MT16 / MT 200
Glendive to Fairview
Corridor Planning Study

Draft Report

July 2012

For:

MONTANA MDT DEPARTMENT OF TRANSPORTATION

By:

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Visit the study website at:
http://www.mdt.mt.gov/pubinvolve/mt16/default.shtml

ACKNOWLEDGMENTS

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ABBREVIATIONS AND ACRONYMS

AADT ..... Annual Average Daily Traffic
BLM ..... Bureau of Land Management
CEIC ..... Census and Economic Information Center
DEQ ..... Montana Department of Environmental Quality
DNRC ..... Department of Natural Resources and Conservation
ETW ..... Edge of Travel Way
FHWA ..... Federal Highway Administration
ft ..... feet
FWP ..... Montana Fish, Wildlife and Parks
GIS ..... Geographic Information System
HCM ..... Highway Capacity Manual
HCS ..... Highway Capacity Software
LOS ..... Level of Service
LUST ..... Leaking Underground Storage Tank
LWQD ..... Local Water Quality District
MCA ..... Montana Code Annotated
MDT ..... Montana Department of Transportation
mph ..... miles per hour
MT 16 ..... Montana Highway 16
MT 200 ..... Montana Highway 200
NEPA/MEPA ..... National and Montana Environmental Policy Acts
NHS ..... National Highway System
NINHS ..... Non Interstate-National Highway System
NRIS ..... Natural Resource Information System
RP ..... Reference Post
SAFETEA-LU ..... Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
Section 4(f) ..... Section 4(f) of the 1966 Department of Transportation Act
Section 6(f) ..... Section 6(f) of the National Land and Water Conservation Funds Act
SVROR ..... Single Vehicle Run-off-the-Road
TMDL ..... Total Maximum Daily Loads
USACE ..... U.S. Army Corps of Engineers
USEPA ..... U.S. Environmental Protection Agency
USFWS ..... U.S. Fish and Wildlife Service
USGS ..... U.S. Geological Survey
UST ..... Underground Storage Tank

EXECUTIVE SUMMARY

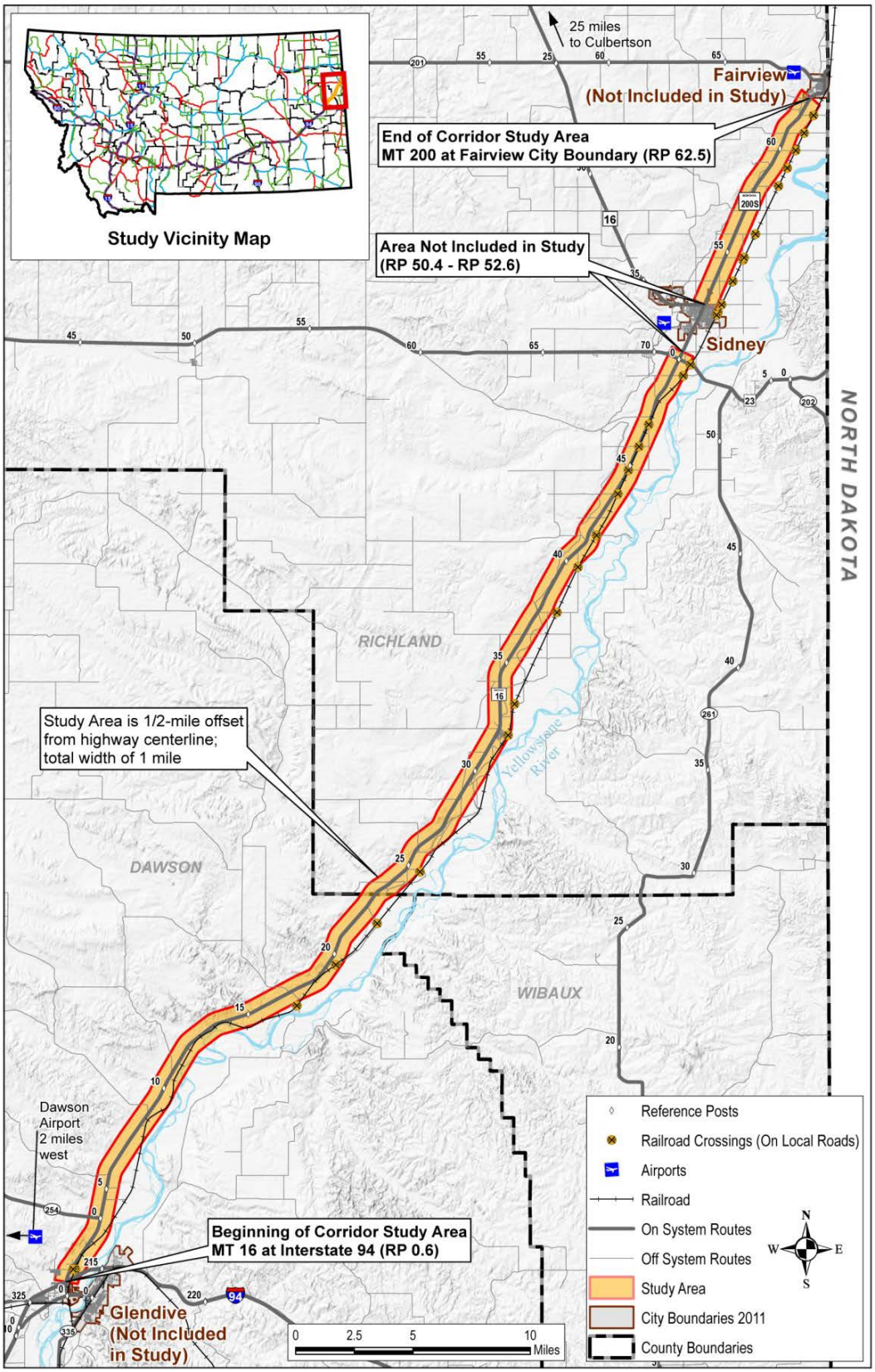
The Montana Department of Transportation (MDT), in cooperation with Dawson and Richland Counties and the Federal Highway Administration (FHWA), initiated a corridor planning study between Glendive and Fairview on MT Highway 16 (MT 16) and MT Highway 200 (MT 200).

A corridor planning study is a planning-level assessment of a study area occurring before project-level environmental compliance activities under the National and Montana Environmental Policy Acts (NEPA/MEPA). The corridor study process is designed to determine what, if anything, can be done to improve the corridor and to facilitate a smooth and efficient transition from transportation planning to environmental review and potential project development. The process involves conducting a planning level review of safety, operational, and geometric conditions and environmental resources within a corridor to identify needs and constraints. The process also allows for early coordination with members of the community, resource agencies, and other interested stakeholders. This planning process is distinct from a NEPA/MEPA environmental compliance document or any design, right-of-way acquisition, or construction phases that occur during project development.

The study area is illustrated in Figure ES-1 and includes approximately 60 miles of the MT 16 / MT 200 corridor beginning at Reference Post (RP) 0.6 just north of the I-94 Interchange in Glendive and extending northeasterly to the intersection of County Road 123 (RP 50.4) south of Sidney. The study resumes at Sidney's northern city limit boundary (RP 52.6) north of the MT 200 intersection with Holly Street, and extends northeast on MT 200 to the Fairview city limits (RP 62.5). The study excludes areas within the city limits of Glendive, Sidney, and Fairview and extends one-half mile on each side of the highway centerline throughout the corridor.

The study area is located within the area of influence of the Bakken formation, which is currently experiencing a boom in oil development. The study addresses traffic and safety concerns resulting from increased regional traffic volumes largely associated with oil industry growth.

Figure ES-1 Study Area



Source: MDT, 2012; DOWL HKM, 2012.

MDT conducted a corridor safety audit (CSA) for the portion of MT 16 / MT 200 between I-94 and the North Dakota state line concurrent with this corridor planning study. A CSA is a formal safety performance review of a corridor by a multi-disciplinary team. The audit team included representatives from MDT, the City of Sidney, the City of Fairview, FHWA, Montana Highway Patrol (MHP), and local media. The CSA team generated recommendations and countermeasures for roadway segments or intersections demonstrating a history of crashes or an identifiable pattern of crash types. This corridor study incorporates CSA recommendations for the rural portion of the MT 16 / MT 200 corridor.

ES.1 Existing and Projected Conditions

The MT 16 / MT 200 corridor is a two-lane rural arterial corridor traversing varying terrain. Issues and concerns identified through review of existing and projected conditions include:

- **Physical Features** – utility crossings and minor pavement condition issues
- **Geometric Conditions** – horizontal / vertical curves and clear zones that do not meet current MDT design standards
- **Safety** – speed differential and speed limit concerns; crashes involving large vehicles, unbelted drivers, out-of-state vehicles, and fatigued and impaired drivers; head-on and single vehicle run-off-the-road collisions; sight distance and lane transition concerns
- **Operational Conditions** – undesirable Level of Service (LOS) C or worse anticipated by 2035 through majority of corridor
- **Environmental Conditions** – prime and important farmlands, surface water bodies, wetlands, hazardous material sites, floodplains, federally listed and sensitive wildlife species, cultural and archaeological resources, and Section 4(f) and 6(f) resources located within the study corridor

ES.2 Corridor Needs and Objectives

Corridor needs and objectives were developed through a review of existing and projected conditions, input from community members and resource agencies, and coordination with MDT staff. The needs and objectives reflect transportation system issues and concerns and the desired condition of the corridor.

Need 1: Improve safety within the MT 16 / MT 200 study corridor, where practicable

Objectives:

1.a Improve roadway geometry to meet current MDT design standards
1.b Reduce conflicts with intersecting roadways
1.c Address head-on and single vehicle run-off-the-road crashes
1.d Address unsafe driver behavior

Need 2: Improve the operation of the MT 16 / MT 200 roadway facility within the study area, where practicable

Objectives:

2.a Accommodate existing and future traffic demands through the 2035 planning horizon

Need 3: Preserve and maintain the MT 16 / MT 200 roadway

Objectives:

3.a Improve roadway surfacing as needed to accommodate volume and mix of vehicles through the 2035 planning horizon

Other issues to be considered:

- Corridor constraints, including utilities and sensitive environmental resources
- Funding availability

ES.3 Improvement Options

Improvement options were identified to address corridor needs and objectives. Options include corridor-wide and location-specific improvements to address:

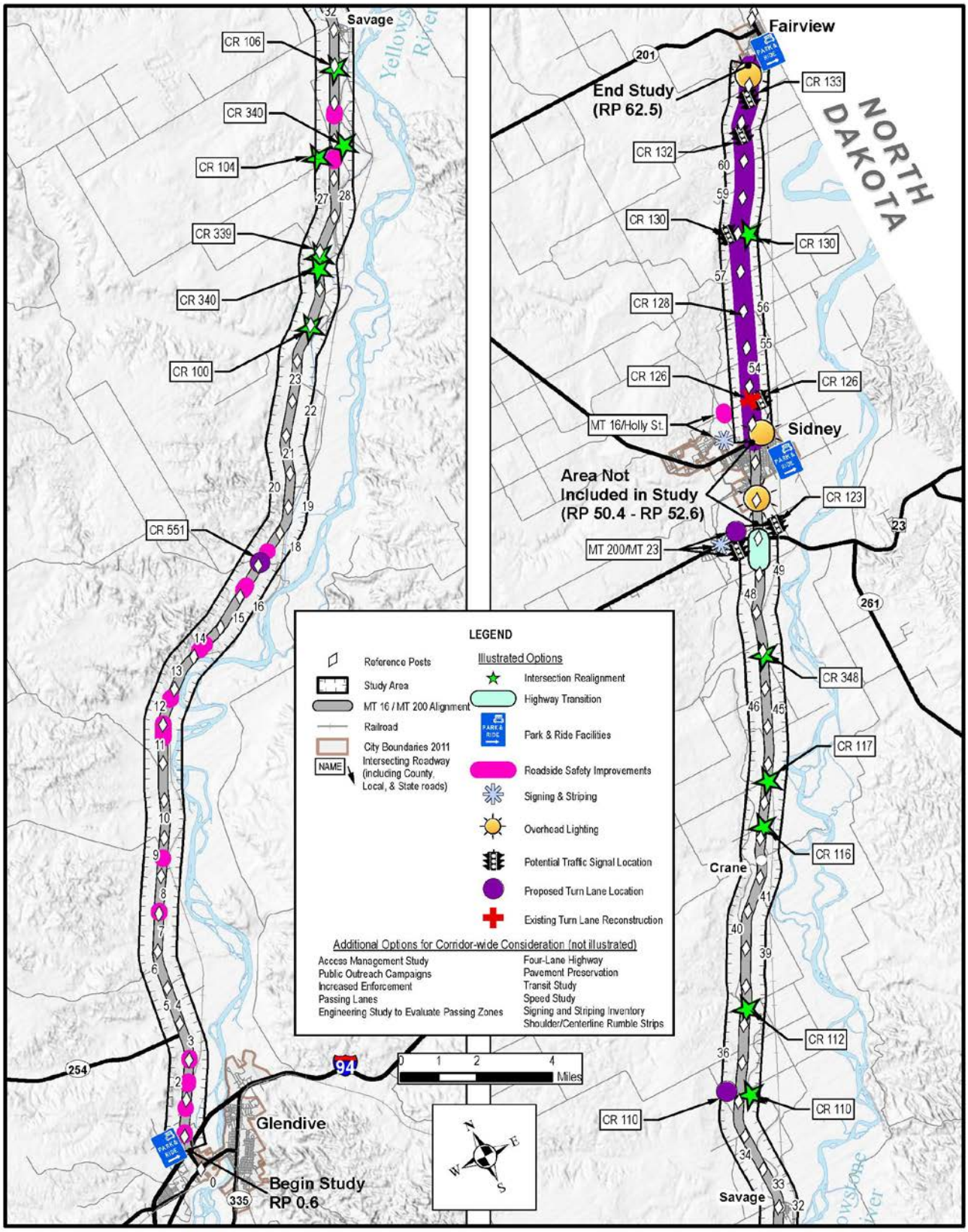
- access management,
- driver education,
- law enforcement,
- passing opportunities,
- roadway capacity,
- pavement condition,
- public transportation,
- roadside safety,
- speed,
- traffic control devices and safety / warning features, and
- turn lanes.

Planning level cost estimates range from $500 for new signage to $177 million to provide a four-lane facility throughout the corridor. Cost estimates reflect anticipated construction costs only, and do not include costs for right-of-way acquisition, utility relocation, preliminary engineering, construction engineering/inspection, or operations and maintenance.

Implementation of recommendations in this study may be the responsibility of MDT, local governments or other state and local agencies. If projects are forwarded from this study, implementation of high priority improvements is recommended within the next three years. Other improvements are targeted for the mid- to long-term (three to 20 years) to allow right-of-way acquisition and funding identification.

Recommended improvement options are illustrated in Figure ES-2.

Figure ES-2 Recommended Improvement Options



Source: MDT, 2012; DOWL HKM, 2012.

ES.4 Conclusion

Safety and operational conditions within the MT 16 / MT 200 corridor are rapidly changing as oil development continues throughout the region. This corridor planning study provides a summary of issues and concerns in the MT 16 / MT 200 corridor and identifies potential improvement options to address corridor needs and objectives.

Corridor safety and operational concerns are best addressed through combined implementation of education, enforcement, and engineering solutions. Improvement options may be implemented by local governments or other state and local agencies, through MDT maintenance programs, or the MDT project development process as funding allows. If improvement options are forwarded from this study, high priority projects could be implemented immediately while other projects could be implemented within the 2035 planning horizon as funding becomes available.

Development and implementation of appropriate combinations of improvement options will depend on personnel resources, funding availability, right-of-way needs, and other project development elements. This corridor planning study indicates there are no major technical or environmental impediments to further development of recommended improvements.

There is currently no funding available for improvement options identified in this study. Federal funding allocations for the MDT Glendive District are committed through 2018. Some smaller spot improvements may be fundable through other mechanisms or at the local level.

In addition to the improvement options identified in this study, MDT will provide passing lanes and shoulder / centerline rumble strips as part of two programmed projects (30 km NE of Glendive – NE and SF 119 – Glendive Rumble Strips). Completion of these projects is anticipated in August 2012 and fall 2012, respectively. If improvements are forwarded from this study, anticipated next steps may include conducting project level analysis, including studies to address access management, safety, signing and striping, speed, turn lanes, and passing lanes as funding and program priorities allow.

1.0 INTRODUCTION

1.1 Purpose and Scope of Study

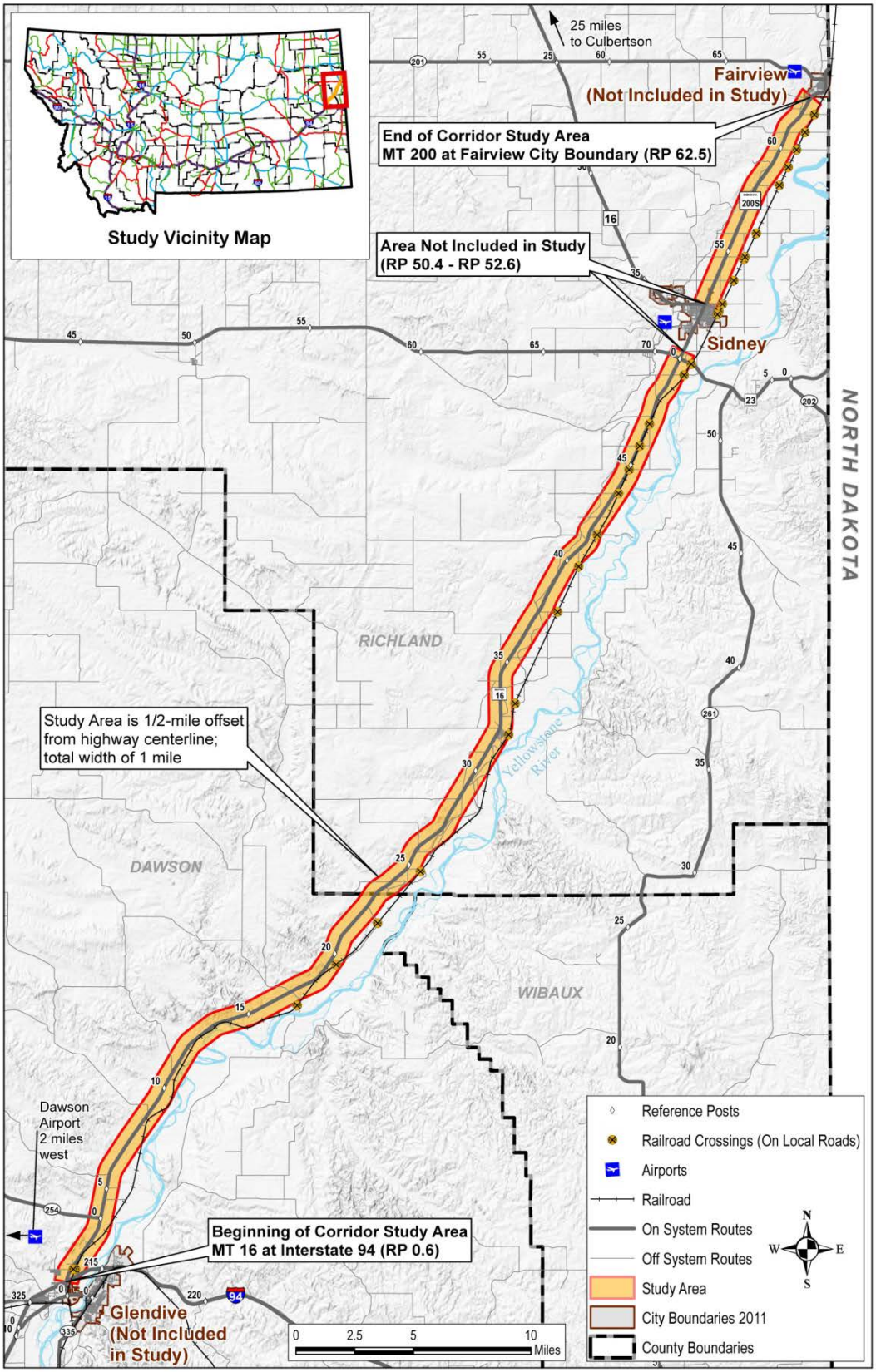
The Montana Department of Transportation (MDT), in cooperation with Dawson and Richland Counties and the Federal Highway Administration (FHWA), initiated a corridor planning study between Glendive and Fairview on MT Highway 16 (MT 16) and MT Highway 200 (MT 200). The study area is illustrated in Figure 1-1 and includes approximately 60 miles of the MT 16 / MT 200 corridor beginning at Reference Post (RP) 0.6 just north of the I-94 Interchange in Glendive and extending northeasterly to the intersection of County Road 123 (RP 50.4) south of Sidney. The study resumes at Sidney's northern city limit boundary (RP 52.6) north of the MT 200 intersection with Holly Street, and extends northeast on MT 200 to the Fairview city limits (RP 62.5). The study excludes areas within the city limits of Glendive, Sidney, and Fairview and extends one-half mile on each side of the highway centerline throughout the corridor.

The study area is located within the area of influence of the Bakken formation, which is currently experiencing a boom in oil development. The study addresses traffic and safety concerns resulting from increased regional traffic volumes largely associated with oil industry growth.

1.2 Study Process

The study follows the 2009 Montana Business Process to Link Planning and National and Montana Environmental Policy Act (NEPA/MEPA) Reviews, MDT's guideline for conducting corridor planning studies. This process facilitates a smooth and efficient transition from early transportation planning to project development and environmental review conducted in compliance with NEPA/MEPA. The planning process identifies corridor needs and objectives; provides opportunities for early engagement with community members, stakeholders, and resource agencies; and develops feasible improvement options that minimize impacts to important resources. Early planning efforts simplify and streamline subsequent project development by identifying and avoiding fatal flaws.

Figure 1-1 Study Area



Source: MDT, 2012; DOWL HKM, 2012.

2.0 COMMUNITY AND AGENCY PARTICIPATION

Community involvement and consultation with federal, state, and local agencies are key elements in linking planning studies and subsequent NEPA/MEPA reviews. MDT invites resource agencies, stakeholders, and community members to participate throughout the corridor planning process and provide input on needs, issues, concerns, and recommended improvement options. Specific outreach measures are described in the following sections. Additional information is provided in the Community and Agency Participation Plan developed for this study (Appendix A).

2.1 Study Website

A study website (http://www.mdt.mt.gov/pubinvolve/mt16/) was developed to provide information about this study. Draft documents were posted for community review and comment during the study process. Informational meeting announcements were posted to encourage community involvement in the study. Website links provided an opportunity for community members to post comments during the corridor study process. A Frequently Asked Questions (FAQs) page provided information about the corridor planning process and community participation opportunities. A Related Links page provided access to MDT, Dawson County, and Richland County websites, as well as links to the Montana Business Process to Link Planning Studies and NEPA/MEPA Reviews and the Sidney Truck Route Study website.

2.2 Community Involvement Activities

Two sets of informational meetings were conducted during the corridor study process. Meetings were advertised in the Glendive Ranger Review, Sidney Herald, Sidney Roundup, and Culbertson Searchlight newspapers. A press release was issued to radio stations, newspapers, and other local media outlets. Newsletters were distributed to the study mailing list before and during each meeting and provided information on corridor study progress, upcoming participation opportunities, and available study documentation. Materials from both sets of informational meetings, including advertisements, press releases, sign-in sheets, agendas, newsletters, presentations, meeting minutes, and written comments are included in Appendix A.

2.2.1 First Informational Meetings

Informational meetings were held on April 4, 2012 in Glendive and April 5, 2012 in Sidney. Seventeen community members attended the meeting on April 4th and 14 community members attended the meeting on April 5th. The presentation provided an overview of the corridor

planning study process, the study area and analysis locations, key findings from the existing and projected conditions report, and a list of recent and proposed MDT projects in the corridor. A discussion period followed the presentation. Attendees commented on safety, traffic volumes, enforcement, speed limits, funding, pavement conditions, passing zones and passing lanes, driver behavior, and the project development process.

2.2.2 Second Informational Meetings

To be completed following meetings.

2.3 Resource Agency Meeting

Resource agencies were invited to attend a meeting on April 12, 2012 to discuss environmental resource issues and concerns within the corridor. Representatives from MDT, Montana Department of Environmental Quality (DEQ), U.S. Environmental Protection Agency (USEPA), Montana Department of Natural Resources and Conservation (DNRC), and the U.S. Army Corps of Engineers (USACE) attended the meeting.

The presentation provided an overview of the corridor planning study process, the study area and analysis locations, an overview of the existing and projected conditions report, and key findings from the draft environmental scan report.

Agency representatives provided comments throughout the presentation. DEQ and USEPA expressed concern regarding the proximity of the road to the Yellowstone River throughout the corridor. USACE noted any impact to the Yellowstone River or wetlands will require a Clean Water Act Section 404 permit and coordination with USACE, US Fish and Wildlife Service (USFWS), and Montana Fish, Wildlife & Parks (FWP). USEPA commented any improvements should avoid encroaching upon the Yellowstone River and wetland areas. USEPA expressed concern regarding transport of hazardous materials within the corridor and appropriate containment measures should a spill occur. DNRC noted concerns regarding potential impacts to leased agricultural lands that may result from roadway expansion.

Materials from the resource agency meeting, including the invitation letter, presentation, meeting minutes, and written agency comments, are included in Appendix A.

2.4 Team Meetings

Representatives from MDT, FHWA, and Dawson and Richland Counties met regularly during the six-month study period to discuss study progress, analysis methodologies and results, draft reports, and other issues and concerns. The corridor study team served in an advisory role and reviewed study documentation before publication.

3.0 EXISTING CONDITIONS

3.1 Transportation System Conditions

This section discusses the highway transportation system within the study corridor in terms of its physical features, geometric characteristics, crash history, access points, traffic volumes, and operational characteristics. Additional information is provided in the Existing and Projected Conditions Report (Appendix B).

3.1.1 Physical Features and Characteristics

The corridor's physical features and characteristics were identified through field observation and a review of published statistics, documentation, GIS databases, and MDT record drawings (also called as-built drawings). A corridor field review was conducted on January 31, 2012 to identify existing conditions and constraints.

Functional Classification and Roadway System

Functional classification is used to characterize public roads and highways in accordance with Federal Highway Administration (FHWA) guidelines according to the type of service provided by the facility and the corresponding level of travel mobility and access to and from adjacent property. MT 16 from Glendive to Sidney (RP 0.6 to RP 50.4) is classified as a principal arterial on the Non-Interstate National Highway System (NINHS). The National Highway System (NHS) includes highways Congress has determined to have the greatest national importance to transportation, commerce, and defense. MT 200 from RP 52.6 to RP 53.7 is classified as a principal arterial, and the MT 200 portion of the corridor from RP 53.7 to RP 62.5 is classified as a minor arterial. The entire segment between Sidney and Fairview (RP 52.6 to RP 62.5) is on the Primary Highway System, and is not part of the NHS.

Structures

The MDT Bridge Bureau identified 12 bridges and four major culvert crossings within the study area. Major culverts are treated similarly to bridges for inspection purposes. None of the 16 structures in the corridor are deficient.

Railroad Facilities

A BNSF Railway facility parallels MT 16 / MT 200 throughout the study area. There are no at-grade or grade-separated railroad crossings on MT 16 / MT 200 within the study area. The railroad location is depicted in Figure 1-1.

Bicycle and Pedestrian Facilities

There are no dedicated bicycle or pedestrian facilities adjacent to MT 16 / MT 200. Seven- to eight-foot shoulders throughout the corridor provide opportunity for non-motorized usage.

Drainage Conditions

MT 16 / MT 200 parallels the Yellowstone River through much of the study corridor, crossing several tributary drainages. Highway run-off is directed to adjoining shoulders where graded side slopes carry run-off to natural drainage conveyances, through constructed ditches within the right-of-way, or via natural drainage patterns formed by the topography of the adjacent lands.

Utilities

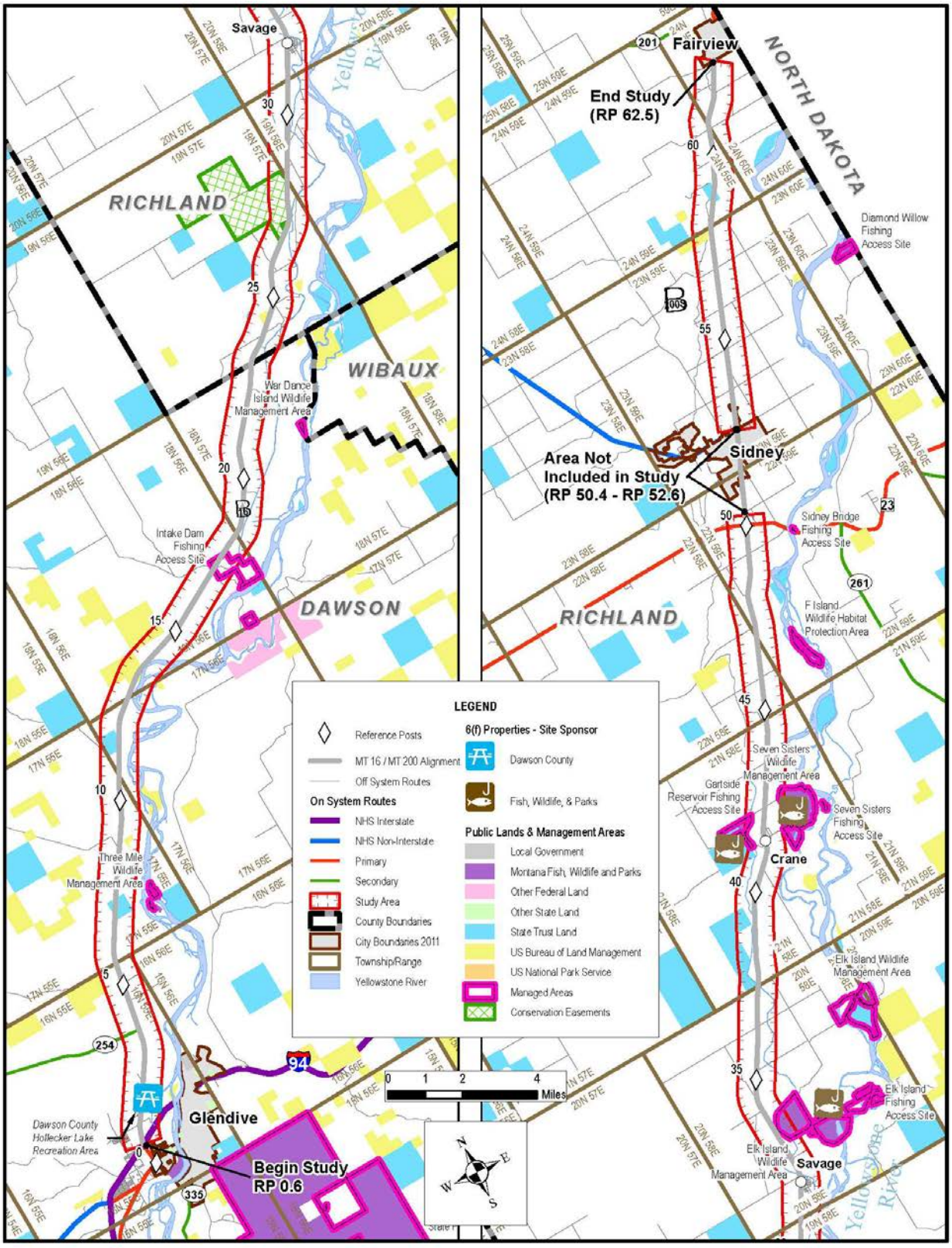
Overhead electric transmission lines and high pressure natural gas lines run adjacent to and cross MT 16 / MT 200 within the study area. Additional utilities are likely located within the corridor, including telephone, cable, and fiber optic lines. Irrigation canals and petroleum pipelines are also known to exist in the vicinity. A detailed utility investigation should be conducted for any improvement options forwarded from this study.

Right-of-Way and Land Ownership

Between Glendive and Sidney (RP 0.6 to RP 50.4), MDT generally owns 160 feet of right-of-way (80 feet on each side of the MT 16 centerline). In some portions of the corridor, MDT right-of-way extends over 400 feet from the centerline where adjacent slopes are cut or filled to accommodate the roadway alignment. Right-of-way between Sidney and Fairview (RP 52.6 to RP 62.5) is narrower, ranging from 100 to 140 feet in width (50 to 70 feet on each side of the roadway centerline).

Most land within the study corridor is privately owned and used for agricultural and ranching purposes. The BNSF railway runs parallel to MT 16 / MT 200 and falls within or directly adjacent to the corridor study area. The Bureau of Land Management (BLM) and the State of Montana also own land within the corridor. A number of areas within the study corridor are managed for recreational or conservation purposes. Land ownership and management status is illustrated in Figure 3-1.

Figure 3-1 Land Ownership



Source: MDT, 2012; NRIS, 2012; DOWL HKM, 2012.

Pavement Condition

MDT geotechnical reports indicate MT 16 / MT 200 is generally composed of a four-inch layer of asphalt over 1.5 feet of crushed base course. Subgrade soils (or material below the base course) are considered poor soils for roadway design due to moisture sensitivity. Minor rutting and cracking was observed in the corridor during the January 2012 field review.

3.1.2 Geometric Characteristics and Roadway Elements

Design Criteria and Guidelines

MT 16 from RP 0.6 to RP 50.4 and MT 200 from RP 52.6 to RP 53.7 are classified as Rural Principal Arterials. MT 200 from RP 53.7 to RP 62.5 is classified as a Rural Minor Arterial.

The design speed used for this corridor analysis is 60 to 70 miles per hour (mph) in combination with level/rolling terrain. Portions of the corridor, including RP 6.1 to RP 18.5 and RP 18.6 to RP 28.9, were designed using 60 mph criteria although the roadway generally meets 70 mph design speed criteria in these locations. The posted speed limit within the corridor is 70 mph for passenger vehicles and 60 mph for trucks, with short sections of reduced speed zones (45 to 55 mph) near the boundaries of Sidney and Fairview and through the community of Savage. The existing roadway alignment is generally on level terrain, although portions of the corridor exceed maximum grades for level terrain. The Existing and Projected Conditions Report (Appendix B) contains additional information regarding design criteria for rural principal arterials and rural minor arterials.

Roadway Width

Within the study area, MT 16 / MT 200 is a two-lane undivided highway with two 12-foot travel lanes. Seven- to eight-foot shoulders are typical throughout the corridor.

Horizontal Alignment

Horizontal alignment is a measure of the degree of turns and bends in the road, and includes consideration of horizontal curvature, superelevation, curve type, and stopping and passing sight distance. Seven of the 57 horizontal curves do not meet current MDT design standards for the design speed with regard to curve radius and stopping sight distance. No major horizontal alignment concerns were identified in the corridor.

Vertical Alignment

Vertical alignment is a measure of the elevation change on a roadway, and includes consideration of grade, vertical curve length, vertical curve type (sag curve or crest curve), and K value. K value is the horizontal distance needed to produce a one percent change in gradient

and is directly correlated to the roadway design speed and stopping sight distance. Eight of the 147 vertical curves within the study corridor do not meet current MDT design standards for the design speed. No major vertical alignment concerns were identified in the corridor.

Passing Zones

Passing zones are periodically provided within the corridor in locations with sufficient passing sight distance. Passing sight distance is defined as the minimum sight distance required to safely complete a passing maneuver. Striped no-passing zones occur within approximately 22 percent of the corridor. No sight distance issues were observed within passing zones or at intersections during the January 2012 field review. Passing opportunities are limited by the frequency of oncoming vehicles (opposing flow rate), including large vehicles.

The MDT Traffic Engineering Manual states "at intersections of 2-lane, 2-way roadways, a no-passing zone should be marked in advance of the intersection or stop bar at a minimum distance of 500 ft (150 m) for rural facilities." MDT is currently considering an exception to this policy at intersections with low-volume minor approaches within the MT 16 / MT 200 corridor.

Clear Zones

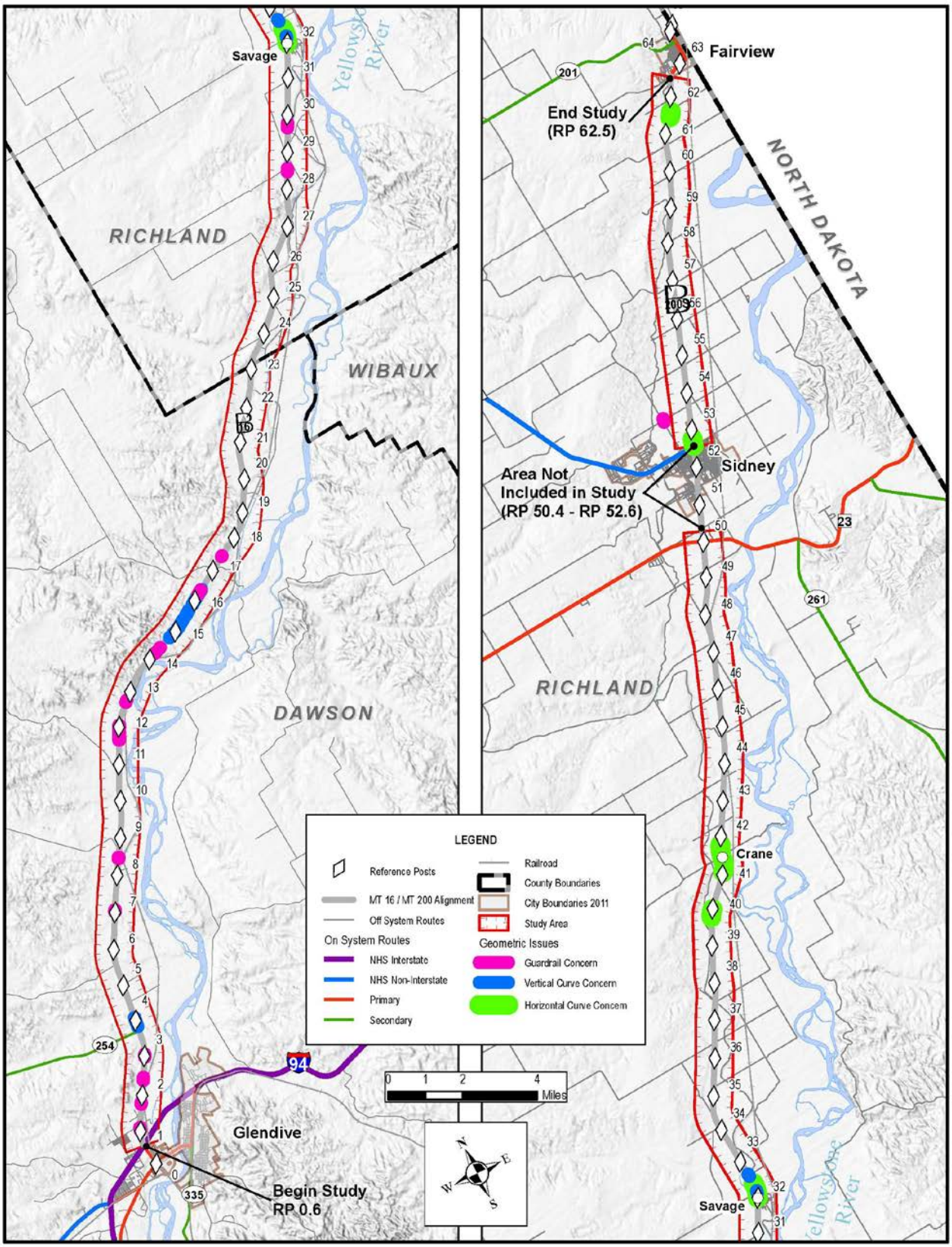
The MDT Road Design Manual specifies a clear zone to be free of any obstructions offset from the edge of the travel way (ETW). The ETW is delineated by the white pavement marking located on the right-hand side of the travel lane. The clear zone includes the roadway shoulder and is defined based on design speed, Average Annual Daily Traffic (AADT), horizontal curvature, and cut / fill slope dimensions.

All cut slope sections within the MT 16 / MT 200 corridor meet current MDT design standards. Thirteen fill slope locations within the portion of the corridor from RP 1.1 to RP 29.7 were identified as possible safety concerns due to inadequate recovery area adjacent to the travel way. Guardrail or slope flattening should be provided in locations with an inadequate recovery area.

Summary of Geometric Concerns

Figure 3-2 presents the location of horizontal curve, vertical curve, and clear zone / guardrail concerns within the corridor.

Figure 3-2 Summary of Geometric Concerns within the Study Area



Source: MDT, 2012; DOWL HKM, 2012.

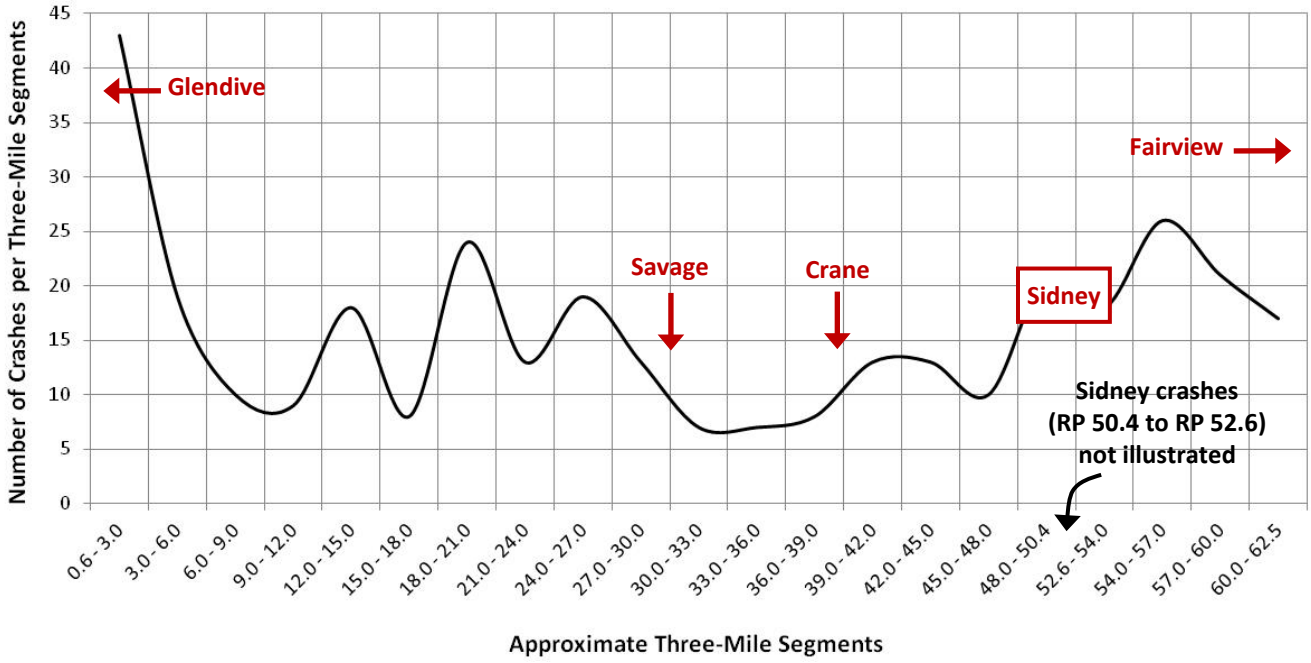
3.1.3 Crash Analysis

MDT conducted a corridor safety audit (CSA) for the portion of MT 16 / MT 200 between I-94 and the North Dakota state line concurrent with this corridor planning study. A CSA is a formal safety performance review of a corridor by a multi-disciplinary team. As part of the CSA, MDT held an audit workshop February 1 and 2, 2012 to gather input from local, state, and federal officials and to conduct an on-site field review of the corridor. The audit team included representatives from MDT, the City of Sidney, the City of Fairview, FHWA, and Montana Highway Patrol (MHP). During the audit workshop, MDT representatives presented a summary of crash data information, followed by a field review of potential safety concerns. The CSA process identified the following concerns relevant to this corridor study.

- Commercial vehicle speed differential, which may lead to large vehicle queues and aggressive passing maneuvers
- Higher occurrence of crashes involving large vehicles
- Higher occurrence of unbelted crashes
- Higher occurrence of crashes involving vehicles with out-of-state registration
- Fatigued and impaired driver crashes
- Ability of the existing transportation network to handle projected regional growth
- Increased driveway / intersection related crashes between Sidney and Fairview
- Moving sight distance concerns at the intersection of County Road 126 (RP 53.7)
- Minimal guidance to drivers and speed limit concerns at the intersection of MT 16 / MT 23 / MT 200 (RP 50.0)
- Head-on and single vehicle run-off-the-road (SVROR) crashes

The CSA considered crash data for the MT 16 / MT 200 corridor from RP 0.0 to RP 64.2 for the five-year period from July 1, 2006 to June 30, 2011. A total of 337 crashes occurred within the MT 16 / MT 200 study corridor (RP 0.6 to RP 50.4 and RP 52.6 to RP 62.5) during this period. Crash locations within the study corridor are illustrated in Figure 3-3.

Figure 3-3 Crash Locations in Study Corridor (2006 – 2011)



Source: MDT, 2012; DOWL HKM, 2012.

Rural Crash Rate, Severity Index, and Severity Rate for Study Corridor

MDT provided crash rate, severity index, and severity rate data for the MT 16 / MT 200 study corridor (RP 0.6 to RP 50.4 and RP 52.6 to RP 62.5) for the five-year period from January 1, 2007 to December 31, 2011.

Engineers assess crash rate, severity rate, and severity index to identify safety concerns. MDT defines the crash rate as a measure of crashes per million vehicle miles of travel. The severity index provides a weighted assessment of crashes, with fatal crashes and crashes resulting in incapacitating injuries weighted more heavily compared to crashes resulting in less serious injuries or property damage only. The severity rate is calculated by multiplying the crash rate and severity index, providing a weighted measure of crashes per million vehicle miles of travel.

The corridor crash rate, severity index, and severity rate were similar to or lower than statewide averages for similar facilities during this period, as presented in Table 3.1.

Table 3.1 Crash History Comparison (Statewide Average vs. MT 16 / MT 200 Corridor)

Criteria	Rural NINHS		Rural Primary	
	Statewide Average (2007 – 2011)	MT 16 RP 0.6 – RP 50.4 (2007 – 2011)	Statewide Average (2007 – 2011)	MT 200 RP 52.6 – RP 62.5 (2007 – 2011)
Crash Rate (All Vehicles)	1.01	1.16	1.12	1.26
Severity Index (All Vehicles)	2.05	1.77	2.22	1.91
Severity Rate (All Vehicles)	2.07	2.05	2.50	2.41

Source: MDT, 2012.
Note: Crash statistics are calculated using Annual Average Daily Traffic Volumes (AADT) and reflect currently available data as of the date of this report.

Safety Audit Analysis – Rural Crashes

From 2006 to 2011, 353 crashes were reported within the rural areas of the corridor outside the city limits of Glendive, Sidney, and Fairview (RP 0.0 to RP 51.3, RP 52.6 to RP 62.5, and RP 63.9 to RP 64.2). Approximately 24 percent of rural crashes resulted in injuries, and three fatal crashes occurred. SVROR crashes accounted for over 35 percent of all crashes within the corridor's rural portions. The highest percentage of rural crashes occurred with dry road conditions (67 percent, or 238 of 353) and during daylight (48 percent, or 168 of 353). Wild animals were involved in 37 percent (130 out of 353) of reported rural crashes. Approximately 12 percent (42 of 353) of rural crashes involved large vehicles.

3.1.4 Access Analysis

A total of 528 access points are evenly distributed between the east and west sides of the MT 16 / MT 200 corridor. The majority of access points are unpaved private approaches.

Access point density is calculated by dividing the total number of unsignalized intersections and driveways on both sides of the roadway segment by the length of the segment in miles. Higher access point densities result in more potential conflicts on the road, decreasing the free flow speed of traffic. Lower access point densities allow for more orderly merging of traffic and present fewer challenges to drivers. Densities range from a low of 5.1 access points per mile on MT 16 from Glendive to Savage to a high of 15.7 access points per mile on MT 200 from Sidney to Fairview.

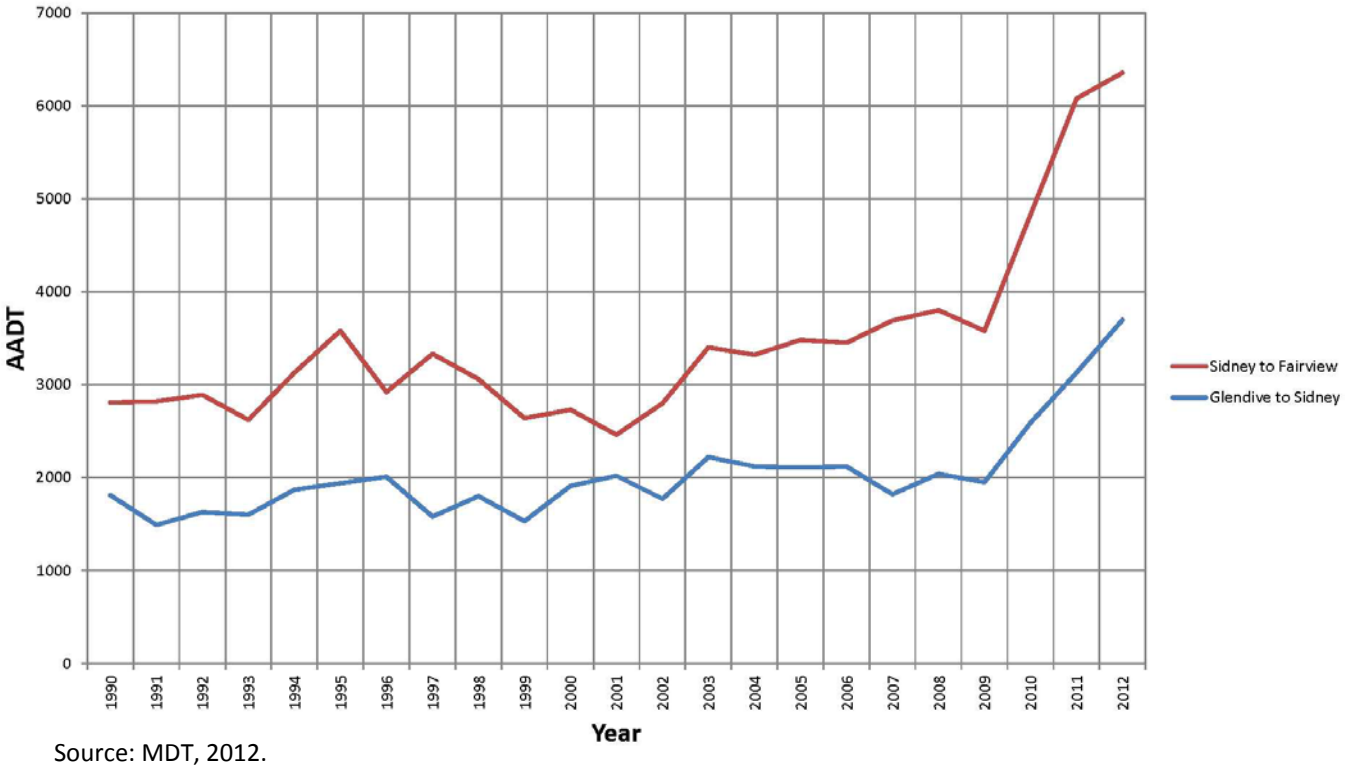
3.1.5 Traffic Volumes

Annual Average Daily Traffic (AADT) Volumes

Annual Average Daily Traffic (AADT) is the total of all motorized vehicles traveling in both directions on a highway on an average day. Traffic count data within the MT 16 / MT 200 corridor was collected using short-term counters.

Figure 3-4 illustrates weighted AADT volumes for the portions of the corridor between Glendive and Sidney and Sidney to Fairview from 1990 to 2012.

Figure 3-4 Weighted AADT Volumes (1990 – 2012)



Source: MDT, 2012.
Note: Yearly AADT volumes represent the weighted average of data from multiple count locations. Traffic volumes were not collected in 2010 for the portion of the corridor from Sidney to Fairview. The 2010 Sidney to Fairview volume represents an average between 2009 and 2011 data.

Observed traffic volumes from Glendive to Sidney increased from 2009 to 2010 and from 2010 to 2011 by 33 percent and 21 percent, respectively. Observed traffic volumes between Sidney and Fairview increased by 70 percent from 2009 to 2011.

Large trucks comprised 16 percent of the total traffic volume from Glendive to Sidney in 2011, an 82 percent increase from 2010. From Sidney to Fairview, large trucks comprised 17 percent of the total traffic volume in 2011, a 245 percent increase from 2010.

3.1.6 Operational Analysis

Within the study corridor, MT 16 and MT 200 fall under the Highway Capacity Manual (HCM) classification of a Class I two-lane highway. Class I two-lane highways are major intercity routes, primary connectors of major traffic generators, daily commuter routes, or major links in state or national highway networks where motorists expect to travel at relatively high speeds. These facilities serve mostly long-distance trips or provide connections between facilities that serve long-distance trips. For a Class I two-lane highway, six LOS categories ranging from A to F are used to describe traffic operations, with LOS A representing the best conditions and LOS F representing the worst. LOS F exists whenever traffic demand flow in one or both directions exceeds the capacity of the road segment, operating conditions are unstable, and heavy congestion exists. Highway Capacity Software (HCS) Version 2010 was used to analyze LOS for a Class I two-lane highway in the corridor.

Analysis Results

Table 3.2 presents the results of the operational analysis for existing (2012) conditions. LOS values represent estimated operational conditions within each corridor segment.

Table 3.2 Class I Two-lane Highway Operational Analysis Results (2012)

Location			LOS
Corridor Segment	Glendive to Savage	MT 16 Northbound RP 0.6 to RP 20.0	B
		MT 16 Southbound RP 0.6 to RP 12.4	B
		MT 16 Northbound RP 20.0 to RP 31.5	A
		MT 16 Southbound RP 12.4 to RP 22.0	A
		MT 16 Southbound RP 22.0 to RP 31.5	B
	Savage to Crane	MT 16 Northbound RP 31.5 to RP 41.5	B
		MT 16 Southbound RP 31.5 to RP 41.5	B
	Crane to Sidney	MT 16 Northbound RP 41.5 to RP 50.4	B
		MT 16 Southbound RP 41.5 to RP 50.4	C
	Sidney to Fairview	MT 200 Eastbound RP 52.6 to RP 62.5	C
		MT 200 Westbound RP 52.6 to RP 62.5	B

Source: DOWL HKM, 2012.

Note: Shaded gray rows indicate analyzed sections with passing lanes and their associated downstream effect. Passing lanes are being constructed as part of the 30 km NE of Glendive – NE project from RP 20.0 to RP 22.0 in the northbound and southbound directions. Project completion is anticipated in August 2012.

The MDT Traffic Engineering Manual defines desirable operations for principal and minor arterial facilities in level terrain as LOS B. The MT 16 / MT 200 corridor currently operates at LOS B or better throughout the corridor, with the exception of MT 16 southbound from Crane to Sidney (RP 41.5 to RP 50.4) and MT 200 eastbound from Sidney to Fairview (RP 52.6 to RP 62.5), which currently operate at LOS C.

3.2 Demographic and Economic Conditions

The study corridor includes portions of Dawson and Richland counties on the eastern border of Montana. The region has trended towards negative population growth in the last three decades. However, recent economic activity has reversed this trend, bringing more workers and traffic to the region. Historic and recent trends in population and economic activity are discussed in the following sections.

3.2.1 Population and Housing Characteristics

Richland and Dawson county demographics are similar by most measures. Richland County is slightly more populated than Dawson County due in part to the larger population of Sidney compared to Glendive.

The Native American population of both counties is approximately three percent, compared to approximately six percent for the state. This percentage is similar to other counties in Montana without Reservation lands.

Vacancy rates for the counties ranged from eight percent to 11 percent at the time of the 2010 Census. A housing unit is considered vacant by the U.S. Census if no one is living in it at the time of the interview, unless its occupants are only temporarily absent. In addition, a vacant unit may be one which is entirely occupied by persons who have a usual residence elsewhere.

Field reports suggest an influx of workers has put increasing pressure on the housing markets in the region since the 2010 Census counts and vacancy rates may be lower now than previously reported. Recent permit applications for temporary housing units (e.g., RV parks or “man camps”) indicate continued scarcity of permanent housing units. Table 3.3 summarizes data from the 2010 Census.

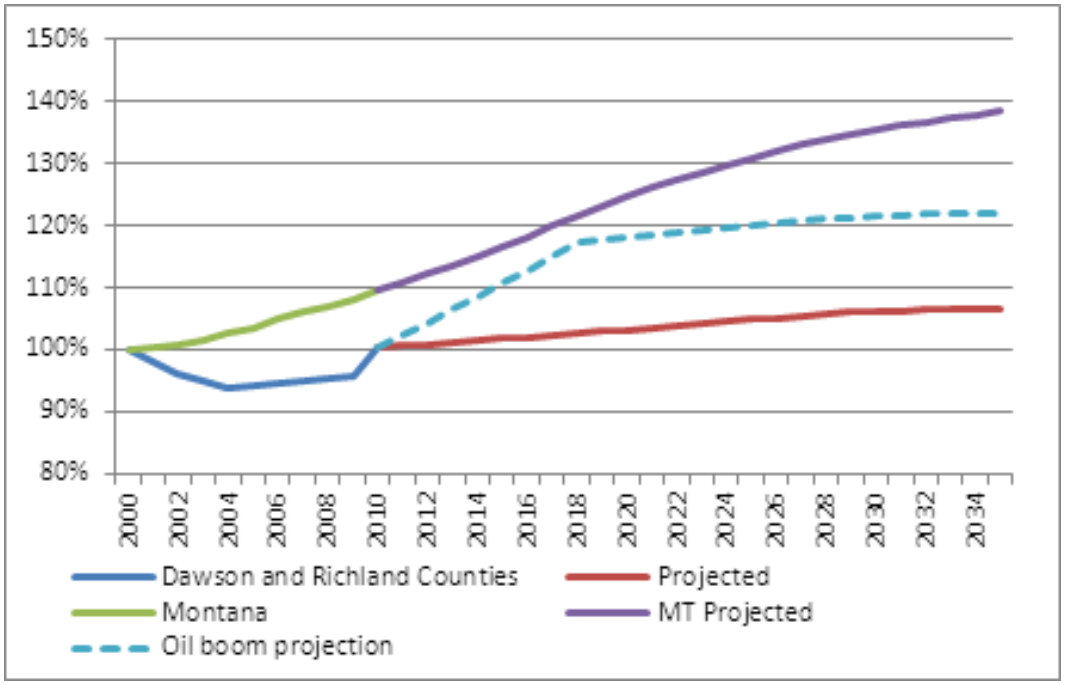
Table 3.3 2010 Census Data

Category		Montana	Richland County	Dawson County
Population	County / State	989,415	9,746	8,966
	Largest City in County Sidney (Richland County) Glendive (Dawson County)	NA	5,191	4,935
Race	White	89%	97%	97%
	American Indian	6%	3%	3%
Housing	Total housing units	482,825	4,550	4,233
	Owner-occupied	58%	64%	63%
	Renter-occupied	27%	28%	26%
	Vacant	15%	8%	11%

Source: U.S. Census Bureau, 2010.

Figure 3-5 illustrates historic and projected populations for Montana, Dawson County, and Richland County from 2000 to 2035. From 2000 to 2004, Richland and Dawson Counties experienced a combined population decline of over 1,000 people. The population increased slightly from 2004 to 2010. The solid red line indicates study area population projections based on historical trends from the last decade. More recently, analysts have revised population projections based on the current oil development boom. The blue dashed line indicates an expected sharp increase in population in the near-term. As energy exploration and development activity eventually decline, population and job growth are expected to flatten. The length, rate, and long-term impacts of this population influx are unknown.

Figure 3-5 Historic and Projected Population



Source: NPS Data Services, 2012; Montana Census and Economic Information Center (CEIC), 2012.

3.2.2 Economy

The energy industry comprised the largest share of the regional economic base of Richland County according to data provided for the 2008 to 2010 period from the University of Montana Bureau of Business and Economic Research. Agriculture, manufacturing, and transportation sectors also play large roles in the regional economy. The economic base is rounded out by government activities, health care, and other industries including tourism.

Recent unemployment figures from the state and federal labor departments suggest favorable employment conditions in the study area. As of November 2011, unemployment in Richland and Dawson Counties was approximately three percent, less than half the statewide rate of 6.6 percent and nearly two-thirds lower than the national rate of 8.6 percent. Unemployment data is presented in Table 3.4.

Table 3.4 November 2011 Unemployment Figures (not seasonally adjusted)

Location	Labor Force	Employed	Unemployed	Rate
Montana	498,322	465,573	32,749	6.6%
Richland County	6,201	6,042	159	2.6%
Dawson County	4,357	4,222	135	3.1%

Source: MDT, 2012.

Energy Industry

The study area is located within the area of influence of the Bakken formation, which is currently experiencing a boom in oil development. That boom has generated growth in freight and other traffic in recent months, making eastern Montana and northwestern North Dakota among the fastest growing economic areas in the United States. The MT 16 / MT 200 corridor is a major service route connecting Interstate 90 to the Bakken region.

The Bakken formation extends well into North Dakota and Saskatchewan. Much of the recent increase in traffic volumes within the study area may be the product of commerce across these boundaries. Apart from drilling activities, economic activity may be generated by transport to and from drilling sites, rail facilities, and transmission stations and performing value-added work such as engineering, processing, marketing, and other services.

In 1995, the US Geological Survey (USGS) estimated 151 million barrels of recoverable oil in the Bakken. A revised estimate released by USGS in April 2008 increased the estimate of recoverable oil from 3.0 to 4.3 billion barrels. Current estimates continue to fluctuate, with some oil company estimates reaching 20 billion barrels of recoverable oil. The average life expectancy of an oil well in the Bakken formation is up to 20 years, although production is highest in the first year. Analysts estimate oil exploration and development in the Bakken formation may continue for another 10 to 20 years.

Agriculture

Agricultural activities are also a major component of the local economy. The 2010 Montana State Rail Plan identifies four shuttle loading facilities in northeastern Montana, one of which is in Glendive. A 110-car grain elevator loading facility is currently being constructed in Culbertson, Montana. Historically, Montana producers relied on smaller, local elevators providing rail service in 52- or 26-car units. The new shuttle loading facilities are designed to load 110 rail cars, double to quadruple previous industry standards.

With fewer and more centralized grain loading facilities, the distance from farm to elevator has generally increased. Haul trucks are often larger, heavier, and travel longer distances to reach grain loading facilities, with potential impacts on pavement condition and roadway maintenance costs.

3.3 Environmental and Physical Setting

MDT prepared an environmental scan report for the MT 16 / MT 200 corridor planning study to identify environmental resource constraints and opportunities within the study corridor. Information was gathered from previously published documents, agency websites, and GIS databases. Key information from the environmental scan report is summarized in the following sections. Additional information is provided in the Environmental Scan Report (Appendix C).

3.3.1 Physical Environment

Soil Resources and Prime Farmland

Some areas within the corridor are classified as prime and important farmlands. If improvement options are forwarded from this study, a U.S. Department of Agriculture Natural Resource Conservation Service Farmland Conversion Impact Rating Form for Linear Projects (form CPA-106) will need to be completed to document any impacts to farmlands.

Geologic Features and Hazards

The MT 16 / MT 200 alignment generally follows a highland terrace of the Yellowstone River, occasionally traversing lowland floodplain areas. Alluvium typically consists of unconsolidated deposits of gravel, sand, silt, and clay.

Surface Water

The study corridor is located in the Lower Yellowstone Watershed. The Yellowstone River from its confluence with the Powder River (near Terry, MT) to the North Dakota border is listed in the 2012 Integrated 303(d / 305(b) Water Quality Report for Montana by DEQ. The 2012 DEQ report classifies the portion of the Yellowstone River within the study area as Category 5 and Category 4C. Category 5 water bodies are waters where one or more applicable beneficial use has been assessed as being impaired or threatened, and a Total Maximum Daily Load (TMDL) is required to address the factors causing the impairment or threat. Category 4C water bodies are waters where TMDLs are not required as no pollutant-related use impairment is identified. TMDLs have not yet been written for water bodies in this watershed. When TMDLs are prepared and implementation plans are in place, any construction practices will have to comply with the requirements set forth in the plan.

There are a number of streams intersecting the corridor with documented fisheries value. Additional information is provided in Appendices A and C.

Groundwater and Sourcewater Points

Numerous groundwater and sourcewater access points are located within the study corridor. Dawson County and Richland County have not developed Local Water Quality Districts (LWQD). If improvement options are forwarded from this study, water quality protection measures may need to be addressed during project development.

Irrigation

Irrigated farmland exists in Dawson County and Richland County adjacent to the study corridor. If improvement options are forwarded from this study, operators of irrigation facilities will need to be contacted for flow requirements during project development to minimize impacts to farming operations. Irrigation facilities will need to be assessed to determine if they are considered Waters of the U.S. and subject to jurisdiction by USACE.

Wetlands

The study area encompasses portions of the Yellowstone River and associated tributaries and wetland areas. If improvement options are forwarded from this study, wetland delineations and jurisdictional determinations will need to be conducted during project development according to standard USACE procedures.

Floodplains

Designated flood zones occur within the study corridor. If improvement options are forwarded from this study, coordination with the County Floodplain Administrator will need to be conducted during the project development process to minimize floodplain impacts and obtain any necessary floodplain permits.

Hazardous Materials

There are a number of underground storage tank (UST) sites, leaking underground storage tank (LUST) sites, and remediation response sites within the study corridor. If improvement options are forwarded from this study, handling and disposing of any contaminated materials encountered during construction activities will be conducted in accordance with applicable state, federal, and local laws and rules.

Air Quality

The study corridor is not located in or adjacent to a non-attainment area and is exempt from a Mobile Source Air Toxics Analysis under the conformity exemption for planning studies.

Noise

Noise receptors may be located within the study area. If improvement options are forwarded from this study, noise studies may need to be conducted for Type I projects during project development.

Visual Resources

The study corridor contains an array of environmental resources which contribute to the rural landscape. There are no properties or view corridors within the study area listed on the Department of Interior's National Landscape Monument System or otherwise designated as high value viewsheds.

3.3.2 Biological Resources

Fish and Wildlife

Threatened and Endangered Wildlife Species

Six (6) endangered, threatened, proposed, or candidate animal species may occur in Dawson and Richland Counties. These species are listed in Table 3.5. If improvement options are forwarded from this study, an evaluation of potential impacts to all endangered, threatened, proposed, or candidate species will need to be completed during the project development process.

Table 3.5 Threatened and Endangered Wildlife Species in Richland and Dawson Counties

Category	Scientific Name	Common Name	Federal Status
Fish	*Scaphirhynchus albus*	Pallid Sturgeon	Listed Endangered
Bird	*Charadrius melodus*	Piping Plover	Listed Threatened, Critical Habitat
	Sterna antillarum athalassos	Interior Least Tern	Listed Endangered
	Grus Americana	Whooping Crane	Listed Endangered
	Centrocercus urophasianus	Greater Sage Grouse	Candidate
	Anthrus spragueii	Sprague's Pipit	Candidate

Source: USFWS, 2011.

Wildlife and Fish Species of Concern

Thirty-nine (39) animal species of concern are expected to exist in Dawson and Richland Counties. Additional information is provided in Appendices A and C.

If improvement options are forwarded from this study, on-site surveys for species of concern will need to be completed during the project development process.

Vegetation

Native vegetation in the study area generally consists of wetland and riparian areas along the Yellowstone River and sagebrush / grasslands in the upland areas. The remaining vegetation consists of cultivated crop land.

Threatened and Endangered Plant Species

No endangered, threatened, proposed, or candidate plant species are listed for Dawson or Richland Counties, and none are expected to exist in the study area.

Plant Species of Concern

A single plant species of concern is anticipated to exist in Dawson County. If improvement options are forwarded from this study, on-site plant surveys will need to be completed during the project development process.

Noxious Weeds

There are 32 noxious weeds in Montana, as designated by the Montana Statewide Noxious Weed List (effective April 15, 2008). If a project is forwarded from the improvement option(s), a noxious weed survey will need to be conducted during the project development process.

3.3.3 Social and Cultural Resources

Cultural and Archaeological Resources

Resources identified within the study corridor include historic irrigation canals, bridges, residences, mining operations and trash deposits, and archaeological sites. If improvement options are forwarded from this study, on-site cultural surveys will need to be completed during the project development process.

Section 6(f) Resources

Five Section 6(f) resources are located within the study corridor and are listed in Table 3.6.

Table 3.6 Section 6(f) Resources within the Project Area

Name	Type of Resource	Location
Dawson County Hollecker Lake	Recreational Lake Area	On MT 16, approximately 0.2 Miles North of the MT 16 / I-94 Junction
Gartside Reservoir	Fishing Access	Approximately 0.5 miles west of Crane, MT
Seven Sisters Island	Fishing Access	Approximately 0.5 miles east of Crane, MT
Intake Dam Fishing Access Site	Fishing Access	On MT 16, approximately 17.0 Miles North of Glendive
Elk Island Wildlife Management Area / Fishing Access Site	Wildlife Management Area / Fishing Access Site	On MT 16, approximately 1.5 Miles North of Savage, MT

Source: MDT, 2012.

Section 4(f) Resources

Known historic sites within the corridor include the Northern Pacific Railway (now BNSF Railway), portions of the Bureau of Reclamation's Lower Yellowstone Irrigation Project, and potentially several steel pony truss bridges in the vicinity of Savage that were built in the second decade of the twentieth century and are associated with the irrigation project. The old wagon road between Fort Keogh (outside Miles City) and Fort Buford in North Dakota is also likely located within the corridor, as are sections of the Red Trail auto trail from the late 1910s and 1920s. Resources listed in the Section 6(f) discussion are also considered Section 4(f) resources. If federally funded improvement options are forwarded from this study, on-site surveys will need to be completed during the project development process to identify additional Section 4(f) resources in the corridor. Known and potential Section 4(f) resources are listed in Table 3.7.

Table 3.7 Known and Potential Section 4(f) Resources within the Study Area

Name	Type of Resource	Location
Northern Pacific Railway (BNSF)	Historic Railway	Throughout Corridor
Lower Yellowstone Irrigation Project	Historic Canal	Various Locations Throughout Corridor
Fort Keogh to Fort Buford Wagon Trail	Historic Roadway	
Red Trail auto trail from the late 1910s and 1920s	Historic Roadway	

Source: MDT, 2012. Section 6(f) resources from Table 3.6 are not duplicated.

Environmental Justice

Minority and low-income persons may live within the study corridor. If a federally funded project is forwarded from the study, environmental justice issues will need to be further evaluated during the project development process.

4.0 PROJECTED CONDITIONS

This section discusses projected highway transportation system conditions within the study corridor in terms of anticipated future growth rates, traffic volumes, and operational characteristics. Additional information is provided in the Existing and Projected Conditions Report (Appendix B).

4.1 Growth Rates

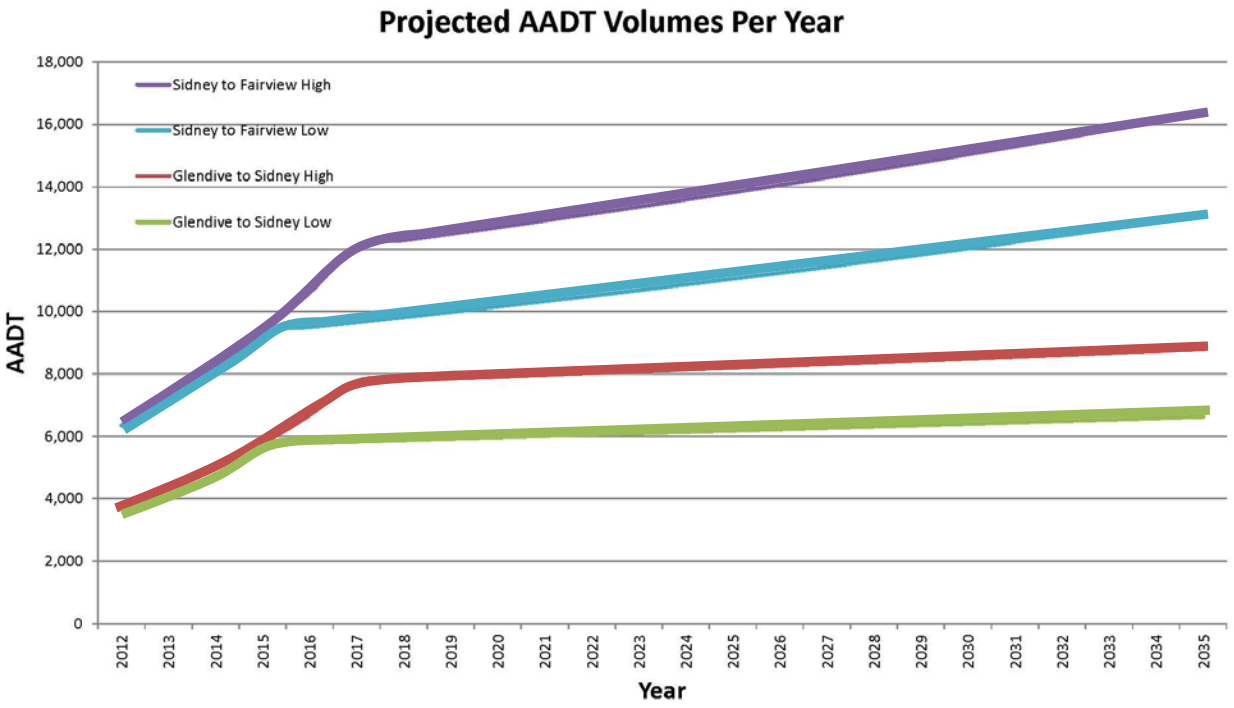
Historical background growth is an increase in traffic volumes over time attributed to population growth and general economic expansion within a study corridor. Prior to the current oil boom, historical background growth rates in the corridor were 0.7 percent (Glendive to Sidney, RP 0.6 to RP 50.4) and 1.7 percent (Sidney to Fairview, RP 52.6 to RP 62.5) from 1990 to 2008. Traffic growth rates have spiked in recent years, averaging 16.0 percent (Glendive to Sidney) and 13.7 percent (Sidney to Fairview) from 2008 to 2012.

The 2008 to 2012 growth rates are not expected to sustain through 2035. The exact period of rapid economic expansion in the region is not known. Traffic volumes may continue to grow at higher growth rates observed in recent years for some time before returning to historic background growth rates. A range of three to five years of continued rapid economic expansion was assumed for this study. Traffic volume levels attained during this initial period of rapid economic expansion are expected to remain steady through 2035. Following the initial period of rapid growth in traffic volumes associated with mobilization to the area, traffic volume growth could decrease to rates more consistent with historical annual growth rates. Beyond 2035, traffic volumes may begin to decline as oil development activity in the region slows.

4.2 Projected Traffic Volumes

Projected traffic volumes were calculated for MT 16 and MT 200 assuming a period of continued rapid growth ranging from three to five years, followed by a return to historic growth rates. Projected 2035 AADT volumes range from approximately 6,600 to 8,800 vehicles per day between Glendive and Sidney, and from approximately 13,100 to 16,400 vehicles per day between Sidney and Fairview. High and low projections in Figure 4-1 represent planning-level estimates and do not reflect annual traffic volume fluctuations likely to occur throughout the planning horizon.

Figure 4-1 Projected AADT



Low estimate indicates three years of rapid traffic volume growth, followed by twenty years of historical background growth.

High estimate indicates five years of rapid traffic volume growth, followed by eighteen years of historical background growth.

Source: DOWL HKM, 2012.

4.3 Projected Operational Characteristics

Analysis Results

Highway Capacity Software (HCS) Version 2010 was used to analyze operational characteristics using the projected traffic volumes. Table 4.1 presents the results of the operational analysis for anticipated 2035 conditions.

Table 4.1 Projected Operational Analysis Results (2035)

Location			LOS	
			Low Estimate[1]	High Estimate[2]
Corridor Segment	Glendive to Savage	MT 16 Northbound RP 0.6 to RP 20.0	C	C
		MT 16 Southbound RP 0.6 to RP 12.4	C	C
		MT 16 Northbound RP 20.0 to RP 31.5	B	B
		MT 16 Southbound RP 12.4 to RP 22.0	B	B
		MT 16 Southbound RP 22.0 to RP 31.5	C	C
	Savage to Crane	MT 16 Northbound RP 31.5 to RP 41.5	C	C
		MT 16 Southbound RP 31.5 to RP 41.5	C	C
	Crane to Sidney	MT 16 Northbound RP 41.5 to RP 50.4	C	C
		MT 16 Southbound RP 41.5 to RP 50.4	C	D
	Sidney to Fairview	MT 200 Eastbound RP 52.6 to RP 62.5	D	D
		MT 200 Westbound RP 52.6 to RP 62.5	D	D

Source: DOWL HKM, 2012.

Note: Shaded gray rows indicate analyzed sections with passing lanes and their associated downstream effect. Passing lanes are being constructed as part of the 30 km NE of Glendive – NE project from RP 20.0 to RP 22.0 in the northbound and southbound directions. Project completion is anticipated in August 2012.

(1) Low estimate indicates three years of rapid traffic volume growth, followed by twenty years of historical background growth.

(2) High estimate indicates five years of rapid traffic volume growth, followed by eighteen years of historical background growth.

The MDT Traffic Engineering Manual defines desirable operations for principal and minor arterial facilities in level terrain as LOS B. The MT 16 / MT 200 corridor is projected to operate at LOS C or worse throughout the majority of the corridor. The MT 16 segments from RP 20.0 to RP 31.5 in the northbound direction and RP 12.4 to RP 22.0 in the southbound direction are exceptions and are projected to operate at LOS B.

5.0 NEEDS AND OBJECTIVES

Needs and objectives for the MT 16 / MT 200 Glendive to Fairview Corridor Planning Study were developed through a review of existing and projected conditions within the corridor, consideration of input from community members and resource agencies, and coordination with the study team members, including representatives from Dawson County, Richland County, and FHWA. The needs, objectives, and other considerations outlined below reflect MDT and community desires to improve the safety, operation, and physical condition of the MT 16 / MT 200 facility where practicable given corridor constraints and funding availability.

Need 1: Improve safety within the MT 16 / MT 200 study corridor, where practicable

Objectives:

1.a Improve roadway geometry to meet current MDT design standards
1.b Reduce conflicts with intersecting roadways
1.c Address head-on and single vehicle run-off-the-road crashes
1.d Address unsafe driver behavior

Need 2: Improve the operation of the MT 16 / MT 200 roadway facility within the study area, where practicable

Objectives:

2.a Accommodate existing and future traffic demands through the 2035 planning horizon

Need 3: Preserve and maintain the MT 16 / MT 200 roadway

Objectives:

3.a Improve roadway surfacing as needed to accommodate volume and mix of vehicles through the 2035 planning horizon

Other issues to be considered:

- Corridor constraints, including utilities and sensitive environmental resources
- Funding availability

6.0 IMPROVEMENT OPTIONS

The corridor planning study team identified improvement options to address corridor needs and objectives and complement CSA recommendations. The team identified safety improvements to address roadway geometry, reduce conflicts with intersecting roadways, and address head-on and single vehicle run-off-the-road crashes and unsafe driver behavior. The team also identified operational and pavement preservation options to accommodate existing and future traffic demands through the 2035 planning horizon. This corridor study incorporates CSA recommendations for the rural portion of the MT 16 / MT 200 corridor.

Recommended timeframes for implementation are defined below.

- Immediate: Implementation is currently ongoing or will be initiated in 2012
- Short-term: Implementation is recommended within a 1- to 3-year period
- Mid-term: Implementation is recommended within a 3- to 6-year period
- Long-term: Implementation is recommended within a 6- to 20-year period
- As needed: Implementation could occur based on observed need throughout the 2035 planning horizon

Planning level cost estimates are listed in 2012 dollars for each improvement option. Cost estimates reflect anticipated construction costs only, and do not include potential costs associated with right-of-way acquisition, utility relocation, preliminary engineering, construction engineering/inspection, or operations and maintenance. Cost ranges are provided in some cases, indicating unknown factors at this planning level stage.

Potentially impacted resources and anticipated permitting / right-of-way requirements are listed for each option. Project level analysis will be needed to quantify resource impacts if improvements are forwarded from this study.

Corridor safety and operational concerns will be best addressed through combined implementation of education, enforcement, and engineering solutions. Improvement options may be implemented at the local level, through MDT maintenance programs, or the MDT project development process depending on personnel resources, funding availability, right-of-way needs, and other project delivery elements.

The following sections discuss recommended improvement options and associated planning level cost estimates, implementation timeframes, potentially impacted resources and

permitting / right of way requirements, and proposed follow-up responsibilities. Additional detail is provided in the Improvement Options Report (Appendix D).

6.1 Access Management

Access management involves controlling ingress and egress to adjacent land parcels to preserve the traffic flow on the surrounding road system and to promote safe and efficient use of the transportation network. The greatest density of access points in the corridor occurs from Sidney to Fairview. The CSA noted several full movement driveways providing access to private residences from Crane to Sidney. Full movement driveways allow unrestricted movements (e.g., right-turn, left-turn, and through movements) to and from the mainline highway. Full movement driveways and intersecting public roadways add conflict points, contribute to crash frequency, present conflicts for pedestrians and bicyclists, and negatively affect travel times.

6.1.1 Recommended Improvement Option

Option 1 Access Management Study

An access management study or a combination of studies is recommended to identify and eliminate duplicative driveways, identify opportunities to combine or realign driveways and approaches, regulate the size and operations of driveways, identify appropriate access for planned future development in the corridor, and identify additional access control or consolidation measures, as appropriate. The study could evaluate access issues within the entire corridor from Glendive to Fairview, with specific focus on full movement driveways in areas with high access density. Access management issues could be addressed through one or multiple studies of varying length and scope.

Proposed Follow-Up Responsibility
MDT

Planning Level Cost Estimate
$50,000 to $300,000, depending on length and scope

Recommended Implementation Timeframe
Short-term

Potentially Impacted Resources and Permitting / Right-of-Way Requirements
None

6.2 Education & Law Enforcement

Unsafe driver behavior was identified as a key concern during the corridor planning and safety audit processes. Community members described frequent speeding, unsafe passing maneuvers,

and near-miss crashes. Safety concerns related to driver behavior can be mitigated through increased law enforcement presence and educational strategies targeting high risk groups or actions.

6.2.1 Recommended Improvement Options

Option 2.a Public Outreach Campaigns

The CSA recommends enhanced public outreach campaigns to provide additional driver education regarding traffic laws and regulations and appropriate driving behavior in proximity to large vehicles. Additionally, the CSA identified the need for enhanced young driver education due to the number of young driver crashes in this corridor.

Enhanced educational strategies could target passenger vehicles operating unsafely around large trucks, aggressive driving, drowsy driving, distracted driving, speeding, impaired driving, texting/cell phone use, and seat belt use. Public outreach methods could include public service announcements, billboards targeting high risk groups, print advertising, promotion of designated driving programs, expansion of free ride home and taxi services, and enhanced driver's education and/or school-based health curriculum.

The MDT website currently provides information and links to additional resources for educational outreach to young drivers (http://www.mdt.mt.gov/safety/safety-initiatives/young.shtml) and impaired driving education (http://www.mdt.mt.gov/safety/safety-initiatives/drugs-alcohol.shtml). Several public outreach tools are available through the local DUI task force coordinator as well as from MDT, including the Respect the Cage Campaign (http://respectthecage.com/), Buckle Up Montana (http://buckleup.mt.gov/default.shtml), and the MDT Plan 2 Live Website (http://plan2live.mt.gov/). The U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA), and the National Safety Council offer online resources at http://www.distraction.gov/ and http://www.nsc.org/SAFETY_ROAD/DISTRACTED_DRIVING/Pages/Public_Education.aspx.

Proposed Follow-Up Responsibility

Dawson and Richland Counties; MDT; Cities of Glendive, Sidney, and Fairview; other local stakeholders

Planning Level Cost Estimate

Various – costs for personnel time, media advertising, curriculum materials, and other public outreach materials were not estimated

Recommended Implementation Timeframe
Short-term

Potentially Impacted Resources and Permitting / Right-of-Way Requirements
None

Option 2.b Increased Enforcement

The CSA identified a need for increased law enforcement patrols along the MT 16 / MT 200 corridor. Law enforcement officials have conducted concentrated enforcement patrols along MT 16 / MT 200 in recent years, although budget and personnel constraints have been identified as limiting factors.

Proposed Follow-Up Responsibility
MHP; Dawson and Richland Counties; Cities of Glendive, Sidney, and Fairview

Planning Level Cost Estimate
$65,000 – approximate annual salary for patrol officer; $60,000 – approximate cost for new patrol vehicle[1]

Recommended Implementation Timeframe
Short-term

Potentially Impacted Resources and Permitting / Right-of-Way Requirements
None

6.3 Geometry

6.3.1 Horizontal & Vertical Alignment

In general, roadways should be constructed to meet current MDT design standards. Where an existing roadway comes close to meeting current MDT design standards, it may not be cost-effective to reconstruct the roadway to address minor geometric issues unless there are crash concentrations attributable to roadway geometry. There are a number of locations within the MT 16 / MT 200 corridor representing minor variations from current MDT design standards for horizontal or vertical alignment. Crash data does not support reconstruction of these areas as stand-alone projects. They should be addressed at the time of future programmed projects in the corridor.

6.3.2 Intersections

Current MDT design standards note roadways should intersect at or as close to 90° as practical. Skewed intersections are undesirable for several reasons:

[1] Source: Rich Rowe, Undersheriff for Dawson County, 2012.

- Vehicular turning movements and sight distance are restricted.
- Additional pavement and channelization may be required to accommodate large vehicle turning movements.
- The exposure time for vehicles and pedestrians crossing the main traffic flow is increased.

MDT design guidance notes intersection angles should not exceed 30° from perpendicular at maximum. Intersections with a skew greater than 30° may require geometric improvements, including realignment.

6.3.3 Transitions

The MT 16 / MT 200 roadway within the study area consists of a two-lane roadway throughout the majority of the study corridor, with short stretches of three-lane sections north of Glendive and through Savage, and a four-lane section near Sidney. Lane transitions should be well delineated, and drivers should be cautioned prior to transition locations. Transition lengths should follow the guidance of the MDT Road Design Manual.

6.3.4 Recommended Improvement Options

Option 3.a Intersection Realignment

A number of intersecting county roads (CRs) within the study corridor are aligned to MT 16 / MT 200 at an angle greater than 30° from perpendicular. Realignment of these intersections is recommended to improve sight distance and accommodate passenger vehicle and large vehicle turning movements. Recommended intersection realignment locations are listed below.

- RP 24.0 (CR 100)
- RP 25.6 (CR 340)
- RP 25.9 (CR 339)
- RP 28.6 (CR 104)
- RP 28.9 (CR 340)
- RP 30.9 (CR 106)
- RP 35.2 (CR 110)
- RP 37.5 (CR 112)
- RP 42.3 (CR 116)
- RP 43.6 (CR 117)
- RP 46.9 (CR 348)
- RP 58.0 (CR 130)

Site specific conditions will dictate the appropriate realignment geometry, depending on constraints and features at each intersection.

CR 116 (RP 42.3) is in proximity to a subdivision undergoing approach permitting at the time this report was written. The subdivision is located 1.3 miles north of Crane at approximate RP 41.5. If the proposed development proceeds, it may be appropriate to consider access

consolidation at the time of intersection realignment to reduce conflict points within the highway corridor.

Proposed Follow-Up Responsibility
Dawson and Richland Counties, in coordination with MDT

Planning Level Cost Estimate
$39,000 to $310,000 per intersection

Recommended Implementation Timeframe
Short-term to long-term

Potentially Impacted Resources and Permitting / Right-of-Way Requirements
Farmlands, wetlands, floodplains, and surface water bodies may be impacted. Additional study will be needed to quantify specific impacts. New right-of-way and permitting may be required.

Option 3.b Highway Transition

The roadway typical section within and south of the Sidney city limits (RP 50.0 to RP 51.7) consists of four travel lanes and a center left-turn lane. The roadway typical section transitions to two travel lanes south of the MT 16 / MT 23 / MT 200 intersection (RP 50.0). Community members have voiced concerns regarding the transition length in this location. Extending the four-lane section further south of the intersection may help alleviate driver confusion.

Proposed Follow-Up Responsibility
MDT

Planning Level Cost Estimate
$460 per lineal ft

Recommended Implementation Timeframe
Short-term to mid-term

Potentially Impacted Resources and Permitting / Right-of-Way Requirements
Farmlands, wetlands, floodplains, and surface water bodies may be impacted. Additional study will be needed to quantify specific impacts. New right-of-way and permitting may be required.

6.4 Passing Opportunities and Capacity Improvements

6.4.1 Passing Opportunities

Passing lanes provided at regular intervals in each direction of travel can improve highway operations. Although passing lanes do not increase the capacity of a two-lane highway, they can improve LOS by allowing vehicle queues in the direction of the passing lane to disperse

through unrestricting passing for the length of the passing lane. Periodic provision of passing lanes can eliminate the formation of long platoons behind a single slow-moving vehicle. Passing lanes may be provided intermittently or at fixed intervals for each direction of travel. They may also be provided for both directions of travel at the same location resulting in a short section of four-lane undivided highway. In portions of the corridor with one or more intersecting roadways, a five-lane section with a center left turn lane may be appropriate.

In addition to passing lanes, passing opportunities may be increased by providing frequent passing zones. Passing zones are indicated by dashed yellow centerlines. Passing zones may be delineated in one or both directions of travel. Passing zones should only be provided in locations with sufficient passing sight distance based on current MDT design standards for the appropriate design speed of the roadway. Passing sight distance is the minimum sight distance required to safely begin and complete a passing maneuver under the assumed conditions of the highway. Community members noted no-passing zones at intersecting roadways divide longer passing segments and hinder passing in the corridor. Passing opportunities are also limited by the frequency of oncoming vehicles (opposing flow rate), including large vehicles.

6.4.2 Capacity

Another method to improve LOS in the corridor is to provide additional capacity by widening the facility from a two-lane highway to a four-lane highway with two travel lanes in each direction. Multilane highways may be divided by various median types, may be undivided with only a centerline separating the direction of flow, or may have a center two-way left-turn lane (TWLTL). Constructing a four-lane highway would provide LOS A throughout the entire corridor within the 2035 planning horizon.

6.4.3 Recommended Improvement Options

Option 4.a Passing Lanes

Passing lanes are recommended at regular intervals throughout the corridor. Further study will be needed to determine appropriate locations for passing lanes based on corridor geometry and constraints. Highest priority should be given from Sidney to Fairview due to anticipated poor operating conditions (LOS D by 2035). Crane to Sidney is anticipated to reach LOS C and D by 2035 and should be a secondary priority, followed by the remainder of the corridor. Concurrent with this corridor study, MDT is using Interactive Highway Safety Design Model (IHSDM) software to identify appropriate passing lane locations.

Proposed Follow-Up Responsibility
MDT

Planning Level Cost Estimate
$1.8 to $2.0 million per mile for undivided four-lane section (passing lanes in both directions); see Appendix D for other assumptions.

Recommended Implementation Timeframe
Immediate to long-term

Potentially Impacted Resources and Permitting Requirements
Farmlands, wetlands, floodplains, and surface water bodies may be impacted. Additional study will be needed to quantify specific impacts. Permitting may be required.

Right-of-Way Requirements
New right-of-way may be required. Varying right-of-way quantities will likely be required for construction within areas of steep terrain (RP 12 to 16 and RP 26.5 to 28), depending on embankment fill height. An additional 20 to 50 ft of new right-of-way extending from existing right-of-way boundaries is anticipated from Sidney to Fairview (RP 52.6 to 62.4).

Constructability Challenges
Passing lane construction may not be cost-effective within certain segments of the corridor due to physical constraints including the adjacent rail facility, the Yellowstone River, and steep terrain.

Option 4.b Engineering Study to Evaluate Passing Zones

An engineering study is recommended to evaluate corridor passing zones and determine if removal of no-passing zones at low-volume intersecting roadways is appropriate.

Proposed Follow-Up Responsibility
MDT

Planning Level Cost Estimate
NA – MDT to conduct study as part of current program

Recommended Implementation Timeframe
Short-term

Potentially Impacted Resources and Permitting / Right-of-Way Requirements
None

Option 4.c Four-Lane Highway

Widening the MT 16 / MT 200 corridor from a two-lane highway to a four-lane highway is recommended for further consideration as a potential long-term option to provide additional

capacity in the corridor. This improvement may be considered within the 2035 planning horizon if regularly-spaced passing lanes cannot provide desirable LOS in the corridor. The north end of the corridor from Sidney to Fairview (RP 52.6 to 62.4) would be a higher priority based on anticipated LOS D in 2035.

Proposed Follow-Up Responsibility
MDT

Planning Level Cost Estimate
$152.8 million to $164.5 million (undivided four-lane section throughout the corridor); $2.6 to $2.8 million (per mile); see Appendix D for other assumptions.

Recommended Implementation Timeframe
Long-term

Potentially Impacted Resources and Permitting / Right-of-Way Requirements
Farmlands, wetlands, floodplains, and surface water bodies may be impacted. Additional study will be needed to quantify specific impacts. New right-of-way and permitting may be required.

6.5 Pavement Preservation

Timely maintenance can extend the life of a pavement surface and minimize long-term maintenance costs. The MDT maintenance program maintains asphalt pavements in a manner that provides a safe roadway, preserves and extends the state's investment, maintains the functional condition, and delays future deterioration by providing the appropriate treatment at the right time. For corridors with increasing traffic volumes, pavement maintenance schedules may need to be altered, and in some cases expedited, to achieve typical maintenance goals.

6.5.1 Recommended Improvement Option

Option 5.a Pavement Preservation

A mill and overlay or another form of surfacing rehabilitation is recommended for the MT 16 / MT 200 corridor at the appropriate time within the maintenance schedule based on projected future traffic volumes and the percentage of large vehicles in the traffic stream. Milling is a process used to remove surface irregularities and deteriorated pavements. Milling is typically performed prior to a surface overlay project and helps to ensure a smooth transition from an existing surface to the new pavement. Based on a preliminary pavement analysis of the MT 16 / MT 200 corridor, a three- to six-inch overlay may be appropriate for the MT 16 / MT 200 corridor within the 2035 planning horizon.

Proposed Follow-Up Responsibility
MDT

Planning Level Cost Estimate
$59.0 million to $63.6 million (entire corridor); $1 million (per mile)

Recommended Implementation Timeframe
As needed, depending on future pavement condition

Potentially Impacted Resources and Permitting / Right-of-Way Requirements
None

6.6 Public Transportation

Public transportation can provide a reduction in the number of single occupant vehicles on the roadway and reduce congestion under favorable ridership conditions. The density of residential developments; roadway congestion levels; and the type, frequency, and accessibility of public transportation services are factors influencing ridership in a highway corridor.

Richland County Transportation offers on-call bus service on weekdays for Sidney, Savage, and Fairview with pick-up and drop-off locations arranged on an individual basis. Dawson County Transit also provides weekday on-call bus service within the Dawson County Urban Transportation District in Glendive.

6.6.1 Recommended Improvement Option

Option 6 Transit Study and Park & Ride Facilities

The CSA recommends investigating the feasibility of constructing park and ride facilities in Glendive and Fairview to alleviate traffic congestion in the corridor. A park and ride facility may also be appropriate in Sidney. Park and ride facilities are parking lots that allow people to leave their vehicles and transfer to public transport for the rest of their trip. Park and ride facilities may be used to facilitate connections with public transportation services, as well as informal ride-sharing networks and employer-sponsored transportation. A transit study could be conducted to identify potential ridership and evaluate potential expansion of existing public transportation services.

Proposed Follow-Up Responsibility
Dawson and Richland Counties; MDT; Cities of Glendive, Sidney, and Fairview; other local stakeholders

Planning Level Cost Estimate
$30,000 – transit study; $300,000 per park and ride facility (actual cost will vary depending on size and amenities)

Recommended Implementation Timeframe
Mid-term to long -term

Potentially Impacted Resources and Permitting / Right-of-Way Requirements
Transit Study: None

Park and Ride Facilities: New right-of-way may be required. Appropriate location should be identified to avoid impacts to resources.

6.7 Roadside Safety

The safest roadside is flat and clear without obstructions or steep slopes. Roadside ditches can present a hazard if an errant vehicle cannot easily travel its slopes, regain control, and return to the travel way. When steep side slopes occur adjacent to a roadway, the hazardous condition ideally should be eliminated by providing slopes and dimensions specified in current MDT design criteria. Oftentimes, this is not practical due to economic, environmental, or drainage conditions. If steep side slopes cannot be flattened due to these reasons, it may be necessary to shield the hazard with a roadway barrier such as guardrail.

6.7.1 Recommended Improvement Option

Option 7 Roadside Safety Improvements

An overhead sign post north of the MT 16 / MT 200 / Holly Street intersection (RP 52.6) is located within the clear zone. Relocation of the sign post outside the clear zone is recommended.

Additionally, based on field review and CSA recommendations, slope flattening or barrier warrants should be considered in the fourteen (14) locations noted below.

- RP 1.1 (East Side)
- RP 1.8 (West Side)
- RP 2.4 (East Side)
- RP 3.0 (East Side)
- RP 7.0 (East & West Sides)
- RP 8.5 (East & West Sides)
- RP 11.8 (East & West Sides)
- RP 12.7 (West Side)
- RP 14.2 (West Side)
- RP 14.4 (West Side)
- RP 16.3 (West Side)
- RP 17.4 (East Side)
- RP 28.5 (East Side)
- RP 29.7 (East & West Sides)

Site specific conditions will dictate the degree of flattening or the appropriate barrier dimensions and placement at each location, depending on which roadside safety method is selected.

Proposed Follow-Up Responsibility
MDT

Planning Level Cost Estimate
$40,000 (overhead sign relocation); $30 per lineal foot (guardrail); $60 per lineal foot (slope flattening average; cost will vary depending on fill height)

Recommended Implementation Timeframe
Short-term to mid-term

Potentially Impacted Resources and Permitting / Right-of-Way Requirements
Few, if any, impacts are anticipated as a result of relocating the overhead sign or installing roadside barriers as these improvements can generally be performed within the existing right-of-way.

Farmlands, wetlands, floodplains, and surface water bodies may be impacted as a result of slope flattening, depending on the need to extend beyond existing right-of-way limits. Additional study will be needed to quantify specific impacts. New right-of-way and permitting may be required.

6.8 Speed

Community members expressed concern regarding the speed differential between large vehicles and passenger vehicles in the corridor. The daytime posted speed limit within the corridor is primarily 70 mph for passenger vehicles and 60 mph for trucks, with short sections of reduced speed zones (45 to 55 mph) near the boundaries of Sidney and Fairview and through the community of Savage. Speed limits for highways within the state are set by the Montana Legislature and are detailed in the Montana Code Annotated (MCA) § 61-8-303.

The Transportation Commission has the authority to set special speed zones. MDT conducts engineering and traffic investigations called spot speed studies to measure speeds at specific locations when requested by local governments. As part of this process, MDT examines physical roadway characteristics, crash data, and traffic data, including the speed at which the majority of traffic is moving. MDT may recommend a special speed zone if the operating character of the roadway deviates from normal conditions addressed by general statutory speed regulation. MDT will prepare a report detailing its findings and recommendations and will submit the report for consideration by the Transportation Commission. If the Transportation Commission determines that a speed limit is greater or less than is reasonable and safe for the roadway, it may set a special speed limit for the corridor.

6.8.1 Recommended Improvement Option

Option 8 Speed Study

A speed study is recommended to assess the differential in speed between passenger vehicles and large vehicles and identify appropriate speed limits for all vehicles in the corridor.

Proposed Follow-Up Responsibility
MDT

Planning Level Cost Estimate
NA – MDT to conduct study as part of current program

Recommended Implementation Timeframe
Short-term

Potentially Impacted Resources and Permitting / Right-of-Way Requirements
None

6.9 Traffic Control Devices and Safety / Warning Features

6.9.1 Traffic Control Devices / Pavement Markings

Traffic control devices are used to promote highway safety and efficiency through the orderly movement of all road users. Traffic control devices notify drivers of regulations and provide warning and guidance to promote efficient operation and minimize crash occurrences.

Traffic signals aim to balance the traffic handling capacity of intersections, as well as reduce the frequency of certain types of crashes. An engineering and traffic study of an intersection's physical characteristics and traffic conditions is necessary to determine if a traffic signal is warranted in a particular location. Signal warrants consider traffic volumes, crash history, proximity to schools, pedestrian usage, and other local needs.

Warning signs may be used to inform drivers in advance of upcoming intersections and lane transitions. Flashing warning beacons can supplement warning or regulatory signs or markers. For example, where a minor side street intersects a highway, a circular yellow flashing indication is sometimes installed prior to the intersection on the minor roadway with an enhanced intersection warning sign and a supplemental name plaque on the major roadway. The need for warning beacons and warning signs is determined on a case-by-case basis.

6.9.2 Rumble Strips

Application of shoulder and centerline rumble strips on two-lane highways has been shown to reduce the incidence and severity of roadway departure crashes, including head-on, opposite direction sideswipe, and single vehicle run-off-the-road crashes. Shoulder and centerline rumble strips in combination with appropriate pavement markings can alert drowsy, inattentive, or impaired drivers who unintentionally stray across the roadway centerline or off the edge of the roadway. The audible sound and physical vibration alert drivers, improving

driver reaction and increasing the likelihood for a safe return to the travel lane. Rumble strips can also assist drivers in identifying lane delineations during low visibility conditions.

6.9.3 Overhead Lighting

Overhead lighting can improve visibility for drivers and other roadway users and provide a safe and comfortable environment for the nighttime driver. Providing overhead lighting for all highways facilities is not practical or cost effective. MDT practice is to provide overhead highway lighting where justified based on engineering judgment and the criteria, recommendations, and principals presented in the AASHTO publication Roadway Lighting Design Guide.

The MDT Traffic Engineering Manual recommends consideration of overhead lighting in locations with high vehicle-to-vehicle interactions, including roadways with numerous driveways, substantial commercial or residential development, and a high percentage of large vehicles. Community members suggested extending overhead lighting outside city limits in the corridor to improve visibility in these locations.

6.9.4 Recommended Improvement Options

Option 9.a Traffic Signals

Installation of flashing beacons with supplemental warning signage or traffic signals should be considered on a case-by-case basis within the 2035 planning horizon if future crash trends indicate intersection-related clusters within the corridor that could be correctable through beacon installation/signage or intersection signalization. The following intersections were identified as potential signal locations due to reported crashes in their approximate vicinity within the 2006 to 2010 period:

Full Signalization

- RP 50.0 (MT 16 / MT 23 / MT 200)

Enhanced Intersection Warning (Beacon / Signage)

- RP 50.4 (MT 16 / MT 200 / CR 123)
- RP 53.7 (MT 200 / CR 126)
- RP 58.0 (MT 200 / CR 130)
- RP 60.7 (MT 200 / CR 132)
- RP 61.7 (MT 200 / CR 133)

Proposed Follow-Up Responsibility
MDT

Planning Level Cost Estimate
$30,000 per flashing beacon; $300,000 per signal

Recommended Implementation Timeframe
As needed

Potentially Impacted Resources and Permitting / Right-of-Way Requirements
None

Option 9.b Signing and Striping

MT 16 transitions from two travel lanes to one lane approximately 300 feet south of the MT 16 / MT 23 / MT 200 intersection (RP 50.0) in the southbound direction. Similarly, MT 200 transitions from two lanes to one lane north of the MT 16 / MT 200 / Holly Street intersection (RP 52.6) in the southbound direction. Through the safety audit and corridor planning study processes, community members voiced concerns regarding inadequate lane reduction warning (signage / pavement markings) in these locations. Advance warning signs and modified striping should be considered to clearly indicate upcoming lane transitions. Additionally, a signing and striping inventory is recommended to identify the need for maintenance or replacement of existing signs.

Proposed Follow-Up Responsibility
MDT

Planning Level Cost Estimate
$500 per new sign; $26 per ft^2 per replacement sign; $50 per station (striping)

Recommended Implementation Timeframe
Immediate to short-term

Potentially Impacted Resources and Permitting / Right-of-Way Requirements
None

Option 9.c Shoulder and Centerline Rumble Strips

Continuous application of shoulder and centerline rumble strips is recommended within the MT 16 / MT 200 corridor with gaps only at major intersecting roadways. An MDT project (SF 119-Glendive Rumble Strips) will install shoulder and centerline rumble strips on MT 16 from approximately RP 1.5 to approximately RP 49.9 and MT 200 from Sidney to Fairview. The anticipated project start date is fall 2012.

Proposed Follow-Up Responsibility
MDT

Planning Level Cost Estimate
$2,100 per mile; $700 per strip

Recommended Implementation Timeframe
Immediate

Potentially Impacted Resources and Permitting / Right-of-Way Requirements
None

Option 9.d Overhead Lighting

Extension of existing overhead lighting should be considered in areas immediately outside the city limits of Sidney and Fairview due to high number of access points and the high percentage of large vehicles in the traffic stream.

Proposed Follow-Up Responsibility
MDT

Planning Level Cost Estimate
$13,000 per overhead lighting fixture (average)

Recommended Implementation Timeframe
Short-term to mid-term

Potentially Impacted Resources and Permitting / Right-of-Way Requirements
None

6.10 Turn Lanes

Intersection turn lanes remove turning vehicles from the through traffic stream on two-lane highways. They reduce turning accidents and delays to through vehicles caused by turning vehicles. Exclusive right-turn lanes may be appropriate at unsignalized intersections on two-lane highways where there are frequent right-turning vehicles or at any intersection where a crash trend involves right-turning vehicles. Left-turn lanes provide a protected location for turning vehicles to wait for an acceptable gap in the opposing traffic stream. This reduces the potential for collisions from the rear. Left-turn lanes have also been shown to reduce delay to through vehicles in locations with high opposing volumes. Exclusive left-turn lanes may be appropriate at unsignalized intersections on two-lane highways where there are frequent left-turning vehicles or where a crash trend involves left-turning vehicles.

6.10.1 Recommended Improvement Options

Option 10.a Proposed Left- and Right-Turn Lanes

The CSA recommends investigating center two-way left-turn lanes in appropriate locations from Sidney to Fairview to reduce the number of intersection-related collisions in this area, a northbound right-turn lane at the intersection of MT 16 / CR 110 (RP 35.3), and a left-turn lane at the intersection of MT 16 / CR 126 (RP 53.7).

Community members also requested consideration of a left-turn lane at the intersection of MT 16 / CR 110, a southbound right-turn lane at the intersection of MT 16 / MT 23 / MT 200 (RP

50.0), and right- and/or left-turn lanes at the intersections of MT 16 / CR 551 (RP 17.0) and MT 16 / CR 128 (RP 55.8).

Consideration of guidelines is recommended in these locations to determine appropriate turn-lane applications.

Proposed Follow-Up Responsibility
MDT

Planning Level Cost Estimate

Warrants: NA; turn lanes: $160,000 to $250,000 per turn lane

Recommended Implementation Timeframe
Warrants: short-term; turn lanes: short-term to mid-term

Potentially Impacted Resources and Permitting Requirements
Warrants: None Turn lanes: Farmlands, wetlands, floodplains, and surface water bodies may be impacted. Additional study will be needed to quantify specific impacts. New right-of-way and permitting may be required.

Right-of-Way Requirements
Right-of-way requirements will vary based on the potential turn lane location, roadside safety treatment, and embankment fill height. Anticipated right-of-way acquisition needs range up to 40 feet from the roadway centerline.

Option 10.b Existing Turn Lane Reconstruction

The CSA recommends reconstruction of the existing northbound right-turn lane at the intersection of MT 200 / CR 126 (RP 53.7) to provide moving sight distance.

Proposed Follow-Up Responsibility
MDT

Planning Level Cost Estimate
$130,000 to $140,000

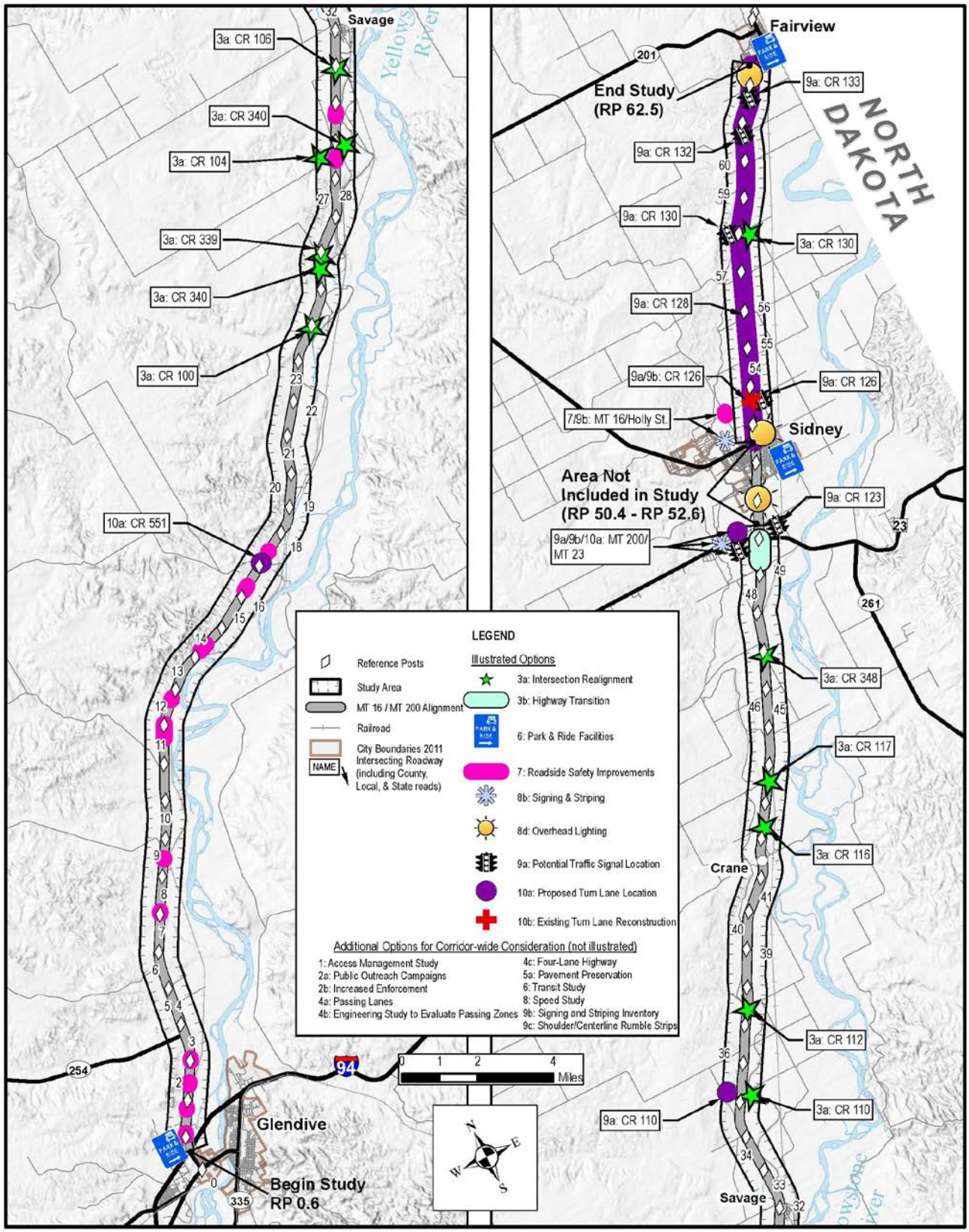
Recommended Implementation Timeframe
Short-term to mid-term

Potentially Impacted Resources and Permitting / Right-of-Way Requirements
Farmlands, wetlands, floodplains, and surface water bodies may be impacted. Additional study will be needed to quantify specific impacts. New right-of-way and permitting may be required.

6.11 Summary of Recommended Improvement Options

Figure 6-1 and Table 6.1 summarize recommended improvement options within the study corridor.

Figure 6-1 Recommended Improvement Options



Source: MDT, 2012; DOWL HKM, 2012.

Table 6.1 Recommended Improvement Options

Recommended Improvement Options			Potential Locations[1]	Proposed Follow-Up Responsibility	Planning Level Cost Estimate[2]	Recommended Implementation Timeframe[3]	Potentially Impacted Resources and Anticipated ROW / Permitting Requirements
Option Category	**Option ID**	**Option Description**					
Access Management	**Option 1**	Access Management Study	Corridor-wide	MDT	$50,000 to $300,000	Short-term	No
Education and Enforcement	**Option 2.a**	Public Outreach Campaigns	Corridor-wide	Dawson and Richland Counties; MDT; Cities of Glendive, Sidney, and Fairview; other local stakeholders	Various[4]	Short-term	No
	Option 2.b	Increased Enforcement	Corridor-wide	MHP; Dawson and Richland Counties; Cities of Glendive, Sidney, and Fairview	$65,000 – patrol officer[5] $60,000 – patrol vehicle[5]	Short-term	No
Geometry	**Option 3.a**	Intersection Realignment	RP 24.0 (CR 100) RP 35.2 (CR 110) RP 25.6 (CR 340) RP 37.5 (CR 112) RP 25.9 (CR 339) RP 42.3 (CR 116) RP 28.6 (CR 104) RP 43.6 (CR 117) RP 28.9 (CR 340) RP 46.9 (CR 348) RP 30.9 (CR 106) RP 58.0 (CR 130)	Dawson and Richland Counties, in coordination with MDT	$39,000 to $310,000 per intersection	Short-term to long-term	Yes
	Option 3.b	Highway Transition	RP 50.0 (South of MT 16 / MT 23 / MT 200 Intersection)	MDT	$460 per lineal ft	Short-term to mid-term	Yes

Recommended Improvement Options			Potential Locations[1]	Proposed Follow-Up Responsibility	Planning Level Cost Estimate[2]	Recommended Implementation Timeframe[3]	Potentially Impacted Resources and Anticipated ROW / Permitting Requirements
Option Category	**Option ID**	**Option Description**					
Passing Opportunities and Capacity Improvements	**Option 4.a**	Passing Lanes	Corridor-wide	MDT	$1.8 to $2.0 million per mile (includes four-lane section with passing lane in both directions)	Immediate to long-term	Yes
	Option 4.b	Engineering Study to Evaluate Passing Zones	Corridor-wide	MDT	NA[6]	Short-term	No
	Option 4.c	Four-Lane Highway	Corridor-wide	MDT	$153 to $165 million (entire corridor) $2.6 to $2.8 million (per mile)	Long-term	Yes
Pavement Preservation	**Option 5.a**	Pavement Preservation	Corridor-wide	MDT	$59 to $64 million (entire corridor) $1 million (per mile)	As needed	No
Public Transportation	**Option 6**	Transit Study and Park & Ride Facilities	Corridor-wide	Dawson and Richland Counties, MDT; Cities of Glendive, Sidney, and Fairview; Other local stakeholders	$30,000 (transit study) $290,000 per park and ride facility	Mid-term to long-term	Transit Study: No Park & Ride Facilities: Potentially Yes

Recommended Improvement Options			Potential Locations[1]	Proposed Follow-Up Responsibility	Planning Level Cost Estimate[2]	Recommended Implementation Timeframe[3]	Potentially Impacted Resources and Anticipated ROW / Permitting Requirements
Option Category	**Option ID**	**Option Description**					
Roadside Safety	**Option 7**	Roadside Safety Improvements	RP 1.1 (East Side) RP 1.8 (West Side) RP 2.4 (East Side) RP 3.0 (East Side) RP 7.0 (East & West Sides) RP 8.5 (East & West Sides) RP 11.8 (East & West Sides) RP 12.7 (West Side) RP 14.2 (West Side) RP 14.4 (West Side) RP 16.3 (West Side) RP 17.4 (East Side) RP 28.5 (East Side) RP 29.7 (East & West Sides) RP 52.6 (West Side)	MDT	$40,000 (overhead sign relocation) $30 per lineal ft (guardrail) $60 per lineal ft (slope flattening average; cost will vary depending on fill height)	Short-term to mid-term	Overhead sign relocation: No Guardrail: No Slope flattening: Yes
Speed	**Option 8**	Speed Study	Corridor-wide	MDT	NA[6]	Short-term	No
Traffic Control Devices and Safety / Warning Features	**Option 9.a**	Traffic Signals	Full Signalization RP 50.0 (MT 16 / MT 23 / MT 200) Enhanced Intersection Warning RP 50.4 (MT 16 / MT 200 / CR 123) RP 53.7 (MT 200 / CR 126) RP 58.0 (MT 200 / CR 130) RP 60.7 (MT 200 / CR 132) RP 61.7 (MT 200 / CR 133)	MDT	$500 (new sign) $30,000 per flashing beacon $300,000 per signal	As needed	No
	Option 9.b	Signing and Striping	Inventory: Corridor-wide RP 50.0 (MT16 / MT 23 / MT 200) RP 52.6 (MT 16 / MT 200 / Holly St.)	MDT	Inventory: NA[6] $500 (new sign) $26 per ft^2 (replacement sign) $50 per station (striping)	Immediate to mid-term	No
	Option 9.c	Shoulder / Centerline Rumble Strips	Corridor-wide	MDT	$2,100 (per mile) $700 (per strip)	Short-term	No
	Option 9.d	Overhead Lighting	North and south of Sidney and south of Fairview	MDT	$13,000 per fixture (average)	Short-term to mid-term	No

Recommended Improvement Options			Potential Locations[1]	Proposed Follow-Up Responsibility	Planning Level Cost Estimate[2]	Recommended Implementation Timeframe[3]	Potentially Impacted Resources and Anticipated ROW / Permitting Requirements
Option Category	Option ID	Option Description					
Turn Lanes	**Option 10.a**	Proposed Left- and Right-Turn Lanes	Sidney to Fairview (RP 52.6 to 62.5) RP 17.0 (MT 16 / CR 551) RP 35.3 (MT 16 / CR 110) RP 50.0 (MT 16 / MT 23 / MT 200) RP 53.7 (MT 16 / CR 126) RP 55.8 (MT 16 / CR 128)	MDT	Warrants: NA[6] Turn Lanes: $160,000 to $250,000 per turn lane	Warrants: Short-term Turn lanes: Short-term to mid-term	Warrants: No Turn Lanes: Yes
	Option 10.b	Existing Turn Lane Reconstruction	RP 53.7 (CR 126)	MDT	$130,000 to $140,000	Short-term to mid-term	Yes

[1] The term corridor-wide is used to indicate consideration throughout the study area, as appropriate. Specific locations may be identified at the project level.

[2] Planning level cost estimates are provided in 2012 dollars and are rounded for planning purposes. Cost estimates reflect construction costs only based on planning level estimates, and should not be considered an actual cost or encompassing all scenarios and circumstances. Cost estimate ranges are provided in some cases due to the high degree of unknown factors over the planning horizon, as well as the substantial amount of items not accounted for in this planning level cost estimate. Costs associated with right-of-way acquisition, utility relocation, preliminary engineering, construction engineering/inspection, and operations/maintenance are not included. Detailed cost estimates are provided in Appendix 2.

[3] The recommended implementation timeframe does not indicate when projects will be programmed or implemented. Project programming is based on available funding and other system priorities. Timeframes are defined as follows - Immediate: Implementation is currently ongoing or will be initiated in 2012; Short-term: Implementation is recommended within a 1- to 3-year period; Mid-term: Implementation is recommended within a 3- to 6-year period; Long-term: Implementation is recommended within a 6- to 20-year period; As needed: Implementation should occur based on observed need throughout the planning horizon.

[4] Public outreach campaigns would involve costs for personnel time, media advertising, curriculum materials, and other public outreach materials, which were not estimated.

[5] Source: Rich Rowe, Undersheriff for Dawson County (2012).

[6] Costs would be absorbed as part of current MDT program.

7.0 OTHER PLANNING EFFORTS AND PROJECTS

Recent and ongoing planning efforts and projects in the study area vicinity are described below.

Sidney Truck Route Study

This 2009 study was initiated by the City of Sidney, in cooperation with MDT, to determine the need for and feasibility of a Sidney truck route. The study determined a truck route east of Sidney would have the greatest potential to attract truck traffic currently traveling north/south along Central Avenue. Feedback from local and regional trucking operations and several local residents and business owners confirmed they favored an eastern route.

Culbertson Corridor Planning Study (ongoing) – The Culbertson area has experienced similar growth in traffic volumes along US 2 and MT 16 as is being experienced along the MT 16 / MT 200 corridor. The Culbertson Corridor Planning Study is primarily focused on truck traffic on US 2 and MT 16 which intersect in Culbertson. The study is anticipated to be completed by the end of 2012.

MT 200 / CR 129 Intersection Signing involved installation of signing at the intersection of MT 200 and CR 129 from approximately RP 56.9 to approximately RP 57.2. The project was completed in 2012.

30 km NE of Glendive – NE involves reconstruction of MT 16 from approximately RP 18.6 to approximately RP 28.9. Centerline rumble strips will be installed throughout the reconstructed segment. An amendment to this project includes northbound and southbound passing lanes on MT 16 from approximately RP 20.0 to RP 22.0. The project began in April 2011 and completion is estimated in August 2012.

Slide Repair – NE of Glendive / MT11-1 is a slide repair project from approximately RP 13.0 to approximately RP 13.5. The project began in July 2012 and includes removing the slide area extending to the roadway shoulder.

Fairview Intersection Improvements is an intersection improvement project extending from approximately RP 63.1 to approximately RP 63.8. The project includes installation of a traffic signal on MT 200 at 6th Street, construction of a pedestrian crossing and installation of a high intensity rapid flashing beacon at Western Avenue, and geometric improvements and installation of all-way STOP control at the MT 200 / Secondary 201 intersection to better accommodate truck turning movements. The project began in May 2012.

SF 119 – Glendive Rumble Strips is a safety project to install shoulder and centerline rumble strips on MT 16 from approximately RP 1.5 to approximately RP 49.9 and MT 200 from Sidney to Fairview. The project will also install shoulder rumble strips on several other roadways outside the study area limits. The anticipated project start date is fall 2012.

Sidney – Southwest is a major rehabilitation project from approximately RP 49.8 to RP 52.6 consisting of a mill, overlay, and seal and cover. This project included lane configuration modifications within Sidney from four lanes to three lanes and signal installation at the 7th Street / Central Ave. and Holly Street / Central Ave. intersections. An amendment to this project involved installing protected left-turn phases in the NB and SB directions at the Holly Street / Central Avenue intersection, in the NB direction at the 2nd Street N / Central Avenue intersection, and in the SB direction at the 14th Street / Central Avenue intersection. The project was let in February 2011.

8.0 POTENTIAL FUNDING SOURCES

8.1 Federal Aid Funding Programs

The following section summarizes major federal transportation funding categories received by the state through the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)-enacted on August 10, 2005, including state developed implementation/sub-programs. Projects must be included in the State Transportation Improvement Program (STIP) in order to receive funding under these programs.

8.1.1 National Highway System Program

NHS funding is intended to support an interconnected system of principal arterial routes to 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. This funding category can be used for projects on NHS routes, including Interstate highway and Non-Interstate national highways.

Activities eligible for NHS funding include construction, reconstruction, resurfacing, restoration, and rehabilitation of NHS segments. Research, planning, carpool projects, bikeways, and pedestrian walkways may also qualify for NHS funding. The Transportation Commission establishes priorities for use of NHS funds and projects are let through a competitive bidding process.

NHS funds are federally apportioned to Montana and 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. The state share is funded through the Highway State Special Revenue Account.

The MDT Glendive District is anticipated to receive an average of about $19 million annually of NHS funds during the next five years. Current Glendive District priorities already under development total an estimated construction cost of $93 million. The Glendive District has an additional $20 million worth of projects that have been nominated, but not yet programmed. These additional projects have been approved by the Transportation Commission and are in the STIP.

8.1.2 Surface Transportation Program

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

Surface Transportation Program Primary Highways (STPP), Surface Transportation Program Secondary Highways (STPS), and the Surface Transportation Program Urban Highways (STPU).

Surface Transportation Program – Primary (STPP)

Federal and state funds available under this program are used to finance transportation projects to preserve, restore, or reconstruct highways and bridges 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)].

Primary funds are distributed statewide [MCA 60-3-205] to each of MDT's five financial districts, including the MDT Glendive District, based on the land area, population, road mileage, and bridge square footage within the district. The Commission distributes STPP funding based on system performance. The federal share for STPP projects is 86.58 percent and the remaining 13.42 percent is funded by the state from the Highway State Special Revenue Account.

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

8.1.3 Highway Safety Improvement Program (HSIP)

HSIP funds are federally apportioned to Montana and allocated to safety improvement projects identified in the strategic highway safety improvement plan by the Montana Transportation Commission. Projects described in the state strategic highway safety plan must correct or improve a hazardous road location or feature, or address a highway safety problem. The Montana Transportation Commission approves and awards projects under this funding category, which are let through a competitive bidding process. Generally, the federal share for the HSIP projects is 91.24 percent and the state is responsible for 8.76 percent.

8.1.4 Congressionally Directed Funds

High Priority Projects (HPP) 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.

8.1.5 Formula Grants for Non-Urbanized Areas (Section 5311)

Pursuant to 49 U.SC. 5311, the Federal Transit Administration (FTA) apportions Section 5311 funds annually to each state through the Non-Urbanized Area Formula Grant Program (also known as the Section 5311 program). Section 5311 funds are apportioned to the states by a statutory formula using the latest available U.S. decennial Census data. The program supports public transportation in rural areas with populations less than 50,000. Eligible fund recipients include local public bodies, incorporated cities, towns, counties, private non-profit organizations, Indian Tribes, and operators of public transportation services. Eligible activities include capital, operating, and administrative expenses for public transportation projects that meet the needs of rural communities.

8.1.6 Transit Capital Investment Program Discretionary Grants (Section 5309)

Pursuant to 49 U.S.C 5309(b)(3), the Bus and Bus Related Equipment and Facilities program provides capital assistance for new and replacement buses, related equipment, and facilities. It is a discretionary program to supplement formula funding in both urbanized and rural areas. Eligible recipients include states and local governments, as well as sub-recipients such as public agencies, private companies engaged in public transportation and private non-profit organizations. Eligible capital projects include the purchase of buses for fleet and service expansion, bus maintenance and administrative facilities, transfer facilities, bus malls, transportation centers, intermodal terminals, park-and-ride stations, acquisition of replacement vehicles, bus rebuilds, bus preventive maintenance, passenger amenities such as passenger shelters and bus stop signs, accessory and miscellaneous equipment such as mobile radio units, supervisory vehicles, fare boxes, computers and shop and garage equipment.

8.2 State Funding Sources

8.2.1 State Funded Construction

The State Funded Construction (SFC) program is funded entirely from the state highway special revenue account and provides funding for projects that are not eligible for federal funding programs. This program requires no federal match. Funding from this source depends on availability and need.

This program funds projects to preserve the condition and extend the service life of highways. Highways must be maintained by the state to be eligible for these funds. MDT staff nominates the projects based on pavement preservation needs. MDT Districts establish priorities and the Montana Transportation Commission approves the program.

8.2.2 Legislative Appropriations

The state of Montana taxes the gross taxable value of petroleum (i.e., oil) and natural gas production. Taxation rates vary based on the type of well, type of production, working or non-working interest, date when production began, and price of crude oil. Distribution of oil and gas tax revenue is specified in state law (MCA 15-36-331). Counties receive a share of the total revenue generated. Each county has an individual statutory distribution percentage ranging from 40 to 70 percent of the total revenue generated in that county, with the remainder allocated to the state general fund and other statewide funding accounts to support state government. Of the amount allotted to counties, a small percentage (roughly one to six percent) is statutorily appropriated to countywide transportation (MCA 15-36-332), with the remainder allocated to school districts and county general funds.

Production tax revenues will increase as oil and gas development increases in Montana, resulting in larger annual appropriations to counties. Counties may consider lobbying the Montana State Legislature to revise tax distribution formulas, with larger percentages allocated to counties and/or larger percentages to fund countywide or regionally impacted transportation systems and corridors.

8.3 Local / Private Funding Sources

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

8.3.1 Capital Improvement Funds

Counties may use capital improvement funds to finance major capital improvements to county infrastructure (MCA 7-6-616). A capital improvement fund must be formally adopted by the governing body. Major road construction projects are generally eligible for this type of funding.

8.3.2 Rural Special Improvement District

Counties may establish a Rural Special Improvement District (RSID) to administer and distribute funds for specified projects (MCA 7-12-2102). Bonds may be issued by local government to cover the cost of a proposed transportation improvement. Revenue to pay for the bonds may be raised through assessments against property owners in the designated district.

8.3.3 Special Bond Funds

A special bond fund may be established by counties on an as-needed basis for a particularly expensive project. Voters must approve a special bond fund.

8.3.4 Impact Fees

Local governments may impose impact fees as part of the private development approval process to fund public infrastructure improvements required to serve new developments. (MCA 7-6-1601). Impact fees can be used to fund additional service capacity for transportation facilities, including roads, streets, bridges, rights-of-way, traffic signals, and landscaping. The amount of the impact fee must be reasonably related to the development's share of the cost of infrastructure improvements made necessary by the new development.

9.0 CONCLUSIONS AND NEXT STEPS

This study evaluated existing and projected conditions, identified corridor needs and objectives, and recommended options to improve conditions within the MT 16 / MT 200 corridor.

Improvement options were identified to address corridor safety and operational needs and complement recommendations generated through the CSA process. The team identified safety improvements to improve roadway geometry, reduce conflicts with intersecting roadways, and address head-on and single vehicle run-off-the-road crashes and unsafe driver behavior. The team identified operational and pavement preservation improvements to accommodate existing and future traffic demands through the 2035 planning horizon.

Development and implementation of appropriate combinations of improvement options will depend on personnel resources, funding availability, right-of-way needs, and other project delivery elements. This corridor planning study indicates there are no major technical or environmental impediments to further development of recommended improvements.

There is currently no funding available for improvement options identified in this study. Federal funding allocations for the MDT Glendive District are committed through 2018. Some smaller spot improvements may be fundable through other mechanisms or at the local level.

Ongoing efforts and anticipated next steps are outlined in Table 9.1.

Table 9.1 Ongoing Efforts and Anticipated Next Steps

Option Category	Ongoing Efforts and Anticipated Next Steps[1]
Access Management	Conduct one or more studies to address access management in the corridor.
Education and Law Enforcement	Expand public outreach and enforcement in the corridor.
Geometry	Coordinate with Dawson and Richland Counties through the System Impact Action Process to address realignment of intersecting roadways that access MT 16 / MT 200.
Passing Opportunities and Capacity Improvements	Construct passing lanes on MT 16 from approximately RP 20.0 to RP 22.0 as part of a current MDT project (30 km NE of Glendive – NE). Project completion is estimated in August 2012. Conduct an analysis using IHSDM software to identify appropriate passing lane locations given corridor geometry and physical constraints. Completion of this effort is expected by fall 2012.
Pavement Preservation	Continue to monitor pavement condition in the corridor and identify appropriate maintenance measures.
Roadside Safety	Conduct an engineering study to identify appropriate roadside safety measures for specific locations in the corridor.
Speed	Conduct a speed study within the corridor at the written request of Dawson and Richland Counties.
Traffic Control Devices and Safety / Warning Features	Install shoulder and centerline rumble strips on MT 16 from approximately RP 1.5 to approximately RP 49.9 and MT 200 from Sidney to Fairview as part of two programmed MDT projects (30 km NE of Glendive – NE and SF 119 – Glendive Rumble Strips). Completion of 30 km NE of Glendive – NE is anticipated in August 2012 and SF 119 – Glendive Rumble Strips is anticipated to begin in fall 2012. Install additional traffic control devices in appropriate locations.
Turn Lanes	Consider turn lane warrants in appropriate locations.

[1] Next steps are dependent on personnel resources, funding availability, right-of-way needs, and other project delivery elements.