are being planned and proposed. In addition, the region is a well-established and productive agricultural area. Grain and pulse crops in the area have been productive, agricultural prices are good, and investments in truck-to-rail facilities for farm crops are continuing.

The main challenge for the analysis presented in this Study is that the most recent economic data are unable to measure the extent of the recent oil activity and are largely limited to providing information from before the current boom.

Figure 2-2 estimates the economic base of Richland County for the period 2008 to 2010 from the University of Montana Bureau of Business and Economic Research (BBER). The economic base of an economy refers to either the activities that bring income into an area or the economy that remains in the area. Although Figure 2-2 only considers Richland County, it is the best window available into the basic economy of the larger Study area.

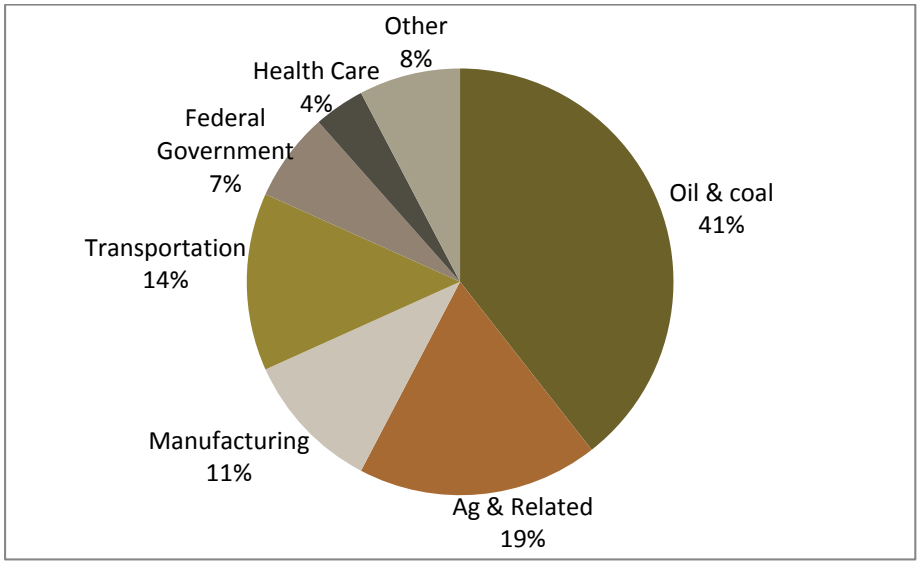


Figure 2-2 Economic Base of Richland County, Montana 2008 to 2010

The single largest share of the Richland County economy is from the energy industry (41 percent). A slightly larger part is made up from the total of the agriculture, manufacturing, and transportation industries (44 percent). Recent projections indicate the energy sector (mining) to be growing faster in the Study area than in the state as a whole.

Figure 2-3 shows oil activity in Montana as of January 2012 according to the Montana Board of Oil and Gas. Here, the green dots represent oil wells that are in the process of development; the yellow dots indicate wells that have been permitted but have not begun; and the red dots represent producing oil wells. It is obvious that the main center of oil activity in this broader region is within Richland County.

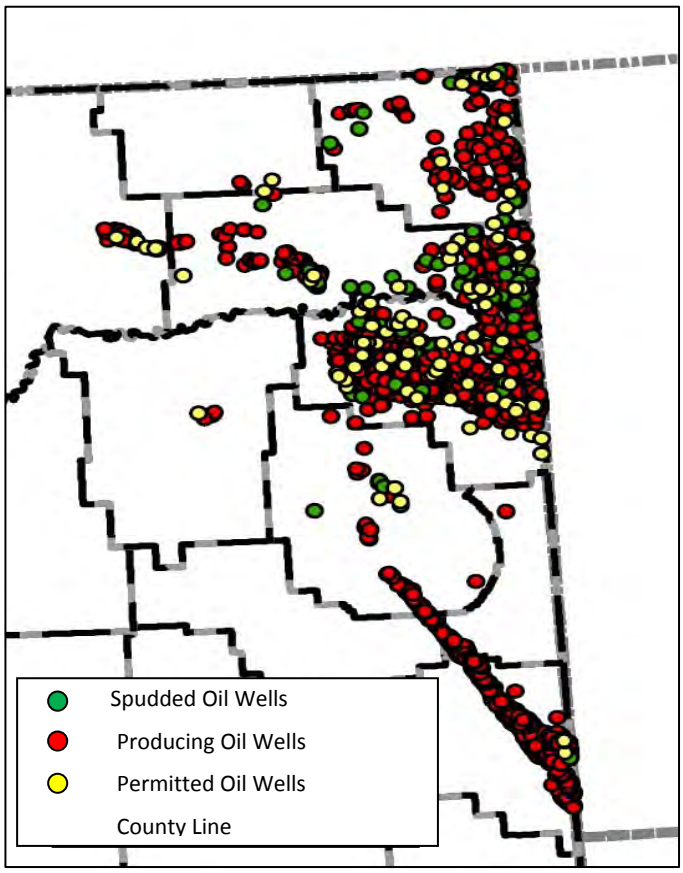


Figure 2-3 Oil Activity in Northeastern Montana (January 2012)

Finally, according to the Montana Board of Oil and Gas of the Montana Department of Natural Resources and Conservation (DNRC), several producing oil wells have actually been drilled within the Study area boundary and are shown in Figure 2-4.

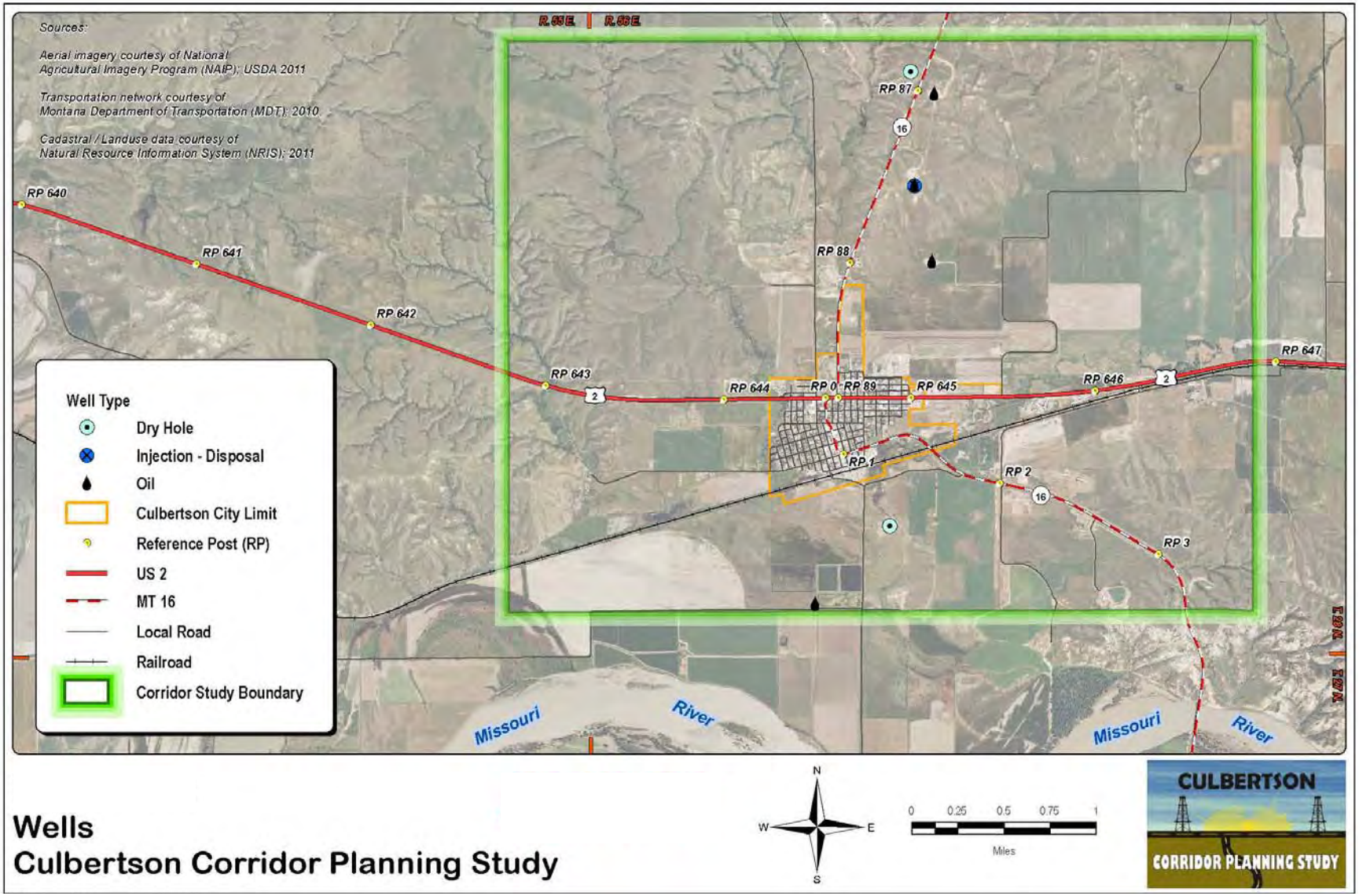


Figure 2-4 Oil Wells within Study Area Boundary

Agriculture also plays a major role in Culbertson's and the surrounding region's economy. The main products harvested in this region are wheat, sugar beets, alfalfa, beef cattle, and food oils. BNSF Railway's loading facility on the south end of Culbertson ships regional products to consumers all across the country. Columbia Barge Company plans to build a 110-car grain loading facility in the Culbertson area. Shuttle loading facilities continue to be added in Montana, and their long-term impacts are difficult to predict. Additional facilities are located approximately 80 miles east of the Culbertson area. Moreover, some studies suggest that the growth of grain loading facilities has, to date, led to heavier grain trucks traveling over longer distances, with potential impacts on Montana roadways.

The Culbertson area offers many recreational opportunities. Fishing, swimming, and boating on the Missouri River, Yellowstone River, and on Fort Peck Lake are available with hunting and trap shooting. Several annual events bring visitors and entertainment to the Culbertson area, and contribute to the local economy:

- Frontier Days & Rodeo (mid-June);
- Roosevelt County Fair (mid-August);
- Labor Day Wagon Train/Trail Ride (Labor Day-September); and
- Northeast Montana Antique Association Threshing Bee & Show (late-September).

2.2 *Existing Traffic Volumes*

The Annual Average Daily Traffic (AADT) is a measure of determining the service demand on a roadway. In order to determine a comprehensive AADT count for US 2 and MT 16 in the Study area, a weighted AADT was determined. This weighted average is based on yearly traffic counts by section for the most recent ten-year data. Traffic counts were not collected in 2010. Table 2.2 shows the weighted AADT for each segment for each year.

Table 2.2 Annual Average Daily Traffic

Length (miles)	Location	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0.305	US 2, entering Culbertson City Limits	1796	1226	1120	1566	1470	1470	1470	1270	1130	1185
0.069	US 2, Junction of MT 16 (south)	2340	1300	2210	2290	2260	2290	2290	2320	2220	2340
0.389	US 2, Junction of MT 16 (north)	2345	2026	1905	1800	2140	2140	2135	2115	1645	1920
	US 2 Weighted Average	**2125**	**1641**	**1619**	**1751**	**1883**	**1886**	**1883**	**1796**	**1491**	**1664**
0.132	MT 16 (north), entering Culbertson City Limits	865	900	830	855	940	940	940	1090	885	1020
	MT 16 (north) Weighted Average	**865**	**900**	**830**	**855**	**940**	**940**	**940**	**1090**	**885**	**1020**
0.876	MT 16 (south), Junction of US 2	1315	1417	1281	1339	1354	1354	1354	1106	1039	1193
2.323	MT 16 (south), leave Culbertson City Limits	860	1085	980	960	1160	1130	1305	825	925	940
	MT 16 (south) Weighted Average	**985**	**1176**	**1062**	**1064**	**1213**	**1191**	**1318**	**902**	**956**	**1009**

Source: MDT Traffic and Data website

An automatic traffic recorder (ATR) is located along MT 16, north of Culbertson, at approximately RP 88.5, represented as Station A-201. The 2011 ATR report at this site indicates the month of August experiences the highest volume of traffic with 1,471 vehicles per day. However, Fridays in the month of June experience the highest average daily number of vehicles with 1,651. The percentage of large trucks was recorded to be 9.64% at this location in 2011.

Because local traffic may have increased in the last two years, turning movement data were gathered at four main intersections in the Study area. The four intersections included US 2 and MT 16 (north), US 2 and MT 16 (south), MT 16 (south) and 1st Street, and MT 16 (south) and County Road 1020. Turning movement counts were gathered for the intersection of US 2 and MT 16 (north) on September 21, 2011. This intersection was recounted in March 2012 in addition to the other three intersections. Each vehicle entering an intersection was put into one of the five following categories: car, medium trucks, heavy trucks, bus, or motor bike. Appendix C shows turning movement counts and the percentage of heavy trucks traveling on each leg of each intersection.

All analyzed intersections show a high percentage of heavy vehicles on MT 16 and US 2. The intersection of MT 16 (south) and County Road 1020 also shows a high percentage of heavy vehicles on the southbound leg. Moreover, it has been observed that many trucks occupy two lanes to make their turning movements.

Turning movement counts were also used to evaluate the current level of service (LOS) at each intersection. LOS for an intersection is a qualitative measure developed to quantify driver perception for such elements as travel time, number of stops, total amount of stopped delay, and impediments caused by other vehicles. It provides a scale that can match the perception by motorists of the operation of the intersection. Thus, the scale measures the ability of an intersection to accommodate the amount of traffic using it. Here, the scale ranges from "A" which indicates little, if any, vehicle delay, to "F" which indicates substantial vehicle delay and traffic congestion. LOS was computed by using the intersection's peak hour (the single hour with the highest traffic), which was different for each intersection. Table 2.3 shows a summary of the LOS for each individual leg of the four intersections studied. Table 2.3 was based on March 2012 turning movement counts for all legs of all intersections.

Table 2.3 Current Intersection Level of Service during Peak Hour

Intersection	EB	WB	NB	SB
US 2 and MT 16 (north)	A	A	B	B
US 2 and MT 16 (south)	A	A	B	N/A
MT 16 (south) and 1st Street	B	A	A	A
MT 16 (south) and County Road 1020	A	A	B	B

(Abbreviations used are as follows: EB = eastbound; WB = westbound; NB = northbound; SB = southbound; N/A = not applicable).

2.3 *Projected Traffic Volumes*

It is difficult to estimate future traffic growth based solely on the most recent historical traffic counts (2000-2009) because local traffic has increased in the last two years (2010-2011) due to recent economic conditions in the Culbertson area. A five-year growth rate, which is more indicative of the latest economic activity, was projected by MDT for each roadway. The five-year growth rate for US 2 is 2.6 percent and for MT 16 north and south of US 2 is 3.2 percent and 16.3 percent, respectively. An analytical approach was used to predict the 20-year growth rate based on the AADT counts for the most recent ten-year data. Appendix C contains additional information on the analytical approach.

Based on the analytical calculations for US 2, MT 16 (south) and MT 16 (north), the twenty-year projected growth rates for these roadways are 1.50 percent, 2.52 percent, and 1.99 percent, respectively. However, it is possible that the region may experience higher (or lower) traffic growth as a result of the Bakken oil boom. Thus, the calculated projections are best estimates based on currently available information, and all other legs of the studied intersections were assumed to have 1.0 percent growth.

Projected LOS was computed by using a given intersection's turning movement counts during that intersection's peak hour and increased by their respective growth rates. Table 2.4 shows the LOS for each individual leg of the four intersections studied for the horizon year 2032. Appendix C contains more detailed information on both the existing and the projected LOS.

Table 2.4 2032 Intersection Level of Service during Peak Hour

Intersection	EB	WB	NB	SB
US 2 and MT 16 (north)	A	A	B	B
US 2 and MT 16 (south)	A	A	B	N/A
MT 16 (south) and 1st Street	B	A	A	A
MT 16 (south) and County Road 1020	A	A	A	B

(Abbreviations used are as follows: EB = eastbound; WB = westbound; NB = northbound; SB = southbound; N/A = not applicable).

In summary, even though the overall traffic projections are for increased traffic through each of the four intersections, the level of service for the intersections is not projected to change appreciably over the next 20 years.

2.4 *Right-of-Way and Jurisdictions*

According to as-built construction drawings, the right-of-way widths along US 2 and MT 16 generally vary from 33 feet to 120 feet on each side of centerline. Existing corridors of US 2 and MT 16 within the Study area are primarily located on private property, and the State of Montana maintains the right-of-way on each side of the highway. BNSF Railway infrastructure and right-of-way is located parallel to US 2 within the Corridor Study area. Other property within the Study area includes local government land as well as Montana State Trust Lands, as shown in Figure 2-5. If a project is advanced from this current study, potential right-of-way will be acquired according to applicable laws.

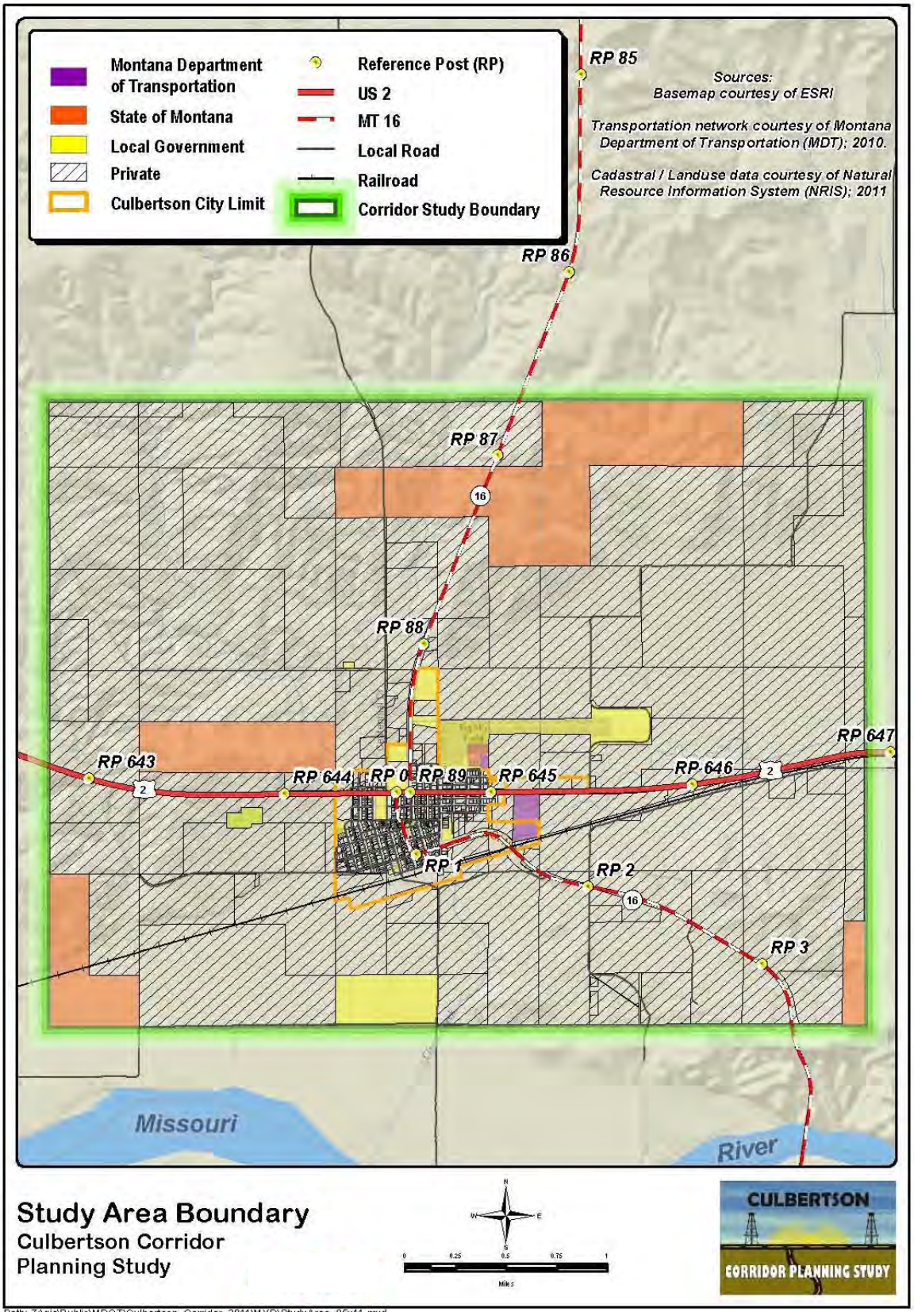


Figure 2-5 Land Ownership in Study Area

2.5 *Physical Characteristics*

US 2 is a major east/west highway providing a vital national link between the states of Washington to the west and Michigan to the east; and MT 16 is a major north/south highway providing a vital regional link between Interstate 94 to the south and Canada to the north. US 2 and MT 16 within the Study area are two lanes, one in each direction, with varying shoulder widths, interspersed parallel parking, and sidewalks on portions through town. Approximately one-quarter mile east of the Culbertson city limits along US 2, there are both an eastbound right turn lane and westbound left turn lane to the weigh scale and rest area located on the south side of the highway.

The posted speed limits along both US 2 and MT 16 through the Study area vary from 25 mph to 70 mph. Each time the posted speed limit is 70 mph, a 60 mph truck speed limit is also posted. Figure 2-6 shows the posted speed limits through the Study area.

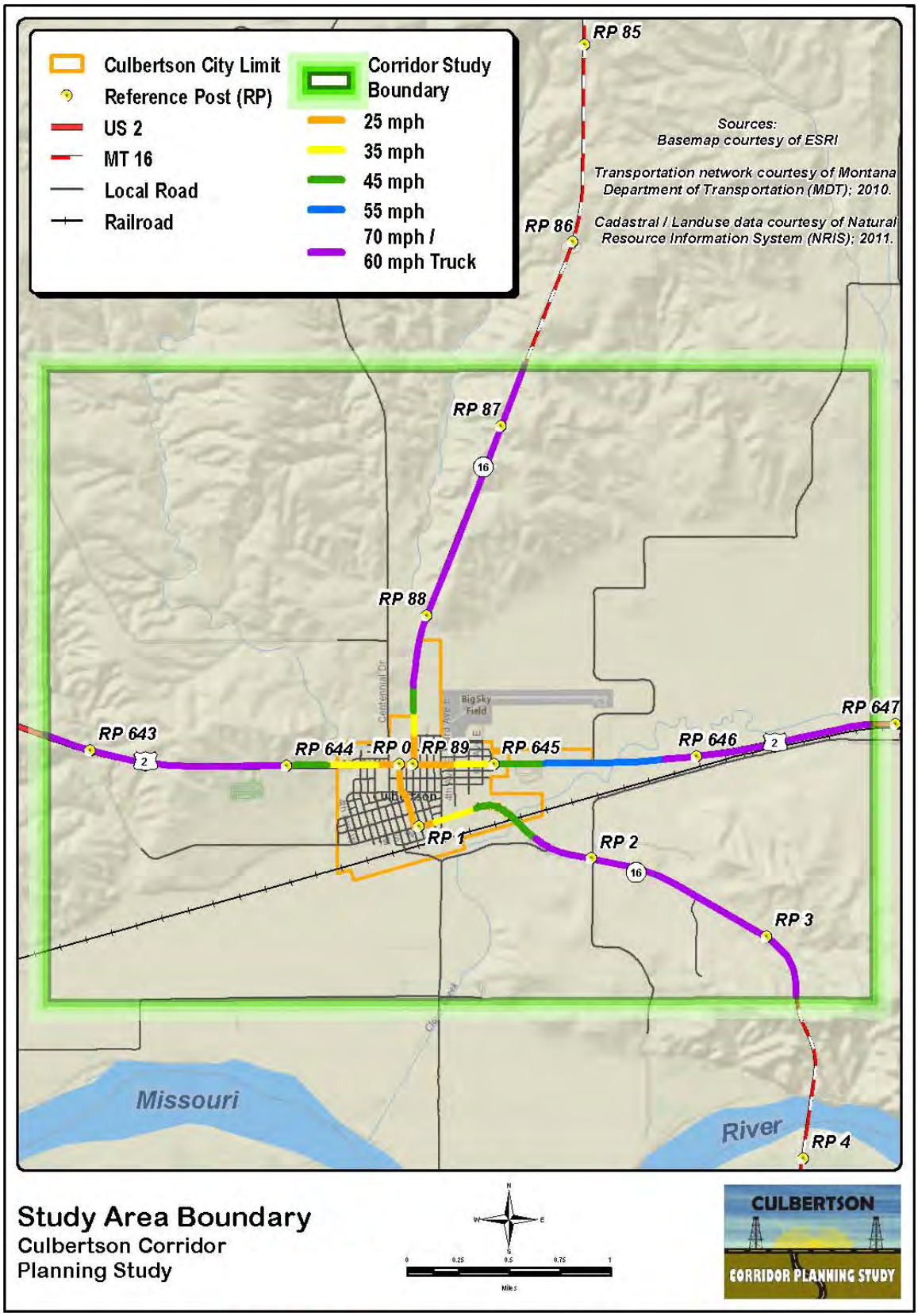


Figure 2-6 Posted Speed Limits

2.6 *Design Standards*

The MDT *Road Design Manual* identifies design standards to determine the overall operational characteristics of the roadway and to enhance the aesthetic appearance of the highway. Geometric design standards for the Culbertson Corridor Planning Study are based on current MDT design criteria for NHS Non-Interstate Rural and Urban Principal Arterials. Through the Town of Culbertson, MDT urban design standards will be applied if improvement options are further developed from this Study.

The design speed for a given roadway depends on the type of terrain, anticipated operating speed, adjacent land use, and on the functional classification of the highway. In rural areas such as Culbertson, topography and the functional classification are generally the controlling factors. The MDT *Road Design Manual* provides the following definitions for determining the type of terrain for a roadway:

- 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.

According to these terrain definitions, the Study area outside of the Town of Culbertson primarily occurs in level terrain (70 mph design speed) with some areas of rolling terrain (60 mph design speed). Table 2.5 lists the design standards for Rural and Urban Principal Arterials according to current MDT design criteria.

Table 2.5 Geometric Design Criteria for Rural and Urban Principal Arterials (National Highway System – Non Interstate) U.S. Customary

Design Element			Design Criteria					
Design Controls	Functional Classification		Rural Principal Arterial			Urban Principal Arterial		
						Curbed	Uncurbed	
	Design Forecast year		20 Years					
	*Design Speed	Level	70 mph			40 - 45 mph	40 - 50 mph	
		Rolling	60 mph					
		Mountainous	50 mph					
	Level of Service		Level/Rolling: B Mountainous: C			Desirable: B Minimum: C		
Roadway Elements	*Travel Lane Width		12'					
	*Shoulder Width	Outside	Varies					
	Cross Slope	*Travel Lane	2% Typical					
		Shoulder	2% Typical					
	Median Width		Varies			N/A		
	TWLTL Width		N/A			16'		
Earth Cut Sections	Ditch	Inslope	6:1 (Width: 10')			N/A	6:1 (Des\4:1 Min)	
		Width	10' Minimum			N/A	10' Min	
		Slope	20:1 towards back slope			N/A	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		50 mph	60 mph	70 mph	40 mph	45 mph	50 mph
	*Stopping Sight Distance		425'	570'	730'	305'	360'	425'
	Passing Sight Distance		1835'	2135'	2480'	N/A	N/A	760'
	*Minimum Radius		760'	1200'	1810'	533'	711'	711'
	*Superelevation Rate		e_{max} = 8.0%			e_{max} = 4.0%		e_{max} = 8.0%
	*Vertical Curvature (K-value)	Crest	84	151	247	44	61	84
		Sag	96	136	181	64	79	96
	*Maximum Grade	Level	3%			6%		
		Rolling	4%			7%		
		Mountainous	7%			9%		
	Minimum Vertical Clearance		17.0'					

Source: Montana Department of Transportation Road Design Manual Chapter 12, Figures 12-3 & 12-7 "Geometric Design Criteria for Rural and Urban Principal Arterials"

*Controlling design criteria (see Section 8.8 of the MDT Road Design Manual)

2.7 *Roadway Geometrics*

Roadway geometric design elements applicable to the Culbertson Corridor Planning Study were evaluated in order to identify areas of concern that do not meet current MDT design standards. This analysis was based on available as-built construction drawings. The segments of US 2 and MT 16 *within* the city limits of Culbertson were compared to current MDT design standards for Urban Principal Arterials, and areas outside of the city limits were compared to Rural Principal Arterial standards.

MT 16 undergoes several directional changes within the Study area, particularly at four intersections. The intersection of US 2 and MT 16 (north)/1st Avenue East, is a four-legged intersection with two-way stop control on MT 16 (north)/1st Avenue East. Lane configurations on all four-legs are currently shared left/thru/right turning movements. The intersection of US 2 and MT 16 (south)/Broadway Avenue is a T-intersection with stop control on MT 16 (south)/Broadway Avenue. Lane configurations at this particular intersection include a shared thru/right on US 2 eastbound, shared thru/left on US 2 westbound, and a shared left/right on MT 16 (south)/Broadway Avenue. The intersection of MT 16/Broadway Avenue and 4th Street is a skewed intersection with two-way stop control on 4th Street. Lane configurations on all four legs of the intersection have shared left/thru/right turning movements. The intersection of MT 16/Broadway Avenue and 1st Street is a four-legged intersection with shared left/thru/right lane configurations. The intersection is three-way stop controlled, but with no stop control on the MT 16 southbound leg.

The Culbertson Public School is located between US 2 and 4th Street and 2nd Avenue West and 1st Avenue West. The school bus loading and unloading facility is located along 4th Street West, between 2nd Avenue West and 1st Avenue West, and off the US 2 and MT 16 highway system.

Roadway geometrics failing to currently meet MDT design criteria are discussed in the following sections. Appendix C covers additional roadway geometrics in greater detail.

2.7.1 Horizontal Alignment

The horizontal alignments of US 2 and MT 16 have a major influence on traffic operation and safety and are comprised of the following elements: curvature, superelevation, and sight distance. In addition, horizontal alignment are directly related to the type of terrain and associated design speed.

Table 2.6 summarizes the substandard horizontal alignment curvature for both US 2 and MT 16. Shown here is the approximate reference post location of the center of the curve, length, and radius. Cells within Table 2.6 shaded in green are segments within city limits and subject to urban design standards.

Table 2.6 Substandard Horizontal Alignment

Approximate RP of Curve Center	Radius (ft)	Length (ft)
US 2 - RP 642.8 to RP 646.8 As-Built Project: FAP #F-84(20), West of Wolf Point-North (1956)		
647.80	11,460.0	1,006.7
MT 16 (north)(N-22) from RP 86.6 to RP 88.6 As-Built Project: FAP #F-193(9), Culbertson-Plentywood (1959)		
No Deficiencies	No Deficiencies	No Deficiencies
MT 16 (south) (N-62) from RP 0 to RP 3 As-Built Projects: FAP #F-273(10) Sidney-Culbertson (1959) & FAP #273-A Culbertson-Sidney Hwy (1933)*		
0.13	134.5	94.0
0.15	185.1	179.2
0.96	1,432.5	1,153.3
2.47	1,273.3	1,405.2
2.77	1,146.0	544.3
2.97	1,432.5	798.3

** Approximate locations are shown as mile posts rather than as reference posts.*

Note: Values shown in red do not meet current MDT design standards for level terrain (outside the city limits) or urban (within city limits) design standards. (See Table 2.5 for criteria)

2.7.2 Vertical Alignment

Vertical alignment measures the elevation change of a roadway. In this regard, the length and steepness of grades directly affects operational characteristics of the roadway. The MDT *Road Design Manual* provides recommendations for maximum grades on rural and urban principal arterials according to the type of terrain in the area. Table 2.7 shows the maximum grade recommendations according to terrain.

Table 2.7 Maximum Grade

Terrain	Maximum Grade
Level – Rural	3%
Rolling – Rural	4%
Level – Urban	6%
Rolling - Urban	7%

The grade and terrain throughout the Culbertson corridor varies from level to rolling and goes from rural to urban. Alignment grades found within Culbertson proper are relatively flat and meet maximum grade

standards for urban principal arterials. However, outside the city limits, five vertical curves have grades greater than 4% and thus exceed the maximum grade for rolling terrain standards (4%). Other controlling design factors for vertical alignments include the rate of vertical curvature (K-value) and stopping sight distance, both of which are dependent on the type of terrain and design speed within the Study area.

Table 2.8 shows deficient vertical alignment information based on available as-built drawings, with deficient vertical alignments within the city limits shaded in green.

Table 2.8 Substandard Vertical Alignment

Approximate RP of Curve Center	Type of Curve	Length (ft)	Grade In (G1)%	Grade Out (G2)%	K-Value	Stopping Sight Distance (SSD) (ft)
US 2 - RP 642.8 to RP 646.8 As-Built Project: FAP #F-84(20), West of Wolf Point-North (1956)						
642.63	Crest	836	-0.990	-4.160	263.7	754.44
643.09	Sag	1,000	-4.160	1.900	165.0	673.93
MT 16 (north) (N-22) from RP 86.6 to RP 88.6 As-Built Project: FAP #F-193(9), Culbertson-Plentywood (1959)						
86.46	Crest	1,200	4.660	0.130	264.9	756.12
86.69	Sag	800	0.120	4.660	176.2	713.89
87.84	Crest	1,800	4.020	1.980	882.4	1,379.97
88.12	Sag	1,000	1.220	4.020	357.1	1,520.76
MT 16 (south) (N-62) from RP 0 to RP 3 As-Built Projects: FAP #F-273(10) Sidney-Culbertson (1959) & FAP #273-A Culbertson-Sidney Hwy (1933)*						
1.13	Sag	300	-3.260	-0.340	102.7	542.56
1.27	Crest	200	-1.420	-3.260	108.7	686.48
1.41	Sag	300	-4.580	-1.420	94.9	475.74
1.55	Crest	400	1.240	-4.580	68.7	385.14
1.69	Sag	300	-3.100	1.240	69.1	327.34
1.85	Crest	200	-2.060	-3.100	192.3	1,137.62
2.40	Sag	300	-3.770	-0.350	87.7	425.03
2.68	Crest	500	6.000	-3.770	51.2	332.34

** Approximate locations are shown as mile posts rather than as reference posts.*
Note: Values shown in red do not meet current MDT design standards for level terrain (outside the city limits) or design standards for urban sections (within city limits). Values in blue exceed the maximum grade of 4% for rolling terrain.

2.7.3 Roadside Safety (Clear Zone)

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

roadside cross section. The urban section through Culbertson has undergone substantial development such as sidewalks, signs, buildings, utilities, and lighting; and it may be impractical to protect or remove the obstacles within the clear zone. Obstructions in the clear zone may cause sight distance issues; and with the increased truck traffic, obstructions may pose a safety concern as well. Current MDT standards establish clear zone guidelines in rural and urban sections. As improvement options are forwarded, roadside clear zones should be designed, to the extent practicable, to meet current MDT urban and rural design standards.

Parallel parking is provided on both sides of MT 16 (south) from 4th Street to the intersection of 1st Street West and 3rd Avenue East. The portion of MT 16 from 4th Street to US 2 also has areas on both sides of the street for parking. However, it is not clear whether the surface width in this section is adequate to safely accommodate both heavy vehicle traffic and parallel parking. On the other hand, wide shoulders along the north side of US 2 from 1st Avenue West to 4th Avenue East provide availability for parallel parking.

2.8 *Intersection Sight Distance*

Adequate sight distance at intersection corners is important for safe vehicle access and for turning movements and is based on the type of traffic control at the intersection. Sight obstructions may be caused by buildings, parked or turning vehicles, by trees, hedges, tall crops, or by un-mowed grass. If sight obstructions are found within the sight triangle, they should be removed or modified where practical in order to improve the driver's view of approaching vehicles. Intersection sight distance was examined at four intersections within the Study area. Intersection sight distance obstructions are summarized below:

- US 2 & MT 16 (north) – the southwest, southeast, and northeast quadrants have obstructions including signs, buildings, and potential parked/turning vehicles.
- US 2 & MT 16 (south) – the southeast quadrant has obstructions including buildings, signs, gas pumps, and potential parked/turning vehicles.
- MT 16/Broadway Avenue & 4th Street – the northeast and southwest quadrants have obstructions not only including trees and buildings, but also a sight hindrance caused by the curve along MT 16/Broadway Ave.
- MT 16/Broadway Avenue & 1st Street – the northeast and southeast quadrants have obstructions including parked/turning vehicles and buildings; and the southwest and northwest quadrants have obstructions including buildings and parked vehicles.

2.9 *Surface Width and Pavement Conditions*

The 2011 *Montana Road Log,* prepared by MDT, provides the most current roadway surfacing characteristics that include surface width, lane width, shoulder width, surfacing thickness, base thickness, and travel lanes. Table 2.9 shows the existing roadway surfacing information for both US 2 and MT 16 within the Study area. Because the Study area has turning lanes and street parking, which are not included in the Road Log, the total surface width may be greater than the sum of lane widths

and shoulder widths. The route segment plan recommends a surface width of 36 feet or greater for MT 16 and 40 feet or greater for US 2. However, the appropriate width would be determined using the MDT Roadway Width Decision Process during future project development. Due to the increased traffic volumes, deterioration of the roadway surface may come at a higher rate. Thus, reduced roadway service life is a concern in the Study area.

Table 2.9 Existing Roadway Surface Widths for US 2 and MT 16

Location Reference Post (RP)	Width (feet)			Thickness (inches)		Travel Lanes
	Surface	Lane	Shoulder	Surface	Base	
US 2 - RP 642.8 to RP 646.8						
642.8 – 644.251 *Enter West Culbertson City Limits @ 644.251*	28	12	2	6.0	14.0	2
644.251 – 644.556	32	12	4	3.0	14.0	2
644.556 – 644.624 *Junction N-62 (MT 16) @ 644.556; Junction N-22 (MT 16) @ 644.624*	32	12	4	3.0	14.0	2
644.624 – 645.498 *Leave East Culbertson City Limits @ 645.498*	32	12	4	3.0	14.0	2
645.498 – 646.8	32	12	4	3.0	14.0	2
MT 16 (north) (N-22) from RP 86.6 to RP 88.6						
86.6 – 88.599 *Enter North Culbertson City Limits @ 88.599*	28	12	2	6.0	16.8	2
88.599 – 88.742 *Junction N-22 (MT 16) & N-1 (US 2) @ 88.742*	43	12	8	6.0	16.8	2
MT 16 (south) (N-62) from RP 0 to RP 3						
0.000 – 0.326 *Junction N-62 (MT 16) & N-1 (US 2)*	44	12	8	3.0	15.0	2
0.326 – 1.200 *Junction MT 16 & 1st Street @ 0.326*	44	12	8	3.0	15.0	2
1.200 – 1.517 *Leave South Culbertson City Limits @ 1.517*	36	12	6	3.0	12.0	2
1.517 – 2.074	36	12	6	3.0	12.0	2
2.074 – 3.00	40	12	8	3.0	8.0	2

Source: *2011 MDT Road Log*, pgs. 39, 69, and 89.

2.10 *Geotechnical*

A detailed geotechnical investigation report was not developed for this Corridor Study. Although the earlier Big Muddy Creek – East project is beyond the western edge boundary of the current Study area, its geotechnical report drew attention to weak foundation soils in the area and required a special provision to replace the traditional embankment construction with geotextile, geogrid, and with special

borrow. At RP 87 on MT 16, a small shallow slope failure occurred due to heavy rainfall in the spring of 2011 and is being repaired.

2.11 *Drainage*

As stated in the *Environmental Scan* within Appendix B, the Corridor Study area is located within the Lower Missouri River Basin, Charlie-Little Muddy Creek Sub-basin. The overall drainage area has several unnamed streams as well as Clover and Diamond creeks running through the Study area. A majority of local streets have curb and gutter allowing gravity flow to drain water away from the city limits.

2.12 *Hydraulic Structures*

The *Existing and Projected Conditions Report* includes a list of hydraulic structures located along US 2 and MT 16 within the corridor. A full hydraulic analysis would be recommended if an improvement option is implemented in the future because of historical flooding within the Study area.

2.13 *Bridge Crossings*

Two bridge crossings are located within the corridor: the Clover Creek Bridge on US 2 near RP 645.6; and the Clover Creek/BNSF Railway Bridge on MT 16 (south) near RP 1.6. The Clover Creek Bridge was last inspected in December 2010, and the Clover Creek/BNSF Railway Bridge was most recently inspected in May 2011. These bridge assessments determined the Sufficiency Rating (SR) for each structure.

The SR formula is a method of evaluating highway bridge data to arrive at a numeric value which indicates the sufficiency of a given bridge to remain in service. At the present time, the Clover Creek Bridge has been categorized as ***not structurally deficient*** and ***not functionally obsolete***. The Clover Creek/BNSF Railway Bridge is categorized as ***functionally obsolete*** and ***eligible for rehabilitation***. According to the MDT Glendive District staff, the Clover Creek/BNSF Railway Bridge is functionally obsolete because it does not have shoulders matching the adjacent roadway. This structure is currently programmed for work to be completed in the Culbertson-South (CN 6972000) project. Proposed work includes removing asphalt from the deck, miscellaneous bridge deck repair, and resealing existing joints.

2.14 *Crash Analysis*

In 2011, the MDT Traffic and Safety Bureau provided crash data along MT 16 from RP 0 to 5, from RP 86 to 88.7, and along US 2 from RP 642 to 647. This data included the most recent available ten-years of crash data from January 1, 2001 to December 31, 2010. At the time of the analysis, crash data through 2011 was not available and has not been included in this analysis.

The ten-year analysis compared the Study area with the statewide average crash rates on Non-Interstate National Highway System (NINHS) rural routes. Crash rates are defined as the number of crashes per million vehicle miles. Severity index is defined as the ratio of the weighted crashes by severity to the total number of crashes. Severity rate is defined as the crash rate multiplied by the severity index. Table 2.10 describes the crash rate, severity index, and severity rate for each roadway as compared to the statewide averages for NINHS rural routes.

Table 2.10 Crash Statistics

	US 2 RP 642.0 to RP 647.0	MT 16 RP 86.0 to RP 88.74	MT 16 RP 0.0 to RP 5.0[1]	Statewide Average for NINHS Rural Routes[2]
All Vehicles Crash Rate	1.53	1.94	1.81	1.07
All Vehicles Severity Index	1.84	1.76	2.26	2.14
All Vehicles Severity Rate	2.82	3.41	4.09	2.29
All Vehicles Crashes	37	17	31	

Denotes above Statewide Average

1. *Source: MDT Traffic and Data Collection Analysis (Includes crash statistics outside the Study area boundary)*
2. *NINHS Route 5-year averages from 2005 through 2009 for the State of Montana*

The crash rate within the Study area is higher than the 2005 through 2009 statewide average for NINHS routes. It should be noted the crash statistics are not a true comparison to rural route crashes due to the inclusion of crashes within the town of Culbertson. According to the crash statistics, the largest crash concentration is on US 2 between RP 644.55 and 644.79, with seven crashes over the ten-year period. In relation to other locations in the Study area, this area has the highest number of crashes. However, this quarter mile section contains both intersections of US 2 with MT 16.

2.15 *Railroad*

BNSF Railway, which runs through the middle of the Study area, must be taken into consideration in developing improvement options. Both freight and passenger train speeds for the corridor are 70 mph outside the city limits, and inside the city limits, the speed is 60 mph for both freight and passenger trains. The system average train length is one mile. Guidelines have been established defining construction requirements and development standards near railroad facilities.

2.16 *Non-Motorized Infrastructure*

Bicyclists and pedestrians, including school-aged children, walk to and from schools, parks, downtown businesses, and from other community services. Current pedestrian infrastructure is inconsistent throughout the corridor because sidewalks are only adjacent to some of the roadways. According to the 2011 Town of Culbertson Growth Policy Update, pedestrian travel interconnectivity is limited throughout the Town and surrounding areas. This limited interconnectivity discourages pedestrian travel or else requires pedestrians to use the roadway in several portions of the Study area.

Currently, only two signed and striped crosswalks are located within the Study area. One crosswalk is located on US 2 between the Culbertson Public Schools and the adjacent convenience store, which is called Val-Am Stop & Go. This crosswalk is located mid-block and is primarily used by school-aged

children to access the convenience store and also to access the Culbertson Schools Recreation Complex. The other crosswalk is located on Broadway, parallel to 5th Street. No signed or striped crosswalk is presently available within the northeast quadrant of Culbertson, located north of US 2 and east of MT 16 (north).

2.17 *Airport*

The Big Sky Field is a public, general aviation airport owned jointly by Roosevelt County and the Town of Culbertson. There are seven hangars of differing sizes and one lighted runway that is 3,800 feet long and 60 feet wide. The runway itself has a 12,500 pounds single-wheel load capacity. Primary aircraft that use Big Sky Field are single engine, general aviation aircraft with the exception of the air ambulance service, which uses a twin engine turbo-prop aircraft. In 2007 there were 100 air taxi operations, 700 itinerant operations, 100 Military operations, and 3,750 local operations.

2.18 *Utilities*

Several utilities are found throughout the Study area, primarily along US 2 and MT 16. These utilities include power, telephone, water, sewer, gas, and fiber optics. Culbertson's water treatment plant draws water from the Missouri River and is situated near the southeast quadrant of the Study area. Water lines run north from the water treatment plant and service not only commercial and residential properties within the City limits, but also service major commercial properties outside the City limits. Water supply lines within the transportation grid are buried under the paved roadways, and sewer lines run underneath alleyways. Fiber optic lines enter the Study area from the north, near MT 16. Overhead power lines service major commercial properties both within and outside the City limits.

In addition to the utilities that service the Town of Culbertson, there is also a Dry Prairie Rural Water pipeline that services northeastern Montana. This pipeline has two branches within the Study area itself. The Culbertson to Medicine Lake Mainline begins at the Culbertson water treatment plant, heads west where it skirts the western edge of Culbertson, crosses US 2, and then heads north. The "A" Branchline connects to the mainline north of Culbertson and then heads east.

2.19 *Access Points*

Access points were counted by using 2012 Google Earth mapping and were field-verified in March 2012. Access points include: driveways, alleyways, local street intersections, and any other defined entrance/exit locations. When parallel parking options exist along US 2 or MT 16, only street intersections and defined entrances/exits were counted. It should be noted that there are multiple commercial entrances throughout the Study area where there is no defined curb and gutter. Although there are no defined entrances/exits to these commercial businesses, each continuous pavement stretch was counted as a single access point.

Within the city limits of Culbertson, there are 50 access points along US 2, 16 access points along MT 16 (north), and 32 access points along MT 16 (south), resulting in 98 accesses over 3.5 miles or an access density of 28 accesses per mile. Conversely, outside the city limits there are only 38 accesses over 5.5 miles for an access density of approximately 7 accesses per mile. No access control is currently being

implemented along either US 2 or MT 16 within the Study area. Access control is anticipated to be developed with the Culbertson to North Dakota state line project. Table 2.11 lists approaches by approximate half-mile increments. Cells within Table 2.11 shaded in green are segments within city limits.

Table 2.11 Access Points along US 2 and MT 16

Reference Post (RP)	No. Accesses	Density (access/mi)	No. Accesses	Density (access/mi)	No. Accesses	Density (access/mi)
US 2	**North of US 2**		**South of US 2**		**Total**	
642.8 to 643.3	2	4	1	2	3	6
643.3 to 643.8	0	0	1	2	1	2
643.8 to 644.3	3	6	2	4	5	10
644.3 to 644.8	14	28	20	40	34	68
644.8 to 645.3	5	10	6	12	11	22
645.3 to 645.8	1	2	2	4	3	6
645.8 to 646.3	2	4	3	6	5	10
646.3 to 646.8	3	6	0	0	3	6
MT 16 (north)	**West of MT 16**		**East of MT 16**		**Total**	
86.6 to 87.1	1	2	1	2	2	4
87.1 to 87.6	0	0	2	4	2	4
87.6 to 88.1	5	10	4	8	9	18
88.1 to 88.6	7	14	9	18	16	32
MT 16 (south)	**South/West of MT 16**		**North/East of MT 16**		**Total**	
0.0 to 0.5	5	10	5	10	10	20
0.5 to 1.0	5	10	4	8	9	18
1.0 to 1.5	6	12	7	14	13	26
1.5 to 2.0	2	4	1	2	3	6
2.0 to 2.5	1	2	1	2	2	4
2.5 to 3.0	3	6	2	4	5	10

In addition to the access points listed in the table above, as of January 2012, MDT has two additional access point requests. If permitted, these access points would be added between RP 644.8 and 645.3.

2.20 *Environmental Settings*

This section includes a brief summary of the environmental elements within the Culbertson Corridor Planning Study area. Also, additional information on each environmental area can be found in the full *Environmental Scan* report in Appendix B.

2.20.1 Physical Environment

The Study area is centered around the Town of Culbertson, located in Roosevelt County in northeastern Montana. The Missouri River is located approximately 1.5 miles south of the Town of Culbertson and outside the Study area boundary. Rolling hills parallel the river and form a break between the valley bottom and the upper glaciated plains. The general topography north of Culbertson consists of rough ridges and steep drainage ways.

Air Quality

The Clean Air Act of 1970, as amended in 1990, is a federal law requiring the U.S. Environmental Protection Agency (EPA) to develop and enforce regulations which reduce air pollution and protect air quality. The EPA has established attainment and non-attainment zones throughout the state. The Study area is outside any non-attainment air quality zones.

Soil Resources and Prime Farmland

The purpose of the Farmland Protection Policy Act of 1981 (Title 7 United States Code, Chapter 73) is "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."

Information on soils from the U.S. Department of Agriculture, Natural Resource Conservation Service (NRCS) was used to determine the presence of prime and unique farmland in the Study area. Roosevelt County soil surveys indicate that the predominant soil types within the Study area include loam, silty loams, and silty clay. Prime farmland, as well as farmland of statewide importance, exists within the Study area. The Form NRCS-CPA-106: Farmland Conversion Impact Rating for Corridor Type Projects is a way for the NRCS to inventory the Prime and Important farmlands within the state. Finally, if any improvement option creates impacts to the soil map units with prime and important farmland status, a NRCS-CPA-106 Form would be completed.

Land Use

According to the National Resource Information System (NRIS), the Corridor Study area has been classified into the following 10 different categories of land use: exempt property, agricultural rural, commercial rural, commercial urban, farmstead rural, industrial rural, residential rural, residential urban, vacant land rural, and vacant land urban. The predominant corridor land use is agricultural rural.

Geological Resources

The Montana Bureau of Mines and Geology has provided geological information for the Study area. According to the U.S. Geological Survey (USGS), shale is the primary rock type of the Fort Union Formation, of which the Tongue River Member is part. The secondary rock type is siltstone, and other rock types associated with this formation are sandstone, coal, and limestone.

The Town of Culbertson is located within the Bakken-Lodgepole Total Petroleum System, which in turn lies within the Williston Basin Province. The rapid growth of oil exploration surrounding the Study area, makes oil the primary contributor to the area's economy.

Seismic information was reviewed for fault lines and for seismic hazard areas. This kind of geologic information can help identify potential design and construction issues which are related to embankments and road design. The Weldon-Brockton-Froid Fault Zone is approximately eight miles outside the Study area, but is the closest fault zone to the Study area.

Water Resources

Surface Water

The Study area itself lies within the Lower Missouri River Basin, Charlie-Little Muddy Creek Sub-basin, and Clover Creek Watershed. By reviewing available geographic information system (GIS) data and a review of USGS Culbertson and McCabe West quad maps, several surface waters have been identified within the Study area.

The Lower Missouri Basin and the Charlie-Little Muddy Creek Sub-basin are both listed in the 2010 Integrated 303(d)/305(d) Water Quality Report for the Montana Department of Environmental Quality (DEQ). Here, the Charlie-Little Muddy Creek Sub-basin is listed as a Category 5 water quality (meaning that one or more applicable beneficial uses have been assessed as being impaired or threatened, and that a total maximum daily load (TMDL) is required to address the factors causing the impairment or threat). Beneficial uses that apply to this area include agricultural, aquatic life, warm water fisheries, drinking water sources, and industry. Probable causes of impairment include flow alteration and temperature modification by dam or impoundment impacts from hydrostructure flow regulation/modification. According to DEQ, Clover Creek and Diamond Creek are not identified as impaired water bodies on the TMDL list. If a project is forwarded from the this Study, potential impacts to all surface waters will need to be examined to determine if the waterways are considered waters of the U.S. and subject to jurisdiction by the U.S. Army Corps of Engineers (USACE).

Public Water Supply

According to NRIS and DEQ, three public water supplies are located inside the Study area boundary. They are summarized in Table 2.12.

Table 2.12 Public Water Supply

Primary Name	City	Population Served (resident/non-resident)	Source Name	Source Type
Town of Culbertson	Culbertson	796/0	Missouri River	Surface Water
Plant Reservoir	Surface Water	n/a	n/a	n/a
Dry Prairie Rural Water Authority	Culbertson	1147/0	Consecutive Connection from 00192	Surface Water

Irrigation

Land within the southern portion of the Study area boundary is irrigated by various types of irrigation systems that include: sprinkler, flood or "gravity flow," and water spreading. According to the U.S. Department of Agriculture, the predominant irrigation methods in Montana are flood and sprinkler systems. Potential impacts to irrigation facilities should be minimized to the greatest extent practicable.

Wetlands

National Wetland Inventory (NWI) Mapping is available for the Study area. Most of the wetlands are located near the southern portion of the Study area boundary and along segments of Clover Creek. However, the NWI map available is not intended to be a complete identification and/or delineation of wetlands present in the Study area. NWI maps are typically generated from aerial and satellite imagery.

If an improvement option(s) is forwarded, formal wetland delineations, based on standard USACE defined procedures, will need to be conducted during the project development process. Jurisdictional determinations of wetlands will also be conducted during the project development process. Wetland impacts should be avoided to the greatest extent practicable, and all unavoidable wetland impacts will need to be mitigated as required by the USACE. Potential mitigation sites should be investigated and constructed prior to project impacts; the USACE generally requires that compensatory mitigation occur in the same watershed as the impacts. Finally, coordination with the USACE will be necessary to determine the appropriate location of any mitigation site.

Floodplains and Floodways

The Federal Emergency Management Agency (FEMA) flood maps show that Flood Zones A and AE are within the Study area. Executive Order (EO) 11988, Floodplain Management, requires federal agencies to avoid direct or indirect support of floodplain development whenever a practicable alternative exists. EO 11988 and 23 Code of Federal Regulations (CFR) 650 Part A requires an evaluation of project alternatives to determine the extent of any encroachment into the base floodplain. Therefore, coordination with Roosevelt County during the project development process is necessary to determine if floodplain permits are required.

Hazardous Substances

The NRIS database identified 13 leak sites within the Study area; all but three sites have been resolved. Two mine sites were also identified in the Study area. Additional unknown contaminated sites may be identified during the project development process and/or during construction, if a project is forwarded from this Study.

If an improvement option is forwarded into project development, further evaluation would be needed at specific sites to determine if contamination will be encountered during construction. This process may include reviewing DEQ files and checking the subsurface for soil and groundwater contamination. If it appears that contaminated soils or groundwater could be encountered during construction, any contaminated material will need to be handled/disposed of in accordance with State, Federal, Tribal, and local laws and rules.

2.20.2 **Biological Resources**

Biological resources in the Study area were identified by using maps, aerial photographs, and Montana Natural Heritage Program (MNHP) data. Also used were the endangered, threatened, proposed, and candidate species list for Montana counties. However, this limited survey is not intended to be a complete and accurate biological survey of the Study area. Rather, a complete biological survey of the Study area would be conducted in accordance with accepted practices if an improvement option is forwarded during the project development process.

Fish and Wildlife

Riparian, river, stream, or creek habitats should be avoided to the greatest extent practicable, and include but are not limited to Clover Creek and Diamond Creek. Montana Department of Fish, Wildlife & Parks (MFWP) keeps a database of information on fish distribution known as the Montana Fisheries Information System (MFISH). The MFISH database notes that Clover Creek is the only waterbody in the Study area that has sufficient year-round flow to house fish. Brook Stickleback was the only species noted in Clover Creek. Encroachment into the wetted width of any waterway and the associated riparian habitat should be limited to the absolute minimum necessary for the construction of the proposed project. Soils, vegetation, and flooding data can be used to determine the extent of riparian habitat.

Threatened and Endangered Animal Species

The federal list of threatened and endangered species is maintained by the U.S. Fish and Wildlife Service (USFWS). Species on this list receive special protections under the Endangered Species Act (Title 16 United States Code, Chapter 35). 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 maintains a list of species that are ‘candidates’ or proposed for possible addition to the federal list.

In May 2011, the USFWS published a list of endangered, threatened, proposed, and candidate species for every Montana county. This list also identified the counties where one would reasonably expect the species to occur. Roosevelt County listed the endangered Pallid Sturgeon, threatened and designated

critical habitat for the Piping Plover, endangered Interior Least Tern, endangered Whooping Crane, and the candidate Sprague's Pipit. However, further evaluation of potential impacts to all threatened, endangered, proposed, or candidate species will need to be conducted and updated critical habitat maps should be consulted during the project development process if an improvement option is forwarded.

Animal Species of Concern

Table 2.13 lists the 15 animal species of concern that the MNHP has records of in Township 58, Sections 55 and 56 of the Study area. Although the MNHP data reflects the current status of their data collection efforts, these results are not intended as a final statement on sensitive species within a given area, or as a substitute for on-site surveys. Therefore, on-site surveys would need to be completed during the actual project development process.

Table 2.13 Montana Animal Species of Concern

	Common Name
Mammals	Townsend's Big-Eared Bat*
	Eastern Red Bat
Birds	Great Blue Heron
	Piping Plover*
	Whooping Crane
Fish**	Blue Sucker
	Iowa Darter
	Shortnose Gar
	Sturgeon Chub
	Sicklefin Chub
	Northern Redbelly Dace
	Sauger
	Pallid Sturgeon
	Pearl Dace
Reptiles	Western Hog-nosed Snake

**** Note: Although MNHP has documentation of the Townsend's Big-eared Bat and Piping Plover existing in T28N R55 and 56E, specific mapped locations of these species shows they are outside, but adjacent to, the Study area.***

*****Note: Although MNHP has documentation of these fish existing in T28N R56E, Clover Creek is the only stream located within the Study area, therefore, the stream is presumed not to have the flow necessary to sustain these fish populations.***

Vegetation

The MNHP land cover database shows that the Study area is largely comprised of lowland/prairie grassland and agriculture. Here, the grasslands support livestock grazing and have been tilled for small grain and hay production. The agriculture land cover category is broken into cultivated crops and pasture/hay.

Threatened and Endangered Plant Species

According to the USFWS, there are not any plant species listed as threatened, endangered, proposed, or candidate species for Roosevelt County. However, an evaluation of potential for and impacts to all threatened, endangered, proposed, or candidate species would need to be conducted during the actual project development process.

Plant Species of Concern

The MNHP has no record of any plant species of concern within the Study area. Results of a data search by the MNHP reflect the current status of their data collection efforts. However, these results are not intended as a final statement on sensitive species within a given area, nor are they intended as a substitute for on-site surveys. Actual on-site surveys would need to be completed during the project development process.

Noxious Weeds

The INVADERS Database System identified six noxious weeds present in Roosevelt County, Montana: Canada Thistle, Dalmatian Toadflax, Field Bindweed, Leafy Spurge, Russian Knapweed, and Spotted Knapweed. However, four noxious weeds are present within the Study area boundary: Leafy Spurge, Spotted Knapweed, Russian Knapweed, and Dalmatian Toadflax. If a project is forwarded, the project area will need to be surveyed for noxious weeds during the project development process.

An important aspect of the development process will be to reduce the spread of noxious weeds and to re-establish permanent vegetation. Also, disturbed areas would need to be seeded with desirable plant species. Finally, County Weed Control Supervisors would need to be contacted prior to any construction activities and informed on specific measures for weed control.

2.20.3 **Cultural Resources**

Archaeological Resources

The Montana State Historic Preservation Office (SHPO) was contacted to identify any known cultural and/or historic sites within the Study area. The file search yielded one previously recorded archaeological resource site which is listed as a prehistoric lithic scatter. If an improvement option is forwarded into project development, on-the-ground fieldwork will be necessary to determine where additional cultural resources are located.

Historic Resources

A file search conducted by SHPO revealed four resource sites within the Study area that are either on or eligible for inclusion in the National Register of Historic Places , and there are 30 undetermined historic properties within the Study area.

If improvement options are forwarded from this Study and are federally-funded, a cultural resource survey of the Area of Potential Effect for this project will need to be completed. This survey will need to follow Section 106 of the National Historic Preservation Act (Title 16 United States Code, Chapter 1; 36 CFR 800). Section 106 requires Federal agencies to “take into account the effects of their undertakings on historic properties.” The purpose of the Section 106 process is to identify historic properties that

could be affected by the undertaking; to assess the effects of the project; and to investigate methods to avoid, minimize, or mitigate any adverse effects on historic properties.

6(f) Resources

Section 6(f) of the Land and Water Conservation Funds Act (Title 16 United States Code, Chapter 1) applies to all projects that impact public outdoor recreational lands purchased and/or improved with land and water conservation funds. Under this Act, the Secretary of the Interior must approve any conversion of property acquired or developed with this assistance to a use other than public, outdoor recreation. The following 6(f) properties have been identified within the Study area:

- Culbertson Swimming Pool;
- Culbertson Bicentennial Park; and
- Culbertson Schools Recreation Complex.

4(f) Resources

Section 4(f) refers to the original section within the Department of Transportation Act of 1966 (Title 49 United States Code, Chapter 3), which sets the requirement for consideration of park and recreational lands, for wildlife and waterfowl refuges, and for historic sites in transportation project development. Prior to approving a project that "uses" a Section 4(f) resource, the Federal Highway Administration (FHWA) must find that there is no prudent or feasible alternative that completely avoids 4(f) resources. "Use" can occur when land is permanently incorporated into a transportation facility or when there is a temporary occupancy of the land that is adverse to a 4(f) resource. Constructive "use" can also occur when a project's proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under 4(f) are "substantially impacted." 4(f) resources include any historic or archaeological sites on or eligible for inclusion in the National Register. Additionally, 4(f) resources include significant publicly-owned parks, recreational areas, and wildlife or waterfowl refuges. The following list includes potential 4(f) resources, including parks and recreational areas and sites eligible for listing on the National Register:

- Culbertson Bicentennial Park;
- Swimming Pool Park;
- Culbertson Public Schools;
- Culbertson Schools Recreation Complex ;
- BNSF Railway;
- Charlie Jacobs House;
- Oelkers Carter Service Center; and
- Petersen House.

If a project moves forward from this Study, one of four compliance steps would need to be taken regarding 4(f) properties. FHWA can determine either there is no use to a Section 4(f) property, they can determine that the project's impacts on one or more properties will be de minimis, they can do a programmatic evaluation, or they can do an individual evaluation.

Noise

If an improvement option is forwarded into project development, a noise study would be required to determine where noise-sensitive land uses are located, what existing noise levels those areas are experiencing, and what future noise levels result from the project per MDT policy. Previous noise studies have been conducted along US 2 within the Study area for the *Culbertson-East to North Dakota Environmental Assessment*. If the project is expected to change traffic volumes on other routes, then off-project routes should also be studied for noise impacts. In areas of residential development, noise impacts (existing or predicted) may need to be mitigated.

2.21 *Areas of Concern*

Based on evaluation of existing conditions of US 2 and MT 16 within the Study area and on input from the public, from stakeholders, and from local government -- roadway issues and areas of concern were identified. These concerns include limited non-motorized infrastructure, substandard geometrics, inadequate sight distance, deteriorating pavement conditions, increased truck traffic, and multiple access points. More detailed information on the areas of concern has been provided previously in the chapter and is summarized in the following sections. The order in which the areas of concern are listed does not indicate one is more important nor has priority over another.

2.21.1 Geometrics

Roadway geometric areas of concern include substandard horizontal and vertical curvature. The geometric areas of concern along US 2 and MT 16 that do not meet current MDT standards have been previously described and are summarized in Table 2.14.

Table 2.14 Geometric Areas of Concern

Approximate Location (RP)	Design Element	Substandard Design Feature	Description
647.8 (US 2)	Horizontal	Length	Does not meet level terrain standards
0.13 (MT 16)	Horizontal	Radius & Length	Do not meet urban 40 mph standards
0.15 (MT 16)	Horizontal	Radius & Length	Do not meet urban 40 mph standards
0.96 (MT 16)	Horizontal	Radius	Does not meet level terrain standards
2.47 (MT 16)	Horizontal	Radius	Does not meet level terrain standards
2.77 (MT 16)	Horizontal	Radius & Length	Do not meet level terrain standards
2.97 (MT 16)	Horizontal	Radius & Length	Do not meet level terrain standards
642.63 – 643.09 (US 2)	Grade	Grade (4.16%)	Grade greater than rolling terrain standards (4%)
86.46 – 86.69 (MT 16)	Grade	Grade (4.66%)	Grade greater than rolling terrain standards (4%)
87.84 – 88.12 (MT 16)	Grade	Grade (4.02%)*	Grade greater than rolling terrain standards (4%)
1.41 – 1.55 (MT 16)	Grade	Grade (4.58%)	Grade greater than rolling terrain standards (4%)
2.68 – 3.00 (MT 16)	Grade	Grade (6.00%)	Grade greater than rolling terrain standards (4%)
643.09 (US 2)	Vertical	K-value & SSD	Do not meet level terrain standards
86.69 (MT 16)	Vertical	SSD	Does not meet level terrain standards
1.13 (MT 16)	Vertical	K-value & SSD	Do not meet level terrain standards
1.27 (MT 16)	Vertical	K-value & SSD	Do not meet level terrain standards
1.41 (MT 16)	Vertical	K-value & SSD	Do not meet level terrain standards
1.55 (MT 16)	Vertical	K-value & SSD	Do not meet level terrain standards
1.69 (MT 16)	Vertical	K-value & SSD	Do not meet level terrain standards
1.85 (MT 16)	Vertical	K-value	Does not meet level terrain standards
2.40 (MT 16)	Vertical	K-value & SSD	Do not meet level terrain standards
2.68 (MT 16)	Vertical	K-value & SSD	Do not meet level terrain standards

**denotes grade is at the maximum allowable grade (4%) for rolling terrain standards.*

2.21.2 Intersections

Four main intersections within the corridor were studied. The intersections included US 2 and MT 16 (north), US 2 and MT 16 (south), MT 16 (south) and 1st Street, and MT 16 (south) and County Road 1020. The geometric layout of each intersection is not sufficient for proper turning movements of large trucks. Most trucks occupy two lanes of traffic to make the turn. Therefore, improvements should be made which improve geometric elements in order to provide for both semi trucks and recreational vehicles.

2.21.3 Access Points

Currently, the Study area contains 98 access points within the city limits of Culbertson and 38 access points outside the city limits. The number of access points within the city limits of Culbertson and their respective locations are a concern. In particular, the proximity of an access point to an intersection is an issue. Too many access points along the highway and those located too close to an intersection can create unsafe conflict points. Additionally, on-street parking and undefined commercial entrance/exit areas along both US 2 and MT 16 raise safety concerns as points of conflict are increased.

2.21.4 Non-Motorized Infrastructure

With the location of US 2 and MT 16 through the middle of Culbertson, as well as the location of the public school, the inconsistency of bicycle and pedestrian facilities is a concern.

2.21.5 Sight Distance

The sight distance along US 2 and MT 16 through Culbertson is a concern; particularly, the sight distance for vehicles trying to enter or exit the roadway or at intersections. Hindered sight triangles with the increased traffic on these roads could pose a safety risk not only for the vehicles on the highway, but also for those trying to enter/exit the highway. Finally, several sight obstructions such as buildings, signs, and parked/turning vehicles are found within quadrants at various intersections in Culbertson.

2.21.6 Pavement Conditions

With increased traffic, particularly large trucks, deterioration of the existing roadway pavement is a concern. Large trucks with dual axle configurations pose the biggest threat to the pavement. As trucks have to pull over to the side of the road, or as rear wheels "track" onto the shoulder going through a right turn, the existing pavement can be considerably damaged. Broken up pavement, substantial cracks, and potholes all reduce the service life of the roadway and thus pose a safety risk to the traveling public.

2.21.7 Truck Traffic

Due to the increased growth of the oil industry in and around the Study area, the town of Culbertson has seen a rapid increase in truck traffic. Although there are no current or projected capacity issues within the Study area, the increase in truck traffic associated with the recent boom in the area may negatively impact other transportation attributes such as mobility and accessibility to destinations.

2.21.8 Environmental

If we assume that standard avoidance, minimization, and mitigation measures would be taken if a project moves forward from this current study, there do not appear to be any immitigable environmental resource areas at this time.

Chapter 3 Consultation, Coordination, and Community Involvement

A goal of the Culbertson Corridor Planning Study process was to have ongoing community involvement. Education and community outreach were an essential part of achieving this goal. A *Public Involvement Plan* (Appendix C) was developed to identify community involvement activities necessary to gain insight and to build consensus on existing and future corridor needs. The purpose of the *Public Involvement Plan* was to develop and maintain a proactive community participation process that would provide opportunities for the community to be involved in all phases of the Corridor Study process.

3.1 *Oversight Committee Meetings*

Oversight Committee meetings were scheduled every three weeks for the duration of the twelve-month Corridor Study. These meetings included the Town of Culbertson, Roosevelt County, FHWA, MDT, the Consultant, and others as needed. These meetings were intended to track progress and to address study development issues and questions. The meetings were considered an important aspect for the exchange of information and ideas during the development of the study. Throughout these meetings, issues, problems, and possible solutions were identified and discussed.

3.2 *Informational Meetings*

Two informational meetings were held throughout the Corridor Study. The purpose of the first informational meeting was to inform the community on the Corridor Study and gather community input on the existing conditions and concerns within the corridor. The purpose of the second and final informational meeting was to present the findings of the Corridor Study and to solicit comments from the community on the conclusions and recommendations contained in the report. Upon completion of the final informational meeting, details of this meeting will be included in the Final Draft of this report.

3.2.1 Meeting Description and Context

The first informational meeting for the Culbertson Corridor Study was held on Wednesday, March 7, 2012, from 6:00 pm - 8:00 pm at the Culbertson Town Hall. Twenty members of the community attended the first informational meeting, not including individuals on the Oversight Committee.

Information regarding the second and final informational meeting for the Culbertson Corridor Study will be included in the Final Draft of this report following the meeting on Thursday, August 16, 2012, from 6:00 pm - 8:00 pm at the Culbertson Town Hall.

3.2.2 Community Notification

Display ads in the *Culbertson Searchlight, Sidney Herald, and Wolf Point Herald News* announced informational meetings prior to the actual meeting. These ads announced the meeting location, time, date, meeting format, meeting purpose, and designated locations where documents could be reviewed. News releases were also submitted to the same newspapers and to local radio stations. The newspapers published the news releases at their discretion. Additional notification was sent via email to interested individuals who provided contact information by participating in informational meetings

and/or provided written comments on the study. Copies of approved meeting announcements are contained within Appendix A.

3.2.3 Meeting Format

The first informational meeting began with a PowerPoint presentation giving an overview of the Corridor Study process and approach. Here, the overall study schedule and a presentation of existing conditions identified within the corridor were discussed. After the formal presentation, the community was given an opportunity to ask questions and to comment on the existing corridor.

Information regarding the second and final informational meeting for the Culbertson Corridor Study will be included in the Final Draft of this report following the meeting on Thursday, August 16, 2012, from 6:00 pm - 8:00 pm at the Culbertson Town Hall.

3.2.4 Issues and Comments by the Community

Following the PowerPoint presentation at the first information meeting, questions and discussion items were recorded. A detailed list of questions and discussion topics is available in the meeting minutes contained in Appendix A. The main topics discussed after the formal presentation are summarized below:

- Confirmation of upcoming traffic counts at additional intersections;
- Confirmation that trucks must check in to the weigh scale before proceeding to their destination;
- Identification of four intersections for further analysis;
- Interest in a truck route that would take truck traffic out of downtown Culbertson;
- Support for local spot improvements and upcoming MDT overlay project;
- Support for reducing the speed limit along US 2 west of the school;
- Concern for safety regarding parking along major roadways;
- Concern for truck traffic crossing railroad tracks; and
- Explanation of shoulders on the bridge as not matching the adjacent roadway.

Discussion items evolving from the second informational meeting are summarized below. A detailed list of comments and questions/answers is provided in Appendix A.

- <Items forthcoming>

3.3 *Stakeholder Involvement*

A stakeholder contact list was developed to include individuals, businesses, and groups identified by the Oversight Committee and community based on their knowledge of the Study area and their involvement within the Study area.

The stakeholder list was developed to identify those individuals and groups to engage and incorporate input during various phases of the Corridor Study. The following groups or businesses were included in the initial list, and study newsletters were sent out to each group as they were developed:

- Town of Culbertson
- Roosevelt County Commissioners
- Culbertson Chamber of Commerce
- Motor Carriers of Montana
- DNRC Montana Board of Oil and Gas
- Holly Sugar
- Roosevelt County contract planner, Scott Aspenlieder (WWC Engineering)
- Culbertson School District
- Roosevelt Medical Center
- BNSF Railway
- Army National Guard
- Big Sky Field Airport
- Roosevelt County Sheriff's Office
- Montana State Highway Patrol
- Dry Prairie Rural Water
- Roosevelt County Conservation District

On March 7, 2012, the consultant project manager had the opportunity to meet with several local stakeholders in Culbertson. Informal meetings were conducted with the Culbertson School Superintendent, Culbertson Chamber of Commerce, United Grain Corp, two City Councilmen, and with one local business owner. These meetings proved invaluable in gathering additional information and concerns within the corridor.

3.4 *Resource Agency Workshop*

A resource agency workshop was held on February 8, 2012. The resource agency workshop was held to introduce the Culbertson Corridor Study process, to confirm the completeness and accuracy of data, and to gather resource agency concerns regarding resource areas that could be affected by potential improvement options. Each agency was sent a Draft *Environmental Scan* Report prior to the meeting to ensure adequate preparation for further discussion. Agencies involved in this meeting included MDT, FHWA, DEQ, U.S. Environmental Protection Agency (EPA), USACE, DNRC, and USFWS.

The meeting began with a PowerPoint presentation which introduced the corridor planning study process, discussed the purpose of the meeting, and reviewed the environmental areas discussed within

the Draft *Environmental Scan* report. Following the presentation, there was an opportunity for specific discussion on resource areas that the agencies considered needed further investigation and addressing. Meeting notes from this meeting can be found in Appendix A.

3.5 *Other Community Involvement Efforts*

Two newsletters were produced to describe the Corridor Study process, to list improvement options, and to present the outcome of the screening process resulting in potential alternate routes. These newsletters can be found in Appendix A. In addition to mailing each newsletter to identified stakeholders, the newsletters were also made available as handouts during informational meetings and at the following locations:

- Roosevelt County Extension Office
- Culbertson Public Library
- MDT District 4 Office - Glendive
- MDT Statewide and Urban Planning Section Office – Helena

Finally, a website was established to provide up-to-date information on the study and to give the community an opportunity to comment on the study. This website www.mdt.mt.gov/pubinvolve/culbertson/ was maintained by MDT.

Chapter 4 Corridor Needs and Objectives

Needs and objectives for the Culbertson Corridor Planning Study have been identified on the basis of reviewing information contained in the *Existing and Projected Conditions* and *Environmental Scan* reports, and on the basis of receiving input from the community, from the local government, from resource agencies, and from the oversight committee. Also, needs and objectives contained in this document greatly assisted in developing potential improvement options within the Study area. Note the objectives followed by an asterisk (*) support the goals and objectives contained in the *Town of Culbertson Growth Policy Update (2011)*.

4.1 *Needs and Objectives:*

4.1.1 Need Number 1: Improve Safety of US 2 and MT 16

Objectives

- Improve pedestrian crossing safety near the school.*
- Enhance pedestrian movements along US 2 and MT 16, to the extent practicable.
- Improve intersection sight distance, to the extent practicable.

4.1.2 Need Number 2: Improve Operations of US 2 and MT 16

Objectives

- Improve geometric elements to provide for semi-trucks and recreational vehicles, to the extent practicable.
- Accommodate current and future capacity demands for US 2 and MT 16, to the extent practicable.
- Accommodate unique turning movements for wide and over length loads, to the extent practicable.

4.1.3 Need Number 3: Minimize Environmental and Transportation Impacts

Objectives

- Minimize impacts to the social, economic, and natural environment, to the extent practicable.*
- Minimize impacts associated with access points and roadside parking, to the extent practicable.
- Minimize the impacts of increased truck traffic through Study area.

4.1.4 Other Objectives

- Construction feasibility
- Availability and feasibility of funding

Chapter 5 Improvement Options

The needs and objectives led to the development of a whole range of improvement options to address specific corridor issues and areas of concern. Information in this chapter provides descriptions, evaluations, and planning-level cost estimates of recommended improvement options in the immediate vicinity of the current Culbertson roadway network. Unless otherwise noted, planning-level costs are for construction costs only and are in 2012 dollars. Also, these planning-level costs do not include right-of-way acquisition, utility relocation, preliminary engineering, or construction engineering. Each cost estimate will be variable depending on the design and whether the improvement is implemented as a stand-alone project or part of a larger project.

Improvement options were categorized into implementation timeframes. Implementation of short-term options could likely fall within two years. Implementation of mid-term options could likely occur between two and five years, but implementation of long-term options would likely take at least five years. Table 5.1 at the end of this chapter summarizes the recommended improvement options on the existing network based on implementation timeframes. Additional analysis was conducted to identify potential alternate truck routes around Culbertson's downtown area, which would be considered long-term improvement options. Analysis of alternate truck route improvement options is described in Chapter 6.

5.1 *Recommended Improvement Options on Existing Network*

Improvement options on the existing network were considered and recommended to address the corridor needs and objectives. Recommended improvement options were grouped into the following five different categories:

- Non-Motorized Infrastructure;
- Geometrics, Sight Distance, and Pavement Conditions;
- Truck Traffic;
- Access Points; and
- Community Area of Concern.

Various types of improvement options on the existing network are summarized in the following sections. A more thorough description of each improvement option can be found in Appendix C. Figure 5-1 shows the approximate location of the recommended improvement options.

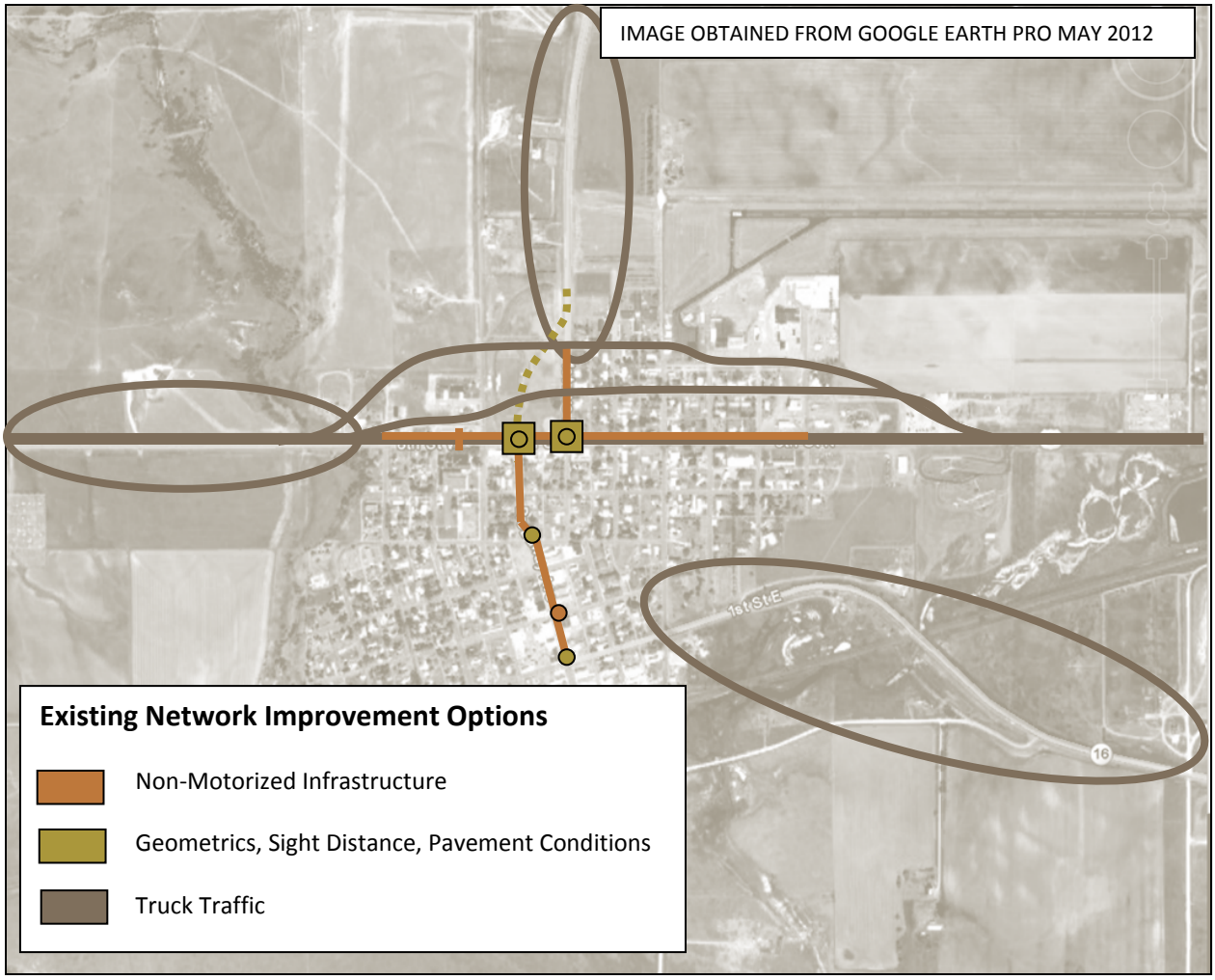


Figure 5-1 Recommended Improvement Options on the Existing Network

5.1.1 Non-Motorized Infrastructure

Additional non-motorized studies and infrastructure are needed in the Study area because of the limited pedestrian travel interconnectivity throughout both the Town and surrounding areas. This limited interconnectivity either discourages pedestrian travel or requires pedestrians to use the roadway in several portions of the Study area. Non-motorized studies and infrastructure have the potential to enhance pedestrian movements along US 2 and MT 16, improve pedestrian crossing safety near the school, and minimize impacts associated with access points and roadside parking.

Improvement Option Number 1: Urban Amenities on MT 16 and US 2

Existing sidewalks and curb and gutter facilities are inconsistent throughout the Study area. Inconsistent sidewalks discourage pedestrian travel or require pedestrians to use the roadway. Thus, it is recommended that sidewalks on both sides of the roadway and curb and gutter be installed on the segments of US 2, MT 16 (north), and MT 16 (south) within the incorporated city limits. This improvement as a whole is considered mid-term, but could be broken into smaller, short-term improvement options as funding becomes available.

Project Timeline: Mid-Term Implementation (2-5 years)
Estimated Cost: $1,000,000 to $1,200,000

Improvement Option Number 2: Rectangular Rapid Flashing Beacon (RRFB)

A crosswalk is currently located mid-block on US 2 between the Culbertson Public Schools and the adjacent convenience store to the north and is primarily used by school-aged children to access the convenience store and also to access the Culbertson Schools Recreation Complex. With the increase in trucks traversing the corridor and the speed limit change so close to this crosswalk location, this situation creates a potential safety concern.

This improvement option calls for the enhancement of the crosswalk through the installation of a highly visible Rectangular Rapid Flashing Beacon (RRFB). Due to the low material cost of this improvement option, the minimal restrictions to complete the improvement option, and the precise location surrounding a pedestrian beacon, this improvement option has been classified as follows:

Project Timeline: Short-Term Implementation (0-2 years)
Estimated Cost: $5,000 to $10,000

Improvement Option Number 3: Non-Motorized Transportation Plan

It is recommended that the City or the County completes a non-motorized transportation plan which selects the best methods to improve pedestrian crossing safety near the school and to enhance pedestrian movements along US 2 and MT 16. A non-motorized transportation plan would help the community identify potential bicycle and pedestrian needs and potential mitigation measures to address these needs for both school-aged children and other pedestrians traversing the Study area. This plan should encompass the area within the incorporated city limits. Due to the lack of construction coupled with the low cost to complete this Study, this option has been classified as follows:

Project Timeline: Short-Term Implementation (0-2 years)
Estimated Cost: $50,000 to $60,000

Improvement Option Number 4: Bulb-Out

At the first public informational meeting, local residents were quick to point out that the intersection of MT 16 (south) and 2nd Street was dangerous because business parking was close to the intersection (sight distance) and because of the high number of pedestrians traveling between businesses on both sides of MT 16 (south). Currently, no signed or striped crosswalk exists between downtown businesses located along both sides of MT 16 (south).

Design and implementation should be considered to heighten pedestrian visibility at the intersection of Broadway Avenue and 2nd Street. A curb bulb-out or other infrastructure would increase awareness to pedestrians, and shifting street parking away from the intersection would also heighten pedestrian visibility and assist the sight distance issue. Moreover, a bulb-out improvement should be done with sensitivity to drainage considerations, to snow plowing operations, and to local truck and vehicle turning movements.

Because curb bulb-outs extend beyond the sidewalk toward the roadway, consideration has been given to the potential conflicts between bulb-outs and the wheel base of trucks turning between Broadway Avenue and 2nd Street. Because school bus parking and the Farm Equipment Sales Incorporated business are both located to the west of the intersection, more trucks and large vehicles are using 2nd Street west of Broadway Avenue. To avoid potential conflicts with trucks turning between Broadway Avenue and 2nd Street west of Broadway Avenue, a curb bulb-out is only recommended on the east side of Broadway Avenue parallel to 2nd Street. To improve sight distance on the west side of the intersection, parking restrictions near the intersection could also be considered. Due to the low material cost of the bulb-out improvement option, it has been classified as follows:

Project Timeline: Short-Term Implementation (0-2 years)
Estimated Cost: $10,000 to $12,000

Non-Motorized Improvement Options Summary

All non-motorized infrastructure options presented in this section would be independent of each other. However, a non-motorized transportation plan may identify better improvement option(s) and/or specific locations to heighten awareness of pedestrians traversing US 2 and MT 16.

5.1.2 Geometrics, Sight Distance, and Pavement Conditions

Many intersections on US 2 and MT 16 in Culbertson are a concern because of limited sight distance, high number of left-turning trucks, and because of substandard geometrics. Thus, one objective for this Study is to improve intersection sight distance along US 2 and MT 16. Another objective for this Study is to improve geometric elements to accommodate semi-trucks and large recreational vehicles.

Improvement Option Number 5: Geometric Upgrade of MT 16 (north) / US 2 Intersection

This improvement option requires that the intersection of MT 16 (north) / US 2 be upgraded to meet current MDT design standards for the WB-67 design vehicle. By bringing the intersection up to current MDT design standards, the objective to improve geometric elements to provide for semi-trucks would be met. Due to the need for engineering design, the need to purchase right-of-way, and the overall cost of construction, this option has been classified as follows:

Project Timeline: Mid-Term Implementation (2-5 years)
Estimated Cost: $300,000 to $400,000

Improvement Option Number 6: Upgrade MT 16 (south) / US 2 Intersection

The geometric layout of the intersection of MT 16 (south) and US 2 is not sufficient for proper turning movements of large trucks because they occupy two lanes to make the turn. With increased traffic, especially large trucks, deterioration of the existing roadway pavement is also a concern. In addition, particular attention should be given to roadway shoulders. Broken up pavement, substantial cracks, and potholes not only reduce the service life of the roadway, but they also pose a safety risk to the traveling public.

This improvement option requires upgrading the intersection of MT 16 (south) and US 2 to meet current MDT design standards for the WB-67 design vehicle. It is recommended that this upgrade include

improvements to the pavement section of MT 16 (south) by adding a concrete element or other means. Improving the pavement section may be implemented as part of the Broadway Avenue rehabilitation project, which the MDT Glendive District is currently working on. The Oelkers Carter Service Center located in the southeast quadrant of the intersection is a potential 4(f) property which may require additional environmental consideration under this improvement option. Due to the need for engineering design in upgrading an intersection, the need to purchase right-of-way, and the overall cost of construction, this option has been classified as follows:

Project Timeline: Mid-Term Implementation (2-5 years)
Estimated Cost: $200,000 to $300,000

Improvement Option Number 7: MT 16 (north) Realignment

When the intersections of MT 16 with US 2 are considered together, the geometric layout of these two intersections is not sufficient for proper turning movements of large trucks. The two sequential 90-degree turns on the two-lane facilities located within one block of each other has the potential to cause congestion and safety issues not only for heavy vehicles, but also for other vehicles behind them. Although there are no current or projected capacity issues at either intersection of MT 16 with US 2, this improvement option can potentially address the need to improve operations of US 2 and MT 16.

This improvement option covers realigning the existing MT 16 (north) roadway so that it lines up with the MT 16 (south)/US 2 intersection. The intersection of MT 16 (north) and 8th Street would remain open to provide access to the nearby hospital, but the small portion of MT 16 (north) located north of 8th Street would be removed. To implement this option, right-of-way would need to be purchased along the new route's entirety; and the Culbertson Public School Recreation Complex would need to be relocated. Due to the overall cost of construction combined with the time needed for both roadway design and for the right-of-way procurement process, this option has been classified as follows:

Project Timeline: Long-Term Implementation (5+ years)
Estimated Cost: $500,000 to $600,000

Improvement Option Number 8: Sight Distance Improvements at Project Intersections

In order to improve sight distance throughout the Study area, obstructions located in sight distance triangles at all quadrants of an intersection should be removed and/or relocated, to the extent practicable. This improvement includes the intersections of MT 16 (north) and US 2, MT 16 (south) and US 2, Broadway Avenue and 4th Street, and Broadway Avenue and 1st Street. On-street parking near these intersections should also be eliminated, to the extent practicable. However, MDT has very limited enforcement over signs placed outside highway right-of-way and parking restrictions. It would be more appropriate for Culbertson to pass an ordinance regarding sight distance and/or parking restrictions if the community considers this improvement option necessary. Because of the low cost and the increased involvement of the Town of Culbertson, this option has been classified as follows:

Project Timeline: Short-Term Implementation (0-2 years)
Estimated Cost: $20,000 to $25,000

Geometric Improvement Options Summary

Options to upgrade the intersections of MT 16 with US 2 should both be considered together. If the option to realign MT 16 (north) is considered, upgrades to the intersection of MT 16 (south) and US 2 should also be considered at that time; however, consideration of the option to realign MT 16 (north) would negate the need to improve the current intersection of MT 16 (north) and US 2. Sight distance improvements at the identified project intersections should be considered regardless of what other improvement options are implemented.

5.1.3 Truck Traffic

Culbertson has experienced greatly increased truck traffic through town because of the booming oil industry in and around the Study area. Improvement options in this section have the potential to address the study objective of minimizing the impacts of increased truck traffic through the Study area.

Improvement Option Number 9: Four Lane US 2

Since an EA was previously prepared for US 2 in the Culbertson area, it was necessary to evaluate the four-lane facility in this improvement option process. The *Culbertson – East to North Dakota EA* investigated a four-lane facility on US 2 from the intersection of MT 16 (north) at approximate RP 644.6 to the North Dakota state line, which is beyond the Study area boundary for this project. The Town of Culbertson noted their preferred typical section from the intersection of MT 16 (north) to the eastern incorporated city limits located at approximate RP 645.0 would be composed of two five-foot sidewalks, curb and gutter on both sides of the roadway, two five-foot shoulders, two 12-foot outside travel lanes, and two 11-foot inside travel lanes. There would be no on-street parking. As the four-lane roadway leaves Culbertson, the curb, gutter, and sidewalks would end, but the roadway would remain in a four-lane undivided configuration with eight-foot shoulders and four 12-foot traveling lanes. This configuration would continue to a point west of the Clover Creek Bridge where it would transition to a divided four-lane section. The Culbertson EA noted that the four-lane facility would improve the level of service, would improve safety, would support anticipated economic growth, and would update roadway design.

In order to be consistent with the proposed action of the Culbertson EA, US 2 to the west of MT 16 (north) would continue the four-lane configuration with sidewalks to the western edge of incorporated city limits at approximate RP 644.3. As US 2 reached the west end of Culbertson proper, the typical section would transition to an undivided four-lane with eight-foot shoulders. This undivided four-lane configuration would continue until US 2 reached the Study area's western boundary at approximate RP 642.8.

The four-lane typical section for US 2 through the Study area would be a long-term solution that is consistent with the local planning efforts including the earlier Culbertson EA and the Town of Culbertson's recent 2011 Growth Policy. New bridges and/or large culverts would be necessary to cross Diamond Creek, Clover Creek, and intermittent streams. Adjacent floodplains would be impacted. This route has the potential to encroach on the Eastern Red Bat, Great Blue Heron, Western Hog-nosed Snake, and habitat for the Whooping Crane. Due to the proximity of a number of hazardous material sites and 4(f) and 6(f) properties, the route's ability to impact or avoid these sites would be determined

during final design if this route were carried forward from this Study. To be consistent with local planning efforts including the Culbertson EA and the Town of Culbertson's 2011 Growth Policy and due to the cost of implementation, this improvement option has been classified as follows:

Project Timeline: Long-Term Implementation (5+ years)
Estimated Cost: $16,500,000 to $20,000,000*

**It should be noted that this cost was based on the overall cost given in the 2008 EA, which is in 2008 dollars and includes construction costs and preliminary right-of-way costs.*

Improvement Option Number 10: 7th Street Couplet

Although the Study area has no current or projected capacity issues, the increased truck traffic associated with the recent oil boom in the area may negatively impact other future transportation attributes such as mobility and accessibility to destinations. The *Culbertson-East to North Dakota EA* identified a proposed action to incorporate a four-lane facility along US 2. Although a one-way couplet was not addressed in the earlier Culbertson EA, it could be a future design option that would allow for consistency and continuity of a four-lane facility.

In reevaluating the US 2 four-lane facility covered in the Culbertson EA, a one-way couplet along 7th Street was considered. This option consists of a couplet using the existing US 2 for the eastbound direction and 7th Street and portions of developed land for the westbound direction. The west end of 7th Street would bisect a residential area and then tie into US 2 near Diamond Creek, and the east end of 7th Street would bisect a residential/industrial area and then tie into US 2 near the weigh scale. Because recreational fields would be impacted, they would need to be relocated. The cost estimate takes into account urban amenity improvements along US 2 and urban rehabilitation and new urban roadway along 7th Street. Due to the cost of implementation, this improvement option has been classified as follows:

Project Timeline: Long-Term Implementation (5+ years)
Estimated Cost: $3,200,000 to $3,800,000

Improvement Option Number 11: 8th Street Couplet

Although there are no current or projected capacity issues along US 2, increased traffic volumes from the recent oil boom may have a future negative impact on other transportation attributes such such as mobility and accessibility to destinations. The *Culbertson-East to North Dakota EA* identified a proposed action to incorporate a four-lane facility along US 2. While a one-way couplet was not addressed in the Culbertson EA, it should be a design option that would allow for consistency and continuity of a four-lane facility.

In reevaluating the US 2 four-lane facility covered in the Culbertson EA, a one-way couplet along 8th Street was considered as a way to minimize impacts to the recreational fields. This option consists of a couplet using the existing US 2 for the eastbound direction and using 8th Street and portions of developed land for the westbound direction. The west end of 8th Street would minimize impacts to the recreational fields and residential area to the extent practicable before intersecting US 2 near Diamond

Creek. The east end of 8th Street would bisect a residential/industrial area and tie into US 2 near the weigh scale. To the extent practicable, this option would reduce impacts both to the recreational fields and to the airport. However, more curves in the alignment would be required. The cost estimate takes into account urban amenity improvements along US 2 and urban rehabilitation and new urban roadway along 8th Street. Due to the cost of implementation, this improvement option has been classified as follows:

Project Timeline: Long-Term Implementation (5+ years)
Estimated Cost: $3,200,000 to $3,800,000

Improvement Option Number 12: Weigh-in-Motion Systems

All trucks entering the Study area from the east, west, and south (and some trucks entering from the north) must first proceed to the weigh scale for processing. Thus, some trucks make two passes through Culbertson before they can proceed to their destination.

This improvement option includes installing three Weigh-in-Motion (WIM) systems: one on US 2 west of Culbertson, one on MT 16 (south), and relocating the current WIM system on MT 16 (north). The precise location and equipment used at each WIM site would be based on general requirements of the WIM system. By installing new WIM systems on the two proposed roadways entering Culbertson and by moving the existing WIM system farther north on the northern roadway, not all truck traffic would have to proceed to the weigh scale before proceeding onto their destinations. This change would potentially diversify the paths of trucks. Even with the installation of WIM systems, the need for other spot improvements would not likely change because truck traffic has no other means of diversion away from downtown. This improvement as a whole is considered mid-term, but could be broken into individual installations as funding becomes available.

Project Timeline: Mid-Term Implementation (2-5 years)
Estimated Cost: $300,000 to $400,000

Truck Traffic Improvement Options Summary

Because the Four Lane US 2, the 7th Street Couplet, and the 8th Street Couplet are all options which include four lanes on US 2, only one of these three options would need to be considered in the future. For this reason, the WIM Systems improvement option should be considered no matter which selection is made regarding four lanes on US 2.

5.1.4 Access Points

The number and location of access points is an area of concern. Of particular concern is the proximity of an access point to an intersection. Too many access points along the highway and access points located too close to an intersection create potentially unsafe conflict points. Additionally, on-street parking and undefined commercial entrance/exit areas along both US 2 and MT 16 raise additional safety concerns because points of conflict are increased. The improvement option in this section has the potential to address one of the objectives of the Study -- minimize impacts associated with access points and roadside parking, to the extent practicable.

Improvement Option Number 13: Access Management Plan

A comprehensive Access Management Plan should be completed along US 2 from approximately RP 644.2 to 645.5, along MT 16 (north) from RP 88.6 to 88.1, and along MT 16 (south) from RP 0 to 1.2. These sections of highway are categorized by multiple approaches, by continuous asphalt parking lots, and by numerous driveway turning movements. The combination of these three categories results is conflicting operations. The success of a formal Access Management Plan depends on aggressive outreach to all affected parties and a basic strategy on why access control would benefit both the adjacent land uses and the traveling public. Not only because of the high level of outreach but also because of the cost associated with completing an Access Management Plan, this improvement option has been classified as follows:

Project Timeline: Mid-Term Implementation (2-5 years)
Estimated Cost: $130,000 to $160,000

5.1.5 Community Area of Concern

During the first public information meeting, community members noted a concern for speeding vehicles.

Improvement Option Number 14: US 2 Speed Study

During the first public informational meeting, community members pointed out that the crosswalk located along US 2, adjacent to the Culbertson Public Schools, is of concern because of the combination of four things: the proximity of the 25 mph sign, the difficulty finding the speed limit sign, the percentage of trucks using US 2, and the hill west of the 25 mph sign. With a combination of these factors, community members observed that many vehicles, especially large trucks, are going faster than the posted 25 mph speed limit and possibly too fast for the crosswalk.

For these reasons, the Town of Culbertson should request a speed study. This speed study would evaluate and determine proper speed limits within the community and would potentially address the Study objective to improve pedestrian crossing safety near the school. It is also recommended that enforcement be increased near speed zone changes. Due to the low cost, this option is considered as follows:

Project Timeline: Short-Term Implementation (0-2 years)
Estimated Cost: $40,000 to $50,000

5.2 *Improvement Options Considered But Not Advanced*

The following improvement options to the existing network were evaluated but were ultimately not recommended.

5.2.1 Traffic Signal or Roundabout at MT 16 (north) / US 2 Intersection

Recommendation of any type of traffic control must first undergo a study and documentation verifying a need before it can be proposed. Currently, the four legs of the intersection at MT 16 (north) and US 2 operate at a level of service A or B and do not warrant a change in traffic control. However, if a different

traffic control measure is warranted in the future, a signal warrant analysis and/or roundabout analysis would take place at that time.

5.2.2 Install Left Turn Lane on MT 16 (north)

The option to install a left turn lane on MT 16 (north) in accordance with current MDT standards was considered. Here, a dedicated left turn lane would allow trucks to turn left towards the weigh scale and still allow vehicles to go straight or turn right at the intersection. At this time the four legs of the intersection at MT 16 (north) and US 2 operate at a level of service A or B. Analysis of projected traffic volumes determined that the four legs of this intersection would continue to operate at level of service A or B in the year 2032. Because there are no current or projected capacity issues at this intersection, this improvement is not advanced.

5.2.3 Install Turn Lanes on US 2

The option to install a left turn lane on the US 2 EB lane and a right turn lane to the US 2 WB lane was considered. Although the inclusion of a WB right turn lane would be ideal, adjacent buildings would hinder this addition. The complexity of intersection geometrics to incorporate these two turning lanes within the constrained corridor—plus the lack of current and future capacity issues—eliminated this improvement option from further consideration.

5.2.4 Convert Old Weigh Scale Area to Parking Lot

Although converting the old weigh scale area to a parking lot would decrease the need for on-street parking, it would result in more pedestrian crossings needed to access businesses to the east and south of this area. Even if parking were moved off the street, there would still be potential for sight distance issues with a new parking lot. This improvement option would not address any need or objective and is therefore not advanced.

5.2.5 3rd Avenue East Truck Route Designation

In the past, 3rd Avenue East was designated as a "truck route," and the Town of Culbertson maintained the facility. This route provided a direct north-south connector for trucks to pass through Culbertson without sharp turns and without travelling through the downtown area of Culbertson, which is the current situation along Broadway Avenue. Recently, signs were placed along 3rd Avenue East stating that "No Trucks over 20,000 GVW" were allowed along this road segment. This action required all trucks to remain on Broadway Avenue/MT 16 (south), creating a longer and more difficult route through the downtown area.

To address these issues with trucks on Broadway and the associated geometric concerns, re-designation of 3rd Avenue East as the truck route was considered. If funding and maintenance responsibility prohibited this recommendation, the Town of Culbertson could consider working with MDT, through their formal process, to designate 3rd Avenue East instead of Broadway Avenue as MT 16 through Culbertson if it is eligible. However, this improvement option was not considered because Culbertson community members recently petitioned to eliminate the 3rd Avenue East truck route designation.

5.3 *Summary and Implementation of Improvement Options on the Existing Network*

The improvement options selected for advancement are intended to offer a range of potential mitigation both in terms of scope and budget. Small scale improvement options can be completed within a short timeframe (0-2 years) because they cost less and have fewer restrictions to complete the improvement option. Moderate scale improvement options can be completed within a two to five year timeframe due to their mid-level costs and/or potential regulatory restrictions. Some mid-term improvement options can be broken down further into short-term improvement options as funding becomes available. However, larger and more complex improvement options were also included. These long-term improvement options on the existing network are expected to take more than five years to complete because of the time required to raise funds for the improvement option and/or because of the intense regulations surrounding the improvement option. Table 5.1 shows a timeframe-based summary of the recommended improvement options on the existing network.

Table 5.1 Recommended Improvement Options on the Existing Network

Category	ID	Name	Location	Estimated Cost Range
Short-Term				
Non-Motorized Infrastructure	2	Rectangular Rapid Flashing Beacon	US 2 near 1st Avenue	$5,000 - $10,000
	3	Non-Motorized Transportation Plan	Corridor-Wide	$50,000 - $60,000
	4	Bulb-Out	Broadway Ave / 2nd St	$10,000 - $12,000
Geometrics, Sight Distance, & Pavement Conditions	8	Sight Distance Improvements at Project Intersections	US 2, MT 16 (north), MT 16 (south), 4th Street, & 1st Street	$20,000 - $25,000
Community Area of Concern	14	US 2 Speed Study	US 2	$40,000 - $50,000
Mid-Term				
Non-Motorized Infrastructure	1	Urban Amenities on MT 16 and US 2	US 2, MT 16 (north), & MT 16 (south)	$1.0M - $1.2M
Geometrics, Sight Distance, & Pavement Conditions	5	Geometric Upgrade of MT 16 (north) / US 2 Intersection	US 2 & MT 16 (north)	$300,000 - $400,000
	6	Upgrade MT 16 (south) / US 2 Intersection	US 2 & MT 16 (south)	$200,000 - $300,000
Truck Traffic	12	Weigh-in-Motion Systems	US 2, MT 16 (north), & MT 16 (south)	$300,000 - $400,000
Access Points	13	Access Management Plan	Corridor-Wide	$130,000 - $160,000
Long-Term				
Geometrics, Sight Distance, & Pavement Conditions	7	MT 16 (north) Realignment	MT 16 (north)	$500,000 - $600,000
Truck Traffic	9	Four Lane US 2*	US 2	$16.5 M - $20.0M
	10	7th Street Couplet*	US 2 & 7th Street	$3.2M - $3.8M
	11	8th Street Couplet*	US 2 & 8th Street	$3.2M - $3.8M

**Note: Only one of these four-lane options may potentially be implemented, not all three.*

Chapter 6 Alternate Truck Route Improvement Options

This Study analyzed improvement options within the Town of Culbertson and also investigated potential alternate routes for truck traffic to lessen the impacts within the community. To analyze potential improvement options outside the existing Culbertson roadway network, a bi-level screening process was used to determine which alternate route(s) would best meet the needs and objectives and would reduce truck traffic within Culbertson. This chapter provides a summary of the investigation and identification of the alternate truck routes. Detailed information may be found in Appendix C.

Alternate truck routes were investigated to the east and west of Culbertson which would connect US 2 to MT 16. The truck routes were developed using a high-level review of current truck traffic patterns with known constrains such as the weigh scale east of Culbertson. The identification of alternate truck routes is necessary to determine which routes are most practicable to carry into the screening process and determine whether a feasible alternate truck route(s) improvement option is viable. Although a No Build option was not considered in the screening process, a No Build option would be carried forward during a NEPA/MEPA environmental review in order to provide a baseline by which the other alternatives are evaluated.

The weigh scale east of Culbertson is a key issue that must be taken into account for the analysis of potential alternate truck routes. All large trucks entering the Study area from the east, west, or south must first proceed to the weigh scale for processing before continuing to their destination. All large trucks entering the Study area from the north use a WIM System and a Variable message sign directs a portion to the weigh scale. If the WIM site detects a violation of speed, axle weight, gross vehicle weight, or bridge weight, truck drivers are directed to the weigh scale. The WIM site detects a violation in approximately 15 percent of the southbound trucks on MT 16 (north).

6.1 *Proposed Truck Route Regions*

The Town of Culbertson has concerns regarding truck traffic on Broadway Avenue and the truck turning movements at both intersections of MT 16 with US 2. Because alternate truck routes on the east and west sides of Culbertson would eliminate the right-angle turning movements at the intersections of MT 16 to US 2, general east and west truck route regions were developed. Regions north and south of US 2 were not developed because truck drivers would continue to use the shortest route through town -- US 2. Figure 6-1 shows the two truck route regions developed for this Study.

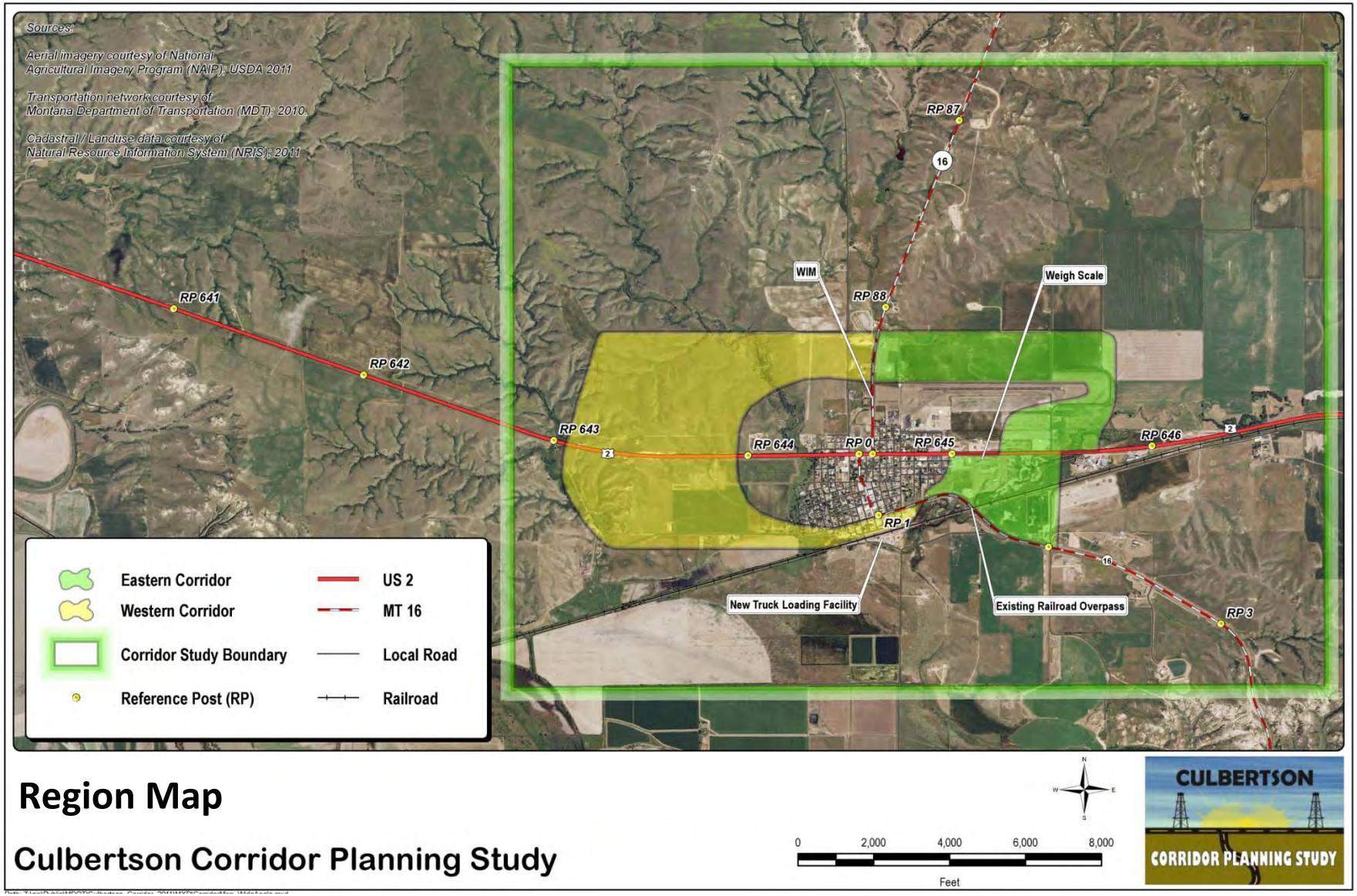


Figure 6-1 Truck Route Regions

6.1.1 Western Truck Route Region

The western truck route region is located west of MT 16, both north and south of US 2, and is located north of the BNSF railway. Major constraints in this region include pronounced elevation changes on the western-most side of the Study area, Hillside Cemetery, and numerous residential and industrial areas within the city limits of Culbertson. Because Diamond Creek travels though this region, a crossing of this creek would be required.

6.1.2 Eastern Truck Route Region

The eastern region is located east of MT 16, both north and south of US 2. Major constraints include the Big Sky Field airport, BNSF Railway, Clover Creek, and numerous residential and industrial areas.

6.2 *Screening of Proposed Truck Routes East and West of Town*

Screening criteria were developed to help evaluate the two truck route regions in the Study area and to help reduce the number of potential alternate truck routes for consideration. This screening process compared regions both quantitatively and qualitatively with a set of specific measures. The first level screening process determines whether or not each region meets the needs and objectives to reduce truck traffic through Culbertson. The region that is best able to accomplish this goal was moved forward to identify individual alternate truck routes within that region. Figure 6-1 depicts the two general truck route regions under consideration.

6.2.1 First Level Screening Criteria

In order to evaluate which region is best able to meet Culbertson's goal of reduced truck traffic through Culbertson, screening criteria were developed. The first level of screening evaluates two truck route regions against the following criteria:

- Accessibility to Weigh Scale; and
- Truck Traffic Patterns.

To determine whether or not a region met each screening criterion, "Yes" or "No" rating factors were developed and assigned to each screening criterion for each region. Table 6.1 shows the first level rating factors.

Table 6.1 First Level Screening Results

YES	NO
Best Able to Meet Screening Criterion	Least Able to Meet Screening Criterion

A description of each screening criterion and a comparison of each truck route region to each screening criterion are described in the sections that follow, and a matrix summary of the results of the first level screening is shown in Table 6.2.

6.2.2 Accessibility to Weigh Scale

Due to the requirement that trucks access the weigh scale before proceeding to their destination, the effectiveness of any truck route depends on its ability to reroute truck traffic away from Broadway Avenue before accessing the weigh scale. Thus, the effectiveness of a truck route region is a direct correlation to the location of the current weigh scale.

Accessibility to the weigh scale was measured in the following way:

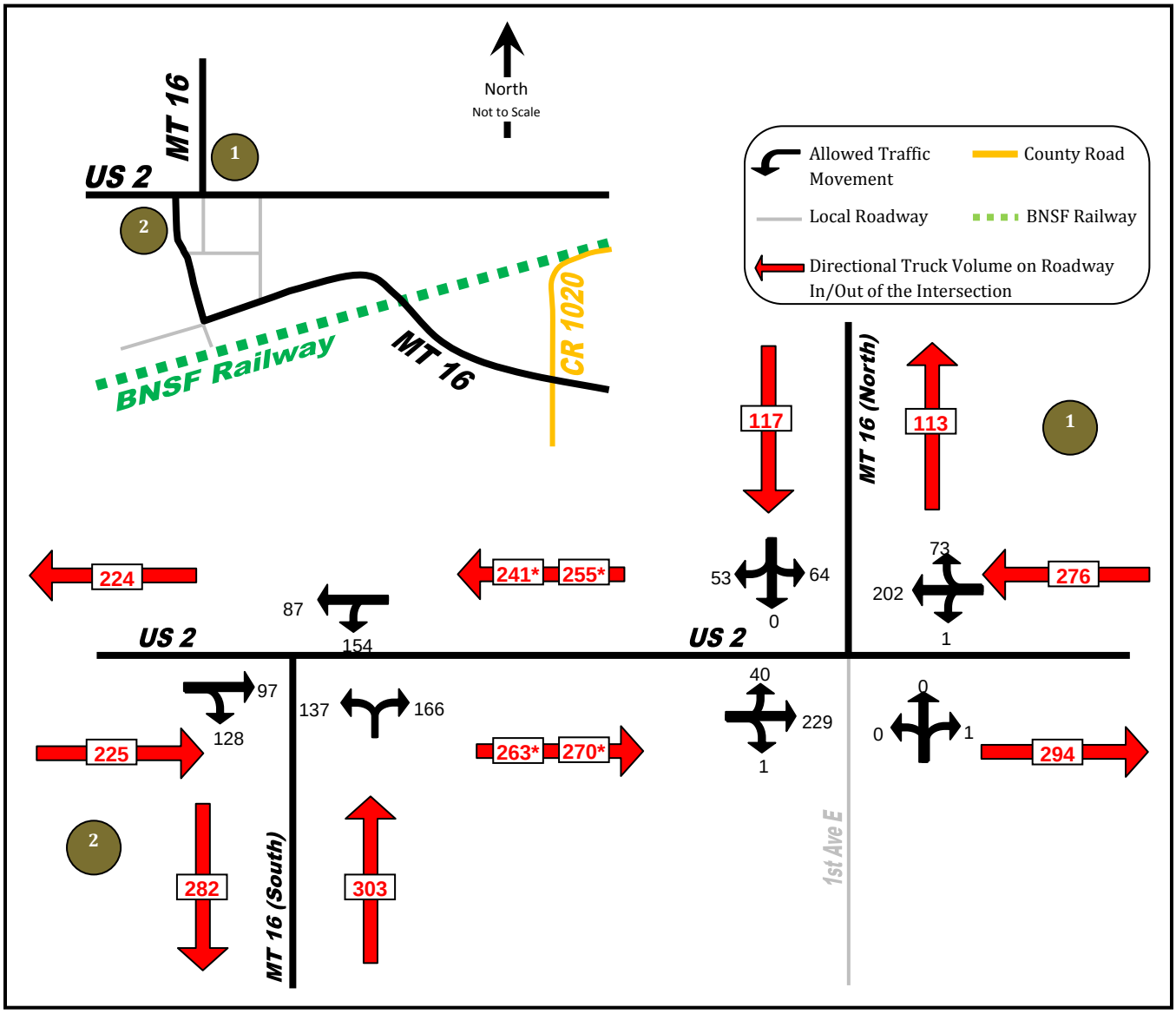
Rating Factor	Rating Factor Description
Yes	Route reduces the volume of truck traffic though Culbertson and provides access to the weigh scale without having to use Culbertson's interior street network.
No	Route does not provide a reasonable alternative route to the weigh scale and thus does not reduce truck traffic volumes through Culbertson.

The western region would not provide direct access to the weigh scale; therefore, all trucks entering the Study area from both the west and from the south must first proceed to the weigh scale for processing before continuing on to their destination. The eastern region would provide direct access to the weigh scale both north and south of US 2.

6.2.3 Truck Traffic Patterns

Truck traffic patterns distinguish which region would meet the needs and objectives relating to truck traffic through Culbertson. The issues concerning trucks include both the volume of trucks and the concerns with the truck turning movements at major intersections (US 2 and MT 16 both north and south). This screening criterion looks at which region has the highest potential to reduce truck traffic volumes through Culbertson proper.

Turning movement counts were gathered at four locations within the Study area. Two of these turning movement counts were analyzed to gauge an overall picture of truck traffic patterns in the Study area. Figure 6-2 shows that the highest volumes of trucks are entering / exiting US 2 east of MT 16 (north) and entering / exiting US 2 via MT 16 (south), essentially moving east and south.



** Traffic counts were taken at different times for intersections 1 and 2; therefore the combined volumes in and out of these intersections do not match.*

Figure 6-2 24-hour Truck Traffic Patterns

Truck traffic patterns were measured in the following manner:

Rating Factor	Rating Factor Description
Yes	Route reduces both truck traffic through Culbertson and turning movements within Culbertson.
No	Route reduces both truck traffic through Culbertson and turning movements within Culbertson.

Truck Traffic Patterns for the Western Region

Analysis of the truck traffic patterns shown in Figure 6-2 indicates that a western region route has the potential to divert 53 trucks from the north-to-west turning movement, 40 trucks from the west-to-north turning movement, 128 trucks from the west-to-south turning movement, and 137 trucks from the south-to-west turning movement, for a total of 358 trucks.

Even if a western alternate truck route were combined with WIM systems on US 2 west of Culbertson and on MT 16 (south and north), approximately 15 percent of truck traffic on all legs may be routed to the weigh scale due to violations. Finally, it is unclear whether trucks would use a western route because it may potentially increase truck travel distance. Appendix C contains additional information on the analytical approach of WIM system applications.

Truck Traffic Patterns for the Eastern Region

The eastern region route has the potential to divert 73 trucks from the east-to-north turning movement, 64 trucks from the north-to-east turning movement, 166 trucks from the south-to-east turning movement, and 154 trucks from the east-to-south turning movement, for a total of 457 trucks. The eastern region has the potential to reduce the most trucks and their turning movements from Culbertson proper. An eastern region route would address the issues with the increasing volumes of trucks through Culbertson as well as the issues with the turning movements of large trucks at the intersections of MT 16 with US 2. A truck route in this area would not require additional WIM system implementation due to the location of the weigh scale.

6.2.4 First Level Screening Results

Table 6.2 shows the results of the first level of screening. This screening process helped identify which region would reduce the most truck traffic through Culbertson and which region could be removed from further consideration.

Table 6.2 First Level Screening Results

Truck Route Region	Screening Criteria		Advanced to Second Level Screening
	Accessibility to Weigh Scale	*Truck Traffic Patterns*	
Western Region	No	No	No
Eastern Region	Yes	Yes	Yes

Because the eastern region has the highest potential to reduce truck traffic through Culbertson, it has been forwarded to the next phase--Alternate Truck Route Identification. Moreover, it should also be noted that even if the western truck route region were broken into northwest and southwest areas, trucks would still need to travel to the weigh scale, and ultimately these routes would not be effective in reducing truck traffic on Broadway Avenue.

6.3 *Eastern Truck Route(s) Identification*

Identification of alternate truck routes is necessary to determine which route location(s) are most viable. Alternate truck routes within the eastern region were identified on the basis of input from the local government and community members and on the basis of engineering constructability. To analyze the eastern region truck routes, a second-level screening process was used to determine which viable alternate route(s) would best meet the needs and objectives of this Study and would reduce truck traffic within Culbertson. In addition to analyzing the individual alternate truck routes, a northern and southern combination was also analyzed to determine whether the benefits of a combined route would outweigh the environmental and financial cost.

Planning-level cost estimates were developed for each alternate truck route. These costs are for construction only and are shown in 2012 dollars. Planning-level cost estimates do not include right-of-way acquisition or utility relocation and do not include preliminary or construction engineering. These estimates reflect roadway costs and a bridge construction cost to arrive at the planning-level cost estimates for each alternate truck route. Specific calculations used to derive the planning-level cost estimates are shown in Appendix C.

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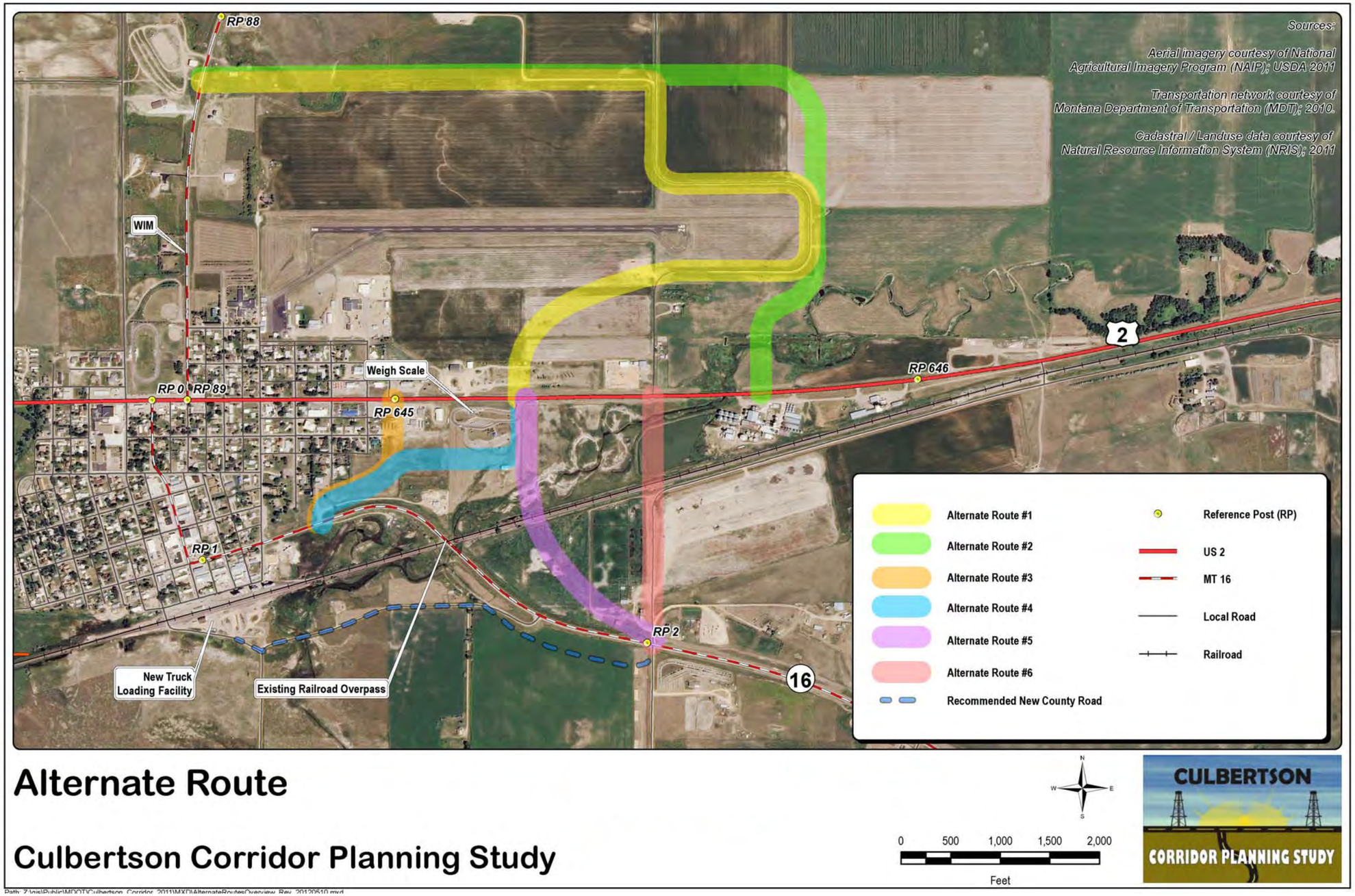

Figure 6-3 Alternate Truck Route Overview Map

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6.3.1 Alternate Route #1

Alternate Route #1 begins on the north side of US 2 at the weigh scale entrance at approximate RP 645.2. Next it heads northeast and follows County Road 1019, curving around the Big Sky Field property for approximately 1.33 miles. At this point, it turns west for approximately 0.87 miles until it intersects MT 16 (north) near RP 88.1. The total distance of this alternate truck route would be approximately 2.2 miles, and the estimated cost would range from $3.1 to $3.7 million.

Alternate Route #1 was first developed in order to avoid established facilities to the extent practicable and to use the existing County Road 1019. Because this route starts directly across from the existing weigh scale, it reduces the need for trucks to backtrack along US 2. This route would avoid wetlands, the airport, hazardous materials sites, and 4(f) and 6(f) sites, and would not impact any residential or industrial structures, but would require new right-of-way along its entirety. In addition, bridges or large culverts would be necessary to cross two intermittent streams and adjacent floodplains would be impacted. This route has the potential to encroach on habitat for the Whooping Crane and would impact farmland of statewide importance. Finally, this route has many sharp turns that would need to be lengthened during final design, possibly increasing its overall length.

6.3.2 Alternate Route #2

Starting on US 2 at approximate RP 645.7, Alternate Route #2 would curve northeast for approximately 0.31 miles where it would then follow the existing County Road 1019 and head north for approximately 0.37 miles before turning west for approximately 1.11 miles until it finally intersects MT 16 (north) at approximate RP 88.1. The total length for this alternate truck route would be approximately 1.8 miles, and the estimated cost would range from $2.8 to $3.3 million.

Alternate Route #2 was developed in order to avoid impacts to the airport and minimize impacts to Clover Creek to the extent practicable. This route would avoid wetlands, hazardous material sites, and 4(f) and 6(f) sites. While this route would not impact any residential or industrial structures, it would require new right-of-way along its entirety. In addition, bridges or large culverts may be necessary to cross two intermittent streams, and Clover Creek and adjacent floodplains would be impacted. This route has the potential to encroach on Whooping Crane habitat. This route would impact farmland of statewide importance, and the primary land use type along this route is agricultural rural. It should also be noted that because this route does not line up with the existing weigh scale, trucks would need to backtrack along US 2 before proceeding to their destination.

6.3.3 Alternate Route #3

Starting on US 2 at approximate RP 645.0, Alternate Route #3 would head south for approximately 0.12 miles and then arc southwest for approximately 0.20 miles until it finally intersects MT 16 (south) at a right angle at approximate RP 1.2. This connection with MT 16 (south) would allow for less cut and fill because it is the closest level point west of the current overpass structure. The total length for this alternate truck route would be approximately 0.32 miles, and the estimated cost would range from $0.7 to $0.8 million.

Alternate Route #3 was developed on the basis of public input in order to avoid impacts to Clover Creek, to BNSF Railway, and to residential and industrial areas. Although this route currently avoids residential and industrial areas, it has received recent attention from developers interested in the area for a potential motel and large RV park. However, this route would not impact wetlands, floodplains, waterways, hazardous material sites, 4(f) and 6(f) sites, or farmland. Also, it would provide the shortest distance to link US 2 and MT 16 and would use an existing approach along MT 16 and impact a portion of vacant rural land. Currently, an existing oilfield man camp is located south of US 2, near RP 645; any impacts to the man camp should be minimized to the extent practicable. This route has the potential to encroach on the Western Hog-nosed Snake and habitat for the Whooping Crane. Because this route does not intersect with the weigh scale, trucks would need to backtrack along US 2 before proceeding to their destination. Finally, addressing any sight distance issues with the connection to MT 16 (south) would be determined during final design if this alternate truck route is forwarded from this Study.

6.3.4 Alternate Route #4

This route begins at the weigh scale entrance at approximate RP 645.2 on US 2. It would follow the existing weigh scale road for approximately 0.10 miles where it would veer west to skirt the rest area buildings for approximately 0.23 miles and then head southwest for approximately 0.21 miles where it would intersect MT 16 (south) at a right angle at approximate RP 1.2. This connection with MT 16 (south) would allow for less cut and fill because this is the closest level point west of the current overpass structure. The total distance for this alternate truck route would be approximately 0.54 miles, and the estimated cost would range from $1.0 to $1.2 million.

Alternate Route #4 was developed on the basis of public input and would avoid impacts to Clover Creek, BNSF Railway, and residential and industrial areas. Although this route currently avoids residential and industrial areas, it has received recent interest for development of a potential motel and large RV park. In addition, this route would not impact wetlands, floodplains, waterways, hazardous material sites, 4(f) and 6(f) sites, or farmland of statewide importance. Alternate Route #4 would provide a direct connection to the weigh scale. Because this route starts at the weigh scale entrance, it reduces the need for trucks to backtrack along US 2. The route would use an existing approach along MT 16 (south) and impact a portion of vacant rural land. It should be pointed out that most of this route exists on State of Montana land. This route has the potential to encroach on the Western Hog-nosed Snake and on habitat for the Whooping Crane. Finally, addressing any sight distance issues with the connection to MT 16 (south) would take place during final design if this alternate truck route is forwarded from this Study.

6.3.5 Alternate Route #5

This route is a north-south connection which begins on US 2 at the weigh scale entrance at approximate RP 645.2 and then proceeds south and east to where a perpendicular overpass for the BNSF railway would be needed. The route would continue southeast until it intersected MT 16 (south) at RP 2.0. The total distance for this alternate truck route would be approximately 0.59 miles. A new railroad overpass would be required for this alternate truck route in order to provide adequate vertical clearance of the

railroad and Clover Creek which has an adjacent floodplain. The estimated cost for this alternate truck route would range from $2.9 to $3.5 million.

Alternate Route #5 was originally developed on the basis of public input and focused on direct access to the weigh scale. Because this route starts directly across from the existing weigh scale, it reduces the need for trucks to backtrack along US 2. This route was slightly modified to allow for a more constructible route that would avoid both a high fill area and skewed intersection near the current overpass. A large portion of the land along this route is located on State of Montana property, and the rest is either on agricultural rural or on vacant rural land. This route would not impact wetlands, hazardous material sites, or farmland of statewide importance; however, it has the potential to encroach on Whooping Crane habitat.

6.3.6 Alternate Route #6

This route is a straight north-south alignment between MT 16 (south) and US 2 that was recommended by the community. It would start on US 2 at approximate RP 645.5 and head south where it would connect to and continue along County Road 1020 until it intersected MT 16 at RP 2.0. An overpass would need to be constructed for this route over the BNSF Railway. The total distance for this alternate truck route would be approximately 0.47 miles, and the estimated cost would range from $4.6 to $5.5 million.

Alternate Route #6 was originally developed on the basis of public input and focused on the use of existing County Road 1020. This route would use the existing County Road for approximately 0.25 miles but would then require a new railroad overpass so as not to impact the BNSF railway. This route may, however, impact the wetland area and Clover Creek located between the BNSF Railway and US 2. Thus, the design of the overpass should consider both the level of impact on the wetlands and/or Clover Creek and the proximity to US 2.

This route is located approximately 0.15 miles east of the weigh scale and does not impact farmland of statewide importance, floodplains, or any 4(f) or 6(f) properties. However, this route has the potential to impact a hazardous material site (Montola Growers, Inc.), and has the potential to encroach on Whooping Crane habitat. Finally, it should be noted that because this route does not line up with the weigh scale, trucks would need to backtrack along US 2 before proceeding to their destination.

6.3.7 New SE County Road

The new County Road alignment was brought forth by local government officials as a way to address the projected increase in truck traffic from the new loading facility located south of the railroad tracks and southwest of MT 16 (south). There are two current routes to the new loading facility: across the at-grade railroad crossing off 1st Avenue West and a route along County Road 2059. However, County Road 2059 is not a preferred route for trucks because of the steep grade leading up to the intersection with MT 16 (south). To reduce truck usage of the at-grade crossing located off 1st Avenue West, the local government officials recommended a new route.

Starting on MT 16 (south) at RP 2.0, the new County Road alignment would generally parallel MT 16 (south) for approximately 0.38 miles at which time it would meet and use the existing County Road 2059 for approximately 0.47 miles. This route would avoid, to the extent practicable, the steepest elevation changes associated with the adjacent overpass. The total distance for this alternate truck route would be approximately 0.85 miles.

This new County Road alignment would impact an intermittent stream, floodplain, and wetlands and has a slight potential for impacts to farmland of statewide importance near the intersection of MT 16 (south). Finally, this alignment has the potential to encroach on the Eastern Red Bat and habitat for the Whooping Crane.

6.3.8 Need for Existing Network Improvement Options if an Alternate Truck Route is Implemented

In order to determine if existing network improvement options would still be necessary after an alternate truck route was implemented, each improvement option was analyzed against each alternate route. To determine if a combination of a northern and a southern route would provide additional benefits, each existing network improvement option was analyzed against a north/south alternate truck route combination. Here, it should be noted that no specific north and south route combination was determined; instead, a conceptual analysis of any combination of north and south options was carried out. Table 6.3 shows which existing network improvement options would still be necessary if each respective alternate truck route was implemented.

Table 6.3 Existing Network Improvement Options Still Necessary with Implementation of Alternate Truck Route

Existing Network Improvement Options	Individual Alternate Truck Routes						Combination
	#1	#2	#3	#4	#5	#6	North and South
1. Urban Amenities on MT 16 and US 2	X	X	X	X	X	X	X
2. Rectangular Rapid Flashing Beacon	X	X	X	X	X	X	X
3. Non-Motorized Transportation Plan	X	X	X	X	X	X	X
4. Bulb-Out at MT 16 (south) & 2nd Street	X	X	X	X	X	X	X
5. Geometric Upgrade of MT 16 (north) / US 2 Intersection*	X	X	X	X	X	X	
6. Upgrade MT 16 (south) / US 2 Intersection	X	X					
7. MT 16 (north) Realignment	X	X	X	X	X	X	
8. Sight Distance Improvements at Project Intersections	X	X	X	X	X	X	X
9. Four Lane US 2**	X	X	X	X	X	X	X
10. 7th Street Couplet**	X	X	X	X	X	X	X
11. 8th Street Couplet**	X	X	X	X	X	X	X
12. Weigh-in-Motion Systems*	X	X					X
13. Access Management Plan	X	X	X	X	X	X	X
14. US 2 Speed Study	X	X	X	X	X	X	X

**Note: Because at least 15 percent of trucks currently proceed to the weigh scale before proceeding to their destination, it is likely that trucks would use the current MT 16 (north) option through the current WIM system instead of proceeding directly to the weigh scale because this option has the potential to shorten their trip.*

***Note: Only one of these four-lane options may potentially be implemented; not all three.*

It was determined that all pedestrian improvement options related to US 2 would still be necessary even if an alternate truck route was implemented because traffic, both heavy vehicles and other vehicles, would still use US 2. Due to traffic on US 2, an access management plan would also be necessary, regardless of the alternate truck route. As noted by the double asterisk following Table 6.3, only one four-lane facility option would be recommended to address transportation attributes along US 2. As far as existing network improvement options are concerned, the sole benefit to combining a northern and southern alternate truck route would appear to be possibly eliminating intersection upgrades to the intersections of MT 16 with US 2 and to eliminate the realignment of MT 16 (north).

6.4 *Second Level Screening*

In order to determine the preferred alternate truck route(s), the six alternate routes developed in the eastern region were screened through a second level of criteria. The screening process relied on evaluating these alternate truck routes by using the following three criteria:

Analysis No. 1 – Travel Time: Because drivers tend to take the shortest route to their destination, each alternate truck route was studied against the current route of trucks to see if the time between points would reduce or increase travel time.

Analysis No. 2 – Impacts: Each alternate truck route was analyzed to see if there was a substantial order of magnitude difference in impacts between various alternate routes.

Analysis No. 3 – Construction Cost Comparison (in 2012 dollars): This analysis was used to document if there was an order of magnitude difference in planning-level costs for each alternate truck route. These costs reflect the planning-level roadway costs assigned in the previous section.

For each criterion, the six alignments were given a numerical rating value of one to six, with one denoting the best option. Analysis of the three screening criteria is described in the following sections and presented in Table 6.8.

6.4.1 Travel Time

The travel time for each route was computed on the basis of the different posted speeds along each route and on the basis of the length of travel at each speed variation. Each alternate truck route was studied against the current route of trucks to see if the travel time between points would provide a benefit or would add time of travel. Since all trucks must proceed to the weigh scale, all travel time was determined to be from the entrance of the weigh scale to the intersection along either US 2 or along MT 16 where the alternate truck route leaves the main thoroughfare.

Approach delays were also considered. Figure 6-4 shows the locations where delays were considered. It should be noted that approach delays were only calculated for four intersections through level of service analysis. Table 6.4 shows the approach delays calculated for these four intersections. All other approach delays were assumed based on the results of the four studied intersections. These assumptions for the intersections that were not calculated by traffic modeling include the following approach delays:

- 0 Seconds – Right turning movement from major leg to minor leg;
- 2 Seconds – Left turning movement from major leg to minor leg;
- 5 Seconds – Right turning movement from minor leg to major leg; and
- 10 Seconds – Left turn from minor leg to major leg or thru movement across major leg from minor leg to minor leg.

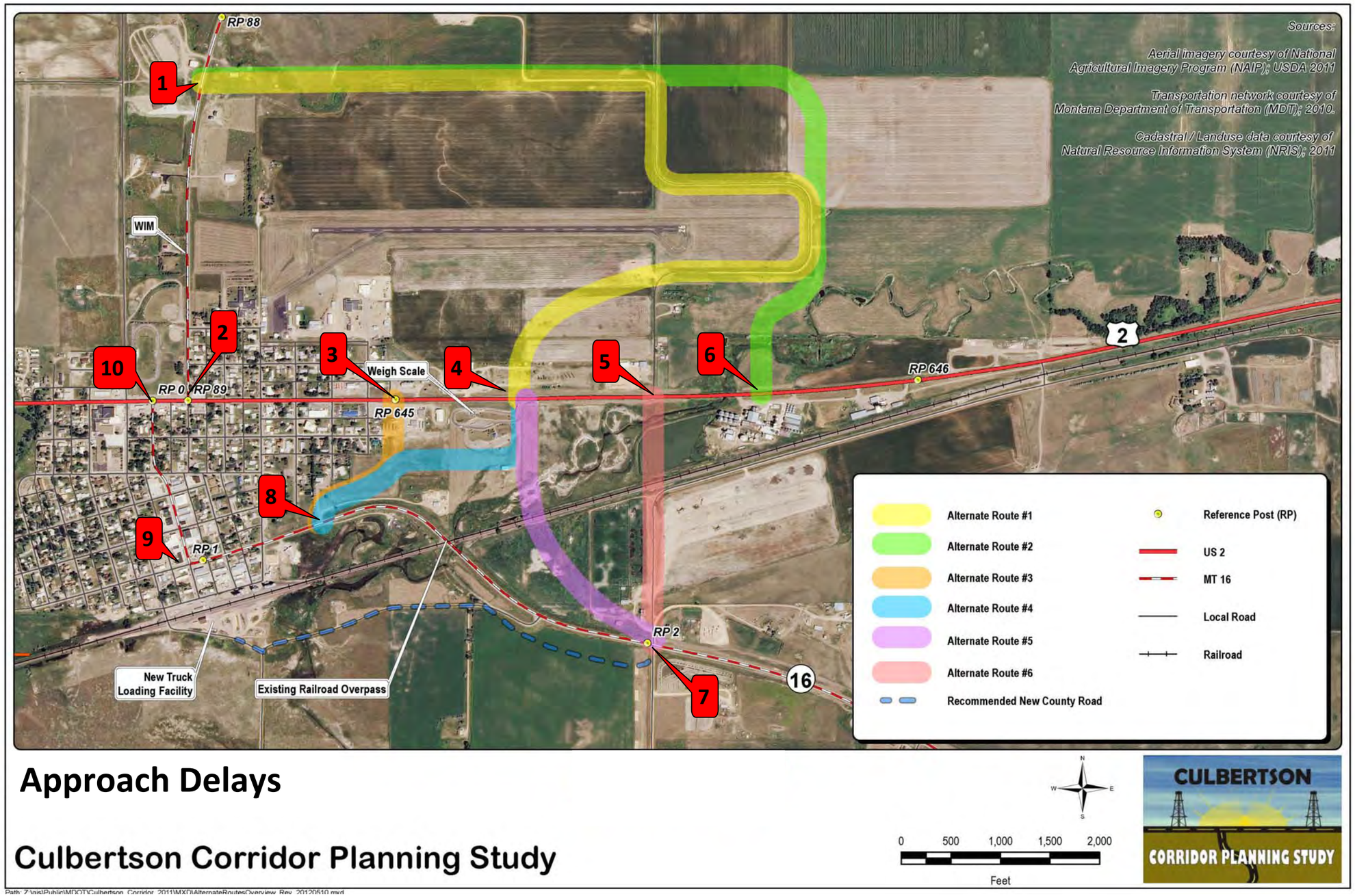

Figure 6-4 Approaches with Delays

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Table 6.4 Calculated Approach Delays

Approach No. (per Figure 6-4)	Intersection Description	Leg	Approach Delay* (seconds)
2	MT 16 (north) / US 2	NB	10.6
		SB	10.5
		EB	2.3
		WB	0.3
7	MT 16 (south) at RP 2.0 / County Road 1020	NB	9.3
		SB	9.5
		EB	0.6
		WB	0
9	MT 16 (south) / 1st Street / Broadway Avenue	NB	7.6
		SB	0
		EB	10.9
		WB	9.5
10	MT 16 (south) / US 2	NB	10.6
		EB	0
		WB	3.5

**Note: The approach delays were calculated by using HCS level of service modeling.*

In order to provide a comparative analysis of the alternate truck routes, the northern alternate truck routes were measured against the current northern route -- RP 88.1 on MT 16 (north) to the weigh scale along US 2 at RP 645.2. Similarly, the southern alternate truck routes were measured against the current southern route -- RP 2.0 on MT 16 (south) to the weigh scale. Table 6.5 shows a breakdown of the distance, respective speed limit, and approach delay(s) equating to the total travel time of each alternate truck route and each current route. Each alternate truck route was compared to the current route to determine if the alternate truck route would add or reduce time of travel. A negative value in the difference column denotes the time saved by using the respective alternate truck route.

Table 6.5 Travel Time Rating

Alternate Route	Route Distance (miles)	Associated Speed (MPH)	Average Approach Delay(s) (seconds)*	Total Time (seconds)	Time Difference (seconds	Rating**
Current Northern Route	0.27	65	11	132	0	N/A
	0.32	45				
	0.30	35				
	0.35	25				
Alternate Route #1	2.2	55	13	157	+25	5
Alternate Route #2	2.25	55	13	160	+28	6
Current Southern Route	0.25	65	17	228	0	N/A
	0.60	45				
	0.40	35				
	0.75	25				
Alternate Route #3	0.25	65	16	137	-91	3
	0.40	45				
	0.28	35				
	0.32	25				
Alternate Route #4	0.25	65	5	137	-91	3
	0.40	45				
	0.08	35				
	0.54	25				
Alternate Route #5	0.59	55	5	43	-185	1
Alternate Route #6	0.72	55	16	63	-165	2

**Note: This analysis is the average of the delay experienced between the two directions of travel.*

***Note: This analysis was based on a numerical rating value of one to six, with one denoting the best option.*

6.4.2 Impacts

Impacted acreage for wetlands, floodplains, farmlands of statewide importance, and for private right-of-way (ROW) were calculated for each alternate truck route. Specific calculations can be found in Appendix C.

It should be noted that right-of-way calculations for alternate routes #1 and #2 did not include the locally-owned areas near the airport or near the rodeo grounds. Similarly, alternate routes #4 and #5 did not include the MDT-owned parcel surrounding the weigh scale.

All alternate truck routes have the potential to impact Whooping crane habitat; therefore, all alternate truck routes show at least one species of concern impacted. In addition to the Whooping crane habitat, alternate routes #3 and #4 would also impact the hog-nosed snake. No prime farmland would be impacted by any of the alternate truck routes. Any alternate truck route would need to clearly avoid the BNSF Railway via an overpass because the BNSF Railway is considered a 4(f) resource. No other 4(f)

resources are located in the vicinity of the proposed alternate truck routes. Alternate Route #6 would impact the hazardous waste site previously owned by Montola Growers, Inc. For purposes of this Study, ROW widths were based on 80 feet each side of centerline, which is the typical width for the type of roadway facility anticipated for each alternate truck route.

Each alternate route's ability to reduce truck traffic was computed. All northern alternate truck routes would reduce the same number of trucks. Similarly, all southern alternate truck routes would reduce the same number of trucks. The number of trucks each alternate route has the potential to reduce was determined from the turning movement counts on Figure 6-2. For the northern routes, alternate routes #1 and #2, it was assumed that the added travel time and travel distance of a northern route would not necessarily motivate all 117 southbound truck drivers on MT 16 (north) to use that particular route because they might choose the current route. These alternate routes may only capture the 64 trucks heading east from MT 16 (north) and the 73 trucks heading north from the weigh scale for a total of 137 trucks per day. Alternate routes 3-6 would have the potential to draw trucks heading east from MT 16 (south) (166 trucks per day), trucks heading south from US 2 (154 trucks per day), and trucks heading east through the MT 16 (south) / US 2 intersection if their reason for heading east was to access the weigh scale (97 trucks per day). Overall, alternate routes 3-6 have the potential to draw up to 417 trucks per day off of MT 16 (south) and US 2. Table 6.6 shows both the alternate truck route ratings and the comparative impact analysis.

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Table 6.6 Impacts Rating

Alternate Route	Wetland (acres)	Rating*	Floodplain (acres)	Rating*	Farmland of Statewide Importance (acres)	Rating*	Private ROW** (acres)	Rating*	Species of Concern Impacted	Rating*	Hazardous-Waste Sites	Rating*	Truck Traffic Reduction (trucks/day)	Rating*	Total Rating	Overall Rating*
Alternate Route #1	0	**1**	14.0	**5**	14.0	**6**	29.5	**5**	1	**1**	0	**1**	137	**5**	24	**5**
Alternate Route #2	0	**1**	14.0	**5**	12.4	**5**	34.3	**6**	1	**1**	0	**1**	137	**5**	24	**5**
Alternate Route #3	0	**1**	0	**1**	0	**1**	7.0	**1**	2	**5**	0	**1**	417	**1**	11	**1**
Alternate Route #4	0	**1**	0	**1**	0	**1**	7.0	**1**	2	**5**	0	**1**	417	**1**	11	**1**
Alternate Route #5	0	**1**	1.8	**4**	0	**1**	8.1	**3**	1	**1**	0	**1**	417	**1**	12	**3**
Alternate Route #6	2.2	**6**	0	**1**	0	**1**	10.3	**4**	1	**1**	1	**6**	417	**1**	20	**4**

**Note: This analysis was based on a numerical rating value of one to six, with one denoting the best option.*

***Note: For alternate routes #1, #2, #4, and #5, private right-of-way did not include locally-owned areas near the airport or near the rodeo grounds, or the MDT-owned parcel surrounding the weigh scale.*

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6.4.3 Construction Cost Comparison

As stated previously, planning-level cost estimates were developed for each of the six alternate truck routes. These costs included construction costs only in 2012 dollars. The planning-level costs did not include right-of-way acquisition, utility relocation, or any preliminary or construction engineering. The costs reflect the planning-level roadway costs and a planning-level bridge construction cost to arrive at the total planning-level cost estimates for each alternate truck route. Each cost projection was inflated by a 20 percent contingency factor to account for preliminary engineering costs, construction engineering costs, and for indirect cost accounting procedure costs. Table 6.7 shows the range of costs for the bridge, roadway, and the combined costs.

Table 6.7 Construction Cost Comparison Rating

Alternate Route	Bridge Cost	Roadway Cost	Total Cost	Rating*
Alternate Route #1	-	$3.1M to $3.7M	$3.1M to $3.7M	5
Alternate Route #2	-	$2.7M to $3.3M	$2.7M to $3.3M	3
Alternate Route #3	-	$0.7M to $0.8M	$0.7M to $0.8M	1
Alternate Route #4	-	$1.0M to $1.2M	$1.0M to $1.2M	2
Alternate Route #5	$2.1M to $2.5M	$0.8M to $1.0M	$2.9M to $3.5M	4
Alternate Route #6	$4.2M to $5.0M	$0.4M to $0.5M	$4.6M to $5.5M	6

**Note: This analysis was based on a numerical rating value of one to six, with one denoting the best option.*

6.4.4 Recommendation for Alternate Truck Route Improvement Option to Carry Forward

After review and analysis of all the information and input from community officials, it is recommended to carry forward Alternate Route #5 from this Study. A summary of the second level of screening is described in the paragraphs that follow, shown in Table 6.8, and shown graphically on Figure 6-5.

Table 6.8 Second Screening Summary

Alternate Route	Travel Time Rating*	Impacts Rating*	Construction Cost Rating*	Total Rating
Alternate Route #1	**5**	**5**	**5**	15
Alternate Route #2	**6**	**5**	**3**	14
Alternate Route #3	**3**	**1**	**1**	5
Alternate Route #4	**3**	**1**	**2**	6
Alternate Route #5	**1**	**3**	**4**	8
Alternate Route #6	**2**	**4**	**6**	12

**Note: This analysis was based on a numerical rating value of one to six, with one denoting the best option.*

Although Alternate Route #5 has a higher construction cost, this option would provide trucks with a more direct connection to the weigh scale by eliminating curves and reducing travel time. Intersecting MT 16 (south) near RP 2, Alternate Route #5 gives trucks convenient access to the new grain loading facility. For these reasons, the Town of Culbertson chose Alternate Route #5 as their preferred alternate truck route. In terms of long-range planning, the Town of Culbertson noted that Alternate Route #5 provided for a route in line with their 50-year plan. Additionally, alternate routes #3 and #4 may not be viable options in the near future because they are located in areas projected for private and commercial development in the area. For these reasons, alternate routes #3 and #4 have been eliminated from further consideration at this time.

Because Alternate Route #5 is located south of US 2 and east/north of MT 16 (south), it can potentially reduce the greatest amount of truck traffic through Culbertson. Alternate Route #5 is also the most feasible route because of its close proximity to the weigh scale, relatively low cost of construction, and small number of impacts. For these reasons and those noted above, Alternate Route #5 was recommended to be carried forward if a project moves forward from this Study. Alternate Route #6 has been eliminated from further consideration at this time as there is a viable alternate truck route with fewer impacts, a lower cost, and better travel time located in the same area.

Although a northern and southern route combination would appear to minimize truck turning movements at the intersections of MT 16 and US 2 and could conceptually provide the most benefit, it was determined that since neither of the northern alternate truck routes would provide a benefit to travel time or to overall truck volumes, a northern/southern route combination would not provide an equitable benefit, given the cost and impacts of construction. Thus, the option to pair a northern and southern route together is not recommended at this time. For these reasons alternate routes #1 and #2 have been eliminated from further consideration at this time.

The preferred alternate truck route, Alternate Route #5, is shown on Figure 6-5.

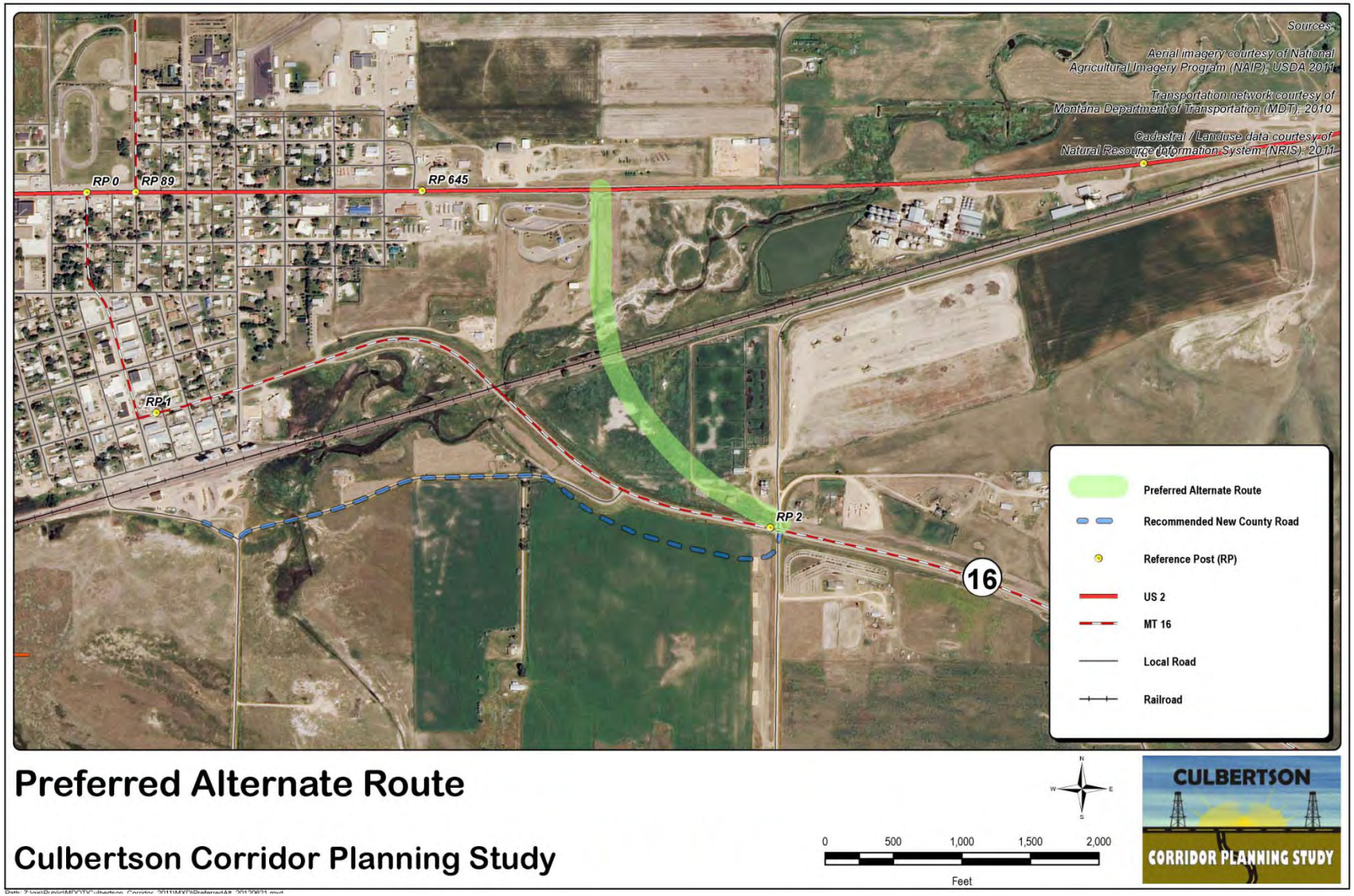

Figure 6-5 Preferred Alternate Truck Route

Chapter 7 Funding Mechanisms

7.1 *Introduction*

Both US 2 and MT 16 are on the National Highway System and are eligible for a number of different federal transportation funding programs. State, local, and private sector funding sources are also discussed in this chapter.

7.2 *Federal Funding Sources*

7.2.1 National Highway System (NHS)

The purpose of the NHS is to provide an interconnected system of principal arterial routes which will serve major population centers, international border crossings, intermodal transportation facilities and other major travel destinations; meet national defense requirements; and serve interstate and interregional travel. The NHS includes all Interstate routes, a large percentage of urban and rural principal arterials, the defense strategic highway network, and strategic highway connectors.

Allocations and Matching Requirements

NHS funds are Federally apportioned to Montana and then allocated based on system performance by the Montana Transportation Commission. The Federal share for NHS projects is 86.58 percent and the State is responsible for the remaining 13.42 percent, which is funded through the Highway State Special Revenue Account.

Eligibility and Planning Considerations

Activities eligible for the National Highway System funding (NH funds) include construction, reconstruction, resurfacing, restoration, and rehabilitation of segments of the NHS. Also eligible are operational improvements and highway safety improvements. Other miscellaneous activities that may qualify for NHS funding include research, planning, carpool projects, bikeways, and pedestrian walkways. The Montana Transportation Commission establishes priorities for the use of National Highway System funds, and projects are let through a competitive bidding process. Both US 2 and MT 16 are currently on the National Highway System.

The Glendive District, which covers the Culbertson corridor, is anticipated to receive an average of about $19 million annually of NH funds during the next five years. Current Glendive District priorities already under development total an estimated construction cost of $93 million. An additional $20 million worth of projects have been nominated, but not yet programmed. These additional projects have been approved by the Transportation Commission and are in the State Transportation Improvement Program (STIP).

7.2.2 Surface Transportation Program (STP)

Surface Transportation Program (STP) funds are Federally apportioned to Montana and allocated by the Montana Transportation Commission to various programs which includes the Surface Transportation Program Primary Highways (STPP), Surface Transportation Program Secondary Highways (STPS), and the Surface Transportation Program Urban Highways (STPU).

Primary Highway System (STPP)*

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 the MDT as either principal or minor arterials and that have been selected by the Transportation Commission to be placed on the Primary Highway System (MCA 60-2-125(3)).

Community Transportation Enhancement Program (CTEP)*

Federal law requires that at least 10 percent of STP funds must be spent on transportation enhancement projects. To comply with this Federal requirement, the Montana Transportation Commission created the Community Transportation Enhancement Program (CTEP) in cooperation with the Montana Association of Counties (MACO) and the League of Cities and Towns.

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. Finally, the Federal share for CTEP projects is 86.58 percent, and the Local and tribal governments are responsible for the remaining 13.42 percent.

7.2.3 Highway Safety Improvement Program (HSIP)

Allocations and Matching Requirements

HSIP is a new core funding program established by Safe, Accountable, Flexible, Efficient Transportation Equality Act: A Legacy of Users (SAFETEA-LU). HSIP funds are Federally apportioned to Montana and then allocated to safety improvement projects identified in the strategic highway safety improvement plan by the Transportation Commission. Projects described in the State strategic highway safety plan must correct or improve a hazardous road location or feature or must address a highway safety problem. The Commission first approves and then awards the projects which are let through a competitive bidding process. Generally, the Federal share for HSIP projects is 91.24 percent, and the State's share is 8.76 percent.

7.2.4 Coordinated Border Infrastructure Program (CBI)

CBI funds are first Federally apportioned to Montana and then allocated by the Commission based on system performance and project eligibilities. These funds may be used on projects within 100 miles of an international border to improve transportation, safety, regulation, or improved planning/coordination to streamline international motor vehicle and cargo movements. The Montana Transportation Commission approves projects which are then let to contract through a competitive bidding process. The Federal share is 86.58 percent, and the State share is 13.42 percent.

* State funding programs developed to distribute Federal funding within Montana.

7.2.5 Transportation & Community System Preservation Discretionary Program (TCSP)

Funded by the FHWA, this program provides discretionary grants to develop strategic transportation plans for local governments and communities. This program's overall goal is to promote livable neighborhoods. Grants may be used to improve the safety and efficiency of the transportation system; to reduce adverse environmental impacts caused by transportation; and to encourage economic development through access to jobs, services, and to centers of trade. Often, this program is used to fund capital expenditures. The TCSP Program federal share is 80% or subject to the sliding scale rate in accordance with 23 U.S.C. 120(b).

The recent trend for projects funded through Federal discretionary programs such as this has been U.S. Department of Transportation (USDOT) and FHWA funding projects which are consistent with the federal Congestive Initiative to fight traffic gridlock. Therefore, recent years have seen funding directed to large urbanized communities in a limited number of urban-type states. If this trend continues, it may be difficult for small Montana communities to compete for this type of funding.

7.2.6 Safe Routes To School (SRTS)

Allocations and Matching Requirements

Safe Routes To School funds are Federally apportioned to Montana for programs to develop and promote a safe environment that will encourage children to walk and bicycle to school. Montana is a minimum apportionment state, and will receive $1million per year, subject to the obligation limitation. The Federal share of this program is 100 percent.

Eligibility and Planning Considerations

Eligible activities for the use of SRTS funds fall under two major categories with 70 percent directed to infrastructure improvements, and the remaining 30 percent directed to behavioral (educational) programs. Funding may be used within a two mile radius of K-8 schools for improvements or programs that make it safer for kids to walk or bike to school. SRTS is a reimbursable grant program, and project selection is done through an annual application process. Eligible applicants for infrastructure improvements include local governments and school districts. Eligible applicants for behavioral programs include state, local and regional agencies, school districts, private schools, non-profit organizations. Recipients of the funds will front the cost of the project and will be reimbursed during the course of the project. For grant cycle information visit:
http://www.mdt.mt.gov/pubinvolve/saferoutes/

7.2.7 Congressionally Directed Funds

High Priority Projects (HPP)

High Priority Projects are specific projects named to receive Federal funding in SAFETEA-LU Section 1702. HPP funding authority is available until expended, and projects named in this section are included in Montana's percent share of the Federal highway funding program. The Montana Transportation Commission approves projects which are then let to contract through a competitive bidding process. In

Montana, the Federal share payable for these projects is 86.58 percent Federal and 13.42 percent non-Federal. Montana received 20 percent of the total project funding named in each year 2006 through 2009, and these funds are subject to the obligation limitation.

Transportation Improvements Projects

Transportation Improvement Projects are specific projects named to receive Federal funding in SAFETEA-LU Section 1934. Transportation Improvement Project funding authority is available until expended, and projects named in this section are not included in Montana's percent share of the Federal highway funding program. The Montana Transportation Commission approves projects which are then let to contract through a competitive bidding process. In Montana, the Federal share payable on these projects is 86.58 percent Federal and 13.42 percent non-Federal. Montana received a directed percent of the total project funding named in each year as follows: 2005 – 10 percent, 2006-20 percent, 2007-25 percent, 2008-25 percent, and 2009-20 percent. Again, these funds are subject to the obligation limitation.

7.3 *State Funding Sources*

7.3.1 State Funded Construction (SFC)

Allocations and Matching Requirements

The State Funded Construction (SFC) Program, which is funded entirely with state funds from the Highway State Special Revenue Account, funds projects on the state highway system (which includes Interstate, NHS, Primary, Secondary, Urban, and State routes). This program is entirely State funded, requiring no match.

Eligibility and Planning Considerations

The SFC program typically funds projects both to preserve the condition and to extend the service life of highways; however, other work types are allowed (as approved by the Transportation Commission). MDT staff nominates the projects based on prioritized system needs.

7.4 *Local Funding Sources*

Local funding sources for the Culbertson Corridor include funds from the Town of Culbertson, Roosevelt County, and from private enterprises. The following are potential local funding sources.

7.4.1 Town Funding Sources

State Fuel Tax

Under 15-70-101, MCA, Montana assesses a tax of $0.27 per gallon on gasoline and diesel fuel used for transportation purposes.

All fuel tax funds allocated to the city and county governments must be used for the construction, reconstruction, maintenance, and repair of rural roads or city streets and alleys. However, these funds may also be used for the share that the city or county might otherwise expend for proportionate matching of Federal funds allocated for the construction of roads or streets on the Primary, Secondary, or Urban Systems. Priorities for these funds are established by the cities and counties receiving them.

For State Fiscal Year 2011, Culbertson/Roosevelt County's combined allocation was approximately $122,672 (Culbertson - $19,411 and Roosevelt County - $103,261) in state fuel tax funds. The amount varies annually, but the current level provides a reasonable base for projection throughout the planning period.

General Fund

There are funds set aside in the City's General Fund under highways, streets, and roadways. In the past, these funds have been used as grant matching funds and also used to fund street-related drainage facility installation projects.

Special Revenue Funds

These funds are used to budget and distribute revenues that are legally restricted for a specific purpose. There are several special revenue funds that benefit the transportation system.

Special Improvement Districts (SID)

An improvement district made up of properties specially benefitted by an improvement can be created and bonds sold to fund design and construction of the improvement project(s). These funds are often used to leverage State and Federal funds to make improvements that not only benefit the district properties, but that also benefit the community at-large.

Tax Increment Financing (TIF)

Funds generated from a TIF district could be used to finance projects which include street and parking improvements, tree planting, new bike racks, trash containers and benches, and other streetscape beautification projects within a defined TIF district.

Impact Fees

Impact fees are charges imposed on private land developers by a governmental entity to fund the additional service capacity required by the development for which it is collected. This governmental entity is usually a local government. On the other hand, developers can also opt to donate land and/or build public infrastructure in lieu of cash payments. Montana Code Annotated, Title 7, Chapter 6, Part 16 enables local governments to establish impact fees to help pay for roads, water, sewer, stormwater, parks, fire and police, library, and solid waste facilities.

Impact fees are becoming an increasingly popular method to help finance transportation infrastructure needs in Montana as well as in other states. They can help local communities generate revenues to develop and extend local street networks and bicycle/pedestrian facilities. Some communities even allow developers to offset some of their anticipated impact fees costs by paying for traffic mitigation, transportation demand management (TDM), or for traffic calming measures in order to benefit the livability of the community.

A modification to impact fees that is currently being considered by other areas across the country is mobility fees, which are now being seen as the next generation of transportation financing. In this case, mobility fees are essentially impact fees that are particularly sensitive to vehicle-miles traveled (VMT). Here, developments are rewarded that locate in or near urban centers and those that offer a balanced

mix of uses with lower fees. Mobility fees also help to streamline concurrency at the local level. Unlike a conventional road impact fee, the mobility fee is tied to achieving an area-wide future condition and therefore may be applicable to addressing existing deficiencies, such as a road segment with no sidewalk.

In the case of Culbertson, mobility fees would not necessarily be imposed on developers for developments in urban areas, but they could be imposed on oil companies, grain companies, trucking companies, and on other carriers that travel through Culbertson. Thus, they could provide funding to achieve the area-wide future benefit of an alternate truck route and other improvement options.

7.4.2 County Funding Sources

County Road Fund

The County Road Fund provides for the construction and operation of all county roadways outside the corporate limits of cities and towns in Roosevelt 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 operating existing facilities allocated for new roadway construction. It should be noted that only a small percentage of the total miles on Roosevelt County's roadway system are located in the Study area. Thus, any project eligible for financing through this fund will be competing for available revenues on a county-wide basis.

County Bridge Fund

The Bridge Fund provides financing for engineering services, capital outlays, and for routine operations necessary to maintain bridges on all off-system and Secondary routes within the county. These monies are generated through intergovernmental fund transfers (i.e., vehicle licenses and fees) and through a county wide mill levy. There is a taxable limit of four mills for this fund.

Special Revenue Funds

These funds are used to budget and distribute revenues that are legally restricted for a specific purpose. There are several special revenue funds that benefit the transportation system.

Capital Improvement Funds

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 Improvement Districts (RID)

This fund is used to administer and distribute monies for special RIDS 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 Fund

A fund of this type may be established by the county on an as-needed basis for a particularly expensive project. However, voters must approve authorization for a special bond fund.

7.4.3 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 transportation facilities can lead to increases in land values and in commercial development possibilities. Several forms of private financing for transportation improvements used in other parts of the United States are described in this section. It should be noted that the local Capital Improvements Plan (2011) includes several smaller scale local funding sources.

Developer Exactions

Road construction or roadway improvements are performed by developers as a condition of approval for their development project. Improvements are typically limited to the local roads within, and the road system adjacent to, the proposed development.

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.

Multi-Jurisdictional Special District

This funding option was authorized in 1985 by the State Legislature. This procedure requires the establishment of a special district, somewhat like an SID or RSID, but which has the flexibility to extend across city and county boundaries. Through this mechanism, an urban transportation district could be established to fund a specific highway improvement that crosses municipal boundaries (e.g., corporate city limits or county line). This type of fund is structured similar to an SID and uses bonds backed by local government which are issued to cover the cost of a proposed improvement. Revenue to pay for the bonds would be raised through assessments against property owners in the service district.

Chapter 8 Corridor Study Conclusion

This planning-level Corridor Study process evaluated segments of US 2 (RP 642.8 to RP 646.8) and segments of MT 16 (between both RP 86.6 and RP 88.6 and between RP 0 and RP 3) to determine the corridor needs, objectives, constraints and opportunities, and funding availability. The corridor planning team weighed the corridor needs, objectives, constraints, and opportunities against all known existing engineering and environmental resource information. The team also solicited community, stakeholder, local government, and resource agency input to produce a package of improvement options which could help the Culbertson community in its future planning efforts.

The various improvement options developed to address corridor needs and objectives ranged all the way from major reconstruction projects along US 2 and MT 16 down to small spot improvement projects to address safety and operational issues. Overall, the improvement options analyzed included 19 existing network improvement options as well as six additional alternate truck route improvement options. Through the analysis of existing network improvement options, this Study recommends only 14 of the original 19 options for future consideration. Existing network improvement options were categorized into implementation timeframes. Implementation of short-term options could likely fall within two years. Implementation of mid-term options could occur between two and five years, and implementation of long-term options would likely take more than five years.

To analyze potential improvement options outside the Culbertson existing network, a bi-level screening process helped determine which alternate truck route improvement option would best meet the needs of the community in effectively reducing internal truck traffic. Screening criteria provide a means of reducing the number of potential alternate routes for consideration by comparing them both quantitatively and qualitatively with a set of specific measures. This screening process was a high level evaluation which would not only identify alternate truck route options that meet the needs and objectives identified for this corridor, but which could also be carried forward for further consideration if a project moves forward from this Study.

Due to the accessibility to the weigh scale and current truck traffic patterns, only alternate truck route improvement options on the east side of MT 16 were analyzed. Six improvement options on the east side of MT 16, both north and south of US 2, were developed due to their potential to divert truck traffic around Culbertson's downtown area. Results of the second and final level of screening showed that alternate routes #3-5 ranked the highest. Although Alternate Route #5 had a higher construction cost, this improvement option would provide trucks with a more direct connection to the weigh scale by eliminating curves and by reducing travel time. Intersecting MT 16 (south) near RP 2, Alternate Route #5 would provide trucks with convenient access to the new grain loading facility. For these reasons, the Town of Culbertson selected Alternate Route #5 as its preferred alternate truck route. In terms of long-range planning, the Town of Culbertson agreed that Alternate Route #5 provided for a route in line with Culbertson's 50-year plan. Additionally, alternate routes #3 and #4 may not be viable options in the near future because they are located in areas projected for private and commercial development.

The screening process and analysis resulted in selecting a single alternate truck route connecting US 2 and MT 16 in the southeastern region of the Corridor Study area. The potential alternate truck route would meet the long term needs and objectives of the community and would best address the issue of increased truck traffic within the corridor.

Information contained in this Corridor Study can be used to document why certain alignments were removed from consideration. As funding becomes available, MDT and/or the study partners may decide to enter into the next phase of project development. An exact alignment would be determined in the project development phase, if a project is forwarded from this Study. Additional avoidance and minimization measures would be investigated at that time.

8.1 *Next Steps*

The ability to develop projects based on the recommended improvement options depends on the availability of existing and future federal, state, local, and private funding sources. Presently, 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.

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