MONTANA
MDT
DEPARTMENT OF TRANSPORTATION

Montana Freight Plan

2017

Montana Freight Plan

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ABBREVIATIONS AND ACRONYMS

AADTT	Annual Average Daily Truck Traffic
AOPL	Association of Oil Pipe Lines
ARMs	Administrative Rules of Montana
ATR	Automatic Traffic Recorders
BBER	University of Montana's Bureau of Business and Economic Research
BCA	Benefit-Cost Analysis
Bcf	Billion cubic feet
BTS	US Department of Transportation Bureau of Transportation Statistics
CBP	US Customs and Border Protection
CDL	Commercial Driver's License
CEIC	Census & Economic Information Center
CHSP	Comprehensive Highway Safety Plan
CMV	Commercial Motor Vehicle
CMAQ	Congestion Mitigation and Air Quality
CVSP	Commercial Vehicle Safety Plan
DEQ	Montana Department of Environmental Quality
DES	Disaster and Emergency Services
EIA	Energy Information Administration
ePART	electronic Permit, Audit, Registration and Tax
ESALs	Equivalent Single Axle Loads
FAF4	Freight Analysis Framework
FAST	Fixing America's Surface Transportation (FAST) Act
FASTLANE	Fostering Advancements in Shipping and Transportation for the Long-term Achievement of National Efficiencies
FERC	Federal Energy Regulatory Commission
FFY	Federal Fiscal Year
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
GDP	Gross Domestic Products
GNC/GNCC	Great Northern Corridor/ Great Northern Corridor Coalition
GVW	Gross Vehicle Weight
HAR	Highway Advisory Radios

HCM	Highway Capacity Manual
HDD	Horizontal Directional Drilling
HHFT	High Hazard Flammable Trains
HSIP	Highway Safety Improvement Program
HSSRA	Highway State Special Revenue Account
HVL	Highly Volatile Liquids
ICED	Increased Canadian Economic Development
IFTA	International Fuel Tax Administration
IRI	International Roughness Index
IRP	International Registration Program
ITS	Intelligent Transportation System
LNG	Liquefied Natural Gas
LOS	Level of Service
LRTP	Long-Range Transportation Plans
MAP-21	Moving Ahead for Progress in the 21st Century
MCA	Montana Code Annotated
MCM	Motor Carriers of Montana
MCOM	Multistate Corridor Operations and Management
MCS	Motor Carrier Services
MCSAP	Motor Carrier Safety Assistance Program
MDT	Montana Department of Transportation
MEPA	Montana Environmental Policy Act
MHP	Montana Highway Patrol
MPO	Metropolitan Planning Organization
MRL	Montana Rail Link
NAPSR	National Association of Pipeline Safety Representatives
NEPA	National Environmental Policy Act
NHFN	National Highway Freight Network
NHFP	National Highway Freight Program
NHS	National Highway System
NPMRDS	National Performance Management Research Data Set
OCR	Optical Character Recognition
OPS	Office of Pipeline Safety
OS/OW	Over Size/Over Weight
P3	Performance Programming Process
PCCP	Portland Cement Concrete Pavement

PCS	Pavement Condition Survey
PHMSA	Pipeline Hazardous Materials Safety Administration
PM	Port of Montana
PMS	Plant Mix Surfacing
PNM	Port of Northern Montana
PP	Petroleum Products
PRB	Powder River Basin
PTC	Positive Train Control
PvMS	Pavement Management System
RHGCP	Rail Highway Grade Crossing Program
RI	Ride Index
RSCC	Rail Service Competition Council
RWIS	Road Weather Information System
SHSP	Strategic Highway Safety Plan
SIAP	System Impact Action Process
SSY	State Fiscal Year
STARS	State Truck Activities Reporting System
STIP	Statewide Transportation Improvement Program
STP	Surface Transportation Program
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TAMP	Transportation Asset Management Plan
TBWG	Transportation Border Working Group
TIGER	Transportation Investment Generating Economic Recovery
TIMS	Transportation Injury Mapping System
TIP	Transportation Improvement Program
TMP	Transportation Management Plan
TPF	Transportation Pooled Fund
TTTR	Truck Travel Time Reliability
UP	Union Pacific
USDOT	U.S. Department of Transportation
V2I	Vehicle to Infrastructure
VMT	Vehicle Miles Traveled
VSL	Variable Speed Limit
WSFC	Western States Freight Coalition
WBWG	Western Border Working Group
WIM	Weigh in Motion

EXECUTIVE SUMMARY

The 2017 Montana Freight Plan represents the first plan specific to freight for MDT and for the state. This plan provides a comprehensive evaluation of freight transportation in Montana and provides guidance for both short and long-term freight-related transportation investment decisions.

MDT MISSION

To serve the public by providing a transportation system and services that emphasize quality, safety, cost effectiveness, economic vitality and sensitivity to the environment.

The Montana Freight Plan was developed in accordance with 49 USC 70202 and in alignment with MDT's long range multi-modal policy plan, TranPlanMT. The plan was developed with input and advisement of freight stakeholders doing business in Montana. The plan includes goals and strategies to improve freight transportation in Montana and support national multimodal freight policy goals. This plan will be updated, as required, every five years, or more frequently if necessary.

Safe and efficient movement of freight is vital to the health of Montana's economy. Montana ranks among the top half of state exporters in 12 industries, including fifth in cement and concrete and tobacco products, ninth in coal and petroleum gases, and twelfth in oilseeds and grains. Freight in Montana is moved primarily by truck, rail, and pipeline.

- Truck: Montana's public roads consist of over 75,000 centerline miles with almost 13,000 miles on the state highway system. MDT uses several metrics to evaluate pavement condition and highway performance and uses an asset management approach, Performance Programming Process (P3), to manage the state's highway system.
- Rail: Active and inactive rail trackage in Montana exceeds 3,200 miles. All rail facilities in Montana are privately owned except the state-owned Central Montana Railroad (CMR), which is leased and operated by a non-profit agriculture group. MDT monitors the safety of at-highway rail crossings; there are currently 1,367 crossings.
- Pipeline: Montana has nearly 15,500 miles of gas transmission gathering and distribution pipelines; there are an additional 3,821 miles of pipeline carrying hazardous liquid commodities such as CO2, crude oil, highly volatile liquids such as propane and refined petroleum products. In Montana, pipelines are privately owned but regulated through a partnership between the Montana Public Utility Commission and the US Department of Transportation, Pipeline and Hazardous Materials Safety Administration.

In the development of this plan, MDT sought input from freight stakeholders and MDT subject experts to identify issues impacting freight movement. The following key issues were identified:

- Funding to address Montana's aging highway infrastructure;
- Safety;
- Transportation labor force challenges, particularly an aging workforce and truck driver shortage; and
- Recurring and non-recurring congestion, although to a lesser degree than what may be found in other states.

Congestion and delay caused by freight in Montana is limited; this determination is based on data and technical analysis of factors such as Level of Service (LOS) and consultation with freight stakeholders and MDT District personnel. Mitigation strategies have been identified to address the few sources of recurring and nonrecurring sources of congestion.

The overall approach to addressing Montana's key freight issues can be found outlined in the policies, goals, and procedures that guide MDT's decisions. Specific policies include: the national freight policy established by the FAST Act and TranPlanMT. TranPlanMT identifies policy goals and strategies for a 20-year period. The primary goals outlined in TranPlanMT include: safety; system preservation and maintenance; mobility and economic vitality; accessibility and connectivity; environmental stewardship; and business operations and management. These policies guide the department's decisions. MDT also works in collaboration with regional partners and local governments to coordinate freight planning efforts and strategies.

Technological innovation also plays a crucial role in MDT's achievement of a safe, secure, and efficient freight network. Technology has been deployed in the areas of credentialing and vehicle clearance, route planning and traffic conditions, and road system enhancements. These advancements help to make roads safer for travelers and to improve efficiency of the highway systems.

The NHFP funds activities that support the efficient movement of freight on the NHFN. At present, Montana's portion of the NHFN consists of two Interstate routes: I-15 and I-90.

MDT utilizes a risk-based asset management plan to analyze transportation system needs. All NHFP projects must be consistent with the eligibilities established for the NHFP and must be fundable. With this is mind, the following improvements have been identified as NHFP projects listed by federal fiscal year (FFY) to improve operations (increase LOS), decrease congestion, and/or promote safety:

- 2016/2017: Missoula East & West – Orange Street Interchange;
- 2017/2018: West Laurel Interchange – West;
- 2018/2019: Missoula East & West – Van Buren Street Interchange;
- 2018/2019: Rocker Interchange Improvements;
- 2019>: Intelligent Transportation System (ITS) technologies;
- 2021>: Lincoln Road – Montana to I-15 – Helena;
- 2021>: Billings Bypass; and
- 2021>: Gore Hill Interchange – Great Falls.

MDT utilized funding sources in addition to NHFP funds to improve interstate capacity and safety. The following is a sample of such projects shown by FFY that will have a significant impact of freight-movement by improving connectivity, operations, access, congestion, and/or reliability:

- 2017/2018: I-90 Bridges – Bonner;
- 2018/2019: Broadus Interchange – Miles City; and
- 2018/2019: Rarus/Silver Bow Creek Structures.

Looking to the future, freight is expected to continue to grow; predictions estimate it will grow nationwide by 40 percent in the next 30 years. Montana's freight plan and investment of NHFP funds are steps toward ensuring a safe and efficient transportation system that will accommodate and support Montana's economy.

1 MONTANA FREIGHT PLAN OVERVIEW

Montana is known as Big Sky Country. It is the fourth largest state by land mass, making transportation of people and goods an important component of daily life. The Montana Freight Plan provides a comprehensive evaluation of freight transportation in the state and provides guidance for both short and long-term freight-related transportation investment decisions. This section briefly describes important components that shaped the development of this plan.

1.1 Freight Plan Purpose

MDT's mission is to serve the public by providing a transportation system and services that emphasize quality, safety, cost effectiveness, economic vitality, and sensitivity to the environment. Fulfilling this mission benefits all who travel to jobs, healthcare, shopping, recreation, and daily activities as well as those who rely on transportation to move goods into, out of, and within the state. Purposes of this Freight Plan include:

- Detailing the role freight movement plays in Montana's economy;
- Identifying significant freight system issues in Montana and strategies for improvement;
- Providing a framework to guide freight-related transportation investment decisions; and
- Informing the public and stakeholders as to how MDT manages the transportation system specifically related to freight.

1.2 Fixing America's Surface Transportation (FAST) Act

The federal FAST Act, signed into law December 4, 2015, includes a focus on improving the condition and performance of the national freight network. These goals align with the Act's overall goals of improving mobility on America's highways, creating jobs and supporting economic growth, accelerating project delivery, and promoting innovation[1].

The FAST Act requires each state to have a state freight plan that addresses current and future freight planning activities, goals, and investments. The freight plan must include the following components if the state receives funding under Title 23 Section 167 of the United States Code (23 USC 167):

- Significant state freight system trends, needs, and issues;
- Freight policies, strategies, and performance measures that guide freight-related transportation investments;
- A listing of designated state multimodal critical rural and urban freight facilities and corridors;
- A description of the state's ability to meet national multimodal freight goals;
- Innovative technologies and operational strategies that improve the safety and efficiency of freight movement;
- Improvements to reduce or impede the deterioration of roadways traveled by heavy vehicles;
- An inventory of facilities with freight mobility issues and strategies to address these issues at state owned or operated facilities;
- Significant congestion or delay caused by freight movements and mitigation strategies; and
- A freight investment plan.

The state freight plan must address a five-year forecast period and be updated every five years or more frequently if needed.

The FAST Act builds on requirements of Title 23 USC for state freight plans to describe how the state will improve its ability to meet the National Freight Policy goals that include:

- Improve the contribution of the freight transportation system to the economy;
- Reduce congestion on the freight transportation system;
- Improve the safety, security, and resiliency of the freight transportation system;
- Improve the state of good repair of the freight transportation system;
- Use advanced technology, performance management, innovation, competition, and accountability in operating and preserving the freight transportation system; and
- Reduce adverse environmental and community impacts of freight transportation.

1.3 TranPlanMT

The Montana Freight Plan is developed under guidance of TranPlanMT. TranPlanMT is Montana's statewide long-range plan for preserving and improving Montana's transportation system.

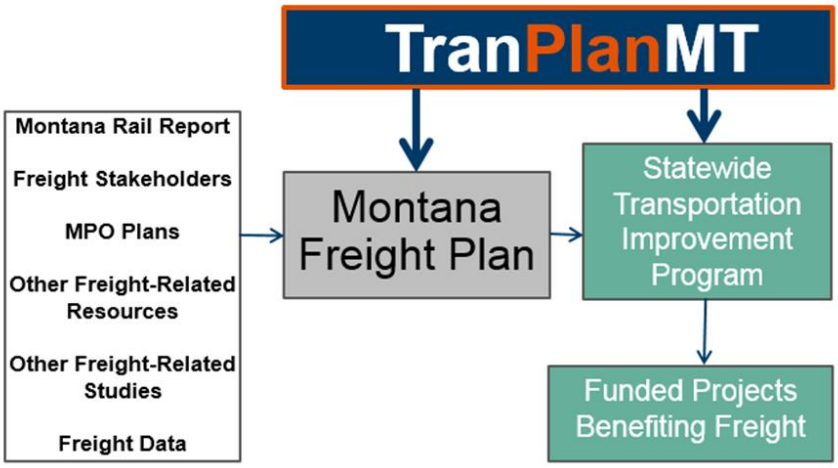
Originally adopted in 1995 as TranPlan 21 and most recently updated in 2017, this long-range plan is an essential component of a continuing statewide planning process focused on assisting MDT in developing and implementing policy goals and actions. TranPlanMT provides MDT an opportunity to work with the public and stakeholders to identify and achieve transportation goals.

TranPlanMT reflects input from the public, MDT staff, transportation stakeholders, local and tribal governments, resource agencies, and others around the state, that guides efforts to effectively and efficiently plan Montana's transportation future.

Primary goal areas addressed in TranPlanMT include:

- Safety - Improve safety for all transportation users to achieve Vision Zero: zero fatalities and zero serious injuries on Montana roads;
- System preservation and maintenance - Preserve and maintain existing transportation infrastructure;
- Mobility and economic vitality - Facilitate the movement of people and goods recognizing the importance of economic vitality;
- Accessibility and connectivity - Preserve access to the transportation system and connectivity between modes;
- Environmental stewardship - Support MDT's transportation mission through regulatory compliance and responsible stewardship of the built and natural environment; and
- Business operations and management – Provide efficient, cost-effective management and operation to accelerate transportation project delivery and ensure system reliability.

These goals relate to and have an impact on freight movement through Montana. TranPlanMT goals and strategies relating directly to freight are discussed in more detail in Section 5.1.2.



1.4 Montana Freight Plan Structure

This plan is organized by chapter topics to first detail the current condition of freight and the state's freight system, then to identify freight-related issues, followed by how MDT is working to support the safe and efficient movement of freight in Montana. Chapters include:

- Freight and Montana's Economy is an overview of Montana's economy including key industries, and the important role freight plays in the state's economic vitality.
- Freight by Mode provides an overview of freight-related infrastructure including highways, bridges, safety rest areas, rail and rail crossings, pipelines, air service, transloading and intermodal facilities, and transit.
- Key Montana Freight Issues are identified.
- Freight-related Requirements, Strategies, and Performance Measures details the context in which MDT is supporting the movement of freight.
- Heavy Vehicles; Delay Caused by Freight; Mobility Issues; Technology; and the State Investment Plan chapters discuss how MDT is working to eliminate barriers to freight movement and invest in the freight transportation system.

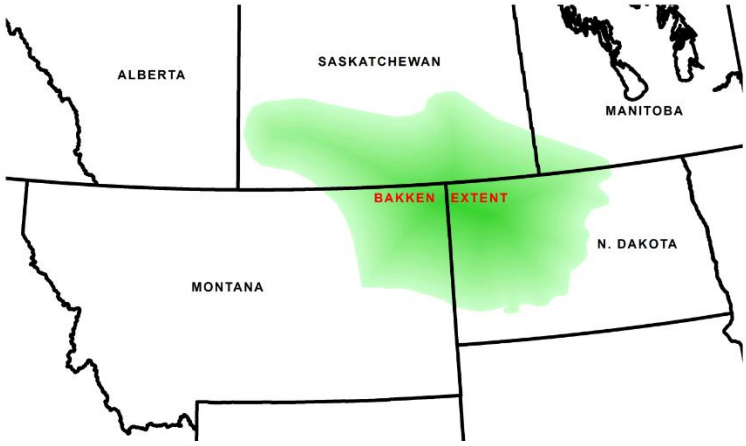
2 FREIGHT AND MONTANA'S ECONOMY

According to the University of Montana's Bureau of Business and Economic Research (BBER) 2015 Economic Outlook, growth in Montana is widespread across major industries, with health care, professional business services, and retail trade posting the biggest gains in inflation-corrected wages.[2] Tourism and recreation is also an important sector of the Montana economy.

2.1 Economy Overview

According to the University of Montana's Bureau of Business and Economic Research (BBER), current economic growth in Montana is widespread across major industries, with health care, professional business services, and retail trade posting the biggest gains in inflation-corrected wages.[2] Tourism and recreation is also an important sector of the Montana economy.

From 2010 to 2015, the oil boom in the Bakken, a vast shale oil formation that crosses parts of North Dakota, Montana, and Saskatchewan, led to a rare trend of rural growth in Montana that out-paced urban area growth.[3] Between 2004 and 2016, oil production activity in North Dakota increased from half a million barrels to over 300 million barrels per year.[4] In late 2014, oil prices began a steep decline[5], falling from an average $91 per barrel in 2013 to $34 in 2016.



While Bakken production influences Montana's economy and transportation system, other factors have influenced recent economic trends as well. In 2013, growth in construction and mining helped offset sluggish or negative production in other industries.[6]

Looking to the future, oil prices and production in the Bakken will continue to be major drivers of Montana's economy. BBER outlined other key economic drivers for the state in the Spring 2015 edition of *Montana Business Quarterly*:

- Federal government spending: The short-lived period of federal government spending discipline and deficit reduction appears to be coming to an end. BBER predicts stable or growing federal spending, ending a period of decline.
- Nonresident spending: Even before the decline in retail gasoline prices, evidence of gains in Montana's tourist industries was plentiful. The prospects of future gains in spending by domestic visitors continue to improve.
- Metal mining: The commodity boom is over, and most metals prices have been in retreat over the last three years. Thus far, those declines have been measured and orderly, and some new projects in Montana remain under active consideration. The sector is unlikely to contribute to growth in the near term.
- Agriculture: In 2015, Montana's farmers and ranchers were doing business in a favorable price environment. Recent declining prices in many commodities and a slowdown in the growth in global demand has caused this positivity to deteriorate.
- Manufacturing: The largest manufacturing sectors in Montana continue to be wood products, food products, fabricated metal products and miscellaneous manufacturing. According to BBER, prospects for growth in Montana's manufacturing industries are not easily specified. Wood products manufacturers have benefited from the home building industry's recovery from the 2008-2009 recession, but gains in this industry have been limited. Other manufacturers have had some success, with tech-related products faring the best and defense-related the worst.

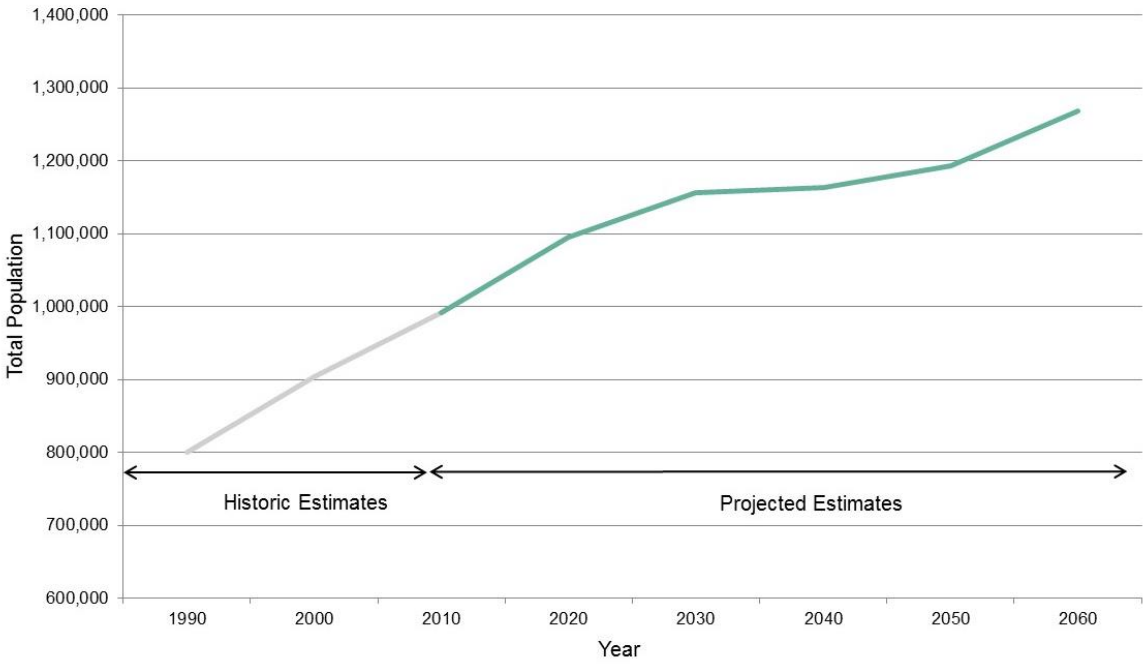
2.2 Population

Montana's population is just over one million people[7], ranking 44th in the U.S., but Montana ranks fourth in land mass, encompassing over 147,000 square miles. At an average of just over seven people per square mile, Montana's population density is 48th in the nation, greater than only Wyoming and Alaska.

State population changes are affected by the number of births, deaths, and migration into and out of the state. According to Census & Economic Information Center (CEIC) population projections[8], by about year 2034, the number of deaths will begin to overtake births, causing a decline in Montana's population growth. Also, migration related to economic opportunity is expected to decrease over the next 20 years. Retired migration will substantially increase, and international migration will increase more slowly.

Figure 1 depicts Montana's historic and projected population. Growth rates are anticipated to vary over the projected time frame, generally decreasing until approximately 2035 and then increasing to year 2060.[9]

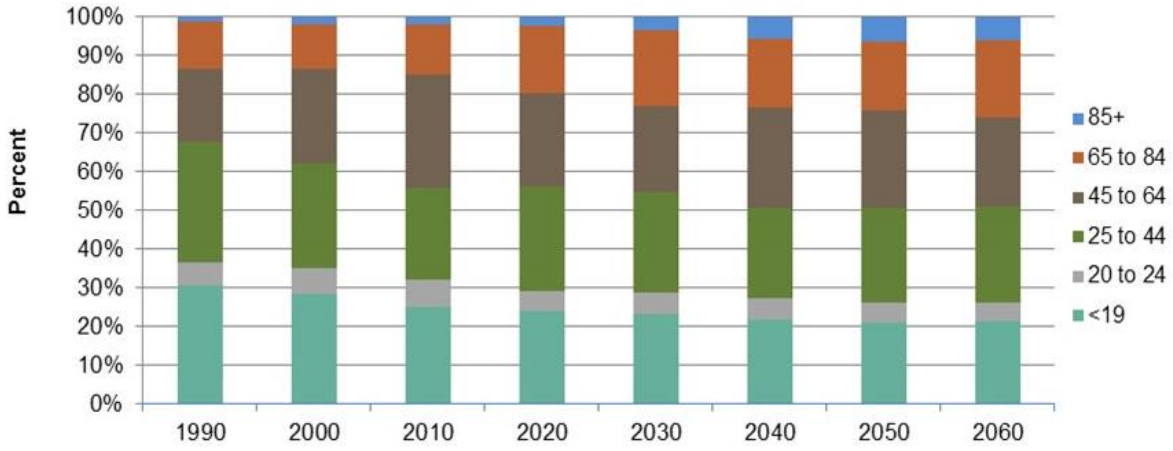
Figure 1: Montana Population Projections



Sources: eREMI – a product of Regional Economic Models, Inc. (www.remi.com) – Released April 2013. Compiled by the Census and Economic Information Center, MT Dept. of Commerce (www.ceic.mt.gov); DOWL 2017.

Montana's population is getting older. In 1990, approximately 30 percent of Montana's population was age 45 and older compared with 50 percent predicted in 2060[10], as shown in Figure 2.

Figure 2: Montana Population Projection by Age

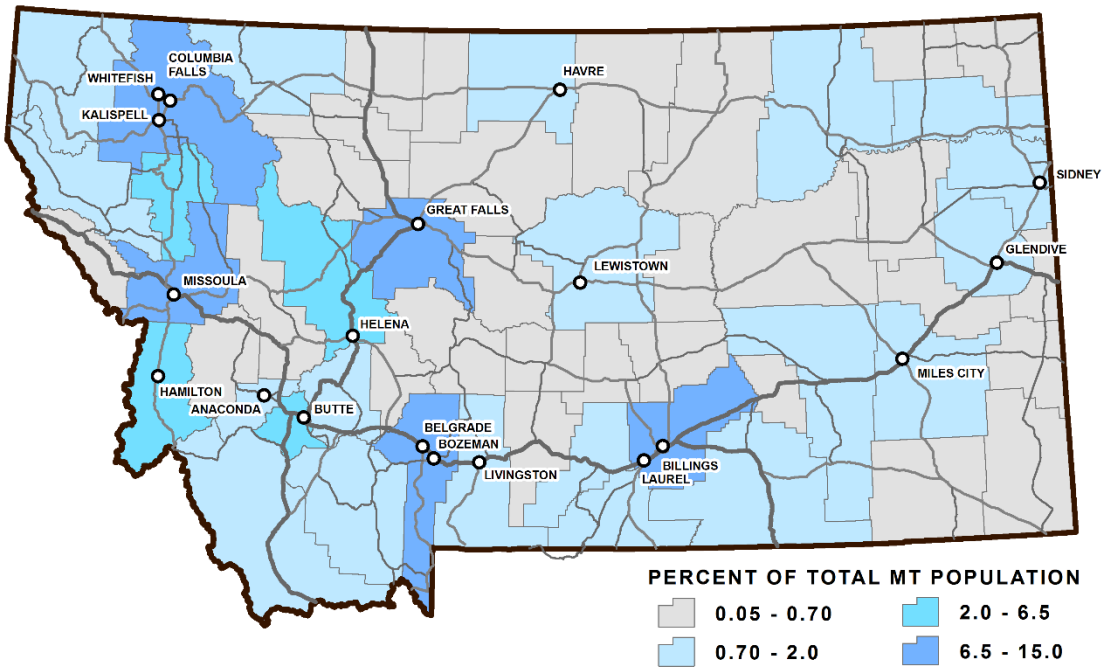


Sources: 2017 TranPlanMT; eREMI – a product of Regional Economic Models, Inc. (www.remi.com) – Released April 2013. Compiled by the Census and Economic Information Center, MT Dept. of Commerce (www.ceic.mt.gov). DOWL 2016.

Montana ranks eighth in the nation for having the oldest population, with a median age of 39.8 years. The median age in neighboring states of Idaho, South Dakota, North Dakota, and Wyoming is younger than Montana.

According to the U.S. Census Bureau, just over half of Montana's population resides within urbanized areas with approximately 35 percent of the population living within the seven largest cities (Billings, Bozeman, Butte, Great Falls, Helena, Kalispell, and Missoula), as shown in Figure 3.

Figure 3: Montana Population Density by Percent of Total

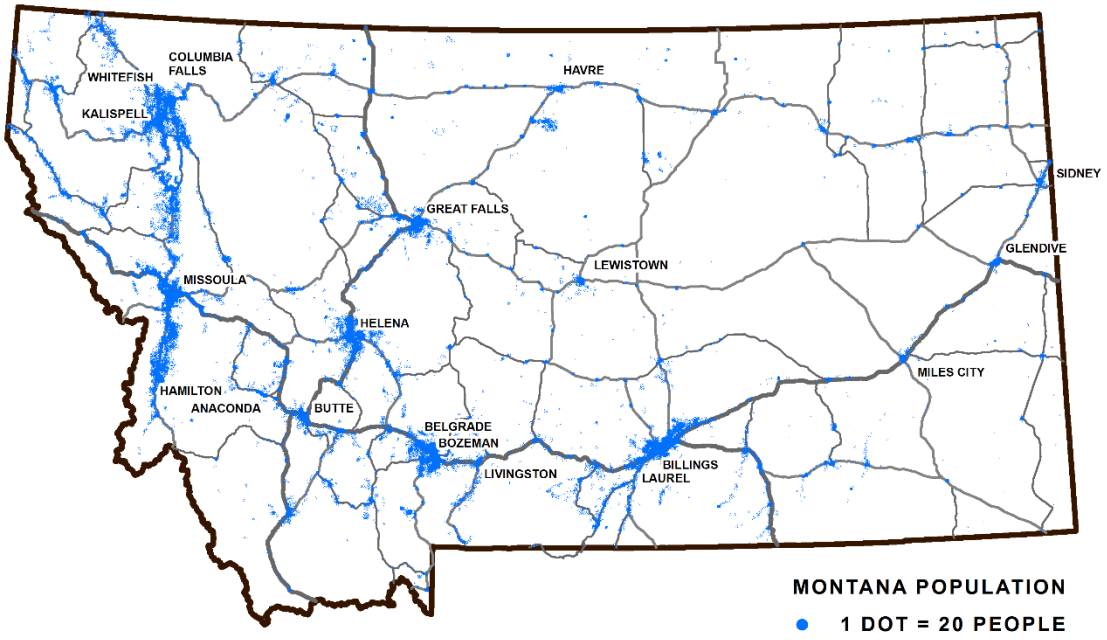


Source: DOWL 2017 TranPlanMT, MDT Geospatial Information Section, U.S. Census Bureau

Montana has three metropolitan planning organizations (MPO) – Billings, Great Falls, and Missoula. It is anticipated that additional MPOs may be added in the next decennial census, as communities such as Bozeman and Belgrade continue to grow.

The majority of land area in Montana is considered frontier, defined as containing less than two people per square mile, as shown in Figure 4.

Figure 4: Montana Population Density



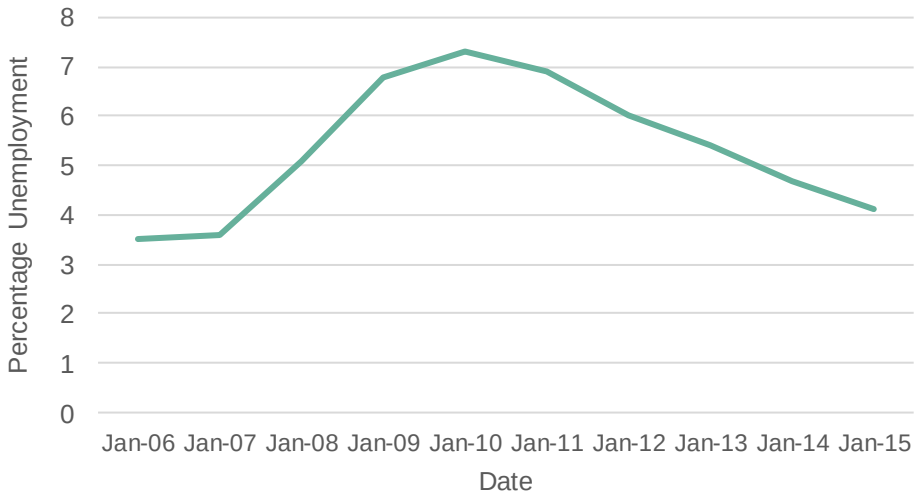
Source: DOWL 2017 TranPlanMT, MDT Geospatial Information Section, U.S. Census Bureau

Approximately 90 percent of the state's population is white, and six percent is American Indian or Alaska Native. Small percentages of other races make up the remaining four percent. Racial diversity in Montana has remained relatively unchanged between 2000 and 2010, although the white population has shown a slight decline and other races have shown slight increases. The United States is becoming more diverse, with white populations growing more slowly than other race groups. According to the US Census Bureau, Montana is less diverse when compared to the United States, although Montana does have a higher American Indian and Alaska Native population as compared to the total.

2.3 Jobs and Income

Montana unemployment was close to 3.5 percent prior to the 2008-2009 recession. During this time, the rate rose sharply to nearly 7.5 percent then dropped steadily to 4.2 percent as of July 2016, as shown in Figure 5.

Figure 5: Montana Unemployment Rate 2006 to 2015



Source: DOWL TranPlanMT and Montana Department of Labor 2016

Since 2008, Montana has fared better than the country overall in terms of employment.[11] The difference in average unemployment rates can be explained as a combination of factors including long-term demographic, population and industry trends, as well as impacts of the recession on various industries throughout the state.

Table 1: Historic Montana Unemployment vs. United States

Montana Unemployment Rate		
Time Period	Montana	United States
April 2010 (Great Recession)	7.4%	10.0%
July 2015	4.1%	5.3%
July 2016	4.2%	4.9%

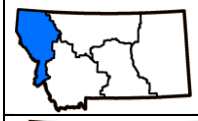
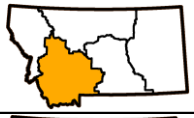
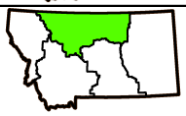
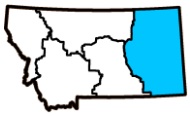
Source: U.S. Bureau of Labor Statistics; Fehr & Peers 2016; DOWL 2016.

In the future, Montana's employment growth is expected to slow due to a restricted labor supply, returning to a pace slightly slower than the long-term growth rate since 1990.[12] Overall job growth is expected to be hindered by worker shortages caused by the retirement of Montana's aging workforce.

The health care industry is projected to demand the most workers of all industries in Montana, adding roughly 1,300 jobs every year through 2024. This employment segment is the only industry that experienced job gains through the recent recession and recovery, and it is expected to grow as Montana's aging population requires more health care services.

Across the state, future employment growth is projected in all of Montana's regions, as shown in Figure 6.

Figure 6: Montana Employment Projections by Region

	Regions	Annual Employment Growth	Top Occupations for Openings
	Northwest	1,570	Home Health Aides, Physical Therapist Aides, Physician Assistants, Rock Splitters
	Southwest	2,030	Economists, Chemical Engineers, Market Research Analysts
	North Central	680	Home Health Aides, Cargo and Freight Agents, Wellhead Pumpers, Personal Care Aides
	South Central	1,600	Insulation Workers, Cement Masons, Carpenters, Construction Managers
	Eastern	450	Petroleum Engineers, Service Unit Operators, Natural Gas and Oil Rig Personnel

Source: Montana Employment Projections: 2015 – 2024, Montana Department of Labor and Industry, May 2015

Montana's southwest region is projected to add the most jobs, approximately 2,000 every year through 2024. This region has recovered well from the recession due to growth of construction related jobs as well as growth of professional and technical services industry, which include occupations like engineers, computer programmers, and economists. Rapid employment growth in the professional and technical services industry is reflective of a general shift in Montana toward a more service-based economy. Table 2 illustrates the growth rate for all industries in Montana and projected job gains or losses per year for each industry through 2024.

Table 2: Montana Job Growth Rates by Industry

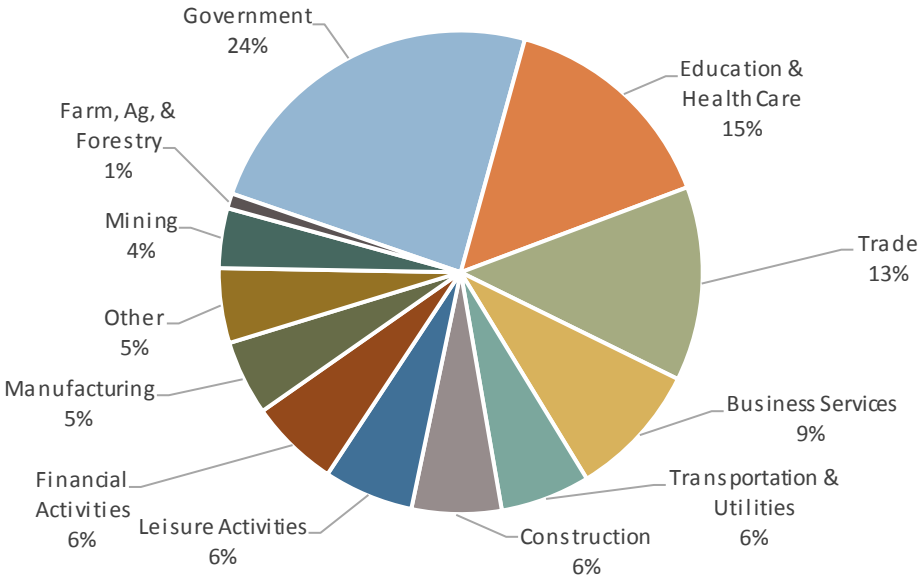
Montana Job Growth Rates by Industry						
Industry	Long Term Annual Growth Rate 1990-13	Annual Growth Rate 2010-13	Annual Growth Rate 2014-16	Annual Growth Rate 2017-24	Average Job Gain Per Year 2014-16	Average Job Gain Per Year 2017-24
Federal Government	-1.40%	-4.70%	-0.80%	-0.40%	-80	-40
Management of companies*	3.50%	3.80%	-1.20%	0.70%	-20	10
Utilities	-0.80%	0.80%	0.70%	0.70%	20	20
Ag and Forestry	0.80%	3.10%	0.70%	0.60%	30	30
Information	0.30%	-3.40%	0.80%	0.40%	50	30
State Government*	1.20%	0.50%	0.20%	0.80%	20	110
Manufacturing	-0.30%	3.70%	1.50%	0.70%	280	130
Transportation	1.90%	2.80%	0.80%	0.70%	140	130
Other Services	2.40%	1.30%	1.10%	0.90%	180	160
Finance and Real Estate	1.60%	0.40%	1.50%	0.90%	320	190
Local Government	2.70%	0.30%	1.10%	1.00%	210	200
Mining	1.50%	5.60%	0.40%	2.30%	40	220
Self-Employed	-3.20%	3.40%	3.10%	0.40%	1,530	230
Educational Services	1.30%	0.20%	0.60%	0.60%	230	240
Admin & Waste Services	4.10%	-2.00%	2.50%	2.10%	440	410
Wholesale & Retail Trade	1.30%	1.40%	1.30%	0.60%	950	500
Professional & Technical Services	4.10%	2.10%	3.20%	2.40%	650	570
Construction	3.60%	2.40%	3.00%	2.30%	770	660
Leisure Activities	2.40%	2.10%	1.50%	1.20%	890	800
Health Care & Social Assistance	2.80%	1.90%	1.80%	1.80%	1,220	1,350
Total Payroll Employment	2.00%	1.30%	1.40%	1.20%	6,330	5,730
Total Employment	1.10%	1.50%	1.60%	1.10%	7,860	5,950

* The long-term annual growth rate is the compound annual employment growth rate from 2000 to 2013, instead of 1990 to 2013

Source: Montana Employment Projections: 2015 – 2024, Montana Department of Labor and Industry, May 2015

Figure 7 illustrates jobs by industry in Montana, based on 2013 data. Government, trade, and education and healthcare jobs account for over half of total compensation by industry.[13]

Figure 7: Montana Compensation by Industry



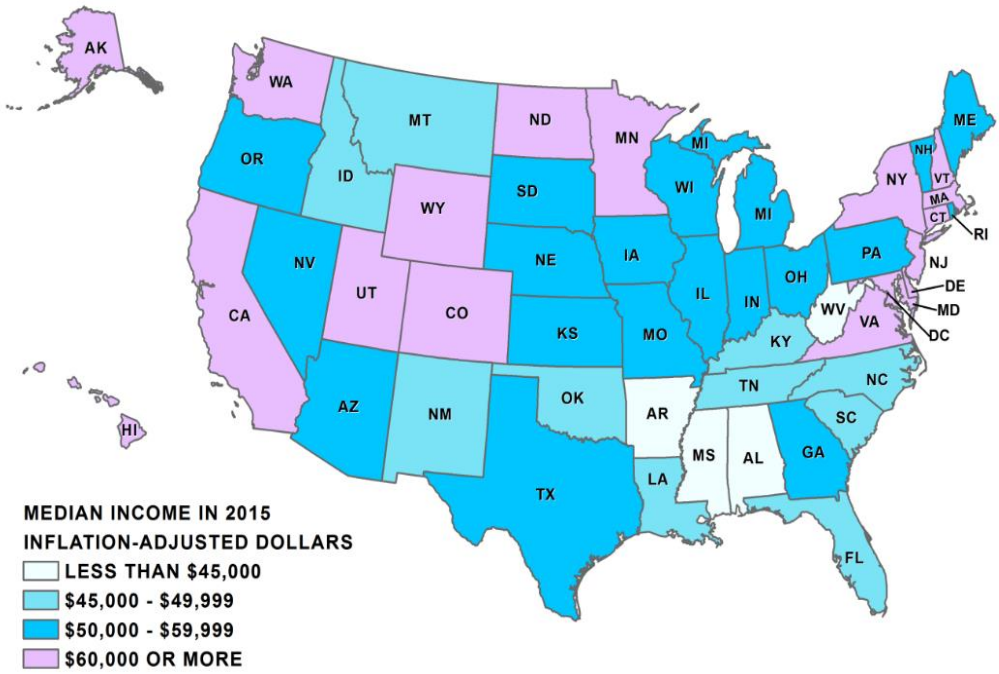
Source: What is Montana's Most Important Industry? Montana Department of Labor & Industry, July 2014

Over the next ten years, professional and technical services, mining, and construction are expected to grow the fastest. The professional and technical services industry is estimated to add roughly 600 jobs every year through 2024.

Railroads employ approximately 2,800 people in Montana, and it is estimated that each freight rail job supports 4.5 jobs elsewhere in the economy.[14] In 2014, the operations and capital investments of America's major freight railroads supported approximately 1.5 million jobs or 1.1 percent of all U.S. workers.[15]

As shown in Figure 8, Montana's median wage rates are comparatively low, 38th in the nation, with a mean annual income of $40,620.[16]

Figure 8: U.S. Median Household Income 2015



Source: U.S. Census Bureau, 2015 American Community Survey

Studies conducted by BBER suggest Montana's "livability factor" has a negative influence on wages.[17] Due to factors such as few people, abundant outdoor and recreational activities, short work commute times, and a relatively low cost of living, the state attracts people and workers. Montanans ranked first in the nation in two Gallup polls that measure state livability.[18] Only 13 percent of Montanans said they would like to move to another state, and 77 percent felt they live in the best or one of the best states.

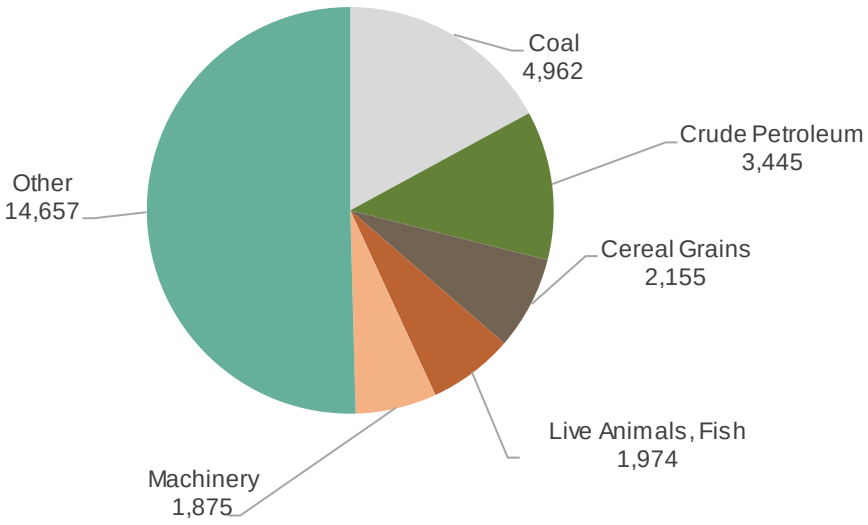
2.4 Montana Exports and Imports

Trade is a vital aspect of Montana's economy, providing access to important commodities, creating jobs, and encouraging investment and economic growth.

2.4.1 Montana Exports

Montana exported over $1.4 billion worth of goods and services in 2015.[19] As shown in Figure 9, the top exported freight commodities based on value were coal, crude petroleum, and cereal grains.[20] Other top commodities include: food and beverage products, wood products, machinery, and minerals.

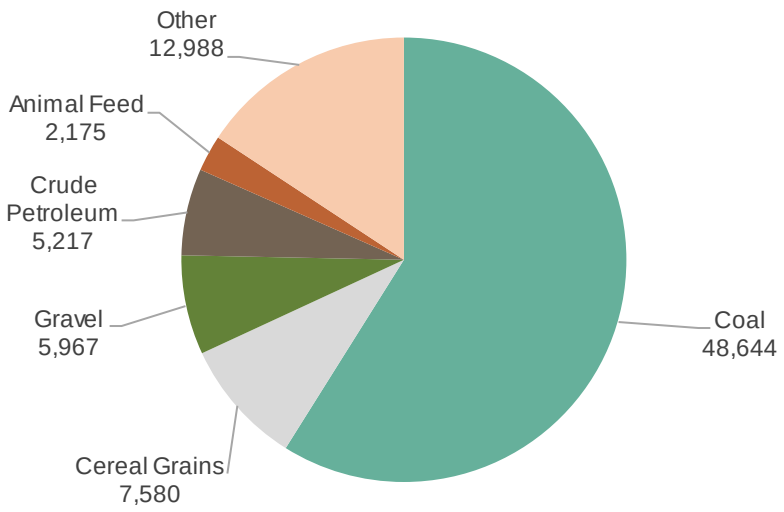
Figure 9: Montana's Top Outbound Commodities by Value 2015



Source: BTS FAF 4 ttps://ops.fhwa.dot.gov/freight/freight_analysis/faf/

As shown in Figure 10, the product mix changes when weight is considered as opposed to value, with the top commodities being coal, cereal grains, and gravel.

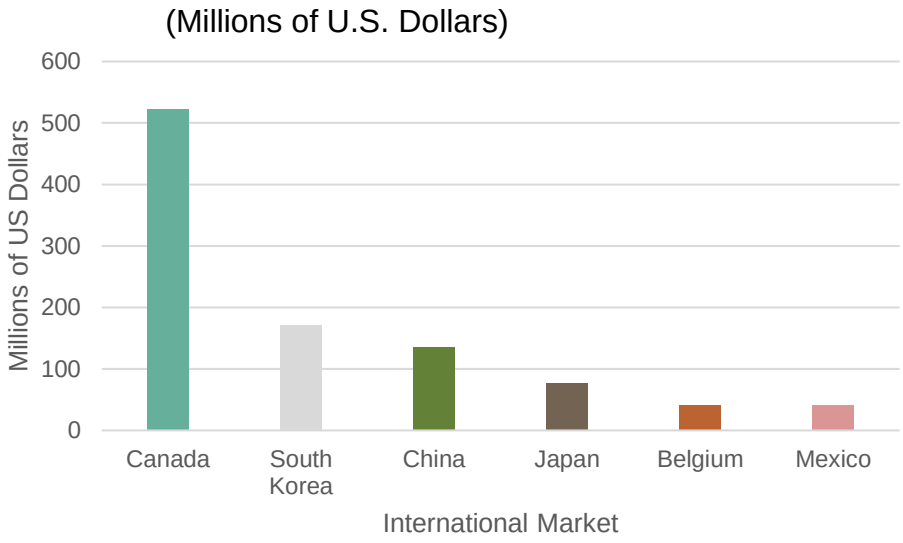
Figure 10: Montana's Top 5 Outbound Commodities by Weight 2015



Source: BTS FAF 4 https://ops.fhwa.dot.gov/freight/freight_analysis/faf/

Montana companies sold products in over 175 international markets[21], with exports growing three times faster than state Gross Domestic Product (GDP) since 2003. Montana's top export markets for goods include Canada, South Korea, and China, as shown in Figure 11. The state's top market for services is Canada.[22]

Figure 11: Montana's Top Export Markets



Source: BTS FAF 4 https://ops.fhwa.dot.gov/freight/freight_analysis/faf/

Montana ranks among the top half of state exporters in 12 industries, including fifth in cement & concrete and tobacco products, ninth in coal and petroleum gases, and twelfth in oilseeds and grains.[23]

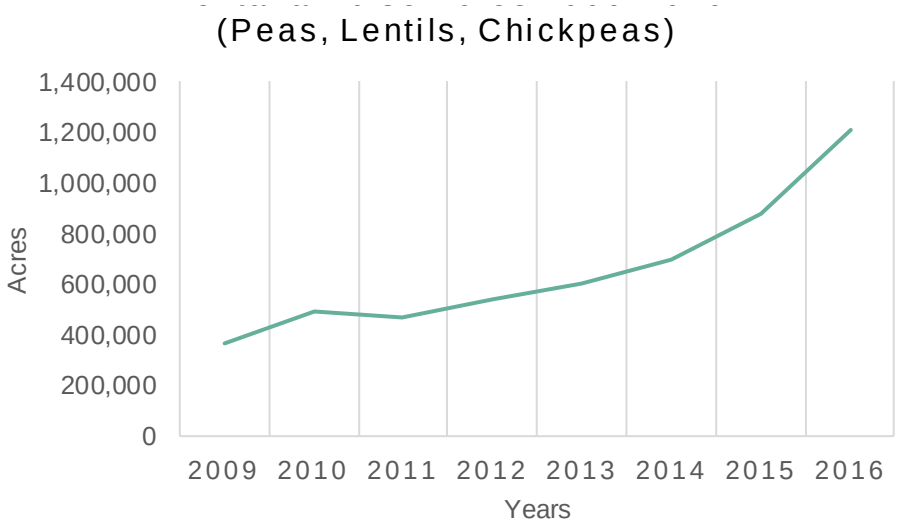
12,085
US jobs supported by goods exports from Montana in 2015

46% of these job were supported by manufactured goods exports

Source: Montana Exports, Jobs and Foreign Investment, International Trade Administration, U.S. Department of Commerce

One of the state's fastest growing export categories is pulse crops, which includes dried peas, beans, lentils, and chickpeas. In 1980, Montana's production of pulse crops was nearly zero. As of 2016, Montana is the nation's leading producer of both lentils and dry peas.[24] According to the Montana Department of Agriculture, cash receipts for peas, beans, and lentils in Montana exceeded $185 million in 2015, more than the combined receipts from Montana's durum wheat and potato harvests.[25] Pulse crops continue to be an increasingly important export commodity for Montana, as shown in Figure 12.

Figure 12: Montana Pulse Crop Production 2009 – 2016

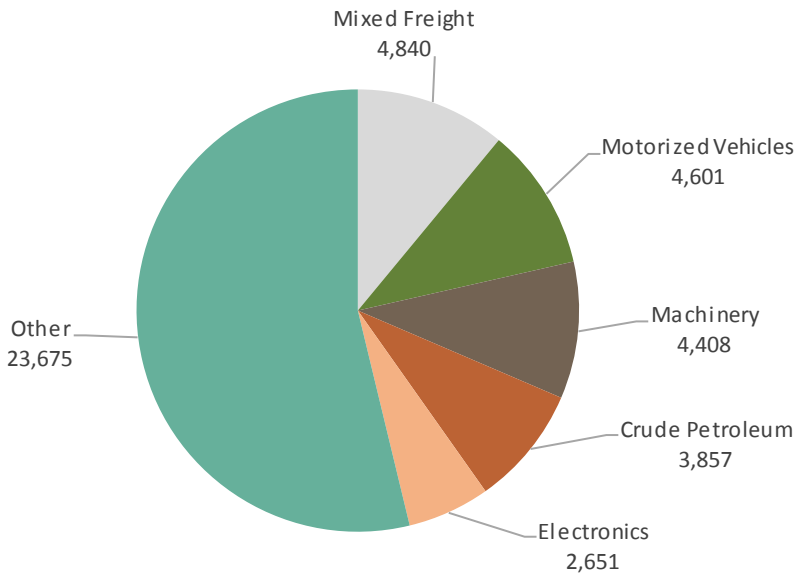


Source: Montana Department of Agriculture

2.4.2 Montana Imports

In 2015, Montana imports totaled more than $4 billion, with 86 percent of products coming from Canada.[26] As shown in Figure 13, top freight commodities imported to Montana by value are mixed freight, motorized vehicles, machinery, crude petroleum, and electronics.

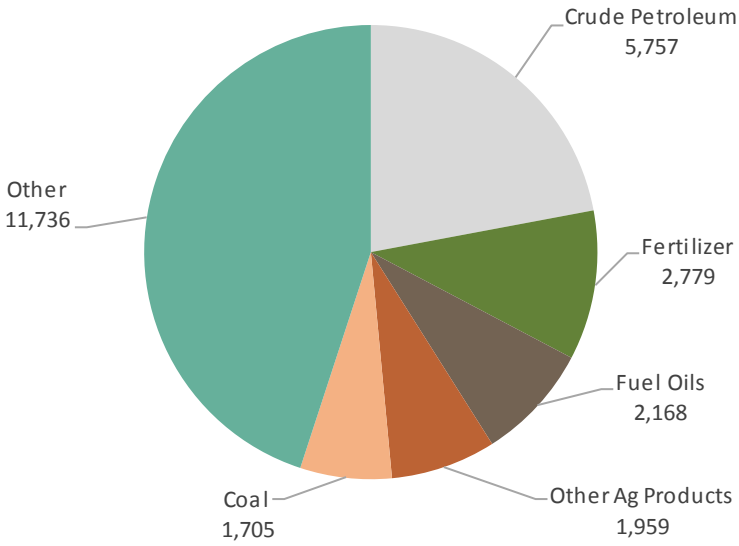
Figure 13: Montana's Top Inbound Shipments by Value 2015



Source: BTS Freight Analysis Framework FAF 4 https://ops.fhwa.dot.gov/freight/freight_analysis/faf/

As shown in Figure 14, Montana's top freight commodities imported by weight are crude petroleum, fertilizers, and fuel oils.

Figure 14: Montana's Top Inbound Shipments by Weight 2015



Source: BTS FAF 4 https://ops.fhwa.dot.gov/freight/freight_analysis/faf/

2.4.3 Trade with Canada

Montana has 13 Canadian international border crossings, making interjurisdictional harmonization and collaborative relationships important aspects for reliable and efficient freight movements. During the past five years, an average of 171,500 trucks crossed the Montana/Canadian border annually.[27] Table 3 shows crossing activity for 2015.

Table 3: Montana/Canada Border Crossings – 2015

Montana/Canada Border Crossings 2015	
Personal Vehicle Passengers	1,203,085
Personal Vehicles	682,806
Trucks	164,562
Loaded Truck Containers	121,380
Empty Truck Containers	32,575
Loaded Rail Containers	14,618
Empty Rail Containers	11,165
Bus Passengers	15,410
Pedestrians	5,404
Train Passengers	2,082
Buses	471
Trains	347

Source: BTS https://transborder.bts.gov/programs/international/transborder/TBDR_BC/TBDR_BCQ.html

Thirteen ports of entry facilitate trade and tourism between Montana and Canada. As shown in Table 4, the Port of Sweetgrass on Interstate 15 is the most active, exceeding the others in all modes of commerce except air imports and exports.

Table 4: U.S./Canada Freight Trade – 2015

U.S./Canadian Freight Trade 2015								
Port/District Description 2015	Truck Exports	Truck Imports	Rail Exports	Rail Imports	Pipeline Exports	Pipeline Imports	Air Exports	Air Imports
Sweetgrass	$161,147,634	$348,248,712	$67,438,181	$62,099,933	$0	$1,393,779,168	$0	$1,650
Raymond	$29,161,027	$63,445,318	$116,714	$0	$0	$0	$0	$0
Roosville	$13,479,056	$48,879,342	$0	$0	$0	$0	$0	$0
Del Bonita	$2,282,994	$4,421,622	$0	$0	$0	$20,779,674	$0	$0
Wildhorse	$1,244,785	$15,827,440	$0	$0	$0	$0	$0	$0
Piegan	$1,188,113	$4,085,864	$0	$0	$0	$178,006,798	$0	$0
Turner	$875,861	$17,415,205	$0	$0	$0	$0	$0	$0
Scobey	$662,895	$5,940,880	$0	$0	$0	$0	$0	$0
Opheim	$586,341	$3,953,920	$0	$0	$0	$0	$0	$0
Great Falls	$368,246	$3,132,011	$0	$0	$0	$1,064,850,965	$1,596,128	$4,294,708
Butte	$40,451	$0	$0	$0	$0	$0	$0	$0
Whitlash	$21,653	$6,133,094	$0	$0	$0	$8,412,126	$0	$0
Whitetail	$0	$0	$0	$0	$0	$0	$0	$0
Morgan	$0	$0	$0	$0	$0	$0	$0	$0
Willow Creek	$0	$750,247	$0	$0	$0	$0	$0	$0
TOTALS	**$211,059,056**	**$522,233,655**	**$67,554,895**	**$62,099,933**	**$0**	**$2,665,828,731**	**$1,596,128**	**$4,296,358**

Source: BTS, https://transborder.bts.gov/programs/international/transborder/TBDR_BC/TBDR_BCQ.html

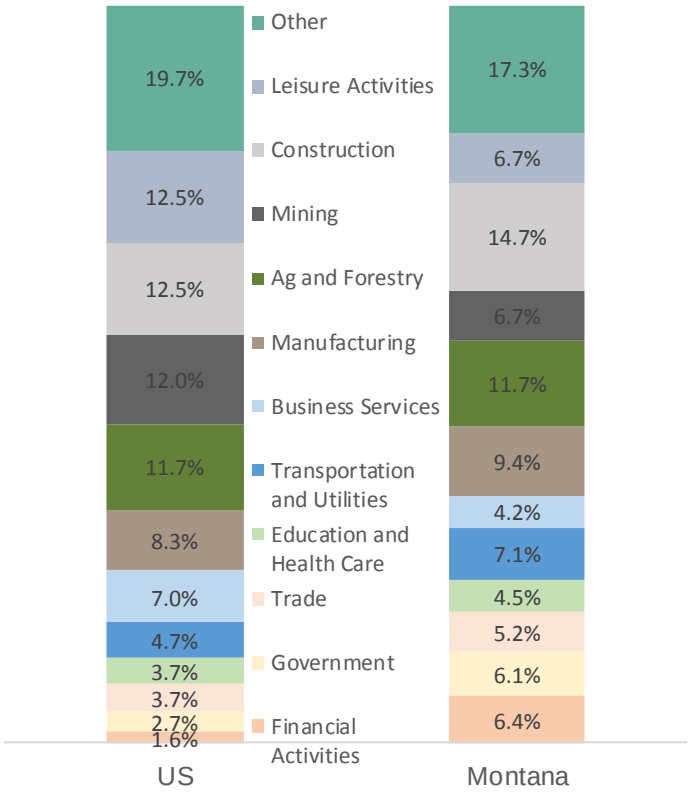
2.5 Montana Freight Generating Industries

GDP reflects the total value of goods and services created by an industry and is a measure of the amount of economic activity generated within a state.[28] GDP is the most widely used measure of overall economic output.

In 2013, Montana's GDP was $44 billion. Montana's largest industries are financial activities ($7.6 billion), government ($6.4 billion), and wholesale and retail trade ($5.1 billion).

In comparison, the top industries in the U.S. economy are financial activities, government, and manufacturing. Figure 15 illustrates how Montana's GDP by industry compares to the national economy. Montana has a larger share of GDP in the government sector than the U.S., in part because of economies of scale. The per person or per business cost of providing government services decreases as more people and businesses are served because the fixed costs of providing public goods are spread among a larger customer base. Nearly half of Montana's government sector is local governments of various types, including 56 county governments, 417 school districts, 7 sovereign American Indian Nations, and many different city/town governments.

Figure 15: Share of GDP by Industry, U.S. vs. Montana



Source: What is Montana's Most Important Industry?
Montana Department of Labor & Industry, July 2014

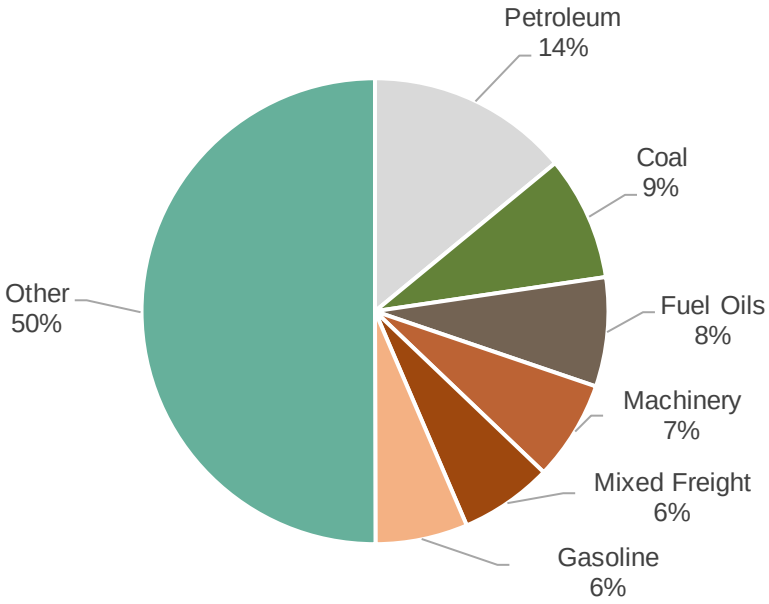
Montana's transportation sector comprises a larger share of the economy as compared to the U.S. due in part to Montana's rural nature and large land mass.

The state's goods-producing industries are agriculture, mining, construction, and manufacturing. Montana has a smaller share of manufacturing than the U.S., 7 percent in Montana compared to 12.5 percent. Larger concentrations in agriculture, mining, and construction make up this shortfall, leaving the goods-producing industries in Montana as roughly 24 percent of GDP compared to 20 percent of U.S. GDP within the goods-producing sectors.

Montana's manufacturing is challenged by the long distance to markets and ports, which increases transportation costs. Montana's manufacturing is concentrated in the value-added manufacturing of natural resources such as petroleum and wood products, where transportation costs are minimized by co-locating manufacturing with input sources.[29]

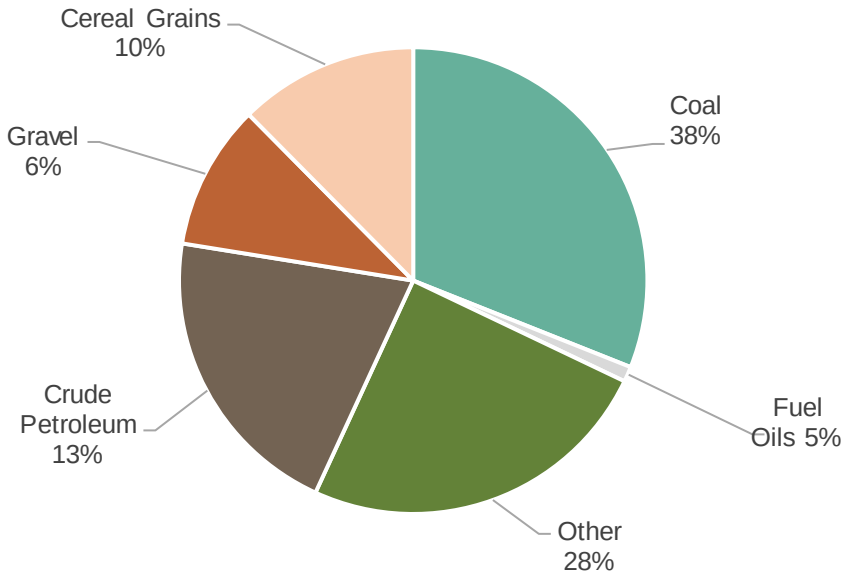
The state's largest freight-driving industries, including imports, exports, and movements within Montana are reflected in Figures 16 and 17. The top five commodities of coal, crude petroleum, cereal grains, gravel, and fuel oil make up 72 percent of Montana's freight flow by weight.[30]

Figure 16: Montana Freight Commodities by Value – 2015



Source: BTS FAF4 https://ops.fhwa.dot.gov/freight/freight_analysis/faf/

Figure 17: Montana Freight Commodities by Weight – 2015



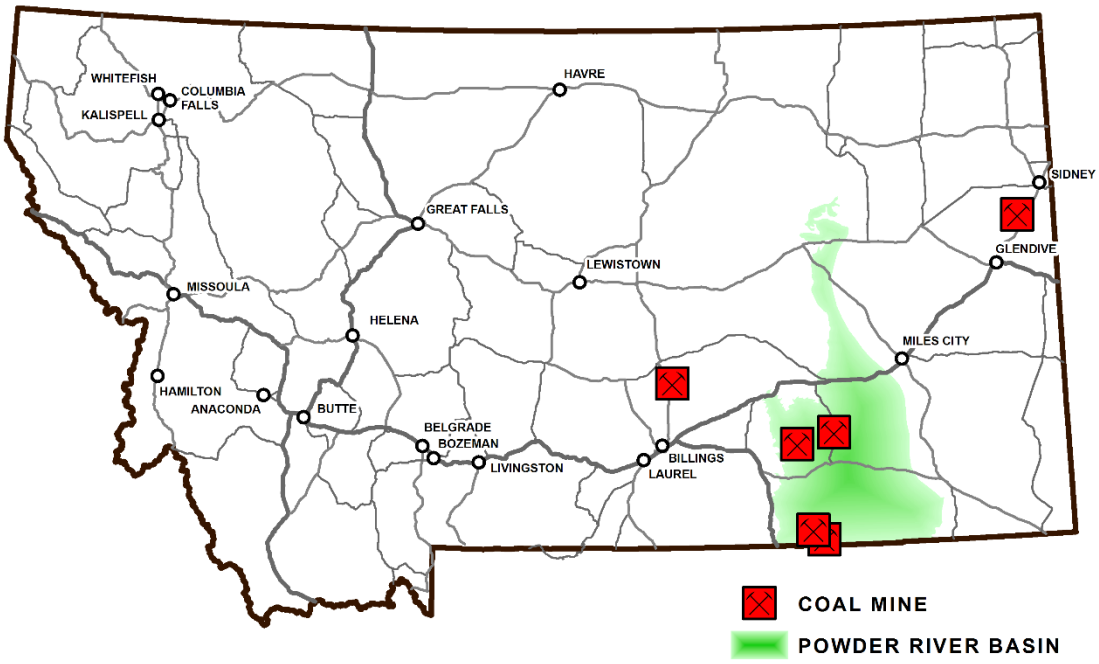
Source: BTS FAF4 https://ops.fhwa.dot.gov/freight/freight_analysis/faf/

2.5.1 Coal

Montana is the sixth largest producer of coal in the United States.[31] Most of this production is in the rural southeast corner of the state.

Most U.S. coal production takes place in three major areas. Western coal is mined in Wyoming, Montana, Utah, Colorado, North Dakota, New Mexico, and Arizona. Most Western coal originates in the Powder River Basin (PRB) of northeast Wyoming and southeast Montana. Over the past two decades, consumption of PBR coal has surged due to increasingly stringent clean air laws. The major benefit of PRB coal is its low sulfur content, which lowers sulfur oxide emissions of power plants. Figure 18 highlights the PRB area in Montana and locations of coal mines in the region.

Figure 18: Montana Coal Mining Areas



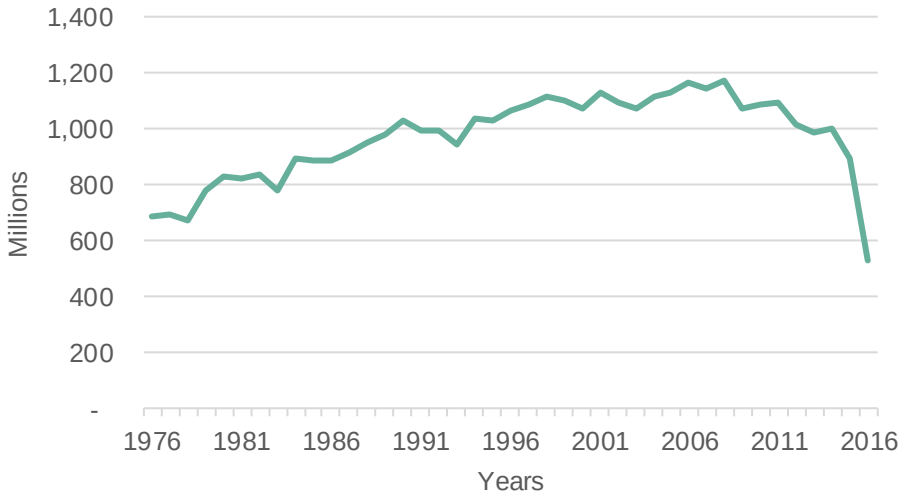
Source: Montana Department of Transportation, Geospatial Information Section

A Federal Highway Administration (FHWA) freight analysis tool indicates that 93 percent of Montana's coal is transported by rail. The U.S. Energy Information Administration (EIA) predicts a decrease in coal demand that may decrease coal production in Montana.

Sixty percent of Montana's electricity generation is powered primarily by coal[32] and hydroelectricity. Since 2000, approximately 25 percent of Montana's coal production has been used to generate electricity in Montana.

Since 2008, U.S. natural gas production has surged due to hydraulic fracturing or “fracking”, resulting in increased competitiveness of electricity generated from natural gas versus coal. In addition, environmental regulations have targeted coal-fueled electricity generation. Consequently, coal and associated rail coal volumes have fallen from where they once were, as shown in Figure 19. In 2017, however, discussions at the federal level indicate the possibility of easing existing policies having detrimental effects on the coal industry.

Figure 19: U.S. Quarterly Coal Production – 1976 to 2016



Source: U.S. EIA, Weekly Coal Report, and U.S. Mine Safety and Health Administration

Also, demand for coal in Asia is expected to increase in the coming years. Several coal export terminals have been proposed on the coasts of Washington and Oregon, including one inland port on the Columbia River. These terminals, if built, would facilitate exporting coal overseas, mostly to Asia, however, this prospect is meeting resistance from various special interest groups.

2.5.2 Crude Oil

As advances in horizontal drilling technology have made recovery of crude oil from shale economically viable, industry attention has turned to the Bakken region shown in Figure 20.

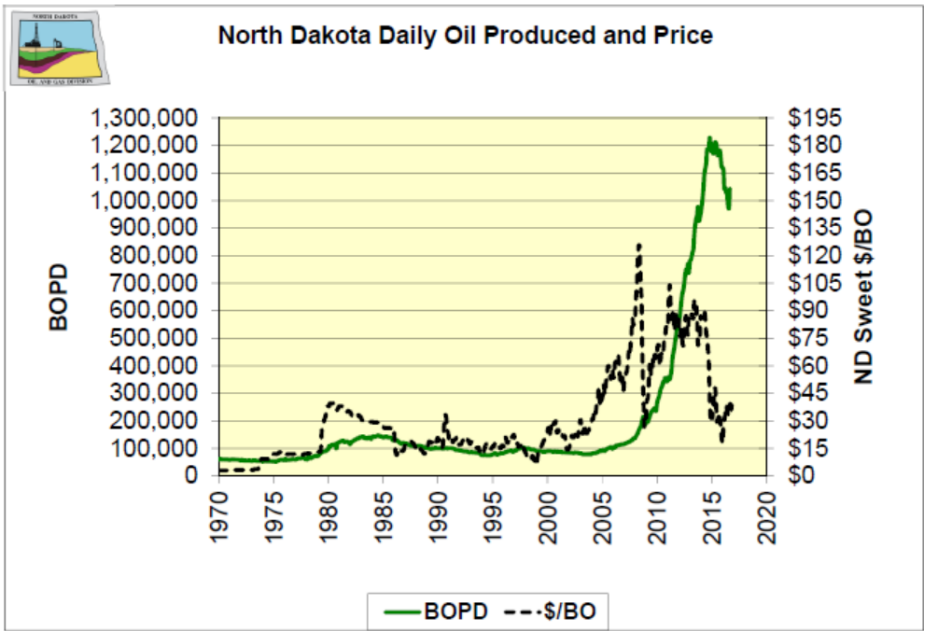
Figure 20: Bakken Oil Fields

Source: The Montana Bakken Oil Play: Great News for a Great Play", Oil and Gas Investments Bulletin, December 18, 2012

Around 2007, crude oil production in North Dakota began a period of rapid growth, climbing over 900 percent, from 4.5 million barrels to over 432 million barrels in 2015. While the rest of the nation experienced a recession, North Dakota experienced increased oil tax revenues and record low unemployment. At the same time, North Dakota also experienced an increased strain on local resources and infrastructure. This economic boom in western North Dakota, as well as significant growth in oil permitting and development in eastern Montana, led to expanded demand for workers, housing, infrastructure and transportation in both Montana and North Dakota.

As shown in Figure 21, North Dakota's daily oil production started to decrease slightly after the steep decline in price per barrel in 2015. Production remains at a significantly higher rate than in years prior to 2010.

Figure 21: North Dakota Daily Oil Produced and Price



Source: North Dakota Industrial Commission and U.S. EIA

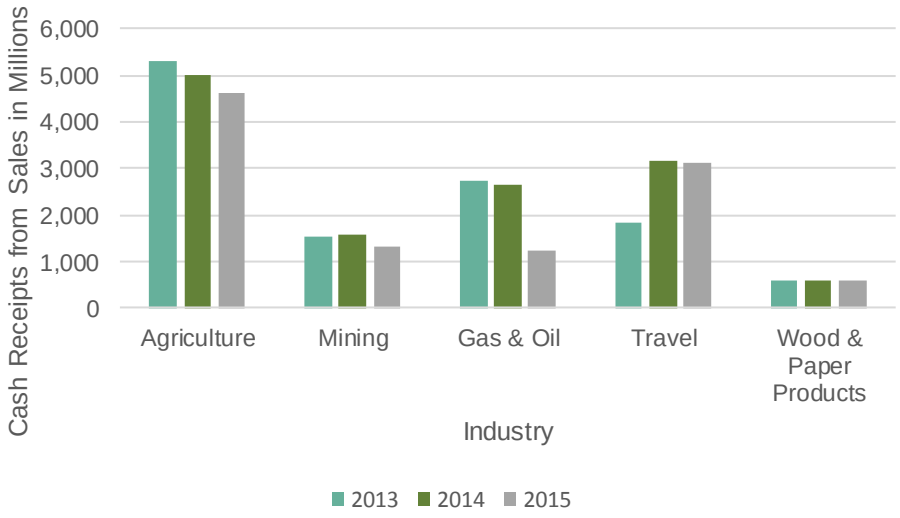
Montana's crude oil production has decreased in recent years[33], ranging from over 34 million barrels in 2007 to approximately 23 million barrels in 2016. In 2012, 47 percent of Montana oil production was shipped to Washington, North Dakota, Wyoming, and other destinations to the south and east. Three crude oil pipeline networks service Montana's oil regions. One bridges the Williston and Powder River Basins in the east, the other two link the Sweet Grass Arch, Big Snowy, and Big Horn producing areas in central Montana. In January 2017, President Trump renewed efforts to develop the controversial Keystone XL crossing Montana and expedited another pipeline project in the Dakotas.[34]

Montana crude oil pipeline infrastructure is often limited to individual oilfields and lacks significant interstate pipeline infrastructure capable of moving large amounts of oil to refineries. Crude oil is generally moved from local fields and pipelines by truck to rail loading facilities, and then shipped by rail to refineries. In some cases, crude oil is moved by pipeline directly to a refinery.

2.5.3 Agriculture

Agriculture is consistently Montana's leading industry, as shown in Figure 22, with cash receipts from sales of $5.4 billion in 2014.

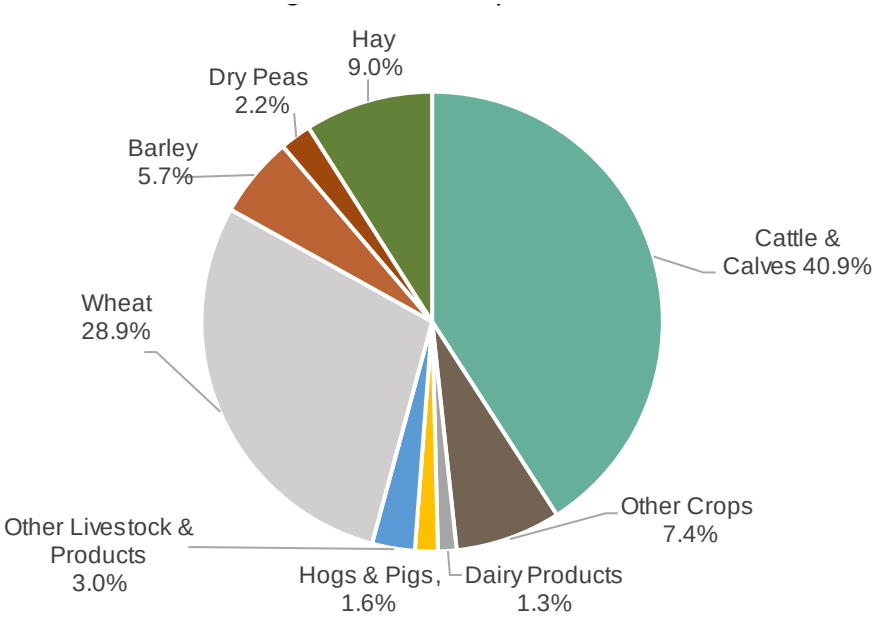
Figure 22: Montana Leading Industries 2013 - 2015



Source: 2016 Montana Agriculture Statistics, Montana Department of Agriculture and USDA

Land devoted to farming and ranching comprises over 64 percent of acreage in Montana[35], with approximately 27,800 operations averaging 2,147 acres each. Cattle and wheat sales accounted for more than 70 percent of agriculture sales in Montana between 2012 and 2014[36], as shown in Figure 23.

Figure 23: Average Agriculture Cash Receipts 2013 - 2015

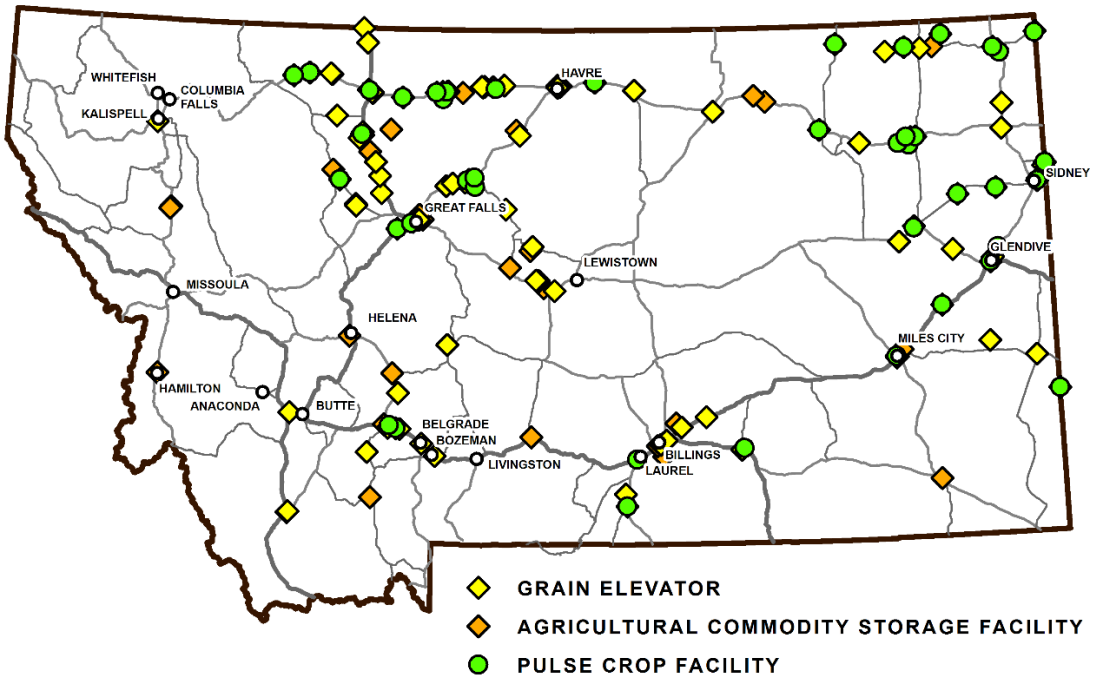


Source: 2016 Montana Agriculture Statistics, Montana Department of Agriculture and USDA, https://www.nass.usda.gov/Statistics_by_State/Montana/Publications/Annual_Statistical_Bulletin/2015/Montana Annual Bulletin 2015.pdf

Montana ranks third in the country for wheat production. In 2015, over five million acres of wheat worth approximately $938 million was harvested in the state.[37]

Approximately 25 percent of Montana's grain and 75 percent of pulse crops are exported out of the United States.[38] These products generally move via truck from farms to rail loading facilities for shipment to west coast ports and other destinations. Montana livestock is transported almost exclusively by trucks. Livestock shipments and crop harvest times are seasonal in nature, resulting in periods of increased truck traffic around ranches, farms, grain elevators, and rail loading facilities. Figure 24 shows locations of grain elevators and pulse crop facilities.

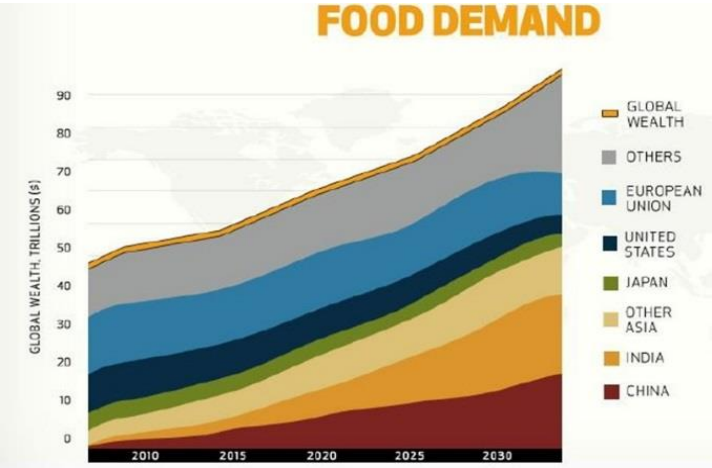
Figure 24: Grain and Pulse Crop Facilities



Source: Montana Department of Agriculture and Montana Department of Transportation

By 2030, global food demand is expected to increase by 35 percent.[39] In addition to increasing population, world demographics are also expected to change, with India and China populations growing to represent 40 percent of the global middle-class, up from less than 10 percent in 2010. This change will alter the composition of global diets with increased demand for protein from non-animal sources and impacting demand for Montana agricultural products. Protein accounts for approximately 25 percent of the nutrient composition of pulse crops[40], twice the amount of protein found in wheat, millet, or sorghum.[41]

Figure 25: World Demand for Food

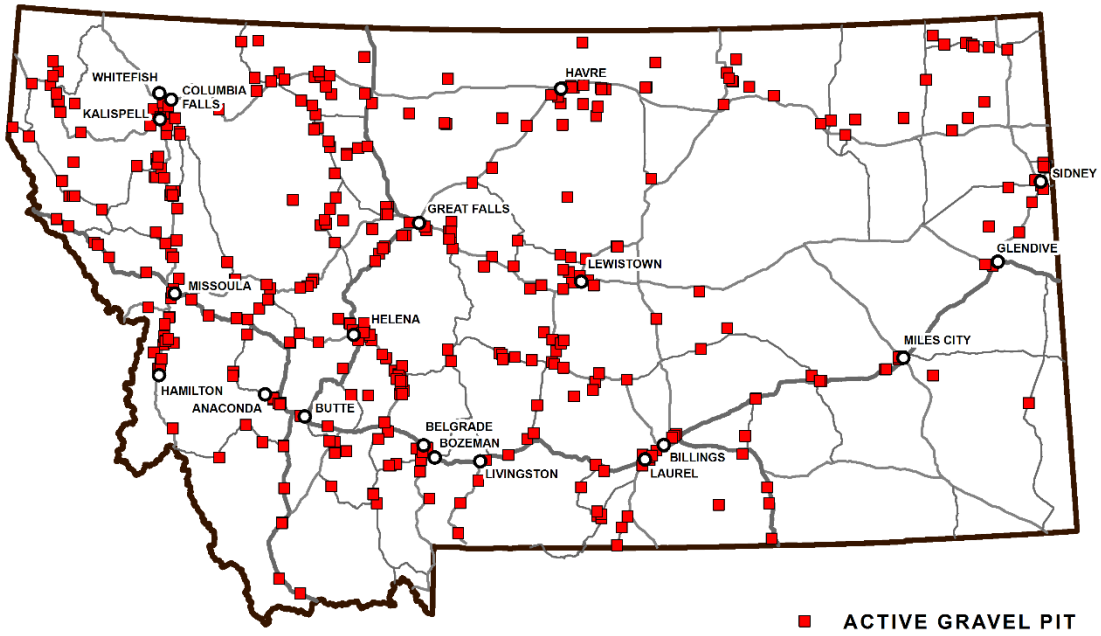


Source: Montana Department of Agriculture

2.5.4 Gravel

Gravel is widely used in Montana for the construction of roads, buildings, and bridges. As of January 2017, Montana had approximately 2,000 permitted opencut pits operated by approximately 600 permit holders.[42] For efficiency, gravel sources are generally located in close proximity to usage. This results in opencut sites spread throughout Montana, as shown in Figure 26.[43]

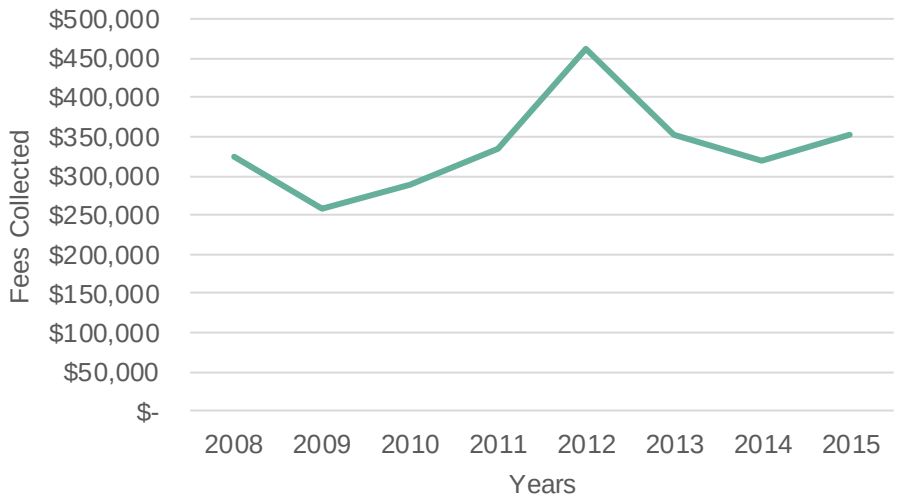
Figure 26: Montana Active Gravel Pits – 2017



Source: Montana Department of Transportation, Pavement Analysis Section

For each opencut operation, operators must submit an annual production report (APR) and fees to the Montana Department of Environmental Quality (DEQ). Figure 27 shows opencut fees collected between 2008 and 2015.

Figure 27: Montana Gravel Opencut Fees Collected 2008 – 2015



Source: Montana DEQ

Gravel resources are tending to become less readily available and proposed permit locations more complicated, due in part to environmental, archaeological, and community concerns. Longer haul distances within Montana between supply and demand locations may result.

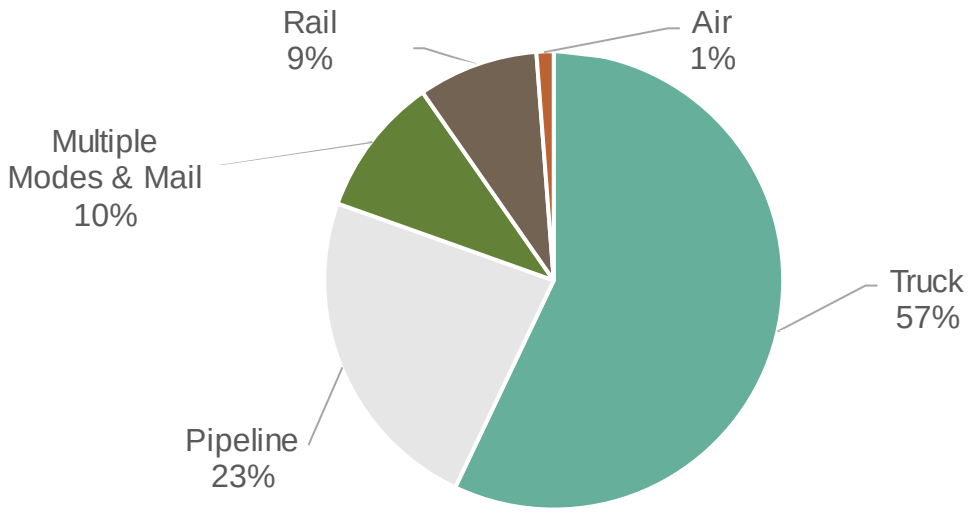
2.5.5 Fuel Oils

Fuel oils, primarily in the form of diesel fuel, are imported to support Montana's agriculture industry and transportation systems. Nearly 300 million gallons of diesel fuel were consumed in Montana in 2015. Over 70 percent of fuel oils were used for on-highway transportation, and 11 percent for farming.[44]

3 FREIGHT BY MODE IN MONTANA

Freight in Montana is primarily moved by truck, rail, and pipeline. At one time, steamboats moved freight to the world's "innermost port" along the Missouri River in Fort Benton, Montana. Railroads proved to be much more efficient, however, and the subsequent construction of dams along the Missouri limits modern day freight movement by water in Montana. As shown in Figure 28, more than 50 percent of freight in Montana measured by value is moved by trucks.

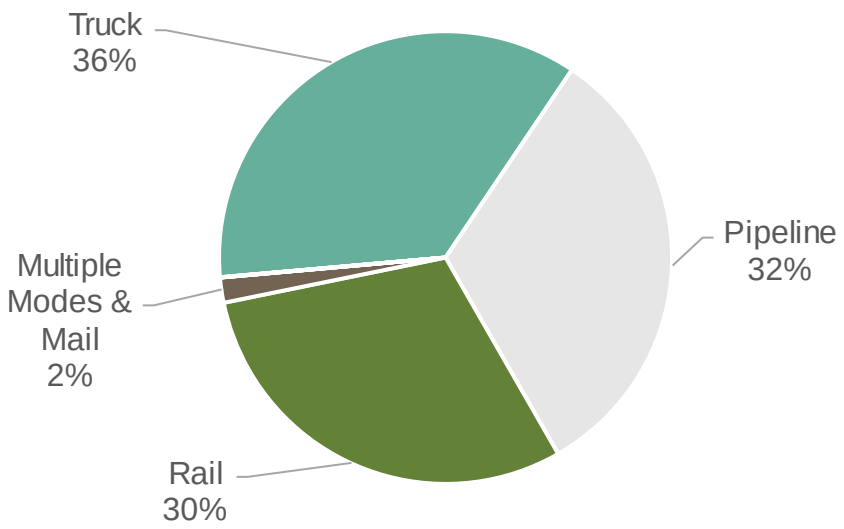
Figure 28: Montana Freight Shipments by Mode by Value 2015



Source: US DOT FHWA Freight Management and Operations - Montana Freight Profiles and Maps (http://ops.fhwa.dot.gov/freight/freight_analysis/state_info/montana/mt.htm)

When measured by weight, as Figure 29 shows, truck, rail, and pipeline each move about a third of Montana's freight.

Figure 29: Montana Freight Shipments by Mode by Weight 2015



Source: US DOT FHWA: Freight Management and Operations - Montana Freight Profiles and Maps (http://ops.fhwa.dot.gov/freight/freight_analysis/state_info/montana/mt.htm)

As Table 5 shows, Montana's freight movements represent approximately 1 percent of total United States freight movements.

Table 5: Montana Freight Movements – Summary

Montana Freight Movements - Summary			
	Pounds (Billions)	Dollars (Billions)	% of Total United States
Outbound	81	28	1%
Inbound	24	43	1%
Within	62	31	1%
Total	**167**	**102**	

Source: 2015 U.S. BTS Commodity Flow Survey

3.1 Highway

As discussed in Section 2.4, 96 percent of freight by weight in Montana moves by trucks, trains and pipelines. Due to the privately owned and operated nature of railroads and pipelines, the Montana Freight Plan emphasizes highway mode of transportation as compared to rail and pipeline.

3.1.1 Highway System Infrastructure

Highways and trucking are the backbone of the freight transportation system in Montana. The extent of Montana's highway system includes approximately 75,000 centerline miles and over 129,000 lane-miles. More than 90 percent of the state's roadway capacity is in jurisdictions designated as rural. Table 6 shows Montana's 2015 centerline road mileage.

Table 6: Montana Centerline Road Mileage 2015

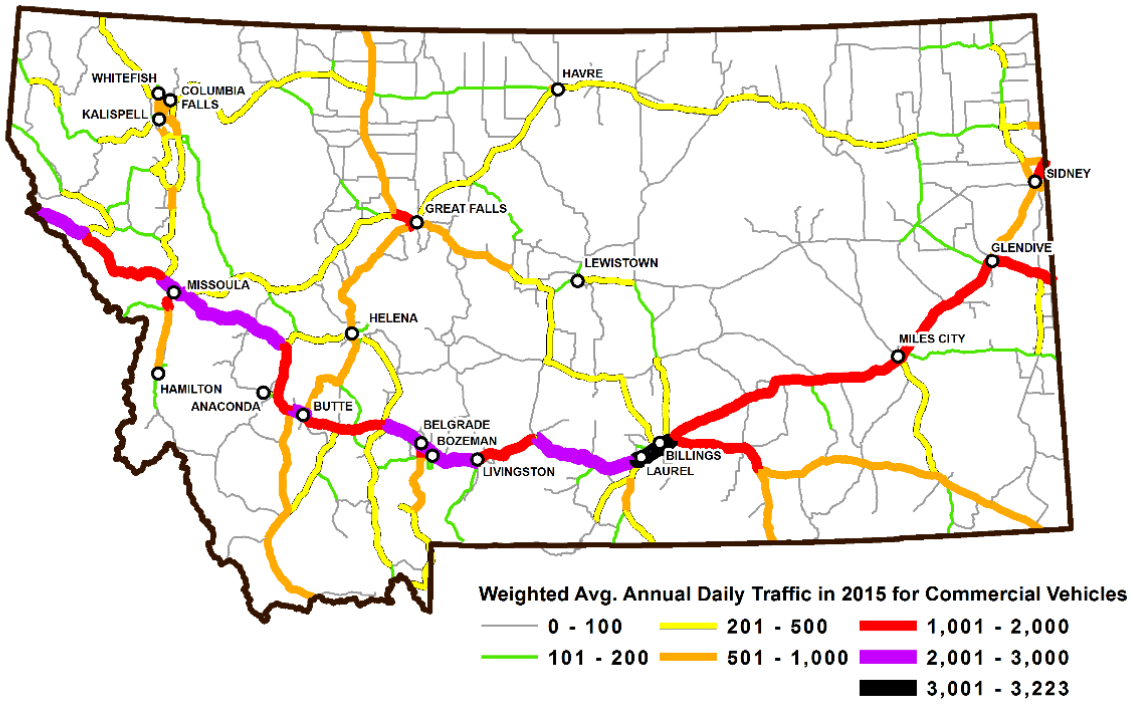
Montana Centerline Road Mileage 2015	
NHS Interstate	1,192
NHS Non-Interstate	2,990
Primary	2,646
Secondary	4,529
Urban	431
State Highway	1,158
Local Roads/Streets (Urban)	3,363
Local Roads (Rural)	58,699

Source: MDT Geospatial Information Section

Commercial vehicle traffic moving to and from the state accounts for about 14 percent of the annual average daily truck traffic (AADTT).[45] Commercial vehicles (FHWA types 5-13) are a mix of single unit trucks (small trucks) and combination trucks (large trucks). Single unit trucks (small trucks) are defined as vehicle classes 5-7, and combination unit trucks (large trucks) are defined as vehicle classes 8-13. Large truck traffic along major Montana highways varies greatly as a percentage of all vehicles. Interstate 90 between Billings and the Idaho border carries the greatest amount of truck traffic – about 3,000 AADTT.

Approximately 56 percent of commercial vehicle traffic occurs on Montana's Interstate Highway System.[46] There are 1,192 centerline miles of Interstate highway on three routes as shown in Figure 30. The busiest of the routes is Interstate 90, with commercial vehicles being most prevalent on I-90 in the Billings area.[47]

Figure 30: Montana Commercial Truck Traffic

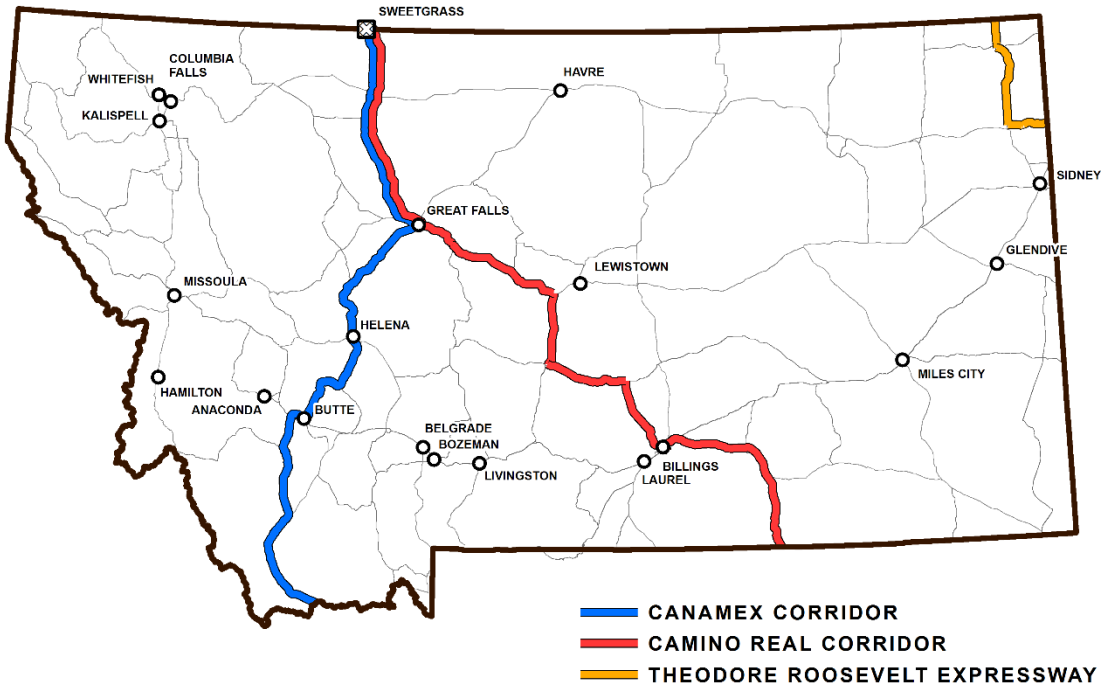


Source: MDT Geospatial Information Section and Traffic Data Collection Section

More extensive but less used by commercial vehicles are Montana's Non-Interstate National Highway System (NHS) routes, which carry 28 percent of the state's commercial traffic. Another 9 percent can be found on 2,575 miles of Primary Highway routes and 4 percent on 5,759 miles of Secondary Highway routes. [48]

Montana's NHS includes three congressionally designated High Priority Corridors (Camino Real Corridor, Canamex Corridor, and the Theodore Roosevelt Expressway) as shown in Figure 31.

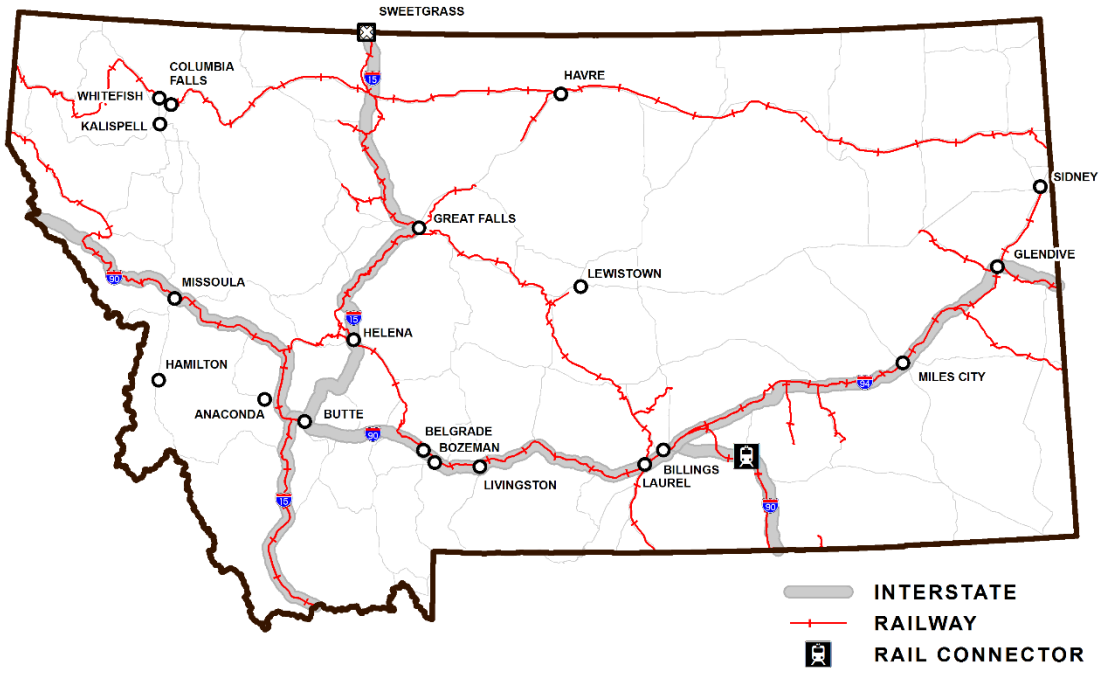
Figure 31: Federally Designated Corridors in Montana



Source: MDT, Geospatial Information Section

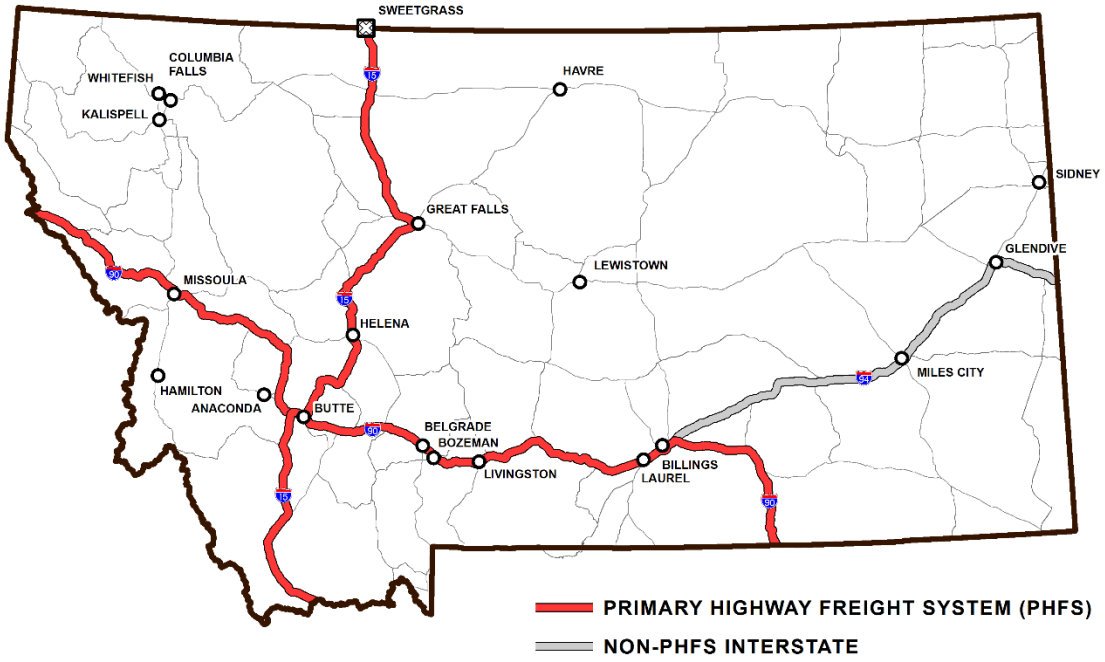
In 2016, as specified under 49 USC 70103, FHWA proposed an Interim National Multimodal Freight Network. This network includes all modes of transportation, mainly highway and rail, for Montana. Figure 32 shows the proposed network for Montana, while Figure 33 shows the currently designated National Highway Freight Network in Montana.

Figure 32: Montana Interim Multimodal Freight Network



Source: MDT, Geospatial Information Section

Figure 33: Montana Highway Freight Network



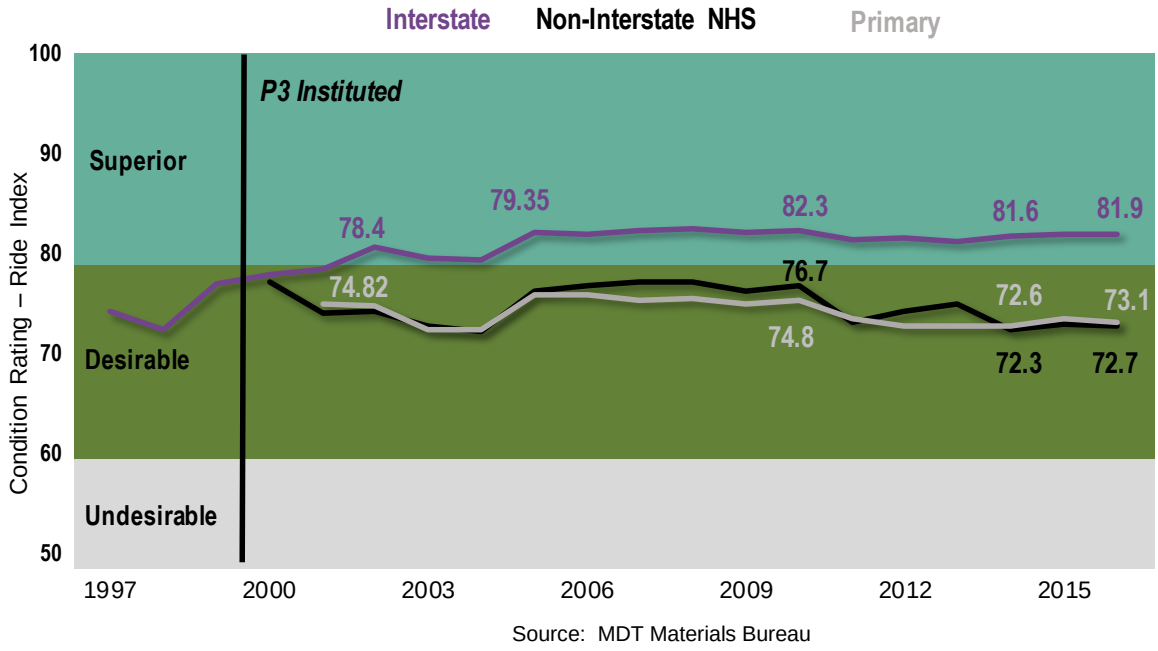
Source: MDT, Geospatial Information Section

3.1.2 Highway System Conditions

As transportation demands outpace funding, effective management of transportation assets is vital. MDT uses an asset management approach, Performance Programming Process (P3), to manage the state's transportation assets. See more details on P3 in Section 5.2.3.

MDT uses several metrics to evaluate pavement condition including Ride Index (RI), which is a measure of perceived ride smoothness. It is calculated by converting the International Roughness Index (IRI) in inches per mile to a 0 to 100 scale. MDT assigns superior/desirable/undesirable levels as shown in Figure 34.

Figure 34: Montana Ride Index



Source: MDT Materials Bureau

MDT collects pavement condition data using equipped with a road profiling system, lasers, and 3D cameras. The Pavement Management System (PvMS) provides methods to analyze multiple data types. Examples of pavement condition are shown in Figure 35.

Figure 35: Montana Pavement Condition

Visible traffic wear with low severity cracking and minimal rutting

Moderate cracking in extent and severity, slight rutting and aggregate loss

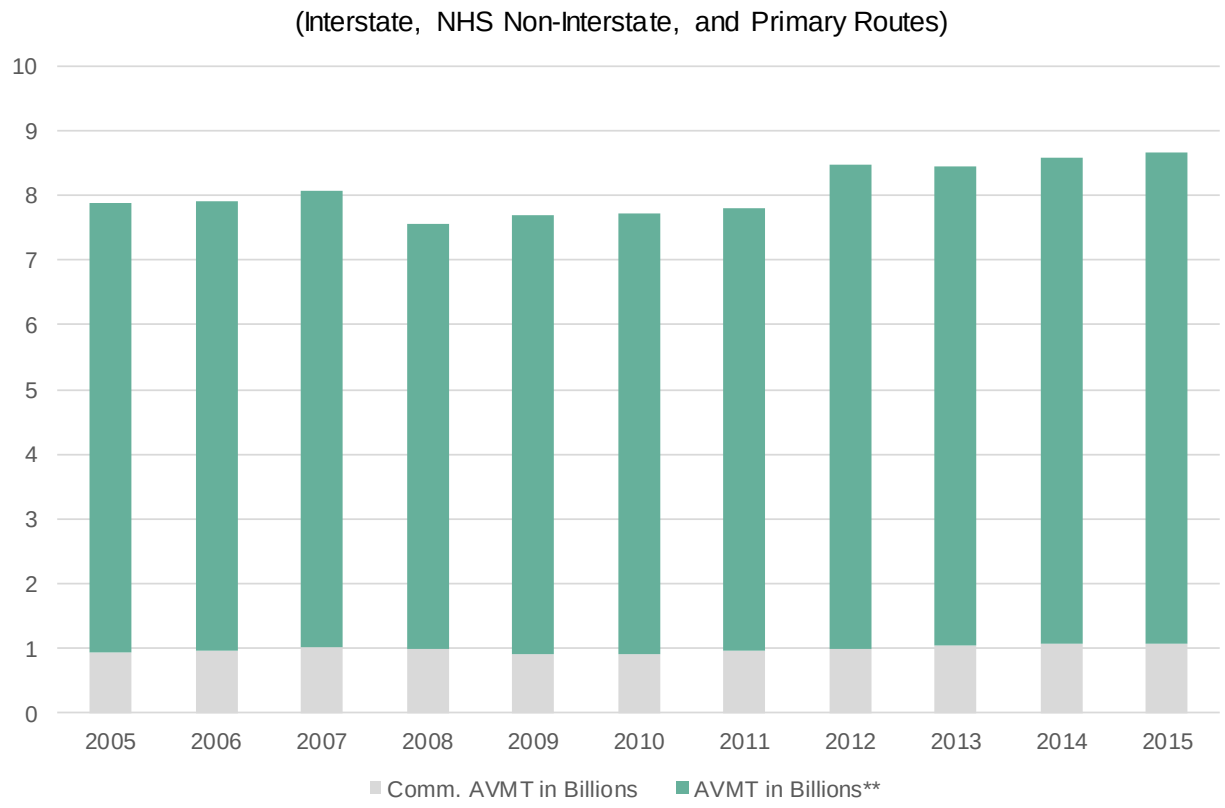
Prevalent cracking in extent and severity, heavy rutting, patching

Source: MDT Materials Bureau 2015.

3.1.3 Highway System Trends

As shown in Figure 36, except for the recession years of 2008-2011, Montana has recorded a moderate and steady increase in Vehicle Miles Traveled (VMT) from 2005 to 2015. Commercial VMT is more consistent during this ten-year period.

Figure 36: Montana VMT and Commercial VMT



Source: MDT Traffic Data Collection Section

3.1.4 Highway System Performance

To support statewide strategic priorities, MDT defines specific pavement goals through P3. The goals seek to “preserve highway pavement condition at existing or higher levels”. MDT’s performance target is to “maintain an average RI of greater than 60.” MDT annually reports pavement condition through the Highway Performance Monitoring System.

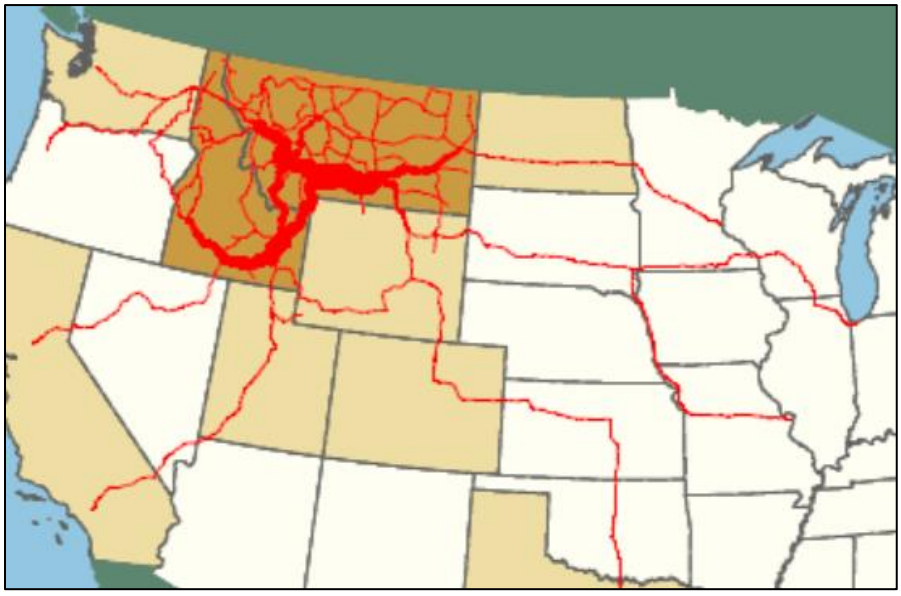
3.1.5 Highway System Forecasts

Since 1997 Interstate pavement conditions in Montana have generally remained stable. Although non-interstate NHS roadways are deteriorating, conditions remain in the desirable range. Due to funding constraints, MDT expects the condition of the Interstate and non-interstate NHS to decline slightly over the next ten years, while staying within current performance target thresholds.

U.S. Department of Transportation's Bureau of Transportation Statistics (BTS) 2016 data predicts freight volume on the nation's transportation network will grow 40 percent as measured by weight in the next three decades. BTS projects freight growth in value during this time to increase 92 percent. This information reflects all modes – air, vessel, pipeline, rail, and trucks.

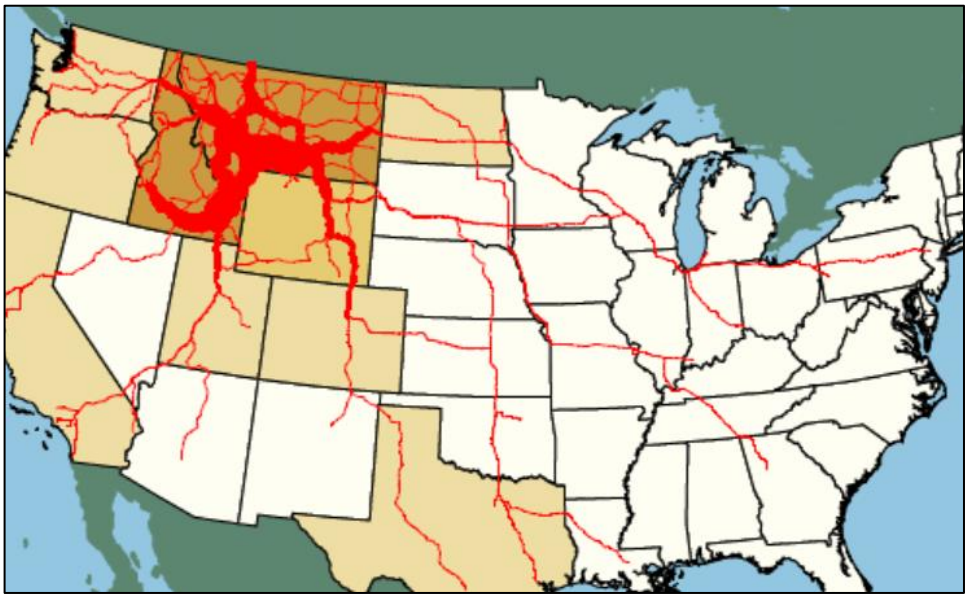
Figures 37 and 38 show the BTS projected increase in freight movement in Montana between 2010 and 2040.

Figure 37: Major Flows by Trucks To, From, and Within Montana 2010



Source: USDOT FHWA, Office of Freight Management and Operations, FAF version 3.4, 2012.

Figure 38: Major Flows by Trucks To, From, and Within Montana 2040



Source: USDOT FHWA, Office of Freight Management and Operations, FAF, version 3.4, 2012.

3.1.6 Bridge Infrastructure

Montana's transportation system includes 4,510 bridges, with 2,520 being state-owned. Table 7 details the bridge system in Montana. MDT maintains inventory data for bridges and culverts within the state, including structures maintained by cities and counties, but excluding those located within federal lands such as national parks. Deck area on the Interstate System is proportionately higher because structures are typically larger on multi-lane roadways.

Table 7: Montana Bridges

Montana Bridge Infrastructure				
System	Bridge Count		Deck Area (square ft)	
Interstate	838	18.6%	7,255,931	34.8%
NH (Non-IM)	539	12.0%	4,072,223	19.6%
Primary (Non-NH)	456	10.1%	2,285,028	11.0%
State Secondary (Non-NH)	393	8.7%	1,639,388	7.9%
State Urban (Non-NH)	29	0.6%	420,603	2.0%
Other State (Non-NH)	265	5.9%	1,295,056	6.2%
Local Urban	39	0.9%	166,355	0.8%
Locan Non-Urban	1,951	43.3%	3,687,108	17.7%
State Owned Total	**2,520**	**55.9%**	**16,968,229**	**81.5%**
Local Total	**1,990**	**44.1%**	**3,853,463**	**18.5%**
Total	**4,510**	**100%**	**20,821,693**	**100%**

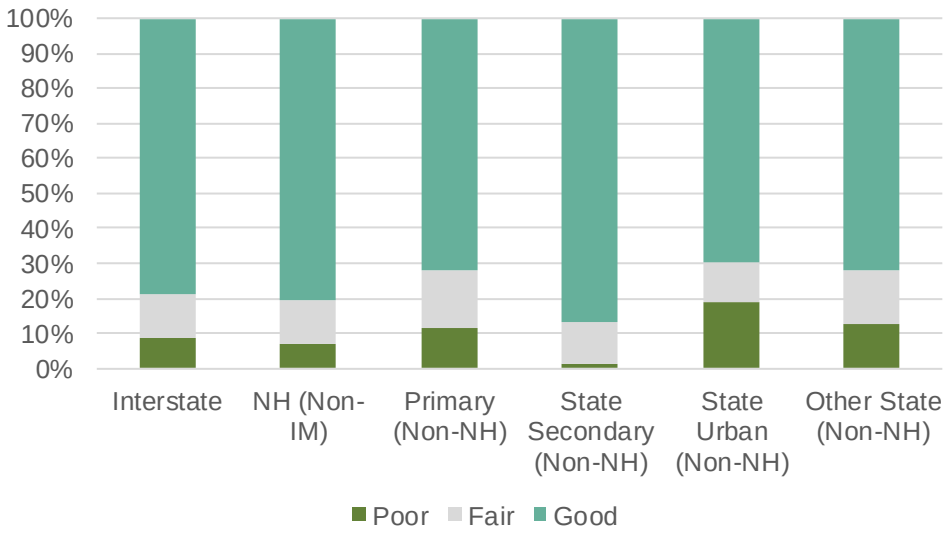
Source: MDT Bridge Bureau

3.1.7 Bridge Conditions

MDT implements a program of regularly scheduled inspections for all publicly owned bridges in Montana and reports condition to the National Bridge Inventory. MDT's Bridge Program supports the preservation goals established in TranPlanMT and selects bridge projects that balance competing needs and minimize life cycle costs.

Figure 39 illustrates the change in the percentage of structurally deficient bridges by deck area since 2014.

Figure 39: Montana Structurally Deficient Bridges by Deck Area



Source: MDT Bridge Bureau

3.1.8 Bridge Trends

From 2004 to 2015, the percentage of structurally deficient bridges increased. For the most part, this increase can be attributed to improved data collection and quality assurance in MDT's bridge inspection program, particularly during 2009 and 2010.

3.1.9 Bridge Performance

MDT uses two bridge performance measures to assess bridge condition. Using a good/fair/poor system, bridge condition, including structure and deck condition, are assessed using the National Bridge Inventory's ratings. These include superstructure rating, substructure rating, deck condition, and structurally deficient status.

3.1.10 Bridge Forecasts

Due to relatively static levels of investment, Montana's bridges are steadily declining in condition, a trend that will continue at current levels of program funding. Based on analysis, MDT expects the condition of NHS bridges to decline slightly over the next ten years, while staying within Title 23 USC minimum level of condition threshold of structurally deficient bridges to not exceed ten percent of overall bridge deck area in the state.

3.1.11 Safety Rest Areas

Safety rest and parking areas play an important role in the statewide transportation network by providing safe stopping opportunities along Montana's highways. Breaks for activities such as walking, using a mobile device, sleeping, resting, and eating can aid in combating drowsy and distracted driving, potentially reducing crashes. Rest and parking areas also offer safe places to stop during weather events and road closures.

MDT recognizes the value of rest and parking areas and continues to focus on addressing critical issues. Using national guidance and best practices from state transportation programs throughout the country, MDT has developed a program tailored to fit Montana's specific conditions and needs. The Montana Rest Area Plan represents MDT's comprehensive statewide vision for the MDT Rest Area Program in the context of challenges such as aging infrastructure, high rest area demand and visibility, and limited funding.

3.1.12 Safety Rest Area Conditions

MDT conducts regular site evaluations to assess the adequacy and availability of services at state-maintained rest and parking areas. Evaluations consider parking, site condition, structure condition, water and wastewater systems, and amenities (including interior and exterior security features), as well as highway signage. Evaluations include a numerical inventory of physical assets, a condition assessment to determine relative quality and performance, a demand assessment to determine parking and restroom usage, and a service life assessment to evaluate the remaining useful life of rest and parking area elements.

3.1.13 Safety Rest Area Trends

Currently, MDT operates 38 state-maintained safety rest areas, 9 truck parking sites, and provides funding for 8 city park rest areas in Montana. Over the last decade, MDT reconstructed or rehabilitated ten of the highest priority safety rest areas. Still there remains a need to address adequacy issues at numerous state-maintained rest and parking areas. Current and future availability of services will be evaluated to provide safe stopping opportunities where needed. These needs will be promoted systematically through the MDT Rest Area Program.

3.1.14 Safety Rest Area Performance

Considering public and freight movement demand for safe, clean, and functional rest and parking areas, a Montana team of transportation professionals including MDT planning, environmental, engineering, maintenance, DEQ, and FHWA has undertaken a process to prioritize rest area investment given available resources. Public perception and comments continue to be both supportive and positive of MDT's Rest Area Program.

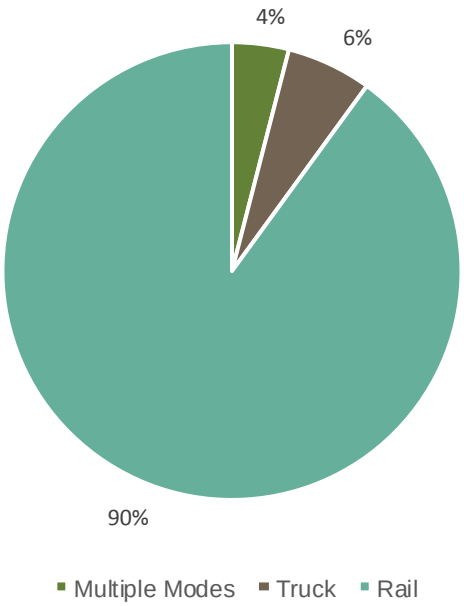
3.1.15 Safety Rest Area Forecasts

The Rest Area Prioritization team actively manages and researches innovative strategies to sustain project delivery. This focused planning, research, and asset management-based approach coupled with internal and multiagency collaboration, innovative contracting, and performance-based maintenance contracts has created quantifiable efficiencies. The MDT Rest Area Program has had success and will continue to evolve to improve efficiency and effectiveness of freight movement and provide safe and clean rest stops.

3.2 Rail and Highway Rail Crossings

Rail freight plays a major role in Montana's highway infrastructure use and condition. One train moves as much freight as several hundred trucks. Without rail, over five million additional trucks would be required on Montana's roadways annually. Coal, in particular, is primarily shipped by rail (see Figure 40).

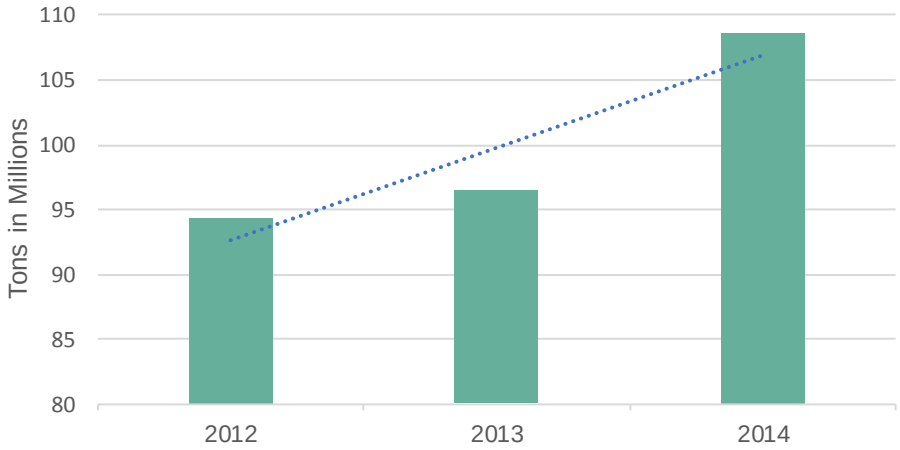
Figure 40: Montana Coal Shipment by Mode



Source: Freight Analysis Framework Data Tabulation Tool (FAF4) accessed 2016; Fehr & Peers 2016; DOWL 2016. Includes Coal and Coal N.E.C.

Most freight rail trips in Montana are pass-through trips. About 75 percent of shipments by revenue, and 54 percent by tonnage neither originate nor terminate in Montana.[49] When rail freight involves imports to or exports from Montana, imports exceed exports.[50] Figure 41 shows how the total number of tons shipped by rail that originate, terminate, and pass through Montana have been increasing.

Figure 41: Number of Tons Shipped by Rail In & Through Montana 2012-2014

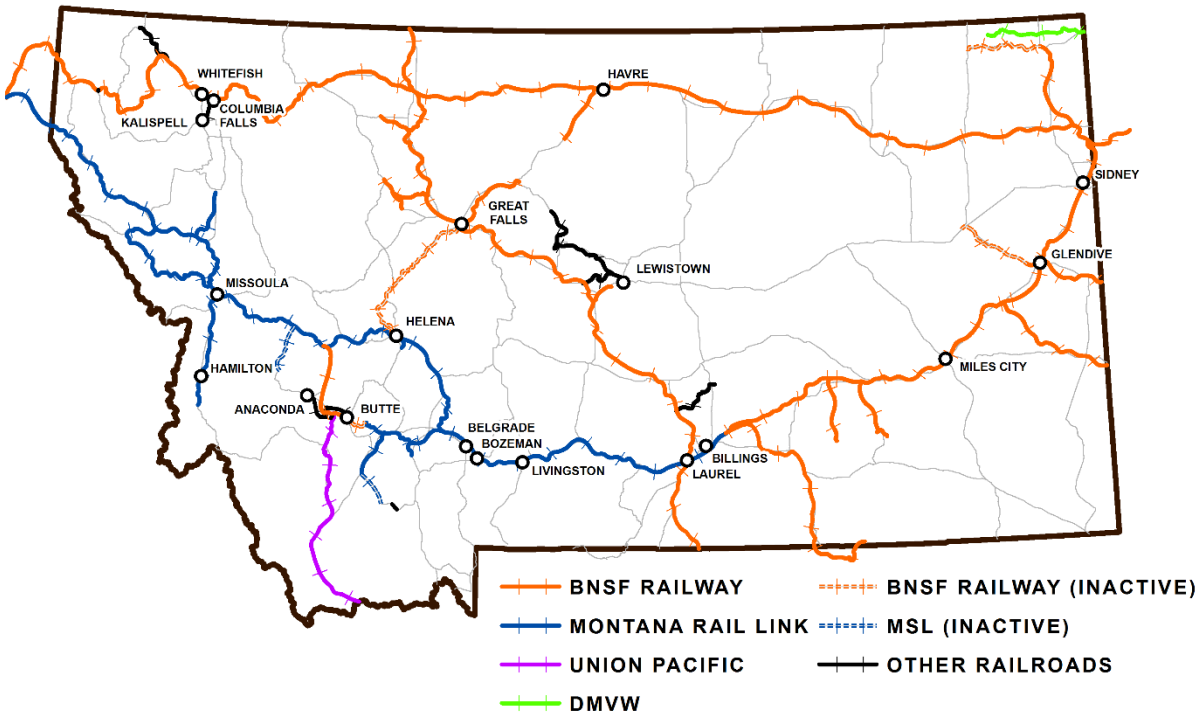


Source: Surface Transportation Board 2014 Carloads and Tons by State report

3.2.1 Rail and Highway Rail Crossing Infrastructure

Active and inactive rail trackage in Montana exceeds 3,200 miles, with 64 percent operated by BNSF Railway (BNSF). Montana Rail Link (MRL) operates on 817 miles of track owned by BNSF. Figure 42 shows BNSF and MRL active and inactive routes in Montana and other railroads and routes.[51]

Figure 42: Montana Rail System



Source: MDT Geospatial Information Section

In addition to BNSF and MRL, ten additional railroads operate the remaining 200 miles of active track, as shown in Table 8. All rail facilities in Montana are privately owned except the state-owned Central Montana Railroad (CMR), which is leased and operated by a non-profit agriculture group.

Table 8: Railroads Operating in Montana

Railroads Operating in Montana		
Class	Name	Active Track Miles
Class I	BNSF	1939.0
Class I	Union Pacific	125.0
Class II	Montana Rail Link	817.0
Class III	Central Montana Railroad	87.0
Class III	Dakota, Missouri Valley & Western Railroad	57.0
Class III	Butte, Anaconda & Pacific Railway	26.0
Class III	Mission Mountain Railroad	42.0
Class III	Global Rail Group	30.0
Class III	Port of Montana	1.5
Class III	Transco	4.0
Plant	Lincoln County Port Authority	0.6
Tourist	Alder Gulch Shortline Railroad	1.5

Source: MDT Geospatial Information Section

To avoid collisions at intersections where highways cross railroads, various types of active and inactive warning devices are used. Montana has 1,367 public at-grade crossings with 470 having active warning devices and 897 having passive warning devices. These crossings are summarized in Table 9.

Table 9: Montana Public At-Grade Crossings

Montana Public At-Grade Railroad Crossings Per Operating Railroad Company by Warning Device											
		Active Warning Device						Passive Warning Device			
Operating Railroad	Crossing Count	Gates & Cantilevers	Gates	Cantilevers	Post Flashing Lights	Other	Total Active	Stop Signs	Cross-bucks	None	Total Passive
CLASS I	**835**						**246**				**589**
BNSF Railway	785	4	174	11	47	0	**236**	44	485	20	**549**
Union Pacific	50	0	5	1	4	0	**10**	4	36	0	**40**
CLASS II	**426**						**184**				**242**
Montana Rail Link	392	12	104	15	48	4	**183**	25	170	14	**209**
Missouri Valley, & Western	34	0	0	0	1	0	**1**	1	32	0	**33**
CLASS III	**105**						**39**				**66**
Central Montana	41	0	0	0	0	0	**0**	0	37	4	**41**
Mission Mountain	26	1	8	5	2	0	16	3	7	0	10
Butte, Anaconda, Pacific	22	0	2	5	9	0	**16**	1	5	0	**6**
Global Rail Group	9	0	0	0	2	0	2	1	6	0	7
Transco Railway Products	6	0	0	0	4	0	**4**	0	2	0	**2**
Port of Montana	1	0	0	0	1	0	1	0	0	0	0
OTHER	1						**1**				**0**
Lincoln Port Authority - Plant RR	1	0	0	0	1	0	**1**	0	0	0	**0**
Alder Gulch Short Line - Tourist RR	0	0	0	0	0	0	0	0	0	0	0
TOTALS	**1367**	**17**	**293**	**37**	**119**	**4**	**470**	**79**	**780**	**38**	**897**

Source: MDT Rail/Highway Safety Unit

3.2.2 Highway Rail Crossing Conditions

MDT inventories all public at-grade crossings on a three-year rotation cycle. The information collected is added to MDT's Highway-Rail Crossing Database and is reported to the Federal Railroad Administration's (FRA) National Highway-Rail Crossing Database. This data is utilized to assess the safety of crossings and identify potential locations for safety improvements.

3.2.3 Highway Rail Crossing Trends

The FRA records highway-rail incidents and fatalities. The annual number of incidents and fatalities in Montana dropped from a high of 14 in 2005 to a low of 8 in 2015. The number of fatalities and incidents involving pedestrians varied from zero to three during that same period.

3.2.4 Highway Rail Crossing Performance

MDT monitors safety at highway-rail crossings and invests in safety improvements within available funding where improvements are feasible and cost effective. These efforts have continued to reduce the total number of highway-rail incidents in Montana.

3.2.5 Highway Rail Crossing Forecasts

Railroad companies continue to invest in capacity expansion as rail traffic increases. Train lengths are increasing, which affect vehicular delays at crossings. Longer trains may also impact crossings that are in sidings that weren't affected previously by shorter train lengths.

3.3 Pipeline

Transportation by pipeline provides highway and rail congestion relief, functioning primarily to connect supply locations to demand areas. Lack of pipeline capacity results in more products, such as crude oil, being transported by other modes. Constraints regarding future pipeline development primarily involve vulnerabilities to attacks, environmental impacts, and rigorous approval processes for new endeavors. Additionally, seasonal fluctuations in demand, peaking in winter months, and the static nature of pipelines constrain flexibility regarding some long-term investment attraction particularly related to natural gas delivery.

Pipelines in Montana include transmission lines carrying energy products over relatively long distances and distribution lines delivering natural gas to businesses and households. The Pipeline Hazardous Materials Safety Administration (PHMSA) collects mileage data on five types of pipelines consisting of:

- Gas Distribution;
- Gas Gathering;
- Gas Transmission;
- Hazardous Liquids; and
- Liquefied Natural Gas (LNG).

In Montana, pipelines are privately owned but regulated through a partnership between the Montana Public Service Commission and PHMSA to assure pipeline operators are meeting requirements for safe, reliable, and environmentally sound operation of their facilities.

Montana statutes and administrative rules regarding pipelines are available online. Table 10 lists pipeline companies (both owners and operators) in Montana and associated commodities transported.[52]

Table 10: Montana Pipeline Companies

Pipeline Companies in Montana and Associated Commodities Transported	
Name	Commodity
Belle Fourche Pipeline Company	Hazardous Liquids Facilities
Bridger Pipeline LLC	Hazardous Liquids Facilities
Butte Pipe Line Company	Hazardous Liquids Facilities
Calumet Montana Refining, LLC	Petroleum Products Pipelines
Cenex Pipeline, LLC	Hazardous Liquids Facilities
Enbridge Pipelines (North Dakota) LLC	Crude Oil Pipeline Facilities
Energy West Montana	Natural Gas & Propane Pipelines
Express Pipeline LLC	Hazardous Liquids Facilities
ExxonMobil Pipeline Co – Montana	Crude Oil Pipeline Facilities
Front Range Pipeline, LLC	Crude Oil Pipeline Facilities
Havre Pipeline Company LLC	Natural Gas & Propane Pipelines
Kinder Morgan CIG – MT, UT & Western WY	Natural Gas & Propane Pipelines
Marathon Pipe Line LLC – WY & MT	Crude Oil Pipeline Facilities
Montana Dakota Utilities Company	Natural Gas Transmission & Distrib. Facilities
NorthWestern Energy – MT	Natural Gas Transmission & Distrib. Facilities
Omimex Canada, Ltd	Xeno & Natural Gas Pipeline Facilities
ONEOK NGL Pipeline, LLC	Natural Gas Liquids Pipeline Facilities
ONEOK Rockies Midstream	Natural Gas Gathering Facilities
Phillips Pipe Line Co – WY & MT	Hazardous Liquids Pipeline Facilities
Plains Pipeline, LP	Petroleum Liquids Pipeline Facilities
Tesoro High Plains Pipeline Company	Hazardous Liquids Pipelines
TransCanada – Bison Pipeline	Natural Gas Transmission Facilities
TransCanada – Keystone Pipeline XL	Crude Oil Pipeline Facilities
TransCanada – Northern Border Pipeline Co	Natural Gas Transmission Facilities
WBI Energy Midstream	Natural Gas Gathering Facilities
WBI Energy Transmission	Natural Gas Transmission Facilities

Source: Pipeline Association for Public Awareness. Pipeline Members. http://www.pipelineawareness.org/about/members-list/

Pipelines carry a significant amount of products in both value and tonnage. The following tables were developed based on FHWA's Freight Analysis Framework (FAF). Due to data limitations, capacity and product flows through Montana are not available. Table 11 shows Montana Pipeline data from 2015 and projections.

Table 11: Montana Pipeline Flows 2015 and 2045

Montana Pipeline Flows 2015 and 2045

2015 Montana Pipeline FAF by Value

	Within Montana	Outbound	Inbound
Domestic	5,882.60	6,750.90	3,172.80
Export	9.2	0	0
Import	7,092.90	1,411.90	0

unit of measure is million U.S. Dollars (2012 constant $)

2045 Montana Projected Pipeline FAF by Value

	Within Montana	Outbound	Inbound
Domestic	5,430	10,698.90	1,928.40
Export	17.4	0	0
Import	10,658.90	1,817.20	0

unit of measure is million US Dollars (2012 constant $)

2015 Montana Pipeline Tonnages

	Within Montana	Outbound	Inbound
Domestic	7,833.00	20,220.80	5,531.30
Export	71.3	0	0
Import	19,464.00	2,144.40	0

unit of measure is thousand tons

2045 Montana Projected Pipeline Tonnages

	Within Montana	Outbound	Inbound
Domestic	8,088.10	35,432.60	4,148.50
Export	135.4	0	0
Import	36,686.30	2759.9	0

unit of measure is thousand tons

2015 Montana Ton/Miles

	Within Montana	Outbound	Inbound
Domestic	1,989.10	13,596.30	3,754.10
Export	9.3	0	0
Import	4,437.00	1,389.90	0

unit of measure is million ton-miles

2045 Montana Projected Ton/Miles

	Within Montana	Outbound	Inbound
Domestic	1,828.90	22,755.50	2,714.90
Export	17.6	0	0
Import	7,221.30	1,788.80	0

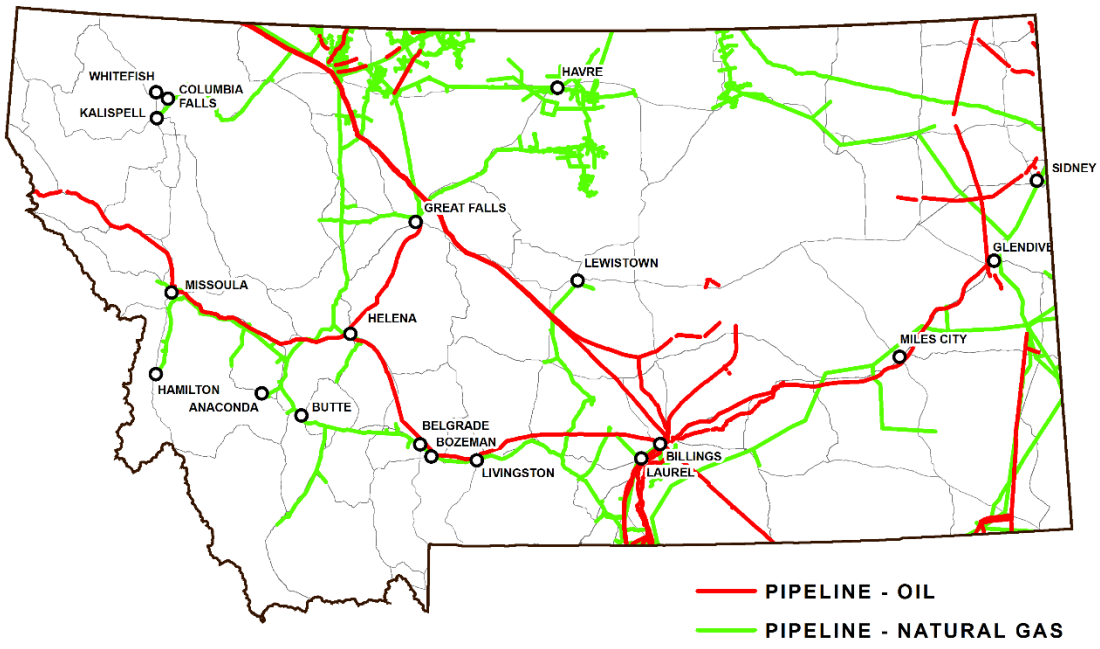
unit of measure is million ton-miles

Source: FHWA FAF4. Version 4.3.1 State Profile Tables "Montana". Updated 03-01-2017. http://faf.ornl.gov/fafweb/FUT.aspx

3.3.1 Pipeline Infrastructure

Of the over 2.7 million nationwide miles of pipelines, Montana has nearly 15,500 miles of gas transmission, gathering, and distribution pipelines. Another 3,821 miles of pipeline carry hazardous liquid commodities such as CO2, crude oil, highly volatile liquids (HVL Flamm Toxic or HVL) such as propane and refined petroleum products (refined PP) including gasoline and diesel.[53] Figure 43 and Table 12 detail Montana's pipeline system.

Figure 43: Montana's Pipeline System



Source: MDT Geospatial Information Section

Table 12: Montana Pipeline Information

Montana Pipeline Information							
Montana Gas Transmission, Gathering & Distribution Pipelines				Montana Hazardous Liquid Pipeline System			
	Total Miles	Intrastate Miles	Interstate Miles		Total Miles	Intrastate Miles	Interstate Miles
Gas Distribution	11,554	0	0	Hazardous Liquids	3,821	525	3,296
Gas Gathering	27	1,673	2,218	CO2	9	0	9
Gas Transmission	3,892	525	3,296	Crude Oil	2,661	517	2,114
				HVL Flamm Toxic	280	9	272
				Refined PP	871	0	871

Source: USDOT Intelligence Portals https://hip.phmsa.dot.gov/

3.3.2 Pipeline System Conditions

Compliance with state and federal pipeline safety regulations is monitored through a comprehensive inspection and enforcement program in which safety violations and compliance are reported annually as part of the state's pipeline safety program certification.

Through an annual grant evaluation process and program certification, PHMSA performs evaluations of each state's pipeline safety regulatory program using field inspections of operations, maintenance, and construction activities; programmatic inspections of operator procedures, processes, and records; incident investigations and corrective actions; and direct dialogue with operator management. To support these evaluations, PHMSA and the National Association of Pipeline Safety Representatives (NAPSR) have developed a set of performance metrics, including:

- Damage Prevention Program;
- Inspection Activity;
- Inspector Qualification;
- Enforcement;
- Leak Management; and
- Incident Investigation.[54]

The program supports pipeline safety and includes providing grant funding for state damage prevention programs and technical assistance related to pipeline safety issues. Over the past ten years, PHMSA grants have provided more than $650,000 to Montana.[55]

Other important stakeholders include the NAPSR, which functions as the national association representing state pipeline safety, the Office of Pipeline Safety (OPS), and the Federal Energy Regulatory Commission (FERC). Through a unique partnership with the USDOT, NAPSR members have oversight responsibilities for the safe and reliable transportation of natural gas and hazardous liquids through pipelines.[56]

3.3.3 Pipeline System Trends

Trends affecting the pipeline industry include aging infrastructure, materials, and construction methods.

Pipeline transportation has been identified as the safest and most cost-effective mode to transport natural gas and hazardous liquid products. However, environmental impacts from pipeline leaks and recent concerns over new pipeline development have heightened attention regarding increasing pipeline capacity. With increased energy demands and aging pipeline infrastructure, the USDOT and PHMSA issued a "call to action" in 2011.[57] Pipeline age and material were identified as posing the highest risk with cast and wrought iron materials used during installation. In Montana, cast and wrought iron pipeline construction were reported as being omitted from original installation material or completely replaced by 2005.[58]

Uncoated steel natural gas and hazardous liquids pipelines are also known as bare steel pipelines. Lack of an outer coating and susceptibility to localized corrosion have accelerated replacement or rehabilitation. Montana's 2015 reported inventory of bare steel pipelines contains three categories:

- Gas Distribution - 8.12 miles representing a 0.1 percent of nationwide total mileage. Service lines within Montana numbered 101;[59]
- Gas Transmission - 40.71 miles representing 1 percent of nationwide total mileage;[60] and
- Hazardous Liquid – None.[61]

Waterway crossings have also been a contemporary focus of the pipeline industry. Retrofitting and new pipelines are increasingly utilizing horizontal directional drilled (HDD) installation as a method to minimize environmental risks and reduce the likelihood of failure due to river scour. Since 2011, 17 Montana pipeline crossings of major rivers have been replaced with HDD pipelines. Of the 64 major river crossings in Montana, 41 now utilize HDD methods. PHMSA has prioritized the importance of leveraging state partnerships to continuously augment pipeline safety.[62]

Crude Oil: According to the Association of Oil Pipe Lines (AOPL), safety, cost, and efficiency incentives have spurred significant growth and opportunity for the liquids pipeline segment of the industry. Between 2010 and 2014, the crude oil pipeline system grew an additional 12,000 miles or 22 percent. In 2015, U.S. liquid pipeline mileage increased 3.5 percent. Volumes increased in 2014 to 9.3 billion barrels, an 11.6 percent increase compared to 2013. Industry members are optimistic regarding maintaining existing throughput and construction of new pipelines.[63]

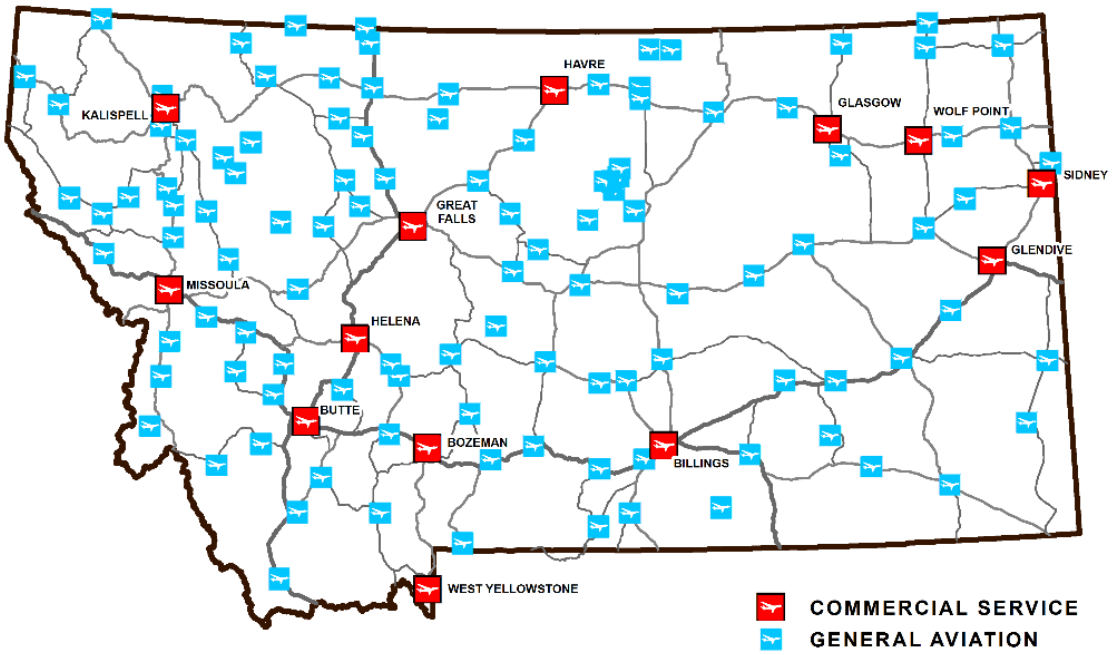
Liquefied Natural Gas (LNG): Because LNG is more energy dense than gaseous natural gas, there is increasing interest in using LNG as a fuel for heavy-duty vehicles and other transportation applications. In 2015, the U.S. imported about 92 billion cubic feet (Bcf) of LNG. Also in 2015, approximately 28 Bcf of LNG was exported from the U.S. to Brazil (48 percent), Egypt (25 percent), and Turkey (27 percent).[64]

The U.S. Department of Energy projects LNG exports will become economically attractive in scenarios with high oil prices as consumers move away from traditional petroleum products. Global LNG export capacity is projected to increase one-third by 2020, with most new capacity located in the U.S. and Australia. When all liquefaction projects currently under construction become operational, the U.S. is projected to have the world's third-largest LNG export capacity enabled in-part due to HDD, fracking, and other new technologies affecting extraction.[65]

3.4 Air

Montana has approximately 124 public-use airports, as shown in Figure 44, and more than 350 private-use airports. Montana airports serve nearly 3.9 million people per year for leisure and business travel.[66]

Figure 44: Montana Air Service Locations



Source: MDT Geospatial Information Section

A 2016 study conducted by MDT summarized annual economic benefits of airports to Montana to include over 23,000 jobs, $838 million in annual payroll, and $2.8 billion in overall economic benefits.

The value of freight transported by air is higher than other modes. Statistics show 0.63 percent of freight by value moves outbound from Montana by air. Air transportation of freight to and from Montana is estimated to exceed $600 million annually, as shown in Table 13.

Table 13: Air Freight in Montana

Air Freight in Montana			
Directional Flow	Tonnage (metric tons)	Value ($)	Percent of Total by Value (%)
Domestic Inbound	3,177	$360,000,000	58%
International Import	469	$84,000,000	14%
Total Air Cargo Received	3,646	$444,000,000	71%
Domestic Outbound	943	$78,000,000	13%
International Export	439	$98,000,000	16%
Total Air Cargo Shipped	1,382	$176,000,000	28%
Total Received and Shipped	5,028	$621,000,000	100%

Source: Montana Airports 2016 Economic Impact Study Final Presentation, MDT

Approximately 86 percent of commodities shipped domestically consist of precision instruments (36 percent), pharmaceuticals (23 percent), electronics (14 percent), and transportation equipment (13 percent). Air international shipments to and from Montana are similar to domestic and include electronics (31 percent), precision instruments (19 percent), machinery (12 percent), and pharmaceuticals (12 percent).[67]

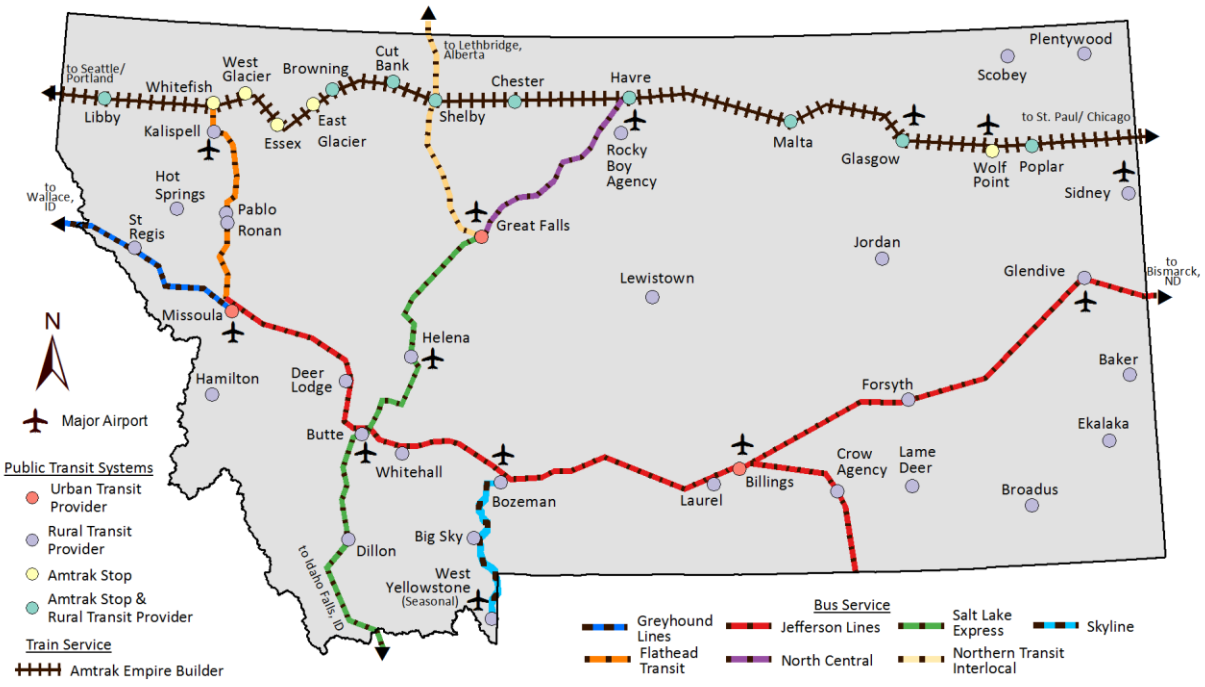
3.5 Transloading and Intermodal Facilities

Transloading facilities allow for the transfer of commodities between modes including highway, rail, and ship. In Montana, this transfer almost exclusively involves the transfer of freight between trucks and trains. Transloading can increase efficiency of goods movement by allowing freight to travel by the most economical mode at a given segment along its journey. Montana has three facilities that allow consolidation of freight to and from Class I rail networks. These facilities are located in Billings, the Port of Montana near Butte, and the Port of Northern Montana in Shelby. An MDT assessment determined intermodal facilities need approximately 250 containers per train per week to remain viable.[68]

3.6 Transit

Forty transit operators conduct business in Montana. Because of the state's large geographic size, rural nature, and aging population, transit services are an important mode of transportation. A minor amount of freight is shipped on transit vehicles in Montana. Intercity transit providers, Jefferson Lines, Flathead Transit, Salt Lake Express, and Northern Transit Interlocal, may move freight, but detailed information is not available for inclusion in this plan. Amtrak's Empire Builder offers express service that allows shipment of goods such as fresh flowers, fish, and medical supplies between cities along the Hi-Line. Figure 45 shows Montana's transit system, including the Empire Builder.

Figure 45: Montana Public Transportation



Source: MDT Geospatial Information Section

4 MONTANA KEY FREIGHT ISSUES

Understanding the issues involved in moving freight in, out, and through the state is paramount to knowing where MDT should focus efforts to improve Montana's freight transportation system.

4.1 Stakeholder Concerns

Understanding how Montana's transportation system is used to move freight is a building block to developing this freight plan. MDT solicited input from stakeholders to better understand how they utilize the freight network and their concerns, needs, and future expectations.

A stakeholder list was developed that included representatives from Montana ports, freight railroads and industry workforce, shippers, carriers, freight-related and industry associations, third-party logistics providers, local governments, intercity bus and freight providers, and aviation interests. These stakeholders were invited to participate in a meeting held October 17, 2016.

Seven stakeholders attended the meeting. The meeting summary is available in Appendix 1. Issues identified include:

- Ocean container availability;
- Funding infrastructure directly affecting freight movement;
- Workforce recruitment and retention;
- Oversized loads and five-state regional size/weight differences;
- Parking and rest areas; and
- Roadway speed.

In addition, MDT Planning staff traveled to MDT District offices in Butte, Great Falls, Billings, Missoula, and Glendive to review plan development and seek input from District personnel. Metropolitan Planning Organization (MPO) staff in Great Falls, Billings, and Missoula were also invited, as well as Transportation Commissioners from each District.

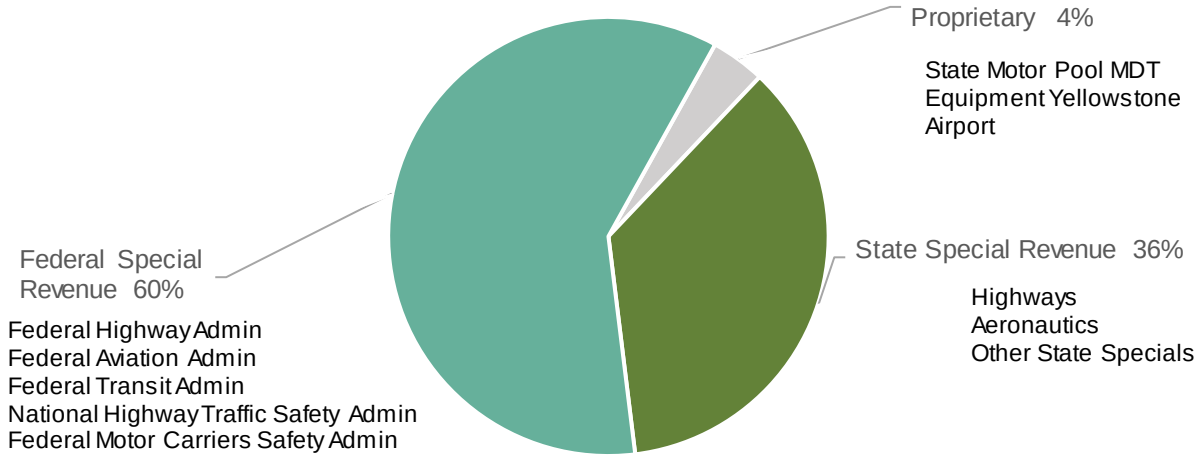
All comments were considered in developing this plan. Appendix 1 provides further details of meeting materials and other public involvement information.

4.2 Funding

Montana's highway infrastructure is aging, and resources available to address growing needs are limited. Montana's surface transportation program relies heavily on federal funds, which are expected to remain relatively flat for the foreseeable future, while the state funding picture is less stable. Over the next ten years, MDT anticipates transportation needs will outpace available revenue by nearly 3-to-1, equating to a $1 billion shortfall annually.

MDT is funded primarily through a variety of federal and state special revenue sources, the largest being reimbursements received by Federal agencies such as FHWA for highway construction and related activities and the Highways State Special Revenue Account (HSSRA). Figure 46 details these funding sources.

Figure 46: MDT Revenue Sources



Source: MDT 2016 Fact Book

The HSSRA is constitutionally restricted as follows:

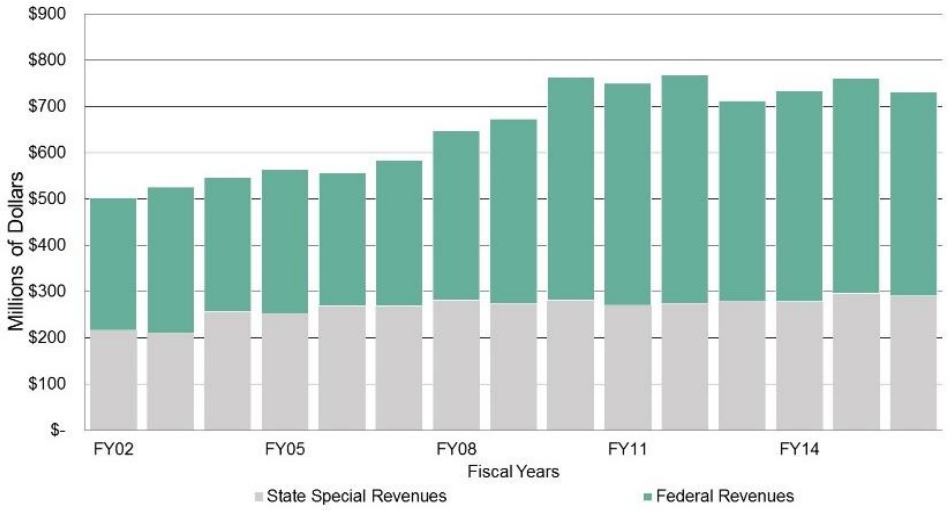
- Payment of obligations incurred for construction, reconstruction, repair, operation, and maintenance of public highways, streets, roads, and bridges.
- Payment of county, city, and town obligations on streets, roads, and bridges.
- Enforcement of highway safety, driver education, tourist promotion, and administrative collection costs.

Primary revenue sources for the state special revenue fund consist of fuel taxes, gross vehicle weight, and permit fees, and cost recoveries from federal, private, and local partnerships. Effective July 1, 2017, the Montana fuel tax rate will be 31.5 cents per gallon for gasoline (previously 27 cents per gallon) and 29.25 cents per gallon for special fuel (previously 27.75 cents per gallon). Starting in state fiscal year (SFY) 2020, these rates will increase annually through SFY 2023 reaching 33 cents per gallon for gasoline and 29.75 cents per gallon for special fuel. This is the first state fuel tax increase since 1994.

Funding challenges include maintenance activities ineligible for federal funds and ensuring a sufficient amount of state revenues is available to meet federal matching requirements.

Figure 47 illustrates comparison of state and federal revenues between SFY 2005 and 2014. Federal funding has increased while state funding has remained relatively flat.

Figure 47: Montana State and Federal Revenue Sources



Source: MDT 2016 Fact Book

4.3 Safety

4.3.1 Highway Safety

Between 2004 and 2013, “large vehicles” were involved in approximately 10 percent of crashes resulting in a fatality or serious injury. Over 85 percent of fatalities and serious injuries involving heavy vehicles occurred in rural areas.[69] The Montana Comprehensive Highway Safety Plan (CHSP) defines a heavy vehicle as a bus, large truck, motorhome, ambulance, fire truck, tow truck, farm vehicle, or construction vehicle. The CHSP and the Commercial Vehicle Safety Plan (CVSP) are discussed in more detail in Section 5.2.2.

4.3.2 Rail Safety

The FRA attributes train accident causes to four primary categories: human factors, equipment issues, track issues, and miscellaneous causes. The FRA works to improve railroad safety in the following areas: Positive Train Control (PTC) implementation; rail grade crossing and trespassing prevention outreach; human factor/work protection; rail infrastructure upgrade funding; and tank car enhancements.

Crude oil moved by rail has been an increasing concern among communities across the U.S. In response to these concerns, the FRA implemented new regulations in 2015 pertaining to the transport of high-hazard flammable freight by trains.

4.4 Transportation Labor Force

4.4.1 Aging Workforce

Between 1970 and 1990, labor force participation, defined as the percentage of working-age population working or looking for work, grew steadily due to the baby boomer generation and an increase in female participation in the workforce. During the last 15 years, however, this participation rate has declined both nationally and in Montana due largely to demographic shifts. As of 2014, approximately 46 percent of Montana's labor force was age 45 and older.[70] The rate of those entering the workforce, mainly ages 16-24, is lower than in the past. This is likely due to a delay caused by higher rates of college enrollment.

4.4.2 Licensed Drivers

The Bureau of Labor and Statistics Occupational Safety and Health Statistics program classifies truck drivers into two occupational groups. Heavy and tractor-trailer truck drivers operate the largest vehicles on the road, defined as having gross vehicle weight (GVW) exceeding 26,000 pounds. Light truck or delivery service drivers are those who drive trucks with GVW under 26,000 pounds.

Of the 7 million people holding trucking-related jobs in the U.S., 3.2 million are employed as truck drivers. Since 2010, there has been steadily increasing demand for freight services. Driver shortage was identified as one of the top ten trucking industry issues by the American Trucking Research Institute in 2014.[71] The American Trucking Industry estimated current shortage between 30,000 to 35,000 drivers with a projection of the shortage increasing to 240,000 drivers by 2022.[72] However, the BTS's job forecast outlook estimates a 5 percent growth to 2024 for heavy and tractor-trailer truck drivers, adding an additional 98,800 truck driving jobs.[73]

Analysis from the Bureau of Labor and Statistics show that Montana's heavy and tractor-trailer truck driver occupation employs 6,530 people earning a mean wage of $21.49 per hour and concentrated at 14 per 1,000 jobs statewide, but as high as 30 per 1,000 in eastern Montana.[74] Nationwide, Montana's truck driving employment levels are in the lowest tier compared to other states.

One requirement to become a truck driver is obtaining a Commercial Driver's License (CDL) and specialized endorsements such as hazardous materials. The Montana Department of Justice Driver Services reports 43,135 CDL holders in Montana that hold 68,582 various endorsements for hauling hazardous materials, tankers, and passengers, as of June 30, 2016. Montana has 49 locations available for proctoring the required written knowledge testing and 23 sites to test CDL driving skills. The Motor Vehicle Division conducted 6,453 CDL driving skills tests in 2016.

Drivers seeking to obtain, transfer, or renew a hazardous materials endorsement must first have a Security Threat Assessment completed by the Transportation Security Administration (TSA). This assessment includes fingerprinting and a criminal background check, which must be completed and processed through a TSA office or vetted affiliate. There are two sites in

Montana, in Sidney and Billings. Out-of-state locations may be accessed in Soda Springs and Idaho Falls, Idaho; Spokane, Washington; and Casper, Wyoming.

Senate Bill 241 was successfully passed during the 2017 Montana Legislature enabling the Department of Justice to contract and certify third party commercial driver testing. This is expected to address testing delays.

4.5 Environment

Montana's large landscape brings with it a diversity of environmental contexts that range from wild and scenic ecosystems to urban population centers, as well as eastern prairies and western mountains, all of which are transected by vital aquatic systems. The environmental issues encountered by Montana's freight delivery systems are no less diverse.

Montana is appreciated by residents and non-residents for its outdoor recreation opportunities, scenic beauty, and abundant natural resources. The value placed on the environment is high, and stakeholders are active in MDT's efforts to promote environmental sensitivity. Focus areas for Montana's stakeholders generally center around wildlife issues, clean water and fisheries, and environmental process inclusion.

Key environmental trends and challenges affecting Montana's transportation system include:

- Critical habitat and wildlife corridor connectivity;
- Wildlife-vehicle collisions;
- Federally-listed and Montana state sensitive species;
- Wetlands;
- Water quality;
- Traffic noise;
- Air quality;
- Hazardous materials;
- Historic and cultural resources;
- Reclamation and weed control; and
- Weather events.

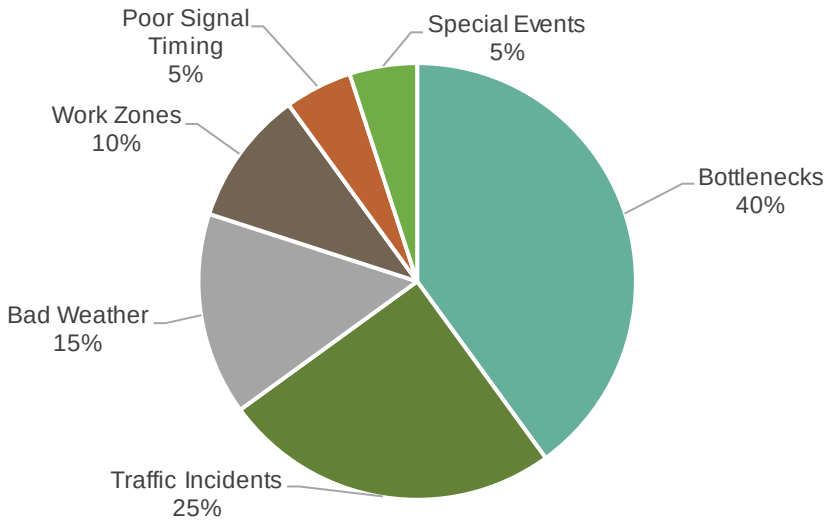
There are numerous federal, state, and tribal environmental laws that affect and shape MDT's decisions. The National Environmental Policy Act (NEPA) and Montana Environmental Policy Act (MEPA) are procedural laws that provide a framework for addressing various applicable environmental statutes, regulations, policies, rules, executive orders, and agreements. NEPA and MEPA set the tone for MDT's environmental ethic by recognizing the need for systematic, interdisciplinary planning and decision-making that considers all environmental factors for federal and state actions that could significantly affect the quality of the human and natural environment. NEPA and MEPA provide processes for sound decision-making based on thorough environmental analysis and public disclosure and review.

The guiding principles of NEPA and MEPA have been incorporated into MDT's transportation planning and project development process, as well as maintenance and operations of the state transportation system.

4.6 Freight Mobility

Freight mobility issues occur when travel is halted, impeded, or congested. Mobility restriction can be either recurring or non-recurring. Recurring restrictions routinely and/or predictably restrict the free flow of freight by any mode. Non-recurring sources of mobility issues are random in nature. According to FHWA, about 40 percent of national traffic congestion is caused by bottlenecks, as shown in Figure 48. Bottlenecks are locations on highways where traffic is delayed because of traffic volumes exceeding available roadway capacity. Those occurring on highways that serve high volumes of trucks are considered freight bottlenecks.

Figure 48: Sources of Congestion



Source: FHWA Public Roads https://www.fhwa.dot.gov/publications/publicroads/07mar/05.cfm

Freight bottlenecks causing recurring, predictable congestion are made up of three categories: infrastructure, institutional, and financial.

Infrastructure bottlenecks are physical locations, which due to design elements, geotechnical nature, or environmental factors, disrupt the free flow of goods. Infrastructure bottlenecks include bridges, border crossing facilities, and at-grade railroad crossings.

Institutional bottlenecks may result in challenges making planning, prioritization, implementation, and funding elements related to freight projects more difficult. Additionally, stakeholders may have different capabilities, priorities, and objectives requiring compromises to effectively plan and implement projects.

Financial bottlenecks consist of establishing the framework necessary to secure federal freight transportation funding specifically dedicated to freight transportation projects. The availability of these funds may assure that selected freight transportation projects be funded and completed.

4.6.1 Highway Freight Mobility Issues

Highway congestion on a national level is forecast to spread from larger urban areas and a few intercity routes to large stretches of intercity highways in both urban and rural areas. High congestion occurs when stop-and-go conditions exist or when volume/service flow ratios are greater than 0.95. Congested segments have reduced traffic speeds with volume/service flow ratios between 0.75 and 0.95.

MDT calculates a level of service (LOS) index based on the Highway Capacity Manual (HCM), a publication of the Transportation Research Board of the National Academies of Science. Vehicle density is calculated for each road segment based on half-mile lengths and posted speed limits. Demand exceeds capacity (LOS equal to F) at a density exceeding 45 vehicles per mile per lane.

On the Interstate System in Montana, any segment with a LOS below B is considered congested. On the NHS, Primary, and Secondary Systems, a LOS of C or below is considered congested. Since 1996, all statewide congestion indices have remained relatively constant, with no areas considered to have significant freight mobility issues. However, localized hot spots have been identified with matching projects underway to alleviate congestion.

To understand highway facilities with freight mobility issues in Montana, it is important to consider whether the sources are recurring or non-recurring, as depicted by Table 14.

Table 14: Sources of Highway Freight Mobility Issues

Sources of Highway Freight Mobility Issues	
Recurring	Non-Recurring
Limited physical capacity (i.e. bottlenecks)	Traffic incidents
Poorly functioning traffic signals	Work zones
Agriculture harvests (seasonal)	Bad weather
Tourism (seasonal)	Special events
Manufacturing facilities	Oversized loads
	Infrastructure failures
	Firefighting (seasonal)

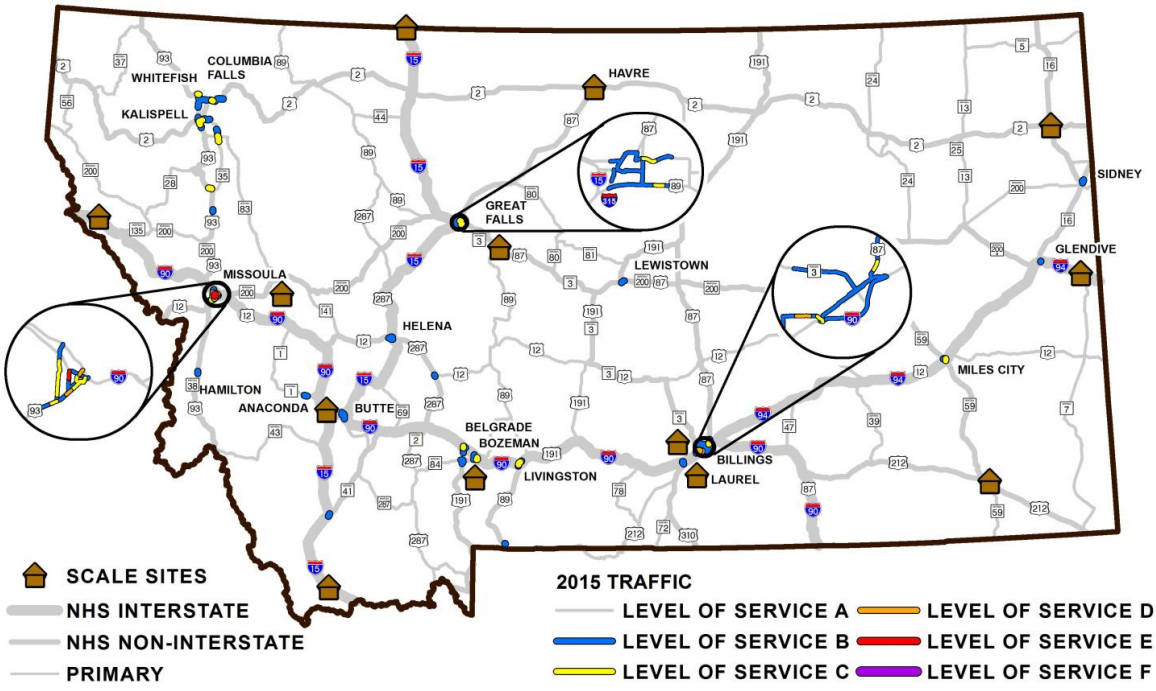
Source: MDT Planning Division

All highway facilities in Montana are exposed to non-recurring freight mobility issues, although some areas are more susceptible than others. Acts of nature such as winter storms and wildfires are common and happen at relatively unpredictable times and locations throughout Montana. Other non-recurring events tend to occur in specific areas, for example, traffic congestion after a concert at the Billings Metra Park. Strategies for mitigating the effects of non-recurring bottlenecks and congestion are discussed in Chapter 8.

Few areas in Montana are considered to have significant freight mobility issues. Recurring freight mobility issues occur in areas with physical limitations and are generally associated with small areas of insufficient capacity or areas that experience swells of traffic due to events such as agricultural harvests and tourism seasons.

Figure 49 shows areas with mobility issues as measured by LOS on the NHS and Primary Highway Systems. Areas with freight mobility issues, such as those highlighted, tend to be urban locations and are consistent with feedback received from freight stakeholders.

Figure 49: Montana Level of Service 2015



Source: MDT Geospatial Information

Congestion and mobility issues are among the factors considered when highway construction projects are nominated. Upcoming projects (as of November 2017) that are anticipated to alleviate congestion in the areas identified in Figure 49 include:

- Missoula East & West – Van Buren Street Interchange: Reconstruction project on Interstate 90 (at the Van Buren Street Interchange in Missoula) to improve operations (increase LOS) and decrease congestion. Includes ramp modifications and intersection improvement work.
- Rocker Interchange Improvements: Reconstruction project on Interstate 90 (at the Rocker Interchange near Butte) to improve operations (increase LOS) and decrease congestion. Includes ramp modifications and intersection improvement work.
- Broadus Interchange – Miles City: Major rehabilitation project on Interstate 94 (at the Broadus Interchange in Miles City) to improve operations (increase LOS) and decrease congestion. Includes ramp reconfiguration, additional turn lanes and intersection improvements.
- West Laurel Interchange – West: Reconstruction project on Interstate 90 (at the West Laurel Interchange near Billings) to improve operations (increase LOS), decrease congestion and promote safety. Includes ramp reconfiguration, new structures and intersection improvements.
- Lincoln Road – Montana to I-15 – Helena: Reconstruction project on Interstate 15 (at the Lincoln Road Interchange near Helena) to improve operations (increase LOS) and decrease congestion. Includes ramp modifications and intersection improvement work.
- I-90 Yellowstone River – Billings: Bridge replacement project on Interstate 90 in Billings to improve operations (increase LOS), decrease congestion and promote safety. Includes additional lanes, new structures and ramp modifications.
- Billings Bypass: Construction of an alternate route in Billings to promote connectivity, improve access, decrease congestion and improve operations (LOS) on major routes in the Billings area. Includes new (and improved) roadway network between Interstate 90 (at the Johnson Lane Interchange) and US-87 (near the Old Highway 312 intersection).
- Kalispell Bypass: Construction of an alternate route in Kalispell to promote connectivity, improve access, decrease congestion and improve operations (LOS) on major routes in the Kalispell area. Includes new (and improved) roadway network on the west side of Kalispell.
- Gore Hill Interchange – Great Falls: Interchange improvement project on Interstate 15 (at the Gore Hill Interchange in Great Falls) to improve operations (increase LOS) and decrease congestion. Includes ramp reconfiguration, additional turn lanes and intersection improvements. Note: Project is still in the evaluation (study) phase.

4.6.2 Rail Freight Mobility Issues

Data on locations of specific railroad bottlenecks and mobility issues for Montana's largest carriers, BNSF and MRL, is proprietary information and therefore is unavailable. Geographical obstructions and limitations, including mountain passes, tunnels, and snow sheds exist, mostly in the western part of the state. These encumbrances pose challenging issues for the railroads, as solutions may be cost and environmentally prohibitive. BNSF invested approximately $180 million in Montana for capital improvements in 2016. This included maintaining and expanding the core network and related assets; new locomotives, freight cars, and other equipment; continuing implementation of PTC; and investing in expansion and efficiency projects to enhance productivity and velocity.

5 FREIGHT-RELATED REQUIREMENTS, STRATEGIES, AND PERFORMANCE MEASURES

MDT's goal of improving the safety, security, efficiency, and resiliency of freight transportation is guided by federal and state laws and rules as well as MDT policies, strategies and performance measures. The following section highlights the most impactful of these to MDT's freight planning efforts.

5.1 Laws and Policies

5.1.1 FAST Act

The FAST Act provides five years of federal funding for surface transportation infrastructure planning and investment. The FAST Act established a national freight policy focused on:

- Maintaining and improving the condition and performance of the National Multimodal Freight Network; and
- Ensuring the Network provides a foundation for U.S. to compete in the global economy.

The FAST Act also established a new National Highway Freight Program (NHFP) to improve the efficient movement of freight on the National Highway Freight Network (NHFN) and support several goals, including:

- Investing in infrastructure and operational improvements that strengthen economic competitiveness, reduce congestion, reduce the cost of freight transportation, improve reliability, and increase productivity;
- Improving the safety, security, efficiency, and resiliency of freight transportation in rural and urban areas;
- Improving the state of good repair of the NHFN;
- Using innovation and advanced technology to improve NHFN safety, efficiency, and reliability;
- Improving the efficiency and productivity of the NHFN;
- Improving state flexibility to support multi-state corridor planning and address highway freight connectivity; and
- Reducing the environmental impacts of freight movement on the NHFN.

5.1.2 TranPlanMT

MDT's long range multimodal policy plan, TranPlanMT, provides the guidance for all MDT decisions. The plan identifies policy goals and strategies for the department for a 20-year time period. Section 1.4 lists these policy goals.

The Montana Freight Plan and performance measures were developed in alignment with TranPlanMT to ensure improvements for the overall movement of freight are consistent with the department's long-range policies.

The following section describes TranPlanMT policy areas specific to the efficient and safe movement of freight.

5.1.2.1 Safety

Safety is a central part of MDT's guiding mission. The department actively emphasizes safety through its programs and coordinated efforts with partners in education, enforcement, engineering, and emergency medical response. MDT maintains a focus on enabling all users to safely access Montana's transportation system. While not specific to freight, MDT's vision of zero fatalities and zero serious injuries on Montana's roadways includes all modes and users of the transportation system.

5.1.2.2 System Preservation and Maintenance

MDT employs a risk-based asset management approach to monitor performance and develop an optimal investment plan, ensuring like conditions throughout the state. Using this asset management approach and a "Right Treatment at the Right Time" philosophy provides a program of activities that preserves the investment in the highway system. Optimized utilization of limited resources ensures Montana's highways will continue to support efficient movement of freight through and within the state.

5.1.2.3 Mobility and Economic Vitality

Facilitating the movement of people and goods and recognizing the importance of economic vitality are important for Montana's transportation system. A well-maintained transportation network of all modes allows people, goods, and services to move freely, reducing "friction" and allowing the economy to thrive. Montana's economy is closely tied to transportation because of the lengthy distances between population centers within the state and to markets for Montana products.

Trucking and rail modes carry the largest percentage of freight commodities within the state. These modes are critical to ensuring freight is adequately and efficiently moved throughout Montana and the nation. MDT regularly monitors and studies freight commodities and travel patterns and considers effects to freight modes as investments are made to the transportation network. MDT will continue to enhance the freight network with targeted investments in infrastructure and operational improvements to highways such as highway and bridge preservation, congestion reduction, improved safety, and improved reliability.

5.1.2.4 Accessibility and Connectivity

MDT's goal is to preserve access to the transportation system and connectivity within and between modes. On a project-by-project basis, MDT evaluates the needs of all users and modes within the project using a context-sensitive approach appropriate for the area and the community.

5.1.2.5 Environmental Stewardship

MDT works to optimize planning and design decisions by balancing transportation needs with responsible, cost-effective stewardship of the environment. This process involves regulatory compliance with the intent to incorporate environmental sensitivity and sustainability as integral aspects of project decisions and design. While not specific to movement of freight, environmental stewardship is an underlying goal that informs decision-making at a broad level within MDT.

5.1.2.6 Business Operations and Management

It is vital that MDT develop and implement a long-range multimodal transportation improvement program that addresses Montana's statewide transportation needs, is consistent with the statewide long-range transportation plan and management system output, and maximizes the use of federal funds through the P3 to ensure a cost-effective, efficient, and safe transportation system that supports the movement of freight. To do this, MDT strives to recruit and retain a qualified workforce and exercise sound financial management to ensure matching funds for the federal aid program and adequate state funding for system maintenance and operations. All of this must be done while ensuring compliance with rules and regulations.

5.1.3 Montana Legislation and Rules

Various state laws and rules govern freight-related issues in Montana. The following includes pertinent statutes and administrative rules; however, others may apply that are not included here.

5.1.3.1 Montana Constitutional Constraints

Article VIII, Part VIII, Section 6 of the Montana Constitution requires GVW fees and excise and license taxes (except general sales and use taxes) on gasoline, fuel, and other energy sources used to propel vehicles on public highways to be used as authorized by the legislature, after deduction of statutory refunds and adjustments, solely for:

- Payment of obligations incurred for construction, reconstruction, repair, operation, and maintenance of public highways, streets, roads, and bridges.
- Payment of county, city, and town obligations on streets, roads, and bridges.
- Enforcement of highway safety, driver education, tourist promotion, and administrative collection costs.

5.1.3.2 Montana Code Annotated (MCA)

Size and weight statutory requirements pertaining to motor carriers and freight movement are contained in MCA 61-10. This section of MCA does not provide requirements or guidance on freight-related investment decisions. However, MCA 61-10-1011 enacts the Multistate Highway Transportation Agreement, which promotes uniformity in allowable vehicle size and weight. Participation is open to all jurisdictions. Current member states include Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. This agreement does not formally direct freight-related investment decisions, although Article IV, Section 1(d) indicates the cooperating committee may recommend improvements in highway operations, in vehicular safety, and in state administration of highway transportation laws.

5.1.3.3 Administrative Rules of Montana

Motor Carrier Services (MCS) is charged with protecting the highway network and ensuring safety for users through uniform regulation of the commercial motor carrier industry. MCS enforces all state and federal commercial motor carrier laws, rules, and regulations, and is responsible for the state's commercial motor vehicle (CMV) and driver safety, licensing, registration, and oversize/overweight permit program. MCS operates under the Administrative Rules of Montana (ARM) contained in Chapter 18. As with MCA 61-10, ARM 18.8 specifically addresses the requirements placed upon CMV carriers to lawfully operate in Montana, but does not formally or informally direct freight-related investment decisions.

In accordance with ARM 18.8.509, MDT implements restrictions on certain loads over the weekends and during holidays on specific routes referred to as "red routes". The intent of red routes is to limit overlap of higher weekend passenger volumes and larger commercial loads to improve overall highway capacity and safety during high-volume periods.

Specifically, travel is not allowed between 3 p.m. Friday and sunrise Saturday and between noon Sunday and sunrise Monday if dimensions exceed:

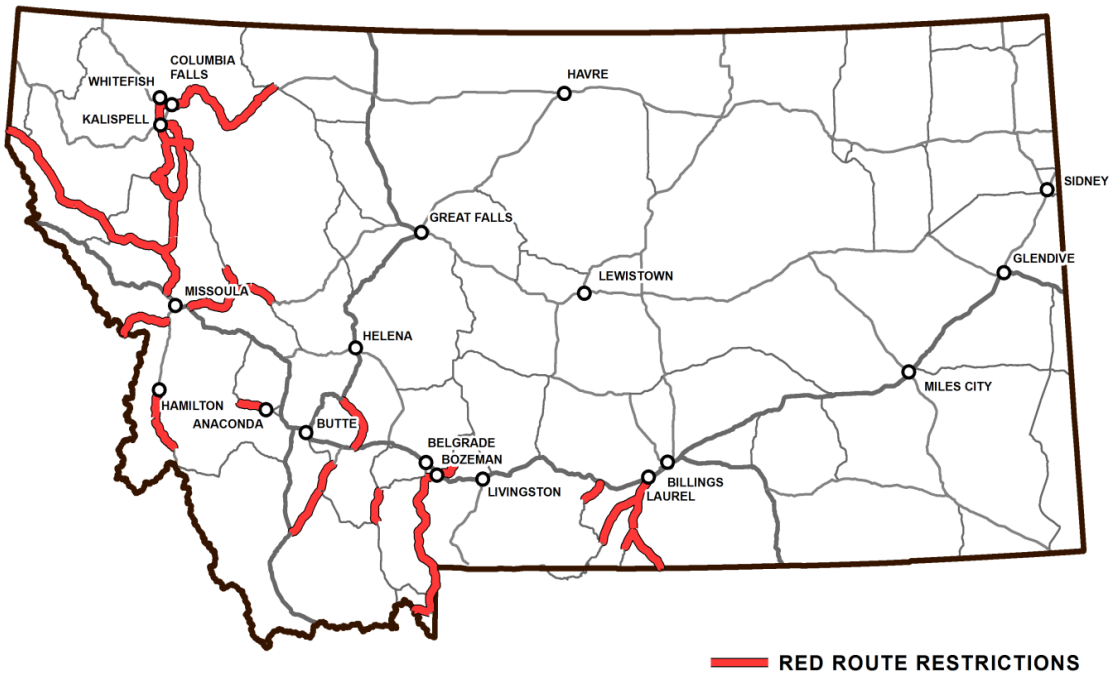
- 10 feet wide; or
- 110 feet long; or
- 15 feet 6 inches high; or
- 55 feet long - single unit.

Travel is not allowed between 3 p.m. on Friday and sunrise Monday if dimensions exceed:

- 18 feet wide; or
- 120 feet long; or
- 18 feet high.

A map depicting the location of Montana red routes is provided in Figure 50.

Figure 50: Red Routes



Source: MDT Geospatial Information Section

5.2 Goals and Strategies

TranPlanMT sets overarching statewide policy goals and strategies for the multimodal transportation system. In support of TranPlanMT, other MDT statewide plans provide additional detail on specific subject areas, such as safety, freight, rest areas, asset management, accessibility, and rail, transit, and aviation facilities. The subject-specific plans outline current and desired future conditions and set specific performance targets and timeframes, where applicable. The following plans and processes are used by MDT to meet the overall goals and strategies contained in TranPlanMT specific to the safe and efficient movement of freight.

5.2.1 Statewide Transportation Improvement Program

The Statewide Transportation Improvement Program (STIP) is developed in accordance with the requirements of Title 23 USC 135. The STIP includes projects that will address Montana's transportation needs over the next five-year period. This program is developed through coordinated efforts of MDT, state and federal agencies, local and tribal governments, metropolitan planning organizations, public agencies, transportation providers, citizens, and other interested parties. The program identifies highway, rail, aeronautic, and transit improvements to preserve and improve Montana's transportation system. Freight-related investments and improvement projects are captured in the STIP.

The projects in the STIP are developed via nominations from MDT district and program managers. Nominations are prioritized and ranked by surface condition, rideability, traffic safety, and geometrics consistent with strategies identified in MDT's asset management program.

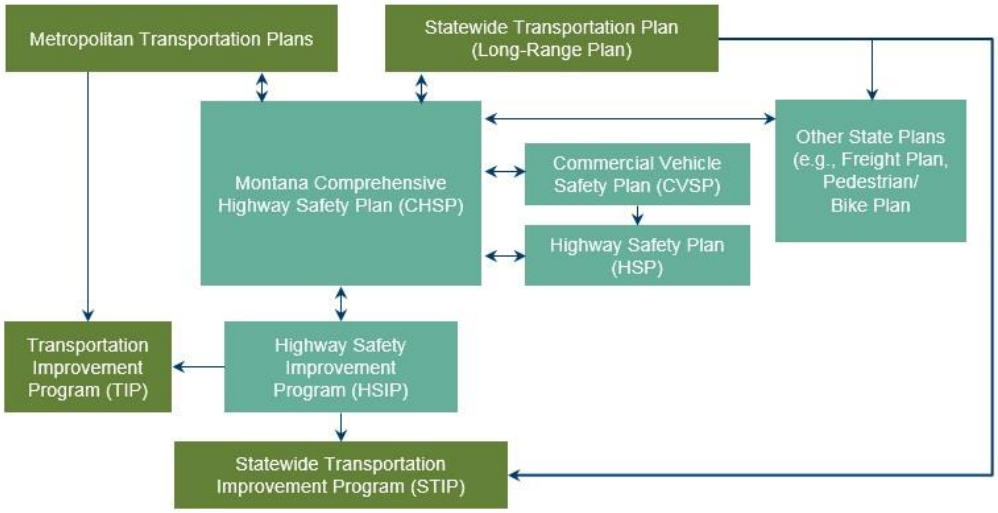
The scope of individual projects and priorities in the STIP may be adjusted periodically to accommodate public input, engineering constraints, and unforeseen needs and events such as weather-related or catastrophic emergencies. The STIP supports policy goals established in TranPlanMT. Freight-related investments and improvement projects are captured in the STIP.

5.2.2 Montana Comprehensive Highway Safety Plan (CHSP)

Under Title 23 USC, states are required to complete a Strategic Highway Safety Plan (SHSP) to receive federal highway safety funding through the Highway Safety Improvement Program (HSIP). The SHSP identifies statewide highway safety problems and analyzes opportunities to address them.

In Montana, the SHSP is referred to as the Montana CHSP. The CHSP was developed in 2006 and updated in 2015. The CHSP is a data-driven, multi-year comprehensive plan establishing statewide goals, objectives, and key emphasis areas. Figure 51 illustrates Montana's CHSP as it pertains to MDT plans and programs.

Figure 51: Montana's CHSP

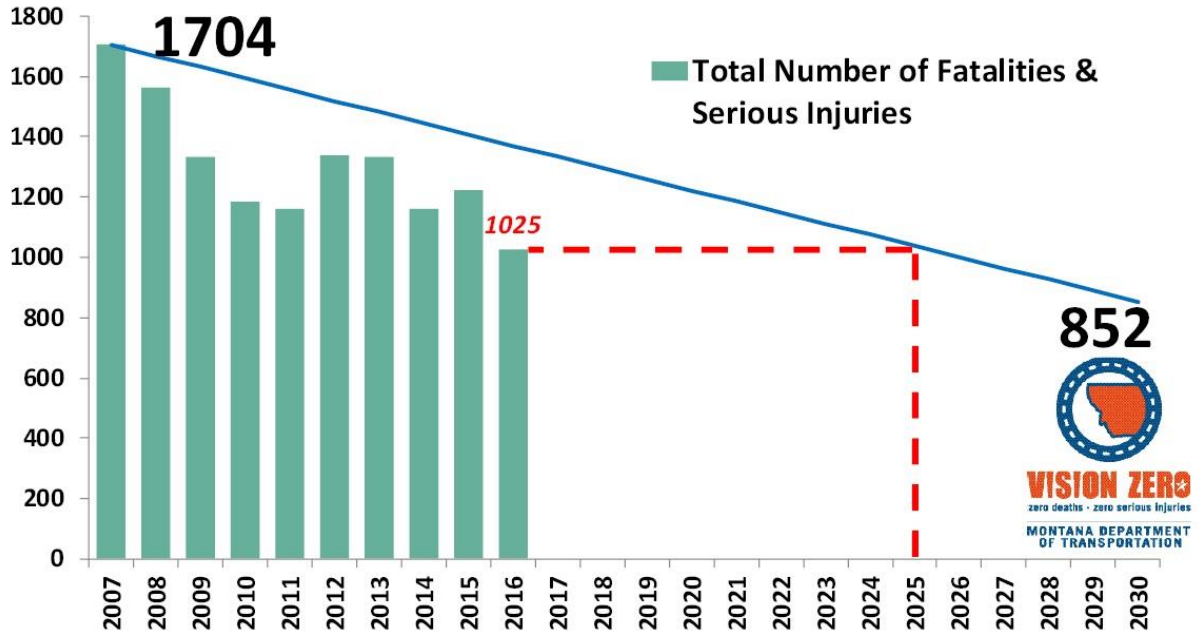


Source: Montana CHSP May 2015

During the 2015 update of the CHSP, highway large vehicle safety issues, including freight, were discussed. Through this process, the Montana traffic safety stakeholders elected to include large vehicle safety concerns and strategies in the three primary emphasis areas, which include: 1) Road Departure & Intersection Crashes; 2) Impaired Driving Crashes; and 3) Occupant Protection.

While the vision for Montana's CHSP is Vision Zero: zero fatalities, zero serious injuries on all public roadways, the CHSP uses an interim goal to track progress in reducing fatalities and serious injuries. The CHSP interim goal is to reduce fatal and serious injuries from 1,704 in 2007 to 852 by 2030. In 2015, Montana experienced 224 fatalities and 1,000 serious injuries. This is a slight increase from the previous year, however Montana is still below the 5-year average. Figure 52 shows fatalities and serious injuries in relation to the interim goal established during the 2015 update process.

Figure 52: Vision Zero Montana Safety Goal



Source: MDT Rail, Transit and Planning Division

5.2.2.1 Highway and Rail Crossing Safety Programs

Both the HSIP and the Rail Highway Grade Crossing Program (RHGCP) are contained within current federal surface transportation system legislation. These programs are data-driven and identify safety improvements to the public road system. While neither program is specifically focused on safety improvements for freight, both include freight-related safety issues in their respective evaluations, which may ultimately lead to safety improvements. Both the HSIP and RHGCP generate safety enhancements across the state that benefit all modes; however, both programs have also recommended specific freight-related improvements. Examples of freight-related safety improvements generated by these programs include active protection at rail crossings, over-height detection systems, and curve speed warnings targeted at larger vehicles.

5.2.2.2 Commercial Vehicle Safety Plan (CVSP)

The CVSP complements the CHSP and relates more directly to trucking and freight. The CVSP is developed by MCS and submitted to the Federal Motor Carrier Safety Administration (FMCSA) for comments and approval. The plan enables funding for Montana's Motor Carrier Safety Assistance Program (MCSAP) to operate. MCS operations continue to have a positive effect on the CMV crash reduction goals, specifically through conducting CMV inspections in accordance with national standards, carrier safety audits, and carrier educational programs. Montana's CMV crash data set reflects a downward trend over the course of a 16-year period.

Because bus crash fatality occurrences are infrequent in Montana, no fatal crash goals were determined to be necessary. However, MCS continues to complete bus inspections and passenger carrier investigations working closely with FMCSA to facilitate targeted special enforcement operations.

5.2.2.3 Motor Carrier Safety Assistance Program

The MCSAP is a federal grant program that provides financial assistance to states to reduce the number and severity of crashes and hazardous materials incidents involving CMV. The MCSAP is administered as a cooperative effort between MCS, Montana Highway Patrol (MHP), and FMCSA.

5.2.3 Performance Programming Process (P3)

MDT uses P3 for asset management at a statewide level. P3 is a method used to develop an optimal investment plan and measure progress in moving toward strategic transportation system goals.[75] Through P3, MDT evaluates investment decisions based on the ability to support core highway system needs and achieve P3 system goals. P3 involves tradeoff analyses to develop a performance-based funding distribution plan that maximizes use of federal funding and guides the project nomination process in alignment with policy and performance goals. P3 ensures that projects entering the program will support overall system performance goals for pavement condition, bridge condition, congestion, and safety.

P3 does not include a specific freight component leading to investment decisions. However, P3's performance-based focus leads to projects that will benefit the movement of freight in Montana.

5.2.4 Transportation Asset Management Plan (TAMP)

The MDT Transportation Asset Management Plan (TAMP) outlines a formal process for identifying, assessing, and prioritizing risks to Montana's surface transportation infrastructure. The TAMP was developed through survey of department staff across functional areas and drawing comparisons of the likelihood and consequence of various risks. The TAMP produced a register of the highest priority risks and a series of coordinated mitigation strategies to respond to those risks.

The TAMP builds from the foundation established by P3 and describes how MDT manages pavements and bridges to meet current requirements. The plan emphasizes:

- Communicating asset management objectives and outcomes to MDT's internal and external stakeholders;
- Documenting a management approach for transportation assets that aligns strategic policy goals with project selection and budgeting decisions;
- Synthesizing information to develop a complete story of the state of transportation assets and how conditions are expected to change over time with available funding;
- Identifying potential investment strategies that will help MDT achieve performance goals in a fiscally constrained environment;
- Assessing risks affecting transportation assets in Montana and MDT's ability to manage these risks; and
- Documenting current gaps in MDT's asset management framework and identifying the activities and resources needed to close those gaps and enhance asset management practices.

5.2.5 Corridor Planning

MDT conducts corridor planning studies to determine cost-effective solutions addressing transportation needs along a corridor. MDT invites local government and stakeholder representatives to assist in identifying corridor issues and concerns, potentially affected resources, and a range of options to improve transportation safety and operations. MDT uses the *Montana Business Process to link Planning Studies and National Environmental Policy Act and Montana Environmental Policy Act Reviews* to guide the corridor planning process.

5.2.6 2016 Montana Rail Grade Separation Study

In 2016, MDT completed a rail grade separation study to review at-grade and grade-separated railroad crossings. The study utilized a data-driven evaluation process to identify a list of at-grade and grade-separated railroad crossings and potential feasible improvements.

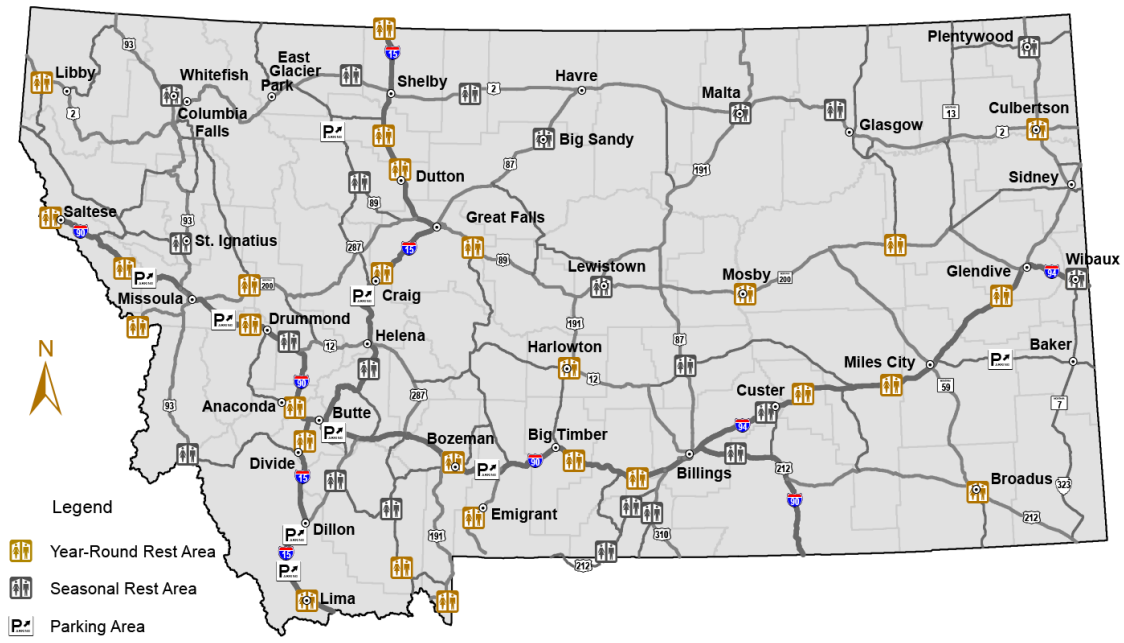
The evaluation process included a two-tiered screening and selection process to identify a final list of crossings. A data-based methodology was used to identify these locations from a total of more than 5,200 at-grade crossings and more than 400 grade-separated crossings throughout the state. For each of the final ten at-grade crossings, potential grade-separated alternatives were identified and conceptual plans, planning-level cost estimates, and benefit-cost analyses were developed. Potential improvements were also identified for selected grade-separated crossings. Section 7.5 discusses some specific outcomes of the study.

5.2.7 Rest Areas and Truck Parking

One of the national safety concerns related to freight is the lack of truck parking. This poses two primary safety challenges. One, it can lead to fatigued drivers because they are not able to find a place to rest, and two, it may also lead drivers to park in undesignated areas for rest. Title 23 USC addresses this issue by incorporating “Jason’s Law”, which surveyed truck parking availability and developed metrics to understand shortages.

Figure 53 provides an overview of available truck parking spaces in Montana. Based on the survey, Montana has the highest number of truck parking spaces per 100,000 miles of daily combination VMT in the nation.

Figure 53: Montana Rest and Parking Areas



Source: MDT Geospatial Information Section

Although parking areas offer a lower LOS compared to rest areas, they provide important stopping opportunities and fill network spacing and truck parking needs along corridor segments. Continued maintenance and operation of parking areas is needed to provide safe locations for motorists to stop during weather events and to avoid drowsy or distracted driving.

When planning reduction of service at existing rest areas, MDT considers maintaining sites as parking areas to provide safe stopping opportunities, if practical. As appropriate at each site, MDT conducts regular inspections and maintenance for parking areas (including vault toilet operation and snow removal) to ensure public access and safety.

Section 3.1.11 details MDT’s statewide rest area plan and program plus rest area infrastructure, condition, trends, performance and forecast.

5.3 Coordination

MDT works with various organizations to advance the safe and efficient movement of freight in the state, region, and nation.

5.3.1 Special Transportation Authorities

Montana is home to two major inland ports. The Port of Northern Montana (PNM) is located in Shelby. PNM is a 120-acre multimodal facility and provides direct access to the BNSF mainline as well as Interstate 15. The facility offers a range of services including consolidation, distribution, and transloading facilities.

The Port of Montana (PM) near Butte provides access to BNSF and Union Pacific railroads as well as access to Interstate 90 and Interstate 15. The Port of Montana offers transload, distribution, and warehouse/storage services.

MDT has no direct regulatory authority over port facilities unless the ports propose infrastructure improvements that impact state highway facilities. MDT has supported port efforts to obtain federal discretionary funding to complete needed intermodal improvements.

5.3.2 North/West Passage Corridor

In February 2002, state representatives from Idaho, Minnesota, Montana, North Dakota, South Dakota, Washington, Wisconsin, and Wyoming met to develop a program to help states along Interstate 90 and Interstate 94 coordinate the development, deployment, and integration of ITS projects. The vision of the North/West Passage Corridor is to focus on developing effective methods for sharing, coordinating, and integrating traveler information and operational activities across state and provincial borders. MDT is an active participant in this multi-state effort.

5.3.3 Western States Freight Coalition

The Western States Freight Coalition (WSFC) is a partnership between the department of transportation freight program personnel in 11 western states, including Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. The WSFC serves as a forum for peer exchange between the states. WSFC representatives discuss on-going freight-related initiatives or projects in each state.

5.3.4 Western Border Working Group

The Western Border Working Group (WBWG) was established in the spring of 2015 and was originally called the Inland Border Working Group. WBWG includes: Manitoba Infrastructure and Transportation, Saskatchewan Ministry of Highways and Infrastructure, Alberta Transportation, British Columbia Ministry of Transportation and Infrastructure, Minnesota Department of Transportation, North Dakota Department of Transportation, MDT, Idaho Transportation Department, and Washington State Department of Transportation. The WBWG was established to foster communication and information sharing among jurisdictions and discuss western perspectives related to bi-national border transportation planning issues. WBWG participates directly with the Canada-United States Transportation Border Working Group (TBWG).

5.3.5 Great Northern Corridor Coalition

The Great Northern Corridor (GNC) is the east-west freight corridor between Chicago and the Pacific Northwest that supports the economic vitality of more than 38 million Americans across eight states bordering Canada. The states of Oregon, Washington, Idaho, Montana, North Dakota, Minnesota, and Wisconsin have been collaborating informally for several years on the development of the Great Northern Corridor Coalition. This multi-state cooperative is comprised of state departments of transportation, ports, BNSF, and others interested in freight movement between the Pacific Northwest and the Great Lakes.

With MDT acting as lead, the coalition received two FHWA Multi-State Corridor Operations and Management Program grants to conduct Strengths, Weaknesses, Opportunities, and Threats Analysis of the GNC along with other activities to identify potential opportunities to improve technology, operations, and infrastructure of the corridor and to establish a maintainable coalition.

5.3.6 Canadian Economic Development

In 2010, MDT in cooperation with FHWA, completed Phase I of the Impacts of Increased Canadian Economic Development (ICED) on Northern Montana Highways research project. The primary purpose of this project was to evaluate current and projected Canadian economic activity and the impacts of associated commercial traffic on Montana highways and US-Canada border crossings. Phase I of the project was an assessment of current and future economic conditions and estimated related commercial vehicle traffic growth with and without expanded port operations.

Phase II of the ICED research project was completed in 2014. The purpose of Phase II was to determine if highway infrastructure in Montana was adequate to support future expected growth in traffic resulting from economic development in Canada and potential changes in border operations, industry structure, and freight-related policy. Conclusions from Phase II of the ICED project are summarized as follows:

1. It is anticipated that existing highway infrastructure in Montana will be adequate to handle the potential increase in overall traffic as well as the potential increase in truck traffic for both corridors of interest: S-232 corridor between US 2 and the Port of Wild Horse, and along the US 191 corridor between US 2 and the Port of Morgan.

2. Should existing pavement and geometric conditions be maintained, expected increases in AADT and truck percentages should not degrade weighted traffic operations below free-flow conditions (LOS A), although individual locations within the corridor may experience higher degradation in operations than the overall weighted average operations.

3. Traffic operations along the highway segments immediately adjacent to the ports are expected to remain below free-flow conditions through 2032. Only under the most aggressive growth scenario would traffic conditions south of Wild Horse deteriorate below LOS A in the busiest hour in 2028.

Final versions of the reports for each of the ICED phases are available online.

5.3.7 Local Governments

MDT works closely with communities across the state to develop long-range transportation plans (LRTP). Billings, Great Falls, and Missoula are the three MPOs in Montana, representing urban areas with populations of at least 50,000. The MPOs are required to develop long-range plans outlining specific strategies and projects to address identified needs within the urban boundary. Non-metropolitan communities may also elect to develop an LRTP to identify and address transportation needs based on public input and technical analysis.

In accordance with federal requirements, each of the MPOs has a current LRTP that, among other goals, directly or indirectly supports the safe and efficient movement of freight. Table 15 provides a listing of freight-related goals contained in the respective LRTPs.

Table 15: Montana MPO Long Range Transportation Plans

MPO	Year LRTP Updated	LRTP Freight Related Goals
Missoula	2017	1. Maintain the existing transportation system.
		2. Improve the efficiency, performance, and connectivity of a balanced transportation system.
		5. Provide safe and secure transportation.
		6. Support economic vitality.
Billings	2014	1. Develop a transportation system that is safe, efficient, and effective.
		2. Optimize, preserve, and enhance the existing transportation system.
		3. Identify and prioritize projects that mitigate deficiencies, maximize the use of existing facilities, and balance anticipated needs with available funding.
		6. Develop a transportation system that supports the existing local economy and connects Billings to local, regional, and national commerce.
Great Falls	2014	1. Maintain the existing transportation system.
		2. Improve the efficiency, performance and connectivity of a balanced transportation system.
		3. Promote consistency between land use and transportation plans to enhance mobility and accessibility.
		4. Provide a safe and secure transportation system.
		5. Support economic vitality of the community.
		7. Maximize the cost effectiveness of transportation.

Source: MDT Statewide and Urban Section

MDT works closely with local governments and communities to mitigate freight-related impacts and to inform the selection of freight-related investments. Within the three MPOs, all federal aid eligible projects must be included in the Transportation Improvement Program (TIP). Any MDT proposed freight-related investments within the MPO boundaries must be included in both the STIP and TIP.

Additionally, MDT has coordinated with local governments to mitigate impacts to communities resulting from freight activities. Recent examples include installing specialized hardware that allows signage and signal poles to be removed or rotated by oversize load movers allowing these loads to move through a community with greater efficiency. These freight-related investments minimize the disruption to traffic flows within the community.

5.3.8 Motor Carriers of Montana

The Motor Carriers of Montana (MCM) is comprised of over 600 companies representing trucking companies, passenger carriers, garbage haulers, and construction and excavating companies plus others. MCM is a key stakeholder during MDT's evaluation of infrastructure improvements that may impact the freight industry and participated in stakeholder activities in the development of the Montana Freight Plan.

5.3.9 Rail Service Competition Council

The Rail Service Competition Council (RSCC) was created in 2005 by Montana Legislature to promote rail service competition in Montana and is defined in MCA 2-15-2511. The council works to promote rail service competition in the state, develop related plans, evaluate taxing practices, assess organizational structures to help facilitate development of rail services, coordinate with railroads, and promote expansion and construction of rail services. Members of the RSCC were identified as stakeholders during the development of the Montana Freight Plan.

5.3.10 Private Sector Plans

MDT's Systems Impact Action Process (SIAP) coordinates review and assessment of impacts resulting from projects initiated by private developers and others. The SIAP team provides a coordinated review of projects that may significantly and permanently impact the state's transportation system. The review process aims to provide private developers with a single point of contact for requesting access to the state's highway system while also protecting taxpayers' investment in a safe and efficient transportation system.

SIAP's coordinated review allows MDT to identify adverse transportation impacts early in the planning and review phases. With SIAP, MDT and local government agencies concurrently review the project to provide a more complete review of the proposal and coordinate efforts in addressing those impacts. Once impacts are identified, the developer must implement approved mitigation measures to minimize effects on the transportation system. Mitigation measures are established as conditions a developer must meet before permits are issued. Projects that may substantially impact the transportation system through increased traffic, traffic delays, safety, etc., are included. Freight-related examples include, but are not limited to:

- Railroad at-grade and above-grade crossings;
- Pipelines;
- Major developments; and
- Oversize vehicle transportation projects requiring ground-disturbing road or utility improvements.

5.4 Performance Measures

MDT measures the success of overall strategies, policies, and investments in achieving the goals and objectives of the Montana Freight Plan. Measures are quantifiable and consistent with those used in other Montana planning documents and in reports and grant requests submitted to the federal government. For annual performance targets associated with each of the measures, refer to the MDT annual performance reporting and target setting document.

5.4.1 Freight Movement on the Interstate System

MDT's development and preservation efforts for Montana's transportation system ensure the reliable movement of freight. Additionally, TranPlanMT provides policy direction to target roadway system performance and preserve mobility. Under this direction, MDT has implemented a corridor analysis approach that assists in identifying congestion and established a dedicated funding allocation for addressing interstate capacity needs over the past couple decades. Obligation priorities established for interstate capacity funding will be complete in FY 2018 and future needs will be considered through NHFP and core funding programs.

The published performance measure to assess freight movement on the Interstate System is the Truck Travel Time Reliability (TTTR) Index (Freight Reliability measure). Freight performance is calculated by establishing the TTTR metric for each 15-minute period of a 24-hour period for a calendar year. In addition to the Normal Truck Travel Time (50th percentile) each interstate segment must also use a specific metric for weekday morning, midday, and evening travel times; overnight travel times; and weekend travel times.

MDT has not quantitatively evaluated the interstate system in Montana using this method. From a qualitative perspective, MDT generally anticipates the 50th percentiles and 95th percentiles to be relatively close for each of the five metrics given the overall lack of congestion on Montana's Interstate system. Additionally, consistent factors such as terrain and roadway geometrics should have an equal effect on all truck travel times.

5.4.2 Other Performance Considerations

While not specific to freight, MDT measures overall performance of the state highway system. The following describes the system performance measures pertinent to the safe and efficient movement of freight.

5.4.2.1 Traffic Safety

Under the CHSP, annually, MDT leads traffic safety stakeholders in discussions on safety performance of the highway system including an evaluation of performance measures required under federal regulation. This includes the number of fatalities, fatality rate, number of serious injuries, serious injury rate, and number of non-motorized fatalities and serious injuries.

5.4.2.2 Pavement Condition

Pavement condition is a key consideration for efficient and safe movement of freight. Poor pavement conditions can slow travel, cause delays or incidents, and damage vehicles and goods in transit. MDT collects pavement condition data annually and uses a Pavement Management System (PvMS) to manage condition data and analyze trends that support statewide strategic priorities. MDT defines specific pavement goals through P3. The goals seek to “preserve highway pavement condition at existing or higher levels.”

5.4.2.3 Bridge Condition

MDT’s Bridge Program supports preservation goals established in TranPlanMT and selects bridge projects to balance competing needs and minimize life cycle costs. Due to relatively static levels of investment, Montana’s bridges are steadily declining in condition; a trend that will continue at current levels of program funding. Based on analysis, MDT expects the condition of NHS bridges to decline slightly over the next ten years.

5.5 National Multimodal Freight Goals

Table 16 identifies how MDT policies, goals, and strategic planning efforts compare to the National Multimodal Freight Policy goals. The table shows how MDT is working to improve its ability to meet the National Multimodal Freight Policy goals described in 49 USC 70101(b) and the NHFP goals described in 23 USC 167(b). An "X" in the table indicates the MDT documents that support national multimodal freight goals. Table 16 also provides a comparison of MDT-established performance considerations and how those support the national freight goals.

Table 16: MDT Policies, Plans and Strategies vs. National Freight Goals

MDT Policies, Plans, and Strategies vs. National Freight Goals							
MDT Policy, Plan, or Strategy	Strengthen and Improve Economic Competitiveness, Efficiency, and Increase Productivity	Reduce Congestion	Improve Safety, Security, Efficiency, Reliability, and Resiliency of System	Achieve and Maintain State of Good Repair	Use Innovation and Technology to Improve Freight Network	Improve Regional Planning Efforts	Reduce Adverse Environmental Impacts
TranPlanMT	X	X	X	X	X	X	X
Statewide Planning	X	X	X	X	X		X
Freight Related State Legislation and Rules			X	X			
Statewide Transportation Improvement Program	X	X	X	X	X	X	X
Montana Comprehensive Highway Safety Plan			X			X	
Performance Planning Process (P3)		X	X	X	X	X	
Transportation Asset Management Plan	X	X	X	X	X	X	
Corridor Planning	X	X	X	X	X		X
Rest Areas and Truck Parking	X		X	X			
Regional Freight Planning Efforts - Northwest Passage - Great Northern Corridor Study	X		X			X	
Coordination with Local Governments	X	X	X	X	X		X
Coordination with Montana Freight Related Institutions - Motor Carriers of Montana - Rail Service Competition Council	X		X			X	
Rest Area Plan			X	X	X	X	
Maintain Freight Movement Reliability	X	X	X	X	X	X	X
Traffic Safety			X		X		
Pavement Condition	X		X	X			
Bridge Condition	X		X	X			

Source: MDT Rail, Transit and Planning Division

6 ADDRESSING HEAVY VEHICLES

The following describes improvements that may be required to reduce or impede deterioration of infrastructure on which heavy vehicles travel and a description of how MDT adapts to fluctuating demands on Montana's infrastructure.

Montana considers heavy vehicles to be those that meet the threshold of 49 CFR 383.5 definition of a CMV. The federal definition of CMV is a motor vehicle or combination of motor vehicles used in commerce to transport passengers or property if the motor vehicle is a:

- Combination Vehicle (Group A) - having a gross combination weight rating or gross combination weight of 11,794 kilograms or more (26,001 pounds or more), whichever is greater, inclusive of a towed unit(s) with a GVW rating or GVW of more than 4,536 kilograms (10,000 pounds), whichever is greater; or
- Heavy Straight Vehicle (Group B) - having a GVW rating or GVW of 11,794 or more kilograms (26,001 pounds or more), whichever is greater.[76]

Much of traffic on rural roadways in Montana is from passenger cars and light trucks with the occasional bus and delivery trucks. The addition of unanticipated haul vehicles disrupts traffic and decreases the life span of the roadway. The surface of a paved road can be damaged or fail due to a variety of factors including temperature changes, water penetration, vehicle loading, and aging. The following discusses damage due to vehicle loading.

6.1 Pavement Management

MDT utilizes a comprehensive pavement management system to identify and prioritize pavement improvement projects, trends, and statistics.

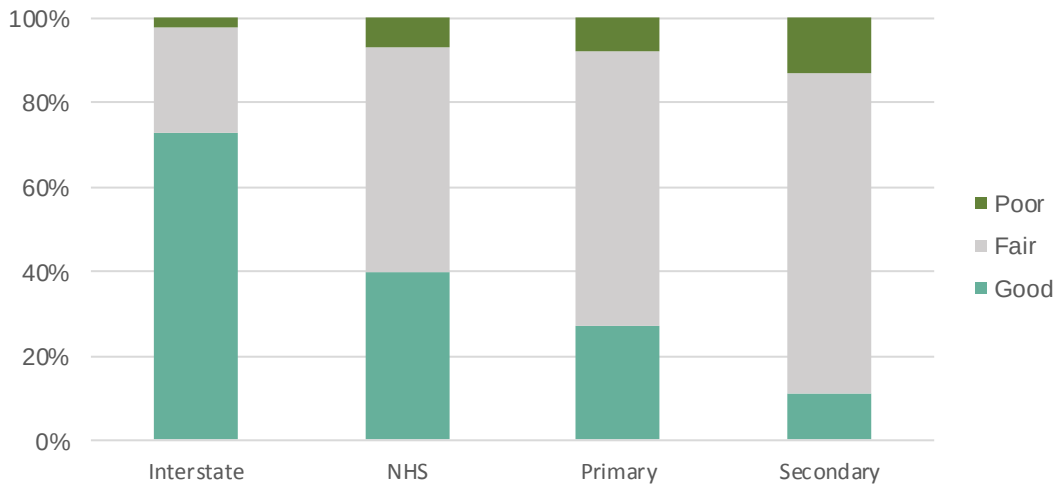
MDT annually conducts a Pavement Condition Survey (PCS) of all lane-miles within Montana's Interstate, Primary, and Secondary highway systems. A database includes annual PCS data, maintenance, and construction history. The database is used to conduct a systematic, objective evaluation identifying maintenance, rehabilitation, and reconstruction needs.

Interstates and NHS routes with the highest volumes have been constructed or reconstructed with greater structural capacities. These highways, which carry the highest truck volumes and vehicle weights, are expected to be sustainable as a result of projected future freight growth without experienced abnormal deterioration rates. Current pavement management policies and practices are projected to sufficiently identify unexpected deterioration trends and are capable of maintaining optimal pavement conditions required to accommodate heavy truck volumes.

6.1.1 Pavement Performance and Condition

Pavement condition data analysis provides an estimate of financial investment needs for Montana's Interstate, NHS, STP-Primary, and Secondary highways to maintain systems in good condition. Ride quality measures pavement's functional performance in terms of smoothness. Rutting and cracking indices are also calculated and factored into the evaluation of overall pavement condition. Figure 54 provides a summary of the 2015 ride quality by highway system. The condition, as well as age of the highway network, influences the treatment selection necessary to maintain the network.

Figure 54: Ride Quality – By System 2015



Source: MDT 2016 Fact Book

6.1.2 Pavement Design

Effective pavement design is an important element of roadway project design. Pavement is the portion of the highway most obvious to the motorist. Montana predominantly utilizes flexible pavements. MDT refers to this as plant mix surfacing. In rare instances, MDT uses rigid pavement commonly referred to as Portland cement concrete pavement. Currently, flexible pavements make up about 97 percent of MDT's road system (excluding gravel roads).

MDT's pavement design method has a practical amount of conservatism balanced with cost-effectiveness. It has been adjusted over the years to reflect improvements in construction practices, materials, and traffic predictions. However, some level of conservatism is still used in those items that continue to be hard to predict, such as the subgrade soil quality and fluctuations in travel demands.

6.2 Bridge Management

Bridge damage is less likely to occur due to design strength of the state's bridges and required overload permitting processes. New bridges are designed for HL-93 loading, which assumes the structure is fully loaded with multiple heavy vehicles. Most older bridges were designed for HS 20-44 or HS 15 loads, which assume multiple heavy trucks to varying degrees. This approach reduces the amount of possible damage from increased heavy loads because bridges are designed to carry constant truck loads. Vehicles weighing more than legal load limits require a permit. The effect on bridges is considered during the permitting process to minimize impacts to bridges. Additional restrictions that ensure overweight vehicles will not damage bridges are added before a permit is issued. For example, some permitted vehicles are required to slow to 10 miles per hour, stay centered on the bridge, and ensure no other traffic is on the bridge when crossing. The number of requested permits goes up during an energy boom, creating a higher workload in the Bridge Bureau and in MCS. Any vehicle that may damage a bridge is denied a permit.

6.3 Traffic Data Collection Program

MDT uses a variety of continuous automatic traffic recorders (ATR) and weigh-in-motion (WIM) systems which enable year-round data collection. The ATR systems range from traditional pneumatic tubes and inductive loops to newer radar, video, and magnetic systems. For WIMs, the systems include single load cells, bending plates, piezoelectric sensors, and fiber optic sensors. MDT collects and utilizes this information to reduce pavement damage from overweight vehicles and to plan for existing and future pavement demands.

The State Truck Activities Reporting System (STARS) consists of an array of WIM/automatic vehicle classification sensors deployed across the Montana highway system. These WIM sensors installed directly in traveling lanes of the roadway unobtrusively and automatically collect information on the weight and configuration of the vehicles traveling on that roadway. Data is processed to characterize commercial vehicle operations at the site by identifying time and locations where the most severe overweight violations occur and classified by configuration. MCS uses the information for enforcement-related resource deployment to mitigate overweight trends on the highway system. Additionally, the data assists in providing demand and usage data that can be utilized for improved pavement design correlated to future demand changes.[77]

6.4 Seasonal Impacts

Agriculture is a major Montana industry and a generator of heavy trucks during harvest times. Traffic data may not include commodity hauls in traffic estimates since traffic counts may have not been conducted during harvest time. For roadways with commodity hauls, MDT estimates the increased daily equivalent single axle loads (ESALs).

6.5 Increases in System Demand

Unanticipated demands on the transportation system can occur for a variety of reasons. These demands vary in both severity and duration. For example, a timber sale results in unplanned demand that is short-term and has minimal impact to the overall life cycle of the affected roadways. The Bakken oil boom exemplifies the opposite in that it has impacts on a significant portion of MDT's system over an extended period of time. As discussed previously, the department's established system for identifying priorities, determining needs, and distributing funding using P3 for asset management may be used to address increased needs necessitated by an increase in system demand.

P3 identifies increased demand on the system due to heavy loads and allows MDT to direct additional funding to meet those needs if determined necessary. More immediate action can also take place in the form of change orders on existing contracts to increase the surfacing sections to accommodate increased loading. Projects in the design phase may be modified to more appropriate scopes. For example, a project originally nominated for a chip seal could be rescoped to a thin lift overlay provided funding is available.

MDT's existing process for determining priorities, distributing funding, nominating projects, and monitoring roadway conditions allows the department to address unanticipated increases in heavy vehicle use. Immediate needs brought about by early roadway failure, versus reduced service life, may be addressed through existing contract modifications, scope changes, or using state maintenance resources.

7 MITIGATING DELAY CAUSED BY FREIGHT

Based on the LOS analysis presented in Section 4.6.1 and consultation with freight stakeholders and MDT district personnel, congestion and delay caused by freight movement is minimal in Montana. While not considered significant by most standards, the following are sources of recurring congestion and delay caused by freight movements in the state and mitigation strategies.

7.1 Harvest/Natural Resources

Cyclical surges in freight movements associated with industries such as agriculture, timber, and mining cause congestion and delay at transloading and processing facilities. This congestion is generally limited to non-NHS routes.

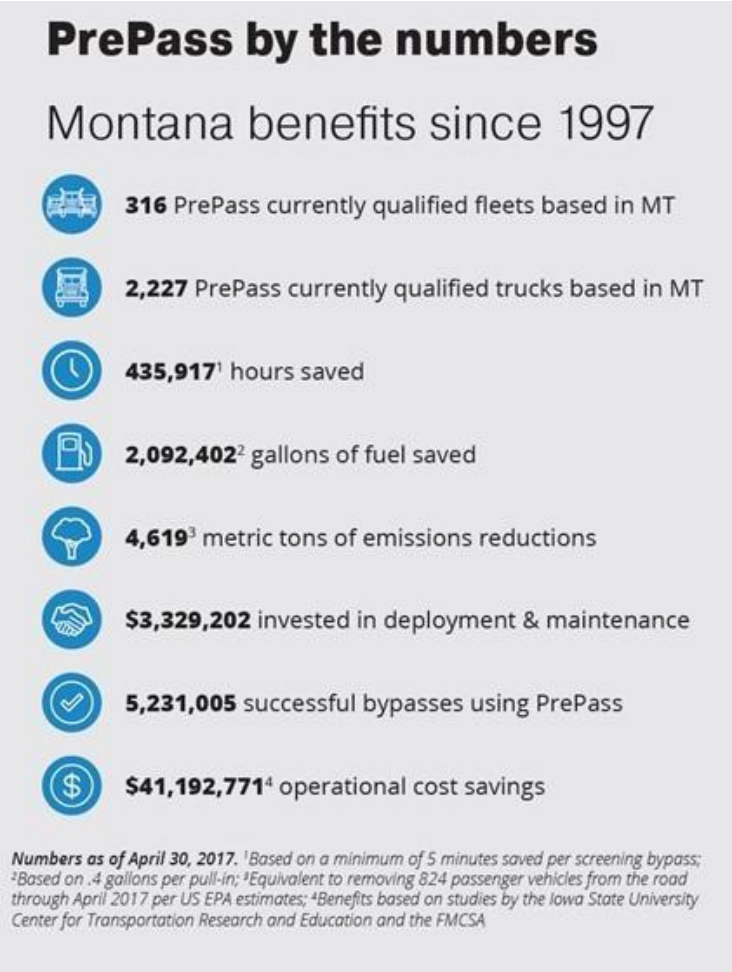
Mitigation strategies that are the responsibility of private entities include construction of additional truck parking and storage facilities on private property, extension of operating hours, and partnering with rail service providers to ensure availability of equipment. MDT considers congestion and delay as part of the project selection process when determining if additional capacity is needed.

7.2 Weigh Scales

Freight traffic at weigh scales infrequently causes congestion and delay. This delay can be both before and after the scale location and is caused by overcrowding of trucks going into the scale and the speed differential after the scale as trucks merge into traffic.

Mitigation strategies include utilizing PrePass to reduce the number of trucks utilizing the scale facility. PrePass allows qualified motor carriers to comply with safety, weight, and credential requirements while traveling at highway speeds, eliminating the need to stop at designated weigh stations and ports-of-entry. This strategy improves safety by reducing congestion around inspection facilities and enables state inspection and law enforcement teams to focus efforts on carriers and trucks that demand more attention. This method improves air quality, reduces emissions from idling trucks, and reduces congestion. Currently, Montana has seven PrePass sites with the first established in 1997. Figure 55 demonstrates the savings generated by this system.

Figure 55: Montana PrePass by the Numbers



Source: MDT2017 http://www.helpinc.us/public-sector/state-fact-sheets

7.3 International Border Crossings

Delay is sometimes present at U.S./Canada border crossings, although this delay is not always attributed to freight movements. Passenger vehicles make up approximately 60 percent of traffic leaving the U.S.

Operational strategies to alleviate delay are implemented by U.S. Customs and Border Protection. MDT partners with authorities in both the U.S. and Canada to optimize port of entry highway facilities. Freight and resource efficiencies are realized by a joint weigh station agreement between Montana and Alberta. Montana has joint weigh station operational agreements in bordering states, as well, that include Idaho and Wyoming.

7.4 Speed Differential

Speed differences between truck and passenger vehicles may cause delay especially on two-lane roadways. This situation is most prevalent in areas of steep and/or winding roadways.

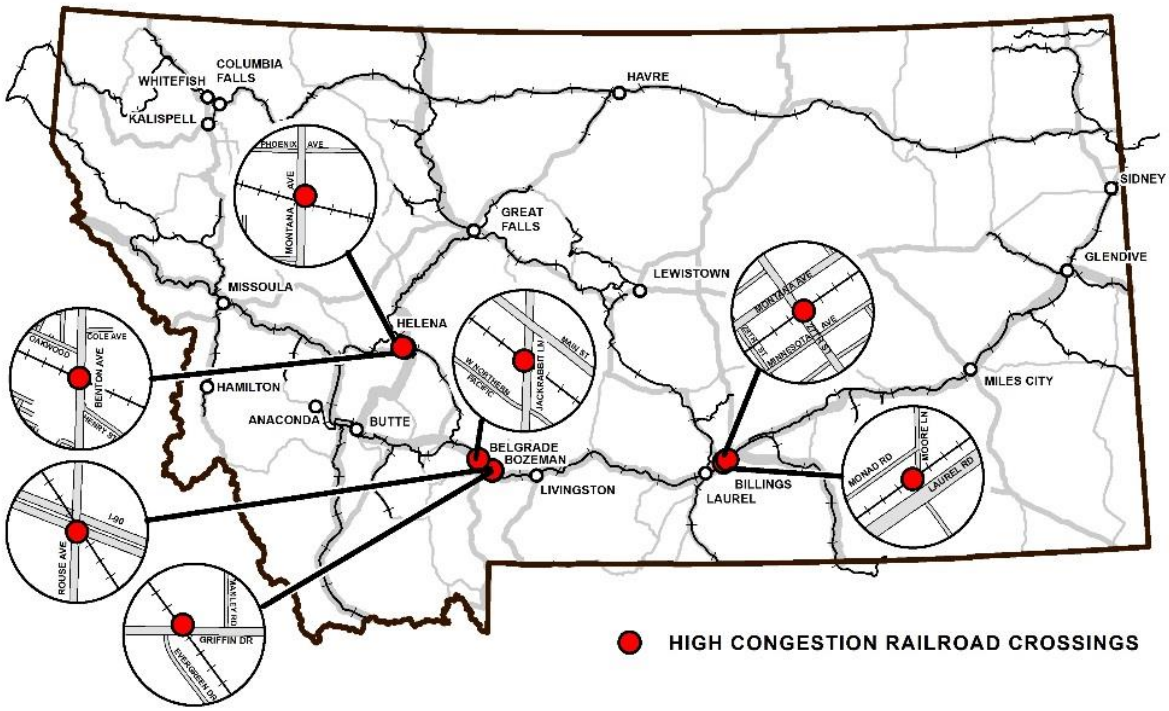
Passing lanes are used as appropriate to alleviate speed differential delay. For super loads, which generally travel below the speed limit, the permit process may require traffic control plans that minimize delays to the travelling public. These types of loads are often required to travel during off-peak hours.

7.5 At-Grade Railroad Crossings

Train traffic causes congestion and delay when vehicles must wait for trains to pass at highway-rail crossings.

The *2016 Montana Rail Grade Separation Study* discussed in Section 5.2.6 identified grade-separation solutions that may be feasible for railroad crossings in Billings, Bozeman, and Helena. Additionally, five grade-separated crossings were identified for further investigation due to vertical or horizontal clearance and/or roadway geometry issues. Using the results of this study, MDT will determine if improvements at these locations are viable and cost effective.

Figure 56: High Congestion Highway Railroad Crossings



Source: MDT Geospatial Information Section

8 ALLEVIATING FREIGHT MOBILITY ISSUES ON STATE OWNED INFRASTRUCTURE

Mobility issues caused by congestion can be categorized as recurring or non-recurring. These issues may be addressed in different ways.

8.1 Recurring Congestion

As described in Chapter 7, MDT employs various methods to minimize recurring congestion and delay caused by freight movements, including design and capacity considerations, PrePass, international border crossing agreements, traffic planning, and permitting.

As discussed in Section 4.6, bottlenecks causing freight mobility issues can be categorized into three areas: infrastructure, institutional, and financial.

Strategies to address infrastructure bottlenecks include:

- Reducing congestion to improve performance of the transportation system;
- Improving safety, security, and resiliency of the transportation system;
- Facilitating intermodal connectivity;
- Identifying major trade gateways, multimodal freight networks and corridors, and working with freight stakeholders and partners to improve mobility in these areas;
- Mitigating impacts of freight projects and movements on communities; and
- Supporting research and promoting adoption of new technologies and best practices.

Strategies to address institutional bottlenecks include:

- Streamlining project planning, review, prioritization, permitting, and approval;
- Fostering multijurisdictional, multimodal collaboration, and solutions;
- Facilitating coordination between public and private stakeholders;
- Improving data sources and modelling; and
- Succession planning for the transportation workforce.

Strategies to alleviate financial bottlenecks include:

- Ensuring maximum utilization of federal funding programs;
- Exploring other funding sources including federal grant programs such as Fostering Advancements in Shipping and Transportation for the Long-term Achievement of National Efficiencies (FASTLANE) and Transportation Investment Generating Economic Recovery (TIGER); and
- Exploring public-private partnerships.

8.2 Non-recurring Congestion

As described in Section 4.6, non-recurring causes of mobility issues are random. While the timing and occurrence of these causes may be unpredictable, measures must be in place to respond to such events to alleviate freight mobility issues associated with state owned highways.

From crashes to oversized loads and construction, any number of conditions can cause congestion. Flooding, snow accumulation, and wind-blown debris can cause capacity reductions, congestion, and delay. Weather events can reduce arterial mobility and reduce the effectiveness of traffic signal timing plans. Road closures and access restrictions due to hazardous conditions (e.g., large trucks in high winds) also decrease freight movement.

The Emergency Operations and Disaster Plan defines MDT actions that are intended to minimize loss of life and property, protect the integrity of the transportation infrastructure, repair damaged highways and structures, and restore the flow of traffic as soon as possible and safe to do so.

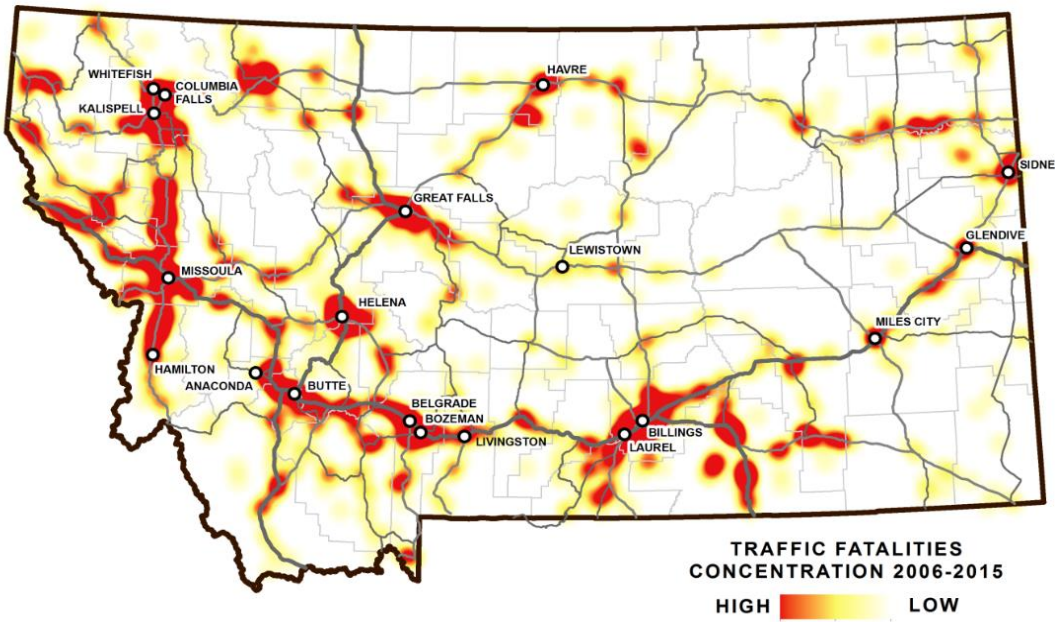
Following are common causes of non-recurring delays, but not inclusive of all events for which MDT prepares.

8.2.1 Crash Delays

According to MDT crash data, between 2011 and 2015, over 105,000 crashes occurred on Montana roadways. This equates to an annual average of over 21,000 crashes. Depending on the severity, location, and alternate routes available, crashes can contribute to significant delay for highway users. On rural, state owned highways, MHP has primary authority for investigating traffic crashes. If warranted and requested by MHP, MDT personnel assist with traffic control until the investigation is complete, and the roadway is cleared.

Crashes are random in nature, but certain locations may exhibit a higher crash frequency than others as shown in Figure 57. MDT has adopted an Emergency Operations and Disaster Plan that provides a basis for MDT's response to these types of events.

Figure 57: Traffic Fatalities Concentration 2006-2015



Source: MDT Geospatial Information Section

8.2.2 Winter Storms

MDT's Winter Maintenance Service Guidelines establish priorities, provide a uniform service between maintenance areas, and optimize resource allocation. Four levels of service guide route priority and consider the following factors:

- Safety;
- Annual Average Daily Traffic;
- School bus routes;
- Availability of alternate routes;
- Public interest and concern;
- Potential economic impact;
- Consequence of not providing higher level of service; and
- Available resources.

MDT has approximately 900 maintenance personnel available to clear Montana's 25,000 lane miles of ice, slush, and snow during winter. Maintenance personnel prepare for winter by stockpiling necessary supplies prior to the season. In the fall, the same trucks that are used during the summer for stockpiling, patching, and other maintenance operations are equipped with snowplows.

MDT snowplow operators use “just-in-time anti-icing” guidelines to avoid unnecessary applications based on inaccurate forecasts. Once the anti-icing work is completed, MDT responds to winter storms as they occur and attempts to clear all roads as snow continues to fall. In situations where a storm covers a large area, resources can be stretched beyond available limits. In these situations, a system of priorities is followed to provide the most effective service.

A variety of factors are considered when deciding the course of action to treat winter roadways. Product application combinations are chosen after maintenance workers evaluate factors such as air temperature, pavement temperature, humidity levels, dew point temperatures, exposure to solar radiation, type and rate of precipitation, weather forecast, weather radar data, and satellite data. MDT monitors road conditions using infrared sensors, thermal mapping, and Road Weather Information Systems (RWIS).

Operational treatments are continuously evaluated by MDT before, during, and after a winter storm. Road treatments and applications are modified through all phases of a storm based on careful analysis of intensity, duration, and type of precipitation.

8.2.3 Infrastructure Failures

Various events, such as rock slides, bridge failures, and flooding, may cause infrastructure failures. When bottlenecks and delay result, appropriate MDT district offices, with support from headquarters staff, promptly initiate an incident management team to establish an appropriate detour. A second project team lead by the primary discipline area initiates the process to implement repairs quickly.

MDT strives to prevent failures before they occur. To prevent rockfalls, for example, MDT utilizes a rockfall hazard rating process and system. In 2005, 10,800 center-line miles were screened for potential rockfall sites, and rockfall history and behavior information was gathered for each site. These sites were rated according to estimated potential for rockfall on the roadway. This system allows MDT to prioritize areas of concern and respond effectively.

8.2.4 Wildfires

Wildland and rangeland fires are hazards that impact Montana every year. In mild fire seasons, there may be relatively small timber and crop resource losses. In extreme years, there can be resource devastation, habitat destruction, structure losses, and deaths.[78] Transportation-related strategies for mitigating congestion and delay due to fires include removal of debris, such as burning trees near the roadway and provision of traffic control, if needed to remove the debris. For evacuations, MDT personnel ensure that evacuation routes are safe and that information on safe, restricted, and closed routes is communicated to the proper authorities and the public.

8.2.5 Oversized Loads

Oversight of oversized loads is important for the health of Montana's infrastructure. Oversight activities include the establishment of frequently used routes for oversized loads and permitting. In 2016, to mitigate delays in obtaining permits for oversized loads, MDT implemented an online permitting system. This system allows customers to more easily apply for various types of oversize permits online.

As discussed in Section 5.1.3.3, red routes and other considerations are used to help reduce delays caused by oversized loads.

8.2.6 Construction Projects

Spring and summer are primary road construction seasons in Montana. MDT has strategies in place to mitigate construction-related delays before they occur. These strategies take into consideration safety, differing traffic types, project significance, location, and timing. Work zone safety and mobility are considered at every stage of project development and construction. MDT has a Work Zone Safety & Mobility Toolbox available online that provides additional details on the many strategies and tools MDT and MDT contractors utilize.

9 UTILIZING INNOVATIVE TECHNOLOGY

MDT continues to advance the use of innovative technologies and best practices for the safe, secure, and efficient movement of freight. Additionally, as freight system users deploy technologies, MDT monitors and responds to these user-driven needs, as appropriate and resources allow.

9.1 Credentials and Vehicle Clearance

MCS manages and implements strategies to enhance freight movement efficiency, including:

- Streamlining motor carrier credentialing process;
- Deploying electronic preclearance technology systems;
- Providing timely system and project information for route planning efficiency; and
- Developing and communicating project sequencing to accommodate oversize/overweight (OS/OW) freight.

9.1.1 Commercial Vehicle Administrative Processes

Montana uses an electronic Permit, Audit, Registration and Tax (ePART) system to issue International Registration Plan (IRP) vehicle registrations, International Registration Plan (IFTA) fuel licensing/ tax returns, and OS/OW permits. ePART is available online for MCS as well as qualifying motor carriers and third-party providers to self-issue credentials online, at any time of day or day of week. Future advanced technologies such as automated routing will simplify OS/OW permitting for both MDT and online users.

9.1.2 Commercial Vehicle Electronic Clearance

Montana has been a member of HELP Inc. since 1995. HELP Inc. is a public/private partnership and the provider of PrePass electronic weigh station bypass and screening systems. As discussed in Section 7.2, PrePass uses Automatic Vehicle Identification to identify enrolled vehicles that have been pre-cleared for safety and credentials. Montana's PrePass systems also integrate WIM systems, as discussed in section 6.3 to weigh trucks for compliance as part of the bypass screening criteria. Deployment of these technologies improves weigh station operations through more efficient freight movements for compliant CMV, while providing officers the ability to focus on those vehicles that are not compliant. Montana currently employs PrePass at seven locations: five weigh stations on Interstates I-15 and I-90, as well as two weigh stations on NHS Highways, US 89, and US 212. An eighth PrePass weigh station is planned for installation during the construction of a new weigh station on I-90 in 2018.

9.1.3 Ramp Screening

Montana has deployed ramp screening technologies at congested weigh stations to improve freight mobility. Ramp screening systems include license plate and USDOT number readers, Optical Character Recognition (OCR) software, and use a consolidated safety and credentials database to provide results immediately. This allows officers to focus on vehicles and drivers most likely to have safety and/or credentialing issues.

9.1.4 Automated Roadside Safety Inspection

FMCSA, HELP Inc., and other public and private entities are evaluating automated roadside safety inspection concepts using in-cab onboard electronic logging devices and roadside infrastructure, also known as “vehicle to infrastructure” (V2I) technologies. Once the technologies and associated regulations are available, MDT will consider them for deployment.

9.2 Road Condition Information and Route Planning

MDT publishes, maintains, and provides both fixed and variable information about route conditions and suitability for freight passage. Travelers use a variety of means to receive traveler information for MDT’s highway system, both pre-trip and en route.

9.2.1 Traveler Services Information

MDT's Traveler Information System was developed to provide travelers with timely, accurate roadway information. The traveler information program is continually evolving but currently includes the following:

- 511 toll-free phone system;
- Traveler information website;
- Mobile app;
- More than 73 Road Weather Information System(RWIS)/cameras statewide;
- Highway Advisory Radios (HAR);
- Permanent and portable variable message signs; and
- Snowplow cameras.

MDT’s website, www.mdt511.com, and the “MDT Travel Info” mobile application are widely used. These sources provide information about weather, construction and maintenance project information, reported incidents, road conditions, load and speed limit restrictions that may impact route decisions, and rest area locations and amenities.

Some travelers use MDT’s 511 phone service also, which provides route specific forecasting, regional reports, facility information, and surrounding states access.

The most recently deployed technology is snowplow cameras. While the plow is operational, these dash-mounted cameras capture images approximately every half mile, which are then

made available to the public via MDT's website and mobile app. This technology helps travelers determine conditions based on firsthand observations and allows them to plan accordingly.

9.2.2 Construction and Work Zone Planning

MDT's Work Zone Safety and Mobility Policy uses the best management practice of minimizing or reducing impacts before they occur. During project pre-construction phase, a project-specific Transportation Management Plan (TMP) is developed to address demand management, corridor/network management, construction zone safety management, and traffic/incident management. One goal of the TMP is to recognize impacts of construction activities on the freight industry and mitigate those impacts as feasible.

9.2.3 Emergency Response

Maintaining and restoring transportation routes caused by destructive events is crucial. MDT has measures in place to respond to such events. In coordination with other Montana state agencies, MDT has the following plans prepared to ensure swift and efficient response:

- Emergency Notification and Personal Security – continuity of operations plan;
- Emergency Vehicle Management – Transportation Injury Mapping System (TIMS), getting to the scene, maps for routing, detouring for incidents, flagging at emergency zones, and traffic control;
- Disaster Response and Evacuation http://readyandsafe.mt.gov/Emergency
- Montana Emergency Response Framework http://readyandsafe.mt.gov/Home/Articles/ArtMID/41421/ArticleID/4115/Montana-Emergency-Response-Framework-Emergency-Support-Functions;
- Montana Emergency Response Framework Support Function #1 Transportation http://readyandsafe.mt.gov/Portals/105/Emergency/DOCS/Planning/ESF%20%20%231%20Update_2016_08_16.pdf; and
- MDT Emergency Operations and Disaster Plan http://mdtinfo.mdt.mt.gov/maint/docs/des_manual/mdt_emergency_disaster_plan.pdf.

9.3 Road System Enhancements

MDT has undertaken studies and installed technologies, including ITS features, which benefit overall system safety and operations, and freight passage.

9.3.1 Real-Time Traffic Control

MDT uses several traffic control technologies including visibility sensors on I-15 northbound, which warn vehicles of reduced visibility and associated route impacts (detour/closure), wind sensors deployed at various locations to determine when high-profile vehicles should be required to detour or reroute, and closure gates.

9.3.2 Sequential Dynamic Curve Warning System

This system, manufactured by Traffic and Parking Control Company (TAPCO), uses a vehicle activated radio-based wireless chevron sign to warn and guide motorists through a curve. MDT has installed two of these systems – one near Beaverhead Rock on MT Highway 41 north of Dillon and one on MacDonald Pass US Highway 12 west of Helena.

9.3.3 Active Intersection Warning Devices

These vehicle-activated devices give drivers additional information to assist in collision avoidance. MDT has installed several active warning devices at un-signalized intersections to warn motorists of crossing traffic or the need to stop ahead. Installations include Bowman's Corner and U.S. Highway 2 & Spring Creek/Dern Road near Kalispell. Each system uses a location-specific design to address the unique crash trends of the intersection.

9.3.4 Warning Flashers

MDT regularly installs advance warning flashers at high-speed signalized intersections. These installations consist of a "Be Prepared to Stop When Flashing" sign and advance warning beacons that are interconnected to traffic signals and provide motorists with a warning that the green indication is about to terminate. These are particularly useful for heavy vehicles that require longer stopping distances.

9.3.5 Signal Synchronization

Proper traffic signal timing promotes safe and efficient traffic flow. A well-timed traffic signal system can reduce fuel consumption and emissions, eliminate unnecessary stops and delays, and increase safety. MDT Congestion Mitigation and Air Quality Improvement Program funds are for projects that improve corridor operations through upgrading traffic signal hardware and reviewing traffic signal timing.

9.3.6 Bluetooth/Wi-Fi Monitoring

MDT uses Bluetooth monitoring to track travel times on corridors for signal retiming. This technology uses Bluetooth or Wi-Fi to anonymously capture data from devices in vehicles that are enabled with these features. Using multiple sensors along a corridor allows for the tracking of a vehicle from point-to-point to establish travel times. Data is available in real time as long as the portable sensors are placed on the corridor. MDT is currently looking to expand the use of Bluetooth monitoring.

9.3.7 Rotator Bases

MDT has installed special signal poles at some intersections with super load traffic. These poles can rotate at the base to move the mast arm and the signal heads out of the way to allow super loads to easily pass through.

9.3.8 AID grant

MDT received a grant in 2015 for developing a concept of operations for traffic signals across the state, developing guidelines for adaptive signal control, and evaluating 14 corridors statewide. These corridors generally comprise the two busiest routes in Montana's seven large urban areas and include Reserve Street in Missoula, Main Street in Billings, and US 93 North in Kalispell. Through this process, MDT is exploring long-term options that have the potential to improve traffic flow through signalized corridors. Options currently being considered include improved monitoring of traffic signal performance, additional detection at signals, freight priority at traffic signals, and adaptive traffic signal control. The Accelerated Innovation Deployment (AID) grant timeline for completion is fall 2017.

9.3.9 Variable Speed Limits

MDT has undertaken a feasibility study to examine the possibility of implementing a Variable Speed Limit (VSL) system on Lookout Pass located on Interstate 90 near the Montana/Idaho border. A VSL system would allow MDT to adjust the posted speed limit on the pass in response to changing traffic, roadway, or weather conditions.

9.4 Rail System Enhancements

MDT works with railroad owners/lessees to implement effective safety technologies, particularly where rail and highway systems meet.

In 2008, Congress required Class I Railroad main lines handling poisonous-inhalation-hazard materials and any railroad main lines with regularly scheduled intercity and commuter rail passenger service to fully implement PTC by December 31, 2015. PTC uses communication-based/processor-based train control technology that provides a system capable of reliably and functionally preventing train-to-train collisions, overspeed derailments, incursions into established work zone limits, and the movement of a train through a main line switch in the wrong position.

In late 2015, Congress extended the deadline by at least three years to December 31, 2018, with the possibility for two additional years if certain requirements are met. Montana's northern rail corridor operated and owned by BNSF is currently being equipped with PTC and it is anticipated that the application may be operational in 2017.

10 MONTANA'S FREIGHT INVESTMENT PLAN

The NHFP funds activities that support the efficient movement of freight on the NHFN. At present, Montana's portion of the NHFN consists of two Interstate routes: I-15 and I-90. Thus, MDT's prioritization efforts have focused on these two routes.

10.1 National Highway Freight Program Project Eligibility

Funds apportioned to Montana under the NHFP may be used to fund projects described in 23 USC 167 (i)(5)(C) to contribute to the efficient movement of freight on the NHFN. Eligible projects must be identified in the freight investment plan included in the state freight plan.

Based on Montana freight infrastructure needs and considering input from stakeholders, MDT has identified capacity and safety as priorities to improve the NHFN in Montana. Eligible NHFN routes in Montana include I-15 and I-90. The following, though not inclusive, are types of projects that will provide the most benefit to Montana freight movement:

- Infrastructure - highway and bridge project development and construction activities including:
    - reconstruction, rehabilitation, and preservation;
    - geometric improvements to interchanges and ramps;
    - climbing and runaway truck lanes;
    - adding or widening of shoulders;
    - truck parking facilities eligible for funding under Title 23 USC;
    - additional road capacity to address highway freight bottlenecks; and
    - projects to improve the flow of freight on the eligible portions of the NHFN.

- ITS and other technology to improve the flow of freight such as:
    - real-time traffic, truck parking, roadway condition, and multimodal transportation information systems;
    - electronic screening and credentialing systems for vehicles, including WIM truck inspection technologies; and
    - work zone management and information systems.

10.2 National Highway Freight Program Projects

As noted previously, MDT utilizes a risk-based asset management plan to analyze transportation system needs. For the NHFP, this analysis includes a physical condition assessment and operational evaluation of Interstate 15 and Interstate 90. Project areas identified via this process are included in Montana's STIP.

All NHFP projects must be consistent with the eligibilities established for the NHFP. Additionally, all NHFP projects must be deemed fundable – given anticipated NHFP apportionment and obligations. In general terms, Montana's NHFP priorities reflect an emphasis on system reliability and operational issues in Montana's urban areas.

Estimated available funding through the FAST Act is about $65 million with an estimated $15 million annually projected beyond the FAST Act. Anticipated NHFP funds to be obligated by federal fiscal year (FFY) include:

- 2016/2017: Missoula East & West – Orange Street Interchange ($3.8 million)
  Reconstruction project on Interstate 90 (at the Orange Street Interchange in Missoula) to improve operations (increase LOS) and decrease congestion. Includes ramp modifications and intersection improvement work.
- 2017/2018: West Laurel Interchange – West ($10 million)
  Reconstruction project on Interstate 90 (at the West Laurel Interchange near Billings) to improve operations (increase LOS), decrease congestion and promote safety. Includes ramp reconfiguration, new structures and intersection improvements.
- 2018/2019: Missoula East & West – Van Buren Street Interchange ($12 million)
  Reconstruction project on Interstate 90 (at the Van Buren Street Interchange in Missoula) to improve operations (increase LOS) and decrease congestion. Includes ramp modifications and intersection improvement work.
- 2018/2019: Rocker Interchange Improvements ($6 million)
  Reconstruction project on Interstate 90 (at the Rocker Interchange near Butte) to improve operations (increase LOS) and decrease congestion. Includes ramp modifications and intersection improvement work.
- 2021: I-90 Yellowstone River – Billings ($30 million)
  Bridge replacement project on Interstate 90 in Billings to improve operations (increase LOS), decrease congestion and promote safety. Includes additional lanes, new structures and ramp modifications.
- 2019>: ITS technologies.
- 2021>: Lincoln Road – Montana to I-15 – Helena

Reconstruction project on Interstate 15 (at the Lincoln Road Interchange near Helena) to improve operations (increase LOS) and decrease congestion. Includes ramp modifications and intersection improvement work.

- 2021>: Billings Bypass
  Construction of an alternate route in Billings to promote connectivity, improve access, decrease congestion, and improve operations (LOS) on major routes in the Billings area. Includes new (and improved) roadway network between Interstate 90 (at the Johnson Lane Interchange) and US-87 (near the Old Highway 312) intersection.

- 2021>: Gore Hill Interchange – Great Falls
  Interchange improvement project on Interstate 15 (at the Gore Hill Interchange in Great Falls) to improve operations (increase LOS) and decrease congestion. Includes ramp reconfiguration, additional turn lanes and intersection improvements. Note: Project is still in the evaluation (study) phase.

10.3 National Highway Freight Program Project Funding

The FAST Act provides Montana approximately $65 million in NHFP apportionment for eligible freight projects. An estimated $15 million annually is anticipated to continue beyond the FAST Act. This is not an increase to MDT's overall budget, but rather reserves part of MDT's existing apportionment for eligible freight projects. MDT will continue to make investments from its core federal program to infrastructure improvements that directly benefit the movement of freight in addition to projects specific to the freight program.

Available NHFP revenue through the Fast Act is estimated at about $65 million while NHFP obligations are estimated at about $62 million. For planning purposes, it is anticipated that NHFP funds will continue beyond the Fast Act at similar levels and available for projects included in this plan as shown in Table 17.

The expected federal participation rate is anticipated to range from 91.24 to 100 percent given opportunities to maximize federal participation and that most planned work involves the Interstate. Non-federal matching funds are anticipated to be paid with Highway State Special Revenue Funds.

Table 17: National Freight Program Funding – Montana

National Freight Program Funds - Montana (in millions)							
	FFY 2016	FFY 2017	FFY 2018	FFY 2019	FFY 2020	FFY 2021*	FFY 2022*
Apportionment							
Prior Year Federal Carry-Over	$ -	$ 8.0	$ 8.8	$ 3.8	$ 17.9	$ 33.5	$ 33.5
Federal Apportionment Allocation	$ 11.8	$ 10.8	$ 12.5	$ 14.1	$ 15.6	$ 15.0	$ 15.0
Transfer In (Out)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Federal Apportionment Allocation	$ 11.8	$ 18.8	$ 21.3	$ 17.9	$ 33.5	$ 48.5	$ 48.5
Proposed Federal Obligations	$ 3.8	$ 10.0	$ 17.5	$ -	$ -	$ 15.0	$ 15.0
Ending Federal Apportionment Balance	$ 8.0	$ 8.8	$ 3.8	$ 17.9	$ 33.5	$ 33.5	$ 33.5
NHFP Project Obligation							
Msla-E&W - Orange St Interchange (Est. total cost $4; NHFP state match $0, Local Contribution $0.2)	$ 3.8						
West Laurel Interchange West Phase 1 (Est. total cost $29.5: NHFP state match $1, IM $16.7**, HSIP $1.8**)		$ 10.0					
Rocker Interchange Improvements (Est. total cost $6.2, NHFP state match $0.30)			$ 5.9				
Msla-E&W - Van Buren St Interchange (Est. total cost $11.6; NHFP state match $0)			$ 11.6				
I-90 Yellowstone River - Billings (Est. total cost $71.4: NHFP state match $2.9, NHPB $27.4**, IM $11.1**)						$ 15.0	$ 15.0
ITS Technologies				← TBD*** →			
Lincoln Road Montana to I-15-Helena						← TBD*** →	
Billings Bypass						← TBD*** →	
Gore Hill Interchange- Great Falls						← TBD*** →	

*For planning purposes it is anticipated that NHFP funding will continue beyond the FAST Act at similar levels.

**Includes State match

***Future obligations, if any, will be within the available Federal apportionment balance to ensure fiscal constraint.

Source: MDT Rail, Transit and Planning Division

10.4 Additional Projects Benefiting Interstate Freight Movement

MDT utilized funding sources in addition to NHFP funds to improve interstate capacity and safety. The following is a sample of such projects shown by FFY that will have a significant impact of freight-movement by improving connectivity, operations, access, congestion, and/or reliability:

- 2017/2018: I-90 Bridges – Bonner
  Bridge replacement project on Interstate 90 (near Missoula) to increase system reliability and improve operations (increase LOS). Includes replacement of east- and west-bound structures over Blackfoot River.

- 2018/2019: Broadus Interchange – Miles City
  Major rehabilitation project on Interstate 94 (at the Broadus Interchange in Miles City) to improve operations (increase LOS) and decrease congestion. Includes ramp reconfiguration, additional turn lanes, and intersection improvements.

- 2018 / 2019: Rarus/Silver Bow Creek Structures
  Bridge replacement project on Interstate 90 (near Butte) to increase system reliability and improve operations (increase LOS). Includes replacement of EB and WB structures over Rarus (BAP) Railway and Silver Bow Creek.

10.5 Montana Critical Facilities

Montana has not formally designated critical urban or rural freight corridors under Section 49 USC 70103 and 23 USC 167. MDT may designate these corridors as plans for specific, freight-related projects develop. Updated information on Montana's designated critical rural and urban facilities will be added as an addendum to this plan and will also be available on the MDT website.

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