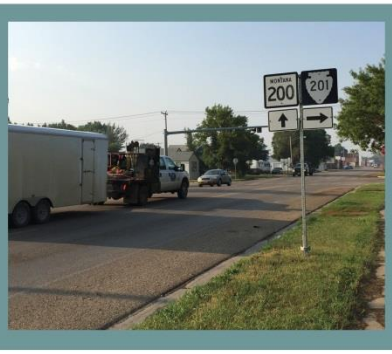
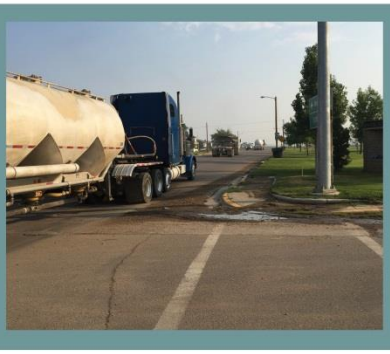
Fairview

CORRIDOR PLANNING STUDY

June 2016





Prepared by:

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MDT
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Table of Contents

Figures

Tables

Appendices

Visit the study website at: **http://www.mdt.mt.gov/pubinvolve/fairview/**

Acknowledgements

The following individuals assisted in the development of the Fairview Corridor Planning Study.

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Abbreviations and Acronyms

AADT	Annual Average Daily Traffic
AASHTO	American Association of State and Highway and Transportation Officials
ADA	Americans with Disabilities Act
AGR	Annual Growth Rate
AM	morning
ARM	Administrative Rules of the State of Montana
AVE	Avenue
BOR	Board of Reclamation
CATEX	Documented Categorical Exclusion
CFR	Code of Federal Regulations
CR	County Road
CSA	Corridor Safety Audit
CWA	Clean Water Act
DEQ	Montana Department of Environmental Quality
DTM	Digital Terrain Model
EB	Eastbound
FAQ	Frequently Asked Questions
FEMA	Federal Emergency Management Agency
FFY	Federal Fiscal Year
FAST	Fixing America's Surface Transportation Act
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Maps
FLAP	Federal Lands Access Program
FPPA	Farmland Protection Policy Act
ft	feet
FWP	Montana Fish, Wildlife and Parks
GO	General Obligation
GIS	Geographic Information System
HCM	Highway Capacity Manual
HCS	Highway Capacity Software
HSIP	Highway Safety Improvement Program
HSSRA	Highway State Special Revenue Account
HUC	Hydraulic Unit Code
ID	Identification
LOS	Level of Service
LPR	License Plate Readers
LUST	Leaking Underground Storage Tank
LWCFA	Land and Water Conservation Fund Act
MAP-21	Moving Ahead for Progress in the 21st Century Act
MCA	Montana Code Annotated
MDT	Montana Department of Transportation
MEPA	Montana Environmental Policy Act
MHP	Montana Highway Patrol
MPO	Metropolitan Planning Organization
MSAT	Mobile Source Air Toxin
NA	Not Available
NB	Northbound
ND	North Dakota
NDDH	North Dakota Department of Health
NDDOT	North Dakota Department of Transportation
NDGF	North Dakota Game and Fish
NEPA	National Environmental Policy Act
NHFP	National Highway Freight Program
NHPB	National Highway Performance Bridge
NHPP	National Highway Performance Program

Abbreviations and Acronyms, continued

NHS	National Highway System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
PM	evening
PROWAG	Public Rights-of-Way Accessibility Guidelines
RCTS	Richland County Transportation Service
ROW	Right-of-Way
RSID	Rural Special Improvement District
RP	Reference Post
RV	Recreational Vehicle
Qat	Quaternary Alluvial Deposit
Qgt	Glacial till
Qor	Quaternary Alluvium
SB	Southbound
Section 4(f)	Section 4(f) of the Department of Transportation Act
SFHA	Special Flood Hazard Area
SHPO	State Historic Preservation Office
SOC	Species of Concern
SPC	Species of Conservation
STBG	Surface Transportation Block Grant Program
STPB	Surface Transportation – Bridge Program
STPP	Surface Transportation Program Primary Highways
STPS	Surface Transportation Program Secondary Highways
STPU	Surface Transportation Program Urban Highways
STIP	Statewide Transportation Improvement Program
TA	Transportation Alternative
T&E	Threatened and Endangered
Tftr	Tertiary Tongue River Member of the Fort Union Formation
TIFIA	Transportation Infrastructure Finance and Innovation Act
TRB	Transportation Research Board
UGPTI	Upper Great Plains Transportation Institute
UPP	Urban Pavement Preservation Program
USACE	United States Army Corps of Engineers
USC	United States Code
USFWS	United States Fish and Wildlife Service
USGS	United State Geological Survey
UST	Underground Storage Tank
V/C	Volume to Capacity
WB	Westbound

Executive Summary

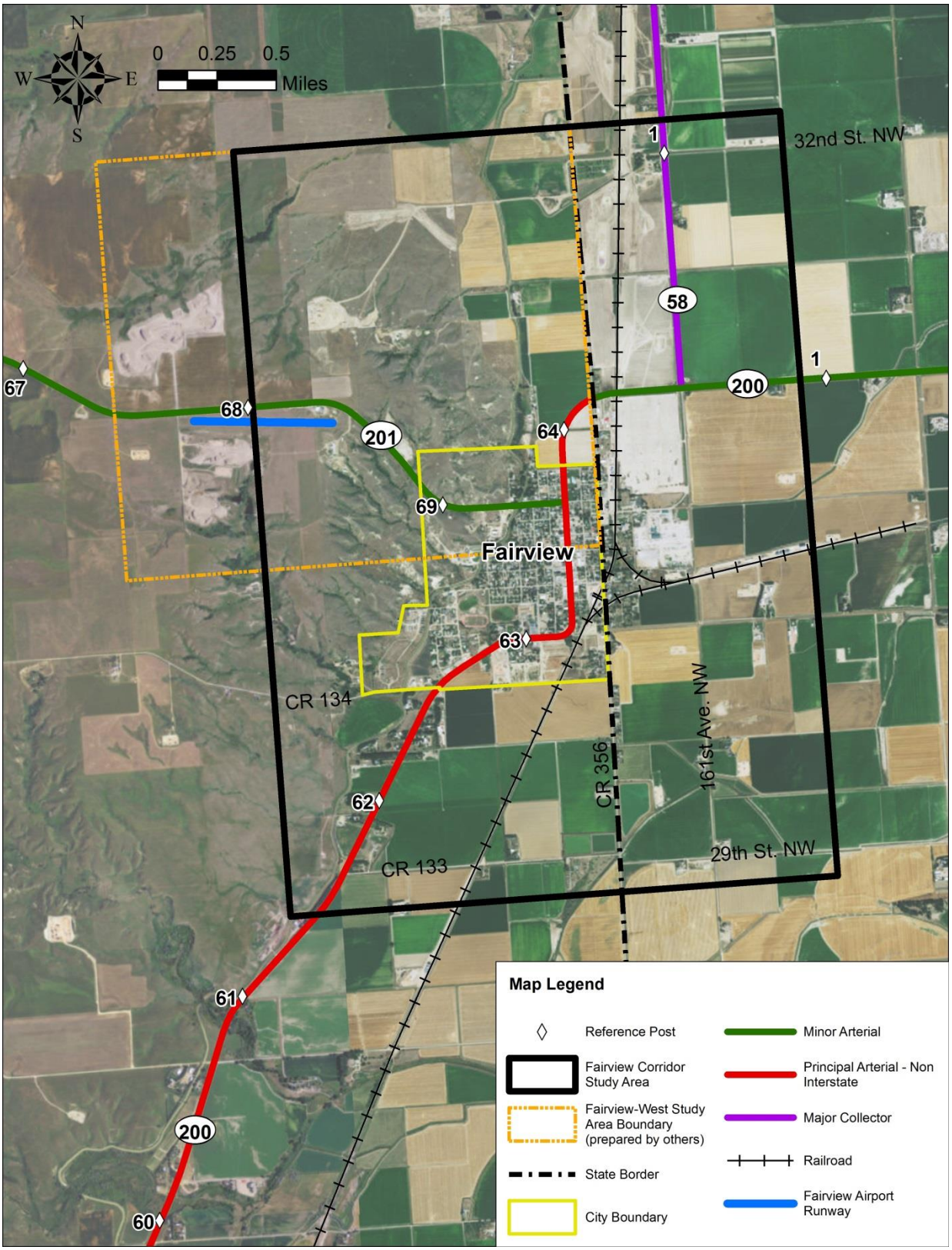
ES.1 Introduction

The Montana Department of Transportation (MDT), in cooperation with the North Dakota Department of Transportation (NDDOT); Town of Fairview; Richland County, Montana; McKenzie County, North Dakota; and the Federal Highway Administration (FHWA), conducted a corridor planning study to investigate options to alleviate truck traffic in the Fairview area. At the time the study was initiated, increases in truck traffic in Fairview had been generated by development in the Bakken oil field in both Montana and North Dakota. The study area includes MT 200, ND 200, ND 58, and the area immediately surrounding Fairview. MT 201 is being evaluated separately as part of another MDT study conducted by others (Fairview-West).

A corridor 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). There is no equivalent state-level environmental policy act in North Dakota. The planning study process is designed to identify potential transportation improvements 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 environmental conditions to identify needs and constraints. It also allows early coordination with members of the public, resource agencies, and other interested stakeholders. This process is separate from the NEPA/MEPA environmental compliance documentation, design, right-of-way acquisition, and construction phases of an individual project. Depending on needs and funding availability, an improvement option may be forwarded from this planning-level study and developed into a project at a later date.

The study area illustrated in Figure ES-1 and extends from RP 61.4 to RP 64.2 on MT 200 and continues along ND 200 to RP 0.9. MT 201 is included from its intersection with MT 200 to RP 68.0. ND 58 is also included from its intersection with ND 200 to RP 1.1.

Figure ES 1. Study Area



ES.2 Existing and Projected Conditions

Key findings identified through review of existing and projected conditions are listed below.

Bicycle and Pedestrian Facilities

- Bicycle and pedestrian facilities consist of intermittent sidewalks along MT 200 through Fairview and four- to eight-foot shoulders along MT 200, ND 200, and ND 58 within the study area.

Utilities

- Utilities in the study area include underground telephone, underground cable television, underground natural gas, underground water, and overhead and underground electric power.
- Irrigation canals and petroleum pipelines also occur in the study area vicinity.

Rail Facilities

- A BNSF Railway facility parallels MT 200 and ND 58 through the study area, with crossings at CR 133 in the southern portion of the study area; 9th, 6th, and 2nd Streets within Fairview; and ND 200 just east of the MT/ND state line.

Drainage Condition

- Rural drainage is generally sufficient.
- Grated trough structures within Fairview are not effective; standing water and truck traffic results in mud splatter.

Pavement Condition

- Fair to poor ride index ratings were documented for MT 200 within the study area.
- Fair to poor ride index, distress, and rut ratings were identified for ND 200 and ND 58 within the study area.
- Pavement deficiencies (including transverse cracking, longitudinal cracking, and/or subgrade/pavement failure) were identified during the field review at the ND 200 railroad crossing and the MT 200 intersections with MT 201, 3rd, 4th, 5th, and 7th Streets.

Horizontal Alignment

- Four of five curve locations on MT 200 do not meet current MDT design criteria.

Clear Zones

- In Fairview, there are obstructions within the clear zone along MT 200.
- Generally, fill and cut slopes contain compliant grades and dimensions.

Crash History

- Approximately 20% of all crashes on MT 200 involved a semi-trailer truck during the 2004 to 2013 period.
- Approximately 33% of intersection-related crashes on MT 200 involved a semi-trailer truck during the analysis period.
- Eight of the 20 crashes occurring on ND 200 during the 2010 to 2013 analysis period resulted in injury and no fatalities were reported. Of these 20 total crashes, 10 crashes occurred at the ND 200/ND 58 intersection.

Traffic Volumes and Operations

- Traffic volumes are anticipated to peak in approximately 2025 and return to lower levels by 2035.
- Corridor segments south of Fairview and between 2nd Street and ND 58 are projected to operate at unacceptable levels by 2020 if no improvements are made.

- The MT 200/MT 201 intersection is expected to operate at unacceptable levels in the PM peak hour by 2025 if no improvements are made.

Origin-Destination Trends

- During the AM peak period, the strongest truck movements occur from west to east/north and from south to north/east.
- During the PM peak period, the strongest truck movements occur from east to south.

Environmental Conditions

- Physical, biological, social, and cultural features may be affected by potential improvements within the study area.

ES.3 Corridor Needs and Objectives

Needs and objectives were developed based on existing and projected conditions within the corridor (including planned projects), input from the public and resource agencies, and coordination with the study advisory committee. Needs, objectives, and considerations are not listed in order of priority.

Need 1: Accommodate existing and projected transportation demands within the study area.

Objectives:
To the extent practicable:

- Meet desirable levels of service on roadway segments and at intersections through the 2035 planning horizon.
- Consider regional and local travel patterns.

Need 2: Provide transportation facilities that safely support travel for all modes.

Objectives:
To the extent practicable:

- Improve roadway and bridge elements to meet current design criteria.
- Improve continuity for pedestrian facilities on MT 200 within Fairview.
- Consider methods to reduce conflicts between local vehicular traffic and regional truck traffic.

Other Considerations

- Local planning efforts, planned projects, and potential future development in the study area.
- Potential impacts to railroad, utility, irrigation, and mining features.
- Potential adverse impacts to environmental resources that may result from improvement options.
- Funding availability.
- Temporary construction impacts.
- Construction feasibility and physical constraints.
- Seasonal variations in truck traffic.

ES.4 Improvement Options

Improvements options were identified for both new alignments around the Town of Fairview and for existing routes.

New Alignments
In consideration of impacts, convenience, functionality in reducing truck traffic in Fairview, and anticipated costs, the following parameters were used to evaluate the six alternative routes:

- route length and travel time,
- at-grade rail crossings,
- parcel impacts and right-of-way acquisition,
- wetland impacts,
- farmland impacts,
- irrigation impacts,
- access point density, and
- cost.

Figure ES.2 illustrates the three scenarios identified through the Quantm alignment analysis software.

- **Western Alignment**: This alignment is located west of Fairview. The alignment would require two bridge crossings over an irrigation ditch (the Main Canal). It also includes an at-grade crossing at the existing railroad mainline at the northern end of the study area. The alignment is approximately 2.9 miles in length (including portions of the existing MT 200 route before start and end points at the CR 133 and ND 58 intersections).

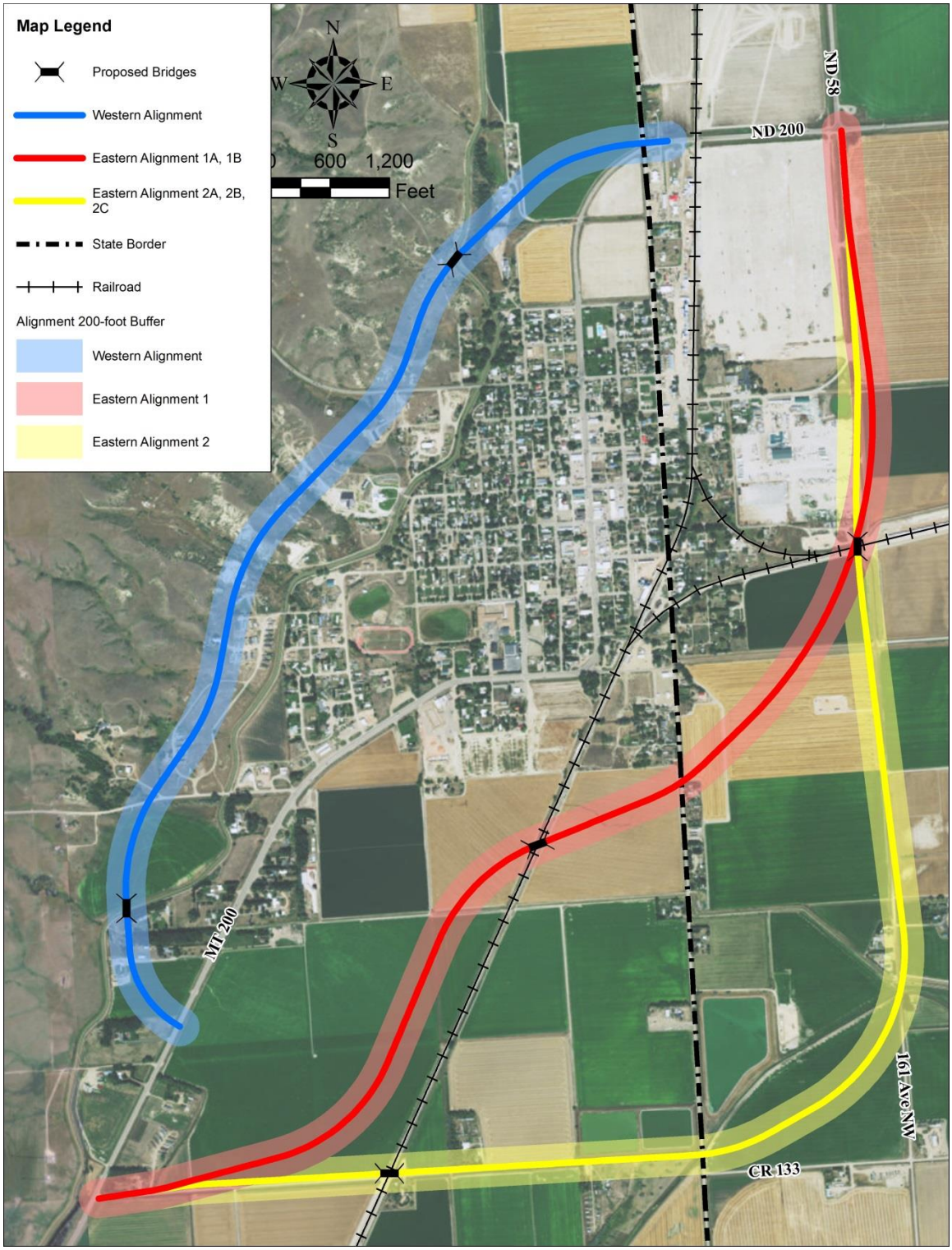
- **Eastern Alignment 1**: This alignment is located immediately east of Fairview. Variations to the eastern alignment 1 include both at-grade and grade separated railroad crossings, which significantly increase cost. The alignment is approximately 2.8 miles in length.

- **Eastern Alignment 2**: This alignment is located east of Fairview and generally follows existing county roads (CR 133 and 161 Ave NW). Variations to eastern alignment 2 also include both at-grade and grade separated railroad crossings, which significantly increase cost. It is the longest alignment at approximately 3.3 miles in length.

A weighting system was developed to reflect the perceived relative importance or risk associated with each parameter used to evaluate the alignments. The parameters were assigned a score to determine the alignment variation that best met the evaluation parameters and their relative importance. The best performing alignment identified from the alternative screening process was the western alignment.

> The **Western Alignment** scored well in several areas including overall cost and travel time and length. It is also anticipated to result in less overall impact than many eastern alignment variations. With less farmland and parcel impacts and smaller bridge structures, this alignment is potentially less costly than others.

Figure ES 2. Optimized Routing



Source: MDT 2015 and DOWL 2015.

Existing Routes

Table ES.1 lists improvements recommended to existing routes, including widening MT 200 south of Fairview to match the typical section planned for the Sidney-Fairview project and improving nonmotorized accessibility. MDT has programmed other projects that will be improving drainage and other issues in Fairview. This study identified gaps in improvements.

Table ES 1. Improvement Options Summary

Improvement Options			Locations	Planning Cost Estimate[1]	Potential Timeframe[2]	Potentially Impacted Resources and Anticipated ROW/ Permitting Requirements
Option Category	Option ID	Option Description				
Traffic Operations	**Option 1**	Roadway Widening (Three Lanes)	RP 61.8 to RP 62.3 (MT 200 South of Fairview)	$3,600,000 to $4,000,000 ($700,000 to $800,000 per 0.1 mile)	Short-term to Long-term	Yes
Pedestrian Improvements	**Option 2**	Sidewalk/ Americans with Disabilities Act (ADA) Improvements	MT 200 RP 62.5 to RP 63.8	$470,000 to 500,000 ($6,600 to $7,200 per 100 feet)	Short-term to Long-term	No

ES.5 Conclusion

The *Fairview Corridor Planning Study* considered potential alternative routes around Fairview to mitigate vehicular conflicts in town while providing an efficient means for regional truck traffic to access the surrounding areas. Through a screening process conducted in coordination with the study advisory committee, the western alignment was identified as the best performing alternative if a design project is forwarded, followed by eastern alignment 2A. Development of a new alignment requires substantial financial investment. Funding availability, right-of-way acquisition, and other MDT Glendive District and NDDOT priorities will factor into any future implementation decisions.

If funding, right-of-way, or other impediments prohibit development of an alternative route around Fairview, improvements on existing routes could be considered. Widening the existing MT 200 roadway to match the new three-lane typical section for the Sidney-Fairview project south of Fairview would improve MT 200 continuity and operations south of Fairview. In addition, this study identified a lack of sidewalk connectivity and accessibility through Fairview, which could be addressed through sidewalk/ADA improvements.

Currently, no funding mechanism has been identified to implement improvements identified in this study. Federal funding allocations for the MDT Glendive District, the MDT Bridge Bureau, and the MDT Traffic Safety Section are committed through federal fiscal year 2020, with additional unfunded projects extending beyond 2020. Future project development and implementation would require the following steps.

- Identify and secure funding.
- Follow appropriate MDT and/or NDDOT processes for project nomination and development, including public involvement and environmental documentation.

The purpose and need statement for any future project should be consistent with relevant needs and objectives contained in this study. Future projects involving federal and/or state actions would require compliance with NEPA/MEPA. This corridor planning study will be used as the basis for determining impacts and subsequent mitigation for future NEPA/MEPA documentation. Future projects must comply with Code of Federal Regulations (CFR) Title 23 Part 771 and Administrative Rules of the State of Montana (ARM) 18, sub-chapter 2, which set forth the requirements for documenting environmental impacts on highway projects.

1.0 Introduction

The Montana Department of Transportation (MDT), in cooperation with the North Dakota Department of Transportation (NDDOT), Town of Fairview, Richland County, Montana, McKenzie County, North Dakota, and the Federal Highway Administration (FHWA), conducted a corridor planning study to investigate options to alleviate truck traffic in the Fairview area. At the time the study was initiated, increases in truck traffic in Fairview had been generated by development in the Bakken oil field in both Montana and North Dakota. The study area is illustrated in Figure 1 and includes MT 200, ND 200, ND 58, and the area immediately surrounding Fairview. MT 201 is being evaluated separately as part of another MDT project conducted by others (Fairview-West).

1.1 Corridor Planning Process

A corridor 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). There is no equivalent state-level environmental policy act in North Dakota. The planning study process is designed to identify potential transportation improvements 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 environmental conditions to identify needs and constraints. It also allows early coordination with members of the public, resource agencies, and other interested stakeholders. This process is separate from the NEPA/MEPA environmental compliance documentation, design, right-of-way acquisition, and construction phases of an individual project. Depending on needs and funding availability, an improvement option may be forwarded from this planning-level study and developed into a project at a later date.

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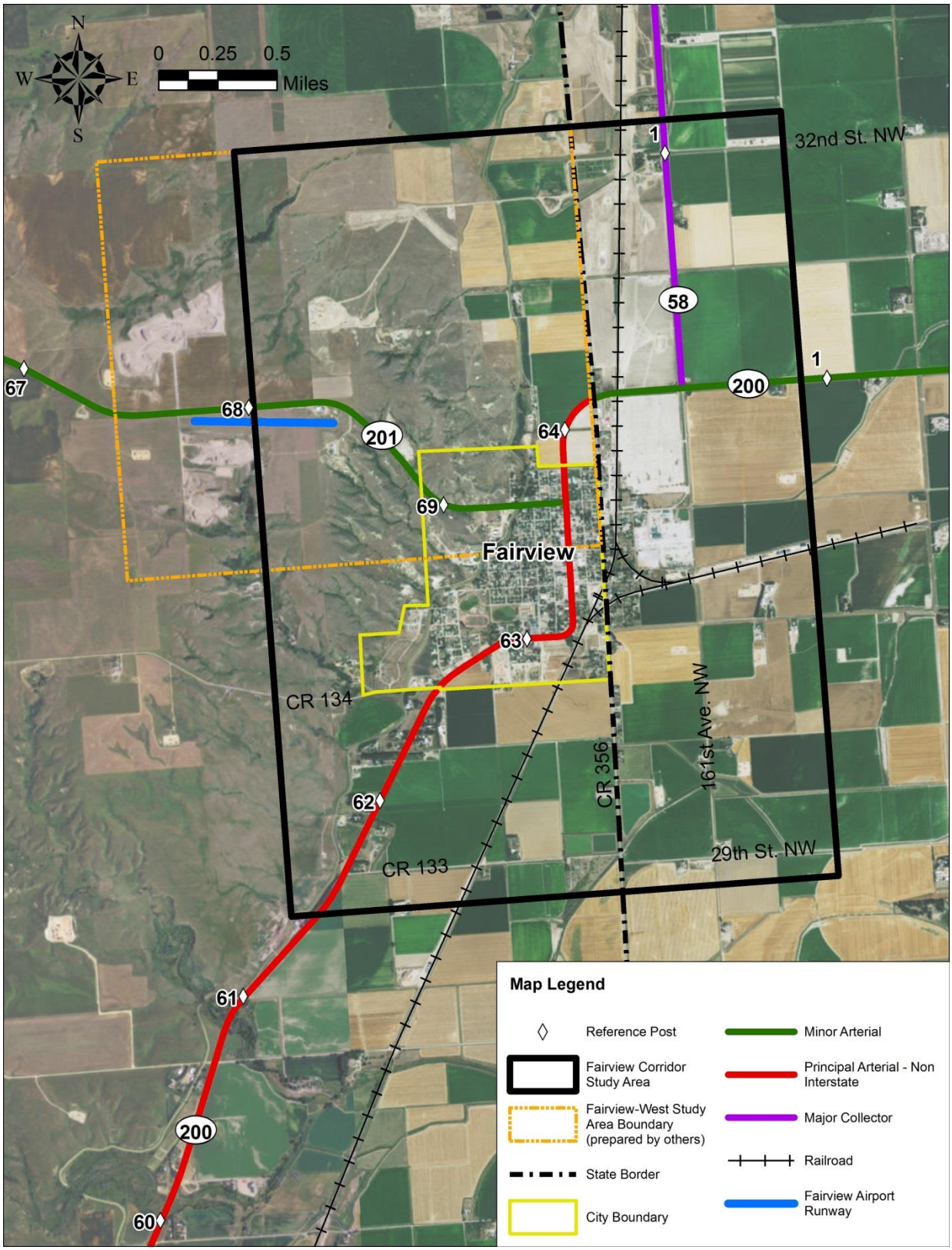


2.0 Public and Agency Participation

Public involvement and engagement with federal, state, and local agencies and representatives are key elements in linking planning studies to future NEPA/MEPA reviews. MDT invited resource agencies, stakeholders, and members of the public to participate in the planning process by providing input on existing and projected conditions, needs, and improvement options. Specific outreach methods are described in the following sections. Additional information is provided in Appendix A.

2.1 Study Website

A study website was hosted at http://www.mdt.mt.gov/pubinvolve/fairview/ to provide information about the progress of the study. Draft documents were posted for public review and comment during the course of the study. The website also provided meeting minutes, information about how to submit comments, and a list of frequently asked questions (FAQs) which contained information about the process and public input opportunities. Related links provided access to the MDT homepage and the MDT's business process for conducting planning studies.

2.2 Advisory Committee Meetings

MDT, NDDOT, FHWA, Richland County, and McKenzie County representatives met regularly during the study period to discuss progress, methods, results, draft documents, public input, and other issues or concerns. The committee served in an advisory capacity and reviewed the study report and related documentation before publication. A full list of committee members may be found in the acknowledgments section of this report.

2.3 Informational/Public Input Meetings

Two informational meetings were held for the planning study. A legal display ad was placed in the Sidney Herald and the Sidney Roundup and a news release was sent to local radio, newspapers, and other local media outlets before each meeting. Newsletters were drafted and provided at the meetings and through an email to members of the public who had provided comment or requested to be included on the study mailing list. Newsletters contained information on study progress, the planning process, upcoming participation opportunities, and available study documentation. Materials from both meetings including advertisements, news releases, sign-in sheets, comment sheets, agendas, newsletters, presentations, and meeting minutes are included in Appendix A.

First Informational Meeting

Forty-nine (49) people attended an informational/public input meeting on July 7, 2015, at the Fairview School cafeteria located at 713 S Western Ave, Fairview, Montana. The meeting began with an introduction of MDT representatives and local advisory committee members. A full list of attendees, sign-in sheets, and meeting minutes are provided in Appendix A. The meeting continued with a presentation of the corridor study planning process, emphasizing public involvement as a major component. Representatives also discussed existing and projected transportation conditions within the study area, the study schedule, and environmental and cultural conditions. A discussion period was held following the presentation; comments from that period are summarized in Table 1.

Table 1. Summary of Comment Topics from Informational Meeting #1

Topic	Discussion Items
Differences between Fairview-West Project and Fairview Corridor Study	• The difference between a project and a planning study. • Priority of currently-planned projects and corridor study recommendations.
Bypass/Economic Vitality	• Possibility of a bypass and the economic effects on the Fairview community. • MDT coordination with local government officials.
NDDOT Involvement	• Location and funding of potential future projects in Montana and North Dakota • NDDOT funding and participation in potential projects.
Eminent Domain	• Use of eminent domain laws. • Right-of-way negotiations as an alternative to eminent domain laws.
Alignments and Possible Routes	• Process of selecting potential recommended alternative routes. • Needs and objectives of potential alternative routes. • Presentation of routes at future informational meeting.

Three written comments were received at the meeting and three written comments were received following the meeting. Comment topics included specific suggestions for new routes, possible impediments for future alignments, Richland County and Fairview planning documents, and the quality of the informational/public input meeting presentation.

Second Informational Meeting

Sixteen (16) people attended an informational/public input meeting on May 10, 2016, at the Fairview School cafeteria located at 713 S Western Ave, Fairview, Montana. The meeting began with an introduction of MDT representatives and local advisory committee members. A full list of attendees, sign-in sheets, and meeting minutes are provided in Appendix A. The presentation addressed existing and projected conditions, study needs and objectives, funding feasibility, and improvement options identified in the study. A discussion period was held following the presentation; meeting comments are summarized in Table 2.

Table 2. Summary of Comment Topics from Informational Meeting #2

Topic	Discussion Items
Project Feasibility, Funding, and Timeline	• Concerns about funding constraints. • Priority of projects in the area. • Continual monitoring of conditions in the study area. • Timing of when future projects may occur. • Potential alternative funding sources.
Right-of-Way and – Eminent Domain	• Impacts to privately-owned properties. • Use of eminent domain laws. • Right-of-way negotiations as an alternative to eminent domain laws. • Determination of land value.
Quantm Modeling	• Factors considered in modeling process. • Process for identifying alternative alignments.
MT 201	• MT 201 traffic interaction with potential new alignments.
Economic Impacts	• Possibility of a bypass and economic effects on the Fairview community. • MDT coordination with local government officials.
Travel Time and Alternative Alignment Usage	• Travel time differences between existing MT 200 route and new route. • Usage of new route by truck traffic.

An additional comment was received by telephone following the meeting regarding the need to minimize impacts to privately-owned properties.

Resource Agency Meeting

Resource agencies were invited to attend a meeting on July 28, 2015, at the Montana Department of Transportation Rail, Transit, and Planning Division in Helena, MT. The meeting focused on discussion of environmental resource issues and concerns within the study area. A copy of the invitation letter with a list of invited agencies is included in Appendix A. Representatives of MDT, the United States Fish and Wildlife Service (USFWS), United States Army Corps of Engineers (USACE), and NDDOT attended in person or via teleconference. The meeting began with a presentation of the study process and findings from the *Existing and Projected Conditions Report* and the *Environmental Scan.* Following the presentation, agencies discussed whooping crane migration corridors, northern long-eared bat presence in the study area, animal-vehicle collisions, jurisdictional determination of waters in the corridor, and possible relocation of pipelines. Meeting minutes with discussion of these topics and a list of attendees are contained in Appendix A.

Public and Agency Review Period

The public and agency review period for the draft corridor study report took place May 1, 2016, through May 31, 2016. Two written comments were received during the review period. Written comments and MDT responses are presented in a comment matrix in Appendix A.

3.0 Local and Regional Planning

McKenzie County Comprehensive Plan, 2013
This plan was developed to guide decision making on long-range development and effectively plan for, and manage, growth while maintaining the community's core values. The plan outlines goals and objectives for community infrastructure, including transportation. In relation to transportation implementation strategies, McKenzie County supports the establishment of a preferred heavy traffic road network and identification of right-of-way needs for future roadway work.

McKenzie County Background Report, 2013
This report provides baseline community and infrastructure data, including information on population, economic factors, housing, education, public services, and transportation. Commuter profiles are based on the U.S. Census Bureau's 2006-2010 American Community Survey and may not accurately reflect recent increases in resource development traffic. ADT for county roads (including ND 200) is provided for 2006-2012.

McKenzie County Zoning Map, 2015
The McKenzie County Zoning Map shows nine county zoning classifications, state and federal lands, tribal lands, township boundaries, and highways. Within the study area, portions of East Fairview are zoned for commercial development and agriculture. The remainder of the study area is administered by the township.

Montana Statewide Transportation Improvement Program (STIP), 2016-2020
The Montana Statewide Transportation Improvement Program (STIP) is developed in accordance with the requirements of Section 135 of 23 USC (United States Code). The STIP details projects that will address Montana's transportation needs for fiscal years 2016 through 2020. There are several projects programmed in the current STIP within the study area. Recent and planned projects are discussed in Section 4.0.

MT 16/MT 200 Glendive to Fairview Corridor Planning Study, 2012
The Glendive to Fairview Corridor Planning Study was completed in 2012 to addresses traffic and safety concerns resulting from increased regional traffic volumes associated with oil industry growth. The study area focused on MT 16 and MT 200 between Glendive and Fairview (RP 0.6 to RP 62.5), and excluded areas within Glendive, Sidney, and Fairview. The study recommended consideration of overhead lighting south of Fairview, enhanced intersection warning at the MT 200/CR 133 intersection (RP 61.7), and turn lanes between Sidney and Fairview.

MT 16/MT 200 Glendive to the North Dakota State Line Corridor Safety Audit, 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 the Glendive to Fairview 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 Town 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. The Glendive to Fairview corridor study incorporated CSA recommendations for the rural portion of the MT 16/MT 200 corridor.

North Dakota 2020 & Beyond, 2012
North Dakota 2020 & Beyond is a visioning document summarizing public input sessions conducted to identify opportunities for future economic and community development. The report outlines a series of goals relating to multiple topic areas. With regard to safety and transportation, North Dakota aspires to build a statewide transportation system that meets the needs for North Dakota's growing population and industries and provides a safe place for workforce, families and visitors.

North Dakota Statewide Transportation Improvement Program, 2016-2019
The North Dakota STIP outlines projects planned for the 2016-2019 period, with the intent to provide the traveling public with the best possible transportation system across all modes and jurisdictions and to support NDDOT's mission to safely move people and goods. There are several projects programmed in the current STIP within the study area. Recent and planned projects are discussed in Section 4.0.

North Dakota State Freight Plan, 2015 (Draft)
The purpose of the North Dakota Freight Plan is to promote safe, secure, sustainable, and reliable freight mobility to enhance a diversified and vibrant economy. This multi-modal report primarily emphasizes highways, with secondary emphasis on last-mile connections to railroad, pipeline transshipment, and air cargo freight facilities. It outlines immediate and long-term investment planning strategies. Strategic freight system highways are divided into three levels: Level 1 (critical), Level 2 (regional/intrastate), and Level 3 (local). ND 200 is identified as a Level 1 corridor and a gateway to the state and ND 58 is designated Level 2. The plan does not provide a list of recommended projects.

Regional Plan for Sustainable Development, 2015
This plan developed by the Vision West North Dakota Consortium is a visioning document intended to guide future development. It notes that the pace of development has significantly impacted the region's roads and highway in recent years due to oil development in the Bakken. The plan outlines transportation-related strategies, including recommendations to conduct a work session on north-south transportation routes, provide long-term funding for county and township roads designated as oil haul roads, and review future rail transportation needs.

Richland County Master Transportation Plan, 2015 (Draft)
This plan summarizes existing and future conditions relating to community health and infrastructure concerns analyzed in the Richland County Growth Policy Update and how they impact the transportation system. The plan outlines current and projected land use and traffic operations, reviews safety data and highlights areas of concern, provides an analysis of functional classification, and provides options for roadway typical sections. Project recommendations are phased over 30 years, with guidance on available funding. Within the study area, the intersection of MT 200 and CR 134 is identified for a realignment project within the 2020-2030 time period.

Richland County Hazard Plan, 2014
Transportation infrastructure is a vital element in responding to any emergency. This plan includes an assessment of hazards and vulnerabilities, including drought, floods, severe storms, and terrorism. Transportation-related mitigation strategies include identification of parking/shelter areas for semi-truck drivers during winter storms and marking/advertising snow routes.

Richland County Transportation Service Coordination Plan, 2013
The purpose of this plan is to identify transportation needs of people with disabilities, older adults, or individuals with limited incomes. It provides strategies for meeting those needs and prioritizes services for funding. The recommendations in this plan do not directly affect this study.

Richland County Community Strategic Plan, 2010 Update
This plan addresses health features of the community, such as tobacco and alcohol use, access to clinical care, and high school dropout rates. Physical environmental concerns mostly address housing, visual condition of the community, and recycling. The recommendations of this plan do not directly affect this study.

Richland County Growth Policy Update, 2015
Richland County has recently updated its Growth Policy. Goals and objectives have been updated for community health and infrastructure concerns, including transportation. The plan provides valuable community context for Fairview, one of two incorporated jurisdictions in the county. One policy objective is to develop urban development guidelines and coordinate those guidelines with future projects. Governmental coordination is a recognized priority and coordination with MDT on improvements to highways and state-owned roads is a transportation objective. The community would like to see prioritized upgrades to MT 200 and MT 201.

Town of Fairview Growth Policy Update, 2015
This update is a more focused treatment of the information presented in the Richland County Growth Policy Update discussed above. This plan also emphasizes prioritized improvements on MT 200 and MT 201.

TranPlan 21, 2008
TranPlan 21 is Montana's federally-mandated statewide transportation plan. Originally adopted in 1995 and most recently amended in 2008, TranPlan 21 is an essential component of the continuing statewide planning process that develops and implements MDT policy goals and actions in cooperation with the public and Montana's transportation stakeholders.

TranPlan 21 establishes statewide transportation policies in six key areas within the federally-required 20-year planning horizon. These policy areas include:

- economic development,
- traveler safety,
- roadway system performance,
- access management/land use planning,
- bicycle and pedestrian transportation, and
- public transportation.

The Roadway System Performance Policy Paper noted improvements will be needed in response to traffic growth in certain corridors.

4.0 Recent and Future Projects

Recent and future MDT and NDDOT projects are listed in Table 3 and Table 4.

Table 3. Recent and Future MDT Projects

Type	Name	UPN	Project Number	Description	Date
Recent Projects	Fairview Intersections	7832	STPP 20-2(28)63, SFCP 20-2(26)63, STPP 20-2(27)63	Installation of traffic signal at MT 200 and 6th St. and improvement of intersection at MT 200 and MT 201.	Let May 2012
	Glendive Rumble Strip Program	7834	STWD(144), HSIP STWD(145)	Shoulder and centerline rumble strips. Project on MT 200 (RP 52.6-62.3) ended at southern edge of the corridor study area.	Let May 2013
Future Projects	MT 200-Fairview	8168	STPP 20-2(31)62, NH 20-2(32)62	Major rehabilitation without added capacity – new storm drains, milling/pulverizing existing surface, new plant mix surface (RP 62.3-64.18).	Anticipated let date 2019.
	Sidney to Fairview	7950	NH 20-2(30)53, STPP 20-2(29)53	Minor rehabilitation with overlay, seal and cover (RP 52.57-62.3) ends at southern edge of corridor study area.	To be let when ready; anticipated construction date 2017.
	Fairview-West	8650	STPP 201-2(14)64, STPP 201-2(15)64	Reconstruction of MT 201 without added capacity (RP 63.6 to RP 69.5).	Anticipated let date January 2019.

Source: MDT STIP 2015-2019 and 2016-2020.

Table 4. Future NDDOT Projects

Type	Name	PCN	Project Number	Description	Date
Future Projects (Illustrative)	State Line to JCT US 85	17861, 20294, 20295	SS-7-200(014)000, SS-7-200(015)003, SS-7-200(016)004	Three contiguous projects involving roadway rehabilitation and ND 200/ND 58 intersection improvements.	FY 2015 (construction planned in 2016)
	JCT 200 N to JCT ND 1804	20416	Unknown	Concrete overlay, hot bituminous pavement, widening	FY 2016-2018

Source: NDDOT STIP 2015-2018 and 2016-2019.

5.0 Existing and Projected Conditions

The *Fairview Corridor Study Existing and Projected Conditions Report* (Appendix B) and the *Environmental Scan Report* (Appendix C) provide a planning-level summary of transportation system features and physical, biological, social, and cultural characteristics to help the advisory committee identify issues, constraints, and opportunities within the study area. The following sections summarize key information from these reports.

5.1 Transportation System

Transportation features were identified through field observation and a review of published statistics, documentation, Geographic Information System (GIS) data, and MDT/NDDOT as-built drawings. A field review of the corridor was conducted on February 25, 2015, to assist in identifying existing conditions and constraints.

The transportation system within the study area is discussed in terms of its features, geometric characteristics, crash history, access points, traffic volumes, and operational characteristics. The analysis in this report focuses on MT 200, ND 200, and ND 58. MT 201 is being addressed separately through the Fairview-West project.

Physical Characteristics

Functional Classification and Roadway System

Functional classification is used to characterize public roads and highways in accordance with 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 200 is classified as a principal arterial non-interstate, ND 200 is classified as a minor arterial, and ND 58 is classified as a major collector on the respective Montana and North Dakota functional classification maps.

Principal arterials serve the major activity centers of an area and consist mainly of the highest-traffic-volume corridors. Principal arterials place an emphasis on mobility and access to abutting land may be limited. Principal arterials carry a high proportion of the total vehicle miles traveled within an area. In rural settings, principal arterials service trips lengths and travel density characteristics similar to that of interstate travel.

Minor arterials provide service for trips of moderate length, serve geographic areas that are smaller than their principal arterial counterparts, and offer connectivity to the principal arterial system. In a rural setting, minor arterials are typically designed to provide relatively high overall travel speeds, with minimum interference to through movement.

Major collectors in the rural setting typically serve intra-county travel, rather than statewide travel, and typically serve shorter trips compared to arterial routes. Trips along major collectors greater in length than intra-country travel will typically funnel motorists to the arterial system.

Right-of-way

Right-of-way widths vary throughout the corridor. MDT right-of-way widths typically range from 105 to 160 feet along MT 200 outside of Fairview. The MT 200 right-of-way width within Fairview is generally 80 feet. Right-of-way widths along ND 200 and ND 58 are generally 150 feet and 170 feet, respectively.

Structures

The MDT Bridge Bureau identified four structures within the study area. Of these, only one is located on MT 200 at RP 69.34 and is in good condition.

There are no structures on ND 58 and ND 200 within the study area. A bridge crossing the Yellowstone River and several box culverts are located on ND 200 east of the study area.

Bicycle and Pedestrian Facilities
Intermittent sidewalks occur along MT 200 through Fairview. Four- to eight-foot shoulders occur along MT 200, ND 200, and ND 58, providing opportunity for non-motorized usage along the edge of the traveled way.

Utilities
Utilities in the study area include underground telephone, underground cable television, underground natural gas, underground water, and overhead and underground electric power. Irrigation canals and petroleum pipelines also occur in the study area vicinity. A detailed utility investigation should be conducted during project development for any improvement options forwarded from this study.

Air Service
There is a small airport located approximately one mile west of Fairview owned by the Sidney-Richland Airport Authority. The Sidney-Richland Municipal Airport is a larger regional airport, and is located approximately 26 miles southwest of Fairview in Sidney, MT. The nearest international airport is the Sloulin Field International Airport located in Williston, ND, approximately 35 miles from Fairview. There are also five small airports located within forty miles of Fairview.

Rail Service
A BNSF Railway facility parallels MT 200 and ND 58 through the study area. There are numerous crossings in the study area including County Road (CR) 133 in the southern portion of the study area; 9th, 6th, and 2nd Streets within Fairview; and ND 200 east of the MT/ND state line. Based on a tonnage detail map from Snowden to Glendive, as of January 27, 2014, there are three through trains per day on this track. A transloading facility is expected to be constructed northwest of the ND 200/ND 58 intersection.

Transit
Richland County Transportation Service (RCTS) is the county's only public transit service. RCTS serves a five mile radius surrounding the four major cities/towns (Sidney, Fairview, Savage, and Lambert) of Richland County. Currently RCTS provides transit to and from Fairview on Thursdays and departing trips from Fairview on Monday, Tuesdays, Wednesday, and Fridays. Service may be requested on other weekdays, but is subject to availability. In addition to regularly-scheduled service, RCTS also offers day trips and special excursion trips. There are no other transit providers in the study area.

Drainage Condition
Drainage throughout the study area is generally sufficient along ND 200, ND 58, and the rural portions of MT 200. Highway runoff is directed to adjoining shoulders. 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 topographic conditions of the adjacent lands.

Isolated areas within Fairview have inadequate drainage. Topography within the study area generally slopes from west to east. The MT 200 drainage system within Fairview consists of curb and gutter, inlets, storm drain, and valley gutters. Several intersections within Fairview contain grated trough structures running perpendicular to MT 200. The purpose of the trough structures is to convey runoff to the east side of MT 200. Based on local feedback, the trough structures are largely ineffective and contribute to poor drainage at the intersections. Standing water in conjunction with increased truck traffic through Fairview has created issues with mud splatter.

Pavement Condition

The 2013 MDT Pavement Condition Treatment Report indicates pavement on MT 200 within the study area is generally in good condition, with a fair to poor ride index rating.

During the field review, rutting of the roadway was observed at several locations within the study area. The most noticeable locations were at the ND 200 railroad crossing and at the MT 201/MT 200 intersection. Potholes and other pavement failures were noted adjacent to the surface drainage crossings at the intersections of MT 201, 3rd, 4th, 5th, and 7th Streets with MT 200. Transverse and longitudinal cracks occur consistently along the entire corridor, although they don't appear to be compromising the pavement. These cracks have been sealed to prevent water infiltration into the subgrade.

A 2015 NDDOT Documented Categorical Exclusion (CATEX) for three projects from the MT/ND state line to Jct US 85 notes ND 200 is currently experiencing pavement deterioration including cracking and rutting, and accelerated deterioration is expected with increasing truck traffic. Fair to poor ride index, distress, and rut ratings were identified for ND 200 and ND 58 within the study area.

Future projects in MT and ND (as noted in Section 4.0) will address pavement deficiencies, resulting in good pavement condition within the defined project limits.

Geometric Characteristics

Design Criteria

MDT geometric design criteria were used to assess MT 200 within the study area (MDT Road Design Manual, Chapter 12, pages 12(7) and 12(12), Figures 12-3 and 12-4, Geometric Design Criteria for Rural Principal Arterials and Rural Minor Arterials (National Highway System – Non Interstate) U.S. Customary, 2008).

ND design guidelines are provided in multiple figures and tables included in the NDDOT Design Manual (Chapter I, Section 6 – Design Philosophy, Investment Strategy, and Guidelines). NDDOT design guidelines are characterized by investment strategy. The investment strategies are preventative maintenance, minor rehabilitation, structural improvement, major rehabilitation, and new/reconstruction projects. The NDDOT design philosophy considers the investment strategy design guidelines in conjunction with design values provided in American Association of State and Highway Transportation Officials (AASHTO) A Policy on Geometric Design of Highways and Streets.

The 2015 Documented CATEX for projects planned on ND 200 notes that substandard vertical alignments and superelevations exist on ND 200. These deficiencies are located to the east outside the study area. Geometric conditions for MT 201, ND 200, and ND 58 were not assessed as part of the Fairview Corridor Planning Study. MT 201 is currently being reviewed as part of the Fairview-West study, and ND 200 was reconstructed in 2015.

The following sections provide information on geometric conditions assessed for MT 200 within the study area.

General Conditions

The existing roadway alignment generally exhibits level terrain characteristics. A design speed of 35 miles per hour (mph) and low-speed urban criteria in combination with a level terrain type was utilized within Fairview (approximately RP 62.5 to RP 63.8). A

design speed of 70 mph and open roadway criteria in combination with a level terrain topography type was used for the remainder of MT 200 outside Fairview. The posted speed limit on MT 200 within the study area varies from 55 mph outside of Fairview and 35 mph within Fairview.

Horizontal Alignment

Based on a review of available data, four of the five horizontal curves analyzed on MT 200 within the study area do not meet current MDT design criteria for curve radius and one curve also does not meet minimum sight distance criteria.

Vertical Alignment

Available information indicates the 14 vertical curves analyzed within the study boundaries meet current MDT design criteria. Several curves do not meet the minimum curve length guideline of 1000' for aesthetics, but otherwise meet minimum length guidance.

Clear Zones

Generally, the MT 200 clear zone areas contain compliant slopes although various obstructions exist within Fairview including, but not limited to, trees, fence, signs, and utilities.

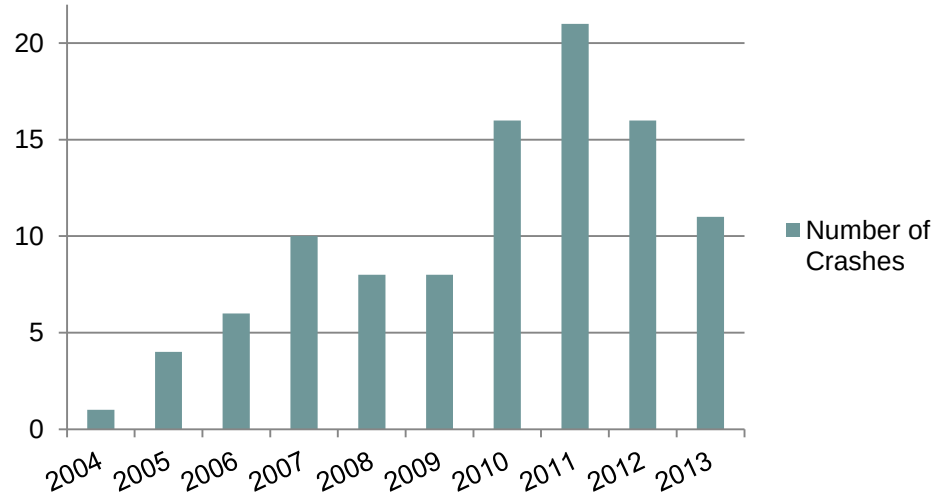
Crash Analysis

Crash data for MT 200 and ND 200 within the study area were reviewed for this report. Crash details and analysis periods differ for MT and ND data.

MDT provided crash data for MT 200 from RP 61.4 to RP 64.2 for the ten-year period from January 1, 2004, to December 31, 2013. During the ten-year analysis period, a total of 66 crashes resulted in 22 injuries and no fatalities. Approximately 20% (13 out of 66) of all crashes involved a semi-trailer truck vehicle. As a result of these crashes, a total of 3 injuries and no fatalities occurred during the analysis period.

As indicated in Figure 2, the number of crashes per year peaked in 2011.

Figure 2. MT 200 Crashes (2004-2013)



Fixed-object (e.g., sign, tree, utility pole) and rear-end crashes occurred at the highest number. Fixed-object crashes occurred more commonly than rear-end crashes, but rear-end crashes were more severe resulting in more injuries. Fixed-object crashes made up 24.2% (16 out of 66) of all crashes and 4.5% (1 out of 22) of all injuries. Rear-end crashes made up 15.2% (10 out of 66) of all crashes and 36.4% (8 out of 22) of all injuries.

The highest number of semi-trailer truck crash type was right angle. Right-angle crashes made up 23.1% (3 out of 13) of semi-trailer truck crashes and 33.3% (1 out of 3) of semi-trailer truck injuries. Rear-end, right-turn, same-direction, and sideswipe same-direction crashes each made up 15.4% (2 out of 13) of semi-trailer truck crashes. Injuries resulted from right-angle, rear-end, and roll-over semi-trailer truck crashes.

The majority of crashes and injuries occurred during clear weather, dry roadway, and daylight conditions.

Contributing factors indicate the majority of crashes were a result of driver error, including inattentive and careless driving, failure to yield, improper maneuvering, falling asleep, following too closely, and speeding.

The highest number of intersection-related crashes occurred at the intersection of MT 200/MT 201. However, the higher number of crashes at this intersection is not unexpected due to the relatively higher volume of vehicles entering this intersection compared to other intersections.

NDDOT did not provide crash data for this study. The 2013 ND Crash Summary report noted that McKenzie County had the greatest number of fatal crashes in the state in 2013. Several of these occurred on ND 200 and ND 58 in the study area vicinity.

A Traffic Operations Study prepared for NDDOT in April 2014 evaluated ND 200 from RP 0.0 to 18.7 to examine potential traffic operational improvements. As part of this study, crash data was summarized over a three-year study period (October 1, 2010, to September 30, 2013). During the three-year analysis period, eight of the 20 crashes resulted in injury. The remaining 12 crashes reported property damage only and none of the 20 crashes involved fatalities. Of the 20 total crashes, 10 crashes occurred at the ND 200/ND 58 intersection. The Traffic Operations Study analyzed several alternatives to improve traffic operations and safety at this intersection. The study concluded a roundabout was the preferred alternative for the ND 200/ND 58 intersection.

Access Analysis

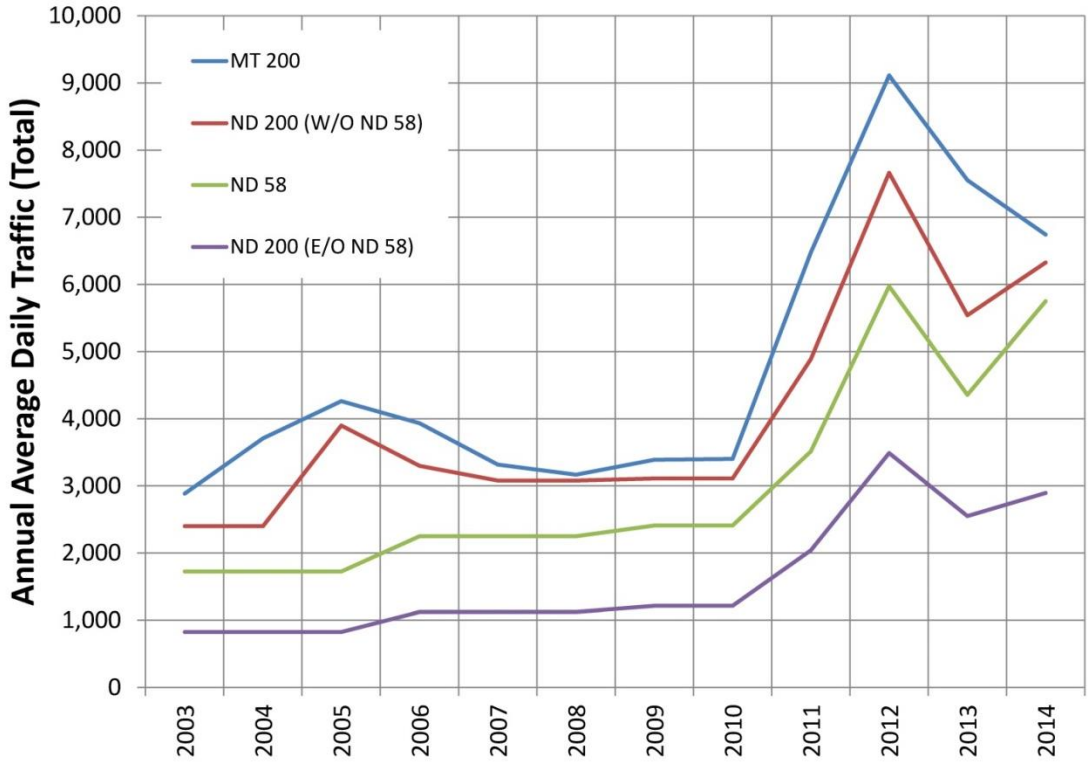
Limited access control occurs on MT 200 from RP 52.37 to RP 63.17. Three access points to residences are located on ND 200 between the state border and the railroad crossing (RP 0.0 to 0.1). There is an additional residential property at RP 0.7 with two access points spaced approximately 340 feet apart. ND 58 has three residential access points located at RP 0.7, RP 0.8, and RP 1.1. The remainder of the ND 200 and ND 58 study corridor contains intermittent primitive access points to agricultural parcels.

5.2 Traffic Volumes

Historic Average Daily Traffic (AADT) Volumes

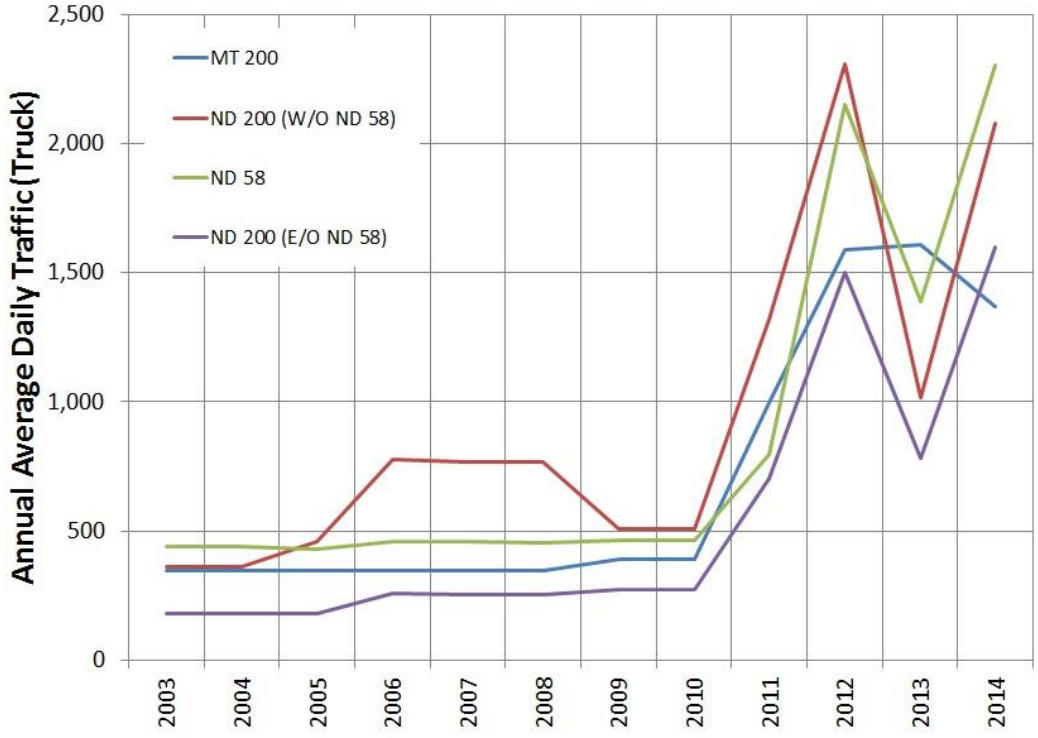
AADT represents the total of all motorized vehicles traveling in both directions on a highway on an average day. AADT volumes from short-term counters 42-2-2, 42-2-11, 42-2-12, 42-2-13, and 42-2-14 located on MT 200 at RP 62.5, RP 63.2, RP 63.6, RP 63.7, and RP 64.2, respectively, were averaged to represent historic traffic volumes on MT 200 in the Fairview area. Historic AADT volumes from short-term counters located on ND 200 and ND 58 were downloaded from the NDDOT webpage. Historic traffic volumes on MT 200, ND 200 and ND 58 in the Fairview area are illustrated in Figure 3. Figure 4 illustrates historic truck traffic volumes. Trucks represent commercial vehicles designated as FHWA types 5-13.

Figure 3. Historic Traffic Volumes



Source: MDT 2015, ND 2015 (http://www.dot.nd.gov/road-map/traffic/). W/O: west of; E/O: east of.

Figure 4. Historic Truck Traffic Volumes



Source: MDT 2015, ND 2015 (http://www.dot.nd.gov/road-map/traffic/). W/O: west of; E/O: east of.

AADT volumes increased relatively rapidly along MT 200, ND 200, and ND 58 during the 2010 to 2012 time period.

Annual Growth Rates and Projected AADT Volumes

Historic annual growth rates (AGRs) on MT 200, ND 200, and ND 58 were determined through a review of traffic count stations near Fairview. Historic AGRs on MT 200, ND 200, and ND 58 were calculated using a compound annual growth rate calculation.

Projected traffic volumes were determined based on a review of traffic volume growth trends identified in the 2012 report entitled, *An Assessment of County and Local Road Infrastructure Needs in North Dakota,* prepared by the Upper Great Plains Transportation Institute (UGPTI), North Dakota State University, and the 2013 report entitled Impacts of Bakken Region Oil Development on Montana's Transportation and Economy, prepared by MDT. The reports identify traffic volume growth trends related to oil industry development in the Bakken region using projection forecasts and traffic estimates. The increase in traffic volumes through Fairview is largely associated with growth in the oil industry in the Bakken region in northeastern Montana and northwestern North Dakota. The reports indicate traffic volumes on roadways serving the Bakken region will continue to grow until 2025. After 2025 the reports indicate traffic volumes on roadways serving the Bakken regions are expected to decrease. Other recent publications use different methodologies for forecasting traffic volumes, but the methodology used in these two reports appears appropriate for this planning study based on the information currently available. The 2012 and 2013 reports are considered conservative based on the pace of more recent development influenced by fluctuating oil prices.

Based on these published projections and review of historic growth trends, it appears that a reasonable high growth scenario for MT 200, ND 200, and ND 58 would be a 10% AGR between 2015 and 2020, a 5.0% AGR between 2020 and 2025, and a -7.0% AGR between 2025 and 2035. The decrease in AGRs between the 2015 to 2020 and the 2020 to 2025 time periods was chosen to represent a slowing of traffic volume growth before declining in 2025 to 2013 levels by the year 2035.

The same methodology was used to estimate future traffic volumes for moderate- and low-growth scenarios. AGRs of 7% (2015 to 2020), 4% (2020 to 2025), and -5% (2025 to 2035) were used for the moderate-growth scenario, while AGRs of 5% (2015 to 2020), 3% (2025 to 2025), and -4% (2025 to 2035) were used for the low-growth scenario.

Traffic conditions and anticipated transportation demands should be confirmed as any projects are forwarded from the study given the uncertainties of oil and gas development and associated growth within the study area.

Intersection Volumes

Two intersections were assessed within the study area, including the ND 200/ND 58 intersection and the MT 200/MT 201 intersection. Figures and tables presenting existing 2015 geometric configurations and intersection control, and AM and PM peak-hour turning movement volumes for years 2015, 2020, 2025, and 2035 are provided in Appendix B.

Segment Level of Service

Traffic conditions on transportation facilities are commonly defined using the Level of Service (LOS) concept. The Highway Capacity Manual (HCM) 2010 defines LOS based on a variety of factors to provide a qualitative assessment of the driver's experience. Within the study corridor, MT 200 and ND 200 fall under the HCM classification of a Class I two-lane highway, with the exception of the MT 200 segment through Fairview, which is considered an urban street section.

Six LOS categories ranging from A to F are used to describe traffic operations for two-lane and urban segments, with LOS A representing the best conditions and LOS F representing the worst. LOS F exists whenever demand flow exceeds the capacity of the segment, operating conditions are unstable, and heavy congestion exists. Highway Capacity Software (HCS) Version 2010 was used to analyze LOS for Class I two-lane highway segments in the corridor. Synchro 8 was used to analyze LOS for urban street sections.

The percentage of heavy vehicles in the traffic stream was considered as part of the analysis. Heavy vehicles are defined as vehicles that have more than four tires touching the pavement. Trucks, buses, and recreational vehicles (RVs) are examples of heavy vehicles. Trucks cover a wide range of vehicles, from lightly-loaded vans and panel trucks to the most heavily-loaded haulers.

Table 5 presents the results of the operational analysis for worst peak-hour/directional existing (2015) and projected (2020, 2025, 2035) conditions using projected high-growth-scenario traffic volumes. LOS values represent estimated operational conditions within each specified corridor segment.

Table 5. Operational Analysis Results (2015)

MT/ND 200Segment		Condition	LOS
A	MT 200 2-lane Segment South of Fairview	Existing 2015	**C**
		Projected 2020	**D**
		Projected 2025	**D**
		Projected 2035	**C**
B	MT 200 4 Lane Segment in Fairview	Existing 2015	B
		Projected 2020	B
		Projected 2025	B
		Projected 2035	B
C	MT 200 2-lane Segment Between 2nd Street and ND 58	Existing 2015	**D**
		Projected 2020	**D**
		Projected 2025	**E**
		Projected 2035	**D**
D	ND 200 2-lane Segment East of ND 58	Existing 2015	B
		Projected 2020	B
		Projected 2025	**C**
		Projected 2035	A

Source: DOWL, 2015. LOS reported for worst condition.

The MDT target for principal arterial-non interstate facilities (MT 200) is LOS B. NDDOT has defined a minimum acceptable LOS C at the ND 200/ND 58 intersection.

The two-lane segment of MT 200 south of Fairview and between 2nd Street and ND 58 currently operate at LOS C and D. Operations are projected to degrade to LOS D and E by 2025 with anticipated increases in traffic volumes.

Intersection Level of Service

The intersection of ND 58/ND 200 is currently a two-way stop-controlled intersection, with stop signs on the northbound and southbound approaches, however a roundabout is planned for construction in 2016. The intersection of MT 200/MT 201 is an all-way (four-way) stop-controlled intersection. LOS for unsignalized intersections and roundabouts is based primarily on the approach with the longest delay. Delay quantifies the increase in travel time due to the intersection control. It is also a surrogate measure of driver discomfort and fuel consumption. Six LOS categories ranging from A to F are used to describe traffic operations, with A representing the best conditions and F representing the worst.

Intersection LOS analyses were conducted using the procedures outlined in the HCM, as appropriate, and through the use of Synchro 8 traffic engineering analysis software based on HCM delay, capacity, and LOS calculations. Table 6 presents existing and projected delay for the worst approach and the corresponding LOS at the study intersections. LOS results for the ND 58 and ND 200 intersection are presented for a stop-controlled configuration for 2015 conditions, and a roundabout configuration for future conditions. Projected high-growth-scenario traffic volumes were used for the operational analysis. Projected LOS values presented in Table 6 may differ from project-specific operational analyses conducted for future planned projects in MT and ND due to differences in base volumes and assumed growth rates and patterns.

Table 6. Intersection LOS and Delay for 2015, 2020, 2025, and 2035 (AM/PM)

Intersection		Condition	AM Peak Hour		PM Peak Hour	
			Approach	LOS	Approach	LOS
1	ND 58 and ND 200[(1)]	Existing 2015	NB/EB	B	SB	B
		Projected 2020	EB	B	SB	**C**
		Projected 2025	EB	C	SB	**D**
		Projected 2035	EB	A	SB	A
2	MT 200 and MT 201	Existing 2015	NB	A	SB/EB	A
		Projected 2020	NB	B	SB	B
		Projected 2025	NB	B	SB	**C**
		Projected 2035	NB	A	SB/EB	A

Source: DOWL 2015. LOS based on the worst approach delay.
(1) 2015 conditions are reported for stop-controlled configuration; 2020, 2025, and 2035 conditions are reported for 1-lane roundabout configuration.

The MDT target for principal arterial-non interstate facilities (MT 200) is LOS B. NDDOT has defined a minimum acceptable LOS C at the ND 200/ND 58 intersection.

Origin-Destination Analysis

An origin-destination analysis was conducted to assess truck traffic patterns within the study area. This effort involved collecting data at points south, west, north, and east of Fairview using tube counters, cameras, and license plate readers (LPRs) for a three-day period in March 2015. Data within the peak period of interest was processed to produce an origin-destination matrix illustrating truck movement trends.

Figure 5 and Figure 6 illustrate these movements. The numbered circles (3, 4, 5, and 6) symbolize origin/destination points used for the study. Arrows are color-coded to indicate the path of travel for trips leaving from the origin points and arriving at the destination points. Numbers and percentages next to each arrow indicate truck trips for each origin point, with trips of the same color adding up to 100% of trips from a single origin point.

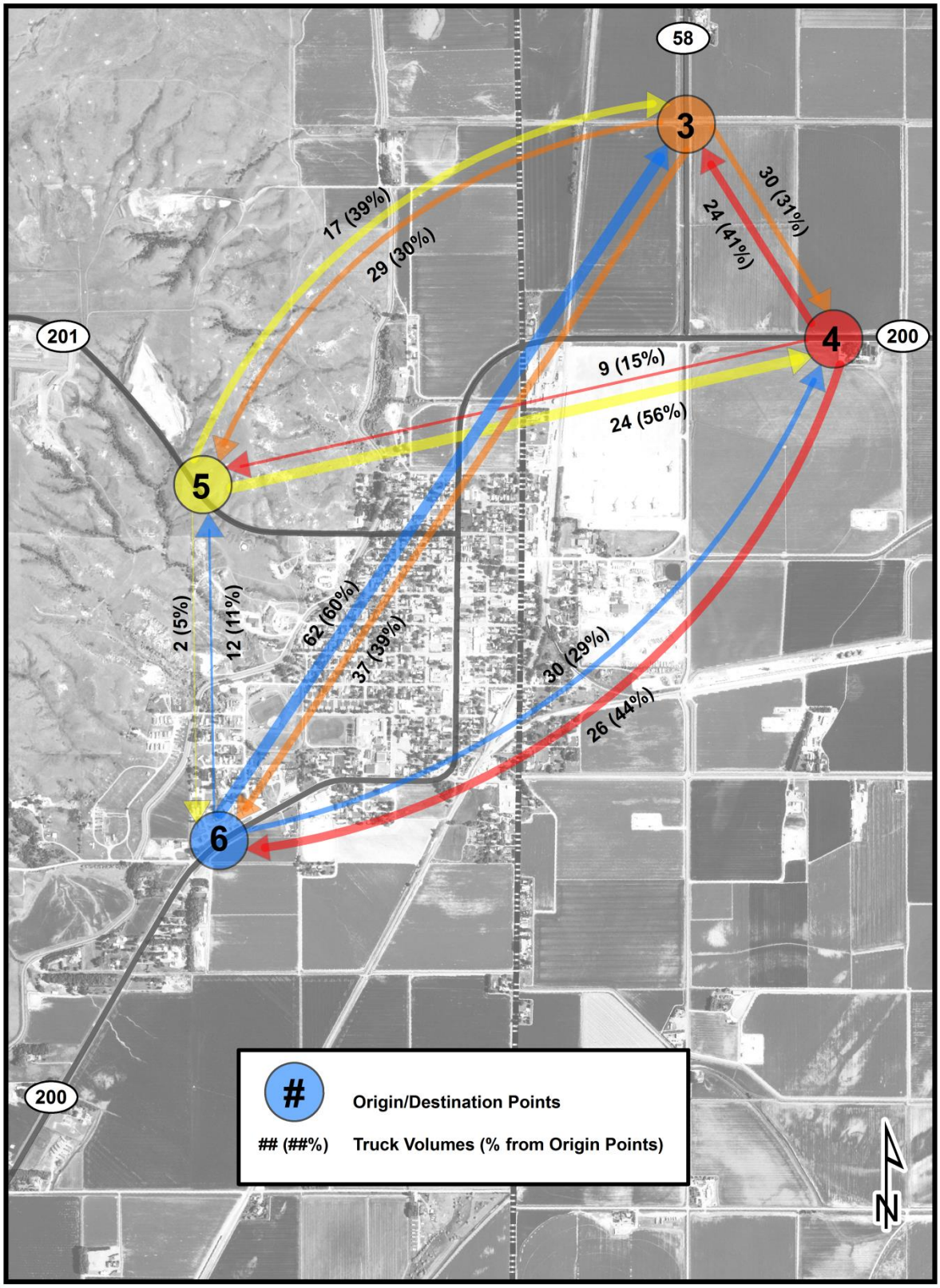
Table 7 summarizes movement trends, with bold text indicating the strongest movements.

Table 7. Truck Movement Trends (2015 – Peak Periods)

Time	Origin Point	Origin Relative to Fairview	Trends
6:00 to 8:30 AM	3	North (ND 58)	• Relatively equal movements (29 to 37, or 30% to 40% of AM trips from Point 3 to Points 4, 5, and 6).
	4	East (ND 200)	• Relatively equal northward and southward movements (24, or 41% of AM trips from Point 4 to Point 3, and 26, or 44% of AM trips from Point 4 to 6) • Limited westward movement (9, or 15% of AM trips from Point 4 to Point 5)
	5	West (MT 201)	• **Strong eastward movement** (24, or 56% of AM trips from Point 5 to Point 4) • Secondary northward movement (17, or 39% of AM trips from Point 5 to Point 3)
	6	South (MT 200)	• **Strong northward movement** (62, or 60% of AM trips from Point 6 to Point 3) • Secondary eastward movement (30, or 29% of AM trips from Point 6 to Point 4)
3:00 to 6:30 PM	3	North (ND 58)	• **Strong southward movement** (90, or 57% of PM trips from Point 3 to Point 6) • Secondary eastward movement (48, or 31% of PM trips from Point 3 to Point 4)
	4	East (ND 200)	• **Strong southward movement** (52, or 53% of PM trips from Point 4 to Point 6) • Secondary northward movement (35, or 36% of PM trips from Point 4 to Point 3)
	5	West (MT 201)	• Mostly northward movement (22, or 63% of PM trips from Point 5 to Point 3) • Secondary eastward movement (10, or 28% of PM trips from Point 5 to Point 4)
	6	South (MT 200)	• Mostly northward movement (45, or 61% of PM trips from Point 6 to Point 3) • Secondary eastward movement (23, or 31% of PM trips from Point 6 to Point 4)

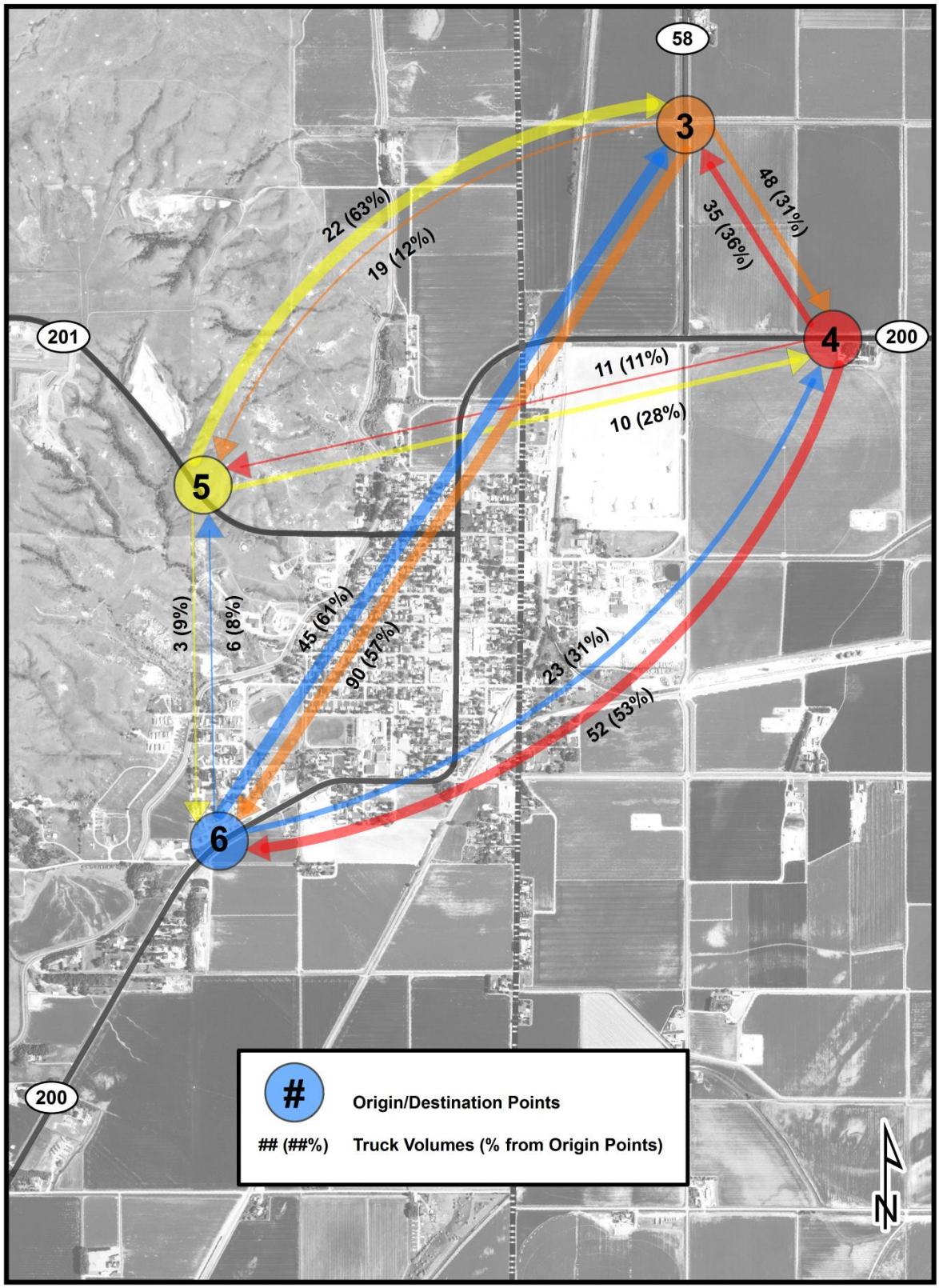
Source: IDAX Data Solutions, 2015. Bold text indicates strongest movements.

Figure 5. Origin-Destination Results (AM)



Source: DOWL, 2015. Data processed for peak period (3/3/2015 6:00am to 8:30 am).

Figure 6. Origin-Destination Results (PM)



Source: DOWL, 2015. Data processed for peak period (3/3/2015 3:00pm to 6:30pm).

Travel Time Analysis

An assessment of the travel time for vehicles on MT 200/ND 200 was conducted using SimTraffic 9 software traffic engineering analysis software. Traffic conditions on MT 200/ND 200 from CR 133 to ND 58 were modeled to identify travel time during the AM and PM peak hours for existing (2015) and projected (2020, 2025, and 2035) conditions. Results of this analysis are presented in Table 8.

Table 8. MT 200/ND 200 Travel Time

MT 200/ND 200 Segment		Travel Time (seconds)			
		AM Peak Hour		PM Peak Hour	
		NB/EB	SB/WB	NB/EB	SB/WB
CR 133 to ND 58	Existing 2015	305.5	306.8	300.5	316.5
	Projected 2020	312.2	313.1	304.6	324.7
	Projected 2025	321.7	318.5	310.0	329.8
	Projected 2035	304.6	304.9	306.3	314.3

Source: DOWL, 2015. Note: travel time analysis is not affected by the planned construction of a roundabout at ND 200/ND 58; analysis only considers the time required to reach intersection.

5.3 Environmental Conditions

The *Fairview Corridor Study Environmental Scan Report* was prepared in support of the study to identify environmental resource constraints and opportunities within the study area. Information was gathered in February 2015 from previously-published documents, websites, GIS data, and a field review conducted on February 25, 2015. The following sections summarize key information from the report.

Physical Environment

Soil Resources and Prime Farmland

Natural Resources Conservation Service (NRCS) soil surveys (ND053 and MT083) from both Richland County, Montana, and McKenzie County, North Dakota, indicate the majority of the study area is either farmland of statewide importance or prime farmland if irrigated. There is a clear distinction in the way each state has classified their soils, with prime farmland if irrigated primarily occurring in Montana and farmland of statewide importance primarily occurring in North Dakota.

Improvement options should consider impacts to farmland and farmland infrastructure, and potential effects if farmland is removed from production. Any forwarded improvement options that require right-of-way within identified farmlands and are supported with federal funds will require a CPA-106 Farmland Conversion Impact Rating Form for Corridor Type Projects completed by MDT or NDDOT and coordinated with NRCS. The NRCS uses information from the impact rating form to keep inventory of prime and important farmlands within each state.

Geologic Resources

Tertiary Tongue River Member of the Fort Union Formation (Tftr), Quaternary alluvial terrace deposits (Qat), and Quaternary alluvium (Qor) make up a majority of the study area. Yellow, orange, or tan, fine- to medium-grained sandstone with thinner interbeds of siltstone and mudstone (Tftr) primarily make up the steeper slopes in the western portion of the study area, and is typical of the badland topography found in eastern Montana and western North Dakota. Alluvium and other unconsolidated deposits are found primarily below the steeper sandstone slopes within the central and eastern portions of the study area. These deposits include a mixture of gravel, sand, silt, and clay (Qat and Qor), and are associated with the plains and terraces of modern rivers and streams. Pockets of glacial till (Qgt) make up the higher elevations on the western slopes.

Typical surficial soils in the study area are AASHTO Soil Classification A-7-6, A-6, and A-4 (Unified Soil Classification CH, CL, and ML). In general, study area soils are considered to have moderate frost susceptibility which can affect pavement and other foundation engineering design. Moisture-sensitive soil can be expected and may affect future construction activities. Future cut slope and embankment design associated with forwarded improvements will need to incorporate stability, erosion, and settlement evaluation due to the prevalence of fine-grained soil in the study area.

No faults have been mapped within or near the study area in eastern Montana or western North Dakota. In addition, the study area, along with most of eastern Montana and western North Dakota, is located within a Seismic Hazard Zone that is not prone to liquefaction and intense ground motion.

In 2005, MDT completed a statewide study of rockfall hazards and mitigation measures. The Rockfall Hazard Rating System report did not identify any sites within the study area that were identified as potential hazards. A similar hazard study has not been conducted by NDDOT.

Surface Waters

There is very little surface water within the study area. One unnamed stream crosses the northwestern corner of the study area, and some small ephemeral drainages cut through the western sandstone slopes. The Main Canal, which flows south to north through the study area, is a large surface water shown on U.S. Geological Survey (USGS) topographic maps as a stream. However, the Main Canal is a man-made irrigation feature that flows seasonally and is discussed in more detail in a later section of this report. No streams or drainages were identified in the eastern portion of the study area (within North Dakota). Freshwater ponds within the study area include a small man-made pond located in East Fairview (North Dakota) and the Town of Fairview sewer lagoons located on CR 133.

Improvement options should consider potential impacts to surface waters and the costs that may be associated with permitting and potential mitigation. Coordination with federal, state, and local agencies may be necessary, as work within these surface waters may be regulated by the USACE, including both the Montana and North Dakota Regulatory Offices; Montana Fish, Wildlife & Parks (FWP); the Montana Department of Environmental Quality (DEQ), and the North Dakota Department of Health (NDDH). In addition, forwarded improvement options may trigger the need to obtain coverage under the Montana Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Construction Activity, the North Dakota Pollutant Discharge

Elimination System General Permit for Storm Water Discharges from Construction Activities, and comply with the requirements outlined in MDT's and NDDOT's Storm Water Management Plans.

Total Maximum Daily Loads

The study area (including North Dakota and Montana) is located within the Lower Yellowstone Watershed (hydrologic unit code [HUC] 10100004). Neither the DEQ nor the NDDH, in their Integrated Section 304(b) and Section 303(d) Water Quality Reports, list any waterbodies within the study area as having an impairment. The closest downstream impaired water is the Yellowstone River, which DEQ lists as impaired for stream alteration, chromium, copper, fish-passage barrier, lead, nitrogen, phosphorus, sediment, total dissolved solids, and pH. The NDDH does not list the Yellowstone River as impaired.

Should improvement options be advanced from this study, it will be necessary to consider downstream TMDL standards within the Yellowstone River and potential impacts to water quality within receiving waterbodies in the study area.

Wild and Scenic Rivers

There are no wild or scenic rivers within the study area.

Wetlands

No large emergent, shrub-scrub, or forested wetlands were observed during the February 25, 2015, field review; however, dead wetland vegetation, including sedge (*Carex* sp.), horsetail (*Equisetum* sp.), and cattail (*Typha angustifolia*), was observed along the edges of several irrigation ditches/canals within the study area. Based on previous delineations conducted for the MDT Sidney to Fairview project, narrow emergent wetland fringe is common along the banks of irrigation ditches/canals within the study area vicinity and emergent wetland fringe would likely be found to some degree along most irrigation ditches/canals within the study area.

Improvement options should consider potential impacts to wetlands and the costs that may be associated with permitting and potential mitigation. Future wetland delineations would be required if improvement options are forwarded from the study that could potentially impact irrigation ditches where fringe wetland may occur. Future improvements would need to incorporate project design features to avoid and minimize adverse impacts to wetlands to the maximum extent practicable. Work within USACE jurisdictional wetlands would require a Clean Water Act 404 permit. Unavoidable impacts to wetlands must be compensated through mitigation in accordance with USACE regulatory requirements and requirements of Executive Order 11990. However, the 2005 USACE Montana Mitigation Ratio Policy states that relocation of regulated ditches and canals that support wetlands will be considered self-mitigating (compensatory mitigation not required) if the new channel is dimensionally similar in cross-section and profile, and in the same type of substrate. Mitigation would need to be sought early in the planning process, as MDT currently does not have wetland mitigation sites within the Lower Yellowstone Watershed. The locations of NDDOT wetland mitigation banks are not available.

Groundwater

There are 4,467 wells on record in Richland County, Montana, and 1,207 wells on record in McKenzie County, North Dakota. Approximately 164 of these wells are located within or immediately adjacent to the study area, particularly within and surrounding the town of

Fairview. As of February 2015, the newest well on record for Richland County was February 20, 2015, and the oldest well on record was from January 1, 1890. The majority of wells within Richland County (approximately 2,671) are at a depth of 0 to 99 feet. The deepest well within the study area (Richland County) is at 1,360 feet. The wells in Richland and McKenzie Counties have widely varying uses, with stock water being the most common, followed by domestic use. Several public water supply and groundwater wells occur within Fairview.

Impacts to existing wells will need to be considered during future project development of improvement options. While there are fewer groundwater wells to the east and southeast of Fairview, impacting one of these wells may be costly if replacement is required.

Irrigation

The study area is within the Lower Yellowstone Irrigation District. Irrigation water is supplied to farmers and ranchers in the area through the Lower Yellowstone Project, a system of canals, laterals, ditches, and drains that crisscross portions of eastern Montana and western North Dakota. Water is diverted from the Yellowstone River by the Yellowstone Diversion Dam, 18 miles below Glendive, Montana. The diverted water flows into the Main Canal, which is a 71.6-mile long canal that flows northeasterly along the western edge of the Yellowstone River Valley to its confluence with the Missouri River. Approximately 225 miles of laterals distribute water to project lands. Seepage is collected and disposed of by 118 miles of irrigation drains. Irrigation waters are distributed primarily through a gravity flow system. The Lower Yellowstone Project provides irrigation water to approximately 52,133 acres of land lying along the west bank of the Yellowstone River.

Within the study area, the Main Canal flows south to north along the western edge of the Yellowstone River Valley and the town of Fairview. Six lateral ditches flow west to east though the study area, providing diverted irrigation water to farmland in the area. A number of farm turnouts divert water from the laterals to individual farms via a smaller ditch network that provides water for flood irrigation or use of large pivots. Two irrigation drains cross through the eastern portion of the study area collecting irrigation waste water and seepage, which is discharged back into the Yellowstone River. The Main Canal, the six lateral ditches, and the two irrigation drains all discharge water back into either the Missouri or Yellowstone Rivers. Irrigation ditches/canals with return flow to a water of the United States are considered jurisdictional by the USACE.

Irrigation facilities are likely to be impacted by improvement options forwarded from the study, given the extent of irrigation infrastructure within the study area. Impacts to irrigation facilities should be avoided to the greatest extent practicable, particularly where large pivots are located as these are costly to mitigate. Any future modifications to existing irrigation canals, ditches, or drains would be redesigned and constructed in consultation with the irrigation district, the Board of Reclamation (BOR), and owners to minimize impacts to agricultural operations. In addition, work within these irrigation ditches/canals may be regulated by the USACE Montana and North Dakota Regulatory Offices, the DEQ, and the NDDH.

Floodplains and Floodways

Federal Emergency Management Agency (FEMA)-issued flood insurance rate maps (FIRM) for Richland County, Montana, and preliminary flood hazard data maps for McKenzie County, North Dakota, indicate that three floodplain zones exist within the study area:

Zone A: Special Flood Hazard Area (SFHA) - 100-Year Flood, No Base Flood Elevations Determined;

Zone D: Flood Hazards Undetermined, but possible; and

Zone X: Areas Outside the 500-Year Flood.

Flood Zone A designated within Richland County, Montana, stops at the North Dakota border. A FIRM map does not currently exist for this portion of McKenzie County, North Dakota. Preliminary flood hazard data indicates "no special flood hazard areas;" however, this delineated Flood Zone A could extend into North Dakota.

Improvement options crossing the delineated flood hazard area would result in the placement of fill within the regulatory floodplain. Impacts to floodplains would need to be identified and evaluated, and coordination with Richland County, Montana, and McKenzie County, North Dakota, would be required to obtain necessary floodplain permits for project construction. Coordination with both counties would likely be required for improvement options with undetermined flood hazard areas, or areas outside of the 500-year flood; however, floodplain permits would not be anticipated.

Air Quality

The study area is not located in a non-attainment area for any criteria pollutants. Additionally, there are no nearby non-attainment areas. As a result, special design considerations are not anticipated in future project design to accommodate air quality issues.

Depending on the scope of improvements being considered within the study area, an evaluation of mobile source air toxics (MSATs) may be required. MSATs are compounds emitted from highway vehicles and off-road equipment which are known or suspected to cause cancer or other serious health and environmental effects.

Hazardous Substances

Based on available information obtained in February 2015, ten active underground storage tank (UST) sites, eight leaking underground storage tank (LUST) sites, four petroleum release fund claims, eight abandoned or inactive mine sites, four open cut permits, the town of Fairview sewer lagoon, several oil and gas wells and horizontal drilling paths, one gas transmission pipeline, and three reported oil spills were identified within the study area.

Additional investigation regarding the precise locations of the USTs may be warranted if improvement options are forwarded from this study. Improvement options located where LUSTs, oil and brine spills, or contaminated soils are encountered would likely require removal and cleanup in accordance with MDT (107-22) and NDDOT (203-P01) special provisions regarding contaminated soil and applicable federal, state, and local laws and regulations. This cleanup may result in additional project construction time and cost.

Improvements near oil wells and improvements crossing the underground natural gas transmission pipeline would require additional investigation and coordination with oil and gas representatives.

Biological Resources

Vegetation

The study area is within the larger River Breaks ecoregion of the Northwestern Great Plains. The River Breaks ecoregion is composed of very highly dissected terraces and uplands that descend to the Missouri and Yellowstone river systems. This ecoregion is dissected to a greater extent than the surrounding ecoregions by uncultivated areas, wooded draws and a number of ephemeral drainages that occur between rolling hills, all of which provide valuable winter and summer wildlife habitat.

Within the study area itself, Montana and North Dakota land cover maps show the area is dominated by a combination of deciduous-dominated draws and ravines, cultivated crops, Great Plains sand prairie, Great Plains mixed prairie grasslands, and pasture/hay habitat. Other land cover in the study area includes quarries, strip mines and gravel pits; developed open space; high-intensity residential; low-density residential; and commercial/industrial.

A large portion of the study area has been disturbed either by cultivation; road and highway construction; and residential, oil, commercial, and industrial development. Cultivated crop land includes crops such as sugar beets, corn, and alfalfa. Other plant species observed within the study area and vicinity during the February 2015 field visit and during previous field visits conducted in the Sidney/Fairview area (2013) include eastern cottonwood (*Populus deltoides*), Russian olive (*Elaeagnus angustifolia*), smooth brome (*Bromus inermis*), crested wheatgrass (*Agropyron cristatum*), common dandelion (*Taraxacum officinale*), and showy milkweed (*Asclepias speciose*). Various landscape and ornamental plants are found around residences and within the town of Fairview.

Native vegetation, which is primarily located along the western study area limits, and large stands of trees and shrubs should be considered during improvement option identification to minimize removal of native vegetation and mature trees and shrubs. If improvement options are forwarded from the study, practices outlined in MDT standard specifications (including staking construction limits, avoiding damage to vegetation not designated for removal, and replacing damaged or destroyed vegetation) and NDDOT standard specifications (which include designating construction limits and vegetation to be preserved) should be followed to minimize adverse impacts to vegetation.

Noxious Weeds

The Invaders Database System lists seven weed species considered noxious in Montana and 55 exotic species for Richland County, Montana. North Dakota Department of Agriculture Weed Surveys for McKenzie County list 13 weed species considered noxious in North Dakota, all of which are also exotic species. From previous vegetation surveys conducted in the Sidney/Fairview area (2013), several noxious weeds have been observed.

If improvements are forwarded from the study, field surveys for noxious weeds should commence prior to any ground disturbance and coordination with the Richland County Weed Control Board and the McKenzie County Weed Control Board should occur. To reduce the spread and establishment of noxious weeds and to re-establish permanent vegetation, disturbed areas should be seeded with desirable native plant species.

General Wildlife Species

Mammals

A majority of the study area has been heavily disturbed by various agricultural practices and residential development; however, small wooded draws still bisect the western portion of the study area. These small, wooded drainage corridors still possess specimens of the native vegetation that was likely present in this area prior to its conversion to agriculture. These corridors are important wildlife corridors for mammals moving from the upper badlands down to the Yellowstone River valley.

The study area and vicinity are home to a number of mammal species including, but not limited to, white-tailed deer, mule deer, raccoon, striped skunk, porcupine, bobcat, beaver, muskrat, deer mouse, and northern grasshopper mouse. It is assumed that most species identified in the Montana portion of the study area would likely be found in the North Dakota portion of the study area as well.

White-tailed and mule deer are prevalent within the study area and the surrounding vicinity. The study area and general vicinity are considered either primary, general, secondary, and/or winter range for mule deer, white-tailed deer, pronghorn antelope, and black-tailed prairie dog.

A review of the MDT Maintenance animal incident database between December 21, 2004, and November 15, 2012, indicates that at least five animal carcasses were collected along the existing MT 200 corridor (RP 61.5 to RP 64.1). All five animal carcasses were white-tailed deer. Carcass data may not accurately reflect animal-vehicle conflicts throughout the corridor, and not all carcasses result from vehicle collisions. Additionally, recently-approved legislation has permitted the collection of game animals killed on MT roadsides for personal consumption. These factors may affect collections and incidents reported in the MDT maintenance animal incident database. NDDOT does not currently have a carcass data program.

If improvement options are forwarded from the study, impacts to habitat and other wildlife mitigation strategies should be considered during the project development process. Additional coordination with the FWP and North Dakota Game and Fish (NDGF) area wildlife biologists should be undertaken for local expertise in the study area.

Amphibians and Reptiles

Amphibian species known to occur within the study area and vicinity include, but are not limited to, the northern leopard frog and the plains gartersnake. No observation data is currently available for North Dakota.

Birds

The conversion of the study area to agricultural, commercial, and residential use has greatly reduced the native vegetation in the area. Nesting habitat for bird species is limited to pockets of native grassland and wooded draws that primarily occur within the western portion of the study area, landscaped trees and shrubs in residential/commercial areas, and the occasional vegetated wind break that surrounds some of the homes in the study area. A grove of cottonwood trees is found at the corner of CR 133 and MT 200.

More than 61 species of birds are documented with the potential to occur and nest in the study area. These species include representative songbirds, birds of prey, waterfowl, owls, and shorebirds. A portion the study area and vicinity is within the distribution range for sharp-tailed grouse. No observation data is currently available for North Dakota; however, it is assumed that most species listed in the Montana portion of the study area would likely be found in the North Dakota portion of the study area as well.

No bald eagle nests are located within the study area. The closest nest recorded is located over ten miles southeast of Fairview on the Yellowstone River; however, there is potential for bald eagles to forage and travel through the study area. Bald eagle nest data for North Dakota is not available. ND sources indicate the study area and surrounding vicinity are primary golden eagle breeding range.

Any improvements forwarded from this study should consider potential impacts to bird nesting and foraging habitat and the presence of unknown or future bald and golden eagle nests. The disturbance or removal of trees or structures associated with nesting birds may need to be scheduled to take place outside of the typical nesting season of April 15 to August 15.

Fisheries

Surface waters within the study area primarily include seasonal irrigation ditches and canals, small ephemeral drainages, and roadside drainage, which are not considered suitable habitat for aquatic species. The closest water bodies that support fisheries are the Yellowstone River (approximately two miles east of the study area) and the Missouri River (approximately six miles north of the study area). Given that the source of water for the Main Canal is the Yellowstone River, which then outlets at the Missouri River, some fish may be present in the Main Canal despite efforts by the BOR, the Lower Yellowstone Irrigation District, and FWP to prevent fish entrainment. Some individual fish may make their way from the Main Canal down the smaller irrigation ditches during the summer irrigation season. However, general irrigation practices likely affect these small populations to some extent when conveyance is ceased each fall**.**

Threatened and Endangered Species

No T&E species occurrences have been documented within the study area, and no critical habitat for T&E species occurs within the study area; however, three T&E species have been documented as occurring outside of the study area in the general vicinity. These species include the least tern, whooping crane, and pallid sturgeon. No observation data is currently available for North Dakota. Given the high degree of disturbance and lack of suitable habitat, T&E species listed for both counties would likely not be found within the study area.

No suitable habitat for greater sage-grouse is found within the study area; however, the study area sits along the border of the USFWS Sage-Grouse Great Plains Management Zone.

While T&E species are not likely to occur within the study area, improvements forwarded from the study should consider potential effects to T&E species during the project development process. As federal status of protected species changes over time, reevaluation of the listed status and afforded protection to each species should be completed prior to issuing a determination of effect relative to potential impacts. Recommendations outlined in Montana's sage-grouse conservation plan should also be taken into consideration during development of improvement options.

Species of Concern and Species of Conservation

Ten Montana species of concern (SOC) are documented within the vicinity of the study area, primarily along the Yellowstone River. Several of the SOC documented in Montana are also considered North Dakota species of conservation (SPC). According to the MDT area biologist, given the highly disturbed nature of the study area, the distance from the Yellowstone River, and the limited aquatic resources within the area, SOC and SPC would likely not be present within the study area due to lack of suitable habitat and human-based activities. In addition, while the greater sage-grouse is not documented within the study area or study area vicinity, the study area is adjacent to the USFWS Sage-Grouse Great Plains Management Zone.

A thorough field investigation for the presence of SOC and SPC should be conducted if improvement options are forwarded from this study. If present, special conditions to the project design or during construction should be considered to avoid or minimize impacts to these species. Recommendations outlined in Montana's sage-grouse plan should also be taken into consideration during identification of improvement options.

Social and Cultural Resources

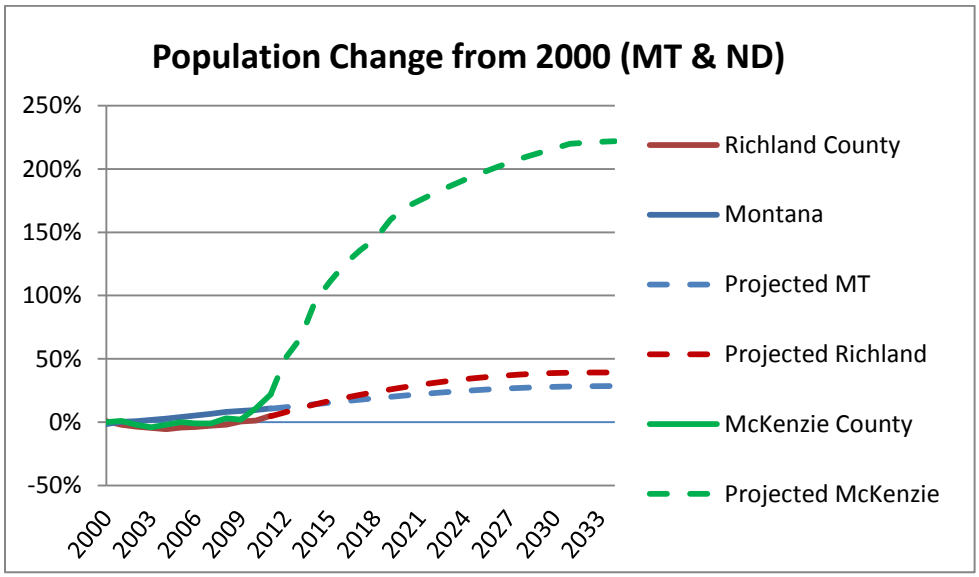
Demographics

The percentages of minority and low-income populations within the study area are consistent with or below the corresponding percentages for Richland and McKenzie Counties, and for Montana and North Dakota.

Populations in eastern Montana and western North Dakota, for the most part, have been declining in recent decades, with the exception of communities near significant oil formations. Even many of these communities were struggling with regard to economic and population trends until the last decade. With more recent technological advances in oil extraction (i.e., horizontal hydraulic fracturing, or "fracking"), many communities in eastern Montana and in North Dakota have seen dramatic changes resulting from oil extraction. As the rest of the country has slowly pulled out of recession, areas near the Bakken have seen unprecedented growth in recent years. Fairview and the surrounding areas are no exception.

As of February 2015, the populations of both Richland and McKenzie Counties had seen substantial growth since the last census in 2010. Fairview's population has grown approximately 12% since 2010. Figure 7 below shows population growth and projections.

Figure 7. Historic and Forecast Population



Source: MT and Richland County estimates are provided by MT Dept. of Commerce EREMI projections. McKenzie County data is derived from "Williston Basin 2012" Study by North Dakota State University's School of Agribusiness and Applied Economics as well as historical Census estimates.

The population of McKenzie County, North Dakota, has increased by more than 100% since 2000, and is projected to double again by the year 2030. Richland County, Montana, has also seen substantial growth, although of a lesser magnitude. Since 2010, the population of Richland County has grown by more than 15% after numerous years of decline. This growth rate is projected to peak at 40% above the 2000 population in year 2033, as compared to 28% for Montana as whole in 2033.

Housing and Income

As of February 2015, the housing market was unable to keep up with demand as a result of oil workers moving to the Fairview region. Total housing demand (both temporary and permanent) is expected to peak in 2020, according to research by North Dakota State University. The percentage of vacant homes/apartments in Richland County is 9.6%, compared to 15.8% for the rest of Montana.

Median household income in Richland County ($56,050) is 23% higher than the Montana average ($45,456). McKenzie County's median household income ($61,893) is almost 20% higher than North Dakota as a whole.

Economic Conditions

Agriculture has historically been the most predominant industry in both Richland and McKenzie Counties. Energy exploration has boomed at times and busted at others, including an increase in the 1970s and 1980s. More recently, advancements in horizontal hydraulic fracturing technology have resulted in increases in accessible oil reserves in the Bakken region and an oil boom larger than those in the past. This has resulted in an increase in jobs, both directly and indirectly related to oil extraction.

The Richland County, Montana, economic base includes oil and coal extraction and agriculture. Coal extraction in Richland County is not located in the immediate Fairview

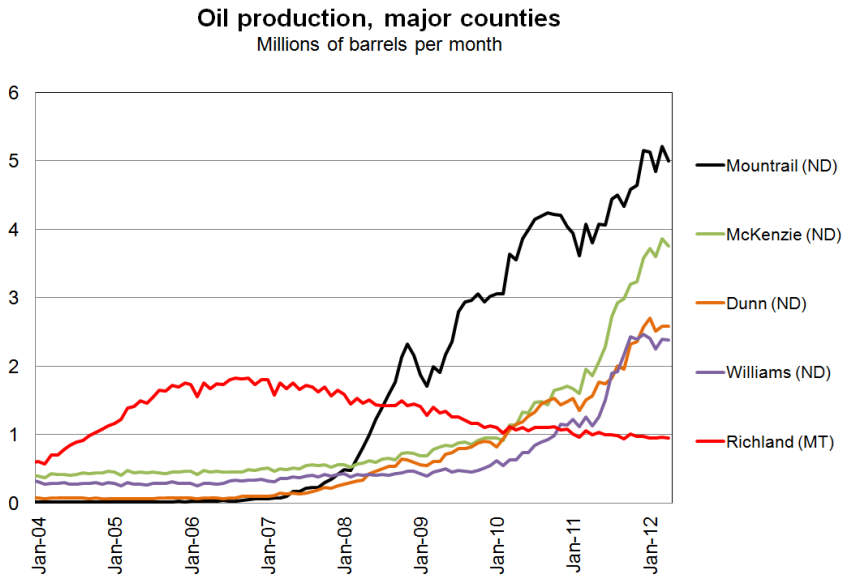
vicinity. The Savage Mine is located approximately twenty miles south of Sidney, and is a substantial producer of lignite coal (about 350,000 tons annually). In terms of oil production, the Elm Coulee oilfield has been a crucial element to the economy since the early 2000s. Elm Coulee is located primarily in Richland County, just southwest of the study area. It extends northwest to southeast through the county. The construction industry is benefitting from mining and oil production as a result of housing and other oil-related infrastructure development. Transportation industries are also benefitting from increased demand for transporting materials such as fracking sand or oil produced from the wells. As with the rest of Montana and the other Great Plains states, farming and ranching have strong roots in the region. The highest grossing agricultural products for Richland County include wheat, alfalfa, sugar beets, and beef cattle.

As of February 2015, both Richland and McKenzie Counties had very low unemployment rates - 2.6% in Richland County and 1.7% in McKenzie County according to the Bureau of Labor Statistics. These are compared to Montana's unemployment rate of 4.6%, North Dakota's unemployment rate of 2.9%, and the United States' rate of 6.2%.

Oil Development

As of May 2014, according to North Dakota's Department of Mineral Resources, oil production in the North Dakota Bakken has exceeded thirty million barrels per month, equivalent to nearly one million barrels per day. If Montana is included, production is over a million barrels per day. The Minneapolis Federal Reserve reports that 2014 will be a record year for oil production in the Bakken, but oil production growth is beginning to lessen. Oil leasing activity has slowed considerably and the number of active oil rigs has leveled off, although the effects of this may not be seen for a few years. Growth over the past decade has been of great magnitude in most of the region, and housing, population, and other development are still catching up to oil production. Figure 8 shows growth in oil production by county through 2012.

Figure 8. Oil Production, Major Counties



Source: North Dakota Department of Mineral Resources and Montana Board of Oil & Gas Conservation

In the early to mid-2000s, Richland County, Montana, and Elm Coulee Oilfield were the highest producers of oil in the region, but production has been declining since 2007 when new fracking technology and vast reserves led to rapid growth in other counties. Currently, McKenzie County is second only to Mountrail in oil production with Richland at substantially lower levels. Williams County, just north of McKenzie County, and home to Williston, falls almost directly between McKenzie and Richland counties in terms of oil production. Williston is widely considered the hub of oil activity in the Bakken and provides the necessary amenities and services, including potential lodging, which many of the smaller towns do not. In Montana, Sidney is largely considered the hub of oil production despite lacking the oil production increases that North Dakota has seen recently. Although oil production may not be as high in the Montana Bakken, many of the impacts are still felt. Many oil-related trucks and workers from North Dakota pass through Fairview and then Sidney in route to Billings or other cities.

Land Use

Property maps for Richland County, Montana, and McKenzie County, North Dakota, show land within the study area as privately owned or owned by the county or the town of Fairview. No federal- or state-owned lands were identified. Land use within the study area is primarily agriculture, with commercial and residential uses centered within and around the town of Fairview. Several oil pads are located within the study area, including a large storage tank facility northwest of the ND 200 and ND 58 intersection. A railroad spur line and large material loading facility are also located in the study area to the east of Fairview. In addition, the town of Fairview sewer lagoons are located just north of CR 133 at the intersection with CR 356.

In general, the North Dakota portion of the study area is zoned residential, agricultural, commercial, and administrative zoning by township. Zoning maps for Richland County, Montana, are not available. Future land use growth areas for residential, commercial, and industrial use are located beyond the Fairview boundary. Residential growth areas have been identified for infill areas around new and existing developments. Commercial growth areas are identified along major transportation corridors, including arterial and collector streets, as well as state highways. Industrial growth areas are focused away from existing and planned future residential development.

Adjacent land ownership and use, including existing zoning and identified future growth areas, will need to be considered during the study process. This would include evaluating how proposed transportation improvements may affect future town of Fairview growth areas and McKenzie County zoning.

Recreational Resources

There are no state or federal public lands within or immediately surrounding the study area. Identified recreational resources include Sharbano Park (corner of MT 200 and 1st Street), the playground and sports field at the East Fairview Elementary School (301 2nd Street), and the sports fields and track at the Fairview High School (713 S. Western Avenue).

Depending on the location of future improvements forwarded from this study, coordination with officials having jurisdiction over the park and schools may be required to assess whether these properties should be protected under Section 4(f) of the U.S. Department of Transportation Act of 1966. Potential effects to any Section 4(f) protected recreational resources would also need to be considered and evaluated in accordance with Section 4(f).

National Land and Water Conservation Fund Act (LWCFA) Section 6(f) grants were used for four projects within the study area. No projects are located in North Dakota. All four projects are found in Montana, within the town of Fairview, at Sharbano Park.

Potential impacts to Sharbano Park would need to be considered if improvements are proposed near the park. Additional coordination with FWP would be necessary if improvements are forwarded from this study that could affect the park.

Cultural Resources

Several properties/sites within or adjacent to the study area are eligible for listing on the National Register of Historic Places (NRHP), including historic irrigation systems, historic railroads, historic residence/homestead/farmstead, and a historic energy development feature. Direct and indirect impacts (such as visual, noise, and access impacts) to eligible or listed properties would need to be considered if improvements options are carried forward. In addition, there are segments of the Lower Yellowstone Irrigation project that have not been surveyed, and there are a number of noted sites within the study area where eligibility has not been determined. A cultural resource survey for unrecorded historic and archaeological sites within the area of potential effect would need to be completed during the project development process. Known sites with undetermined eligibility and sites identified during future surveys would need to be assessed for listing eligibility on the NRHP. Concurrence from the Montana State Historic Preservation Office (SHPO) or the North Dakota SHPO on the eligibility determinations would need to be requested. Flexibility in design will be important to avoid and/or minimize impacts to any significant sites.

Noise

Traffic noise would need to be evaluated for future improvements forwarded from this study. Noise analysis is required for all Type I-classified projects. Type I projects involve construction of a highway on a new location or the physical alteration of an existing highway which significantly changes either the horizontal or vertical alignment or increases the number of through-traffic lanes.

Type I projects require a detailed noise analysis, consistent with FHWA requirements and MDT and NDDOT noise policies which include measuring ambient noise levels at selected receivers and modeling design year noise levels using projected traffic volumes. Noise abatement measures would need to be considered if noise levels approach or substantially exceed noise abatement criteria. The noise abatement measures must be considered reasonable and feasible prior to implementation and supported by the affected public.

Visual Resources

The study area is characterized as primarily agricultural, with low- and high-density residential areas, commercial and industrial areas, and a transportation network of roadways and railroads. The landscape towards the central and eastern edge of the study area is primarily flat, with agricultural fields and irrigation ditches extending out east, south, and north as far as the eye can see. Distant views of the cottonwoods along the Yellowstone River corridor are visible far to the east. In the center of the study area is the town of Fairview with its residential and commercial development. The western edge of the study area includes sandstone slopes that rise 200 feet from the Yellowstone River valley floor. Oil wells, with their continually moving pump jacks, are scattered throughout the area. While the study area has been highly disturbed through

years of agriculture, the rural and scenic landscape remains, offering aesthetically-pleasing views to residents and motorists.

Evaluation of the potential effects on visual resources would need to be conducted if improvement options are forwarded from this study.

6.0 Needs and Objectives

Needs and objectives for the study were developed based on existing and projected conditions within the corridor (including planned projects), input from the public and resource agencies, and coordination with the study advisory committee. Needs, objectives, and considerations are not listed in order of priority.

Need 1: **Accommodate existing and projected transportation demands within the study area.**

Objectives:
To the extent practicable:

- Meet desirable levels of service on roadway segments and at intersections through the 2035 planning horizon.
- Consider regional and local travel patterns.

Need 2: **Provide transportation facilities that safely support travel for all modes.**

Objectives:
To the extent practicable:

- Improve roadway and bridge elements to meet current design criteria.
- Improve continuity for pedestrian facilities on MT 200 within Fairview.
- Consider methods to reduce conflicts between local vehicular traffic and regional truck traffic.

Other Considerations

- Local planning efforts, planned projects, and potential future development in the study area.
- Potential impacts to railroad, utility, irrigation, and mining features.
- Potential adverse impacts to environmental resources that may result from improvement options.
- Funding availability.
- Temporary construction impacts.
- Construction feasibility and physical constraints.
- Seasonal variations in truck traffic.

7.0 Improvement Options

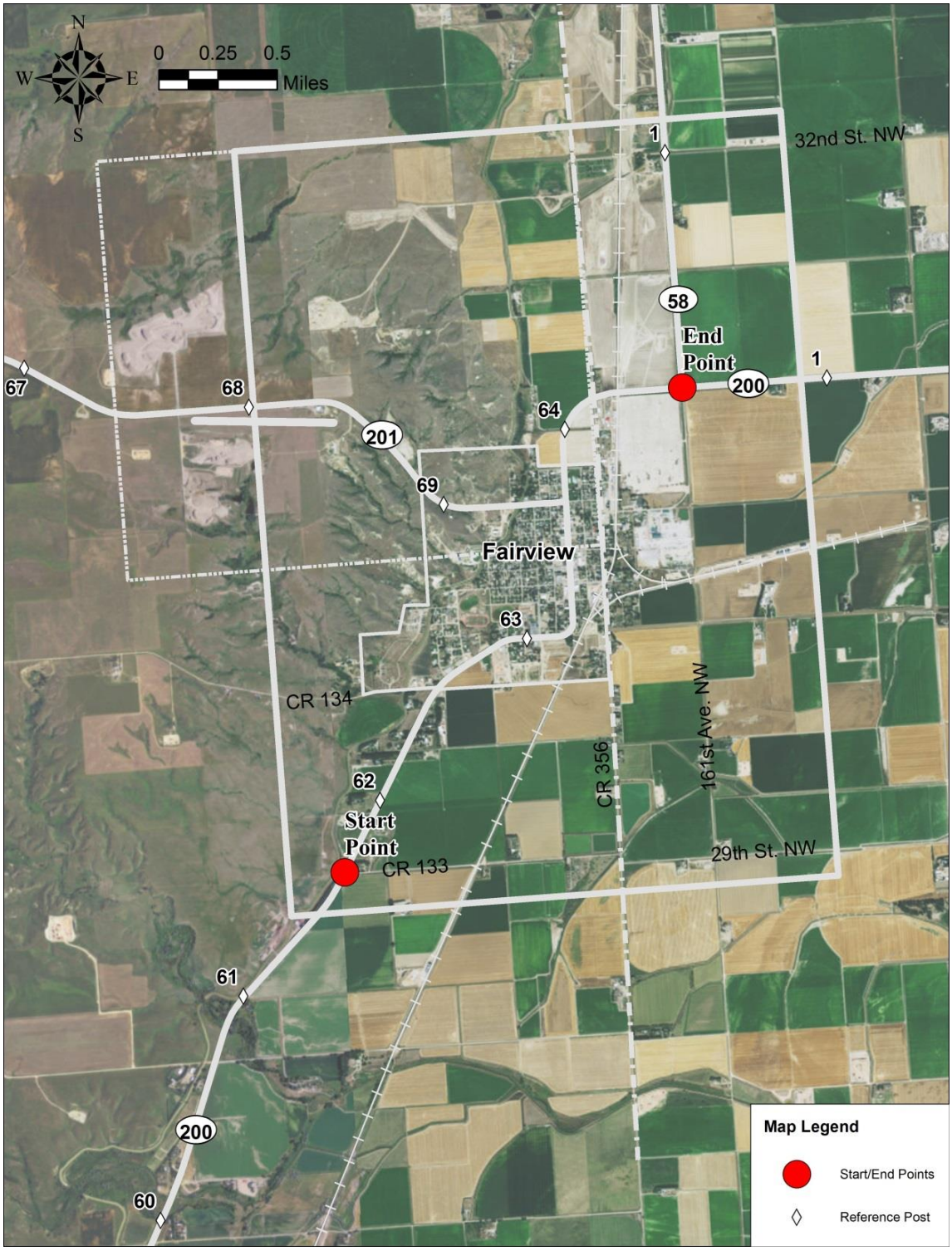
The improvement options identified with this study include potential alternative routes around the community of Fairview, as well as improvements to existing routes within the study area.

7.1 New Alignments

Quantm Modeling
Trimble Quantm Alignment Planning System (referred to as Quantm in this report) is a software tool that generates planning-level alignments satisfying geometric, social, environmental, and terrain constraints. The Quantm system considers millions of route options before delivering a range of options that best meet planning needs and objectives, while balancing social and environmental impacts against cost scenarios. Route optimization is an iterative process allowing users to refine alignments to minimize impacts and reduce costs, in consideration of public and stakeholder feedback. To build the Quantm model, all available data was synthesized into a GIS format. The available data included linear features, special zones, structure sizes, geometric standards, and the Digital Terrain Model (DTM).

Based on results of the origin-destination analysis conducted for the study, the alignment starting point was defined as the intersection of MT 200 and CR 133. The end point was defined as the intersection of ND 200 and ND 58. These locations are illustrated in Figure 9.

Figure 9. Start/End Points



Source: DOWL, 2015.

Geometric Parameters

Engineering design parameters are used to specify elements such as roadway width, design speed, vertical grades, and horizontal curvature for new roadway alignments modeled in Quantm. For the Fairview Corridor Planning Study, new alignments were required to conform to criteria for rural principal arterials (National Highway System – Non Interstate) as defined in the MDT Road Design Manual. An undivided facility with two travel lanes and 8-foot shoulders, level terrain type, and 70 mile-per-hour (mph) design speed was specified for this effort. The selected design criteria for new alignments provide continuity with the existing MT 200 roadway, which is classified as a non-interstate principal arterial.

Cost Parameters

Quantm incorporates cost parameters for road construction features and right-of-way acquisition. Depending on the parameter, costs may be assigned by volume, area, linear unit, or by feature. For consistency, cost values generated for the Fairview-West project were used in the Fairview Corridor Planning Study, as presented in Table 9.

Table 9. Cost Parameters

Cost Parameter	Assigned Cost
Global Cost Zones	Pavement (Template Section): $92/sf
	Earth movement:$0.50/cy/mi for haul and $3.50/cy for dump
	Fill: $2/cy
	Cut: $1.50/cy
	Bridge: $150/sf
Area Cost Zones	Agricultural land: $3,500/ac
	Commercial land: $15,000/ac
	Residential land: $1.50/sf plus an additional $200,000 per parcel for total acquisition if a residence is affected.

Source: Fairview-West Alternative Alignment Analysis, 2015, and MDT Quantm output data files, provided October 2015. sf: square foot, cy: cubic yard, ac: acre, mi: mile.

A global cost zone covers the entire study area. An area cost zone increases the cost of construction to account for land acquisition within a specifically defined area.

Quantm Constraint Inputs

Quantm allows users to define specific constraints that limit or increase the cost of potential new alignments. Constraints such as socially- and environmentally-sensitive areas can be protected by defining these areas as avoid zones, or modeled by incorporating associated costs for purchase or mitigation.

Avoid Zones

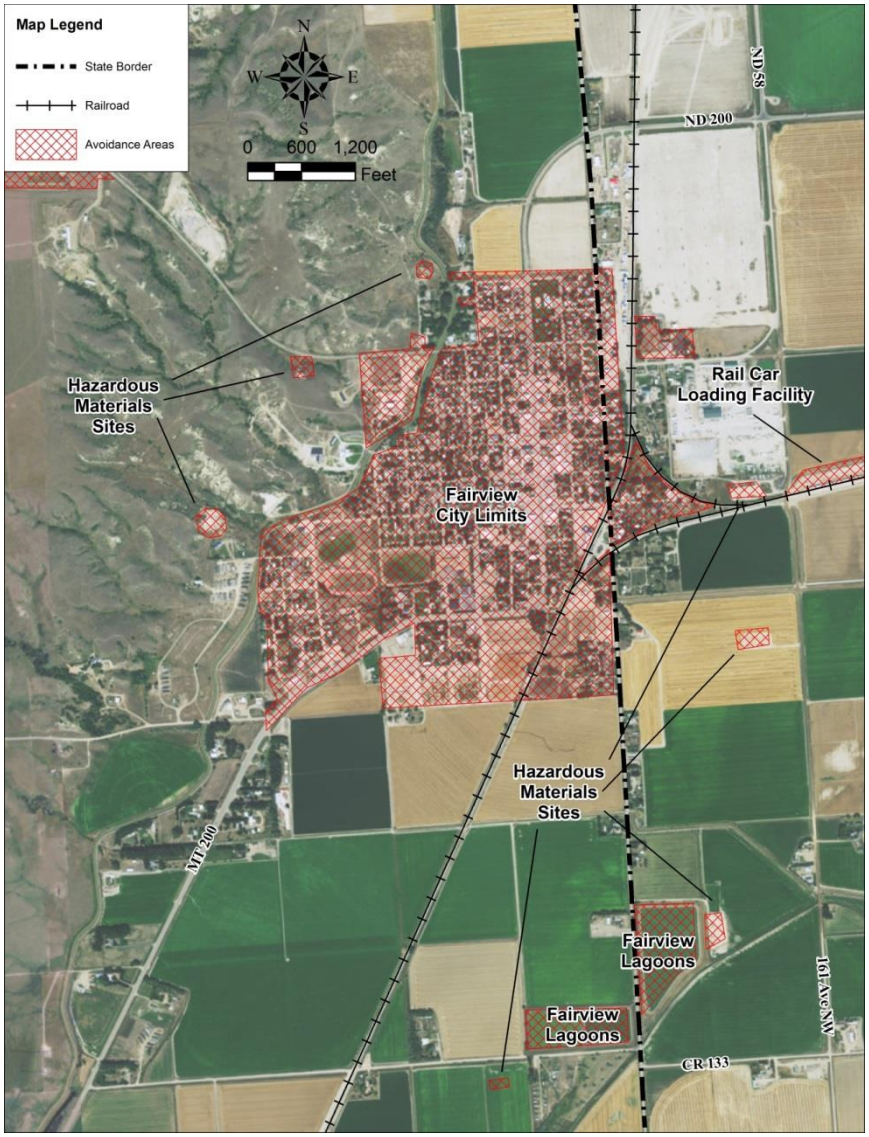
Avoid zones are assigned to areas of environmental and social importance that would be particularly difficult or costly to mitigate. Depending on the priority level assigned in Quantm, alignments will generally avoid entering these zones, which may result in increased alignment length and/or cost. Table 10 and Figure 10 present avoid zones defined for this study.

Table 10. Avoid Zones

Avoid Zone	Description
Fairview Limits	The intent of a new alignment is to provide an alternative to the existing MT 200 alignment within Fairview. By defining the area within the limits of Fairview as an avoid zone, new alignments are forced around the town.
Fairview Lagoons	The Fairview sewer lagoons are located just north of CR 133 at the intersection with CR 356.
Hazardous Materials Sites	A number of oils wells, injection disposal wells, and abandoned mines have been identified within the study area boundary. These features were modeled as avoid zones.
Rail Car Loading Facility	A railroad spur line and large material loading facility are located within the study area to the east of Fairview. This area was modeled as an avoid zone.

Source: MDT Quantm output data files provided October 2015.

Figure 10. Avoid Zones



Source: MDT Quantm output data files, provided October 2015.

Special Zones

A special zone is assigned to locations that would be more costly to mitigate compared to the default settings within the study area. Designation of a special zone increases the cost of construction within the zone boundary. Table 11 lists special zones defined for this study.

Table 11. Special Zones

Special Zone	Description
Irrigation Structures	Multiple irrigation structures including center pivots are located outside Fairview.
Wetlands	No large emergent, shrub-scrub, or forested wetlands were observed during the February 25, 2015, field review; however, dead wetland vegetation, including sedge, horsetail, and cattail, was observed along the edges of several irrigation ditches/canals within the study area.
At-grade Railroad Crossings	At-grade railroad crossings occur along the proposed eastern alignments. These crossings are located on County Road 133 and 161 Ave NW.

Source: MDT Quantm output data files provided October 2015.

Other Inputs

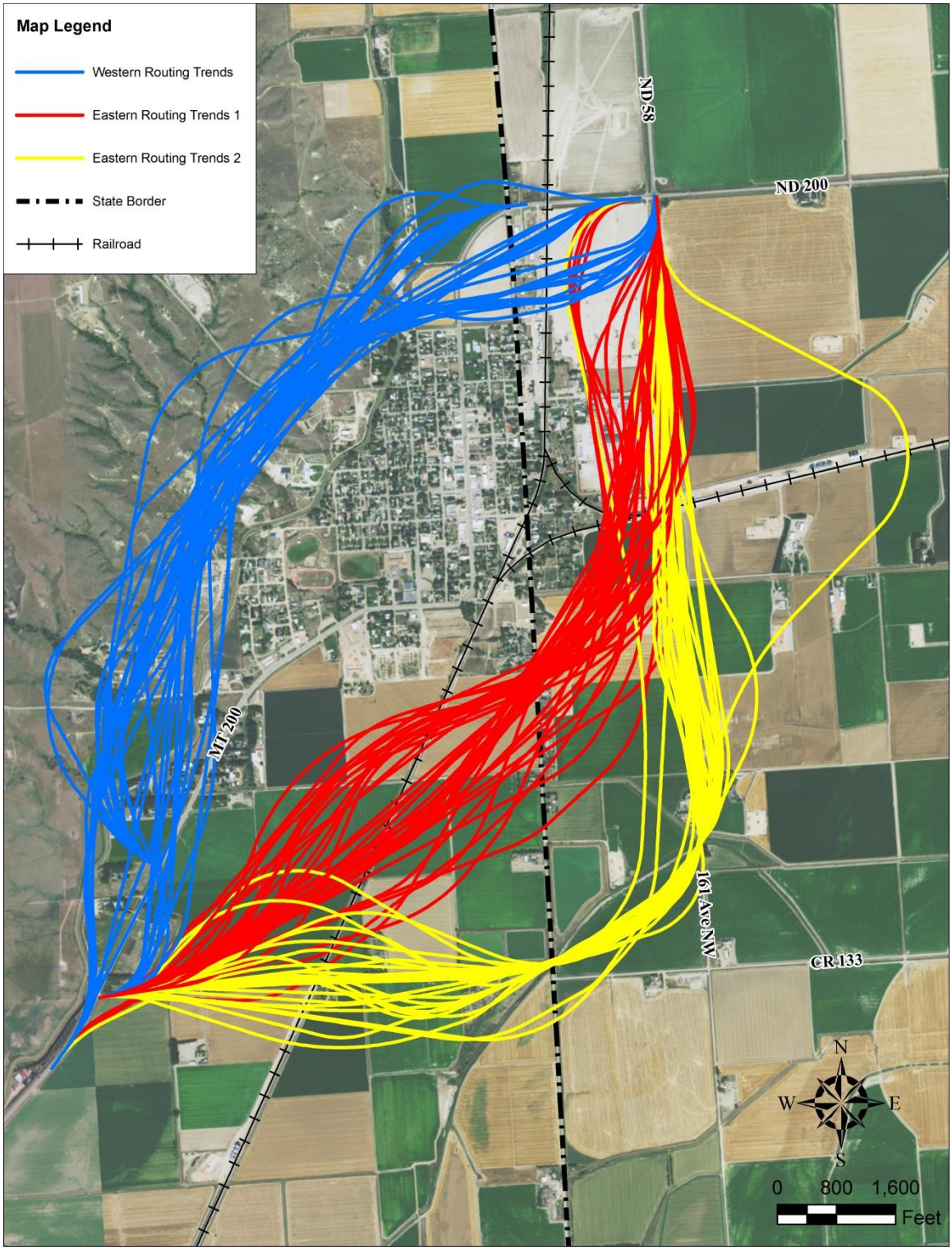
Quantm also considers other specific resource information gathered from publically-available data sources. The following data for both Montana and North Dakota was utilized to support the modeling effort.

- Airports and Railroads
- Cadastral
- Cultural Resources
- Floodplains
- Geology
- Groundwater Wells
- Hazardous Materials
- Irrigation
- Land Cover
- Land Use
- Riparian Areas
- Prime and Unique Farmland
- Recreational Section 4(f) Resources
- Roads
- Surface Waters and Wetlands

7.2 Alternative Scenarios

Based on the start/end points, cost parameters, constraints, and geometric inputs outlined in Section 7.1, initial development of alternative alignments with Quantm revealed several common routing trends. The alternatives generally include a pattern of alignments west of Fairview and two variations of alignments east of Fairview. To minimize right-of-way impacts, one group of eastern alignments closely follows the existing county roads while the other eastern alignment pattern minimizes overall project impacts and costs. Initial alignment trends developed for the study through Quantm are shown in Figure 11.

Figure 11. Routing Trends



Source: MDT 2015 and DOWL 2015.

In consideration of impacts, convenience, functionality in reducing truck traffic in Fairview, and anticipated costs, six alignments were identified as a result of the initial Quantm analysis to explore for further consideration. Quantm was used to generate, refine, and optimize several iterations of these six alignments to identify the most

appropriate route. Initial alignments were manipulated through the use of waypoints and horizontal alignment adjustments to either avoid features such as residential properties and irrigation structures or to improve and simplify the alignment geometrics. The alignments were manipulated to minimize grade changes to allow for unhampered traffic flow at the desired design speed. To allow for further refinement during a future design phase for a selected alternative, a 400-foot wide swath centered on each Quantm alignment was used to identify the potential limits of a new corridor. It is anticipated that additional flexibility will be needed to accommodate design considerations when detailed survey and investigation is conducted if a design project is pursued. The alignments forwarded for consideration with this study are illustrated in Figure 12 and defined below.

- Western Alignment: This Quantm-generated alignment is located west of Fairview. The alignment comes close to residential property northwest of the presumed intersection point with MT 200. It has the greatest grade change of the six alignments and would require two bridge crossings over an irrigation ditch (the Main Canal). The crossings would be located on the southern and northern portions of the alignment and are shown on Figure 12. It also includes an at-grade crossing at the existing railroad mainline at the northern end of the study area. This location is not appropriate for a grade-separated structure due to its proximity to the existing ND200/ND 58 intersection. The alignment is approximately 2.9 miles in length (including portions of the existing MT 200 route before start and end points at the CR 133 and ND 58 intersections).

- Eastern Alignment 1A: This alignment is located immediately east of Fairview. To minimize travel interruptions, this alignment would include a railroad overpass structure located on farmland south of the town of Fairview. The alignment is approximately 2.8 miles in length and includes one new grade-separated railroad crossing and one existing at-grade spur crossing.

- Eastern Alignment 1B: This alignment is located immediately east of Fairview and follows the same corridor as eastern alignment 1A. To minimize interruptions, this alignment would include a railroad overpass structure located on farmland south of the town of Fairview and an additional railroad overpass structure located east of the town of Fairview. The alignment is approximately 2.8 miles in length.

- Eastern Alignment 2A: This alignment is located east of Fairview and generally follows existing county roads (CR 133 and 161 Ave NW). It is the longest alignment at approximately 3.3 miles in length and includes two at-grade railroad crossings at existing mainline and existing railroad spur crossing locations.

- Eastern Alignment 2B: This alignment generally follows eastern alignment 2A, but includes a grade-separated structure at the existing mainline crossing location. Like eastern alignment 2A, this alignment is approximately 3.3 miles in length, follows CR 133 and 161 Ave NW, and would maintain the existing at-grade spur crossing east of Fairview.

- Eastern Alignment 2C: This alignment generally follows eastern alignments 2A and 2B but includes a grade-separated rail spur crossing in addition to a

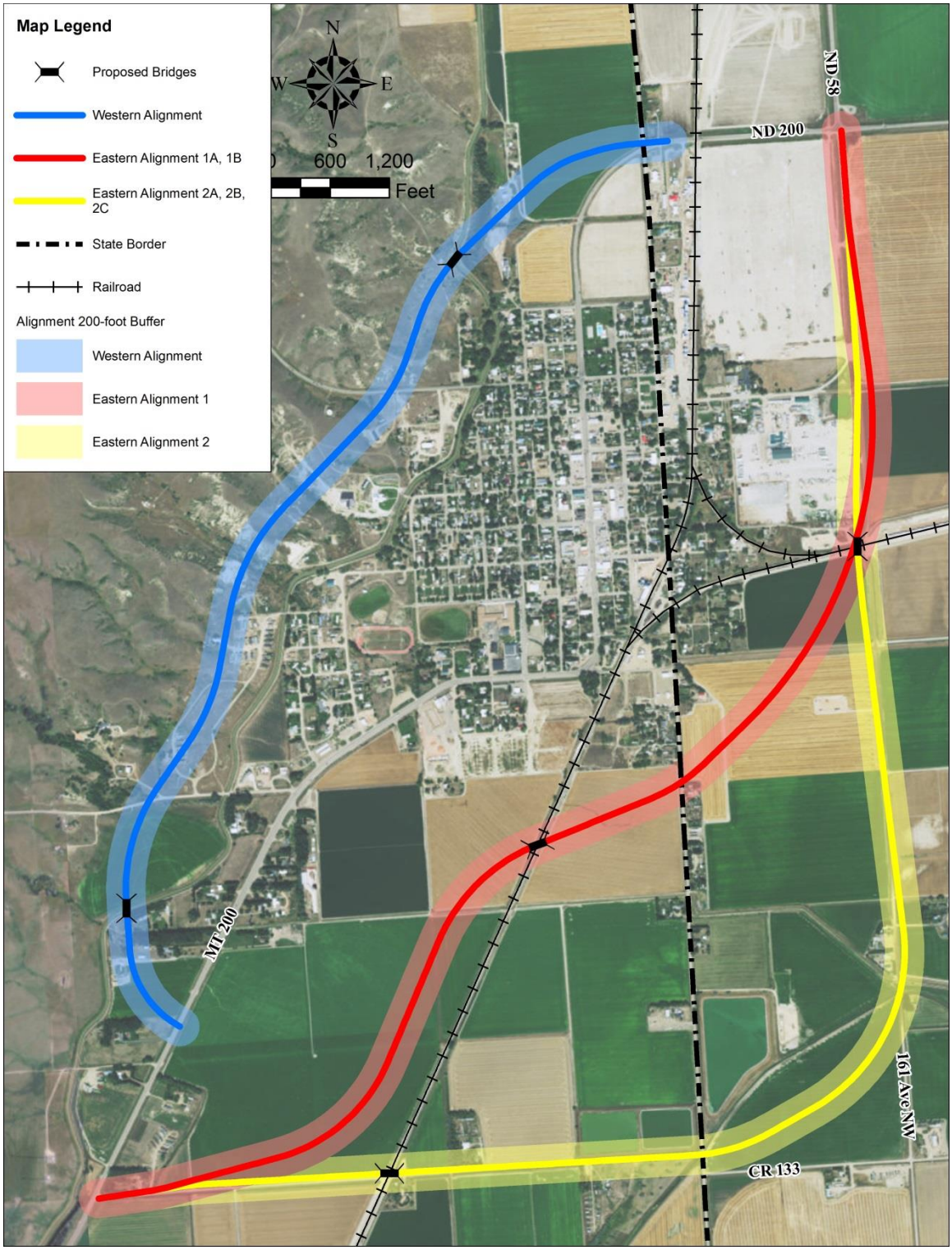
grade-separated structure at the existing mainline crossing location. Like eastern alignments 2A and 2B, this alignment is approximately 3.3 miles in length and follows CR 133 and 161 Ave NW.

NDDOT uses the terms *truck reliever route* and *truck bypass route* to clarify the function of a new route and its relationship to an existing route. A truck reliever route provides an alternative alignment to relieve truck traffic traveling through an existing town. Vehicles must turn off of the primary through route to travel along the new truck reliever route. A truck bypass route is intended to divert the majority of traffic around an existing town, allowing traffic to directly flow onto the route. It serves as the primary through route, replacing the function of the existing route. Depending on future design considerations and public/stakeholder feedback, a future alignment could be configured as a truck reliever or a truck bypass route.

The Montana Code Annotated, Section 60-2-211, states that MDT "may not construct highway bypasses or highway relocation projects without prior consent of the governing body of an incorporated municipality when the bypasses or projects: (a) are not part of the national system of interstate highways built under the National Defense Highway Act; and (b) divert motor vehicles from an existing highway route through a municipality incorporated prior to January 1, 1965." It also requires that MDT notify the governing body of an affected municipality by certified mail and provide 60 days to consent or object to the bypass. MDT would follow these regulations and communicate with community members and local officials in advance of any future project to construct a new alignment in the study area.

New alignments are referred to as alternative routes for the remainder of the report.

Figure 12. Optimized Routing



Source: MDT 2015 and DOWL 2015.

Screening Parameters and Alternatives Analysis

An analysis was performed for the six alternative routes to assess anticipated functionality, relative impacts, and costs. Geometric design criteria were used in Quantm to determine approximate construction limits, area impacts, and their associated costs. The following parameters were used to evaluate the six alternative routes.

- Route Length and Travel Time
- At-grade Rail Crossings
- Parcel Impacts and Right-of-Way Acquisition
- Wetland Impacts
- Farmland Impacts
- Irrigation Impacts
- Access Point Density
- Cost

Route Length and Travel Time

Roadway and bridge lengths affect travel time on each alternative route as well as future maintenance requirements and costs. Maintenance of a longer length of roadway can be considerably more time and cost intensive than a shorter and more direct route. Bridge length and bridge skew are additional concerns that should be considered when selecting an alternative. Design and construction of skewed bridges can be much more challenging than a non-skewed bridge design.

Topography of each alternative route was incorporated into the travel time analysis to reflect changes in elevation that may affect travel speed. The proposed western route has multiple grade changes that may require trucks to travel at slower speeds when compared to the proposed eastern routes. Additionally, the varying topography of the western route would likely reduce sight distance and provide less opportunity for trucks and passenger vehicles to pass slower motorists.

Travel times for the six alternative routes were analyzed using SimTraffic 9 software. Each analysis consisted of three simulation runs, and the median value of the three runs was reported. The simulations included the stop-controlled intersection at MT 200 and the roundabout at ND 58 so that these interrupted flows are included in the travel time. The following assumptions were incorporated into the analysis.

- It was assumed that 100% of truck traffic and 50% of passenger vehicle traffic would use a new truck reliever route.
- The travel speed of the roadway was modeled at 70 mph, with 1,000 feet of 35-mph travel modeled where the roadway approaches either a stop-controlled intersection or a roundabout.
- For all at-grade mainline and spur railroad crossings, it was assumed one train crossing would occur during the peak hour for a duration of ten minutes.
- The western alignment intersection with MT 201 was modeled with two-way stop control on the minor legs of MT 201, and uncontrolled through movement on the western alignment.
- At their southern junctions with MT 200, the eastern and western alignments were modeled with stop control and the existing MT 200 route was modeled as the through movement.
- At their northern junctions with MT 200, the eastern alignments were modeled as connecting into the single-lane roundabout at the ND 200/ND 58 intersection.
- At its northern junctions with MT 200, the western alignment was modeled as a through movement connecting with ND 200.

At-grade Rail Crossings

The number of at-grade rail crossings for each alternative is a consideration for determining the overall functionality of the route. The main disadvantage of at-grade rail crossings is that they are likely to adversely affect travel time, which was addressed in the discussion above. Additional factors are more difficult to quantify. Users may be less likely to use alternative route with at-grade rail crossings based on perceived inconvenience and the probability for increased delay time. Additionally, emergency response vehicles may be less likely to use a route with at-grade rail crossings because the crossings could impose delay that would slow emergency response time. The Transportation Research Board (TRB) has released guidance on the impact of at-grade rail crossings titled *Quantifying the Public Impacts of Highway-Rail Grade Crossings on Surface Mobility.* Before selecting an alternative route with an at-grade rail crossing, additional research should be conducted to quantify the resulting impact.

In the event an alternative containing an at-grade rail crossing is selected, installation of variable message signs (VMS) at each end could be utilized to alert traffic to potential delays associated with using the route. The VMS would be activated in conjunction with existing rail crossing warning signs.

Parcel Impacts and Right-of-Way Acquisition

The estimated right-of-way acquisition needed for each alternative route is determined based on the existing topography and current land use. Construction limits define the area impacted by each alternative. The total construction limits of each route were calculated using the following methodology: Quantm-generated impact width, plus 10-foot buffer on each side of Quantm impact width, minus 60 feet of width for any portion of the proposed route that would follow an existing County Road easement. The total construction area needed to construct each route was generated by Quantm based on the input parameters and the existing surface. It is anticipated that there will be additional impacted areas after additional design work is completed for the potential routes. Additionally, Quantm calculated the number of parcels that will likely be impacted by each alternative. A larger number of parcel impacts could lead to increased coordination and cost associated with right-of-way acquisition.

Wetland Impacts

Section 404 of the federal Clean Water Act (CWA) governs wetland impacts for all new construction areas. After an alternative route is selected, additional design work will be completed to reduce impacts to wetlands. It is desirable to avoid and minimize impacts to wetlands as much as practicable when constructing a new route. A field wetland delineation was not completed for this analysis. Quantm uses the USFWS National Wetlands Inventory (NWI) mapping database to determine potential wetland impacts. All alternative routes are anticipated to qualify for a CWA Nationwide Permit 14 for Linear Transportation Projects from the United States Army Corps of Engineers.

Farmland Impacts

Special consideration must be given to impacted areas with soils that are considered prime farmland, unique farmland, or farmland of statewide or local importance by the U.S. Department of Agriculture NRCS in accordance with the Farmland Policy Protection Act (FPPA) (7 U.S.C. 4201 et. seq.) Prime farmland soils are defined as those that have a favorable combination of physical and chemical characteristics for producing food, feed, and forage. The areas with these attributes must be available for farming to be considered prime farmland. Prime farmland can include areas that are currently non-irrigated, but would be considered prime if irrigated. Farmland of statewide importance

is land that has been designated essential for the production of food, feed, forage, and oilseed crops by the NRCS.

Farmland impacts were estimated for the six alternative routes using the preliminary construction area impacts within the construction limits. Mapped farmland impact that occurs within the current county road easement was subtracted from the Quantm output to provide an accurate impact estimate.

Irrigation Impacts
To measure potential irrigation impacts associated with each alternative route, three categories were considered. First, the need to replace, relocate, or modify an existing pivot was assessed. Secondly, bridges utilized by Quantm to cross major irrigation facilities are also considered an impact because they are a source of future maintenance costs. Lastly, any crossing of major existing canals and laterals that may potentially require a culvert or siphon are considered an irrigation impact.

Access Point Density
Access point density for each alternative route was determined by examining each route and determining the potential number of access points that would need to be perpetuated during construction of a new route. For each alternative, access points were classified as public (e.g., existing intersections with county or city streets) and private (e.g., driveways and subdivision access points). Access point density was considered as a screening criterion due to the fact that more access points along a route may slow traffic, create additional conflict points and potential safety issues, and generally make the route less desirable for motorists trying to bypass traffic congestion by choosing to use the alternative route.

Planning-level Costs
Planning-level cost estimates were prepared for the six alternative routes. Specific adjustments to the individual alternative route cost estimates were made to reflect irrigation impacts, at-grade railroad crossings and bridge lengths. Recent bid history was applied to the irrigation and railroad crossing assumptions. Structure lengths associated with the railway crossings would accommodate three total tracks and a service road.

To capture the comprehensive financial impact of a potential future project, it was desirable to incorporate additional costs associated with the six alternative routes, including multiple intersection treatments for the junction of the new route with MT 200 south of Fairview. Four potential intersection configurations were analyzed including a bypass configuration as well as stop controlled, signalized, and roundabout (which could be used with a truck reliever configuration). All four intersection treatment options are viable options for any of the six alternative route scenarios.

Screening Parameters Considered But Not Forwarded
Multiple parameters were considered as options to evaluate the six alternative routes, but ultimately were not included in the final alternative screening. These included: level of service, Section 4(f) impacts, public perception, safety, local planning efforts and future developments, utility impacts, wildlife connectivity, potential hazard to Fairview residents, noise, visual impacts, value to roadway network, maintenance, topography, financial participation and NDDOT coordination, and project development schedule. Reasons for excluding these parameters included inability to objectively quantify results, relative level of importance (i.e., low probability that the parameter would materially

affect route selection), and the attempt to avoid double counting the same concept through multiple parameters. Additional information on screening parameters considered but not forwarded is provided in Appendix D.

7.3 Alternative Screening

A weighted screening process was applied to the screening criteria based on input provided by the study AC. Points were initially assigned according to the performance under each criterion, with the lowest score (1) indicating the best performance and the highest score (6) indicating the worst performance in each category. A tied score was allotted for two or more routes that performed equally for a particular category.

Based on survey responses from the AC, a weighting system was developed to reflect the perceived relative importance or risk associated with each criterion. Qualifying survey responses were averaged, grouped, and assigned a weight ranging from 50 to 200. Initial scores were multiplied by the criterion weight. The total score listed in Table 12 indicates the relative level of impact and cost, with the lowest score potentially indicating the least impactful and most cost-effective alternative route according to the criteria assessed. Table 12 summarizes impacts and costs estimated for the six alternative routes. Estimated values for route length and travel time on the existing MT 200 route (with and without construction of a new route) are provided for comparison purposes.

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Table 12. Impact, Cost, and Screening Summary

Criteria	Weight	MT 200 No Build	MT 200 Build	Western			Eastern 1A			Eastern 1B			Eastern 2A			Eastern 2B			Eastern 2C		
				Value	Rank	Weighted Score	Value	Rank	Weighted Score	Value	Rank	Weighted Score	Value	Rank	Weighted Score	Value	Rank	Weighted Score	Value	Rank	Weighted Score
Route Length (feet)[1]	150	15,500	15,500	15,150	1	**150**	15,000	1	**150**	15,000	1	**150**	17,600	2	**300**	17,600	2	**300**	17,600	2	**300**
Travel Time WB (minutes/ seconds)[2]	200	2025: 6.4/385.2 2035: 5.9/355.3	2025: 6.3/380.0 2035: 6.0/356.9	2025: 5.4/320.9 2035: 5.0/297.0	2	**400**	2025: 8.1/488.1 2035: 4.5/266.9	4	**800**	2025: 4.1/247.8 2035: 3.5/207.1	1	**200**	2025: 8.7/523.9 2035: 5.6/334.8	5	**1000**	2025: 8.0/481.8 2035: 4.9/294.6	4	**800**	2025: 5.7/342.2 2035: 3.8/225.1	3	**600**
At-grade Rail Crossings	150	1	1	1	2	**300**	1	2	**300**	0	1	**150**	2	3	**450**	1	2	**300**	0	1	**150**
Parcel Impacts	100	0	0	24	3	**300**	14	1	**100**	17	2	**200**	29	4	**400**	29	4	**400**	31	5	**500**
Right-of-way Acquisition (acres)[3]	150	0	0	48.3	4	**600**	45.4	3	**450**	50.9	5	**750**	32.9	1	**150**	40.7	2	**300**	45.5	3	**450**
Wetland Impacts (acres)	100	0	0	0.4	4	**400**	0.2	2	**200**	0.3	3	**300**	0.1	1	**100**	0.2	2	**200**	0.1	1	**100**
Total Farmland Impacts (acres)[3]	50	0	0	21.4	1	**50**	45.7	5	**250**	50.9	6	**300**	30.2	2	**100**	38.7	3	**150**	42.4	4	**200**
Irrigation Impacts (Pivot/Bridge/ Major Ditch)[3]	100	0	0	1/2/0	3	**300**	1/0/1	2	**200**	1/0/1	2	**200**	1/0/0	1	**100**	1/0/0	1	**100**	1/0/0	1	**100**
Access Point Density (Total/Public/ Private)[4]	150	NA	NA	6/2/4	1	**150**	8/5/3	2	**300**	8/5/3	2	**300**	20/4/16	3	**450**	20/4/16	3	**450**	20/4/16	3	**450**
Total Estimated Project Development Cost	200	0	0	$17,200,000 to $19,800,000	2	**400**	$21,800,000 to $24,800,000	3	**600**	$27,100,000 to $30,500,000	5	**1000**	$16,300,000 to $18,900,000	1	**200**	$22,800,000 to $25,900,000	4	**800**	$29,600,000 to $33,300,000	6	**1200**
Total Point Score						**3050**			**3350**			**3550**			**3250**			**3800**			**4050**

Source: MDT Quantm output data files provided October 2015, and DOWL 2015.
[1] Equal scores allotted for values within 500 feet.
[2] Travel time calculated using the PM peak hour and truck reliever configuration. Travel time screening based on minutes, with equal scores allotted for values within 0.1 minute.
[3] Irrigation impacts screened based on total number of impacts. [4] Access point density screened according to the total number of access points per mile.

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The results of the screening process indicate that the best performing alternative is the western alignment, followed by eastern alignment 2A. If impediments to a western alignment are discovered in the future and an eastern alignment is pursued, construction of eastern alignment 2 could be phased to initially provide at-grade crossings and construct grade-separated crossings as part of a future project phase.

7.4 Existing Routes

Potential Improvement Options

Option 1: Roadway Widening (Three Lanes)
This option considers widening MT 200 from the existing two-lane highway to a three-lane highway between County Road 133 and 0.2 miles south of County Road 134. This two-lane segment south of Fairview is anticipated to operate at LOS D in 2020 and 2025 during the peak hour assuming high-growth-scenario traffic volumes as documented in the *Existing and Projected Conditions Report* prepared for this study. The three-lane expansion would begin near the end of MDT's current Sidney to Fairview project (RP 52.6 to RP 62.3) (prior to its taper back to two lanes) and end at the intersection of the existing four-lane section of MT 200 traveling through Fairview. This lane expansion would provide continuity on MT 200 from the end of the Sidney to Fairview project to the existing four-lane section in Fairview and eliminate an unnecessary two-lane taper. Additionally, the three-lane section would provide improved functionality at all minor intersections along the proposed lane expansion section. Figure 13 shows the location of the potential lane expansion along MT 200 from RP 61.8 to RP 62.3.

Figure 13. RP 61.8 to RP 62.3 Potential Roadway Widening

Planning Cost Estimate
Unit Cost: $700,000 to $800,000 per 0.1 mile
Total Cost: $3,600,000 to $4,000,000

Recommended Implementation Timeframe
Short-Term to Long-Term

Potentially-impacted Resources/Anticipated Right-of-Way
Potential impacts to farmlands, irrigation laterals, historic resources, right-of-way, and utilities may result from this option.

Option 2: Sidewalk/ADA Improvements
Fairview has existing sidewalk on both sides of MT 200 from RP 63.3 to 63.8. These facilities should be evaluated to ensure existing sidewalks and any new improvements are continuous and meet Public Rights-of-Way Accessibility Guidelines (PROWAG). As such, sidewalk intersections with existing approaches would be reconstructed with PROWAG-compliant curb ramps, and cross-slope and running-slope requirements would be met on all portions of newly-constructed sidewalk. The construction of additional sidewalk from RP 62.5 to RP 63.8 is recommended as needed to improve pedestrian safety and provide continuous pedestrian access.

Planning Cost Estimate
Unit cost: $6,600 to 7,200 per 100 feet of newly-installed sidewalk and ADA curb ramps
Total cost: Approximately $470,000 to $500,000 to install missing sidewalk and replace damaged/inaccessible sidewalk from RP 62.5 to 63.8.

This estimate is based on a cursory survey of the existing sidewalk within the defined limits. Additional investigation will be needed to develop a more accurate cost estimate.

Recommended Implementation Timeframe
Immediate to Short-term

Potentially-impacted Resources/Anticipated Right-of-Way
This project would occur within Fairview and within existing right-of-way. No environmental resource, utility, or right-of-way impacts are anticipated.

Summary of Improvement Options for Existing Routes
Table 13 summarizes potential improvement options for the existing MT 200 route within Fairview. These options are intended to address corridor needs and objectives, and may be pursued in addition to or independent from construction of an alternative route outside of Fairview.

Table 13. Summary of Improvements for Existing Routes

Improvement Options			Locations	Planning Cost Estimate[1]	Potential Timeframe[2]	Potentially Impacted Resources and Anticipated ROW/ Permitting Requirements
Option Category	Option ID	Option Description				
Traffic Operations	**Option 1**	Roadway Widening (Three Lanes)	RP 61.8 to RP 62.3 (MT 200 South of Fairview)	$3,600,000 to $4,000,000 ($700,000 to $800,000 per 0.1 mile)	Short-term to Long-term	Yes
Pedestrian Improvements	**Option 2**	Sidewalk/ADA Improvements	MT 200 RP 62.5 to RP 63.8	$470,000 to 500,000 ($6,600 to $7,200 per 100 feet)	Immediate to Short-term	No

[1] Cost estimates are provided in 2015 dollars and are rounded for planning purposes. Cost estimates reflect contingency ranges to account for the high degree of unknown factors at the planning level. Costs associated with right-of-way acquisition, utility relocation, preliminary engineering, and construction engineering/inspection, and other indirect costs are included where appropriate.

[2] Potential timeframe does not indicate when projects will be programmed or implemented. Project programming is based on available funding, the complexity and urgency of potential improvements, and other system priorities. Timeframes are defined as follows. Immediate: Implementation is currently ongoing or will be initiated in 2015; Short-term: Implementation could occur within a 1- to 3-year period; Mid-term: Implementation could occur within a 3- to 6-year period; Long-term: Implementation could occur within a 6- to 20-year period.

8.0 Potential Funding Sources

This chapter identifies potential sources of funding that could be used to finance future improvements in the Fairview study area. As of this publication date, no funding has been dedicated to improvements identified in this study.

8.1 Federal Funding Programs

MDT administers a number of programs that are funded from state and federal sources. Each year, in accordance with 60-2-127, Montana Code Annotated (MCA), the Montana Transportation Commission allocates a portion of available federal-aid highway funds for construction purposes and for projects located on the various systems in the state as described throughout this document

The Fixing America's Surface Transportation Act (FAST Act) was signed into law on December 4, 2015, and authorizes federal transportation funding for federal fiscal years 2016 through 2020.

The following sections summarize relevant federal transportation funding categories received by the state through Titles 23 and 49 of the U.S. Code, including state-developed implementation/sub-programs that may be potential sources for projects. To receive project funding under these programs, projects must be included in the STIP, where relevant.

8.1.1 National Highway Performance Program

The National Highway Performance Program (NHPP) funds are federally apportioned for the National Highway System (NHS) roads and bridges, which includes the Interstate

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

Allocations and Matching Requirements

NHPP funds are federally apportioned to Montana and allocated to Districts by the Montana Transportation Commission. Based on system performance, the funds are allocated to three programs; Interstate Maintenance, National Highway, and NHPP Bridge.

Eligibility and Planning Considerations

Activities eligible for NH funding include construction, reconstruction, resurfacing, restoration, and rehabilitation of NH segments. Construction, replacement, rehabilitation, preservation and protection of bridges on the National Highway System; and projects or part of a program supporting national goals for improving infrastructure condition, safety, mobility, or freight movements on the National Highway System. Reconstruction, resurfacing, restoration, rehabilitation, or preservation of a bridge on a non-NHS federal-aid highway so long as bridge condition provision requirements are satisfied. Operational improvements, project to reduce risk of failure of critical infrastructure, as well as highway safety improvements are also eligible. Other miscellaneous activities that may qualify for NH funding include bikeways and pedestrian walkways, environmental mitigation, restoration and pollution control, infrastructure based intelligent transportation systems, vehicle-to-infrastructure communication equipment, traffic and traveler monitoring and control, and construction of intra or inter-city bus terminals serving the National Highway System. The Transportation Commission establishes priorities for the use of National Highway Performance Program funds and projects are let through a competitive bidding process.

The MDT Glendive District is anticipated to receive an average annual NH apportionment of approximately $24 million during the next five years. Current Glendive District priorities already under development total an estimated construction cost of $162 million. Eligible NH funding is currently committed through federal fiscal year (FFY) 2020 as documented in the 2016-2020 STIP. Unfunded Glendive District projects total approximately $77 million.

Interstate Maintenance

The Commission approves and awards projects for improvements on the Interstate Highway System which are let through a competitive bidding process. The IM Program finances highway and bridge projects to rehabilitate, restore, resurface, and reconstruct the Interstate System. MDT districts are allocated IM funds by Montana's Transportation Commission based on system performance. The federal share for this program is 91.24% and the state is responsible for the remaining 8.76%. The state share is funded through the Highway State Special Revenue Account (HSSRA).

National Highway
The federal share for non-Interstate NHS projects is 86.58% and the state is responsible for the remaining 13.42%. The state share is funded through the HSSRA.

NHPP Bridge (NHPB)
Federal funds under this program are used to finance bridge inspection, improvement, and replacement projects on Interstate and non-Interstate National Highway System routes. NHPB program funding is established at the discretion of the state. However, Title 23 U.S.C. establishes minimum standards for NHS bridge conditions. If more than 10% of the total deck area of NHS bridges in a state is on structurally deficient bridges for three consecutive years, the state must direct NHPB funds equal to 50% of the state's FY 2009 Highway Bridge Program to improve bridges each year until the state's NHS bridge condition meets the minimum standard.

Surface Transportation Block Grant Program
Surface Transportation Block Grant Program (STBG) 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), the Surface Transportation Program Urban Highways (STPU), and the Surface Transportation Program – Bridge Program (STPB), as well as set-asides for programs including Transportation Alternatives (TA) and Recreational Trails. The federal share for these projects is 86.58% with the non-federal share typically funded through HSSRA.

The Montana Transportation Commission establishes priorities for the use of STBG funds and projects are let through a competitive bidding process.

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

Allocations and Matching Requirements
Primary funds are distributed statewide (MCA 60-3-205) to each of five financial districts. The Commission distributes STPP funding based on system performance. The federal share for this program is 86.58% and the state is responsible for the remaining 13.42%. The state share is funded through the HSSRA.

Eligibility and Planning Considerations
STP Primary funds are eligible for a wide range of transportation improvement projects and activities, ranging from roadway reconstruction and rehabilitation, to bridge construction and inspection, to highway and transit safety infrastructure,

[1] State funding program developed to distribute federal funding within Montana.

environmental mitigation, carpooling, vehicle-to-infrastructure communication equipment and bicycle and pedestrian transportation facilities.

Secondary Highway System (STPS)[2]
The federal and state funds available under this program are used to finance transportation projects on the state-designated Secondary Highway System. The Secondary Highway System includes any highway that is not classified as a local route or rural minor collector and that has been selected by the Montana Transportation Commission to be placed on the Secondary Highway System. Funding is distributed by formula and is utilized to resurface, rehabilitate and reconstruct roadways and bridges on the Secondary System.

Allocations and Matching Requirements
Secondary funds are distributed statewide (MCA 60-3-206) to each of five financial districts, based on a formula, which takes into account the land area, population, road mileage and bridge square footage. Federal funds for secondary highways must be matched by non-federal funds. The federal share for this program is 86.58% and the state is responsible for the remaining 13.42%. Normally, the match on these funds is from the HSSRA.

Eligibility and Planning Considerations
Eligible activities for the use of Secondary funds fall under three major types of improvements: Reconstruction, Rehabilitation, and Pavement Preservation in addition to vehicle-to-infrastructure communication equipment. The Reconstruction and Rehabilitation categories are allocated at 65% of the program funds with the remaining 35% dedicated to Pavement Preservation. Priorities are identified in consultation with the appropriate local government authorizes and approved by the Montana Transportation Commission.

Urban Highway System (STPU)[3]
The federal and state funds available under this program are used to finance transportation projects on Montana's Urban Highway System, as per MCA 60-3-211. STPU allocations are based on a per capita distribution and are recalculated each decade following the census.

Allocations and Matching Requirements
State law guides the allocation of Urban funds to Montana's urban areas (population of 5,000 or greater) through a statutory formula based on each area's population compared to the total population in all urban areas. The federal share for this program is 86.58% and the state is responsible for the remaining 13.42%. The state share is funded through the HSSRA.

Montana's urban areas are as follows:

Anaconda	Columbia Falls	Helena	Miles City
Belgrade	Kalispell	Glendive	Missoula
Billings	Great Falls	Laurel	Sidney
Bozeman	Hamilton	Lewistown	Whitefish
Butte	Havre	Livingston	

[2] State funding program developed to distribute federal funding within Montana.
[3] State funding program developed to distribute federal funding within Montana.

Eligibility and Planning Considerations

Urban funds are eligible for rehabilitation, resurfacing, new construction, reconstruction of existing facilities, operational improvements, vehicle-to-infrastructure communication equipment, bicycle facilities, pedestrian walkways, carpool projects and traffic operation projects on the 430 miles on the state-designated Urban Highway System. Priorities for the use of Urban funds are established at the local level through local planning processes with final approval by the Transportation Commission.

Bridge Program (STPB)

The federal and state funds available under this program are used to finance bridge projects for on-system and off-system routes in Montana. Title 23 U.S.C. requires that a minimum amount (equal to 15 percent of Montana's 2009 federal Bridge Program apportionment) be set aside for off-system bridge projects. The remainder of the Bridge Program funding is established at the discretion of the state. Bridge Program funds are primarily used for bridge rehabilitation or reconstruction activities on Primary, Secondary, Urban or off-system routes. Projects are identified based on bridge condition and performance metrics.

Urban Pavement Preservation Program (UPP)[4]

The Urban Pavement Preservation Program (UPP) is a sub-allocation of the larger Surface Transportation Program that provides funding to urban areas with qualifying Pavement Management Systems (as determined jointly by MDT and FHWA). This sub-allocation is approved annually by the Transportation Commission and provides opportunities for pavement preservation work on urban routes (based on system needs identified by the local Pavement Management Systems).

Highway Safety Improvement Program (HSIP)

HSIP funds are apportioned to Montana for safety improvement projects approved by the Commission and are consistent with the strategic highway safety improvement plan. 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 Commission approves and awards the projects which are let through a competitive bidding process. Generally, the federal share for the HSIP projects is 90% and the state is responsible for the remaining 10%. Typically, the state share is funded through the HSSRA.

Federal Lands Access Program (FLAP)

The Federal Lands Access Program was created by the "Moving Ahead for Progress in the 21st Century Act" (MAP-21) to improve access to federal lands and is continued in the FAST Act. FHWA's Western Federal Lands Division administers the program and MDT is an eligible applicant for the funds.

The program is directed towards Public Highways, Roads, Bridges, Trails, and Transit systems that are under state, county, town, township, tribal, municipal, or local government jurisdiction or maintenance and provide access to federal lands. The Federal Lands Access Program funds improvements to transportation facilities that provide access to, are adjacent to, or are located within federal lands. The program

[4] State funding program developed to distribute federal funding within Montana.

supplements state and local resources for public roads, transit systems, and other transportation facilities, with an emphasis on high-use recreation sites and economic generators. Program funds are subject to the overall federal-aid obligation limitation. Funds are allocated among the states using a statutory formula based on road mileage, number of bridges, land area, and visitation.

Eligibility and Planning Considerations

The following activities are eligible for consideration on Federal Lands Access Transportation Facilities:

1) Preventive maintenance, rehabilitation, restoration, construction, and reconstruction.
2) Adjacent vehicular parking areas.
3) Acquisition of necessary scenic easements and scenic or historic sites.
4) Provisions for pedestrian and bicycles.
5) Environmental mitigation in or adjacent to federal land to improve public safety and reduce vehicle-wildlife mortality while maintaining habitat connectivity.
6) Construction and reconstruction of roadside rest areas, including sanitary and water facilities.
7) Operation and maintenance of transit facilities.

Proposed projects must be located on a public highway, road, bridge, trail or transit system that is located on, is adjacent to, or provides access to federal lands for which title or maintenance responsibility is vested in a state, county, town, township, tribal, municipal, or local government.

Allocation and Matching Requirements

The federal share for this program is 86.58% and the state provides match for projects on state highways that address MDT identified infrastructure condition deficiencies; local governments provide the match for off-system projects. State share is funded through the HSSRA. Funding is authorized and allocated for each state under U.S.C. Title 23, Chapter 2, MAP-21, Division A, Title I, Subtitle A, Section 1119 distribution formula.

National Highway Freight Program (NHFP)

The National Highway Freight Program was created by the FAST Act to invest in freight projects on the National Highway Freight Network. This program is apportioned to states by formula and a state must have a freight plan in place beginning FY 2018 in order to receive formula funding. This program provides funding for construction, operational improvements, freight planning and performance measures. Up to 10% of these funds may be used for intermodal projects. Generally, the federal share for this program is 91.24% and the State is responsible for the remaining 8.76%. The state share is typically funded through the HSSRA for projects on state highways and local governments provide the match for local projects.

Nationally Significant Freight and Highway Projects

This program was also established by the FAST Act to create competitive grants or Transportation Infrastructure Finance and Innovation Act (TIFIA) loans for projects >$100 million. This is a discretionary freight-focused grant program that allows states, MPOs, local governments, tribal governments, special purpose districts and public authorities (including port authorities), and other parties to apply for funding to complete projects that improve safety and hold the greatest promise to eliminate freight

bottlenecks and improve critical freight movements. Generally, the federal share for this program is 91.24% and the state is responsible for the remaining 8.76%. The state provides match for projects on state highways that address MDT identified infrastructure condition deficiencies; local governments provide the match for off-system projects. The state share is typically funded through the HSSRA.

Eligible Activities

- Highway freight projects on the National Highway Freight Network
- NHS highway/bridge projects, projects in National Scenic Areas
- Freight rail/intermodal/port projects
- Rail-highway grade crossings or grade separation projects

Congressionally-directed or Discretionary Funds

Congressionally-directed funds may be received through highway program authorization or annual appropriations processes. These funds are generally described as "demonstration" or "earmark" funds. Discretionary funds are typically awarded through a federal application process or Congressional direction. If a locally-sponsored project receives these types of funds, MDT will administer the funds in accordance with the Montana Transportation Commission Policy #5 – "*Policy resolution regarding Congressionally-directed funding: including Demonstration Projects, High Priority Projects, and Project Earmarks."*

Transit Capital & Operating Assistance Funding

The MDT Transit Section provides federal and state funding to eligible recipients through federal and state programs. Federal funding is provided through the Section 5310 and Section 5311 transit programs and state funding is provided through the TransADE program. MAP-21 incorporated the JARC and New Freedoms Programs into the Section 5311 and 5310 programs, respectively. It also created a new bus and bus facilities discretionary formula program (Section 5339) for fixed route bus operators. All projects funded must be derived from a locally developed, coordinated public transit-human services transportation plan (a "coordinated plan").

The coordinated plan must be developed through a process that includes representatives of public, private, and nonprofit transportation and human service providers and participation from the public.

Bus and Bus Facilities (Section 5339)

This program provides capital funding to replace, rehabilitate and purchase buses and related equipment and to construct bus-related facilities. Federal funds pay 80 percent of capital costs. The remaining 20 percent must come from the local recipient. Funds are eligible to be transferred by the state to supplement urban and rural formula grant programs (5307 and 5311, respectively).

Enhanced Mobility of Seniors/Individuals with Disabilities (Section 5310)

Section 5310 authorizes capital grants to eligible organizations to assist in providing transportation for the elderly and/or persons with disabilities. Federal Transit Administration (FTA) funds 80 percent of all costs for equipment, with 20 percent match provided by the local recipient. Eligible recipients for this program are private, nonprofit organizations; public bodies approved by the state to coordinate services for elderly persons and persons with disabilities; or public bodies which certify to the Governor that no nonprofit organization is readily

available in a service area to provide this transportation service. Ten percent of the state's Section 5310 apportionment can be used to administer the program, to plan, and to provide technical assistance.

Formula Grants for Rural Areas (Section 5311)
This program enhances the access of people in non-urbanized areas by providing public transportation. Federal funds pay 86.58 percent of capital costs and 54.11 percent of deficit operating costs, 80 percent of administrative costs, and 80 percent of maintenance costs. The remaining 13.42, 45.89, 20, and 20 percent respectively must come from the local recipient. Eligible recipients of these funds can be a state agency, a local public body, a nonprofit agency, or an operator of public transportation services. Ten percent of the state's Section 5311 apportionment is dedicated to carry out a program to develop and support intercity bus transportation.

Urbanized Area Formula Grants (Section 5307)
This program enhances the access of people in urbanized areas by providing public transportation. Federal funds pay 80 percent of capital costs and 50 percent of deficit operating costs. The remaining 20 and 50 percent respectively must come from the local recipient. The designated recipient of Section 5307 funds is the Governor who in turn can designate the funds to a public body. In Montana, the Governor has designated Missoula, Great Falls, and Billings as the recipients of the Section 5307 funds.

8.2 State Funding Sources

Rail/Loan Funds
Administration and Matching Requirements
The Montana Rail Freight Loan Program (MRFL) is a revolving loan fund administered by the Montana Department of Transportation to encourage projects for construction, reconstruction, or rehabilitation of railroads and related facilities in the state and implements MCA 60-11-113 to MCA 60-11-115. Loans are targeted to rehabilitation and improvement of railroads and their attendant facilities, including sidings, yards, buildings, and intermodal facilities. Rehabilitation and improvement assistance projects require a 30 percent loan-to value match. Facility construction assistance projects require a 50 percent match.

Eligibility and Planning Consideration
Eligible applicants for loans under the program include railroads, cities, counties, companies, and regional rail authorities. Port authorities may also qualify, provided they have been included in the state transportation planning process. Projects must be integrally related to the railroad transportation system in the state and demonstrate that they will preserve and enhance cost-effective rail service to Montana communities and businesses.

TransADE
The TransADE grant program offers operating assistance to eligible organizations providing transportation to the elderly and persons with disabilities.

Allocations and Matching Requirements
This is a state funding program within Montana statute. State funds pay 54.11 percent of deficit operating costs, 80 percent of administrative costs, and 80 percent of

maintenance costs. The remaining 45.89, 20, and 20 percent respectively must come from the local recipient. Applicants are also eligible to use this funding as match for the federal transit grant programs.

Eligibility and Planning Considerations
Eligible recipients of this funding are counties, incorporated cities and towns, transportation districts, or non-profit organizations. Applications are due to the MDT Transit Section by the first working day of March each year. To receive this funding the applicant is required by state law (MCA 7-14-112) to develop a strong, coordinated system in their community and/or service area.

State Funds for Transit Subsidies
The 46th Montana Legislature amended Section 7-14-102 MCA providing funds to offset up to 50 percent of the expenditures of a municipality or urban transportation district for public transportation. The allocation to operators of transit systems is based on the ratio of its local support for public transportation to the total financial support for all general purpose transportation systems in the state. Local support is defined as:

$$\text{Local Support} = \frac{\text{Expenditure for public transportation operations}}{\text{Mill value of City or urban transportation district}}$$

State Fuel Tax – Locally Allocated
The State of Montana assesses a tax of $0.27 per gallon on gasoline and $0.2775 per gallon on clear diesel fuel used for transportation purposes. According to state law, each incorporated city and town within the state receives an allocation of the total tax funds based upon:

1) the ratio of the population within each city and town to the total population in all cities and towns in the State, and
2) the ratio of the street mileage within each city and town to the total street mileage in all incorporated cities and towns in the state. (The street mileage is exclusive of the federal-Aid Interstate and Primary Systems.)

State law also establishes that each county be allocated a percentage of the total tax funds based upon:

1) the ratio of the rural population of each county to the total rural population in the state, excluding the population of all incorporated cities or towns within the county and state;
2) the ratio of the rural road mileage in each county to the total rural road mileage in the state, less the certified mileage of all cities or towns within the county and state; and
3) the ratio of the land area in each county to the total land area of the state.

For state fiscal year 2016, Richland County received $ 89,682.53 in state fuel tax funds. The amount varies annually.

All fuel tax funds allocated to the city and county governments must be used for the construction, reconstruction, maintenance, and repair of rural roads or city streets and alleys. The funds may also be used for the share that the city or county might otherwise expend for proportionate matching of federal funds allocated for the construction of

roads or streets that are part of the primary, secondary or urban system. Priorities for the use of these funds are established by each recipient jurisdiction.

8.3 Local 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. The following text summarizes programs that could be used to finance transportation improvements by Richland County.

Road Fund

County road funds provides for the construction, maintenance, and repair of county roads outside the corporate limits of cities and towns. Revenue for these funds comes from intergovernmental transfers (i.e., state gas tax apportionment and motor vehicle taxes) and a mill levy assessed against county residents living outside cities and towns. County road fund monies are used primarily for maintenance, with little allocated for new road construction. Only a small percentage of the total miles on the county road system is located in the study area. Projects eligible for financing through this fund would compete for available revenues on a countywide basis.

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.

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.

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.

8.4 Private Funding Sources

Private financing of roadway improvements may be available in the form of right-of-way donations and cash contributions. In some cases, the private sector has recognized that better access and improved facilities can be profitable due to increased land values and commercial development possibilities. Several forms of private financing for transportation improvements used in other parts of the United States are described in this section.

Cost Sharing

In a cost-sharing scenario, the private sector pays some of the operating and capital costs for constructing transportation facilities required by development actions.

Transportation Corporations

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

Road Districts
These are areas created by a petition of affected landowners, enabling issuance of bonds for financing local transportation projects.

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

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

Local Improvement District
This funding option is applicable to counties wishing to establish a local improvement district for road improvements. While similar to RSID, this funding option is more streamlined, thus benefiting counties.

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.

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

9.0 Conclusions and Next Steps

MDT initiated this pre-NEPA/MEPA transportation study in partnership with FHWA, and in coordination with NDDOT, the Town of Fairview, Richland County, and McKenzie County to better understand the study area's needs, objectives, constraints, and opportunities. The study examined roadway geometrics, crash statistics, land use and development patterns, physical and environmental constraints, and existing and projected operational characteristics for the study area.

Based on evaluation of existing and projected conditions within the study area, improvement options for existing routes and new routes were identified to address short-term and long-term transportation needs within the 20-year planning horizon (2035). The study considered potential alternative routes around Fairview to mitigate vehicular conflicts in town while providing an efficient means for regional truck traffic to access the surrounding areas. Through a screening process conducted in coordination with the study advisory committee, the western alignment was identified as the best performing alternative route, followed by eastern alignment 2A. Development of a new alignment requires substantial financial investment. Funding availability, right-of-way acquisition, and other MDT Glendive District and NDDOT priorities will factor into any future implementation decisions. These factors would be considered in the future if a design project is forwarded from this study.

If funding, right-of-way, or other impediments prohibit development of any alternative route around Fairview, improvements on existing routes could be considered. Widening the existing MT 200 roadway to match the new three-lane typical section for the Sidney-Fairview project south of Fairview is a potential option to improve operations. In addition, this study identified a lack of sidewalk connectivity and accessibility through Fairview.

Implementation of improvement options located off system (i.e., not on an MDT–maintained route) would be the responsibiliy of the appropriate state and local government and would need to follow the local procedures to move projects forward. Depending on the location of forwaded improvements, future coordination would be required with the Town of Fairview, MDT Glendive District, the Montana Transportation Commission, NDDOT, Richland County, and McKenzie County to identify appropriate funding sources. At this time, funding is not available to implement any of the improvement options identified by this study. Federal funding allocations for the MDT Glendive District are committed through FFY 2019, with numerous unfunded projects extending beyond 2019. Future project development and implementation will require the following steps.

- Identify and secure funding.
- Follow appropriate MDT and/or NDDOT processes for project nomination and development, including public involvement and environmental documentation.

Future projects resulting from this corridor planning study will be required to comply with NEPA/MEPA depending on if federal/state funds or a federal/state action is involved. The purpose and need statement for any future project should be consistent with the needs and objectives for this study. This corridor planning study will be used as the basis for determining impacts and subsequent mitigation for improvement options in future NEPA/MEPA documentation. Any project developed would have to comply with the Code of Federal Regulations Title 23 Part 771 and Adminsitrative Rules of Montana 18, subchapter 2, which set forth the requirements for documenting environmental impacts on highway projects. Additionally, traffic conditions and anticipated transportation demands should be confirmed as any projects are forwarded from the study given the uncertainties of oil and gas development and associated growth within the study area.