2040 NORTH DAKOTA STATE RAIL PLAN

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Prepared for
North Dakota Department of Transportation

NDDOT
North Dakota
Department of Transportation

wsp

North Dakota Department of Transportation

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Fellow North Dakotans:

Throughout North Dakota's history rail has played a critical role. The importance of rail to North Dakota's economy cannot be understated. Railroads are critical to the economic prosperity of North Dakota and serve as the financial engines in many of the state's communities, providing a vital transportation link to the regional, national, and global economies. Many of the state's economic sectors, particularly agriculture and energy depend on rail service. Passenger rail also provides a transportation alternative to residents and visitors of North Dakota. The previous state rail plan was developed in 2007 and since that time significant changes to North Dakota's economy have occurred. Rail traffic has changed substantially due to growth in energy, agricultural, and manufacturing production.

This plan serves as a practical roadmap for future rail investment and policies in North Dakota, guiding the advancement of the rail system used by the state's freight shippers and rail passengers. It provides an assessment of the rail system and offers recommendations for policies, programs, processes, and projects that will improve rail related safety and service. The document includes input from rail stakeholders and the public on a variety of areas, including safety and community impacts, the movement of freight by rail, and passenger rail service in the state.

The development of this plan was a collaborative effort of the North Dakota Department of Transportation in partnership with the North Dakota Public Service Commission, the North Dakota Department of Commerce, the North Dakota Department of Emergency Service, the North Dakota Pipeline Authority, and the Upper Great Plains Transportation Institute. We are greatly appreciative of our partners, the public, and North Dakota's rail stakeholders for providing valuable input in shaping this document.

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2040 North Dakota State Rail Plan

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The North Dakota 2040 State Rail Plan stakeholder and public participation plan is consistent with the North Dakota Department of Transportation Public and Non-Metropolitan Local Official Participation Plan for Statewide Planning and Programing Activities

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Chapter 1. The Role of Rail in North Dakota

1.1 PURPOSE AND USE

The purpose of the 2040 North Dakota State Rail Plan (SRP) is to guide the advancement of the rail system used by the state's freight shippers and rail passengers. This SRP assesses the rail system, provides recommendations for policies, programs, processes, and projects to improve rail-related safety and service, and serves as a practical roadmap for future rail investment and policies in North Dakota. This document will be used to understand existing and future issues and trends influencing the state's rail system from the present year to the year 2040. It will further address the needs of the state by providing guidance and recommendations to enhance North Dakota's rail system and service. The North Dakota Department of Transportation (NDDOT), the North Dakota Public Service Commission, North Dakota Department of Commerce, the North Dakota Department of Emergency Services, the North Dakota Pipeline Authority, and the Upper Great Plains Transportation Institute have worked collaboratively to prepare this SRP. This plan meets the requirements of the federal Passenger Rail Investment and Improvement Act (PRIIA) of 2008, as well as the subsequent *State Rail Plan Guidance* report issued by the Federal Railroad Administration (FRA) in 2013.

1.2 PLAN SCOPE

This plan represents an update to the SRP completed in 2007 and per FRA guidance and PRIIA requirements, includes the following:

- A discussion of the role of rail in North Dakota's Transportation System (Chapter 1)
- A description of the state's existing rail system (Chapter 2)
- An analysis of trends and forecasts that will create opportunities or needs in the future (Chapter 2)
- A discussion of passenger needs and opportunities, and proposed initiatives to meet these needs (Chapter 3)
- A discussion of freight needs and opportunities, and proposed initiatives to meet these needs (Chapter 4)
- The overall SRP vision and goals and a proposed Rail Service and Investment program to address identified opportunities and needs (Chapter 5)
- A discussion of how NDDOT incorporated stakeholder input into the plan (Chapter 6)

1.3 NORTH DAKOTA MULTIMODAL TRANSPORTATION SYSTEM GOALS

This SRP is part of North Dakota's overall multimodal transportation planning efforts. In that context, this SRP is an outgrowth of North Dakota's Long-Range Transportation Plan (LRTP), *TransAction III*, which provides direction for the continued development of the state's transportation system. Published in 2012, the *TransAction III* endeavors to work with the members of the transportation community, its stakeholders, and the public to facilitate a transportation system that meets the personal and freight mobility needs of the state's residents, visitors, and businesses. *TransAction III's* vision and goals provide

a guideline for future transportation investment in North Dakota, including rail. The vision and goals of the state's multimodal transportation system are as follows:

Vision

- North Dakota's multimodal transportation system is strategically developed and globally integrated.

Goals

- Safe and secure transportation
- Sustainable and reliable mobility
- Diversified and sufficient funding
- Communication and cooperation
- Strong economic growth with consideration of environmental, cultural, and social impacts.

Source: *http://www.dot.nd.gov/business/transactioniii/transaction-iii.pdf*

These transportation goals—mobility of both freight and people—are seen by the state as interdependent and mutually supportive, and apply to the network of the state's transportation system infrastructure and services. As such, these goals also have many implications for the future of North Dakota's rail network. NDDOT prepared this SRP to be consistent with *TransAction III*.

The *North Dakota State Freight Plan*, published in 2015, reiterates the vision and goals from *TransAction III,* and also acknowledges the need for the state freight plan to describe how the plan will improve the ability of the state to meet the national freight goals established in 23 U.S.C. 167 and required by Section 1118 of Moving Ahead for Progress in the 21st Century (MAP-21).

1.4 BACKGROUND ON THE U.S. RAILROAD INDUSTRY

1.4.1 Evolution of the Rail Industry

The American railroad industry began in 1828 with the incorporation of the Baltimore & Ohio Railroad. The industry grew very quickly, playing an important role in the development of the country and its westward expansion in the 19th century. In 1830, there were only 40 miles of rail lines in the United States. By 1870, the industry had grown to nearly 50,000 miles, and by 1890, the rail network had expanded to 170,000 route miles. Much of the expansion between 1870 and 1890 was attributable to the westward extension of the industry.

The railroads flourished until the early 1930s, transporting both freight and passengers. However, railroads then began to face increasing competition from trucks and automobiles, with an increasing number of paved roadways facilitating motor vehicle travel. The passenger business grew before and through World War II, with the railroads being instrumental in moving troops about the country and ultimately to their points of embarkation for the overseas battles. After the war, the situation changed dramatically. As a result of the wartime demands, the rail infrastructure and equipment were distressed and in need of maintenance and reinvestment. However, business dwindled and capital was not forthcoming in the quantities needed. Moreover, following World War II, national transportation policy emphasized a two-mode transportation system based on highways and aviation. The development of the interstate highway system strengthened the trucking industry providing it with improved access to every population center in the U.S. The interstate highways also fostered the move of freight from rail to the highways, darkening the railroads' revenue picture. The interstate system, coupled with expanded air travel, similarly reduced the role of the railroads in moving people.

In 1929, the U.S. railroads moved 1.3 billion tons of freight, after which freight traffic began to decrease. World War II, however, brought an increase in tonnage to 1.5 billion. After World War II, rail freight tonnage again declined. By 1960, rail volume fell to 1.2 billion tons, during a time when the U.S. economy was booming.

Passenger rail's story is somewhat similar. Except for ridership spikes during the World War II years, passenger rail ridership peaked in 1929 when the railroads transported 25 billion passenger miles. In 1971, the volume fell to 6 billion passenger miles. Though passenger service was never highly profitable to the railroad companies, the deterioration in passenger ridership had a significant negative impact on the financial condition of the rail carriers.

To relieve the freight railroads of the financial burden of operating passenger trains and preserve passenger rail service in the U.S., Congress created Amtrak in 1970 with operations beginning in 1971. In its first full year of operation, Amtrak transported 16 million passengers. Ridership stagnated at roughly 20 million passengers per year to the end of the century. Ridership increased during the first decade of the 21st century after capital improvements in the Northeast Corridor were implemented and automobile fuel costs increased. In 2014, Amtrak patronage reached 32 million riders nationally and continues to grow.

Besides Amtrak's assumption of passenger rail operations, the 1970s saw the beginning of a significant restructuring of the now freight-only railroads. Bankruptcies and mergers reduced the number of major railroads from over 125 in the mid-1950s to 35 in 1980. The Staggers Rail Act in 1980 served as a turning point for freight rail industry. The act removed restrictive regulations, making the railroads more competitive with its principal competitor, trucking. Moreover, the act made it easier for railroads to abandon unprofitable lines.

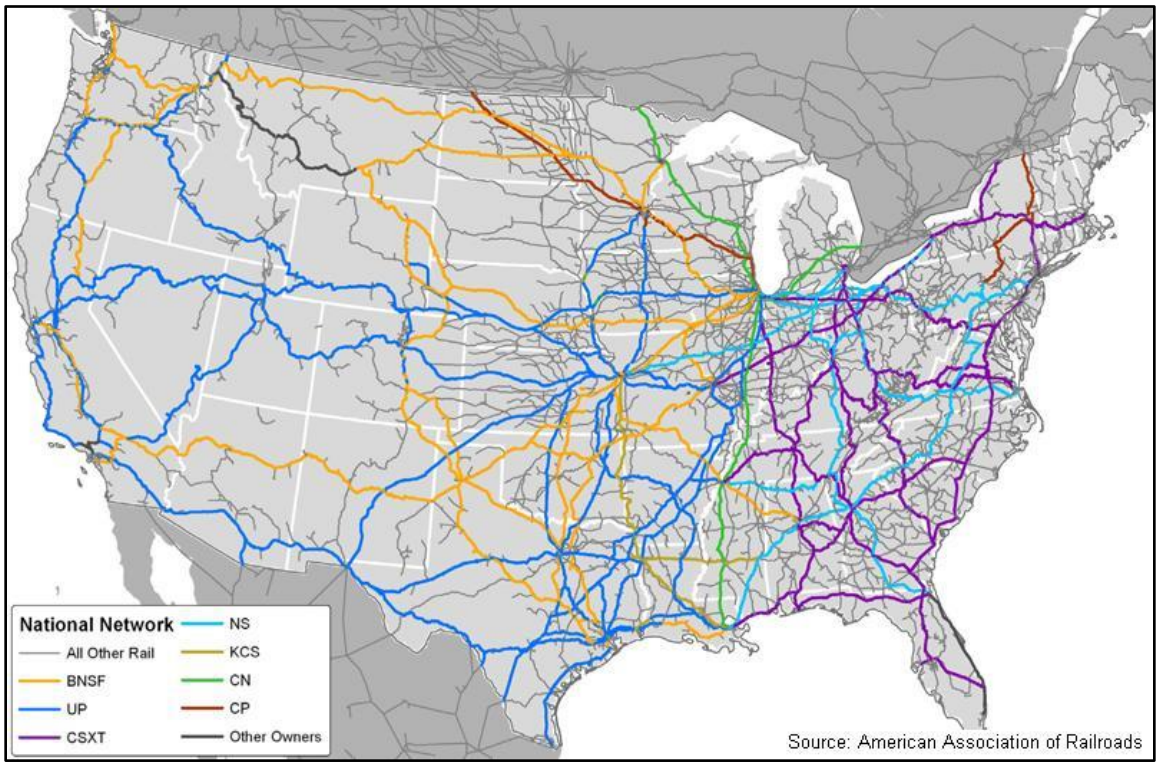
Although the rail industry restructured before the Staggers Act—including the consolidation of the railways serving North Dakota with the joining of the Great Northern and Northern Pacific railroads with

the Chicago, Burlington, and Quincy railroad—the decades after passage of the act were the era of numerous major mergers:

- 1982 – Norfolk Southern formed from the Norfolk and Western and Southern Railway
- 1982 – Union Pacific acquired the following:
  - 1982 – Missouri Pacific and the Western Pacific Railroads and Missouri–Kansas–Texas Railroad
  - 1995 – Chicago and North Western Railroads
  - 1996 – Southern Pacific Railroad
- 1986 – CSX formed from the Chessie System and the Seaboard System
- 1991 – Canadian Pacific acquired the Delaware and Hudson
- 1996 – BNSF Railway formed from the Atchison, Topeka and Santa Fe and Burlington Northern
- 1997 – CSX and Norfolk Southern acquired most of the Conrail freight rail assets
- 1999 – Canadian National acquired the Illinois Central
- 2013 – Canadian National acquired the Elgin, Joliet & Eastern

With the post-Staggers Act consolidations, the North American railroad industry dwindled to seven major railroads operating 95,300 route miles. The regional and short line railroads operate another 33,200 route miles. The existing 128,500-mile network decreased from 254,000 miles in 1916. Figure 1-1 presents the current U.S. rail network.

Figure 1-1. U.S. National Rail Network



In parallel with changes in policies that permitted a rational restructuring of the industry was the growth of several of its business sectors. The universal acceptance of double-stack train technology and the investment to remove clearance restrictions in the national rail network enabled the railroads to successfully compete in capturing business that once moved by truck. Since 1980, intermodal traffic volumes have increased by nearly 400 percent. In 2014, railroad intermodal traffic in the U.S. was 13.5 million units; by comparison, in 1980, the railroads moved 3.1 million units.

In terms of rail-transported commodities in North Dakota, agriculture has been a mainstay of the state's economy. The state typically ships agricultural commodities such as corn, soybeans, and wheat out of state with distances typically favorable to rail. Over the years, rail has been an important and reliable means for farmers to move large volumes of crops to ports on the West Coast as well as Chicago and the East Coast. In many cases, these goods head to Asian or European destinations. The competitive cost of rail transport for long-distance high-volume shipments makes rail transportation attractive for the movement of North Dakota grain to the ports and domestic markets.

Crude oil has recently grown in importance as a rail-transported commodity. Technological advancements such as hydraulic fracturing (fracking) have made it cost-effective for energy producers to extract oil and gas from shale formations. A shale well requires 30 rail carloads of inbound well-service materials (e.g., pipe, sand, aggregates, and lubricants) and can produce more than 20 rail carloads of outbound materials (e.g., drill cuttings, brine water, natural gas liquids and crude). Rail allows buyers and sellers of oil to take advantage of regional price differentials, moving oil to locations where the price advantage exceeds the cost of transportation because of rail's flexibility in serving multiple origins and destinations. Rail's popularity as a transportation option for crude oil also stems from a lack of pipeline capacity and the scalability of rail. While crude oil rail shipments have declined as oil prices have softened and pipeline capacity has increased, crude oil continues to be moved by rail.

1.4.2 History of Rail Transportation in North Dakota

The following three major railroads shaped North Dakota's rail system through the mid- to late-19th century:[1]

- **Northern Pacific Railway:** Congress chartered the Northern Pacific Railway (NP) in 1864 and gave it a 50-million-acre land grant to construct a railroad from Duluth, MN, to the Puget Sound in Washington. The NP founded the city of Fargo in 1871 and brought rail service to North Dakota in 1872, when construction of a bridge across the Red River linking Fargo and Moorhead, MN, was completed. The NP completed building its rail line west across the state, crossing the Montana border just west of Beach.
- **Manitoba Railway:** The Manitoba Railway was formed in 1879, reaching Fargo in 1880 with James J. Hill (known as the *Empire Builder* because of the influence by the Hill rail lines) as its general manager.

[1] This section is mainly from the 2007 State Rail Plan, which cited (1) Thoms, William E. and R.J. Tosterud, *West of the Red – the Role of Transportation in the Development of North Dakota*, UGPTI, Reprinted 1996; (2) Robinson, Elwyn B. *History of North Dakota*, University of Nebraska Press, 1963; and (3) various newspaper articles and railroad press releases.

A line from Fargo to Grand Forks was completed in 1881, and construction continued toward the Canadian border. The Manitoba also built a rail line west from Grand Forks, reaching Devils Lake in 1883 and Minot in 1886. Construction continued west and the line crossed the Montana border near Williston in 1887. Several branch lines—known as the "Finger Lines"—were built along with the Grand Forks to Montana route, primarily to move grain. The Manitoba became the Great Northern Railway Company in 1889. The NP and Great Northern operated in North Dakota until 1970, when they became part of what is now BNSF Railway.

- **Soo Line:** The Soo Line was formed in 1888 with the consolidation of the Minneapolis, Sault Ste. Marie & Atlantic Railway, the Minneapolis & Pacific Railway, the Minneapolis & St. Croix Railway and the Aberdeen, Bismarck & North Western Railway. In 1893, the Soo Line completed a diagonal route across North Dakota from Fairmount to Portal, where it interchanged with the Canadian Pacific Railway (CP). CP was by then a transcontinental railroad, having competed construction of a line across Canada in 1885. The Soo Line next built a branch line network south and east of Bismarck, connecting to Fairmount via Oakes. Finally, between 1905 and 1912, the "Wheat Lines," which run across much of North Dakota, were constructed. The Soo Line became a subsidiary of the CP when CP participated in its financial restructuring in the late 1940s. After the restructuring, CRP held 56 percent of Soo Line common stock. CP purchased 100 percent of Soo Line stock in 1990, making it a wholly owned subsidiary.

Several other railroad companies have owned or operated track in North Dakota: the Milwaukee Road; Chicago & Northwestern; Dakota, Minnesota & Eastern; and the Midland Continental. Of these, only the Dakota, Minnesota & Eastern still exists as an operating railroad, but it no longer owns or operates track in North Dakota.

According to the North Dakota Public Service Commission data, miles of railroad track (also known as miles of road) in North Dakota peaked in 1920, at nearly 5,400. By the end of the 1920s, it was down to about 5,300 miles. During the 1940s through 1960s, miles fluctuated between roughly 5,100 and 5,250 miles. In total, approximately 2,070 miles of track have been abandoned in North Dakota since the peak years. Currently, the state's rail system has approximately 3,330 miles.

1.4.3 National Freight Rail System

Railroad System

The Surface Transportation Board[2] (STB), which regulates the rail industry, separates freight railroads into three categories, based primarily on revenue:

- **Class I railroads**, the largest of the country's railways, generate annual revenues greater than $467 million.[3] The majority of rail-based freight movements occur on Class I railroads operating over

[2] The Surface Transportation Board regulates business and economic matter of the railroad industry. Safety regulation is the responsibility of the Federal Railroad Administration.
[3] Figures given are for 2014.

95,300 miles of rail routes. In 2010, the major railroads hauled 1.9 billion tons of freight. Seven Class I railroads operate in the U.S.:

- BNSF Railway
- Canadian National Railway
- Canadian Pacific Railway
- CSX Transportation
- Kansas City Southern
- Norfolk Southern
- Union Pacific

- **Class II railroads**, typically referred to as regional railroads, have lesser revenues than the Class I railroads and operate over smaller geographic networks. Class II railroads have revenues between $37.4 million and $467.0 million. There are 12 Class II railroads in operation in the U.S.
- **Class III railroads**, or short line railroads are the smallest. Many are former unprofitable lines of the larger railroads. Short lines are either not unionized or have more favorable labor contracts than the Class I railroads, allowing them to operate at a lower cost. Revenues for each of the nearly 592 Class III railroads are less than $37.4 million annually. Short lines are an important segment of the railroad industry since they provide critical transportation services to the more remote and smaller market areas.

Types of Services

The STB categorizes freight rail services as follows:

- **General merchandise train services**: Merchandise trains comprise freight shipments from multiple shippers to multiple receivers. Various shippers pick up single or a smaller than train size numbers of freight cars and assemble them at marshalling yards into longer trains that move to a subsequent marshalling yard where the trains are disassembled. The individual cars are then delivered to the receivers. This type of service is offered to railroad customers who have an inadequate number of shipments to warrant a dedicated train.
- **Local train service**: Local trains are those that pick up freight cars from and deliver freight cars to railroad customers such as industries, warehouses, and distribution centers. These trains are integral to the general merchandise train service acting as feeders.
- **Unit train service**: Unit trains are dedicated to carrying a single commodity from one origin point to one destination point. Unit trains are commonly used to transport bulk products such as grain, oil, coal, and gravel among others that are shipped in trainload lot sizes. The shuttle trains serving North Dakota's grain elevators and crude by rail trains fall into this category.
- **Intermodal train service**: Intermodal trains are a specific type of dedicated train used to transport containers and truck trailers. These trains move between major terminals where the containers are transferred between trucks and rail cars, or between ships and railcars at seaports. Unlike other service types where the railroad picks up or delivers freight cars directly to customers, intermodal shipments involve multiple modes of transportation.

- **Assembled motor vehicle train service**: Another variation of the unit train, these trains are dedicated to transporting assembled automobiles, trucks, vans, and other vehicles from auto assembly plants—or ports in the case of imported cars—to regional distribution centers.

1.5 ROLE OF FREIGHT RAIL TRANSPORTATION IN NORTH DAKOTA

North Dakota has a significant role in the national rail network, with the six railroads operating a total of 3,330 miles in the state.[4] The state continues to serve as the nation's largest originator of agricultural products and, until the crash in oil prices, had become the largest origin of crude oil shipped by rail. Situated on key trade corridors linking the Midwest to the Pacific Northwest—as well as the BNSF Mid-Continent north-south corridor—North Dakota is a major producer of products typically carried by rail.

The state's railroads have had a great impact on the establishment and economic success of North Dakota. North Dakota's railroads played a key role in transforming the northern plains into one of the largest agricultural producing regions of the U.S. along with providing an important role in the North Dakota oil boom.

The North Dakota freight system is multimodal, comprising highway, air, and rail transportation. In addition, the system includes the connector facilities that make the efficient transfer of freight between modes possible. North Dakota's freight rail system is expected to continue to play a strong role in maintaining its leadership position in the energy and agricultural sectors of the U.S. economy. The railroads in the state provide an essential goods movement service that is strategically connected to other modes. Improving the rail system's productivity is critical to keeping North Dakota a significant economic force. Table 1-1 summarizes North Dakota's freight network.

Table 1-1. North Dakota Transportation Infrastructure

Type of Infrastructure	Miles/Number
Federal, State, County Roads	27,685 miles
Primary Highway Freight System	461 miles
National Highway Freight Network	875 miles
Class I railroad trackage*	2,180 miles
Class III railroad trackage*	1,151 miles
Public use airports	8 certified for air carrier operations

Source: Federal Highway Administration, Bureau of Transportation Statistics, Association of American Railroad
* Includes trackage rights

Railroads possess a significant transportation infrastructure in the state. The freight railroad network is seven times the Primary Highway Freight System and two and a half times the National Highway Freight Network designated by the Federal Highway Administration (FHWA). As part of a new National Highway Freight Program, the Fixing America's Surface Transportation (FAST) Act established a new national highway freight network comprising four elements:

[4] *https://www.aar.org/Style%20Library/railroads_and_states/dist/data/pdf/North-Dakota%202012.pdf*

- The Primary Highway Freight System (PHFS)
- Critical Rural Freight Corridors
- Critical Urban Freight Corridors
- Those portions of the interstate highway system that are not part of the PHFS

North Dakota has no Critical Urban or Critical Rural Freight Corridors designated at this time. NDDOT is amending the North Dakota State Freight Plan to identify these corridors by the end of 2017.

Examining freight activity, Table 1-2 shows the modal shares for 2002 and 2015.

Table 1-2. North Dakota Total Freight Activity

Transportation Modes	All Traffic			
	2002		2015	
	Tons (000s)	Mode Share	Tons (000s)	Mode Share
Air	0	0.0%	16	0.0%
Multiple Modes & Mail	152	0.1%	2,915	0.8%
Other and Unknown	33,901	19.9%	11,340	3.2%
Pipeline	18,994	11.1%	134,427	38.1%
Rail	20,444	12.0%	73,573	20.8%
Truck	97,143	56.9%	130,917	37.1%
Total	**170,635**	**100.0%**	**353,187**	**100.0%**

Source: Freight Analysis Framework 4.0
Note: FAF-4 overstates pipeline tonnage

Between 2002 and 2015, total freight tonnage grew from 170.6 million tons to 270.0 million tons, an average annual increase of 5.8 percent. Most of this growth was attributable to the significant increase in oil production and the continuing growth in agriculture shipments. Rail traffic grew, more than tripling over the period. Its share of the freight transportation market rose from 12 percent to 21 percent. While trucking also grew and remained the dominant mode, its share decreased considerably.

Rail transportation plays an important role in outbound shipments from North Dakota. Although it lost some market share between 2002 and 2015, freight rail transportation grew significantly and rail still maintains a dominant position. The oil boom provided a large increase in outbound rail traffic, from 14.1 million tons in 2002 to 55.1 million tons in 2015. Trucking showed a decrease over this period. Table 1-3 shows the outbound freight from North Dakota.

Table 1-3. North Dakota Outbound Freight Activity

Transportation Modes	Outbound			
	2002		2015	
	Tons (000s)	Mode Share	Tons (000s)	Mode Share
Air	0	0.0%	3	0.0%
Multiple Modes & Mail	75	0.2%	1,650	1.0%
Other and Unknown	31	0.1%	9	0.0%
Pipeline	5,031	12.7%	93,805	56.9%
Rail	14,137	35.7%	55,131	33.4%
Truck	20,302	51.3%	14,239	8.6%
Total	**39,577**	**100.00%**	**164,837**	**100.0%**

Source: Freight Analysis Framework 4.0
Note: FAF-4 overstates pipeline tonnage

North Dakota is a heavy exporting state. In 2015, inbound freight traffic was less than a third of outbound freight traffic. Trucking is the principal mode for inbound shipments. Inbound rail traffic essentially tripled between 2002 and 2015, but it lost share. Rail transportation, however, gained share against motor carrier. Table 1-4 presents inbound modal shares.

Table 1-4. North Dakota Inbound Freight Activity

Transportation Modes	Inbound			
	2002		2015	
	Tons (000s)	Mode Share	Tons (000s)	Mode Share
Air	0	0.0%	13	0.0%
Multiple Modes & Mail	56	0.4%	1,191	2.2%
Other and Unknown	4	0.0%	5	0.0%
Pipeline	3,006	20.3%	16,225	29.6%
Rail	3,535	23.8%	11,992	21.9%
Truck	8,237	55.5%	25,368	46.3%
Total	**14,838**	**100.0%**	**54,794**	**100.0%**

Source: Freight Analysis Framework 4.0
Note: FAF-4 overstates pipeline tonnage

Although rail transportation nearly tripled in mode share between 2002 and 2015, it remained a small portion of the total intra North Dakota freight volume at 4.8 percent in 2015. The short distances of intrastate traffic are not conducive to shipping by rail. Table 1-5 presents intrastate freight activity within North Dakota.

Table 1-5. North Dakota Intrastate Freight Activity

Transportation Modes	Within North Dakota			
	2002		2015	
	Tons (000s)	Mode Share	Tons (000s)	Mode Share
Air	0	0.0%	0	0.0%
Multiple Modes & Mail	21	0.0%	73	0.1%
Other and Unknown	33,866	29.1%	11,325	8.5%
Pipeline	10,957	9.4%	24,397	18.3%
Rail	2,772	2.4%	6,449	4.8%
Truck	68,604	59.0%	91,310	68.4%
Total	**116,220**	**100.00%**	**133,556**	**100.0%**

Source: Freight Analysis Framework 4.0
Note: FAF-4 overstates pipeline tonnage

1.6 FREIGHT RAIL OPERATORS IN NORTH DAKOTA

Two Class I railroads serve North Dakota's freight shippers: BNSF Railway (BNSF) and Canadian Pacific Railway (CP). BNSF was formed in 1996 from the Atchison, Topeka and Santa Fe Railway and the Burlington Northern Railroad. BNSF operates the greatest number of route-miles in the state, operating over a network of 1,723 miles serving the Bakken regional and the agricultural areas as well as all the major population centers in North Dakota. BNSF's presence in Texas and other oil refining states provides an outlet for North Dakota's oil reserves that offers an alternative to pipelines. Its connections to the Pacific Coast and Gulf of Mexico seaports link North Dakota to overseas markets for its products as well as sources of products consumed in the state. Figure 1-2 depicts the BNSF network.

CP operates 484 miles of railway in North Dakota. The line crosses the U.S.-Canada border at Portal and proceeds in a southeasterly direction across the state. Its operation in the state evolved from the Soo Line Railroad, a former U.S. subsidiary of CP that provided North Dakota shippers with alternative rail access to Minneapolis-St. Paul, MN. In 1990, the CP rail system fully integrated the Soo Line. Figure 1-3 shows the entire CP rail system.

Figure 1-2. BNSF Railway System Map

Source: https://www.sec.gov/Archives/edgar/data/15511/000001551113000005/bnsfcorpcommform10kmapsmalls.jpg

Figure 1-3. Canadian Pacific Railway System

Source: Canadian Pacific website: *http://www.cpr.ca/en/choose-rail/intermodal-shipping*

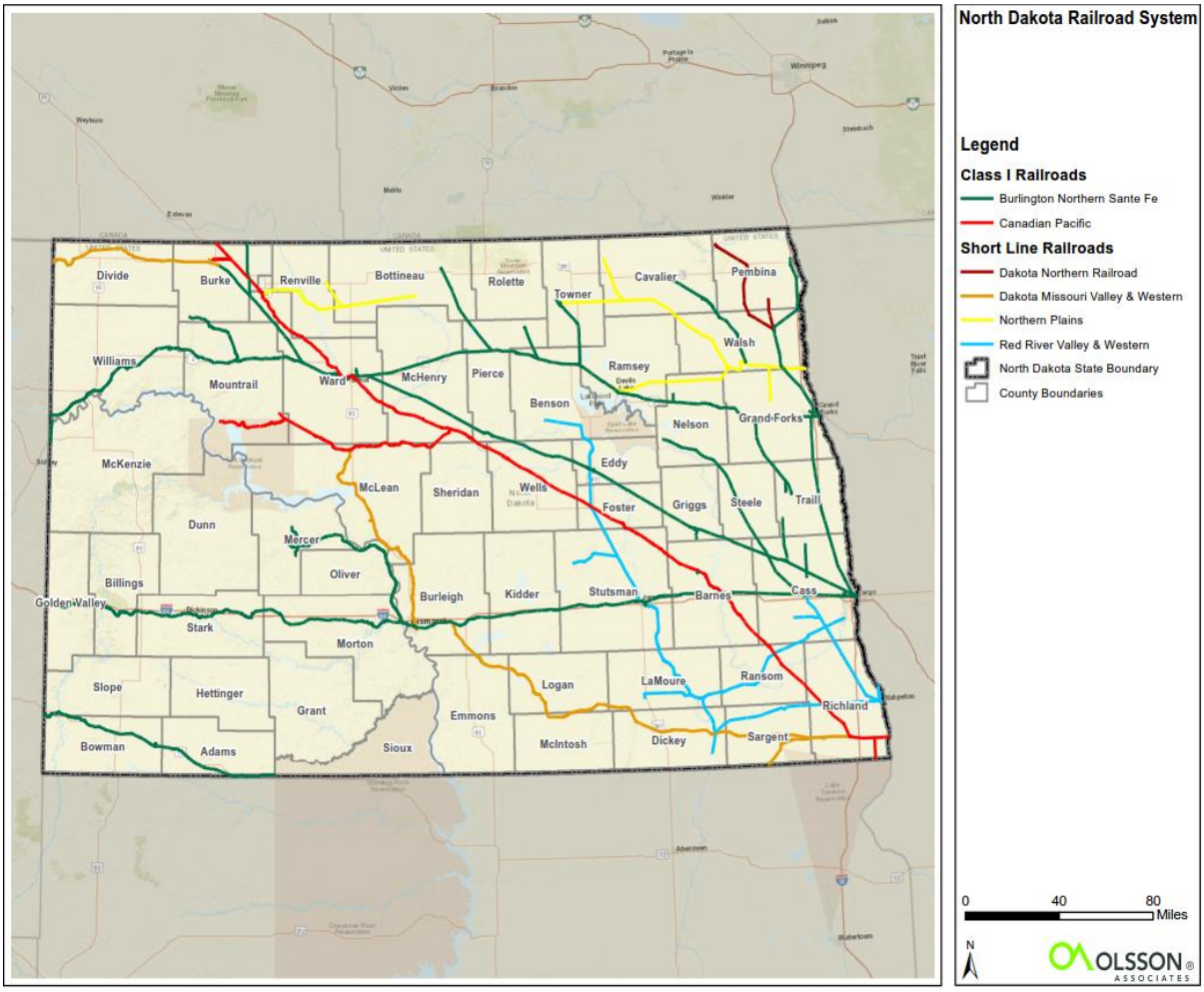
In addition to the two Class I railroads, four Class III railroads operate in the state. Frequently referred to as short line railroads, they provide rail transportation to market areas with inadequate volume to be served profitably by the larger railroads, in effect performing a feeder service. In most instances, the short line railroads were once part of the network of a larger railroad. Short line railroads serve as economic engines in many North Dakota communities, providing the vital transportation link to the regional, national, and global economies. Table 1-6 lists the short line railroads and miles operated in North Dakota. Figure 1-4 shows the North Dakota rail system.

Table 1-6. North Dakota's Short Line Railroads

Railroad	Miles Operated in North Dakota
Dakota, Missouri Valley, & Western	389
Dakota Northern Railroad	48
Northern Plains Railroad, Inc.	342
Red River Valley & Western Railroad	546

Source:North Dakota Public Service Commission Reports

Figure 1-4. North Dakota Rail System



1.7 ROLE OF INTERCITY PASSENGER RAIL IN NORTH DAKOTA

Before World War II, competition from air travel was minor and some of the railroads even participated by offering long-distance plane and train services where passengers flew by day and slept on the train at night. At war's end, large numbers of military transport aircraft were made available at surplus prices for conversion to passenger airliners. This permitted passenger airlines be established with inexpensive aircraft flying to a network of military-built airports throughout the country. Of greater consequence were the improvements to the national highway system. The interstate highway system, initiated in the 1950s, has grown to nearly 48,000 miles.

Despite the new competition faced by the railroad's passenger services, passenger trains were required to operate regardless of their profitability. This situation festered until the late 1960s when passenger service losses threatened the financial viability of the entire rail industry. In response, Congress passed the Rail Passenger Service Act of 1970. The act established the National Railroad Passenger Corporation, known as Amtrak. Railroad participation in Amtrak was voluntary but permitted the railroad company to relieve themselves of their passenger service obligations.

The Amtrak based its business arrangements with the volunteer railroads on the following principles:

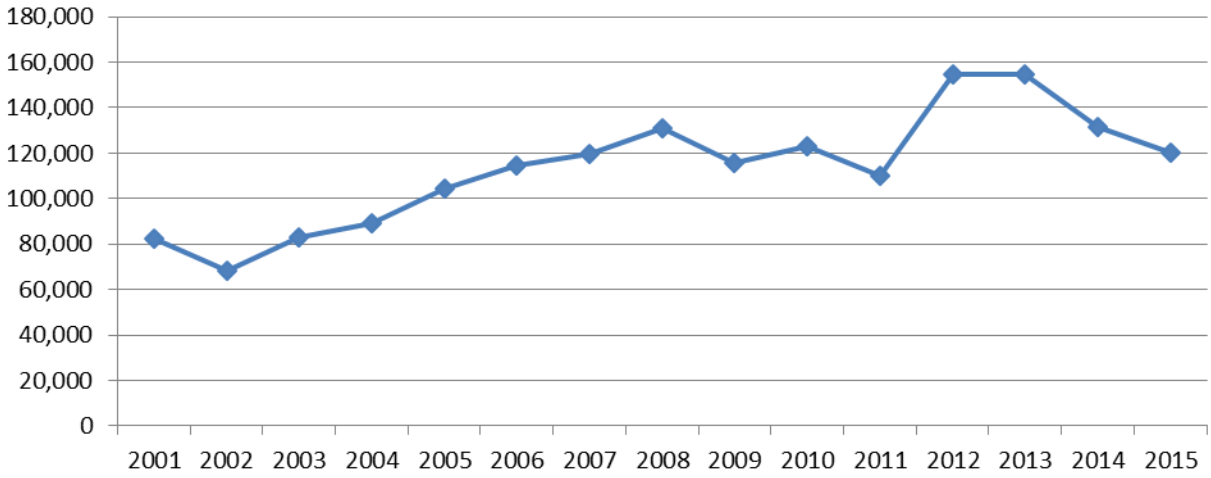
- In exchange for capital stock in Amtrak, the railroad transferred title to their passenger train equipment to Amtrak.
- The railroad granted to Amtrak the right to operate passenger trains on any tracks in their system.
- The railroad was granted relief from their passenger service obligations.
- Amtrak paid the railroad the incremental cost of maintaining their lines over which Amtrak operated. The costs covered were those required to keep the freight tracks up to passenger track standards.
- The railroad was indemnified for most liability arising out of passenger operations.

Amtrak provides intercity passenger rail service within the U.S. Amtrak's through its *Empire Builder* route. The *Empire Builder* serves North Dakota once a day in each direction between Chicago and Portland, OR/Seattle, WA. In North Dakota, the *Empire Builder* operates over BNSF rail between Fargo on the Minnesota border, and Williston, before continuing to Havre in Montana. The *Empire Builder* serves seven stations in North Dakota (Figure 1-5): Fargo, Grand Forks, Devils Lake, Rugby, Minot, Stanley, and Williston.

Figure 1-5. Amtrak Route in North Dakota

As shown in Figure 1-6, Amtrak ridership grew 60 percent between 2001 and 2008, and then fell 16 percent between 2008 and 2010, the period of the Great Recession. Ridership dipped further in 2011 due to major flooding of the Souris River, but then resumed growing until 2013 with the oil boom. Since 2013, ridership has decreased principally due to the decline of activity in the Bakken region.

Figure 1-6. Amtrak North Dakota Ridership



Source: 2007 North Dakota State Rail Plan and Amtrak Monthly Performance Reports

1.8 LEGAL AUTHORITIES FOR RAIL TRANSPORTATION

1.8.1 Freight Transportation Planning

Section 24-02-01.4 of the North Dakota Century Code (NDCC) provides the authority for state rail planning within the NDDOT. The section states:

> The department of transportation must be structured to promote efficient and effective operations consistent with fulfilling its statutory duties. The department of transportation must be organized into offices, divisions, and districts as the director of the department of transportation determines necessary, and as provided in this section.

Subsection 3 of the NDCC states:

> The director may establish an office of transportation planning to administer the department's authority and responsibilities for planning all surface modes of transportation, budgeting, development of programs and projects, data collection and management, and research. Coordination must be established between the aeronautics commission planning section and the department of transportation office of planning for airport development as it pertains to surface access.

The state's rail transportation planning roles are further defined by federal mandate. The United States Code, Title 23 Section 135, sets forth the following general requirements for statewide and nonmetropolitan transportation planning:

- Development of plans and programs: To accomplish the objectives stated in Section 134(a), each State shall develop a statewide transportation plan and a statewide transportation improvement program for all areas of the State, subject to Section 134.[5]
- Contents: The statewide transportation plan and the transportation improvement program developed for each State shall provide for the development and integrated management and operation of transportation systems and facilities (including accessible pedestrian walkways and bicycle transportation facilities) that will function as an intermodal transportation system for the State and an integral part of an intermodal transportation system for the United States.
- Process of development: The process for developing the statewide plan and the transportation improvement program shall provide for

[5] North Dakota's statewide strategic transportation plan, *TransAction III*, published in April 2012, defines the mission, vision, goals and initiatives for continued development of the state's transportation system, inclusive of rail freight and rail passenger transportation.

> consideration of all modes of transportation and the policies stated in Section 134(a), and shall be continuing, cooperative, and comprehensive to the degree appropriate, based on the complexity of the transportation problems to be addressed.

Subsequently, Section 135 requires that a state shall:

- Coordinate planning carried out under this section with the transportation planning activities carried out under Section 134 for metropolitan areas of the State and with statewide trade and economic development planning activities and related multistate planning efforts; and
- Develop the transportation portion of the State implementation plan as required by the Clean Air Act (42 U.S.C. 7401 et seq.).

While these are broad planning directives, they guide rail planning within the states.

1.8.2 Freight Rail Operations

The role of North Dakota and other states in the development and operation of rail infrastructure has evolved. In 1973, Congress passed the Regional Rail Reorganization Act of 1973. The act, often referred to as the 3R Act, established the Local Rail Service Assistance (LRSA) program to provide financial support to states in the Northeast for the continuation of rail freight service on abandoned light-density rail lines.

In 1976, Congress passed the Railroad Revitalization and Regulatory Reform Act, (4R Act). The 4R Act expanded the provisions of the LRSA program to all states. Financial assistance covered the following:

- The cost of acquiring a line of railroad or other rail properties to maintain existing or provide for future rail service
- The cost of constructing rail or rail related facilities (including new connections between two or more existing lines of railroad, intermodal freight terminals, sidings, and relocation of existing lines of railroad) to improve rail freight service

North Dakota, through NDDOT, initially implemented the LRSA program by awarding grants for rail rehabilitation projects and later created a revolving loan program.

Passenger Rail Investment and Improvement Act of 2008 – State Rail Plans

The PRIIA was enacted principally to fund high-speed passenger rail service. A part of the act, however, stipulated that every state seeking funding have an SRP with its purpose outlined as the following:

- To set forth state policy involving freight and passenger rail transportation, including commuter rail operations, in the state.
- To establish the period covered by the SRP.
- To present priorities and strategies to enhance rail service in the state that benefits the public.
- To serve as the basis for federal and state rail investments within the state.

PRIIA also stipulated the mandatory elements of the plan. In 2012, FRA issued its SRP guidance, which expanded on the requirements of PRIIA. Over time, FRA has looked to SRPs to support funding activities beyond those outlined in the Act.

Moving Ahead for Progress in the 21st Century Act (MAP-21)

In 2012, Moving Ahead for Progress in the 21st Century Act (MAP-21) was signed into law. It encouraged each state to develop a freight plan that provides a comprehensive framework for the immediate and long-range planning activities and investments of the state with respect to freight across all modes. A freight plan could be developed separately from or incorporated into the statewide strategic LRTP required by the U.S. Code. Giving recognition to its relationship to North Dakota's statewide strategic transportation plan, *TransAction III*, North Dakota published and adopted its state freight plan in April 2015.

FAST Act

On December 4, 2015, President Obama signed a five-year, $305 billion transportation authorization—the Fixing America's Surface Transportation Act or FAST Act—the first long-term transportation bill in 10 years. The FAST Act contains several provisions that focus on the efficient movement of goods, including, for the first time, creating two forms of dedicated freight funding:

- $6.3 billion in National Highway Freight Program "Formula" funds, up to 10 percent or $630 million of which may be used for rail or port projects.
- $4.5 billion in Nationally Significant Freight and Highway Projects (NSFHP) competitive grant funds
  - $500 million purposed for intermodal projects including rail and port related projects
  - Highway freight projects also qualify for NSFHP grants, but only the rail and port portion is committed to freight.
  - Projects must be able to commence within 18 months. Minimum grants are usually $25 million, but $5 million grants are allowed
  - Highway Trust Fund resources can be diverted to freight rail projects up to a maximum of $500 million over the next 5 years.

1.8.3 State Authority

In addition to the federal programs, the NDCC includes highway-rail grade crossing safety improvements (i.e., protective devices, surface upgrades, separations, quiet zones, etc.) and governs appropriations to the NDDOT for such projects through the State Highway Fund prioritizing as follows:

- The cost of maintaining the state highway system.
- The cost of constructing and reconstructing highways in the amount necessary to match, in whatever proportion may be required, federal aid granted to this state by the U.S. government for road purposes in North Dakota.[6]

[6] The current and past federal surface transportation acts have provided funds for rail infrastructure and highway safety improvement projects.

- Any portion of the highway fund not allocated may be expended for the construction of state highways without federal aid or may be expended in the construction, improvement, or maintenance of such state highways.

1.8.4 Passenger Rail Operations

Amtrak is a partially government-funded passenger railroad. It is operated and managed as a for-profit corporation, and provides intercity passenger service in the contiguous U.S.. Amtrak was founded in 1971 through the government-sponsored consolidation of most of the preexisting passenger rail companies in the U.S. Amtrak operates a single route in North Dakota, *The Empire Builder*.

North Dakota support for passenger rail service has been limited. In the late 1970s and early 1980s, there was considerable discussion among the state's leaders regarding subsidizing Amtrak service. Ultimately, no state action was taken, thus establishing a de-facto policy of not subsidizing passenger rail service, which has been followed to the present.

While not specifically targeted to maintain or improve rail passenger service, North Dakota, through its department of transportation, has used its federal Highway Safety Improvement Program (HSIP) funds to make numerous safety upgrades on Amtrak's *Empire Builder* route. Upgrades included installing new protective devices, replacing obsolete protective devices, upgrading existing rail grade-crossing surfaces, building grade separations, and participating in the development of rail quiet zones.

In 2011, NDDOT received a $10 million Transportation Investment Generating Economic Recovery (TIGER) grant to raise the grade of the BNSF Mainline between Devils Lake and Churchs Ferry.[7] This project also included 55.5 miles of replacement rail. The $100 million project—funded equally by BNSF Railway, Amtrak, and NDDOT—has been critically important to the continued service of Amtrak's *Empire Builder* and freight rail service to grain elevators.

The NDCC prescribes the regional role of North Dakota in passenger rail transportation.

Chapter 8-11.1 of the NDCC provides for membership in the Midwest Interstate Passenger Rail Commission (MIPRC), which includes the states of Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. The State of North Dakota is a voting member of MIPRC through the Governor designee. MIPRC posts its roster *http://miprc.org/About/Roster* showing the appointed members from the Governor. NDDOT participates, but is an ex officio member."

MIPRC has five objectives:

- To promote development and implementation of improvements to intercity passenger rail service in the Midwest

[7] The Devils Lake to Churchs Ferry BNSF mainline grade raise project was necessitated due to the rising level of Devils Lake, which imminently threatened both passenger and freight rail service.

- To coordinate interaction among Midwestern state-elected officials and their designees on passenger rail issues
- To promote development and implementation of long-range plans for high-speed rail passenger service in the Midwest and among the regions of the United States
- To work with the public and private sectors at the federal, state, and local levels to ensure coordination among the various entities having an interest in passenger rail service and to promote Midwestern interests regarding passenger rail
- To support efforts of transportation agencies involved in developing and implementing passenger rail service in the Midwest

1.8.5 Local Government Authority in Rail Transportation

Chapters 11 and 40 of the NDCC provide a role for counties and municipalities to conduct limited rail planning through their powers to develop comprehensive plans and an adoption of zoning ordinances. Many municipalities and counties have been actively involved in the development of rail infrastructure by installing and upgrading railroad protective warning devices, at-grade surface improvements, grade separations, and rail quiet zones.

1.8.6 Metropolitan Planning Organization Authority

North Dakota's three metropolitan planning organizations (MPO) are responsible for conducting long-range transportation planning and the developing Transportation Improvement Programs.[8] The Fargo-Moorhead Council of Governments (FMCOG) and Grand Forks-East Grand Forks MPO straddle the North Dakota-Minnesota border. The Bismarck-Mandan MPO lies wholly within the state.[9] All three of North Dakota's MPOs have been actively involved in the development of rail quiet zones and other rail planning activities. The FMCOG and Bismarck-Mandan MPO have also been involved with past NDDOT efforts to study the opportunities for establishing dedicated intermodal rail freight service in the state.

[8] A Transportation Improvement Program (TIP) is a federal- and state-mandated program document that includes information concerning local highway, state highway, and transit projects and services for a period of six years. TIPs list every transportation project that will receive federal funds or are subject to a federally required action (e.g., review for air quality impact).

[9] By agreement with the Minnesota Department of Transportation, NDDOT provides the transportation planning lead to the MPOs straddling the border between the two states.

Authority for MPO activities is found both in state and federal law. Federal authority is granted in Sec 134 Title 23 USC, Metropolitan Transportation Planning states:

> It is in the national interest - (1) to encourage and promote the safe and efficient management, operation, and development of surface transportation systems that will serve the mobility needs of people and freight and foster economic growth and development within and between States and urbanized areas, while minimizing transportation-related fuel consumption and air pollution through metropolitan and statewide transportation planning processes identified in this chapter; and (2) to encourage the continued improvement and evolution of the metropolitan and statewide transportation planning processes by metropolitan planning organizations, State departments of transportation, and public transit operators as guided by the planning factors identified in subsection (h) and section 135(d).

Section 24-01-04.1 of the NDCC provides state authority:

> Metropolitan planning organizations shall develop, in cooperation with the state and public transit operators, transportation plans and programs for metropolitan areas which encourage and promote the safe and efficient management, operation, and development of surface transportation systems that will serve the mobility needs of people and freight and foster economic growth and development within and through urbanized areas of this state while minimizing transportation-related fuel consumption, air pollution, and greenhouse gas emissions. The plans and programs for each metropolitan area must provide for the development and integrated management and operation of transportation systems and facilities, including pedestrian walkways and bicycle transportation facilities that will function as an intermodal transportation system for the metropolitan area. A metropolitan planning organization is a political subdivision for purposes of chapter 54-52.

1.9 RAIL TRANSPORTATION ORGANIZATIONS AND INSTITUTIONS

1.9.1 Railroads

The railroads operating in North Dakota are either publicly or privately held for-profit corporations. They own, build, and maintain the rail lines, facilities, and rights-of way on which they operate. The railroads pay property and fuel taxes, and employ hundreds of North Dakotans. The railroads support many vital community services with philanthropic contributions. Most importantly, they are critical to the movement of bulk commodities, an important component of the state's economy.

The role of the railroad's operating in the state also includes participating in rail safety programs of the federal, state, and local governments, MPOs, and private-sector entities such as the North Dakota Safety Council. Additionally, their role includes, but is not limited to, participating with state and local planning organizations and local road authorities to plan, build, maintain, and upgrade rail-highway crossing infrastructure, and collect and report rail-related data. Section 49-10.1-02 of the NDCC states all railroads are common carriers affected with a public interest and are subject to regulation as prescribed by Chapter 49-10.1 and other applicable provisions of law.

1.9.2 Federal Agencies

Federal Railroad Administration

The FRA was created by the Department of Transportation Act of 1966. The mission of FRA is to enable the safe, reliable, and efficient movement of people and goods for a strong America, now and in the future. FRA has roles in the following grant programs:

- **Railroad Safety** – The FRA Office of Railroad Safety promotes and regulates railroad safety. The office is staffed with federal safety inspectors who operate out of regional offices. FRA safety inspectors focus on compliance and enforcement of rules and regulations pertaining to hazardous materials transportation, motive power and equipment, operating practices, signal and train control, and track conditions. The office's functions include railroad safety and customer training (including state safety inspectors), crash and employee fatality investigations and reporting, partnerships between labor, management, and development and implementation of safety rules and standards.

  The North Dakota local FRA Office of Rail Safety is located in Bismarck. The office is staffed to undertake track, signal, hazardous materials, and mechanical inspections.

- **Rail Network Development** – FRA's rail network development activities include the issuance, implementation, and enforcement of safety regulations; selective investment to develop the rail network across the country; and research and technology development. FRA also works with other agencies and rail stakeholders to develop comprehensive network development strategies.
- **Research & Development (R&D**) – Safety is the primary focus of FRA's R&D program. Indirectly, FRA's R&D focus on safety also yields solutions toward the goals of state of good repair, economic competitiveness, and environmental sustainability goals. Stakeholder engagement and partnerships are key components of FRA's R&D strategy.

- **Legislation & Regulations** – FRA regulates the safety of the nation's railroad system and development of intercity passenger rail through Legislative Rules, Non-legislative Rules (Interpretive Rules and Policy Statements), and Management and Procedural Rules.
- **Grant & Loans** – FRA administers a variety of competitive grants, dedicated grants, and loan programs to develop safety improvements, relieve congestion, and encourage the expansion and upgrade of passenger and freight rail infrastructure and services. FRA also provides training and technical assistance to grantees and stakeholders. The following FRA grant and loan programs are relevant to North Dakota:
- **Competitive Programs**
  - *Railroad Safety Grants for the Safe Transportation of Energy Products by Rail Program* – This program makes $10,000,000 in discretionary funding available to states for public and private railroad grade-crossing enhancement and track improvement projects that improve safety on rail routes that transport flammable energy products.
  - *FRA-Led Regional Rail Planning* – FRA solicits statements of interest from groups of states that wish to participate in an FRA-led planning for multi-state passenger rail networks.
  - *Railroad Rehabilitation & Repair (Disaster Assistance)* – This program provides grants to repair and rehabilitate Class II and Class III railroad infrastructure damaged by hurricanes, floods, and other natural disasters in areas for which the President declared a major disaster. Acceptance of applications is subject to change.
  - *Railroad Safety Technology Grant Program* – This program provides financial assistance to passenger and freight rail carriers, railroad suppliers and state and local governments for the deployment of positive train control (PTC) collision avoidance systems and complementary advanced technologies. Acceptance of applications is subject to change.
  - *Transportation Investment Generating Economic Recovery (TIGER)* – The TIGER Discretionary Grant program, is a USDOT-wide program that invests in critical road, rail, transit and port projects across the nation. Although the program is managed by USDOT's Office of the Secretary, FRA has considerable say into what grants are awarded.
  - *University Grants* – This program is used to enhance FRA's safety R&D program by developing cooperative research relationships with selected academic institutions. Acceptance of applications is subject to change.
- **Dedicated Grant Programs**
  - *Amtrak Capital Grants* – FRA is responsible for administering federal grants to Amtrak. FRA is also responsible for oversight of Amtrak spending.
  - *Operation Lifesaver, Inc*. – This program receives funding to support its public education efforts to reduce collisions between trains and motor vehicles at highway-rail grade crossings, and discourage illegal trespassing along railroad rights-of-way. It is led in North Dakota by the North Dakota Safety Council and supported by a variety of partners, including federal, state, and local government agencies, highway safety organizations, law enforcement and the nation's railroads and suppliers.

- **Loan Programs**
  - *Railroad Rehabilitation & Improvement Financing (RRIF) Program* – This program provides direct loans and loan guarantees to acquire, improve, or rehabilitate intermodal or rail equipment or facilities, including track, bridges, yards, buildings, and shops; refinance outstanding debt incurred for the purposes listed above; and develop or establish new intermodal or railroad facilities.
  - *Transportation Innovation & Finance (TIFIA)* – This USDOT program makes three forms of credit assistance available—secured (direct) loans, loan guarantees, and standby lines of credit—for surface transportation projects of national or regional significance.
- **Communications** – The FRA Office of Communications provides policy, management and execution of agency communications, including media relations, public engagement, industry outreach, and government affairs. The office also maintains the FRA Safety Data site that contains data on railroad safety information including crashes and incidents, inspections and highway-rail crossing data.

Federal Highway Administration

The FHWA has a limited role in rail planning. FHWA uses its State Planning and Research funds to support the statewide transportation planning efforts of the states. Title 23 USC, Section 135 defines the general requirements of statewide transportation planning:

> - **Development of plans and programs** – To accomplish the objectives stated in section 134(a), each State shall develop a statewide transportation plan and a statewide transportation improvement program for all areas of the State, subject to section 134.
> - **Contents** – The statewide transportation plan and the transportation improvement program developed for each State shall provide for the development and integrated management and operation of transportation systems and facilities (including accessible pedestrian walkways and bicycle transportation facilities) that will function as an intermodal transportation system for the State and an integral part of an intermodal transportation system for the United States.
> - **Process of development** – The process for developing the statewide plan and the transportation improvement program shall provide for consideration of all modes of transportation and the policies stated in section 134(a), and shall be continuing, cooperative, and comprehensive to the degree appropriate, based on the complexity of the transportation problems to be addressed.

FHWA's support for the development of statewide transportation plans that are integrated, intermodal, and consider all modes strongly implies the consideration and incorporation of railroad transportation. Section 1118 of MAP-21 (the former federal surface transportation authorization) directs the Secretary of Transportation to encourage each state to develop a comprehensive State Freight Plan that outlines immediate and long-range plans for freight-related transportation investments. FHWA has consistently

exhibited support for including railroads in the statewide transportation planning activities of state departments of transportation (DOTs).

FHWA does administer the *Railway-Highway Crossing Hazard Elimination Program*. This program provides funding for safety improvements at public highway-rail grade crossings along federally designated high-speed rail corridors.

Surface Transportation Board

The Interstate Commerce Commission (ICC) Termination Act of 1995 created the Surface Transportation Board (STB) and is the successor agency to the ICC. The STB is a regulatory agency with jurisdiction over railroad interstate rate and service matters, and rail restructuring transactions (mergers, line sales, line construction, and line abandonments). STB is an independent agency, although it is administratively affiliated with the USDOT.

1.9.3 State of North Dakota Agencies

North Dakota Department of Transportation

The North Dakota Department of Transportation (NDDOT) comprises three groups: Engineering, Vehicle Services, and Business Support. Within the Engineering group is the Office of Transportation Programs. This office is responsible for transportation planning activities and includes the Planning/Asset Management Division, which has rail planning as one of its functions. The Planning/Rail Section of the Planning/Asset Management Division has rail planning responsibilities that include the following:

- Developing the State Rail Plan
- Administering the state rail loan programs
- Managing rail crossing programs

The Planning/Rail Section is also responsible for developing and implementing the statewide LRTP, annual State Planning and Research Program, special studies and reports, development of new programs, and applying for discretionary grants; establishing and maintaining a network of contacts with other state and provincial DOTs, and state, federal, tribal, and local governments and agencies; and supporting the activities of other NDDOT Divisions.

North Dakota Public Service Commission

State law provides that the North Dakota Public Service Commission (NDPSC) is the state agency charged with representing the state's rail interests before federal agencies and in direct negotiations with rail carriers. The NDPSC also has jurisdiction over specific safety and landowner rights' matters.

The NDPSC's regulatory authority over railroads diminished as a result of the enactment of the federal Staggers Rail Act in 1980 and the ICC Termination Act in 1995. The 1995 enactment eliminated many ICC functions and transferred all remaining duties to the STB within the USDOT.

Specifically, NDPSC has the following rail regulatory responsibilities as provided for by the NDCC:

- **Authority of public service commission**. The commission, to the extent not inconsistent with federal law, may regulate railroads within this state to the extent railroad activities constitute intrastate commerce. The commission may represent the state interests in direct negotiations with rail carriers and in proceedings before Congress, federal agencies, and courts.

- **Public policy concerning the regulation of railroads**. All railroads are common carriers affected with a public interest and subject to regulation as prescribed by this chapter and other applicable provisions of law. The commission, to the extent not inconsistent with federal law, shall regulate railroads to ensure that all rates, facilities, and services are just and reasonable, and are not unduly discriminatory, unduly or unreasonably prejudicial, nor unduly or unreasonably preferential.

- **Regulatory powers.** In relation to all freight and passenger railroads, the commission can act to (1) Prevent unfair competition, unjust discrimination, or undue or unreasonable preferences between shippers or consignees by lines of competing railroads; (2) Require the filing of reports and data by railroads as the commission may determine to be necessary to allow it to carry out its regulatory functions under this chapter and other provisions of law; (3) Regulate railroads in all matters affecting the relations between railroads and the public to the end that this chapter may be fully and completely carried out.

- **Spur tracks**. On a finding by the commission that public convenience and necessity so require it, a railroad shall be required to build a spur track to serve elevators, warehouses, mills, or like structures, at the expense of the party desiring the spur track to be built. The person desiring the construction of said spur track may be required by the railroad to deposit the estimated cost of the spur track with the commission before the railroad can be required to construct said spur track. The person desiring said spur track may be charged a monthly charge by the railroad for the cost of maintaining the spur track and the switch.

- **Commission may adopt and enforce safety rules**. The commission, for the protection of persons and property, may adopt and enforce railroad safety rules not inconsistent with any federal agency having jurisdiction over railroads. The commission may adopt rules more

stringent than federal rules when necessary to eliminate an essentially state or local safety hazard if the rules are not incompatible with any federal law or rule and do not create an undue burden on interstate commerce.

- **Railroad crossing determination**. If a dispute arises as to whether a railroad grade crossing should be classified as public or private as defined in section 49-11-00.1, the railroad corporation, governmental entity, or private property owner may file with the commission a petition and the commission shall determine whether the crossing is public or private.

As part of its regulatory responsibilities, the NDPSC established and manages the state's rail safety inspection program. The North Dakota 64th Legislative Assembly approved funding for a state-run rail safety pilot program intended to supplement federal oversight of rail safety. An inspection program was established with state rail and mechanical inspectors who are autonomous and entirely accountable to NDPSC. State rail inspectors inspect rail to federal standards and have the same enforcement authority and tools as federal inspectors.

North Dakota Department of Emergency Services

The North Dakota Department of Emergency Services (NDDES) provides 24/7 emergency communications and resource coordination with more than 50 lead and support agencies, private enterprise, and voluntary organizations to assist local jurisdictions in disaster and emergency response activities. It administers federal disaster recovery programs and the Homeland Security Grant Program. NDDES also manages the Emergency Management Assistance Compact that serves as a national clearinghouse though which member states may request and provide mutual aid assistance. With respect to rail, it has the legislative mandate to:

- **Crash reporting**. A railroad corporation shall provide immediate notification to the department of emergency services of an accidental release of a hazardous material.
- **Railroad training programs**. Has oversight over railroad training programs. Training must address the general hazards of oil and hazardous substances, techniques to assess hazards to the environment and to the safety of responders and the public, factors an incident commander must consider in determining whether to attempt to suppress a fire or to evacuate the public and emergency responders from the area, and other strategies for initial response by local emergency responders. Training must include suggested protocol or practices for local responders to safely accomplish these tasks

North Dakota Safety Council

The North Dakota Safety Council (NDSC) is a private non-profit organization. NDSC's primary role related to rail transportation is administering public education and awareness programs to prevent collisions, injuries, and fatalities on and around railroad tracks and highway-rail grade crossing. At the heart of the program is a cadre of volunteer presenters, most of whom are railroad employees. NDSC initiated its Operation Lifesaver program in the mid-1980s, which is financially supported by the state's railroads, NDDOT, FRA through a competitive grant, and grants from safety organizations.[10]

Upper Great Plains Transportation Institute

Section 54-53-01 of the NDCC established the Upper Great Plains Transportation Institute. Located at North Dakota State University, Upper Great Plains Transportation Institute's (UGPTI) purpose is to conduct and supervise research in the field of transportation and logistics. The institute also acquires a wider knowledge and understanding of marketing factors associated with the geographical location of the state of North Dakota and the Upper Great Plains in the field of transportation and their influence on the socioeconomic systems of the state, region, and country.

Since its inception, UGPTI has had a prominent role in the state's rail planning efforts. The institute, under contract to NDDOT, developed the state's first rail plan in 1978 and has been integrally involved in the development of each subsequent rail plan. UGPTI also developed the benefit cost analysis process used by NDDOT to evaluate rail projects benefit cost ratios and has been responsible for publishing several rail-related studies.

1.10 RAIL PROGRAMS, PLANNING EFFORTS, PROCESSES, POLICIES, AND REGULATIONS

1.10.1 State Rail Programs

State Rail Loan Programs

The greatest benefit of state rail policies and programs is aiding short line railroads. NDDOT established a low-interest, revolving rail loan program using its Local Rail Service Assistance (LRSA) grant funds. In 1989, Congress modified the LRSA program, renaming it the Local Rail Freight Assistance (LRFA) program. LRFA funds were considered federal funds until October 2008, when a change in federal law transferred these funds to the states. The transfer of LRFA funds from federal to state identity included the condition that the LRFA funds, although now state funds, would continue to be used for their original intent. In 1995, NDDOT established a state low-interest, revolving rail loan program called the Freight Rail Improvement Program (FRIP). The FRIP was established using interest from repaid LRFA loans. The FRIP followed the same basic program guidelines used to administer the LRFA loan program. Both the LRFA and FRIP funds have been used primarily for infrastructure rehabilitation projects on short line railroads.

[10] *http://www.ndsc.org/OperationLifesaver/default.aspx*

North Dakota Public Service Commission State Rail Inspection Program

The North Dakota 64th Legislative Assembly approved funding for a state-run rail safety pilot program intended to supplement federal oversight of rail safety. The volume of rail traffic in North Dakota increased nearly 233 percent between 2000 and 2012. At the same time, the products transported changed from largely non-hazardous products like coal and grain to large volumes of hazardous materials such as crude oil and ethanol. In the last five years, there have been 56 track-related crashes in North Dakota (costing $19 million) and 22 equipment-caused crashes ($11.5 million in damages). NDPSC targeted these two causes targeted as top priorities for correction because they contribute to the largest number and most severe crashes in North Dakota.

The North Dakota Public Service Commission (NDPSC) has prioritized track and mechanical inspections to prevent train derailments and improve overall community safety by keeping trains on the track. An inspection program was established with state inspectors autonomous and entirely accountable to NDPSC. The FRA trains and certifies the inspectors who then work in partnership with the local and regional federal inspectors. State inspectors inspect rail to federal safety standards and have the same enforcement authority and tools as federal inspectors. A regional FRA specialist files all violations that result in financial penalties, which FRA then processes. The program has several strategies:

- Expand safety inspections of track infrastructure to include main line, sidings and industrial spurs, railroad equipment and cars, hazardous material and operating practices.
- Utilize enforcement actions to include education, notification, and penalties in regards to compliance with safety standards.
- Work with railroads and shippers to upgrade safety and community relations.
- Ensure crude oil/hazardous materials routes are inspected regularly, as well as components and equipment used to transport/carry commodities.

Rail Quiet Zone Projects

In 2009, the state legislature passed Senate Bill 2338, which amended the NDCC to provide grants for highway-rail crossing safety projects. Subsequent legislation in 2011, 2013, and 2015 have provided for the continued expenditure of the funds appropriated in 2009. Funding included $1.6 million from the North Dakota highway-rail grade crossing safety projects fund and $900,000 from federal highway traffic safety funds. As of late 2016, funding for the North Dakota quiet zone program had been depleted. Grants met several requirements:

- A political subdivision must file the application with the department of transportation for a grant.
- The grant applicant must provide ten percent matching funds for the project costs but no local matching funds are required for a highway-rail grade crossing on a state highway.
- Grant funds may be allocated for development of railroad quiet zones, installation or upgrading of active warning devices, resurfacing crossings, building of grade separations, and other costs associated with these improvements.
- An applicant for grant approval for development of a railroad quiet zone shall provide the department of transportation a copy of the notice of intent filed with the federal railroad administration regarding

establishment of a proposed quiet zone and copies of any subsequent filings with or orders from the federal railroad administration relating to the notice of intent.

- Grants for a single crossing may not exceed $75,000 and grants for all crossings within a city may not exceed a cumulative amount of $225,000.

Table 1-7 presents the state funding received by applicants for highway-rail crossing safety projects in quiet zones.

Table 1-7. State Funding for Highway-Rail Crossing Safety Projects – Quiet Zones

City	Allocated	Spent
Beach	$131,707	$149,654
Bismarck	$2,240,000	$225,000
Casselton	$1,280,436	$225,000
Grand Forks	$403,774	$225,000
Harwood	$124,214	$121,006
Jamestown	$482,722	$225,000
Mapleton	$27,550	$34,145
Medora	$196,461	$134,000
Minot	$117,738	$179,675
South Heart	$80,005	$75,000

Source: North Dakota Department of Transportation, 2017

The Fargo Quiet Zone was established in 2006 pre-dating the Senate Bill. The Fargo Quiet Zone received partial federal funding from Section 164, the Repeat Offender Transfer Provision and the Railway-Highways Crossing (Section 130) Program.

Statewide Rail Crossbuck Replacement Program

In the mid-1990s, NDDOT implemented a statewide rail crossbuck replacement program. The program, the result of a study by the 1994 Interim Legislative Committee on Health and Communications, was a cooperative effort of North Dakota's railroads and the NDDOT. The goal of this program was to identify and implement the most efficient configuration of retro-reflective material for rail crossbucks and posts at non-signalized grade crossings, to improve visibility and safety at night. After analyzing rail crossbuck configurations of other states, NDDOT chose to deploy rail crossbucks similar to those found in Minnesota.[11]

At the time, the crossbuck replacement project was initiated there were approximately 4,000 non-signalized public at-grade crossings on North Dakota's rail lines. Funding for the project was spread over a three- to five-year period. The first year's program included only the BNSF railway segment of track from Fargo to Minot to Williston. This segment was chosen as a test based on train traffic.

[11] North Dakota's configuration includes double-sided Diamond Grade™ cross bucks and two 2-inch by 48-inch strips of Diamond Grade™ material attached to the front and back of each post. This configuration will produce a highly visible sign, while also producing a strobe-effect when trains are moving through the crossing at night.

Table 1-8 shows the approximate number of each railroad's crossings affected by the crossbuck replacement project. The project was financed using 90 percent federal funds and 10 percent railroad funds. Approximately $1,000,000 in federal funds was allocated to this project.

Table 1-8. Statewide Crossbuck Replacement Program by Railroad

Railroad	Route Mileage	Included Crossings	Percentage of Railroad Total
Burlington Northern	2,327	2,240	56%
CP Rail	916	880	22%
Red River Valley and Western	657	680	17%
Dakota Missouri Valley & Western	243	200	5%

Source: North Dakota Department of Transportation, 2017

1.10.2 Safety Programs

Highway Safety Improvement Program

The Highway Safety Improvement Program (HSIP) provides funds for safety improvements to reduce the number of fatalities, injuries, and crashes at public grade crossings. Each year NDDOT administers approximately $3.2 million in HSIP funds. The HSIP requires a minimum of 50 percent of each state's railway-highway crossing funds must be set aside for the installation of protective devices at-grade crossings or for upgrading existing antiquated signal systems, unless a state demonstrates to the satisfaction of the USDOT that it has met all its needs for installation or of upgrades of protective devices at crossings. The remaining funds may be used for other highway safety improvement purposes. A state may use up to 2 percent of its grade crossings funds for compilation and analysis of data for a required annual report to the USDOT on the progress that is being made implementing the program.

Annually, NDDOT dedicates approximately $2 million of its HSIP funding to install and upgrade between seven and nine protective crossing devices. All crossing improvements are determined by a diagnostic team using specific analysis criteria. The diagnostic team is comprised of representatives of the local road authority, operating railroad and the NDDOT. All on-site diagnostic reviews conclude with a consensus decision to implement any appropriate safety enhancements. The cost-sharing ratio to install or upgrade a protective device is 90 percent federal and 10 percent local highway authority. If the project is on a township road or in a city of less than 5,000 population, the county is also asked to assist with the local match. In hardship situations, up to 97 percent of the project may be paid for with federal funds. In some cases, private developers may contribute if they benefit from the project. Railroads may also be a contributor.

NDDOT uses the remaining HSIP funds for hazard elimination projects. These include signage, improving sight distances, new signals, signal upgrades, advance warning beacons, surfacing, and associated roadway work. Each year, letters are sent to school districts, tribal governments, the North Dakota League of Cities, Association of Counties and Township Officers Association, Metropolitan Planning Organizations, cities of more than 5,000 population and NDDOT district engineers to solicit potential projects. The annual number of rail surface upgrade projects varies from year to year, as does the cost of each project based

on the number of traffic lanes and rail lines. Typically, NDDOT upgrades 10 to 15 rail grade surfaces at an average cost of $1,500 per linear foot.

According to HSIP, each state is required to conduct and systematically maintain a survey of all highways to identify those railroad crossings that may require separation, relocation, or protective devices, and establish and implement a schedule of projects for this purpose. At a minimum, this schedule is to provide signs for all railway-highway crossings.

A railroad participating in a hazard elimination project is responsible for compensating the state transportation department for the net benefit to the railroad of the project. The net benefit is determined by the Secretary of Transportation, but may not exceed 10 percent of the project cost.

A state may use its railway-highway crossings funds to make an incentive payment to local government for a public at-grade crossing closure, as long as the railroad owning the track also makes an incentive payment.

Each state is required to update information in the USDOT *National Crossing Inventory* database annually, including information about warning devices and signage, for each public crossing located within its borders. NDDOT used the GX 32 program to maintain the data required for the National Crossing Inventory. Changes to the reporting process now require railroads and state DOTs to submit data updates and online changes to USDOT.

Operation Lifesaver

Operation Lifesaver (OL) is a non-profit organization that provides public education and awareness programs to prevent collisions, injuries, and fatalities on and around railroad tracks and highway-rail grade crossings in all 50 states. In 1986, a non-profit national OL office was created to help support the efforts of state OL programs and raise national awareness on highway-rail grade crossing issues. OL programs are co-sponsored by federal, state, and local government agencies, highway safety organizations, and America's railroad.

The North Dakota Operation Lifesaver Program[12] is administered by the NDSC. NDDOT began its support of OL in the early 1990s. Currently, NDDOT supports OL with an annual financial contribution of $6,000. NDDOT staff also attend OL meetings and serve as volunteer program presenters.

Positive Train Control

The Rail Safety Improvement Act (RSIA) of 2008 mandated the implementation of advanced train control technology, Positive Train Control (PTC), on mainlines that transport any poisonous-inhalation-hazardous materials and where regularly scheduled intercity passenger or commuter rail services.

PTC uses communication-based/processor-based train control technology that provides a system capable of reliably and functionally preventing train-to-train collisions, over speed derailments, incursions into

[12] *http://www.ndsc.org/default.aspx*

established work zone limits, and the movement of a train through a main line switch in the improper position. PTC is expected to be implemented over approximately 70,000 miles of track.

PTC has not been fully implemented on rail lines in North Dakota. In November 2015, Congress extended the original PTC deadline (December 31, 2015) to Dec. 31, 2018. Railroads were required to submit revised PTC implementation plans to FRA by January 27, 2016, that outline how and when they will have PTC fully installed and activated.

Transportation of Flammable Liquids by Rail

In May 2015, USDOT announced the Final Rule to Strengthen Safe Transportation of Flammable Liquids by Rail. The final rule, developed by the Pipeline and Hazardous Materials Safety Administration and FRA, in coordination with Canada, makes extensive changes aimed to improve crash prevention, mitigation, and support emergency response. The rules provide for the following:

- Enhances rail tank car standards and a risk-based retrofitting schedule for older tank cars carrying crude oil and ethanol;
- Requires a new braking standard for certain trains to reduce the severity of a crash, and the "pile-up effect."
- Designates new operational protocols for trains transporting large volumes of flammable liquids, such as routing requirements, speed restrictions, and information for local government agencies; and
- Provides new sampling and testing requirements to improve classification of energy products placed into transport.

1.10.3 North Dakota Rail Programs

1.10.4 Current and Proposed Rail Planning Efforts

Local Rail Planning

Rail planning at the local level (cities smaller than those constituting the state's MPOs) has historically been limited to project-specific actions or general applications contained in local land use plans. Cities such as Dickinson and Jamestown have been actively involved in rail planning during the development of rail quiet zones, although Dickinson did not pursue when the funding was depleted

Metropolitan Planning Organization Rail Planning Efforts

Fargo-Moorhead Council of Governments

The City of Fargo is studying the possibility of extending the downtown quiet zone westward on the Prosper Line from 7th Street N to Dakota Drive. The impetus for this study is to accommodate increased student housing that has been built in this area. The City of Moorhead is studying quiet zone studies involving BNSF and Otter Tail Valley rail lines.

Prior to 2006, the Fargo-Moorhead Council of Governments (FMCOG) had an active role in developing quiet zones in both Fargo and Moorhead. In 2008, FMCOG completed the Downtown Moorhead Railroad

Grade Separation Feasibility Study, and in 2016 completed the Moorhead Downtown Grade Separation Study.

FMCOG's Metro 2040 LRTP lists two additional grade separation projects in Fargo: the 8th Street/11th Street Railroad Grade Separated Crossing and the 21st Street Railroad Grade Separated Crossing Project.

Grand Forks-East Grand Forks MPO

BNSF is the only provider of rail service operating within the Grand Forks-East Grand Forks (GF-EGF) MPO study area. BNSF is a voting member of the MPO's Technical Advisory Committee, giving the railroad the opportunity to coordinate with all GF-EGF transportation planning and programming activities.

The GF-EGF MPO recently completed several rail planning studies. One study identified parcels adjacent to existing rail facilities that could be used for development activities. The identified parcels that had municipal services available, appropriate land use designations and willing landowners. The study conceptualized how various parcels could be developed with track sidings of various designs which including a planning level of rail infrastructure costs.

A second study captured the traffic signal pre-emptions rail traffic has on signals adjacent to at-grade rail crossings. The MPO's obtaining timely and informative data on the impact rail conflicts with traffic was a challenging exercise. GF-EGF is now obtaining traffic signal data to identify when and how long rail traffic has pre-empted the traffic signals. The MPO plans to use this data in a variety of ways, ranging from on-time notification to emergency management when crossings are blocked to establishing more predictable train movements (movement patterns are beginning to emerge) to better modeling impacts rail has on travel reliability.

A third study examined the possibility of consolidating rail traffic from a spur with that of another existing branch. The potential consolidation of rail service could allow the possible abandonment of rail right-of-way and providing redevelopment potential. The study is analyzing the impacts of the consolidation to one rail line and identifying potential problems along with mitigation alternatives.

A fourth study resulted in the development of rail quiet zones that incorporate most grade crossings in the city of Grand Forks. The MPO is continuing its effort, exploring funding options for implementing remaining potential quiet zones in the MPO study area. Concern was raised that with no train horns, people may inadvertently walk/bike into the path of trains. Gates will be installed at many crossings where high pedestrian/bicyclists counts indicated higher risk of this occurring.

The MPO's most recent long-range transportation plan, completed in 2014, stresses the importance of the region's railroads, and includes an objective to support local and regional connections that are efficient for freight and rail movement. The document also presents a list of "illustrative projects of significance," including one project related to rail: in the city of Grand Forks, on 42nd Street at DeMers Avenue, a grade-separated rail crossing is proposed over BNSF.

A second rail-related project in Grand Forks from the LRTP is the 2nd Avenue NE grade separation from the railroad, which would create a continuous north-south corridor.

The MPO also prepared a Quiet Zone Assessment in 2009, which included four projects:

- Quiet Zone at-grade crossing
- NW 3rd Street, install gates and constant warning time (CWT)
- Central Avenue NW, install gates and CWT
- 2nd Avenue NE, install CWT

Bismarck-Mandan MPO

The Bismarck-Mandan MPO's rail planning efforts currently include the following:

- **Continued development of "quiet rail" in selected downtown streets of Bismarck.** The planning, engineering, and construction of the three crossing locations has been completed. All three crossings added four-quadrant gates, pedestrian mazes, and flashing red lights and motion sensors. A sidewalk was added on the west side for one of the crossings. The project was completed in 2016, and the Notice of Establishment from FRA was dated January 3, 2017.
- **The MPO's Downtown Bismarck Subarea Plan**, completed in December 2013, identified a project for Bismarck to investigate **the viability and possible construction of a bike and pedestrian trail**, parallel and adjoining the existing BNSF active rail line in downtown Bismarck. The concept of the trail would be for it to run from downtown Bismarck, west to the Missouri River. Possible routes, safety concerns, and logistic issues of the routes are being analyzed and investigated by the City of Bismarck, the state, and interested citizens.
- **Continued planning and engineering of a pedestrian underpass or overpass for the 5th Street BNSF rail line crossing**. A pedestrian underpass was recommended in the Downtown Bismarck Subarea Plan. Serious engineering issues regarding a viable underpass have developed and there has been additional thought regarding an overpass to accommodate future pedestrian crossing needs.
- **The MPO's 2015–2020 LRTP has identified railroad-related projects within a phased plan**. Construction of a grade-separated crossing on 66th Street over the BNSF Railway is identified in the short term (2015–2023). A grade separated crossing on 71st Avenue with the DMVW Railway is identified in the mid-term plan (2024–2032). Several other rail-associated improvements were identified as alternatives, but were not selected for the phased schedule or as illustrative projects.
- **Burleigh County, through the MPO's TIP process, has brought forward a project to construct an overpass at the intersection of 66th Street and the BNSF rail**. This project has ranked as a high priority for the MPO's Urban Roads Program for the last two years, but has not yet been selected as the top priority for roadway development.

Regional Rail Planning Coalitions

Great Northern Corridor Coalition

The Great Northern Corridor Coalition (GNCC) is coalition of freight stakeholders located in the area of the Great Northern Corridor, which is an east-west oriented transportation corridor spanning eight states from Illinois to Washington and Oregon. The inter-connected transportation corridor serves 27 million Americans. The purpose of the GNCC is to promote freight mobility in the northern tier of the country. In August 2012, the Montana Department of Transportation received a Multi-State Corridor Operations and Management grant to study the corridor and identify freight mobility needs. North Dakota was one of the founding members and remains an active participant in the GNCC.

Midwest Interstate Passenger Rail Commission

The Midwest Interstate Passenger Rail Commission (MIPRC) is a forum for a group of state leaders from across the region to advocate for passenger rail improvements. Formed by compact agreement in 2000, MIPRC's current members are Illinois, Indiana, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, and Wisconsin. The main purposes of the compact are the following:

- Promote both current improvements and long-range plans for intercity passenger rail service in the Midwest.
- Coordinate interaction among Midwestern state officials, and between the public and private sector at all levels (federal, state, and local).
- Support current state efforts being conducted through state DOTs.

North Dakota participates in the MIPRC as a non-voting associate member.

Federal Highway Administration/Transport Canada Trans Border Working Group

In October 2000, Transport Canada and the USDOT concluded a Memorandum of Cooperation that highlighted the importance of coordinating closely on transportation initiatives along the Canada-US border. The memorandum cited the need for "increasing the degree and speed of communication" between both departments, and stressed the importance of "meeting more regularly to conduct information exchanges and discuss issues of mutual concern.

Out of this, the Canada-US Trans Border Working Group (TBWG) was formed in January 2001. Core membership includes federal, state, and provincial DOTs from both sides of the border, US Customs and Border Protection, and the Canada Border Services Agency. Additional members include Foreign Affairs Canada, the US Department of State, regional planning agencies, Canadian provinces, and northern border US States. NDDOT has been an active member of TBWG since its inception.

The mission of the TBWG is to facilitate the safe, secure, efficient, and environmentally responsible movement of people and goods across the Canada-US border. TBWG subcommittees work on a variety of important issues such as promoting Border Flow Information Architecture to enhance border technology interoperability. In addition, although much of TBWG's focus has been on freight movements, cross border passenger movement is also an issue of importance.

The Pembina/Emerson Land Port of Entry Inter-Agency Planning Group

In 1998, NDDOT secured a grant through the FHWA's Coordinated Border Infrastructure Program to conduct a transportation planning study for the Pembina/Emerson Land Port of Entry. Shortly after the study was completed, 9/11 occurred, which effectively postponed implementation of the study's recommendations. In 2008, Manitoba Infrastructure and Transportation re-initiated cross border transportation planning efforts at the port. In 2012, a long-range concept plan addressing traffic and operational requirements to the year 2035 was published. A product of the study was the creation of an Inter-Agency Planning Committee that provides the mechanism for planning long-term enhancements to the port's rail infrastructure.

1.11 RAIL POLICIES

Historically, North Dakota has followed a set of informal rail-related policies. Simply stated North Dakota:

- Will not own or operate rail lines.
- Will not subsidize railroad operations (including passenger rail).
- Regards the development of Rail Quiet Zones as a local issue.
- Supports the continued evaluation and application of Intelligent Transportation Systems to improve grade crossing safety and reduce urban traffic congestion.
- Supports the removal or mitigation of obstructions to visibility at at-grade rail crossings.
- Supports evaluation of at-grade rail crossings to improve sight distances.

Additionally, *TransAction III*, North Dakota's Statewide Transportation Plan, and North Dakota's State Freight Plan contain Goal, Strategy and Initiative statements that further define the state's rail-related policy.

1.11.1 2015 Legislative Session Actions

The 2015 North Dakota Legislature passed the following rail-related legislation:

- **CHAPTER 12 HOUSE BILL NO. 1012 –** An Act to provide appropriations for defraying the expenses of the department of transportation; to provide an appropriation to the state treasurer for allocations to townships in non-oil-producing counties; to provide for transfers; to amend and reenact section 39-02-03 of the NDCC, relating to department of transportation motor vehicle branch offices; to provide for legislative management studies; to provide for a department of transportation study; to provide for a report to the legislative management; to provide for a report to the legislative council; to provide exemptions; and to provide for application. BE IT ENACTED BY THE LEGISLATIVE ASSEMBLY OF NORTH DAKOTA (italics provided to highlight key elements):
  - **SECTION 7. APPROPRIATION – STRATEGIC INVESTMENT AND IMPROVEMENTS FUND**. There is appropriated out of any moneys in

the strategic investment and improvements fund in the state treasury, not otherwise appropriated, *the sum of $7,000,000, or so much of the sum as may be necessary, to the department of transportation for the purpose of one-time funding for the department of transportation's short line railroad program,* for the biennium beginning July 1, 2015, and ending June 30, 2017.

- **SECTION 13. EXEMPTION – HIGHWAY-RAIL GRADE CROSSING SAFETY PROJECTS FUND**. The amount appropriated to the department of transportation from the highway-rail grade crossing safety projects fund, as contained in section 4 of chapter 43 of the 2013 Session Laws, is not subject to the provisions of section 54-44.1-11 [cancelling all unexpended appropriations]. *Any unexpended funds from this appropriation are available to the department highway-rail grade crossing safety projects* during the biennium beginning July 1, 2015, and ending June 30, 2017.
- **SECTION 18. RAIL SAFETY – REPORT TO LEGISLATIVE MANAGEMENT**. The department of transportation shall report to a committee designated by the legislative management, regarding the department's updated North Dakota state rail plan and the director of the department of transportation *shall post the department's updated North Dakota state rail plan report on the department's public website and provide an electronic copy to the legislative council for placement on the legislative branch public website* for the biennium beginning July 1, 2015, and ending June 30, 2017.
- **SECTION 19. LEGISLATIVE MANAGEMENT STUDY – SHORT LINE RAILROAD INFRASTRUCTURE**. During the 2015-16 interim, the legislative management *shall consider studying short line railroad expansion, spurs, switches, or other infrastructure enhancements and the effect of short line railroads on reducing commercial traffic on the state highway system*. The legislative management shall report its findings and recommendations, together with any legislation required to implement the recommendations, to the sixty-fifth legislative assembly.

➢ **CHAPTER 42 SENATE BILL NO. 2008** – An Act to provide an appropriation for defraying the expenses of the public service commission; to provide for a railroad safety pilot program; to provide for a railroad training program; to amend and reenact sections 49-01-05 and 57-43.2-19 of the NDCC, relating to the salary of public service commissioners and the special fuels excise taxes distribution of funds; to provide a statement of legislative intent; to authorize a transfer; to provide

an effective date; to provide for retroactive application; and to declare an emergency.

- **SECTION 3. RAILROAD SAFETY PILOT PROGRAM - RAIL SAFETY FUND - LEGISLATIVE INTENT**. The railroad safety program line item in section 1 of this Act includes $523,345 from the rail safety fund, of which $253,345 relates to salaries and wages, $70,000 relates to operating expenses, and $200,000 relates to a railroad safety pilot program temporary employee for the public service commission to establish and operate a state railroad safety pilot program for the biennium beginning July 1, 2015, and ending June 30, 2017***.*** *It is the intent of the sixty-fourth legislative assembly that the railroad safety pilot program continues through the 2017-19 biennium*.
- **SECTION 4. RAILROAD TRAINING PROGRAM**. *All railroads shall make training available to all fire departments having jurisdiction along routes traversed by unit oil trains. Training must be made available by June 30, 2016, with refresher training made available at least every three years thereafter***.** Training must address the general hazards of oil and hazardous substances, techniques to assess hazards to the environment and to the safety of responders and the public, factors an incident commander must consider in determining whether to attempt to suppress a fire or to evacuate the public and emergency responders from the area, and other strategies for initial response by local emergency responders. Training must include suggested protocol or practices for local responders to safely accomplish these tasks.

Chapter 2. North Dakota's Existing Rail System

North Dakota ranks sixteenth in the country in total miles. Six freight railroads provide rail freight service in North Dakota, operating over a 3,331-mile network. Figure 2-1 shows the rail network in the state.

While North Dakota does not contain any intermodal facilities, there are connections to numerous intermodal facilities in the US and Canada. Figure 2-2 shows the intermodal facilities served by BNSF Railway (BNSF) and Canadian Pacific Railway (CP).

2.1 CLASS I RAILROADS

BNSF and CP are the two major freight railroads in the state, with each operating principally an east-west network.

2.1.1 BNSF Railway

BNSF has the largest number of route-miles in the state. It operates over a network of 1,687 miles, serving the Bakken Shale region and the agricultural areas, as well as all the major population centers. Nationally, BNSF owns approximately 23,000 miles of track and operates over approximately 9,000 miles of trackage rights on lines of other railroads throughout 28 states and two Canadian provinces, providing access to major economic centers throughout the country. Figure 2-3 shows the BNSF national rail system

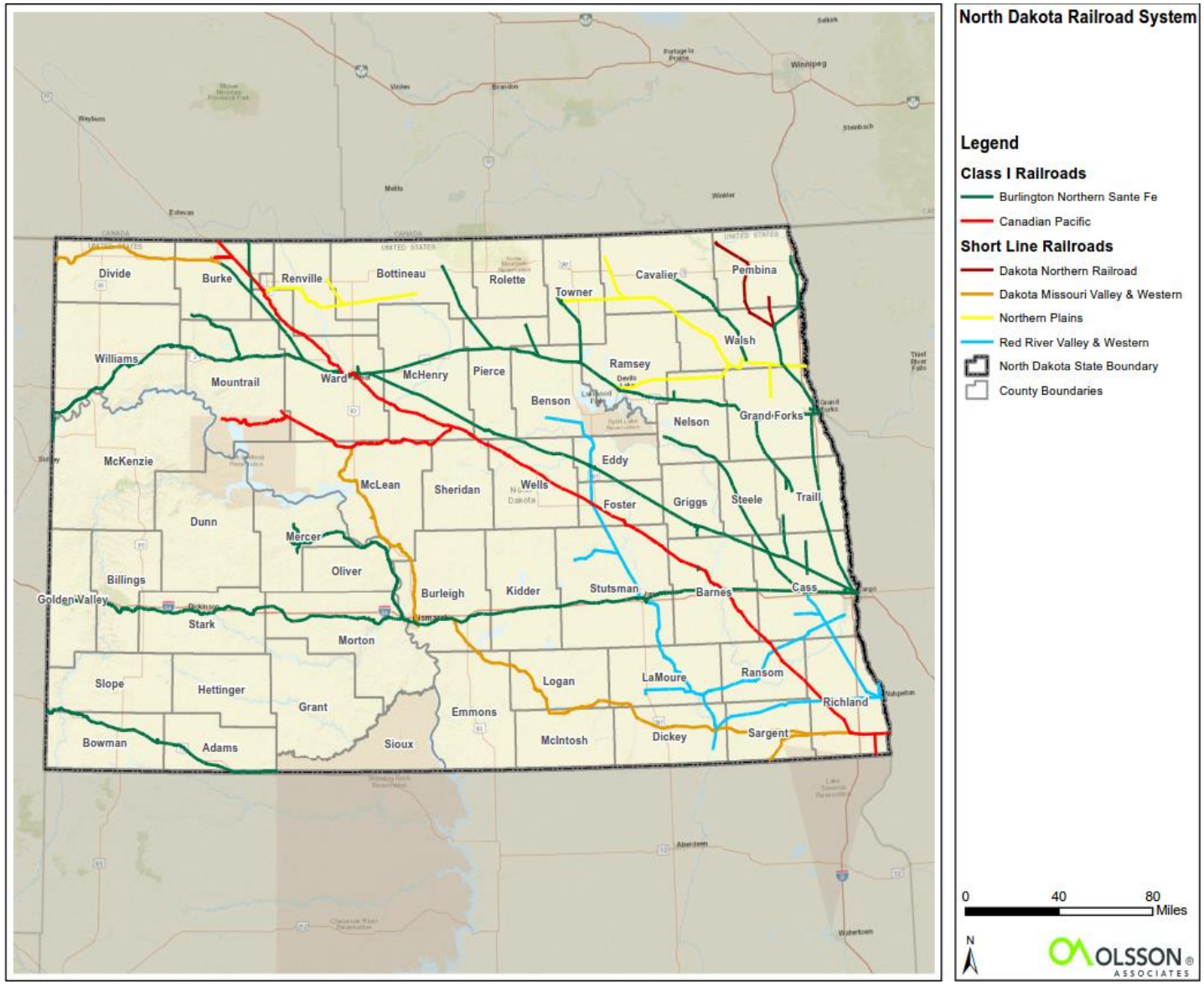
The railroad hauls a variety of products, most notably coal, grain, and intermodal containers and trailers. BNSF has direct access to the low-sulfur coal of the Powder River Basin in Wyoming. BNSF serves over 1,500 grain elevators throughout the Midwest.

BNSF's intermodal network connects the major ports on the Pacific Coast and Gulf Coast with major markets west of the Mississippi River. Through connections with the eastern railroads in Chicago, St. Louis, Memphis, and New Orleans, BNSF accesses markets in the east. BNSF also has an intermodal connection with Mexico at El Paso. The BNSF intermodal network includes 26 terminals located at strategic locations throughout its system.

Figure 2-4 shows the BNSF intermodal map and network. BNSF's intermodal network includes 22 terminals physically located on BNSF, as well as additional terminals it serves through connections with other carriers.

BNSF's presence in Texas and other oil refining states provides an outlet for North Dakota's oil reserves, offering an alternative to pipelines. Its connections to the Pacific Coast and Gulf of Mexico seaports link North Dakota to overseas markets for its products as well as sources of products consumed in the state.

Figure 2-1. North Dakota Rail System

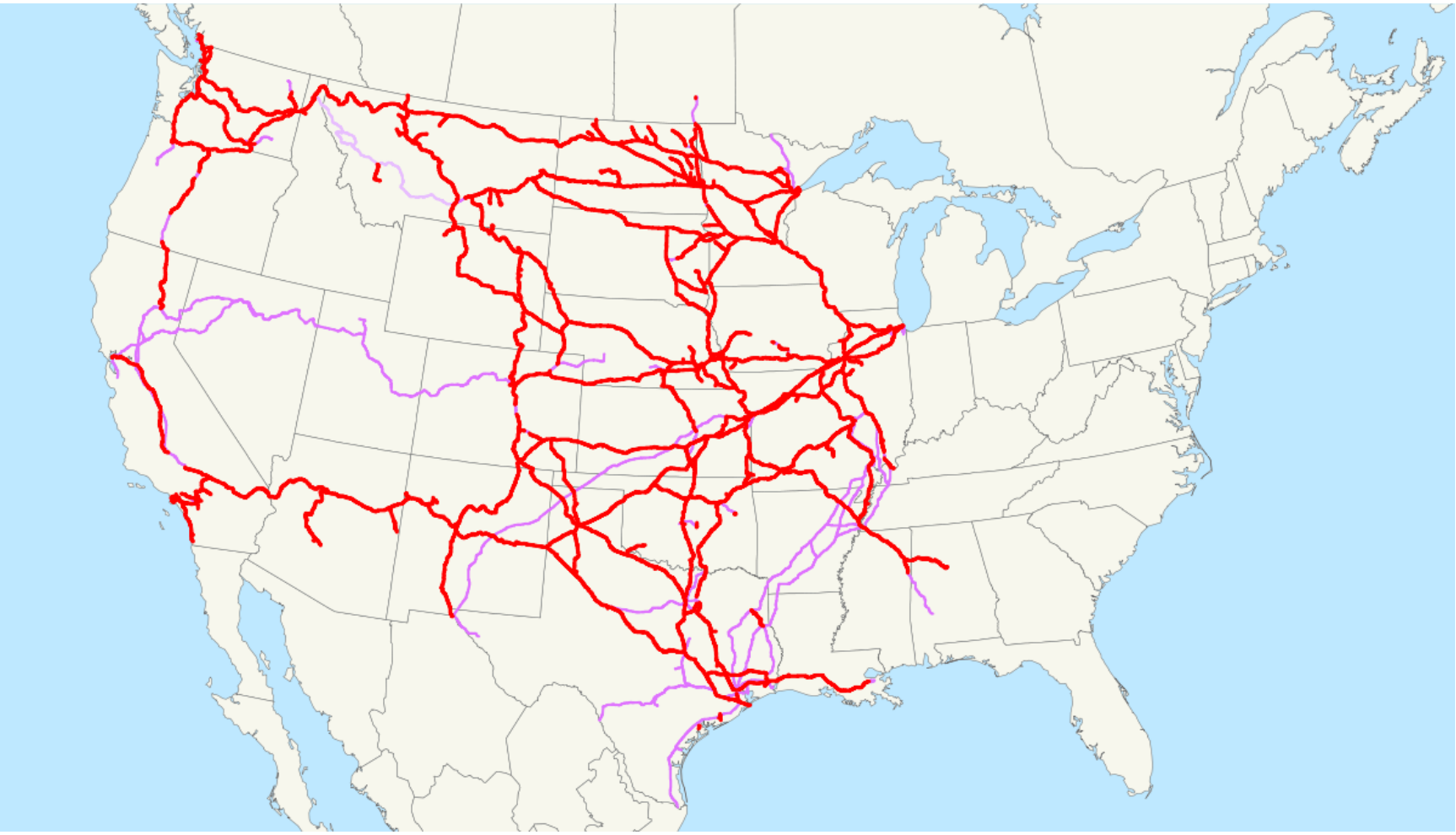


Source: North Dakota DOT, WSP

Figure 2-2. Intermodal Facilities Served by Railroads in North Dakota

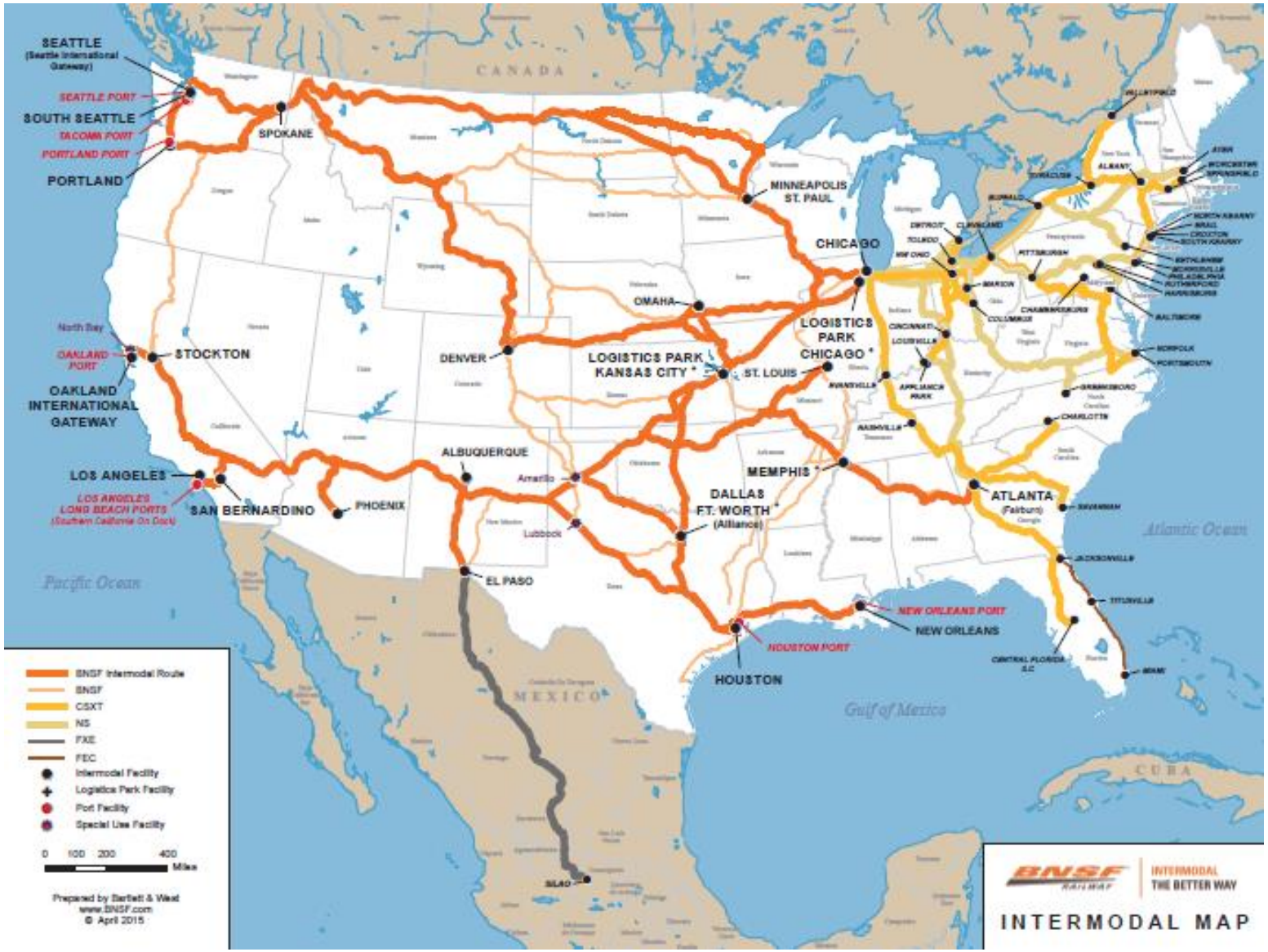
Source: North Dakota DOT

Figure 2-3. BNSF National Rail System



Source: BNSF Railway

Figure 2-4. BNSF Intermodal Rail System



Source: BNSF Railway

North Dakota is located on both BNSF's Great Northern Corridor (GNC) and its MidCon Corridor. Both are part of BNSF's Corridors of Commerce, the three major corridors in the railroad's network. The GNC connects Chicago with the Pacific Northwest, passing through Illinois, Wisconsin, Minnesota, Montana, Idaho, Oregon, and Washington. It is the most northern major rail corridor in the US providing access of the northern border states to the Pacific Northwest ports. Historically, the principal commodities moving over the corridor have been grain, containers, and coal. With the Bakken Region having become an important source of crude oil, the GNC has evolved into one of North America's major energy corridors, adding additional traffic to its already significant volume.

North Dakota is the northernmost endpoint of the BNSF MidCon Corridor. The MidCon extends south to the Gulf of Mexico. The corridor provides a major outlet for crude oil extracted in North Dakota. Besides providing access to the refineries on the Gulf Coast, the corridor connects to a line serving Cushing, Oklahoma, the principal oil storage area in the US. Other products move on the corridor for export through the Port of Houston.

Network Configuration

BNSF is the largest rail operator in North Dakota. The BNSF network in the state is principally single track, with passing sidings to permit trains traveling in opposing directions to pass each other and faster trains to overtake slower trains.

The BNSF network in North Dakota does include limited sections of double track in parts of the state where traffic density warrants two tracks to preserve the capacity of the network. Figure 2-5 shows the locations**.**

The sidings need to be spaced to maintain a steady flow of trains and must be long enough to set aside trains with more than 100 cars. Figure 2-6 shows the locations of BNSF passing sidings in the state.

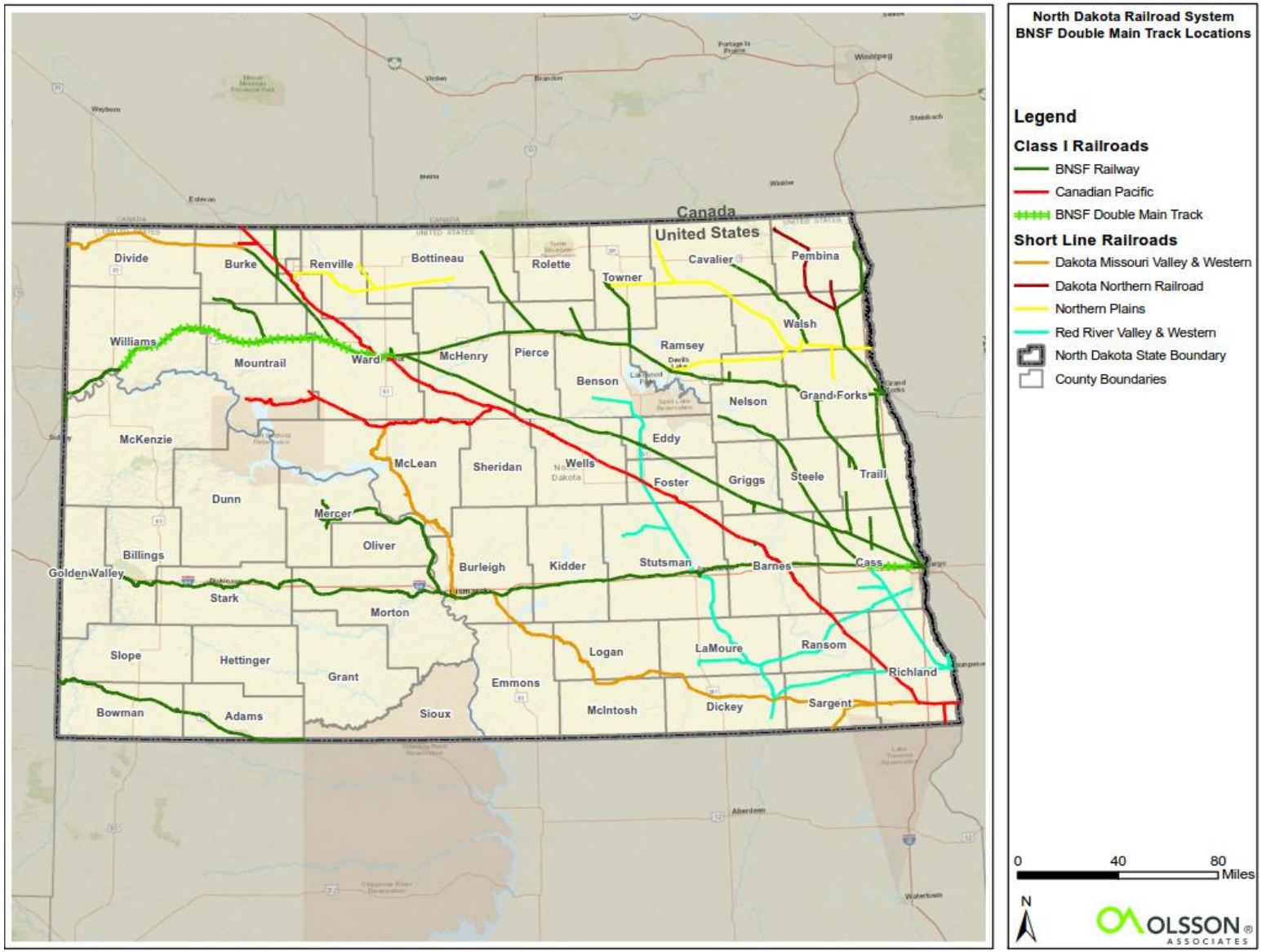
Freight cars have increased in size over the years with the capability of carrying larger, heavier loads. The greater load capacity provides operating cost reductions that can significantly benefit shippers. Today, the industry standard maximum car weight is 286,000 pounds (286K), including both the cargo and the weight of the car.

Figure 2-7 shows the weight restrictions on the BNSF national network. The extensive capability of the network to accommodate the larger cars makes it important that the North Dakota network is capable of handling these cars so as not to penalize its rail users by placing weight limitations on their shipments.

With the exception of a few light-density line segments, the BNSF lines in North Dakota can accommodate the standard heavier freight cars weighing up to 286K, the industry standard.

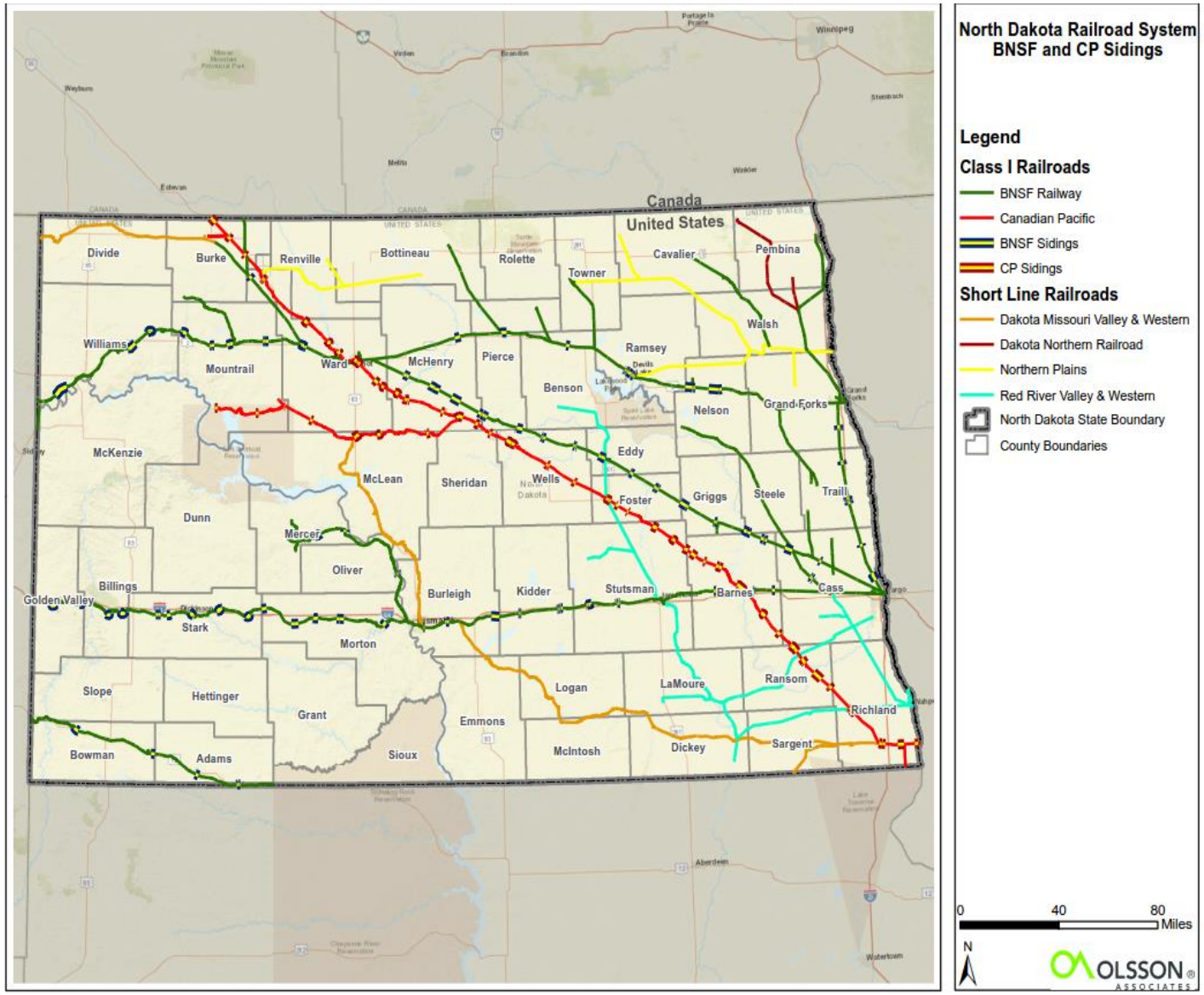
BNSF's network in North Dakota consists of two operating territories: the Twin Cities Division and the Montana Division. Following is a description of each division outlining the physical features by subdivision.

Figure 2-5. BNSF Rail Network Double-Track Main Line Locations



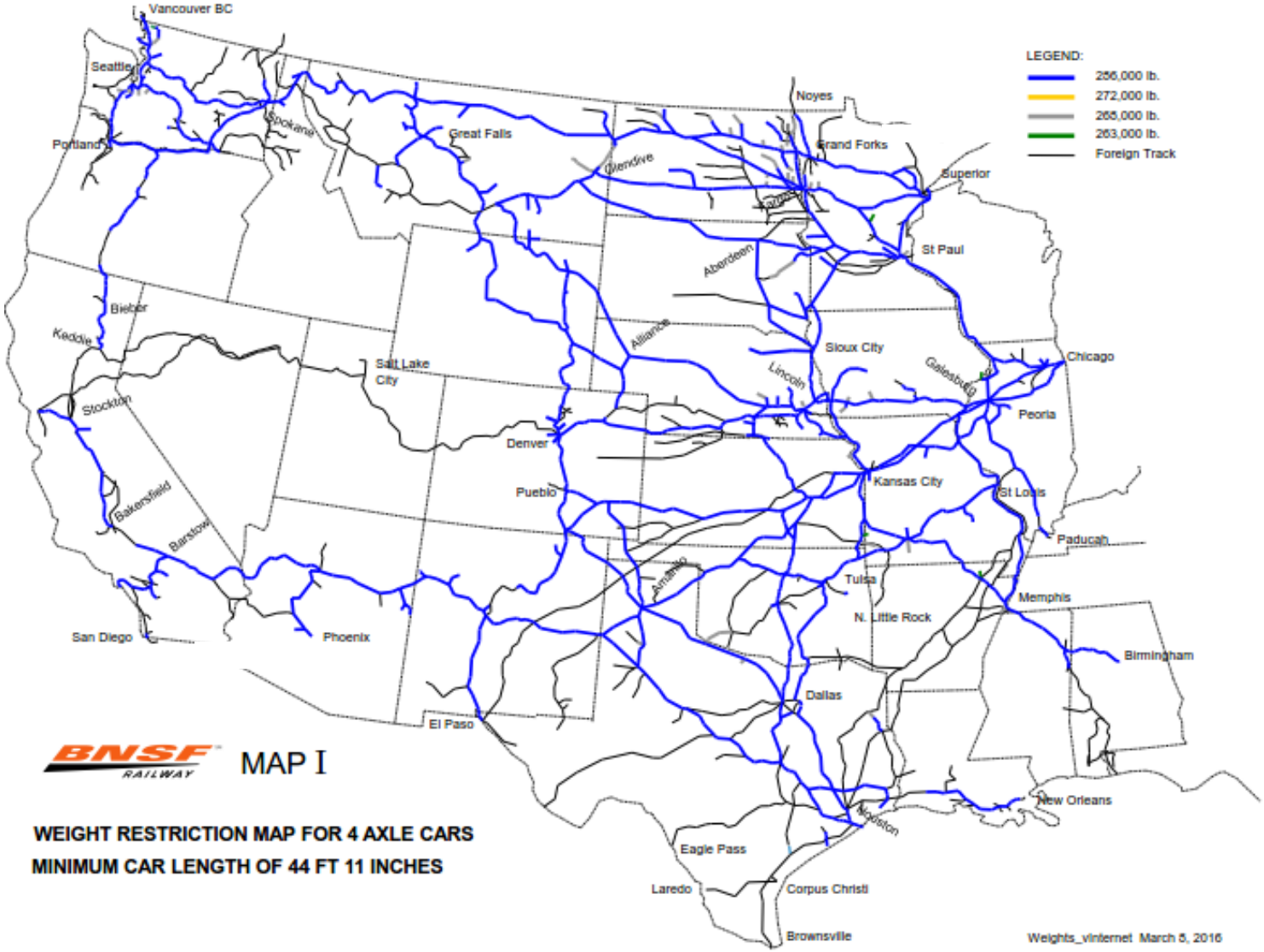
Source: BNSF Railway, WSP

Figure 2-6. North Dakota Rail System Class I Passing Sidings



Source: BNSF Railway, WSP Analysis

Figure 2-7. BNSF Weight on Rail Limitations



Source: BNSF Employee Timetables; WSP Analysis

Twin Cities Division

The Twin Cities Division spans the eastern part of the state from Minot and Bismarck to the Minnesota border. As shown in Figure 2-8, the division has three main lines that are eastward extensions of the Montana Division. Two main lines connect Minot with the Minnesota border, one crossing at Grand Forks and the second crossing at Fargo. The third main line extends from Bismarck to Fargo.

The Twin Cities Division comprises 16 subdivisions. Maximum train speeds on the main line subdivisions are 50–60 miles per hour (mph) for freight trains, and 70–79 mph for passenger trains. Main line passing sidings range 6,500–11,000 feet.

Devils Lake Subdivision

The subdivision is a main line between the Devils Lake Switch in Grand Forks at MP 0.4 and Surrey for a length of 194.9 miles. The KO Subdivision connects with the Devils Lake Subdivision at Surrey.

- **Maximum operating speed** for freight less than 100 tons per car is 60 mph, and 45 mph for loads of 100 tons or more. The maximum operating speed for the Amtrak *Empire Builder* passenger line on the Devils Lake Subdivision is 79 mph.
- **Maximum gross weight** per car is 286K over the entire 194.9 miles.

DEVILS LAKE SUBDIVISION MAIN LINE		
Rail Siding Locations and Lengths		
Emerado	MP 12.3	7,380 ft.
Michigan	MP 50.3	8,575 ft.
Lakota	MP 60.7	8,695 ft.
Devils Lake	MP 85.3	10,530 ft.
Churchs Ferry	MP 104.2	4,361 ft.
Leeds	MP 115.7	8,115 ft.
Rugby	MP 142.4	6,160 ft.
Towner	MP 161.3	7,870 ft.

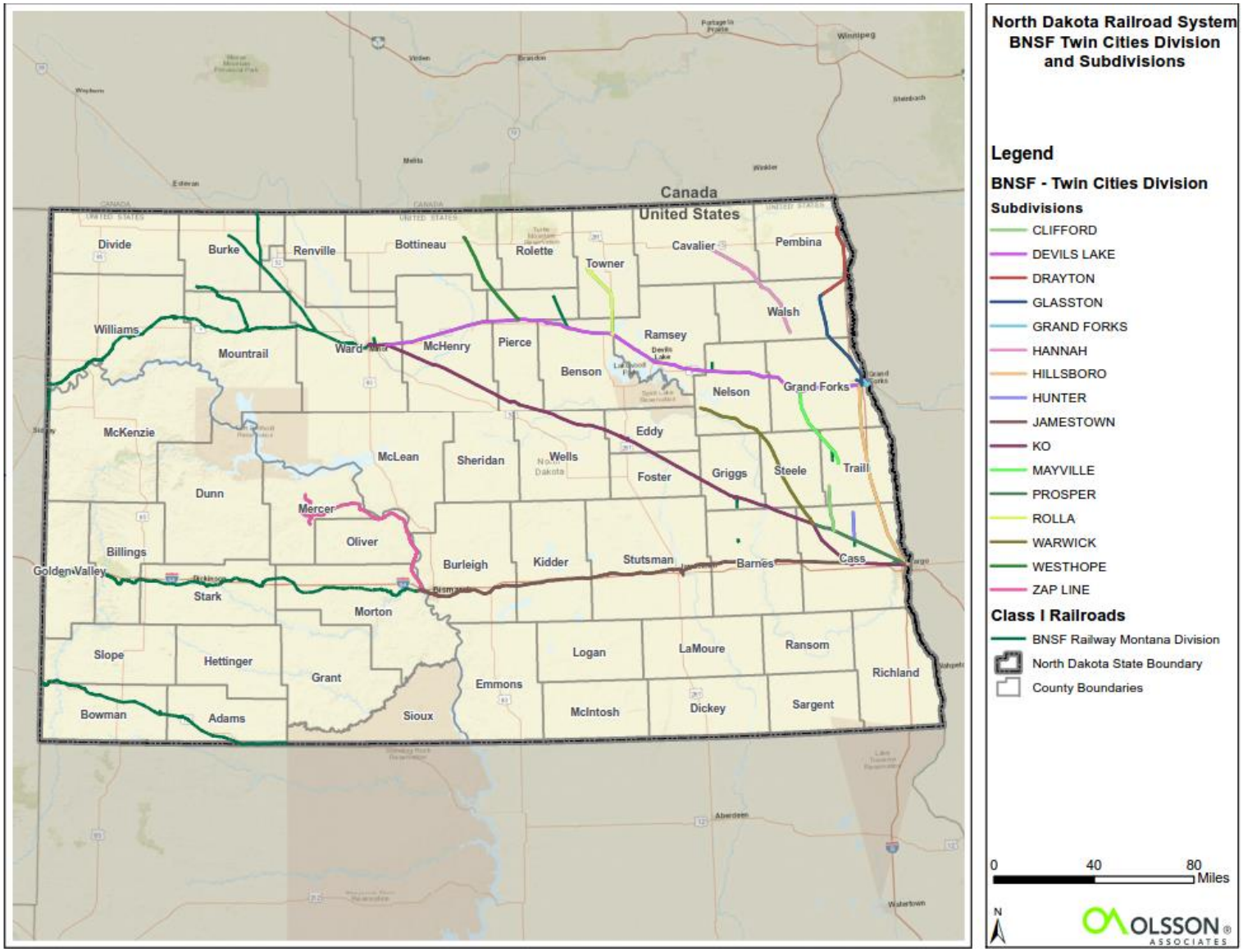
Source: BNSF Employee Timetables; WSP Analysis

Drayton Subdivision

The subdivision is a 35.3-mile branch line, between MP 144.2 and MP 179.5, 7.0 miles south of Grafton and Joliette.

- **Maximum operating speed** is 25 mph, with permanent 10 mph speed restrictions between MPs 146.0 and 148.0 and 159.6 and 161.0.
- **Maximum gross weight** per car is 286K for the entire line, with the exception of 268,000 pounds between MPs 165.0 and 179.5.

Figure 2-8. BNSF Twin Cities Division



Source: BNSF Railway

Glasston Subdivision

The subdivision is a 30.6-mile branch line between Grand Forks and the end of the subdivision 8.16 miles north of Minto.

- **Maximum operating speed** is 25 mph, with permanent 10 mph speed restrictions between MPs 0.0 and 0.4.
- **Maximum gross weight** per car is 286K for the entire line.

Grand Forks Subdivision

The 135.0-mile main line connects with the Devils Lake Subdivision at the Devils Lake Switch on the east edge of Grand Forks with 4.0 miles in North Dakota. The line traverses the DeMers rail yard in Grand Forks.

GRAND FORKS SUBDIVISION MAIN LINE		
Rail Siding Locations and Lengths		
Wilton	MP 84.1	8129 ft.
Ebro	MP 57.7	8,239 ft.
McIntosh	MP 37.2	9,033 ft.
Benoit	MP 12.9	9,038 ft.
Fish	MP 93.1X	7,710 ft.

Source: BNSF Employee Timetables; WSP Analysis

Hannah Subdivision

The 50.8-mile branch line is located between Conway and Langdon. The subdivision connects with a section of line on which BNSF and Northern Plains Railroad (NPR) have joint trackage rights, and connects with the Glasston Subdivision at Ardoch via the NPR Devils Lake Subdivision.

- **Maximum operating speed** is 25 mph.
- **Maximum gross weight** per rail car is 286K for the entire line.

Hillsboro Subdivision

The subdivision is a 74.0-mile main line located between the connection with the KO main line in Fargo and the connection with the Devils Lake Subdivision in Grand Forks.

- **Maximum operating speed** for freight is 50 mph with permanent speed restrictions of 10 mph for MPs 97.6 and 98.2, 25 mph between MPs 24.2 and 24.3, and 30 mph between MPs 24.3 and 26.1.
- **Maximum operating speed** for the Amtrak *Empire Builder* passenger train is 70 mph with permanent speed restrictions of 10 mph between MPs 97.6 and 98.2, 25 mph between MPs 24.2 and 24.3 and 50 mph between MPs 24.3 and 26.1.
- **Maximum gross weight** per rail car is 286K for the entire line.

HILLSBORO SUBDIVISION MAIN LINE		
Rail Siding Locations and Lengths		
Bison	MP 28.4	9,382 ft.
Harwood	MP 31.9	6,455 ft.
Grandin	MP 49.5	11,701 ft.
Hillsboro	MP 61.7	9,780 ft.
Buxton	MP 76.7	12,180 ft.
Spirit	MP 86	9,472 ft.

Source: BNSF Employee Timetables; WSP Analysis

Hunter, Clifford Line, and Warwick Subdivisions

These three branch lines are 11.0 miles, 17.5 miles, and 68.7 miles, respectively.

- **Maximum operating speed** is 10 mph on the Hunter subdivision, and 25 mph on the Clifford Line and Warwick Subdivisions.
- **Maximum gross weight** on all three subdivisions is 286K per rail car.
- No **rail sidings** on these three branch lines.

Jamestown Subdivision

The 169.1-mile main line connects with the Montana Division's Dickinson Subdivision main line at Mandan and with the KO Subdivision main line at the Surrey Junction, 31.2 miles west of Fargo.

- **Maximum operating speed** is 60 mph for rail cars loaded under 100 tons, and 45 mph for rail cars loaded 100 tons and over. There are permanent speed restrictions:
  - MP 59.0 to MP 64.3: 50 mph
  - MP 64.3 to MP 65.3: 40 mph
  - MP 65.3 to MP 68.0: 50 mph
  - MP 97.6 to MP 96.0X: 35 mph
  - MP 108.0 to MP 112.5: 50 mph
  - MP 192.0 to MP 196.0: 35 mph
  - MP 196.0 to MP 198.9: 25 mph
- **Maximum gross weight** for the entire line is 286K.

JAMESTOWN SUBDIVISION MAIN LINE		
Rail Siding Locations and Lengths		
Koldok	MP 51.8	7,318 ft.
Peak	MP 60.0	6,648 ft.
Sanborn	MP 76.1	7,940 ft.
Urbana	MP 86.4	8,768 ft.
Windsor	MP 109.0	6,998 ft.
Medina	MP 121.5	7,169 ft.
Ladoga	MP 134.5	10,829 ft.
Steele	MP 151.0	6,852 ft.
Driscoll	MP 161.9	8,260 ft.
Burleigh	MP 181.6	7,603 ft.
Pierce	MP 189.8	7,400 ft.

KO Subdivision

The 203.2-mile main line is located between the East Dilworth station in Dilworth, MN, passing through Fargo and Minot, where it connects with the BNSF Montana Division's Glasgow Subdivision. Double main line tracks in North Dakota between MPs 7.1 and 31.1.

- **Maximum operating speed** is 70 mph for freight trains meeting specific operating requirements; otherwise, the maximum operating speed is 60 mph. There are several short sections of other permanent speed restrictions on this line from 35 mph and 55 mph.
- **Maximum gross weight** per rail car is 286K for the entire route.

KO SUBDIVISION MAIN LINE		
Rail Siding Locations and Lengths		
Absaraka	MP 10.5X	9,371 ft.
Nolan	MP 24.3X/41.0	9,490 ft.
Pillsbury	MP 52.8	7,733 ft.
Luverne	MP 60.2	9,145 ft.
Hannaford	MP 73.0	9,613 ft.
Sutton	MP 86.4	9,686 ft.
Juanita	MP 99.9	9,630 ft.
Brantford	MP 112.7	8,797 ft.
New Rockford	MP 124.3	11,516 ft.
Bremen	MP 136.8	8,552 ft.
Heimdal	MP 149.5	9,078 ft.
Selz	MP 161.7	8,994 ft.
Aylmer	MP 177.0	9,526 ft.
Guthrie	MP 186.8	9,388 ft.
Karlsruhe	MP 199.6	9,168 ft.
Simcoe	MP 211.9	9,782 ft.

Source: BNSF Employee Timetables; WSP Analysis

Mayville Subdivision

The 31.5-mile branch line is a line from the Mayville Junction within the Devils Lake Subdivision south and Mayfield.

- **Maximum operating speed** is 25 mph for the entire line.
- **Maximum gross weight** per rail car is 286K, except for the last southern 0.5 mile where it is 268,000 pounds.

Prosper Subdivision

The 41.0-mile subdivision is a main line between the Fargo Yard and Nolan, where it connects with the KO Subdivision main line.

- **Maximum operating speed** is 49 mph for the entire route. There are short, specific permanent speed restrictions along the line from 10 mph to 40 mph.
- **Maximum gross weight** per rail car is 286K for the entire line.

PROSPER SUBDIVISION MAIN LINE		
Rail Siding Locations and Lengths		
Mason	MP 28.9	3,546 ft.

Source: BNSF Employee Timetables; WSP Analysis

Rolla Subdivision

The 47.3-mile branch line is a line north between the Devils Lake Subdivision main line at Churchs Ferry and Rolla.

- Maximum operating speed is 25 mph.
- Maximum gross weight per rail car is 286K.

Westhope Subdivision

This 40.1-mile branch line is a line north between the Devils Lake Subdivision main line at Rugby and the end of the track, 2.2 miles north of Bottineau.

- **Maximum operating speed** is 25 mph between MPs 1.0 and 37.2 and 10 mph between MPs 8.4 and the NPRR crossing.
- **Maximum gross weight** per rail car is 286K between MPs 0.0 and 37.9 and 268K between MPs 37.9 and 40.1.

Zap Subdivision

The subdivision is an 80.5-mile branch line between the Jamestown Subdivision main line at Mandan and Zap.

- **Maximum operating speed** is 25 mph with several specific locations with permanent speed restrictions of 10 mph.
- **Maximum gross weight** per rail car is 286K for the entire line.

ZAP LINE SUBDIVISION BRANCH LINE		
Rail Siding Locations and Lengths		
Sanger	MP 27.0	8,500 ft.
Stanton	MP 52.4	3,646 ft.
Hazen	MP 64.4	9,107 ft.

Source: BNSF Employee Timetables; WSP Analysis

Montana Division

The Montana Division, headquartered in Billings, MT, covers the western part of North Dakota. The main line of the Montana Division begins in Minot, ND, and passes through Stanley and Williston before it crosses the Montana border at Fort Union, MT. The Montana Division is part of BNSF's main route through North Dakota and a segment of BNSF's GNC, moving crude oil, grain, and coal through the western part of the state. Amtrak also operates over the division connecting Minot with stations and the west.

The Montana Division in North Dakota comprises seven subdivisions as shown in Figure 2-9.

Two subdivisions constitute the division's main line: the Dickinson and Glasgow Subdivisions. Freight trains are permitted to operate at a maximum of 60 mph on the main line; however, with a restriction of 50 mph on the Dickinson Subdivision for cars with loads in excess of 100 tons. Amtrak trains can operate at 79 mph on the main lines. Main line passing sidings range between 6,500 feet and in excess of 15,000 feet, permitting the operation of long trains.

Train speeds on the branch lines range 10–40 mph. Portions of the division's branch line network cannot accommodate cars at the preferred gross weight of 286K. Select features of each subdivision are described in the following sections.

Crosby Subdivision

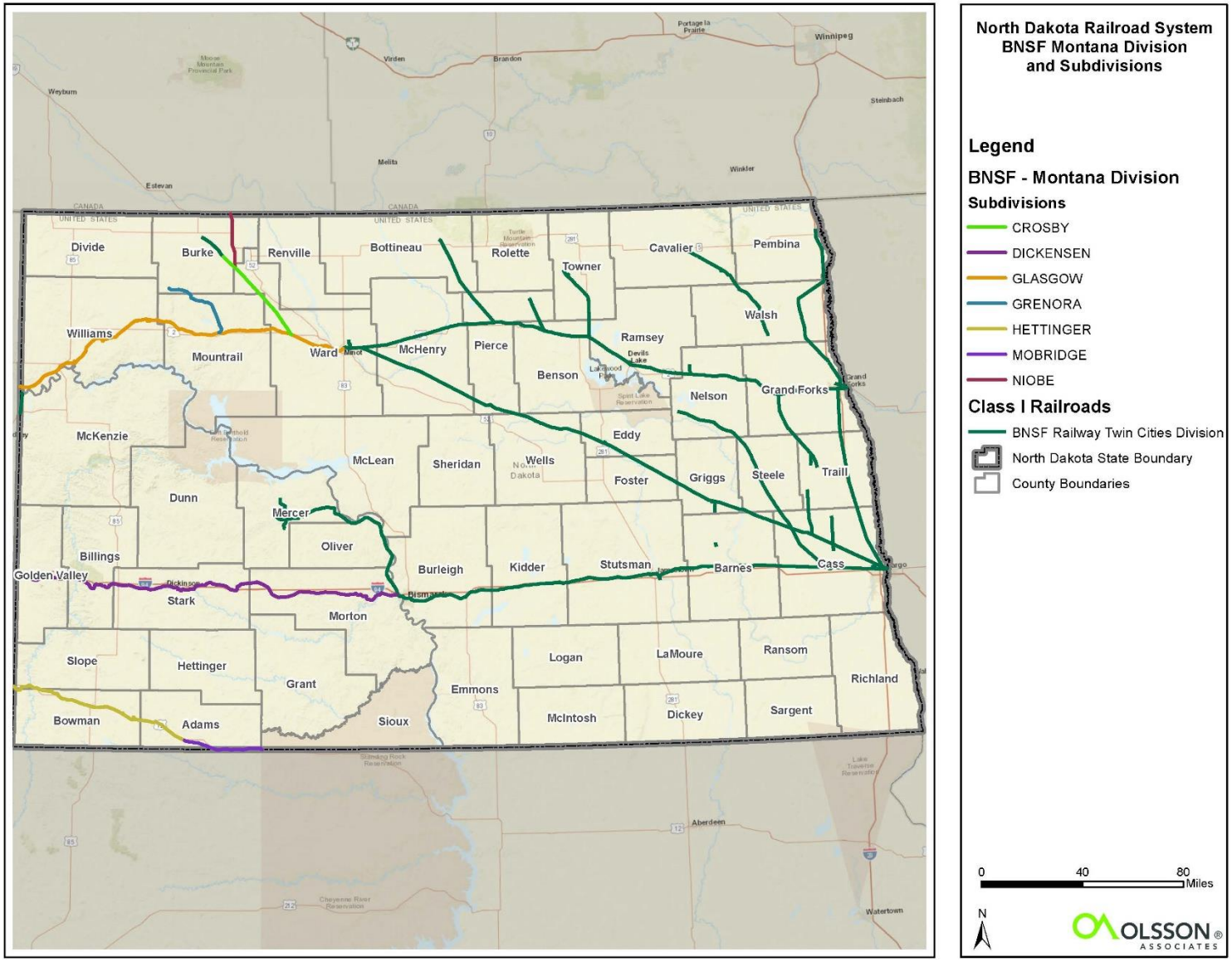
The subdivision is a 47.0-mile branch line between Berthold and a point 6.4 miles past Coteau.

- **Maximum operating speed** is 25 mph from Berthold and Niobe, and 10 mph for loads between MPs 33.9 and 47.0.
- **Maximum gross weight** between MPs 0.0 and 33.9 is 286K and between MPs 33.9 and 47.0 is 268K.

CROSBY SUBDIVISION BRANCH LINE		
Rail Siding Locations and Lengths		
Berthold	MP 0	1,913 ft.
Niobe	MP 33.9	1,703 ft.

Source: BNSF Employee Timetables; WSP Analysis

Figure 2-9. BNSF Montana Division



Source: BNSF Railway

Dickinson Subdivision

The subdivision is a 215.8-mile main line between Mandan and Glendive, MT. Approximately 175 miles lies in North Dakota.

- **Maximum operating speed** is 60 mph for rail cars loaded under 100 tons and 50 mph for rail cars loaded over 100 tons.
- **Maximum gross weight** is 286K for the entire line; however, shorter cars cannot be loaded to the maximum 286K.

DICKINSON SUBDIVISION MAIN LINE		
Rail Siding Locations and Lengths		
Lyons	MP 8.3	7,360 ft.
Judson	MP 22.6	9,012 ft.
New Salem	MP 27.9	7,558 ft.
Dengate	MP 38.7	6,875 ft.
Glen Ullin	MP 57.5	11,405 ft.
Hebron	MP 70.1	9,437 ft.
Antelope	MP 79.2	7,982 ft.
Taylor	MP 92.0	10,917 ft.
Lehigh,	MP 104.9	7,003 ft.
South Heart,	MP 119.1	7,577 ft.
Fryburg,	MP 134.5	9,673 ft.
Sully Springs,	MP 141.0	9,592 ft.
Rider,	MP 155.0	7,474 ft.
Sentinel Butte,	MP 167.2	10,115 ft.

Source: BNSF Employee Timetables; WSP Analysis

Glasgow Subdivision

The subdivision is a 278.2-mile line between Minot and Glasgow, MT, with approximately 145 miles in North Dakota. Double main line tracks in North Dakota are between MPs 0.0 and 4.7 and MPs 5.9 and 124.8.

- **Maximum operating speed** is 60 mph for freight and 79 mph for the Amtrak *Empire Builder* passenger train operating over this line.
- **Maximum gross weight** is 286K for the entire line.

GLASGOW SUBDIVISION MAIN LINE		
Rail Siding Locations and Lengths		
Berthold	MP 22.7	9,880 ft.
Tagus	MP 31.1	10,195 ft.
Blaisdell	MP 39.4	9,090 ft.
Stanley	MP 52.5	10,248 ft.
Ross	MP 61.5	8,264 ft.
Wheelock	MP 99.0	8,665 ft.
Trenton	MP 133.2	15,021 ft.

Source: BNSF Employee Timetables; WSP Analysis

Grenora Subdivision

The subdivision is a 26.0-mile branch line between the Stanley station and the end of the subdivision, 1.4 miles west of Powers Lake station.

- **Maximum operating speed** is 10 mph.
- **Maximum gross weight** is 286K for the entire line.

Hettinger Subdivision

The subdivision is a 152.9-mile main line between Hettinger, ND, and Terry, MT, with approximately 76 miles in North Dakota.

- **Maximum operating speed** is 40 mph with a permanent speed restriction of 20 mph between MPs 927.5 and 928.0.
- **Maximum gross weight** is 286K for the entire line.

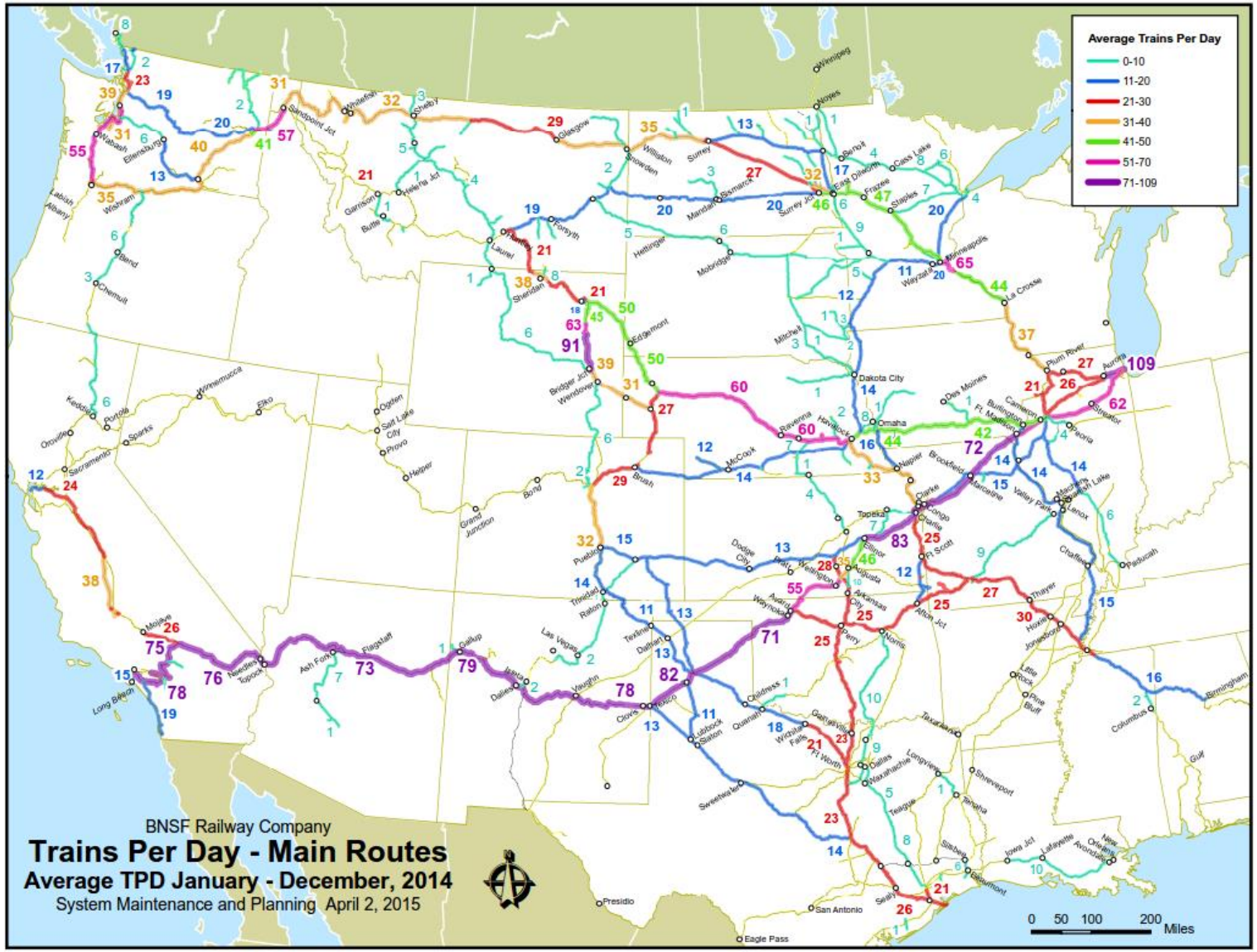
HETTINGER SUBDIVISION MAIN LINE		
Rail Siding Locations and Lengths		
Hettinger	MP 926.0	9,690 ft.
Buffalo Springs	MP 959.6	7,806 ft.
Rhame	MP 980.6	6,550 ft.

Source: BNSF Employee Timetables; WSP Analysis

BNSF Operations

North Dakota is located at the center of BNSF's operations between Chicago and the Pacific Northwest. Consequently, a significant volume of east-west traffic passes through the state. In addition, North Dakota is a substantial originator of freight rail traffic. In 2014, 60 trains per day crossed the Minnesota-North Dakota border traveling over North Dakota's three BNSF main lines (Figure 2-10). Twenty of those trains operated between Fargo and Bismarck, with the other 40 converging east of Minot at Surrey where the Devils Lake and KO Subdivisions join. Thirteen of those 40 trains passed through Grand Forks while 27 passed through Fargo.

Figure 2-10: BNSF Average Trains per Day



Source: BNSF Railway

The western part of the state experienced nearly as much train activity on the BNSF routes. Thirty-five trains per day operated between Minot and the Montana border; 20 trains per day traveled between Bismarck and the border.

BNSF's operations can also be described by the tonnage traversing its lines. Table 2-1 presents the top five commodities originated and terminated by BNSF in North Dakota in 2015. Figure 2-11 and Figure 2-12 map the gross tonnage moving over BNSF network. For each BNSF line, the top bar represents the eastward traffic volume and the bottom bar, the westward traffic volume. The map shows that the line through Bismarck has significant imbalance of tonnage with a heavier traffic flow moving east. Considering that this volume appears to originate in northeastern Wyoming, it can be assumed that the traffic is predominately eastbound, coal from the Powder River Basin with the westbound flow being empty coal cars.

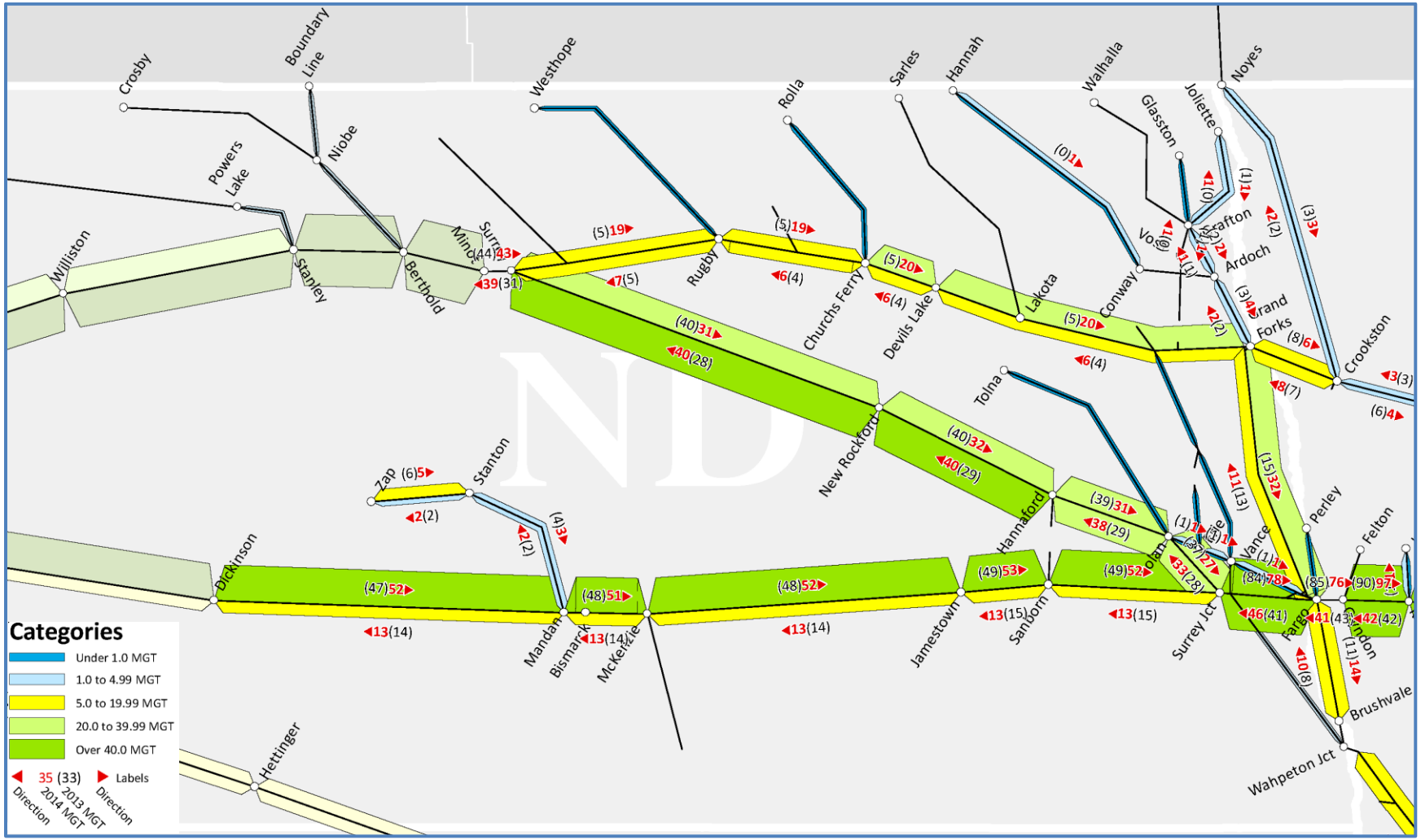
Table 2-1. BNSF Commodities Originating and Terminating in North Dakota (2015)

BNSF Originated			BNSF Terminated		
Commodity	Number of Cars	Number of Tons	Commodity	Number of Cars	Number of Tons
Crude, Petroleum, Natural Gas & Natural Gasoline	268,077	26,581,776	Nonmetallic Minerals Except Fuels	37,724	4,005,456
Grain	119,693	12,803,345	Coal	26,449	3,010,136
Coal	34,537	3,367,455	Chemicals and Allied Products	13,788	1,332,332
Food and Kindred Products	30,917	2,887,520	Stone, Clay, Glass & Concrete Products	8,875	938,215
Petroleum and Coal Products	22,416	1,674,046	Farm Products	6,727	664,976
All Other	13,768	1,141,680	All Other	23,415	1,210,388
Total	**489,408**	**48,455,822**	**Total**	**116,978**	**11,161,503**

Source: North Dakota Public Service Commission Annual Reports

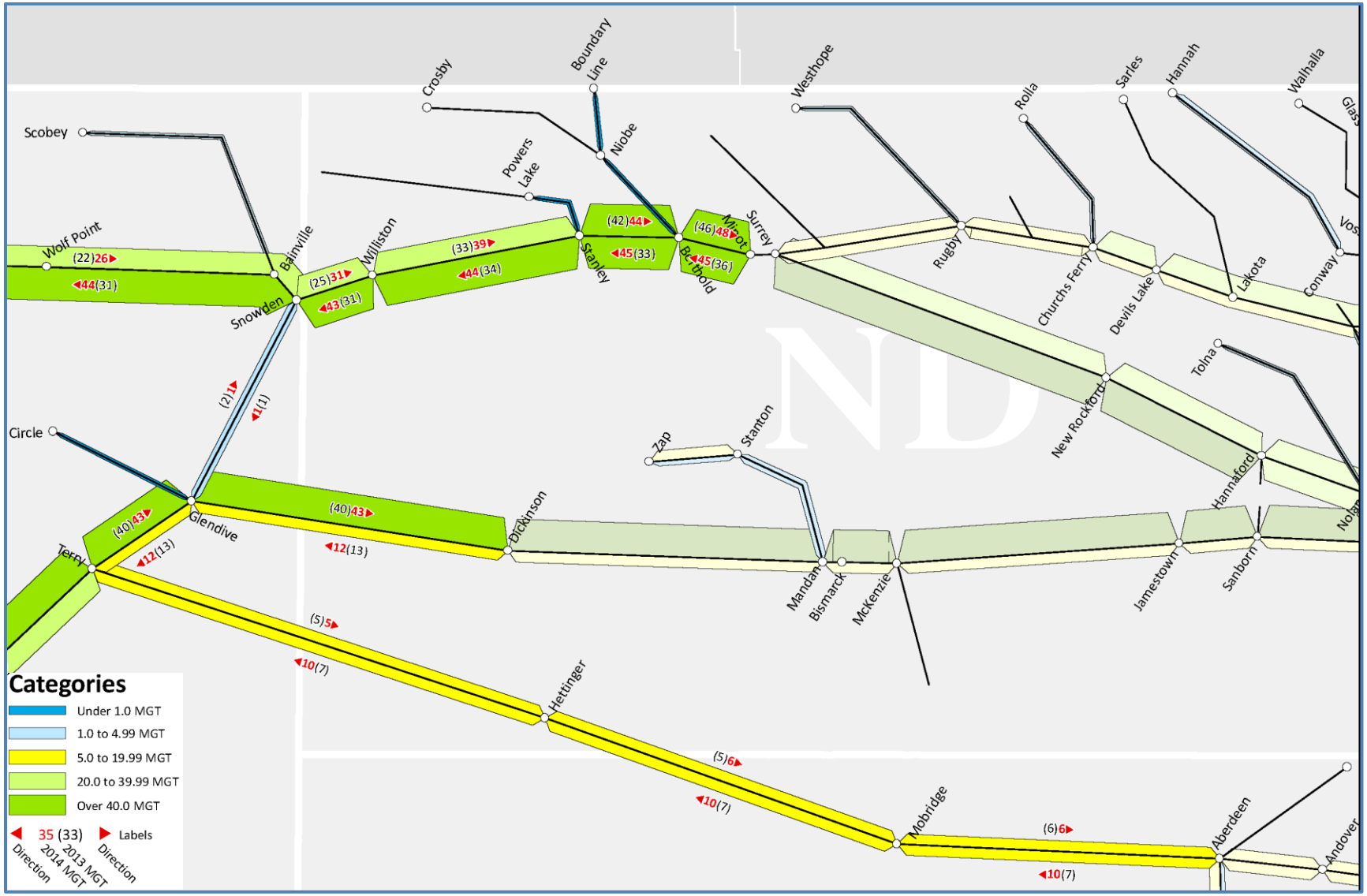
The main line directly connecting Fargo and Minot shows an imbalance with westerly tonnage greater than tonnage moving to the east. Although the volumes are not as great, the Devils Lake Subdivision has a greater eastward flow of traffic, reflecting BNSF employing a degree of directional running over these parallel lines.

Figure 2-11. Twin Cities Division Traffic Density



Source: BNSF Railway

Figure 2-12. Montana Division Traffic Density



Source: BNSF Railway

2.1.2 Canadian Pacific Railway

Canadian Pacific Railway (CP) operates over 483 miles of railroad in North Dakota. CP's entry into the state was through its US subsidiary, the Soo Line, which as of 1990 is now fully incorporated into the parent company. The CP line crosses the US-Canadian border at Portal and proceeds in a southeasterly direction across the state. Its operation in the state evolved from the Soo Line, which provided North Dakota shippers with alternative rail access to the Twin Cities.

Headquartered in Calgary, Alberta, CP serves seven Canadian provinces and eight US states. Its network serves the international gateway ports of Vancouver, Thunder Bay, and Montreal. More than a third of its traffic is intermodal with another third consisting of coal, grain, chemicals, and petroleum products. Its US operations reach Chicago and Northern New Jersey where it connects to the Port of New York and New Jersey.

Network Configuration

From the west, CP's Heartland Division enters the state at Portal, the border crossing with Canada. The main line then proceeds in a southeasterly direction through Minot and Carrington to the southeast corner of the state where it eventually crosses into Minnesota (Figure 2-13).

As with BNSF, the CP network in North Dakota is principally single track with passing sidings (Figure 2-14).

Following is a description of CP's network in North Dakota.

<u>Portal Subdivision – Main Line</u>

The 152.5-mile main line runs southeast out of Portal at the Canadian border to Harvey. Capacity improvements were completed in 2012 and 2013, allowing for an additional 2 trains per day on the line.

- **Maximum operating speed** on this line is 49 mph.
- **Maximum gross weight** on this line is 286K.

<u>Carrington Subdivision – Main Line</u>

The 112.2-mile main line runs from Harvey, where it connects with the Portal Subdivision to Enderlin. A capacity improvement project was completed in 2013 that provided an additional track to improve operational efficiencies at Enderlin.

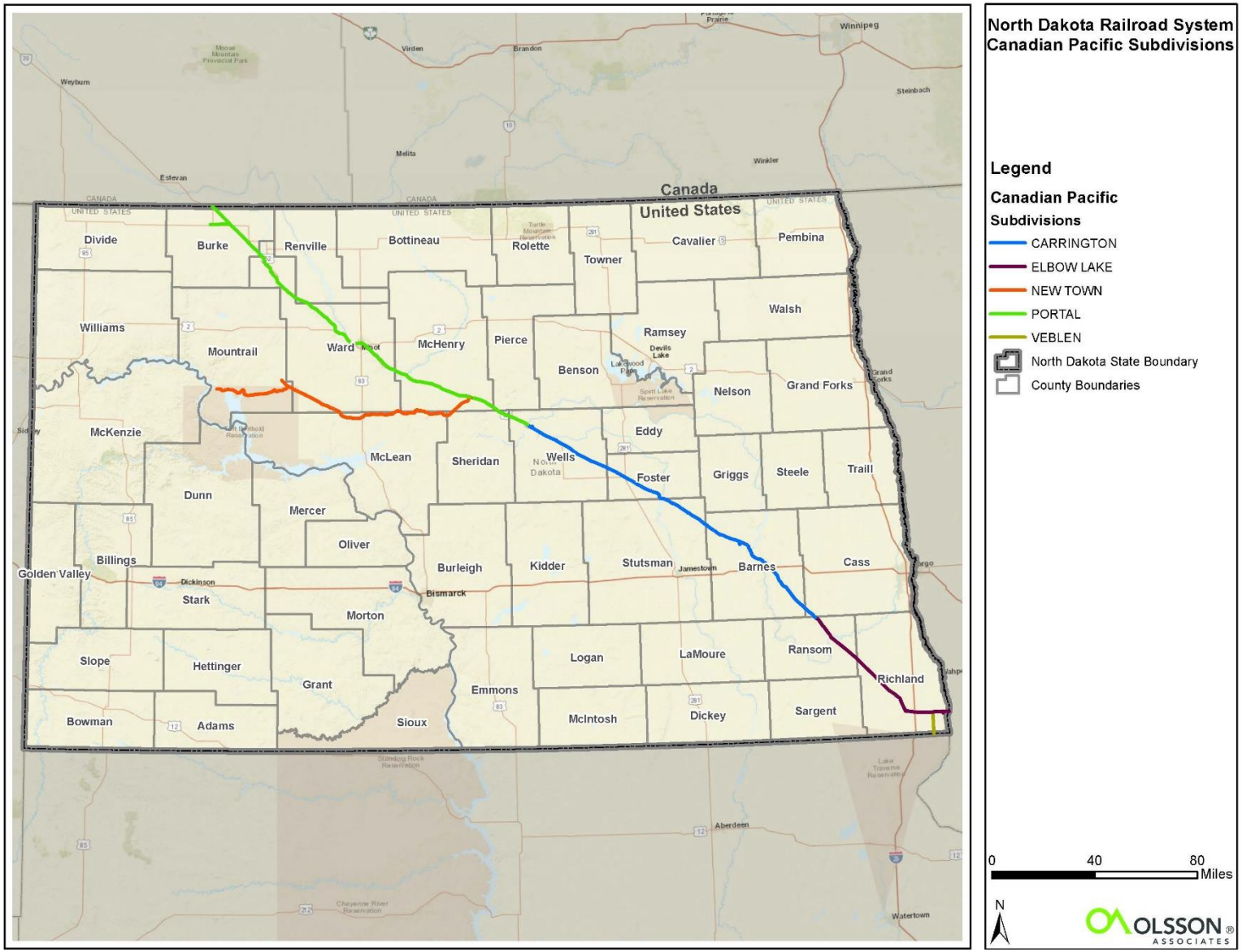
- **The maximum operating speed** on this main line is 49 mph.
- **Maximum gross weight** is 286K over the entire line.

<u>Elbow Lake Subdivision – Main Line</u>

The 67.0-mile main line connects Enderlin and Fairmont.

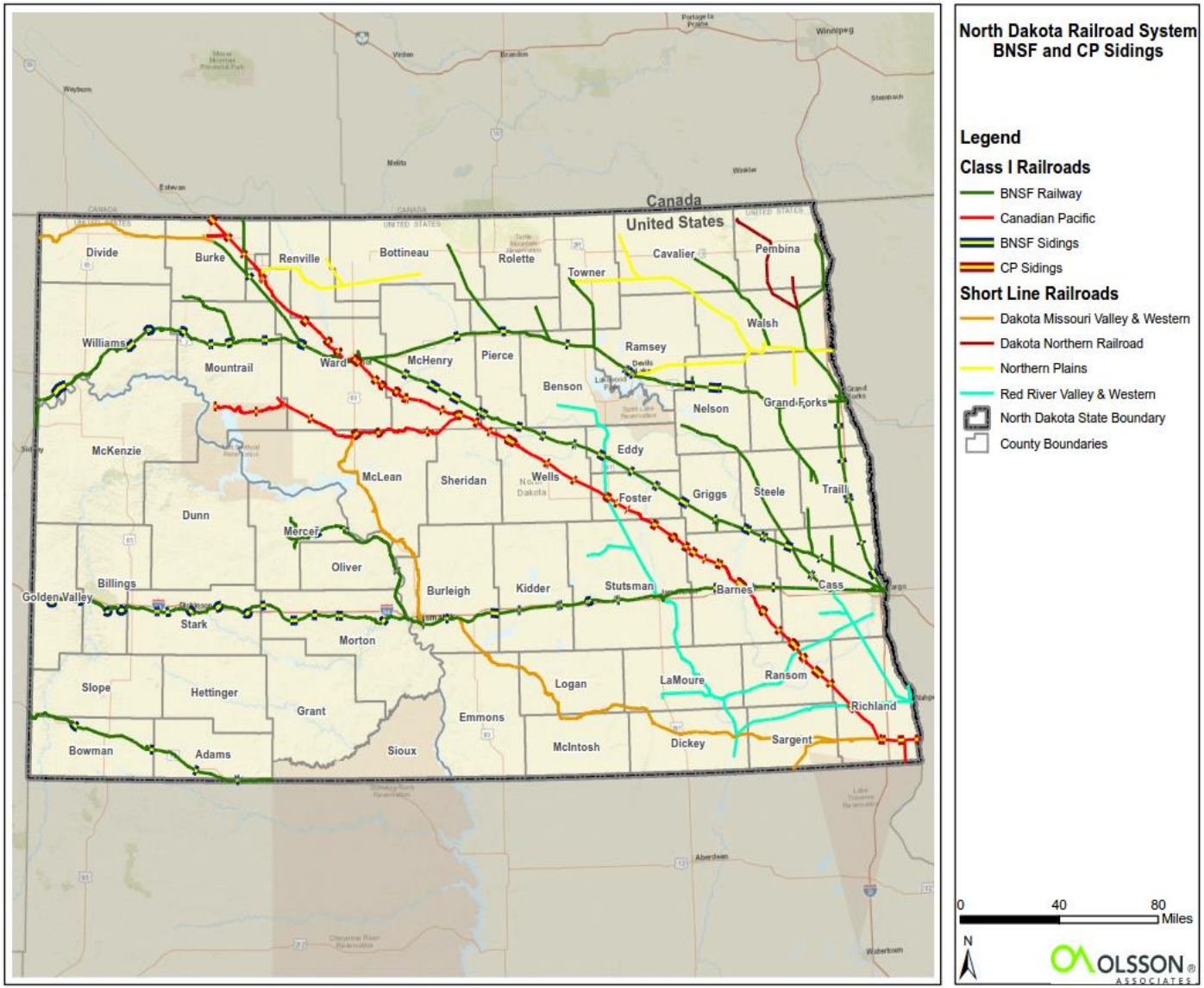
- **Maximum operating speed** is 49 mph for the entire line.
- **Maximum gross weight** is 286K for the entire line.

Figure 2-13. Canadian Pacific North Dakota Network



Source: Canadian Pacific Railway

Figure 2-14. North Dakota Rail System Class I Passing Sidings



Source: BNSF Railway, Canadian Pacific Railway, WSP Analysis

New Town Subdivision – Branch Line

The 114.7-mile subdivision includes the lines between Drake and Max, Max and New Town, and the line between Prairie Junction and Plaza. The Drake-Max line connects with the Portal subdivision 49.2 miles southeast of Minot and proceeds west for 48.2 miles to Max. The Max-New Town line runs 62.7 miles to the northwest from Max. Prairie Junction is located 31.1 miles west of Max with the Prairie Junction to Plaza line extending 3.8 miles to the north to Plaza.

- **The maximum operating speed** is 25 mph**.**
- **The maximum gross weight** is 286K**.**

Veblen Subdivision – Branch Line

This branch line connects with the Elbow Lake Subdivision – Main line at Hankinson and runs 8.9 miles to the South Dakota border.

- **The maximum operating speed** is 25 mph.
- **The maximum gross weight** is 286K for the entire line**.**

Canadian Pacific Operations

CP operates an average of 10 intercity freight trains per day between Portal and Drake. In addition, one or two local trains operate over various sections of the line. Approximately 13 intercity trains per day operate between Drake and Veblen, complemented by one or two local trains over sections of the line. Table 2-2 presents the top five commodities originated and terminated by CP in North Dakota in 2015.

Table 2-2. Canadian Pacific Commodities Originating and Terminating in North Dakota (2015)

CP Originated			CP Terminated		
Commodity	Number of Cars	Number of Tons	Commodity	Number of Cars	Number of Tons
Grain	52,378	5,285,330	Nonmetallic Minerals	7,682	842,899
Crude, Petroleum, Natural Gas & Natural Gasoline	35,811	3,643,116	Stone, Clay, Glass & Concrete Products	3,909	427,713
Food and Kindred Products	8,179	817,299	Chemicals and Allied Products	4,655	407,825
Chemicals and Allied Products	5,017	474,288	Farm Products	2,207	216,022
Coal	2,898	289,899	Primary Metal Products	981	85,514
All Other	5,467	499,759	All Other	1,552	110,668
Total	**109,750**	**11,009,691**	**Total**	**20,986**	**2,090,641**

Source: North Dakota Public Service Commission Annual Reprts

2.2 NORTH DAKOTA SHORT LINE RAILROAD PROFILES

The fundamental purpose of the short line railroad in North Dakota is to provide access for the multitude of small rural towns to the Class I railroad network connecting to the rest of the North American continent. Rail moves large volumes of freight at a relatively inexpensive price as compared to other modes of transportation. Additionally, items such as oil and many agricultural products would require a fleet of trucks, and be impractical and detrimental to the state's roadways. A short line operator may stop at several small transload facilities or grain elevators, and collect a variety of freight that will be delivered to and sorted by a main line operator for delivery across the continent. Inbound freight goes through the same process in reverse order.

The short line railroads provide a more customer focused experience than the main line carriers. They view their customers as partners in their success. Because of their size, short lines are more sensitive to the needs of their customers. With this attitude, North Dakota's short line railroads provide fuel savings and environmentally friendly shipping opportunities for many businesses and communities throughout the state. Short lines provide efficient transportation services, while maintaining and protecting the environments in which they operate. The freight moved by rail also improves highway safety and reduces congestion on the state roadways. This issue is becoming more critical as increasing amounts of materials are traversing the state to support growing agricultural activities, energy production, and farm product processing.

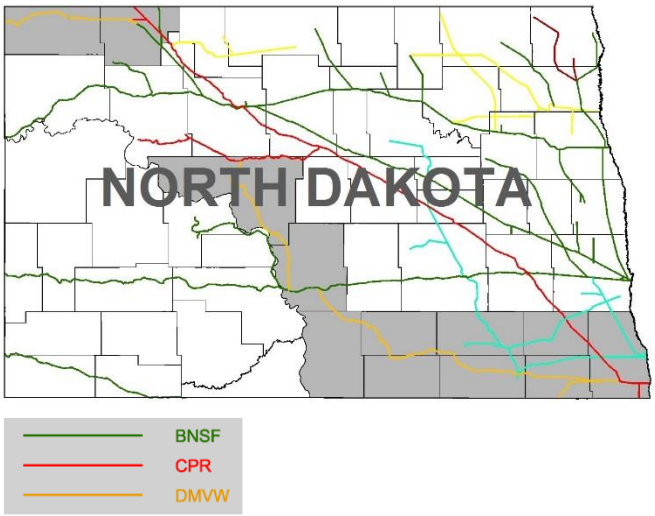
A difficulty faced by the short line railroad operator is striking a balance between serving the needs of local producers and manufacturers while meshing with the requirements and schedules of the main line carriers. The expanding size and number of unit trains on the rails by both BNSF and CP is adding to the reliance and need for efficient short line partners. These two main line railroads primarily transport goods between larger cities within the state, and carry freight beyond the borders of North Dakota, connecting to the larger North American continent. This provides economic opportunities for all types of businesses that either import freight to manufacture products and to grow crops or are the originator of freight like agricultural, processing, and oil operations.

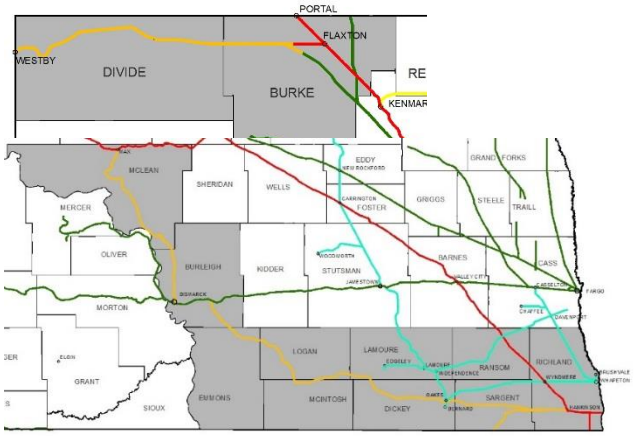
Cooperation is a necessity between the main line and the short line carriers. Each has a different business model and each has different customers, but in the final analysis, each depends on the other.

Following are profiles of the state's short line railroads.

2.2.1 Dakota, Missouri Valley and Western Railroad (DMVW)

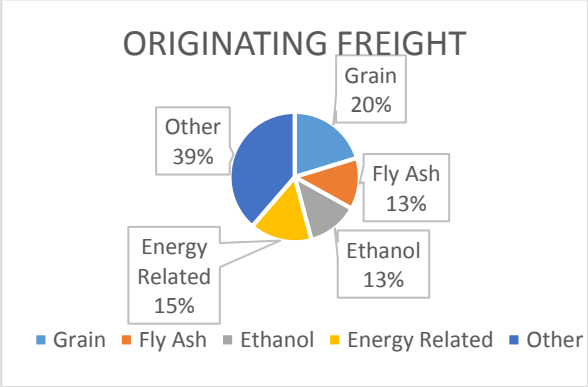
The Dakota, Missouri Valley, and Western Railroad began operations in September 1990, when the company was the successful bidder to operate 360 miles of Soo Line track and trackage rights in North Dakota and Montana. Currently, DMVW operates 530 miles of track with 389 miles in North Dakota. The railroad interchanges with Canadian Pacific (CP) at the ND cities of Flaxton, Hankinson, and Max. DMVW also has interchange capability with BNSF at Bismarck, ND.





Track Data

Owned/Leased Track	375
Miles of Trackage Rights	14
Class 1 Track	239 miles
Class 2 Track	109 miles
Less than 286K	239 miles

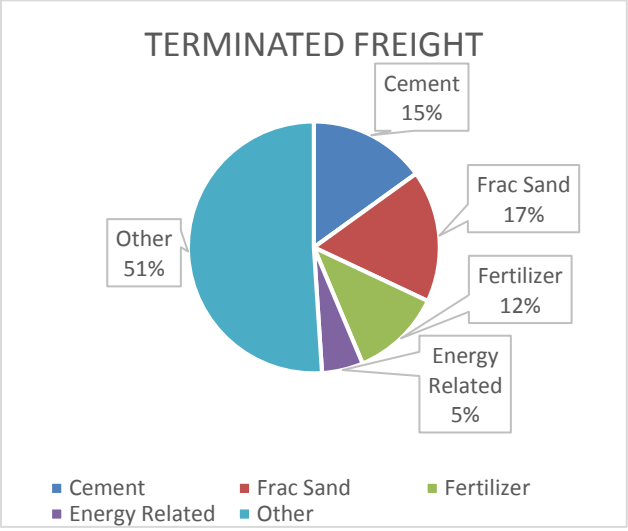


Originated Freight System Wide

Grain	2,889,120 Tons	22,224 Carloads
Fly Ash	182,390 Tons	1,403 Carloads
Ethanol	182,000 Tons	1,400 Carloads
Energy Related	221,130 Tons	1701 Carloads
Other	551,460 Tons	4,242 Carloads
Total	4,026,100 Tons	30,970 Carloads

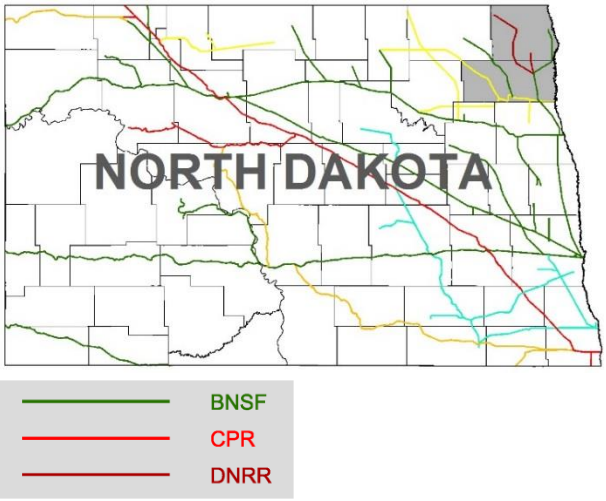
Terminated Freight System Wide

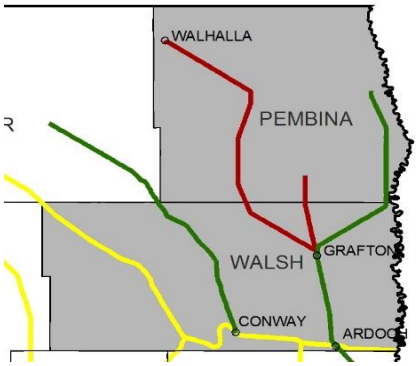
Cement	106,860 Tons	822 Carloads
Frac Sand	120,380 Tons	926 Carloads
Fertilizer	82,940 Tons	638 Carloads
Energy Related	37,570 Tons	289 Carloads
Other	304,040 Tons	2,788 Carloads
Total	651,790 Tons	5,463 Carloads



2.2.2 Dakota Northern Railroad (DNRR)

The Dakota Northern Railroad was started in 2006 with the lease of track from BNSF to KBN Inc. and Independent Locomotive Service. The company currently operates 48 miles of track between Grafton and Walhalla with four employees. Outbound freight includes wheat, corn, soybeans, edible beans, and potatoes. The inbound freight includes a variety of fertilizers. Grafton serves as the connection point with BNSF and Walhalla is the terminus point with seven stops in between. An additional 23 miles of the Glasston subdivision – beginning in Grafton - is currently under embargo due to unsteady freight volumes.





Track Data

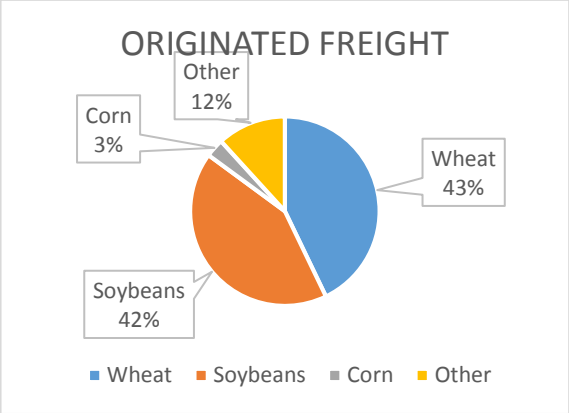
Owned/Leased Track	48 miles
Class 1 Track	29 miles
Class 2 Track	19 miles
Less than 286K	0 miles

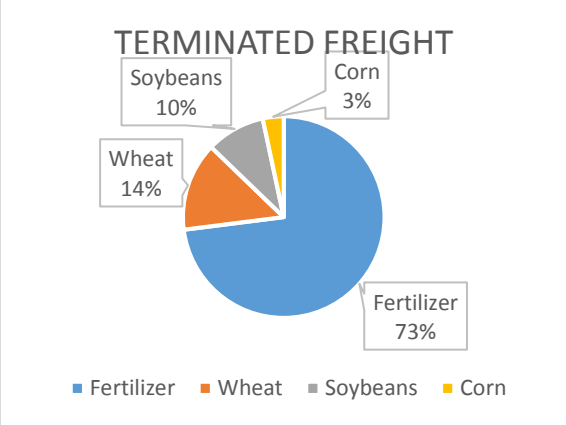
Originated Freight State Wide

Wheat	201,900 Tons	2,019 Carloads
Soybeans	198,900 Tons	1,989 Carloads
Corn	14,900 Tons	149 Carloads
Other	55,400 Tons	554 Carloads
Total	421,701 Tons	4,711 Carloads

Terminated Freight State Wide

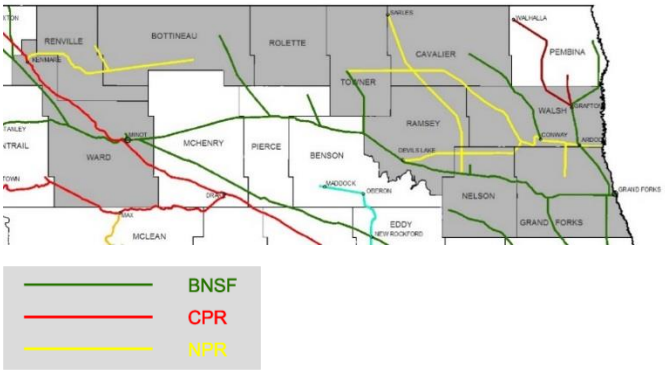
Fertilizer	71,900 Tons	719 Carloads
Wheat	14,000 Tons	140 Carloads
Soybeans	9,300 Tons	93 Carloads
Corn	3,300 Tons	33 Carloads
Total	98,500 Tons	985 Carloads





2.2.3 Northern Plains Railroad (NPR)

Northern Plains Railroad (NPR) began operations in January of 1997 on a railroad branch formerly known as the "Wheat Lines." Currently they lease 388 miles of branch line track in North Dakota and Minnesota from Canadian Pacific Railway (CP), and operate lines owned by Mohall Railroad, Inc. (MRI), and Mohall Central Railroad, Inc. (MHC), which were purchased from BNSF. The westernmost line connects with CP at Kenmare and connects with BNSF in Conway, Forest River, and Ardoch before heading east into Alvarado, Minnesota. Their southern line originates in Devils Lake, connects with their northern line, and terminates in Conway. NPR primarily serves the North Dakota agricultural community by servicing numerous grain elevator operators.



Track Data

Owned/Leased Track	342 miles
Class 1 Track	268 miles
Class 2 Track	74 miles
Less than 286K	177 miles

Originated Freight System Wide

Soybeans	813,670 Tons	6,259 Carloads
Wheat	679,510 Tons	5,227 Carloads
Corn	317,460 Tons	2,442 Carloads
Other Grains	144,170 Tons	1,051 Carloads
Total	1,954,810 Tons	14,979 Carloads

Terminated Freight System Wide

Frac Sand	61,880 Tons	476 Carloads
Pipe	41,080 Tons	316 Carloads
Fertilizer	28,470 Tons	219 Carloads
Other	290,160 Tons	2,232 Carloads
Total	421,590 Tons	3,243 Carloads

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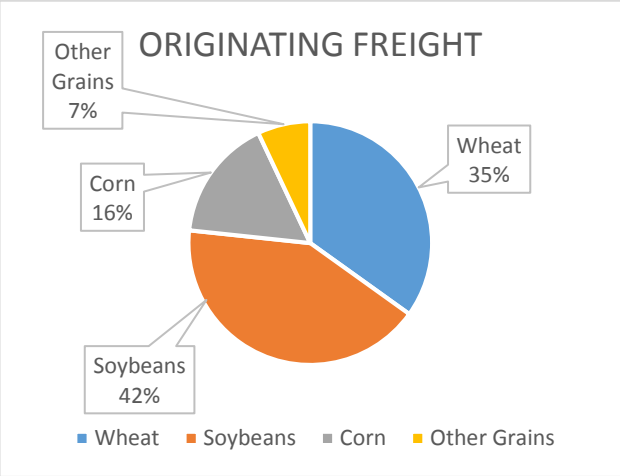
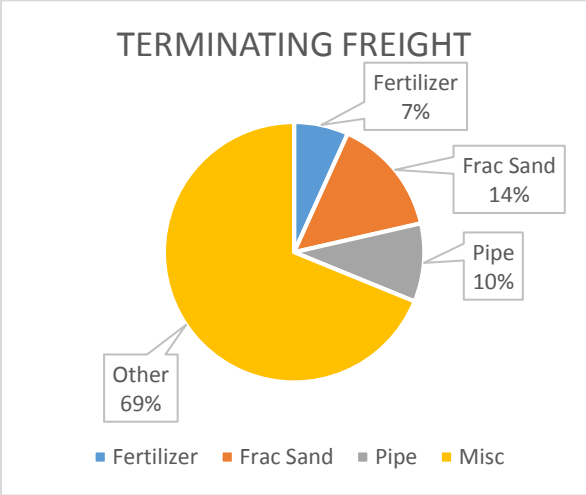
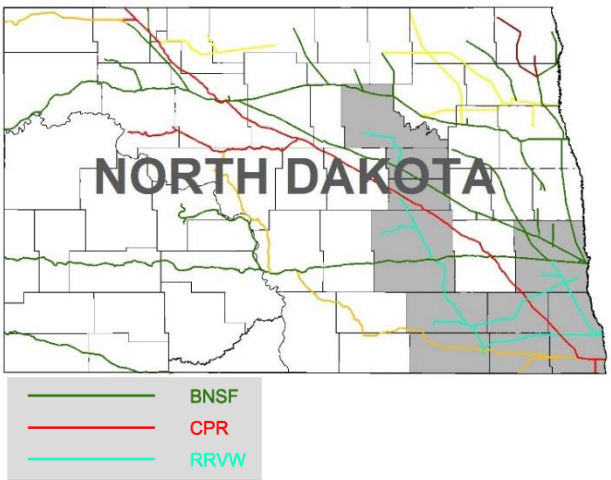
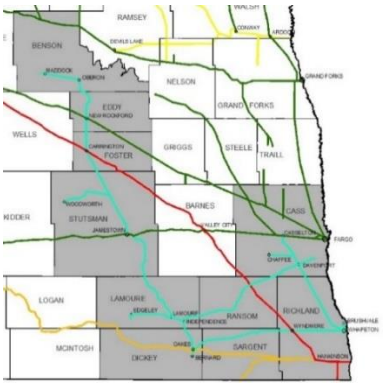




2.2.4 Red River Valley & Western Railroad (RRVW)

The Red River Valley and Western Railroad began operations in July 1987, and currently operates 546 miles of track in the mid to southeastern corner of North Dakota. The northern most destination is Maddock and routes connect with Canadian Pacific (CP) in Carrington, Ransom Junction, and Hankinson. Connections with BNSF are at New Rockford, Jamestown, Casselton, and Breckenridge, MN. RRVW also connects with DMVW in Oakes. The majority of freight carried by the RRVW is agricultural and processed products.





Track Data

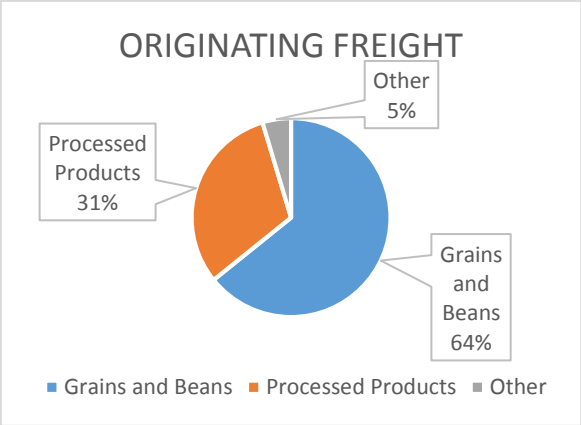
Owned/Leased Track	427 miles
Trackage Rights	119 miles
Excepted Track	62 miles
Class 1 Track	18 miles
Class 2 Track	347 miles
Less than 286K	190 miles

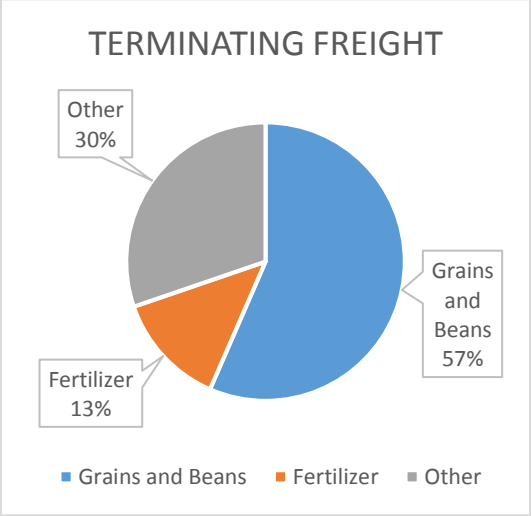
Originated Freight System Wide

Grains and Beans	3,070,000 Tons	29,743 Carloads
Processed Products	1,510,000 Tons	14,423 Carloads
Other	225,000 Tons	2,149 Carloads
Total	4,805,000 Tons	46,315 Carloads

Terminated Freight System Wide

Grains and Beans	942,000 Tons	9,614 Carloads
Fertilizer	242,000 Tons	2,248 Carloads
Other	540,000 Tons	5,144 Carloads
Total	1,724,000 Tons	17,006 Carloads





2.5 PRINCIPAL LOGISTICS FACILITIES/INLAND PORTS

North Dakota has three transload facilities/inland ports. They provide truck-rail transfer operations for multiple commodities.

2.5.1 North Dakota Port Services, Inc.

North Dakota Port Services, Inc. is North Dakota's only inland port. Located in Minot, the 124-acre facility provides services focused on the agriculture and energy industries. The port is served by BNSF and is situated 1.4 miles from the intersection of U.S. Highway 2 and 55th Street SE in Minot. NDPS services are transloading, intermodal container shipping, and product storage. Products that the NDPS specializes in include agricultural products, ceramic proppants, frac sand, crude oil, petroleum products, aggregates, pipe, and building materials.

2.5.2 Red River Oilfield Services

Red River Oilfield Services provides transload operations in Williston. Red River Oilfield Services includes the Stony Creek rail yard. The rail yard comprises nine tracks with capacity for 100 rail cars. Its principal products include industrial products; palletized, breakbulk and bulk dry goods, crude oil, NGLs, refined products, chemicals, pipe, agricultural products, and forest products. The Stony Creek rail yard provides warehousing, dry bulk storage, liquid bulk storage, and blending. Red River Oilfield Services has a second transload facility at its West Yard. Services provided comprise liquid and dry bulk transloading, liquid and dry bulk custom blending and packaging, liquid and dry bulk storage, and warehousing. BNSF is the serving railroad.

2.5.3 The Northern Plains Commerce Centre

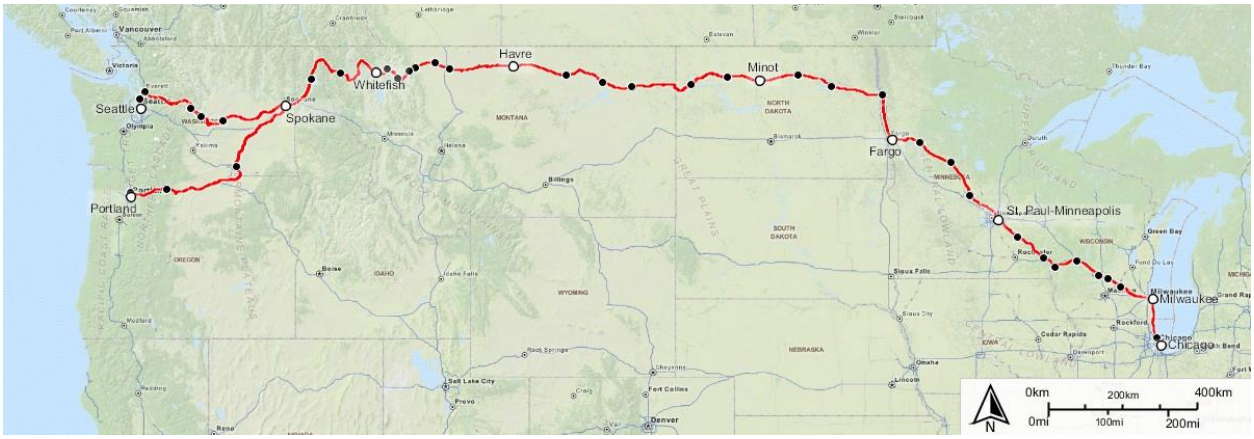
The Northern Plains Commerce Centre (NPCC) is a rail-served industrial park located in Bismarck, North Dakota. The site is located adjacent to the Bismarck Airport, The NPCC is served by both Canadian Pacific and the BNSF via the DMVW Railroad. The truck route connecting US I-94 and NPCC is considered a heavy haul corridor.

Tenants are the Bobcat Acceleration Center and Tubular Transport and Logistics (TTL), a transload facility. TTL handles both bulk and dimensional cargo.

2.6 NORTH DAKOTA PASSENGER RAIL SERVICE

Passenger rail service in North Dakota is provided by the Amtrak, *Empire Builder* service, a long-distance train that operates between Chicago and Portland/Seattle. The westbound train splits in Spokane, WA, with one section continuing to Seattle and a second traveling to Portland. The reverse occurs for the eastbound train with the two sections combined in Spokane.

Figure 2-15. Amtrak *Empire Builder*



Source: Amtrak

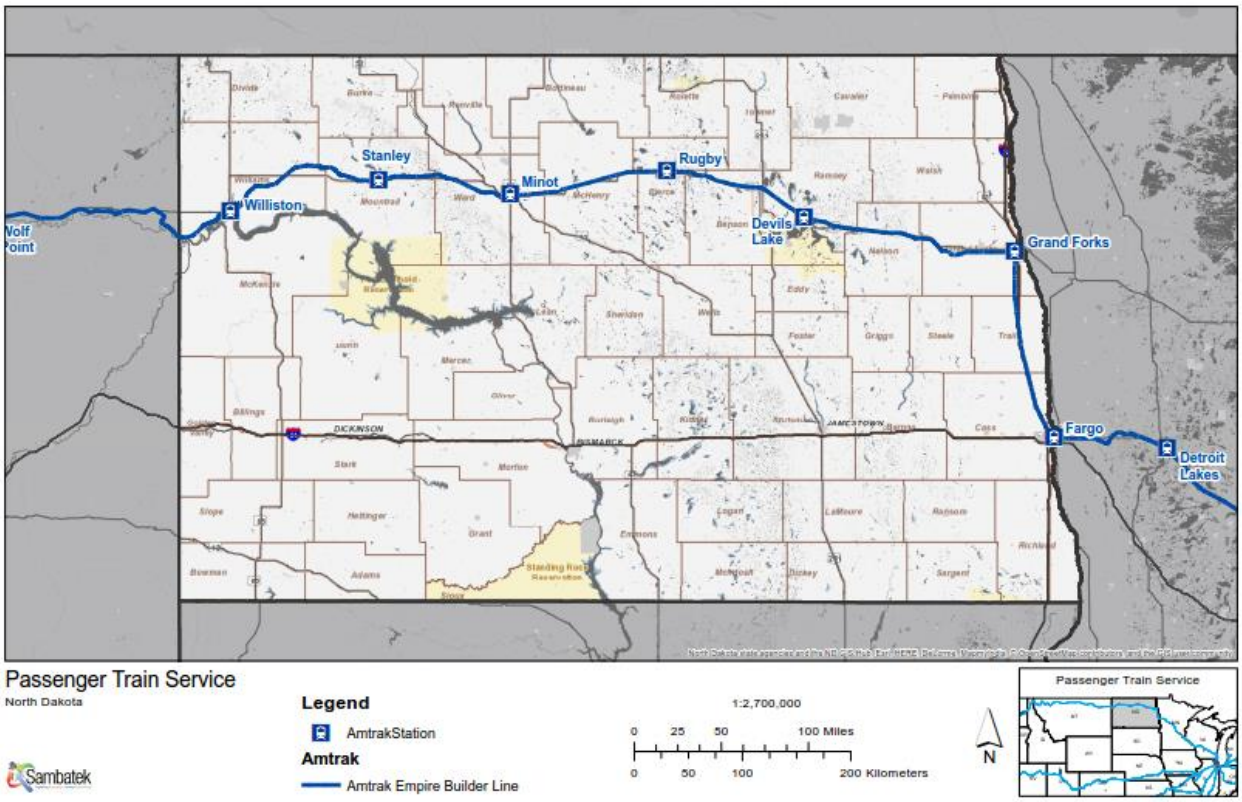
A single train in each direction passes through North Dakota each day serving seven stations. The westbound train serves North Dakota principally during the morning, while the eastbound train crosses the state at night.

Table 2-3. Amtrak *Empire Builder* Schedule

Train Number	Fargo	Grand Forks	Devils Lake	Rugby	Minot	Stanley	Williston
7/27 Westbound	3:34 AM	4:41 AM	6:02 AM	6:56 AM	8:29 AM	9:57 AM	11:07 AM
8/28 Eastbound	2:18 AM	1:02 AM	11:37 PM	10:43 PM	9:27 PM	8:01 PM	6:59 PM

The westbound and eastbound *Empire Builder* trains offer coach and sleeping car service with a dining car for convenience of the customers. Checked baggage is also provided at Fargo, Minot, and Williston. As shown in Figure 2-16, the *Empire Builder* serves Fargo, Grand Forks, Devils Lake, Rugby, Minot, Stanley, and Williston. No passenger service is provided to Bismarck.

Figure 2-16. North Dakota Amtrak Stations



Source: Amtrak

2.6.1 Population Served

The seven Amtrak stations serving the *Empire Builder* provide accessibility to many of the large population centers in the state. Along the *Empire Builder*, four of the top 10 stations by ridership are in North Dakota. Forty-four percent of the population of the state is less than 25 miles from a station. Sixty percent of the population is less than 50 miles from a station. No nearby state has the same level of population accessibility. The least accessible large city is the state capitol of Bismarck, located about 110 miles south of Minot.

Table 2-4. North Dakota Population in Proximity of a Station

Station	Within 25 Miles	Percentage of Total State Population	Within 50 Miles	Percentage of Total State Population
Devils Lake	15,060		26,460	
Fargo	152,600		172,360	
Grand Forks	64,090		84,340	
Minot	63,440		76,730	
Rugby	5,260		29,980	
Stanley	4,170		19,350	
Williston	24,280		31,820	
Total	**328,900**	**44%**	**441,040**	**60%**

Source: WSP Analysis

Table 2-5. Nearby State Population in Proximity of a Station

Station	Within 25 Miles	Percentage of Total State Population	Within 50 Miles	Percentage of Total State Population
Minnesotans	3,227,550	30%	4,294,177	40%
Montanans	143,290	7%	219,050	11%
Idahoans	82,342	3%	194,879	6%

Source: WSP Analysis

2.6.2 History and Trends

The *Empire Builder* carried more passengers in 2012 than any of Amtrak's other long-distance trains. Significant fluctuations in ridership, however, have marked recent history on the route. Ridership on the *Empire Builder* declined from a peak in 2008 to its lowest levels in 2014. The declines in ridership are attributable to a number of factors. First, the downturn in 2009 is consistent with a downturn in all forms of travel due to the recessionary economy. Lingering economic impacts negatively affected ridership through 2011.

By 2012, passengers returned to the *Empire Builder*, restoring ridership to pre-recession levels. The increased ridership was most pronounced in North Dakota. Annual ridership increased by more than 40 percent from 2011 to 2012. Across the Northern Tier states, ridership also rose by nearly 20 percent.

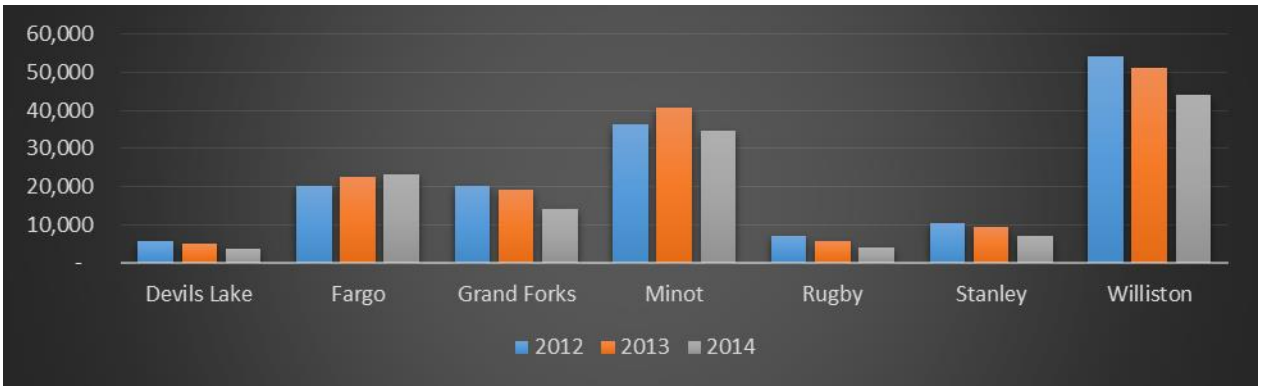
While ridership maintained peak levels through 2013, the conditions quickly eroded. On-time performance fell to 31 percent in 2013 and 21 percent in 2014. Any number below 80 percent is considered substandard. Ridership in 2014 quickly retracted by 15 percent in North Dakota and by an equivalent percentage for the entire route.

Table 2-6. North Dakota Ridership by Station

Station	2008	2009	2010	2011	2012	2013	2014	2015	2016
Devils Lake	6,860	5,740	6,148	4,569	5,505	5,142	3,555	3,512	4,223
Fargo	24,142	21,514	21,286	16,968	20,304	22,497	23,314	22,829	21,495
Grand Forks	21,942	17,928	19,641	16,935	20,028	19,141	13,976	12,131	13,882
Minot	41,754	38,418	39,585	28,217	36,285	40,595	34,834	31,827	29,424
Rugby	7,048	5,906	6,409	6,106	7,057	5,637	4,053	4,254	4,161
Stanley	3,694	3,921	4,549	6,146	10,234	9,411	7,036	6,514	5,133
Williston	23,619	21,793	24,586	29,920	54,324	51,076	44,013	38,477	27,845
Total	131,067	117,229	124,214	110,872	155,749	155,512	132,795	119,544	106,163

Source: Amtrak

Figure 2-17. North Dakota Ridership by Station (2012 – 2014)



Source: Amtrak

Freight congestion, weather conditions, and ongoing capital improvements throughout the year compounded performance challenges on the route. Delays caused an imbalance of equipment and personnel and public reports indicate that Amtrak took the drastic step of cancelling trains multiple times in one week.

Most recently, on-time performance has improved. In October and November 2015, nearly three out of four *Empire Builder* trains arrived on time.

2.6.3 Travel Characteristics

North Dakota passengers on the *Empire Builder* have a long-distance journey, typically greater than 500 miles. Among the top city pairs by passengers in 2016, eastbound travel from Minot, Fargo, and Williston to St. Paul, MN, were important ridership generators. The only westbound city pair in the top 10 was Williston to Whitefish.

Table 2-7. North Dakota Top Amtrak City Pairs by Ridership (2016)

Rank	Station Pair	Distance
1	Minot to St. Paul	522 miles
2	Fargo to St. Paul	244 miles
3	Williston to St. Paul	643 miles
4	Fargo to Chicago	662 miles
5	Grand Forks to St. Paul	319 miles
6	Williston to Whitefish	565 miles
7	Minot to Chicago	940 miles
8	Williston to Chicago	1,061 miles

Source: Amtrak

2.6.4 Passenger Rail Performance

Among the four *Empire Builder* Northern Tier states, Amtrak passengers from North Dakota generated the greatest number of coach class revenue passenger miles, yielding the greatest revenues. The total annual fare values exceeded $10 million in North Dakota in coach or business class. Among the same grouping of states, the fare value in first or sleeper class was led by Montana, followed by Minnesota then North Dakota. Fares were generally commensurate with the overall average trip length.

Table 2-8. State Financial Performance, Amtrak *Empire Builder* – Passenger Miles and Revenues

	Revenue Passenger Miles	Fare Revenue
COACH		
North Dakota	73,068,414	$10,454,940
Minnesota	57,562,065	$8,140,090
Montana	61,223,822	$8,169,161
Idaho	4,771,200	$663,495
FIRST/SLEEPER		
North Dakota	12,130,450	$3,463,755
Minnesota	18,909,576	$4,806,846
Montana	27,248,052	$7,584,225
Idaho	918,192	$260,568
ALL SERVICES		
North Dakota	85,269,212	$13,862,786
Minnesota	76,516,300	$12,934,250
Montana	88,481,900	$15,724,900
Idaho	5,687,630	$925,301

Source: Amtrak

Average fares are highest in North Dakota, Montana, and Idaho among the Northern Tier states. The coach or business class fare is nearly $90 on average. The lower average coach or business class fare in Minnesota reflects the shorter average trip length.

Table 2-9. State Financial Performance, Amtrak *Empire Builder* – Average Trip Length and Fares

	Average Trip	Average Fare
North Dakota	629 miles	$90.00
Minnesota	495 miles	$70.00
Montana	682 miles	$91.00
Idaho	640 miles	$89.00

Source: Amtrak

The *Empire Builder* is one of Amtrak's poorer performing trains. It is one of the least reliable of Amtrak's 15 long-distance trains, currently ranking in the bottom three in on-time performance and customer satisfaction. However, with the exception of 2014 when northern tier rail operations severely deteriorated due to excessive traffic and difficult winter conditions, the *Empire Builder* on-time performance is improving.

Table 2-10. Amtrak *Empire Builder* Service Measures (2012-2015)

Factor	Q3 2012	Q3 2013	Q3 2014	Q3 2015
Average Annual Speed	(0.6)	(0.6)	(4.3)	(1.7)
End Point OTP	33.1%	41.4%	31.0%	45.4%
All Stations OTP	24.5%	24.1%	22.6%	32.0%
Customer Service Score (Standard=82)	67	70	56	66
Customer Service Failure	Amtrak Personnel	Cleanliness	Cleanliness	Comfort Food

Source: Amtrak

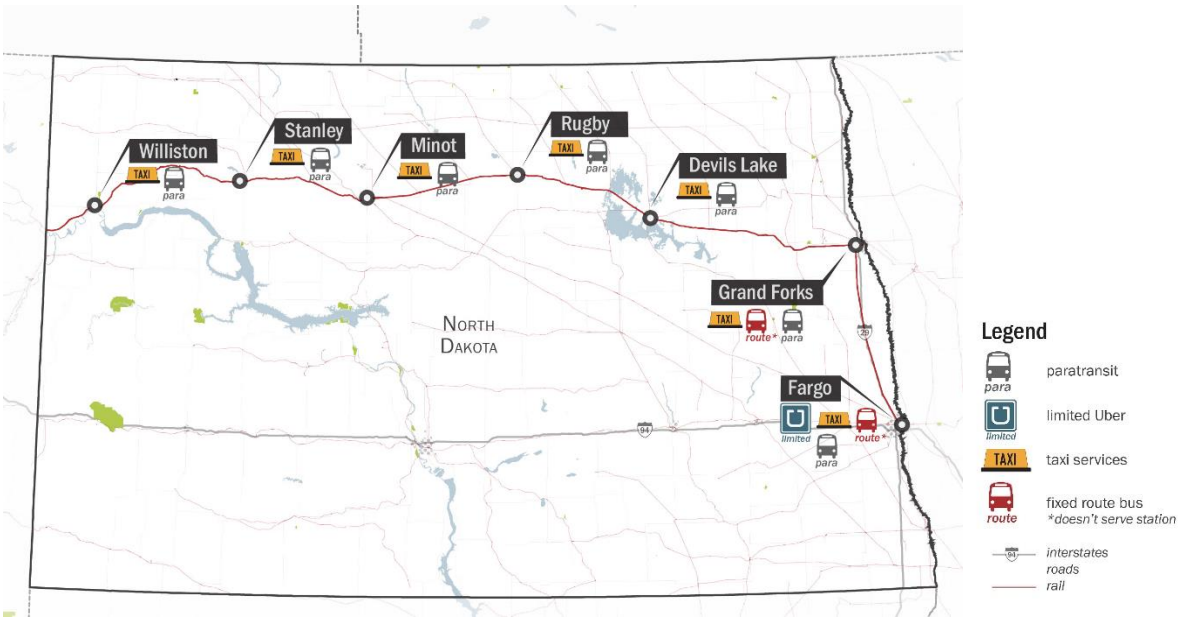
2.6.5 Multimodal Passenger Connections

Amtrak's *Empire Builder* train route runs along a corridor with little to no bus or air service, no parallel interstate highway for much of the route, and extreme winter weather conditions that frequently close highways and airports. The train connects rural communities in North Dakota, Montana, and Eastern Washington to larger urban centers with essential services (e.g., hospitals) such as Minneapolis, Spokane, Portland, Seattle, and Chicago.[13]

Stations

Three of the seven Amtrak stations are located in cities with fixed route bus service, but the bus routes in these cities do not connect to the Amtrak stations. There is also limited Uber service available in Fargo. Figure 2-18 provides a map of the stations and connecting services with Table 2-11 providing details on the stations and the amenities available at each.

Figure 2-18. Amtrak Station Connecting Services



Source: WSP Analysis

2.6.6 Passenger Rail Service Objective

North Dakota passenger rail service objectives are the following:

- Amtrak continues to operate the *Empire Builder.*
- Amtrak continues to work with BNSF to improve on-time arrivals.
- Amtrak improves the quality of its on-board service.

[13] *https://www.amtrak.com/ccurl/676/676/PRIIA-section-210-FY-12-performance-improvement-plan-amtrak,0.pdf*

Table 2-11. Stations and Amenities

	Williston	Stanley	Minot	Rugby	Devils Lake	Grand Forks	Fargo
Address	1 South Main Street, Williston, ND 58801	Main Street & Railroad Avenue, Stanley, ND 58784	400 1st Avenue S.W., Minot, ND 58701	201 West Dewey Street, Rugby, ND 58368	Railroad Avenue and Third Street, Devils Lake, ND 58301	5555 DeMers Avenue, Grand Forks, ND 58201	420 4th Street North, Fargo, ND 58102
Shelter	Enclosed Waiting Area	Enclosed Waiting Area	Enclosed Waiting Area	Enclosed Waiting Area	Enclosed Waiting Area	Enclosed Waiting Area	Enclosed Waiting Area
ADA Accessible	Station and Platform	Platforms only	Station and Platform	Platforms only	Platforms only	Station and Platform	Station and Platform
Parking	20 long-term spaces	5 short-term and 40 long-term spaces	Short-term spaces and 20 long-term spaces	Short-term spaces and 20 long-term spaces	Short-term spaces and 9 long-term spaces	Short-term spaces and 50 long-term spaces	Short-term spaces and 18 long-term spaces
Depot Hours	Daily 10:10 am to 2:00 pm and 3:30 pm to 7:10 pm	Daily 8:55 am to 10:15 am and 7:10 pm to 8:30 pm	Daily 6:30 am to Noon and 2:00 pm to 10:15 pm	Daily 5:30 am to 8:30 am and 8:30 pm to 11:30 pm	Daily 5:25 am to 6:40 pm and 10:30 pm to 11:50 pm	Daily Midnight to 8:00 am and 11:00 pm to 11:59 pm	Daily Midnight to 7:30 am
Baggage Service	Checked baggage	None	Checked baggage, assistance, carts, and storage	None	None	Carts	Checked baggage
Ticket Office	Yes	No	Yes	No	No	No	Yes
Quik-Trak	No	No	No	No	No	No	No
Restrooms	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Telephone	Payphone	No	Payphone	No	Payphone	Payphone	Payphone
Wi-Fi	No	No	No	No	No	No	No

Source: Amtrak.com

2.7 NORTH DAKOTA RAIL CROSSING PROFILE

2.7.1 Crossing Characteristics

This section provides an overview of the characteristics of highway-rail crossings in North Dakota. Information was obtained from a national inventory of crossings developed and maintained by the FRA. The inventory includes both crossings that are at-grade and grade separated. The inventory describes crossings at a high level of detail; not all information is available for each crossing.

North Dakota has 4,977 crossings, with 74.2 percent involving public roads and 25.4 percent involving private roads, which are not maintained by the state (Table 2-12). This proportion of public crossings in North Dakota is higher than the rest of the US, where 61.8 percent of all crossings are public.[14] The vast majority of crossings in the state are at-grade, representing 96.4 percent of all crossings. The remainder is comprised of grade-separated crossings, with 79 roadway bridges over track and 101 rail bridges over roadways. Of the at-grade crossings, 1,050 of them have no sign or signal and 2,985 have crossbucks. Uncontrolled or passively controlled crossings represent 81 percent of all crossings in the state. Private crossings signing are the responsibility of the owner of the crossing. Class 1 RR requires special signing at private crossings.

Table 2-12. 2016 North Dakota Crossing Profile[15]

Type of Crossing	Control Device	Type of Road Not Recorded	Private	Public	Total
At-Grade	No sign or signal	15	968	67	1,050
At-Grade	Other signs or signals		1		1
At-Grade	Crossbucks	1	178	2,806	2,985
At-Grade	Stop signs		93	57	150
At-Grade	Flashing lights	1		20	21
At-Grade	Gates		5	585	590
Railroad Under	Not Applicable	3	1	75	79
Railroad Over	Not Applicable	2	18	81	101
Total		22	1,264	3,691	4,977

Source: Federal Railroad Administration Rail Crossing Inventory

Compared to other Northern Tier states and the US as a whole, North Dakota has a smaller proportion of grade crossings with no signals or stop signs as shown in Table 2-13.).

Figure 2-19 maps the number of public crossings in each of the counties in North Dakota. The color shading describes the graphically describes the total number of crossings in each county, the darker the color, the greater the number of crossings. Cass County contains the most crossings due principally to three BNSF subdivision merging into the Fargo metropolitan area along with a dense street network. Other counties with a large number of crossings include Walsh, Ward, Stutsman, and McHenry.

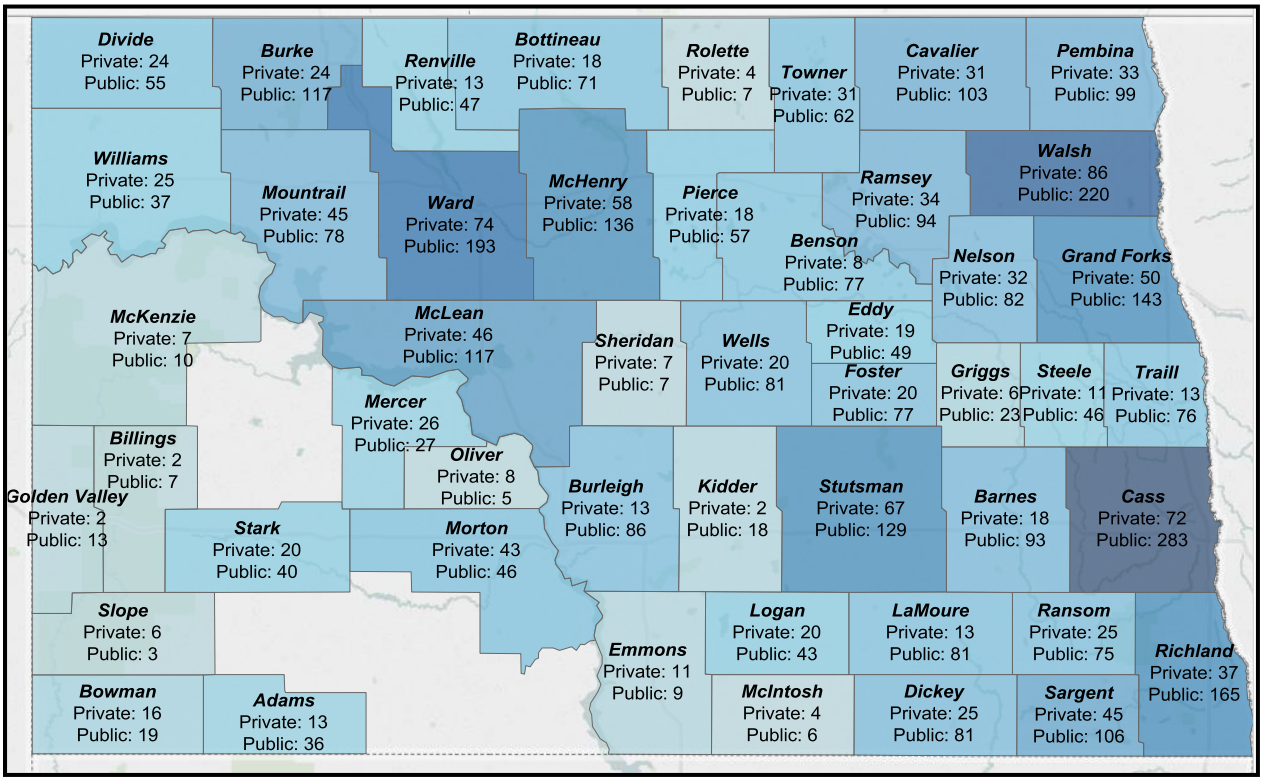
[14] *https://www.fra.dot.gov/Page/P0156*
[15] It should be noted that the status of crossings fluctuates frequently and reflects updates to the inventory provided by the railroads to the FRA

Table 2-13. Comparison of North Dakota Crossing Type with Neighbor States 2016

Type of Control		ND	SD	MN	MT	ID	All US
At-Grade	No sign or signal	21.1%	28.4%	22.1%	39.2%	32.3%	23.9%
At-Grade	Other signs or signals	0.0%	0.1%	0.3%	0.4%	0.2%	0.8%
At-Grade	Crossbucks	60.0%	48.6%	19.6%	27.3%	19.0%	21.6%
At-Grade	Stop signs	3.0%	2.9%	25.2%	6.6%	26.0%	7.8%
At-Grade	Flashing lights	0.4%	7.1%	4.1%	5.3%	7.6%	8.3%
At-Grade	Gates	11.9%	2.4%	17.9%	10.1%	7.6%	20.6%
Railroad Under	Not Applicable	1.6%	2.9%	4.5%	6.3%	3.6%	8.1%
Railroad Over	Not Applicable	2.0%	2.9%	6.3%	4.8%	3.7%	9.0%

Source: Federal Railroad Administration Rail Crossing Inventory

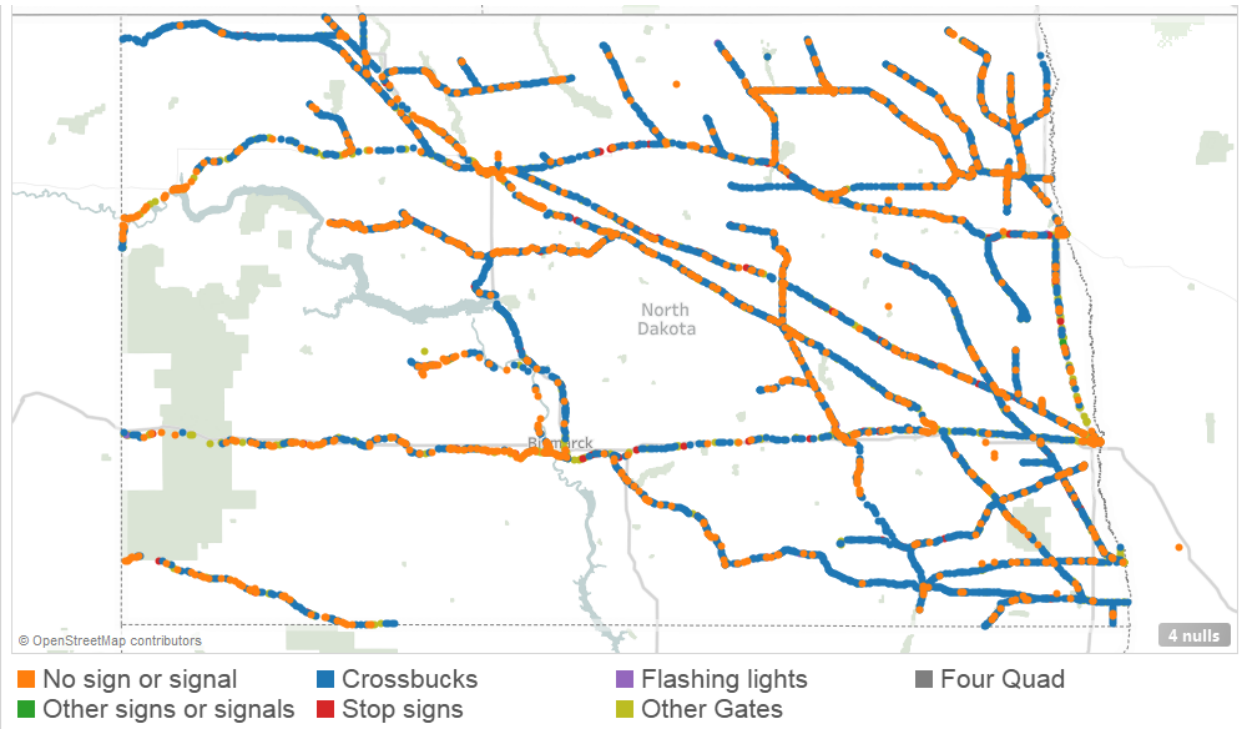
Figure 2-19. At-Grade Crossings by County



Note: Darker the color the greater the number of crossings
Source: FRA's Rail Crossing Inventory

Figure 2-20 maps the distinct at-grade crossing locations by type of control device. The majority of rural areas in the state rely primarily on crossbucks, stop signs, or even no signage, while the more densely populated regions use gates and flashers with a higher frequency.

Figure 2-20. At-Grade Crossings by Control Device



Source: FRA Rail Crossing Inventory

Table 2-14 provides additional detail about the types of crossings that are found for different types of roads in the state, where reported. The vast majority of at-grade crossings are passive. These are mostly at local road intersections, but they also include collectors and some minor arterials. There are 611 crossings with automated signal systems, which include flashers only, four quadrant systems, and standard flashing lights and gate arms, representing nearly 18 percent of all at-grade crossings in the state.

Table 2-14. Crossing Type by Type of Road

Position of Crossing	Control Device	Type of Road Not Reported	Interstate	Other Freeways and Expressways	Other Principal Arterial	Minor Arterial	Major Collector	Minor Collector	Local	Total
At-Grade	No sign or signal	953		1		4	5	1	86	**1,050**
At-Grade	Other								1	**1**
At-Grade	Crossbucks	138			1	25	186	116	2,519	**2,985**
At-Grade	Stop signs	90					8	1	51	**150**
At-Grade	Flashing lights				4	5	5		7	**21**
At-Grade	Gates	4		1	31	118	189	22	225	**590**
Railroad Under		75	1		2				1	**79**
Railroad Over		96	1		1	3				**101**
Total		**1,356**	**2**	**2**	**39**	**155**	**393**	**140**	**2,890**	**4,977**

Source: FRA Rail Crossing Inventory

Table 2-15 shows at-grade crossings by railroad. The largest railroad in North Dakota is BNSF, and as expected, it is involved in the largest number of crossings, adding up to 43.6 percent of the total. Of these crossings, 23.5 percent involve private roads and 75.9 percent involve public roads. The rest did not report the type of crossing. The second railroad with the most crossings is the CP. Of its 852 crossings, 29.2 percent involve private roads and 70.4 percent involve public roads. Of the third railroad with the most crossings, the Red River Valley & Western Railroad, 25.9 percent involve private roads and 70.1 percent involve public roads.

Table 2-15. At-Grade Crossings by Railroad

Railroad	Railroad Name	Type of Crossing Not Reported	Private	Public	Total
BNSF	BNSF Railway Company	11	493	1,591	2,095
CP	Canadian Pacific Railway	3	249	601	853
DMVW	Dakota Missouri Valley and Western Railroad		147	398	545
DN	Dakota Northern Railroad		40	111	151
NPR	Northern Plains Railroad	3	148	354	505
RRVW	Red River Valley & Western Railroad		168	480	648
	Total	**17**	**1,245**	**3,535**	**4,797**

Source: FRA Rail Crossing Inventory

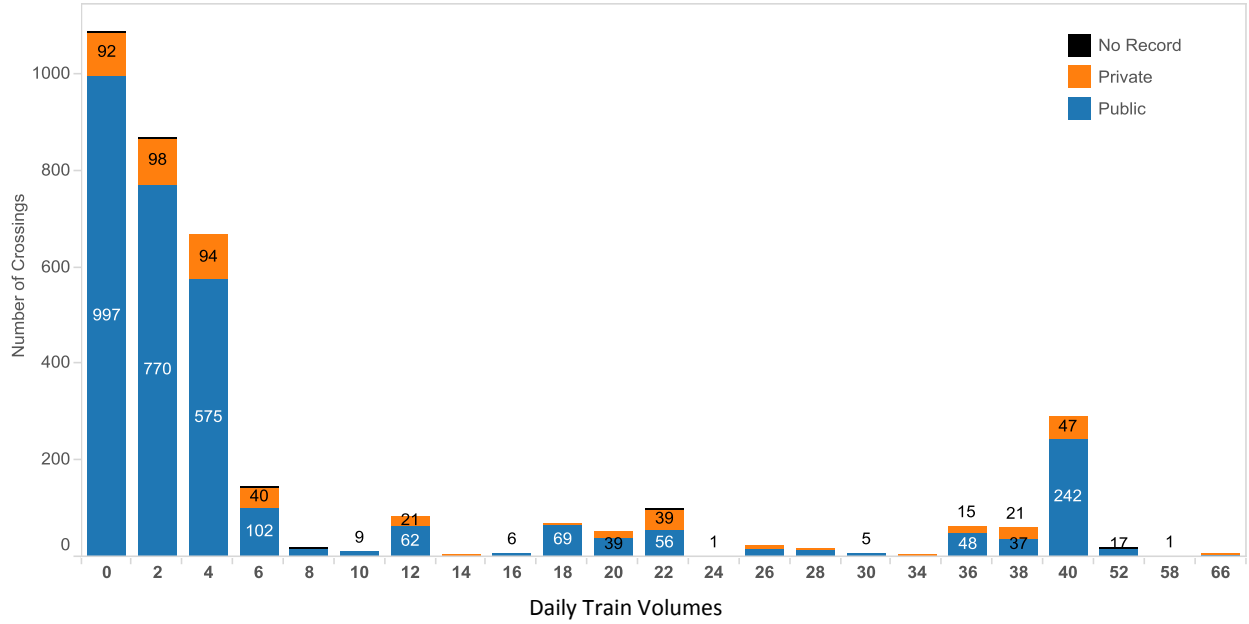
Figure 2-21 and Figure 2-22 show railroad and vehicle activity of the at-grade crossings in North Dakota. The FRA crossing inventory reports estimated numbers of trains at crossings each day. The data show that the preponderance of crossings has limited train activity; however, 429 at-grade crossings experience daily train volumes greater than 35 trains the higher-density rail corridors in the state. Of these, four-fifths intersect public roads and the rest private roads. Only 95 of the high train volume crossings have active control devices (gates). The rest rely on crossbucks (255), stop signs (31), or have no sign/signal at all (49). The latter are private crossings. All public crossings are at least protected by crossbucks. The majority of the high train volume crossings have relatively low vehicle volumes, between 0 and 100 AADT. However, 19 of them have vehicular volumes over 500 annual average daily traffic (AADT).

Figure 2-23 describes the vehicular volumes at crossings in the state.[16] The figure shows how there are 379 at-grade crossings with more than 500 AADT and 197 with more than 1,200 AADT. Of these more heavily used crossings, 139 have gates and nine have flashing lights. The majority have active control devices that alert drivers of oncoming trains.

As shown in Figure 2-24, most grade crossings have train speed limits that typically do not exceed 40 mph with the most common operating speeds ranging between 20 mph and 40 mph. There are, however, a significant number of crossings with maximum train speed over 60 mph.

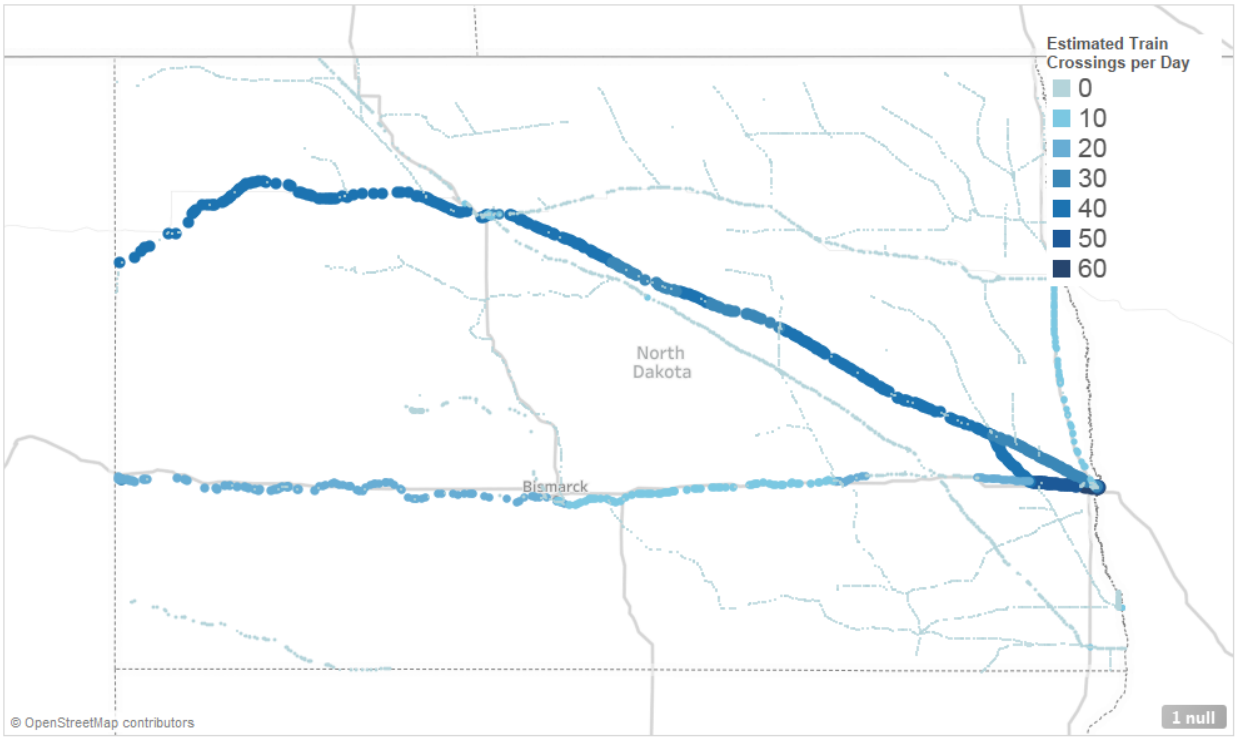
[16] Volumes were recorded the last time the crossing information was updated in the inventory, which for many was decades ago. Therefore, these AADT volumes should be interpreted just like the daily train volumes, as providing an order-of-magnitude approximation.

Figure 2-21. At-Grade Crossings by Daily Train Volumes (2015)



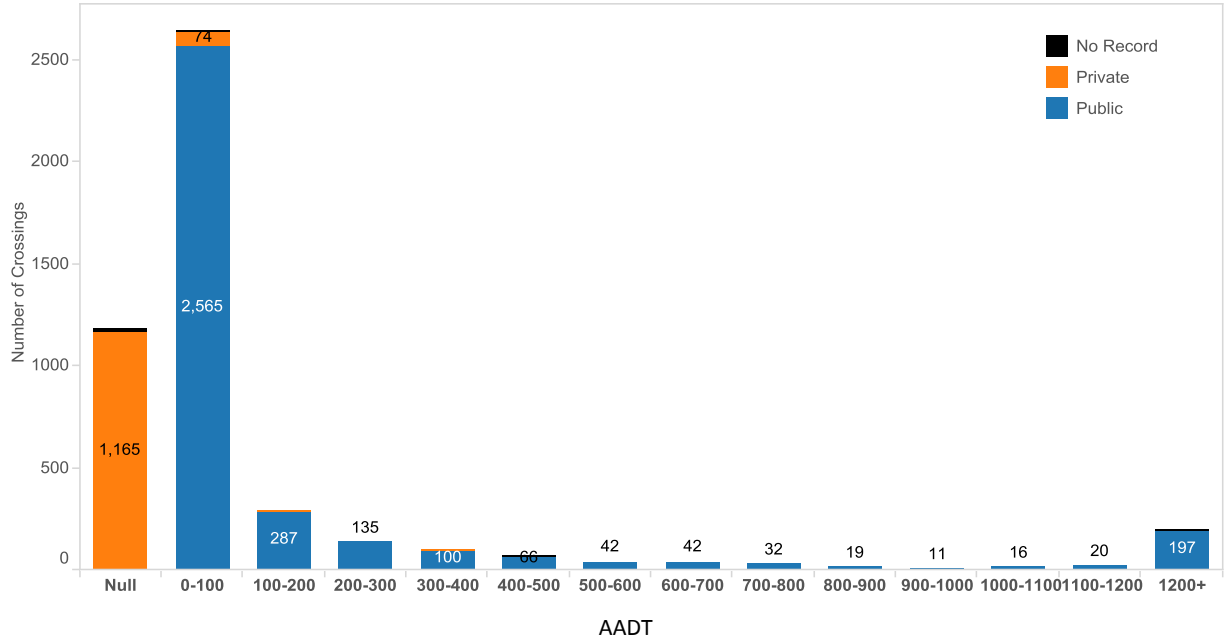
Source: FRA Rail Crossing Inventory

Figure 2-22. FRA Estimated Daily Train Crossings (2015)



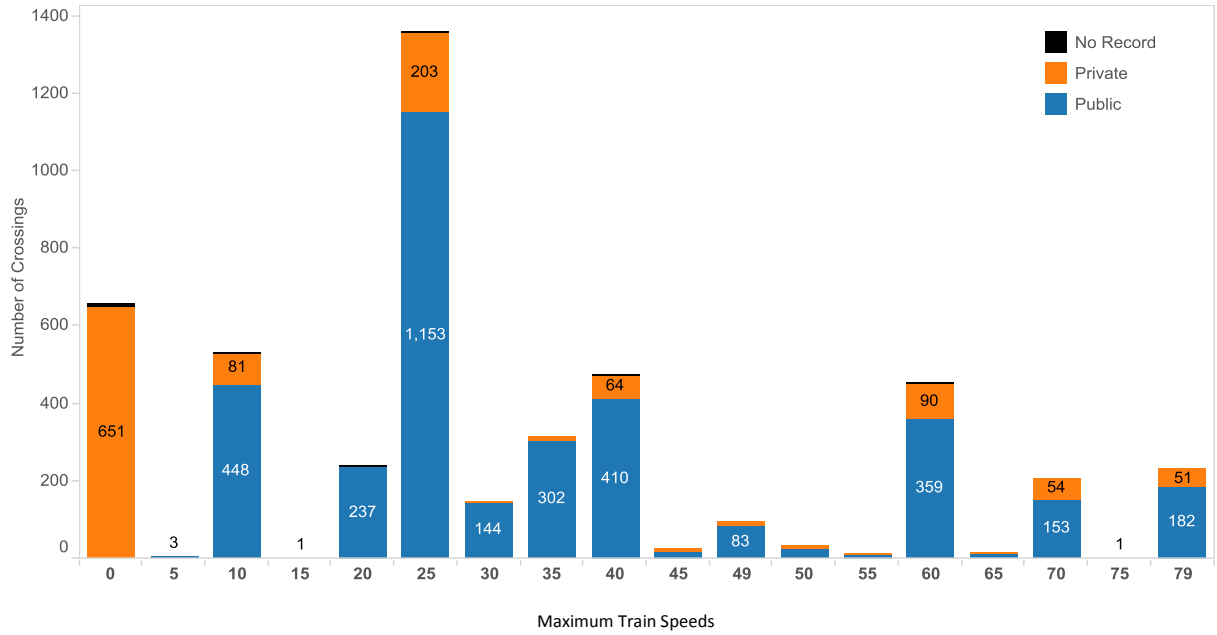
Source: FRA Rail Crossing Inventory

Figure 2-23. At-Grade Crossings by Roadway AADT (2015)



Source: FRA Rail Crossing Inventory

Figure 2-24. At-Grade Crossings by Maximum Train Speed (mph) (2015)



Source: FRA Rail Crossing Inventory

2.7.2 Crash History

Table 2-16 shows the number of injuries, and Table 2-17 shows the deaths to highway users, employees, and train passengers, over time. In 2014, there were five grade crossing injuries in North Dakota. The five injuries were lower than the average over the period. However, 2012 and 2013 saw exceptionally high crash rates, mostly involving highway users.

Table 2-16. North Dakota Crossing Injuries (2015)

Year	Highway Users Injuries	Employee Injuries	Train Passenger Injuries	Total Injuries	Rail Tons (Millions	Injury Index	Volume Index
2000	1	1	—	2	90.8	1.00	1.00
2001	5	3	—	8	90.0	4.00	0.99
2002	13	—	—	13	89.5	6.50	0.99
2003	4	5	—	9	94.8	4.50	1.04
2004	10	1	—	11	106.9	5.50	1.18
2005	4	—	—	4	113.4	2.00	1.25
2006	4	—	—	4	121.8	2.00	1.34
2007	4	—	—	4	119.6	2.00	1.32
2008	4	3	—	7	119.2	3.50	1.31
2009	5	1	—	6	107.3	3.00	1.18
2010	8	—	—	8	121.6	4.00	1.34
2011	7	2	—	9	105.0	4.50	1.16
2012	14	2	—	16	125.8	8.00	1.39
2013	16	—	2	18	138.4	9.00	1.52
2014	3	2	—	5	150.2	2.50	1.65
Average	6.8	1.33	0.13	8.27			

Source: FRA Highway-Rail Grade Crossing Accident/Incident Report, WSP Analysis

Table 2-17. Crossing Fatalities in North Dakota (2015)

Year	Highway Users Fatalities	Employee Fatalities	Train Passengers Fatalities	Total Fatalities	Rail Tons (Millions	Fatality Index	Volume Index
2000	6	—	—	6	90.8	1.00	1.00
2001	2	—	—	2	90.0	0.33	0.99
2002	—	—	—	—	89.5		0.99
2003	6	—	—	6	94.8	1.00	1.04
2004	—	—	—	—	106.9		1.18
2005	8	—	—	8	113.4	1.33	1.25
2006	—	—	—	—	121.8		1.34
2007	4	—	—	4	119.6	0.67	1.32
2008	1	—	—	1	119.2	0.17	1.31
2009	3	—	—	3	107.3	0.50	1.18
2010	2	—	—	2	121.6	0.33	1.34
2011	—	—	—	—	105.0		1.16
2012	4	—	—	4	125.8	0.67	1.39
2013	3	—	—	3	138.4	0.50	1.52
2014	4	—	—	4	150.2	0.67	1.65
Average per Yr	2.87	—	—	2.87			

Source: FRA Highway-Rail Grade Crossing Accident/Incident Report, WSP Analysis

Highway users represent the majority of injuries at-grade crossing crashes and all of the fatalities. In 2014, four people died in grade crossing crashes; this is noticeably higher than the average since 2000, but was in-line with 2013 and 2012.

Both the number of injuries and fatalities fluctuate considerably from year to year. However, considering also crashes that involved only property damage, totals have increased in North Dakota over the past decade, as can be seen in Table 2-18. The last four years in particular have seen much higher accident rates than the average since 2000. Although a number of factors could contribute to this, the increase in accidents correlates with the increase in rail traffic through the state as shown by the relationship between the accident and traffic volume indexes in Table 2-18 .

Table 2-19 provides a breakdown of the railroads involved in the at-grade crossing crashes that led to injuries with Table 2-20 providing the same breakdown for crashes that led to fatalities. Due to its large presence in North Dakota, BNSF is involved in the majority of injury and fatal crashes (56.4 percent of injuries and 75.2 percent of fatalities on average since 2000).

Figure 2-25 shows how the number of injuries and deaths spikes during the summer when train and vehicle volumes are the highest.

The following three tables describe the causes of the fatalities and injuries. From Table 2-21, it can be seen that 93 percent of deaths occurred when trains struck vehicles and 7 percent occurred when vehicles struck trains. For injuries, the split was 68.5 percent for trains striking vehicles and 31.5 vehicles striking trains. The former is caused primarily by vehicles becoming immobilized on the railroad tracks. Such crashes have a much higher likelihood in resulting in deaths.

Identifying the types of vehicles involved in at-grade crashes is useful in determining ways of improving crossing safety. Table 2-22 shows the average annual death and injury rates by type of vehicles involved. According to the FRA, truck-trailers are involved in almost as many deaths and injuries as automobiles, while representing a much smaller percent of traffic volumes. In addition, almost 30 percent of deaths since 2000 have resulted from pedestrians being struck by the trains.

Figure 2-26 provides an overview of the crossing deaths and injuries by county since 2000. The counties with the largest population and population density as well as train volumes, such as Cass, Ward, Williams, and Grand Forks, also had the greater number of fatalities and injuries.

Table 2-18. Total Fatalities, Injuries, and Property Damage Only Crashes (2015)

Year	Fatalities	Injuries	Damage Only	Total Crashes	Rail Tons (Millions	Accident Index	Volume Index
2000	6	2	9	17	90.8	1.00	1.00
2001	2	8	7	17	90.0	1.00	0.99
2002	0	13	13	26	89.5	1.53	0.99
2003	6	9	8	23	94.8	1.35	1.04
2004	0	11	5	16	106.9	0.94	1.18
2005	8	4	6	18	113.4	1.06	1.25
2006	0	4	8	12	121.8	0.71	1.34
2007	4	4	5	13	119.6	0.76	1.32
2008	1	7	6	14	119.2	0.82	1.31
2009	3	6	7	16	107.3	0.94	1.18
2010	2	8	11	21	121.6	1.24	1.34
2011	0	9	11	20	105.0	1.18	1.16
2012	4	16	7	27	125.8	1.59	1.39
2013	3	18	6	27	138.4	1.59	1.52
2014	4	5	19	28	150.2	1.65	1.65
Average per Yr.	2.87	8.27	8.53	19.67			

Source: FRA Highway-Rail Grade Crossing Accident/Incident Report, WSP Analysis

Table 2-19. Crossing Injuries by Railroad (2015)

Year	Amtrak	BNSF	CP	DMVW	NPR	RRVW	Total
2000	—	2	—	—	—	—	**2**
2001	—	4	3	—	1	—	**8**
2002	—	6	6	—	—	1	**13**
2003	2	6	—	1	—	—	**9**
2004	—	3	8	—	—	—	**11**
2005	—	4	—	—	—	—	**4**
2006	1	3	—	—	—	—	**4**
2007	—	2	1	1	—	—	**4**
2008	—	7	—	—	—	—	**7**
2009	1	2	3	—	—	—	**6**
2010	4	3	—	—	1	—	**8**
2011	—	5	2	—	—	2	**9**
2012	2	7	6	—	1	—	**16**
2013	3	14	1	—	—	—	**18**
2014	—	2	2	—	—	1	**5**
Average	1.30	4.67	2.13	0.25	0.43	0.50	**8.27**

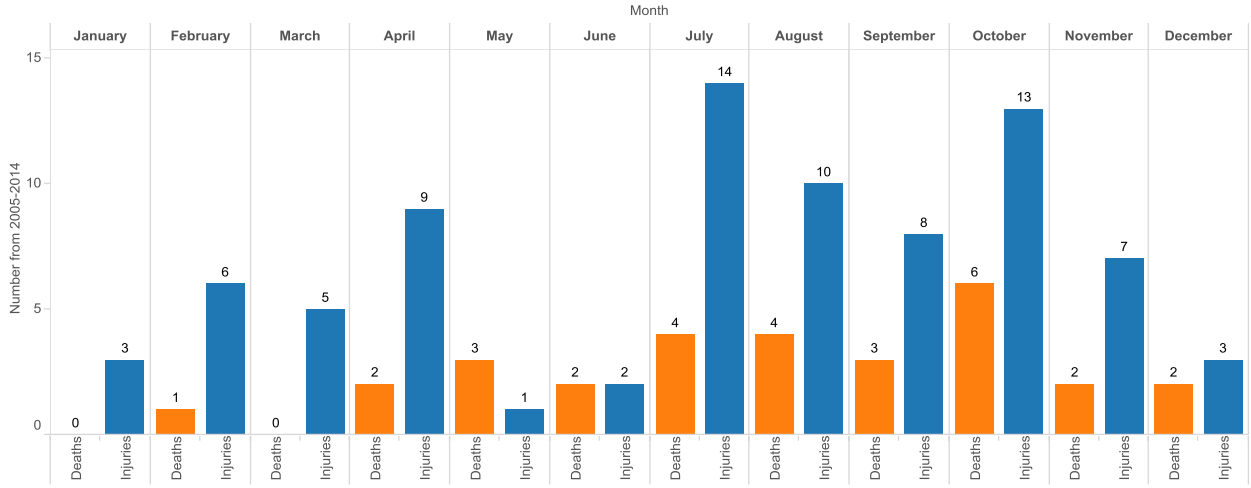
Source: FRA Highway-Rail Grade Crossing Accident/Incident Report

Table 2-20. Crossing Deaths by Railroad (2015)

Year	Amtrak	BNSF	CP	DMVW	NPR	RRVW	Total
2000	—	6	—	—	—	—	**6**
2001	—	2	—	—	—	—	**2**
2002	—	—	—	—	—	—	**—**
2003	2	4	—	—	—	—	**6**
2004	—	—	—	—	—	—	**—**
2005	1	4	3	—	—	—	**8**
2006	—	—	—	—	—	—	**—**
2007	—	3	1	—	—	—	**4**
2008	—	—	1	—	—	—	**1**
2009	—	3	—	—	—	—	**3**
2010	—	2	—	—	—	—	**2**
2011	—	—	—	—	—	—	**—**
2012	—	2	1	—	1	—	**4**
2013	1	2	—	—	—	—	**3**
2014	—	4	—	—	—	—	**4**
Average	0.27	2.13	0.40	—	0.07	—	**2.87**

Source: FRA Highway-Rail Grade Crossing Accident/Incident Report

Figure 2-25. Number of Crossing Injuries and Deaths from 2005 to 2014 by Month (2015)



Source: FRA Highway-Rail Grade Crossing Accident/Incident Report

Table 2-21: Deaths and Injuries per Year by Collision Type (2000 – 2014)

Year	Train struck vehicle		Vehicle struck train		Total	
	Deaths	Injuries	Deaths	Injuries	Deaths	Injuries
2000	5	2	1	0	6	2
2001	1	6	1	2	2	8
2002	0	4	0	9	0	13
2003	6	7	0	2	6	9
2004	0	6	0	5	0	11
2005	7	4	1	0	8	4
2006	0	4	0	0	0	4
2007	4	4	0	0	4	4
2008	1	4	0	3	1	7
2009	3	5	0	1	3	6
2010	2	6	0	2	2	8
2011	0	6	0	3	0	9
2012	4	12	0	4	4	16
2013	3	14	0	4	3	18
2014	4	1	0	4	4	5
Average	2.67	5.67	0.20	2.60	2.87	8.27

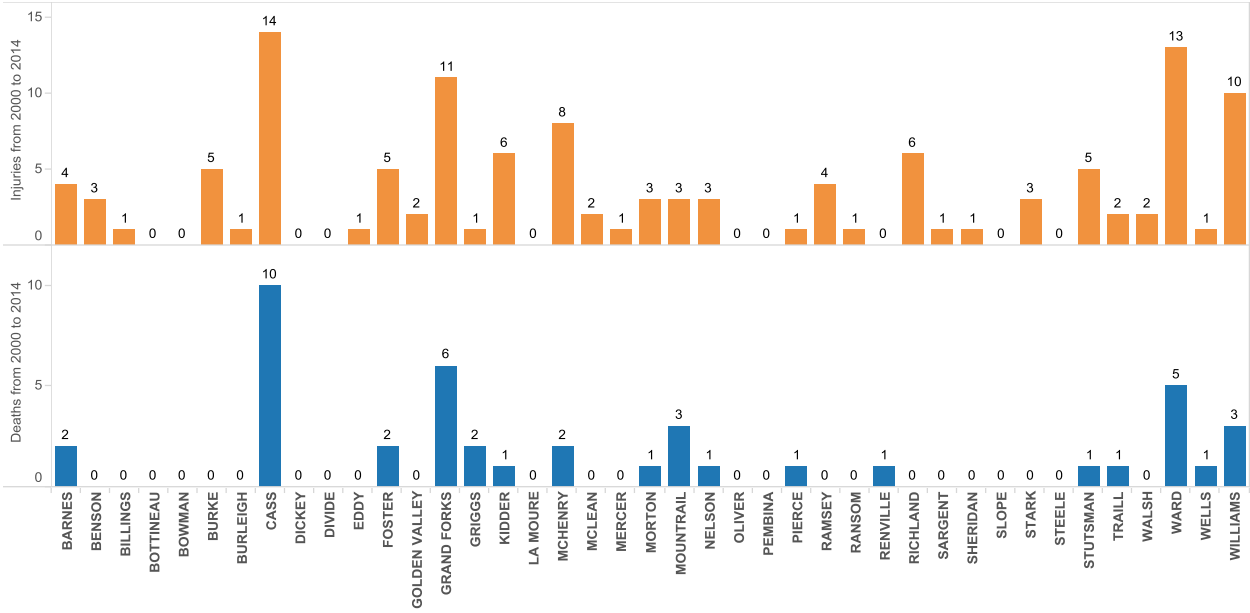
Source: FRA Highway-Rail Grade Crossing Accident/Incident Report

Table 2-22. Average Annual Rates of Deaths and Injuries by Vehicle Type (2000 – 2014)

	Automobile	Other Highway User	Other Motor Vehicle	Pedestrian at crossing	Pick-up Truck	Truck (flatbed tow, etc.)	Truck-Trailer	Van	Total
Deaths	0.53	0.40	0.55	0.83	0.67	0.29	0.47	0.17	2.87
Injuries	2.47	0.80	1.09	0.67	1.40	0.86	2.00	0.67	8.27

Source: Federal Railroad Administration Highway-Rail Grade Crossing Accident/Incident Report

Figure 2-26. Number of Crossing Deaths and Injuries by County (2000 – 2014)



Source: FRA Highway-Rail Grade Crossing Accident/Incident Report

2.8 HAZARDOUS MATERIALS SAFETY

2.8.1 Hazardous Material by Rail Vulnerability

Until the recent decline in crude oil shipments, nearly half the rail shipments originating or terminating in the state were hazardous materials. In 2014, 33.5 million tons of the 36.2 million tons of hazardous materials were shipped from or to the state were originating crude oil shipments. The next most significant commodity was miscellaneous organic chemicals with 750,000 tons shipped by rail into the state.

Rail Crashes

The increased movement of crude oil and other hazardous materials by rail has raised a number of safety concerns. Several crashes in recent years have raised the level of awareness of the risks posed by the transportation of these cargoes over the nation's transportation networks.

The North Dakota Department of Emergency Services recently published a study examining the risk of transporting crude oil by rail.[17] The study found that between 2008 and 2014, an average of three serious incidents occurred each year with average property damage of $382,000. A serious incident is defined as the following:

- A fatality or major injury was caused by the release of a hazardous material
- Twenty-five or more employees, or responders or any number of the general public, as a result of release of a hazardous material or exposure to fire had to be evacuated
- A release or exposure to fire resulted in the closure of a major transportation artery
- An aircraft flight plan or operation was altered
- Radioactive materials from Type B packaging was released
- A suspected release of a Risk Group 3 or 4 infectious substance was released
- Over 11.9 gallons or 88.2 pounds of a severe marine pollutant was spilled
- A release of a bulk quantity (over 119 gallons or 882 pounds) of a hazardous material occurred

Table 2-23 summarizes the cause of the serious railroad incidents.

[17] *North Dakota Crude Oil Response Report*, North Dakota Department of Emergency Services, 2015

Table 2-23. Serious Railroad Incident Causality

Cause of Failure	Percentage of All Crashes
Derailment	36%
Loose Closure Component or Device	27%
Missing Component or Device	7%
Broken Component or Device	5%
Defective Component or Device	5%
Fire Temperature or Heat	5%
Valve Open; Loose Closure Component or Device	5%
Derailment; Fire Temperature or Heat	2%
Deterioration or Aging	2%
Human Error; Improper Preparation for Transportation; Overfilled	2%
Missing Component or Device; Valve Open	2%
Human Error 2	2%

Source: *North Dakota Crude Oil Response Report*, North Dakota Department of Emergency Services, 2015

The most significant cause of incident was derailments, followed by car components not properly secured.

County Vulnerability Assessment

The 2015 *North Dakota Crude Oil Response Preparedness* report also provided a county-by-county risk assessment. The risk and vulnerability assessment included factors such as likelihood, or probability, that any incident will occur over a 20-year period. Risk was then determined by combining the potential impacts with incident likelihood. Thirty-three counties were assessed based on a 0.5-mile buffer to Class I railroad routes.

The risk and vulnerability assessment provided an analysis of the risks and vulnerabilities associated with crude oil transportation within each mode. The project team applied a combination of qualitative and quantitative analyses to determine risk, including associated impacts and likelihood of crude oil transportation incidents.

The likelihood of occurrence is an estimate of how often an incident might occur within the 0.5-mile buffer. Incidents may occur within the buffer with or without impact. In the report, likelihood is described by a Likelihood Rating Scale—an assessment of the chances that a hazard event might occur in the buffer zone during a 20-year timespan, based on a review of historic events and available data.

The Railroad Likelihood Value was derived in a multi-step process. Each county's total train-miles were determined by multiplying the total linear mile of track by the average number of trains that traverse the tracks. The average number of trains per week was calculated using averaged ranges of trains per week based on the most recent available data provided by BNSF and CP. The actual number of trains per week can vary, depending on oil production and transportation routing. The results of this assessment should be considered as a snapshot of a regularly changing and adjusting transportation industry.

Each county's train-miles were evaluated to determine the percentage of total train-miles within the state. The county's percent of the total train-miles was then multiplied by the total number of incidents projected to occur in North Dakota within a 20-year period. This resulted in the Railroad Likelihood Value.

The result is a projection of the number of incidents in each county over the next 20 years, from which probability is derived. The 20-year probability was then annualized by dividing the Railroad Likelihood Value by 20.

The Likelihood Rating Scale provided in Table 2-24 provides the likelihood value, rating, and probability of occurrence over a 20-year period. Those counties with a likelihood rating of 1 (negligible) have less than a 1 percent probability of occurrence and those with a rating of 5 (extreme) have greater than a 50 percent probability of occurrence over the 20-year period.

Table 2-24. Likelihood Rating Scale

Likelihood Value	Likelihood Rating	Percentage Probability per 20 years
1	Negligible	<1.0%
2	Low	1.0 – 10.0%
3	Moderate	10.1 – 30.0%
4	High	30.1-50.0%
5	Extreme	>50.1%

Source: *North Dakota Crude Oil Response Report*, North Dakota Department of Emergency Services, 2015

Table 2-25 outlines the rail transportation-related risk of hazardous materials based on the methodology above. More details are available in the 2015 *North Dakota Crude Oil Response Preparedness* report.

Table 2-25. County Vulnerability Scoring

All Counties	Likelihood of an Incident over a 20-Year Period	Likelihood Value	Population	Dependent Population Facilities Impact Level Value	Environmental Impact Level Value	Average Impact Value	Risk Score
Cass	Extreme	5	5	5	5	5.00	25.00
Barnes	High	4	5	5	5	5.00	20.00
McHenry	High	4	5	5	5	5.00	20.00
Ward	Extreme	5	5	3	3	3.67	18.33
Mountrail	Moderate	3	5	3	3	3.67	11.00
Pierce	Moderate	3	5	3	3	3.67	11.00
Stutsman	Moderate	3	5	3	3	3.67	11.00
Wells	Moderate	3	5	3	3	3.67	11.00
Williams	Moderate	3	5	3	3	3.67	11.00
Burleigh	Low	2	5	3	3	3.67	7.33
Eddy	Low	2	5	3	3	3.67	7.33
Foster	Low	2	5	3	3	3.67	7.33
Grand Forks	Low	2	5	3	3	3.67	7.33
Griggs	Low	2	5	3	3	3.67	7.33
McLean	Low	2	5	3	3	3.67	7.33
Morton	Low	2	5	3	3	3.67	7.33
Ransom	Low	2	5	3	3	3.67	7.33
Richland	Low	2	5	3	3	3.67	7.33
Stark	Low	2	5	3	3	3.67	7.33
Kidder	Low	2	5	1	1	2.33	4.67
Benson	Negligible	1	5	3	3	3.67	3.67
Burke	Negligible	1	5	3	3	3.67	3.67
Golden Valley	Negligible	1	5	3	3	3.67	3.67
McKenzie	Negligible	1	5	3	3	3.67	3.67
Mercer	Negligible	1	5	3	3	3.67	3.67
Nelson	Negligible	1	5	3	3	3.67	3.67
Oliver	Negligible	1	5	3	3	3.67	3.67
Ramsey	Negligible	1	5	3	3	3.67	3.67
Sheridan	Negligible	1	5	3	3	3.67	3.67
Billings	Negligible	1	5	1	1	2.33	2.33
Traill	Negligible	1	5	1	1	2.33	2.33
Renville	Negligible	1	3	1	1	1.67	1.67
Steele	Negligible	1	3	1	1	1.67	1.67

Source: *North Dakota Crude Oil Response Report*, North Dakota Department of Emergency Services, 2015

2.8.2 Hazardous Materials Emergency Preparedness and Safety Procedures, Policies, and Regulations

The following outlines the key roles and responsibilities that North Dakota agencies and state-supported entities use in hazardous materials transportation to mitigate the risks associated with the shipment of hazardous materials.

Homeland Security Program

The Homeland Security Grants section of the North Dakota Department of Emergency Services (NDDES) enhances security by managing and administering grant programs that increase the capability and capacity of local, tribal, and state government, first responders, and the citizens of North Dakota. The grant programs provide the necessary funding to local units of government and first responders to prevent, protect against, respond to, and recover from catastrophic incidents.

The North Dakota Homeland Security Program[18] has entered into a cooperative agreement with Cass, Burleigh, and Ward counties, and the City of Grand Forks to initiate a statewide comprehensive regional response program. The program places personnel and resources into four geographic regions to provide a mechanism for a coordinated response to a chemical, biological radiological, nuclear, or explosive incident.

Protective measures have been developed and employed to:

- Increase awareness.
- Reduce threats/vulnerabilities.
- Enhance response to incidents, whether natural or manmade.

The section in coordination with the North Dakota State & Local Intelligence Center (summarized later in this section), manages the state's critical infrastructure program by facilitating vulnerability and threat assessments, site security advice and buffer zone protection plans for facilities within the state. Members manage and maintain the North Dakota Hazardous Chemicals Preparedness and Response Program and conduct weekly and monthly equipment tests for the Harris Radio, Amateur Radio, National Warning System, and the Emergency Alert System.

Local Emergency Planning Committee

Local Emergency Planning Committees (LEPC)[19] were organized to fulfill the requirements of the federal regulations regarding Title III of the Superfund Amendment and Reauthorization Act (SARA) of 1986. LEPCs are organized at the county level and are responsible for preparing hazardous materials emergency response plans, serving as a repository for hazardous materials information and performing outreach functions to include hazardous materials awareness. Statutorily provided in North Dakota Century Code (NDCC) 37-17.1-07.1(b) in conjunction with the State Emergency Response Commission (SERC), the LEPCs, as appointed by the boards of county commissioners, and the local emergency management organizations

[18] *http://www.nd.gov/des/homeland/*
[19] *http://www.nd.gov/des/planning/haz-chem/state-emergency-response-commission/*

coordinate the development and maintenance of a state hazardous chemicals preparedness and response program.

North Dakota Department of Emergency Services

The North Dakota Department of Emergency Services (NDDES) [20] provides 24/7 emergency communications and resource coordination with more than 50 lead and support agencies, private enterprise, and voluntary organizations to assist local jurisdictions in disaster and emergency response activities. A core responsibility of the NDDES is to work with local, state, federal, and tribal agencies, and private entities to coordinate and prepare for response operations associated with natural, human-made, and technological disasters in the state. NDDES has the responsibility and authority to manage emergency events that overwhelm the local capabilities of cities and counties, requiring the assistance of state personnel, equipment, and resources. NDDES recognizes the authority of the local jurisdictions and will only provide assistance during an emergency event when requested by local authorities.

NDDES is responsible for the management and continued development of the North Dakota State Emergency Operations Plan (SEOP). This plan provides overall guidance for the direction, coordination, and control of emergency operations at the state level, working in coordination with the local jurisdictions. The SEOP identifies preparedness and response responsibilities and outlines implementation of the Incident Command System for incidents in North Dakota. Included as a supporting document to the SEOP, NDDES has developed a Hazardous Materials Incident Annex. This annex identifies personnel, equipment, and resources specific to the needs of a hazardous materials incident, including crude oil incidents. It is in effect when the governor issues a declaration, or when NDDES, in coordination with other state agencies, determines that a hazardous materials incident has occurred or is imminent.

In its description of state resources, the State Hazmat Incident Annex outlines the structure of a typical hazardous materials response/recovery cleanup operation. A flow chart is included in the plan that outlines decisions and actions from the initial notification of the incident, to the notification of NDDES (if necessary), and local and state responsibilities. Hazardous materials response incidents will be managed first by the local authority, through the local emergency operations coordinator, and supported by state resources as requested. When the incident reaches the level of a state operation, coordination of state emergency management operations will take place in the state emergency operations center (SEOC).

NDDES supports four regional hazardous materials regional response teams (RRTs) that are operated by local fire departments and are strategically positioned across the state. Each region has two components—an operations team and technician level team—operated independently and strategically separated to better serve the regions. In the Northeast Region, Spirit Lake operates the operations level team and Grand Forks operates the technician level team. The Southeast Region has an operations team in Jamestown and a technician team in Fargo. The Southwest Region has an operations team in Dickinson and a technician team in Bismarck. The Northwest Region has an Operations team in Williston and a technician team in Minot. Each RRT may respond independently or in support of each other. They may respond within their home jurisdictions without deployment approval by NDDES. However, if emergency

[20] *http://www.nd.gov/des/about/*

response is requested outside of their home jurisdictional boundaries, the RRT must be deployed by NDDES.

NDDES also provides a Regional Response Coordinator Program to assist local emergency managers. This program was developed to address gaps in response capabilities for hazardous materials incidents in the state. The program consists of four regional coordinators, each geographically responsible for counties that are in the northwest, southwest, northeast, and southeast quadrants of the state. The regional coordinators work with local jurisdictions and the NDDES office to support preparedness, mitigation, response, and recovery operations initiated and managed by the local jurisdictions. The regional coordinators also assist local jurisdictions with locating and allocating necessary resources to support incident response needs.

North Dakota Department of Health – Environmental Health Division

The Environmental Health Division works with the contract air monitoring company on-scene at a hazardous materials rail incident to verify data and ensure environmental compliance. The division utilizes the US Department of Transportation's Emergency Response Guide for plume modeling, and it provides recommendations on evacuations or sheltering in place to local incident commanders. It also monitors cleanup operations to ensure mitigation and remediation measures meet state and federal standards. Once on scene, Environmental Health Division staff work through the incident commander and the responsible party (e.g. the railroad or motor carrier company involved) to provide technical recommendations for actions including types of monitoring or size of containment area.

The division has a six-person spill-response team available to support incident management. Generally, one person may respond to any given incident. Staff assists also with press release development and provides guidance on the information that goes to the public. Environmental Health Division staff members receive hazardous materials response training through either the 24- or 40-hour Hazardous Waste Operations or Emergency Response Standard class, plus an annual eight-hour refresher program.

North Dakota Division of State Radio

North Dakota Division of State Radio provides voice and data public safety communications to responding agencies, coordinates radio frequency use by responding agencies, provide situational awareness through multiple channels (phone, radio, fax, etc.), serves as the backup Public Safety Answering Point in the state, and dispatches North Dakota Hazardous Materials RRTs at the direction of North Dakota HLS.

North Dakota Fire Marshal

The North Dakota Fire Marshal (NDFM) provides technical assistance to local responders. The NDFM may serve on-scene as liaison or as the on-scene commander in coordination with the SEOC, as requested. The NDFM supports environmental remediation and provides investigation support.

North Dakota Highway Patrol

The North Dakota Highway Patrol (NDHP) evaluates the need for and executes, if necessary, road closures, openings, and alternate routes based on analysis from North Dakota Department of Transportation (NDDOT) for state and federal roadways. Additionally, NDHP coordinates with local law enforcement

regarding state and federal road closures. NDHP assists with evacuations and search and rescue operations.

State Emergency Response Commission

The SERC[21]—as outlined in Public Law 99-499 and also referred to SARA Title III, in conjunction with LEPCs and local emergency management organizations—coordinates the development and maintenance of a state hazardous chemicals preparedness and response program. The SERC ensures that local emergency response groups and citizens are provided emergency and hazardous chemical inventory information upon request in accordance with the state and federal laws. The SERC consists of 18 appointed members, with representatives from agencies including the State Fire Marshal's Office, Department of Health, NDHP, and NDDOT among others.

North Dakota State and Local Intelligence Center

The mission of the North Dakota State and Local Intelligence Center (NDSLIC)[22] is to gather, store, analyze, and disseminate information on crimes, both real and suspected, to the law enforcement community, government officials and private industry concerning terrorism activity, among other things, for the purposes of decision-making, public safety and proactive law enforcement while ensuring the rights and privacy of citizens.

The NDSLIC provides 24-hour contact for any state, local, or private agency requesting or providing intelligence on security-related issues. It provides services such as conducting vulnerability and threat assessments, advising on site security plans, and providing anti-terrorism and security training. The NDSLIC works with the public and private sector with a common goal of protecting North Dakota's citizens, critical infrastructures, and the assets they control.

The North Dakota Terrorism Protective Measure Resource Guide provides an overview of terrorist threats facing critical infrastructure and are intended to provide information and assist in determining areas that are vulnerable to possible terrorist attacks and ways in which to protect them. Upon request, the NDSLIC provides onsite threat/vulnerability assessments at no cost. The assessments are confidential and are protected by the North Dakota Century Code.

North Dakota Local Response Groups

County and municipal emergency management entities bear primary responsibility for planning, and preparing for, and managing emergency response operations related to hazardous materials incidents on railways that occur within their jurisdictional boundaries. Local first responders, including emergency managers, fire departments, law enforcement, public works, and emergency medical services, will make any initial emergency response.

Most county sheriff's departments have small staffs focused primarily on daily law enforcement duties. Hazardous materials incidents requiring law enforcement support can overwhelm county resources. In

[21] *http://www.nd.gov/des/planning/haz-chem/state-emergency-response-commission/*
[22] *http://www.nd.gov/des/homeland/fusion-center/*

most rural counties, mutual aid and state law enforcement support is necessary to provide rapid response to support an incident and maintain daily police operations.

Almost all fire and emergency medical services in the state rely on volunteers to staff and operate the services.[23] They have limited capabilities and resources to manage large hazardous materials incidents. They rely on mutual aid and state support to provide operational staff, technical support, and specialized equipment to conduct operations outside of their normal structural and grass firefighting capabilities. Urban fire departments in larger cities have better hazardous materials response capabilities, usually provided by and through the RRTs that are based in their departments, but also have the full-time, specialty-trained staff to manage hazardous materials response incidents. The same staff is typical part of the state RRT, which provide response support to rural areas of the state.

2.8.3 Current and Emerging State and Federal Practices and Regulatory Policies

The State of North Dakota provides regulatory oversight, in alignment with federal requirements, and response roles to the crude oil industry. Regulatory functions are performed by agencies such as the Public Service Commission (PSC) and the Industrial Commission. State agencies have responsibilities for preparedness and response activities to protect human health and safety, property, and the environment in North Dakota.

Depending on the incident, multiple state agencies may have roles and responsibilities. State law establishes state agencies' responsibilities and authorities generally. The Hazardous Materials Incident Annex to the SEOP provides direction to North Dakota's state agencies and local governments.

North Dakota State Legislature

The North Dakota Legislature and executive agencies with responsibility related to crude oil transportation have long been working to improve policy, administration, and regulation in the state. The risks are regularly reviewed, updated, and addressed through proposed legislation, rulemaking, staffing augmentation, and safety enhancements. While much of the responsibility for interstate commerce via common carriers falls under federal jurisdiction, the state has proposed and imposed its own initiatives to address risk.

State of North Dakota – Industrial Commission Order No. 25417

Industrial Commission Order 25417 requires crude oil producers in the state to condition light sweet crude oil to a vapor pressure of no more than 13.7 pounds per square inch (psi) (about that of automobile gasoline). National standards set crude oil stability at a vapor pressure of 14.7 psi. Under the order, all light sweet crude oil produced in North Dakota will be conditioned. The order requires operators to separate light hydrocarbons from light sweet crude oil in order to be transported, and prohibits the

[23] US Fire Administration, *National Fire Department Census Quick Facts*, January 2015, *https://apps.usfa.fema.gov/census/summary.cfm* (accessed June 22, 2015).

blending of light hydrocarbons back into oil supplies prior to shipment. The order became effective April 1, 2015.[24]

Senate Bill No. 2008 (15.8121.01000) – State-Run Rail Safety Pilot Program

North Dakota Senate Bill 2008 was approved on April 27, 2015, and was signed into law by the governor on April 29, 2015. It will fund a state-run rail safety pilot program to supplement federal oversight of oil train traffic. The budget will be provided by the state PSC through excise taxes paid by the railroads on diesel fuel. It will fund one additional inspector salary, one temporary employee salary, and operating costs for 2017–19. The bill also includes a railroad training program for fire departments with jurisdictions along routes traveled by oil trains. The PSC budget would provide $523,345 for the project.[25] On March 9, 2016, FRA certified the state's first rail inspector.

North Dakota Century Code

North Dakota Century Code is the compilation of all statutes passed by the North Dakota Legislative Assembly. Within the Century Code, the following Titles are directly applicable to crude oil transportation by rail in the state:

- **North Dakota Century Code, Title 24 -Highways, Bridges, and Ferries:** Title 24 governs highway, bridge, and ferry transportation within North Dakota, including railroad crossings.
  - Chapter 24-01-17 – Grade crossing elimination[26]
  - Chapter 24-09 – Railroad Crossings[27]
- **North Dakota Century Code, Title 39: Motor Vehicles**: Title 39 governs roadway transportation within North Dakota, including at railroad crossings. Within Title 39, the following chapters are applicable:
  - Chapter 39-10-43 – Certain vehicles must stop at all railroad grade crossings. (Special Vehicles and Exempt Crossings)[28]
  - Chapter 39-10-67 – Moving heavy equipment at railroad grade crossings (Slow and Low Vehicles)[29]
- **North Dakota Century Code, Title 49 - Public Utilities**: governs railroad regulations and property. Within Title 49, the following Chapters are applicable:
  - Chapter 49-01 – Public Safety Commission
  - Chapter 49-02 – Powers of Commission Generally
  - Chapter 49-04 – Duties of Public Utilities

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[24] State of North Dakota, Industrial Commission, Order No. 25417, Case No. 23084, September 23, 2014, *https://www.dmr.nd.gov/oilgas/Approved-or25417.pdf* (accessed June 22, 2015).
[25] Sixty-fourth Legislative Assembly of North Dakota, North Dakota Senate Bill No. 2008, January 6, 2015, *http://www.legis.nd.gov/assembly/64-2015/documents/15-8141-06000.pdf?20150622211124* (accessed June 22, 2015).
[26] North Dakota Century Code § 24-01-17, *Grade Crossing Elimination.*
[27] North Dakota Century Code § 24-09, *Railroad Crossings*.
[28] North Dakota Century Code, 39-10-43, Certain vehicles must stop at all railroad grade crossings. (Special Vehicles and Exempt Crossings).
[29] North Dakota Century Code, § 39-10-67, *Moving heavy equipment at railroad grade crossings*.

- Chapter 49-10.1 – Railroad Regulation by Public Service Commission[30]
- Chapter 49-10.1-08 – Tampering, altering, or damaging railroad property – Penalty[31]

2.9 RECENT INFRASTRUCTURE IMPROVEMENTS

2.9.1 BNSF Improvements

In response to increases in rail traffic in North Dakota, BNSF has invested heavily in improving infrastructure in the state. Since 2011, BNSF has spent $1.1 billion in expanding capacity and other upgrades in North Dakota. BNSF's expenditures in North Dakota over the last five years were the following:

- 2011 – TBD
- 2012 – $80 million
- 2013 – $220 million
- 2014 – $400 million
- 2015 – $326 million

2.9.2 Canadian Pacific Improvements

CP has also reinvested in its North Dakota infrastructure. CP's annual investment in the state over the last five years:

- 2011 – $42 million
- 2012 – $22 million
- 2013 – $4 million
- 2014 – $21 million
- 2015 – $45 million

[30] North Dakota Century Code § 40-10.1, *Railroad Regulation by Public Service Commission.*

[31] North Dakota Century Code, § 49-10.1-08, Tampering, altering, or damaging railroad property – *Penalty*.

2.10 IMPACTS OF RAIL TRANSPORTATION

2.10.1 Economic Impact of Rail in North Dakota

Railroads are critical to the economic prosperity and global competitiveness of the United States. Railroads move more than 40 percent of the country's freight ton-miles linking producers to consumers as well as both to the ports facilitating foreign trade. They also contribute billions of dollars each year to the economy through wages, purchases, and taxes.

Freight rail service is an important contributor to economic growth. Many of the state's businesses, particularly agriculture, depend on rail service since it is a far more cost-effective way of shipping than trucking. In 2012, agriculture was an $11 billion dollar industry in the state with the preponderance of agriculture products moving by rail. During the recent surge in oil production, rail became an important mode of transportation as much for its ability to provide access to locations not served by pipelines as much as to provide surge capacity.

Besides moving products to market, railroads contribute directly to the North Dakota economy. According to the Association of American Railroads (AAR), North Dakota's railroads employed 2,026 individuals in the state in 2012 generating $213 million in annual income. Each freight rail job supports another 4.5 jobs. The same year, 2,904 railroad retirement beneficiaries were located in North Dakota, receiving $60 million in retirement benefits. According to Amtrak, the company contributed another 10 jobs in the state in the federal fiscal year ended September 2013, paying total wages of $650,000. Amtrak also purchased $3.8 million of goods and services.

2.10.2 Energy Impact of North Dakota Rail Transportation

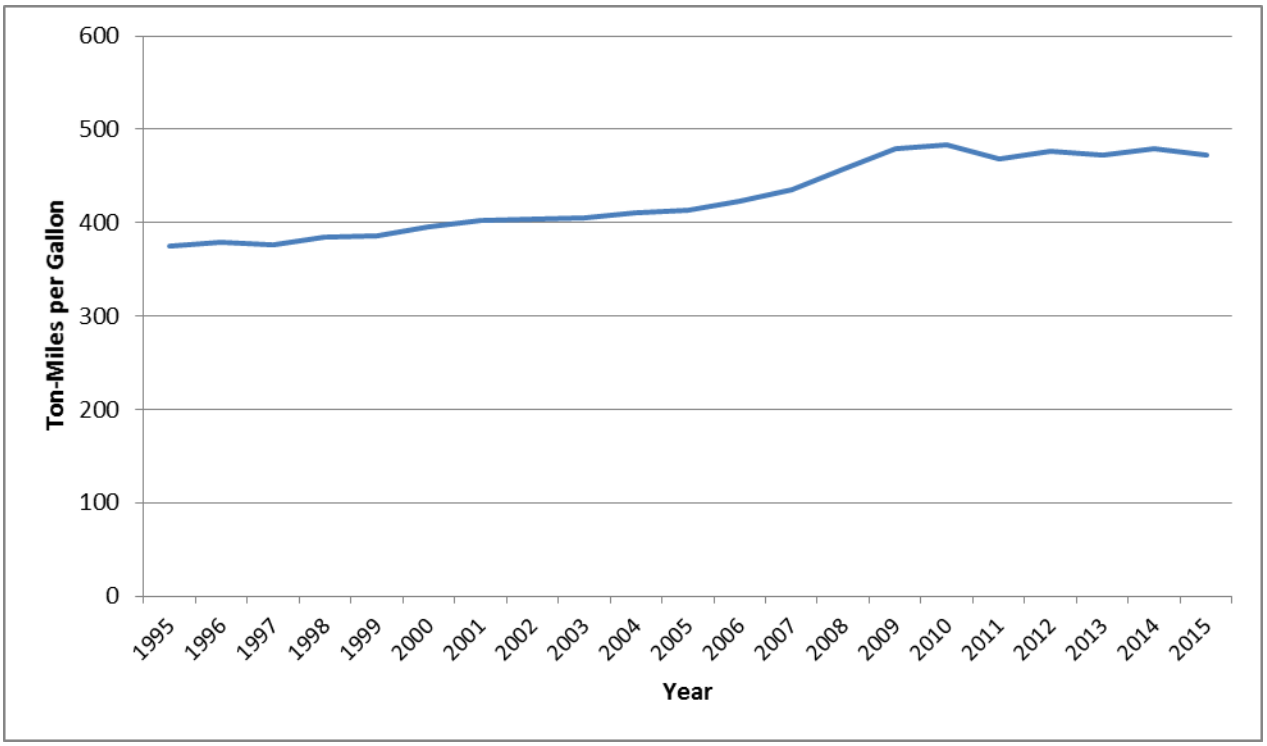
Freight rail is a highly energy-efficient mode of transportation. A 2009 FRA study examined truck and rail fuel consumption on 23 competitive routes.[32] The study found that rail fuel efficiency on these routes ranged from 156 to 512 ton-miles per gallon, while truck fuel efficiency ranged from 68 to 133 ton-miles per gallon. Rail transportation was between 5.5 and 1.9 times as fuel efficient than motor carrier transportation. On average, railroads were four times more fuel-efficient than trucking, a factor oft cited by the rail industry.

Truck transportation of freight that either originates or terminates in the North Dakota generates 37.8 billion ton-miles nationwide. If 10 percent of those ton-miles, a reasonable estimate according to the AAR, were diverted to rail, North Dakota freight traffic would consume 24 million fewer gallons of fuel across the country.

The AAR cites that in 2015, the rail industry moved a ton of freight an average of 473 miles, and has been continually improving its fuel efficiency. Average ton-miles per gallon of fuel consumed by the railroad industry more than doubled since 1980 when the industry achieved only 235 ton-miles per gallon.

[32] ICF International for the FRA, *Final Report: Comparative Evaluation of Rail and Truck Fuel Efficiency on Competitive Corridors,* November 19, 2009.

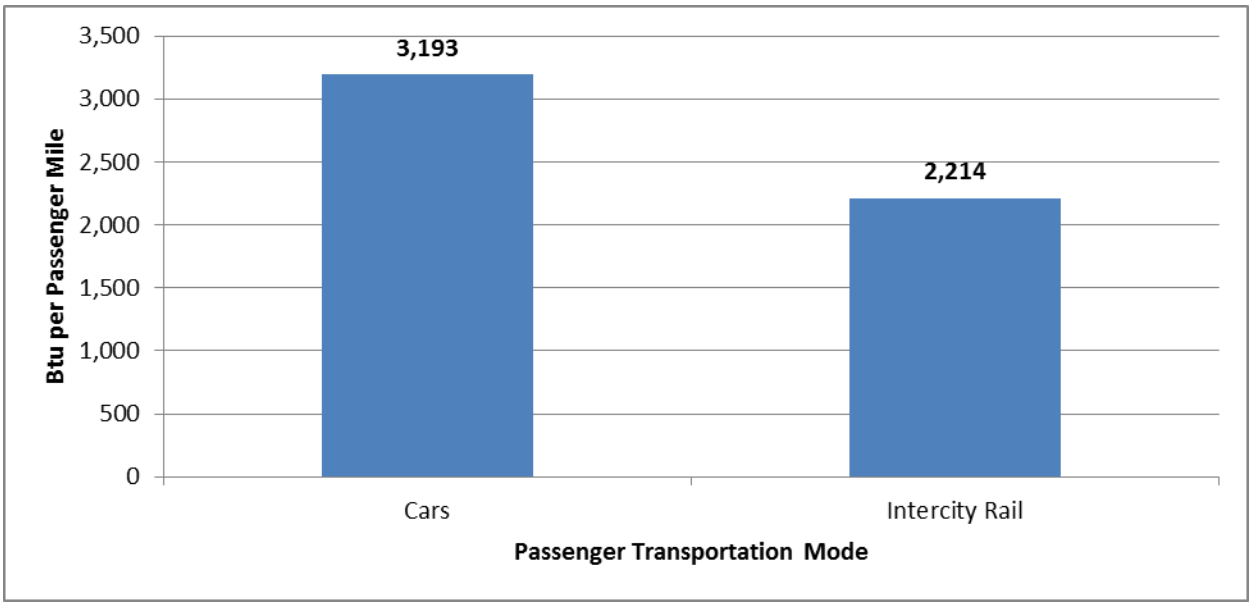
Figure 2-27. Railroad Average Fuel Consumption



Source: Association of American Railroads

Passenger rail travel is also more fuel efficient than automobile travel. According to data gathered by the Energy Information Administration (EIA), intercity passenger rail consumes about 31 percent less energy per passenger-mile than automobile travel (Figure 2-28).

Figure 2-28. Btu per Passenger-Mile (2012)



Source: EIA, *Transportation Energy Data Book*, 33rd Edition

Because rail is more fuel efficient, diversion of freight and passengers from highway transportation to rail could decrease the amount of diesel and gasoline consumed in North Dakota.

2.10.3 Environmental Impact of North Dakota Rail Transportation

Since rail transportation consumes less fuel than highway transportation, rail produces fewer greenhouse gases. According to the US EIA, a gallon of diesel fuel produces 22.38 pounds of carbon dioxide.[33] Based on an annual reduction of 24 million gallons of fuel at a 10 percent truck to rail diversion rate, carbon emissions would be reduced by 245,000 metric tons per year across the country.

Although energy efficient, railroads continue to introduce measures to improve fuel efficiency and reduce greenhouse gas emissions further:

- **New Locomotives.** As railroads update their locomotive fleets, less efficient older locomotives are replaced with more efficient new models. Some new locomotives, "gensets," have two or three independent engines that switch on and off, depending on how much power is needed.
- **Reduced Idling**. Locomotives idle for a number of reasons—such as to prevent freezing of coolant, charge batteries and air reservoirs, and provide heat and other amenities for crew members. Railroads are experimenting with technologies that will enable engines to shut down when not in use, smaller engines that use antifreeze, auxiliary power units that heat the engine and allow locomotives to shut down in cold weather, or stop-start technologies that evaluate whether ambient conditions are such that engines can be shut down.
- **Training.** Railroad engineers can reduce fuel usage through their skill and knowledge of handling trains. Training programs and simulators offer opportunities for engineers to learn new fuel-saving practices.
- **Information Technology.** Operations management systems plan the most fuel-efficient spacing and timing of trains. Locomotive monitoring systems can provide feedback to locomotive engineers on the most fuel-efficient speeds for a train, as well as warn of inefficiently performing locomotives. Improved trip planning can optimize how and when freight cars are assembled to form trains and when those trains depart. Improvements can result in better asset use, smoother traffic flow, and reduced fuel consumption.

2.10.4 Safety Impact of Rail in North Dakota

Compared to trucking, rail transportation is a very safe mode of transportation. A modal comparison study by the National Waterways Foundation found the frequency of fatal injuries per ton-mile of truck transportation was more than seven times that of freight rail transportation between 2001 and 2009. Similarly, the number of trucking injuries per ton-mile was almost 17 times the injury rate of freight rail transportation.

[33] *www.eia.gov/tools/faqs/faq.cfm?id=307&t=11*

The risk of hazardous material spills associated with rail is also less than that of trucking. The same study estimates that the number of gallons spilled per million ton-miles of hazardous materials carried by truck was over twice the rate for rail.[34]

2.11 FREIGHT RAIL TRAFFIC PROFILE

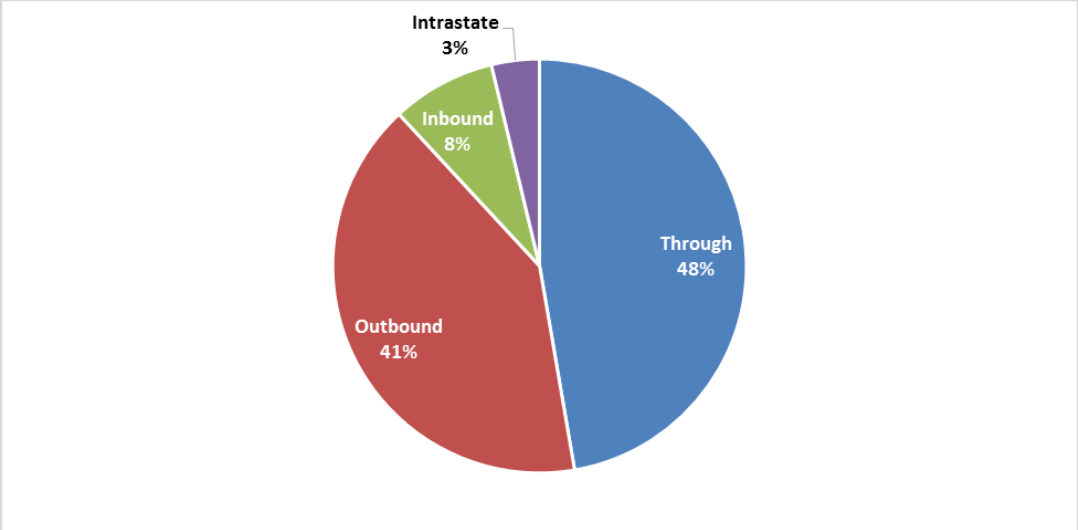
North Dakota has a significant role in the national railroad network. For years, the state has been the nation's largest originator of agricultural products, and recently has become the largest rail origin of crude oil. North Dakota also lies on key trade corridors linking the Midwest to the Pacific Northwest, as well as the BNSF Mid Continent north-south corridor.

This SRP provides a perspective on the state's rail traffic composition based on 2014, the most recent year for which comprehensive data was available. It also provides some insight into the current market environment. Phase II will examine future trends and the impact on rail traffic.

2.11.1 Freight Rail Traffic – Directional Profile

According to the Surface Transportation Waybill Sample, 150.5 million tons of freight were transported by railroads to, from, within, or through North Dakota in 2014. North Dakota is a major producer of products that are typically carried by rail. In 2014, 61.5 million tons (41 percent of the total rail traffic) was shipped from North Dakota to other states. In contrast, 12.0 million tons (8 percent of the state's rail tonnage) was inbound shipments. The highest rail volume, however, was traffic passing through the state, commonly referred to as overhead traffic. Approximately 72 million tons (48 percent of North Dakota rail movements) passed through the state between origins and destinations in other states in 2014. Over 5 million tons of commodities travel intrastate within North Dakota.

Figure 2-29. Direction of North Dakota Rail Flows by Tonnage (2014)



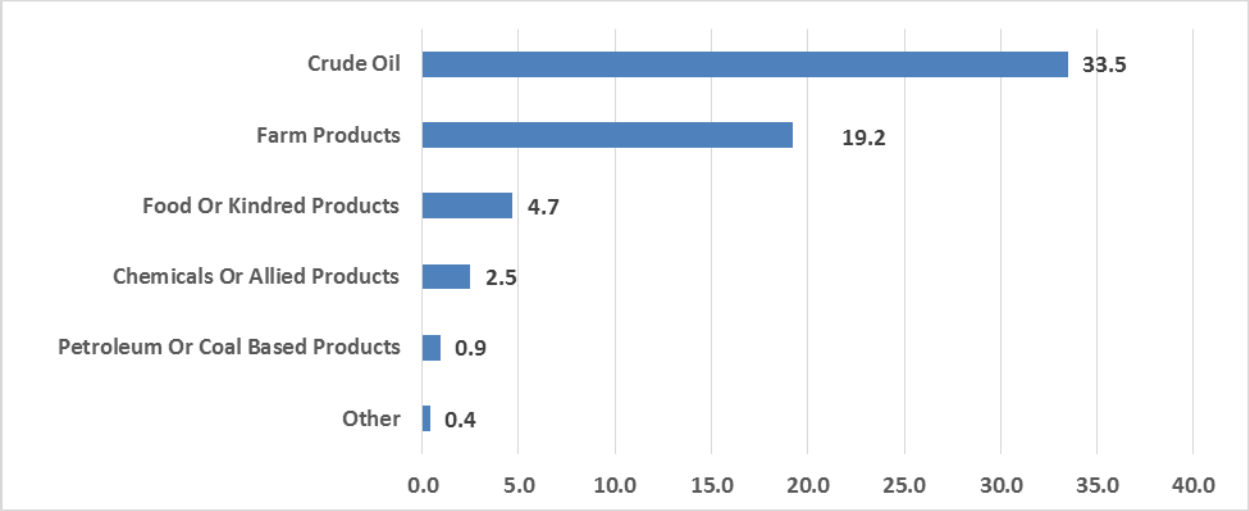
Source: Surface Transportation Board Waybill Sample

[34] Texas Transportation Institute for the National Waterways Foundation, *A Modal Comparison of Domestic Freight Transportation Effects on the General Public 2001 - 2009,* February 2012.

2.11.2 Freight Rail Traffic -Commodity Profile

Crude oil and agriculture-related products were the top two products exported to other states by rail from North Dakota in 2014. Crude oil and farm products combined with coal and food products comprise nearly 98 percent of all originating tonnage. Farm products consisted primarily of corn, soybeans, and wheat shipments. The emergence of crude oil as the top commodity results from energy development in the Bakken oil fields and represents a dramatic increase over a short period.

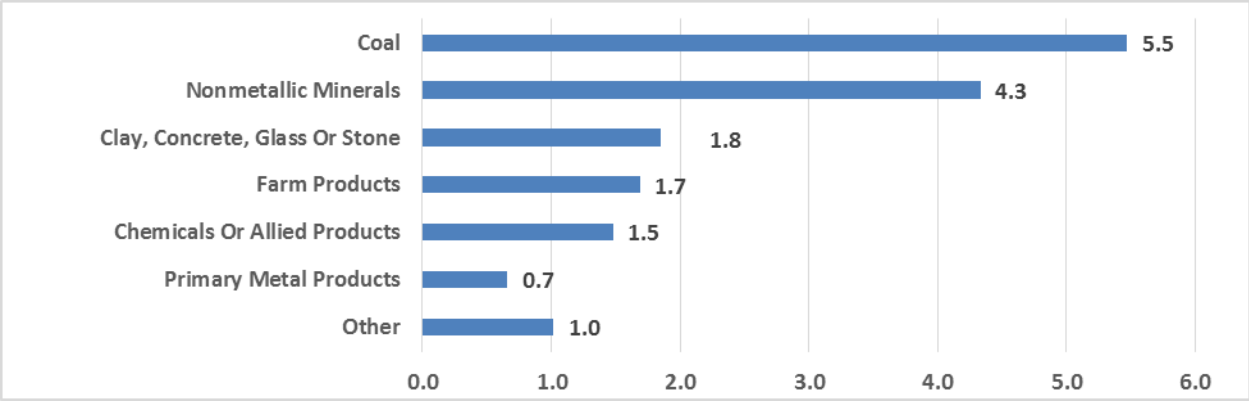
Figure 2-30. Outbound Rail Shipments by Commodity by Millions of Tons (2014)



Source: STB Waybill Sample

In 2014, coal was the top inbound commodity at 5.5 million tons, representing 33 percent of all North Dakota inbound rail tonnage in 2014. The other top terminating products in North Dakota were nonmetallic minerals consisting of sand, gravel and stone (4.3 million tons); clay, concrete, glass and stone (1.8 million tons); agriculture-related products (nearly 1.7 million tons); and chemical products (nearly 1.5 million tons). Of the 4.3 million tons of sand, gravel, and stone that terminated in North Dakota in 2014, 3.1 million tons were related to the energy industry consisting of sand shipments used in hydraulic fracturing.

Figure 2-31. Inbound Rail Shipments by Commodity by Millions of Tons (2014)

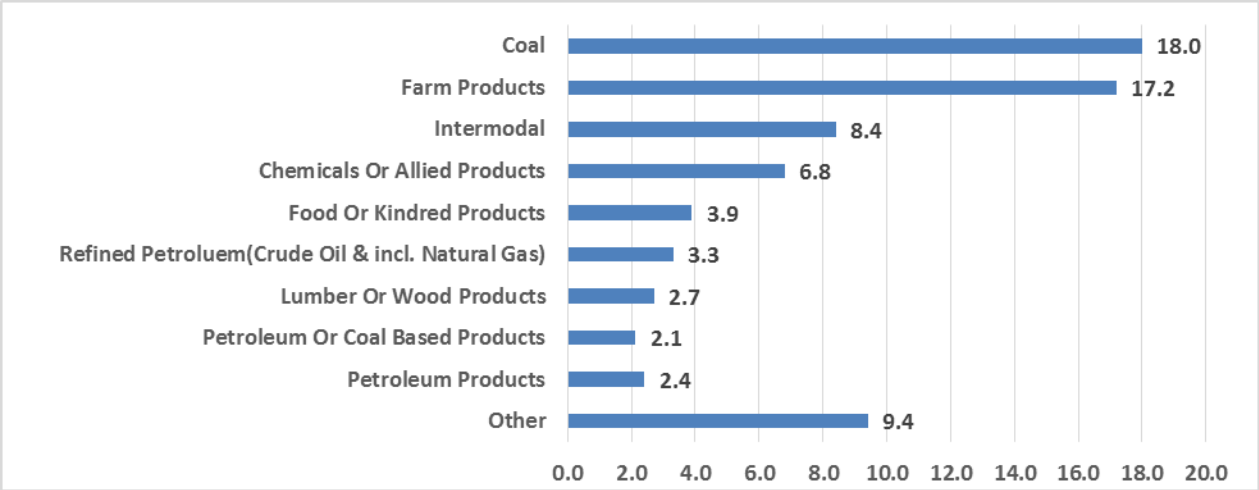


Source: STB Waybill Sample

A significant quantity of rail freight is also shipped within North Dakota. In 2014, the North Dakota rail network handled about 6.2 million tons of intrastate shipments most of which was coal, followed by farm products. Intrastate shipments of farm products vary considerably between years.

In 2014, about 72 million tons of freight were shipped across North Dakota between other states. The largest tonnages were in coal and agriculture-related products, which collectively accounted for 48 percent of the freight shipped through North Dakota between other states. North Dakota is also located on several important intermodal corridors, although intermodal accounted for 12 percent of the rail tons shipped through the state, it represented an estimated 27 percent or more of the cars.

Figure 2-32. 2013 Pass-Through Rail Shipments by Commodity by Millions of Tons



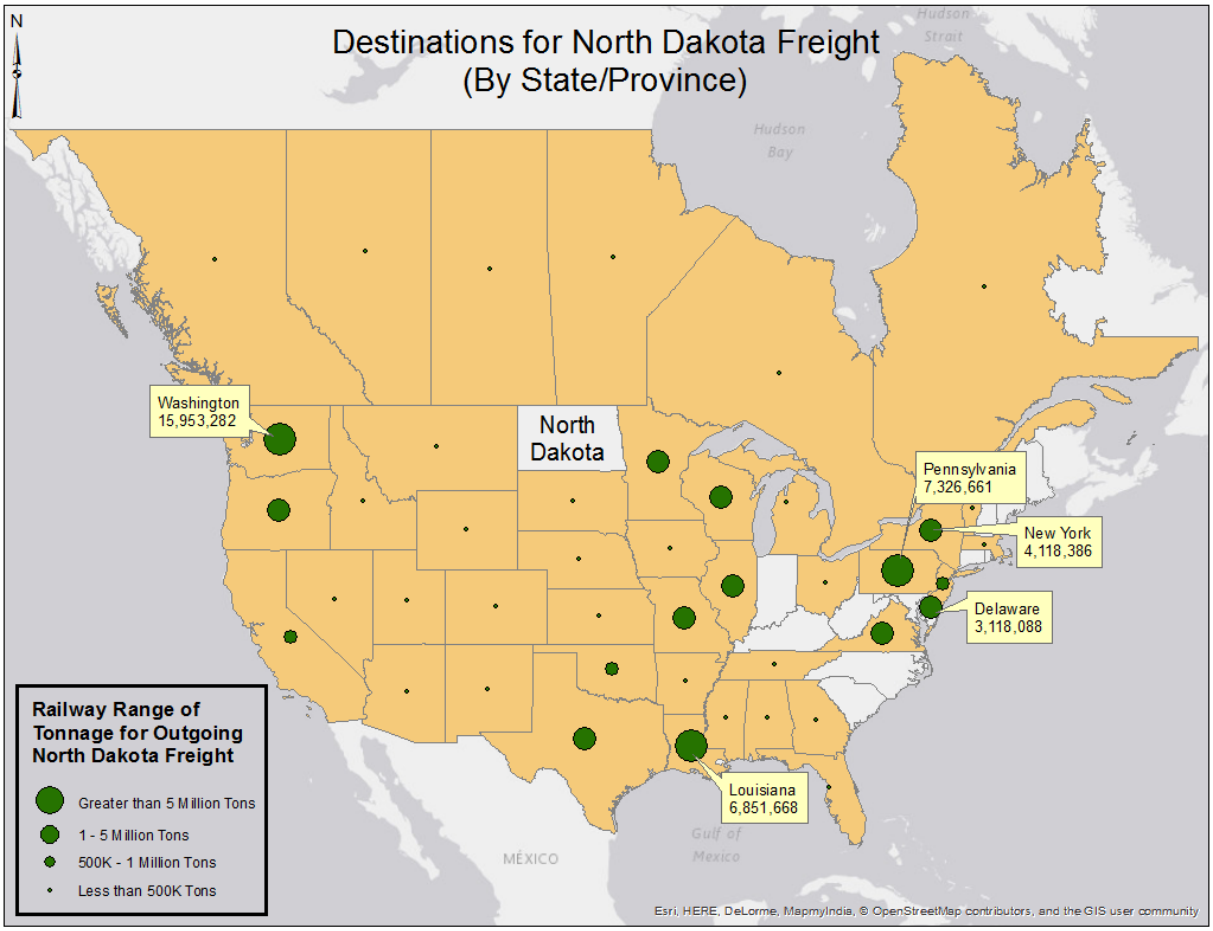
Source: STB Waybill Sample

2.11.3 Freight Rail Traffic – Geographic Profile

State to State Rail Flows

As shown in Figure 2-33, the largest destinations of freight shipped from North Dakota in 2014 were Washington, Pennsylvania, Louisiana, New York, and Delaware. Volumes shipped to Washington were nearly 16 million tons, more than double any other state. Rail shipments to Washington largely consisted of both farm products and crude oil. Shipments to Pennsylvania, New York, Delaware, and Louisiana were mainly crude oil.

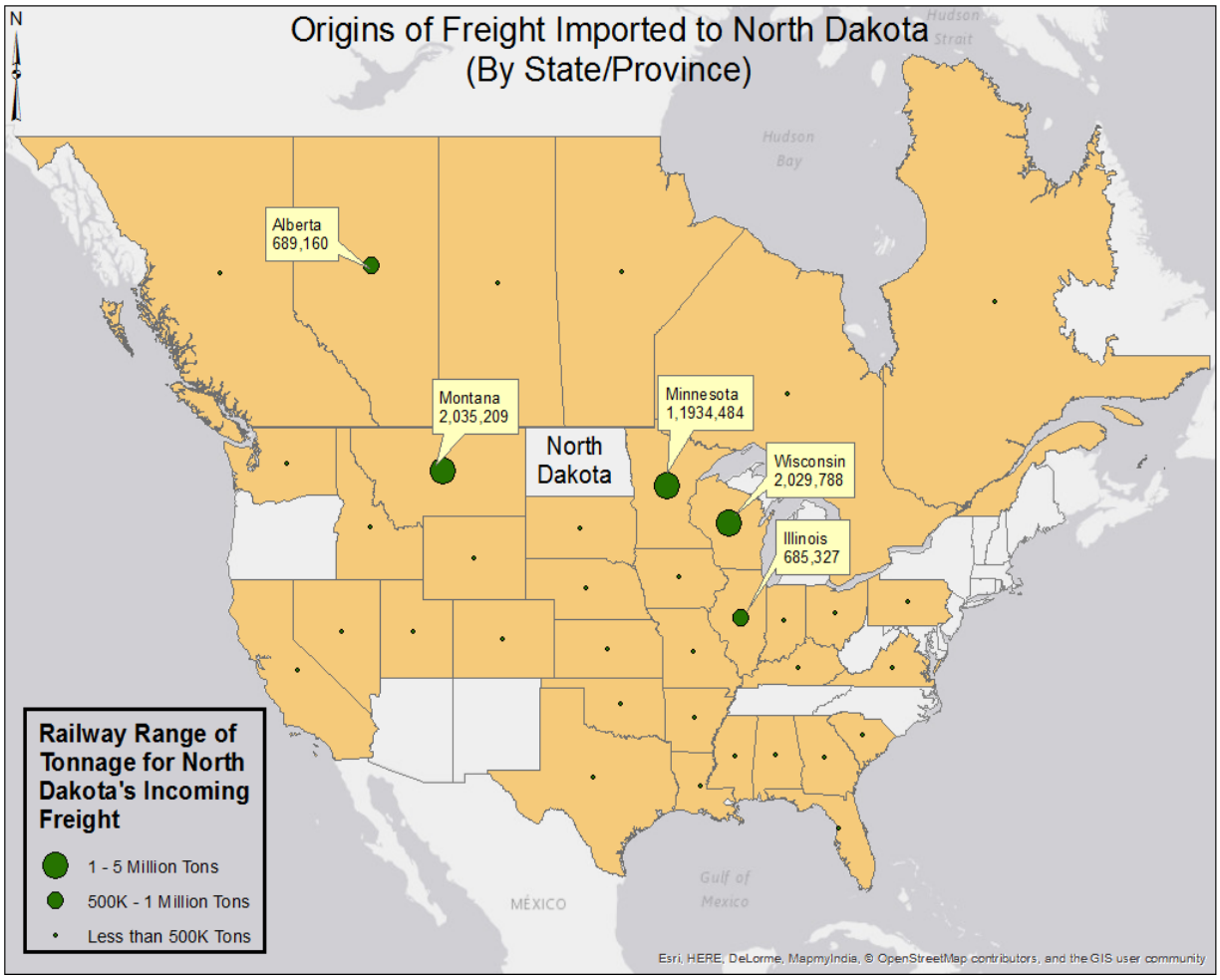
Figure 2-33. Tonnage Shipped by Rail from North Dakota by Destination State (2014)



Source: STB Waybill Sample

As shown in Figure 2-34, the largest origins of rail freight shipped to North Dakota were Montana and Wisconsin, each at over two million tons. Shipments from Montana consisted primarily of coal, nonmetallic minerals (including sand and gravel), and agriculture-related products. Shipments from Wisconsin consisted primarily of nonmetallic minerals (including sand and gravel), clay, concrete, glass, and stone. The sand shipments were attributable to the energy industry. Other leading locations shipping products by rail to North Dakota were Minnesota, Alberta, and Illinois. These shipments consisted mainly of nonmetallic minerals (including sand and gravel), agriculture-related products, clay, concrete, glass and stone, and chemicals.

Figure 2-34. Tonnage Shipped by Rail to North Dakota by Origin State



Source: STB Waybill Sample

County Rail Flows

Williams County was the largest county originating rail shipments, with nearly 13 million tons of farm, nonmetallic minerals (including sand and gravel), petroleum- or coal-based products, and crude oil originated in 2014. The next three most significant rail-originating counties were Mountrail, Ward and Stark Counties, with 9.2, 6.0, and 5.4 million originated tons, respectively. These counties shipped chemicals or allied products related to the energy industry along with clay, concrete, glass, stone and other products.

Mercer County was the busiest North Dakota county for terminating rail shipments with 4.2 million tons destined for the county. Much of this consisted of chemicals or allied products, clay, concrete, glass, stone, coal nonmetallic minerals (including sand and gravel), and crude oil. The other top terminating counties include Mountrail, Williams, Cass, and Ward. Each of these counties was the rail destination of 1–1.6 million tons of freight, including imports of chemicals or allied products, clay, concrete, glass and stone. Nonmetallic minerals (including sand and gravel), food or kindred products, coal and farm products were also major commodities shipped to these counties by rail.

Rail Flows by International Trading Partner

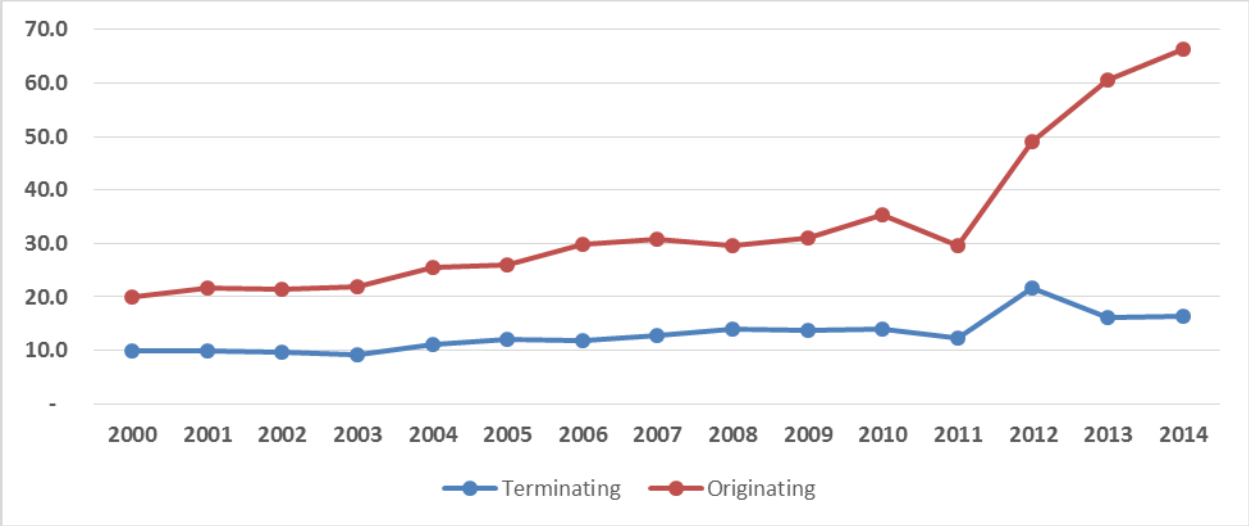
Canada is North Dakota's largest foreign trading partner for freight that travels by rail. Canada accounted for 58 percent of North Dakota's international rail tonnage in 2012, the most recent year data was available. Canada accounted for nearly all (98 percent) of the rail import trade. Imports from Canada by rail consisted of a variety of products, including fertilizers and chemicals, grains and other agricultural products, as well on nonmetallic minerals and nonmetallic mineral products. Canada was the second largest recipient of North Dakota exports by rail, receiving 41 percent of North Dakota rail export tons. Sixty-five percent of rail exports to Canada were petroleum products, including crude oil, gasoline, and fuel oil. Most of the remaining rail exports to Canada consisted of food and agriculture products.

Eastern Asia was the largest recipient of North Dakota exports shipped by rail to seaports, receiving 45 percent of North Dakota exports shipped by rail in 2012. The primary gateways were the Port of Seattle and to a lesser extent the Port of Portland. Measured in tonnage, agricultural products represented 97 percent of North Dakota exports to East Asia.

2.11.4 North Dakota Rail Flows – Historic Trends

Products originating in North Dakota steadily increased between 2000 and 2010, primarily due to continuous growth in farm product shipments. However, starting in 2011, North Dakota rail shipments spiked dramatically, with outbound shipments more than doubling within the space of several years. This was mostly driven by shipments of crude oil from the Bakken oil fields. Inbound shipments spiked to a lesser extent, primarily associated with inputs to oil development, such as rail shipments of sand and pipe. Sand shipments grew from approximately 80,000 tons in the year 2000 to 3.1 million tons in 2014.

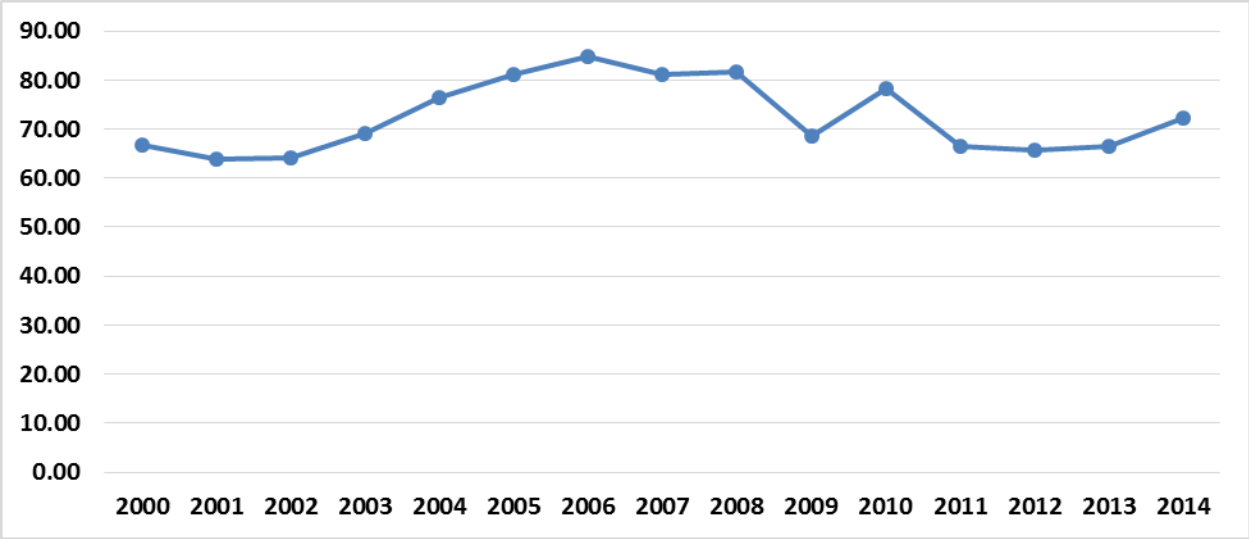
Figure 2-35. North Dakota Originating and Terminating Rail Traffic (millions of tons)



Source: STB Waybill Sample

Figure 2-36 shows the historic trend of rail traffic crossing through North Dakota. Overhead traffic grew between 2000 and 2006. The Great Recession reduced rail traffic traversing the state, which has yet to return to pre-recession levels.

Figure 2-36. North Dakota through Rail Traffic (millions of tons)



Source: STB Waybill Sample

2.12 OUTLOOK FOR RAIL DEPENDENT INDUSTRIES

2.12.1 Petroleum Industry

Hydraulic fracturing or "fracking" and horizontal drilling have created a revolution in oil production in the United States. Fracking involves pumping a mixture of water, sand, and chemicals into a well to free oil and gas from shale rock and allow them to be brought to the surface. Horizontal drilling creates a vertical bore, which then continues horizontally, so that a single well can recover oil or gas over an area instead of drilling multiple wells. Due to the presence of the Bakken Shale play within the state, these two technological advances have made North Dakota the second largest oil-producing state within the U.S. behind Texas. North Dakota produced over 13 times as much oil in 2014 as in 2003.

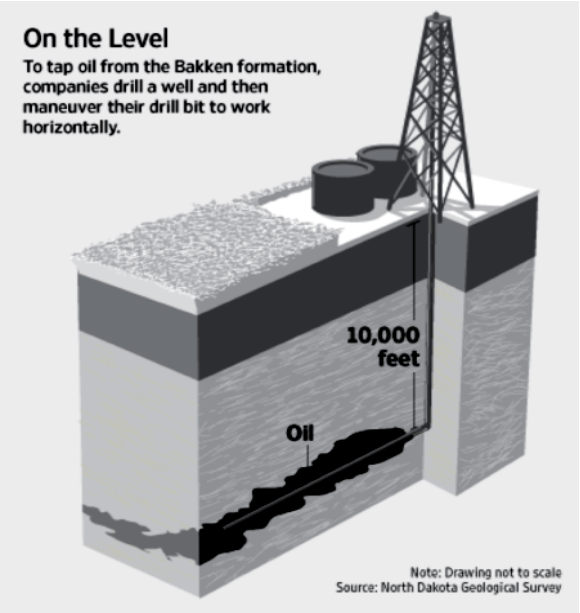
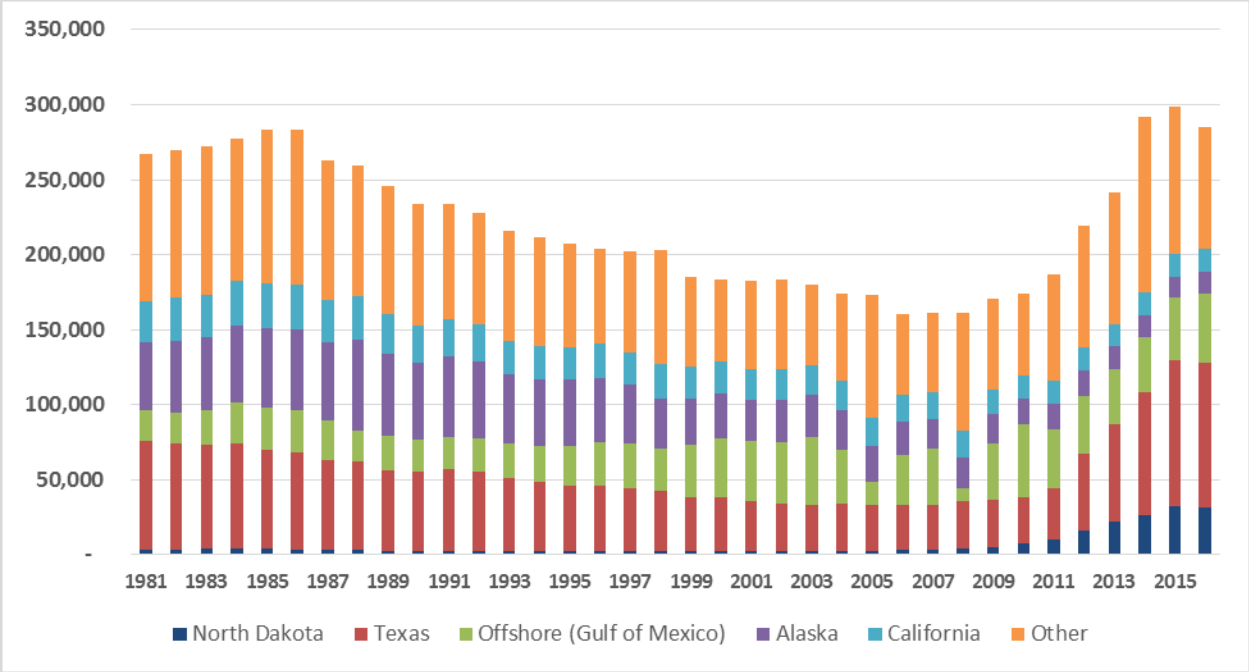


Figure 2-37. U.S. Crude Oil Production (1,000 barrels per year)

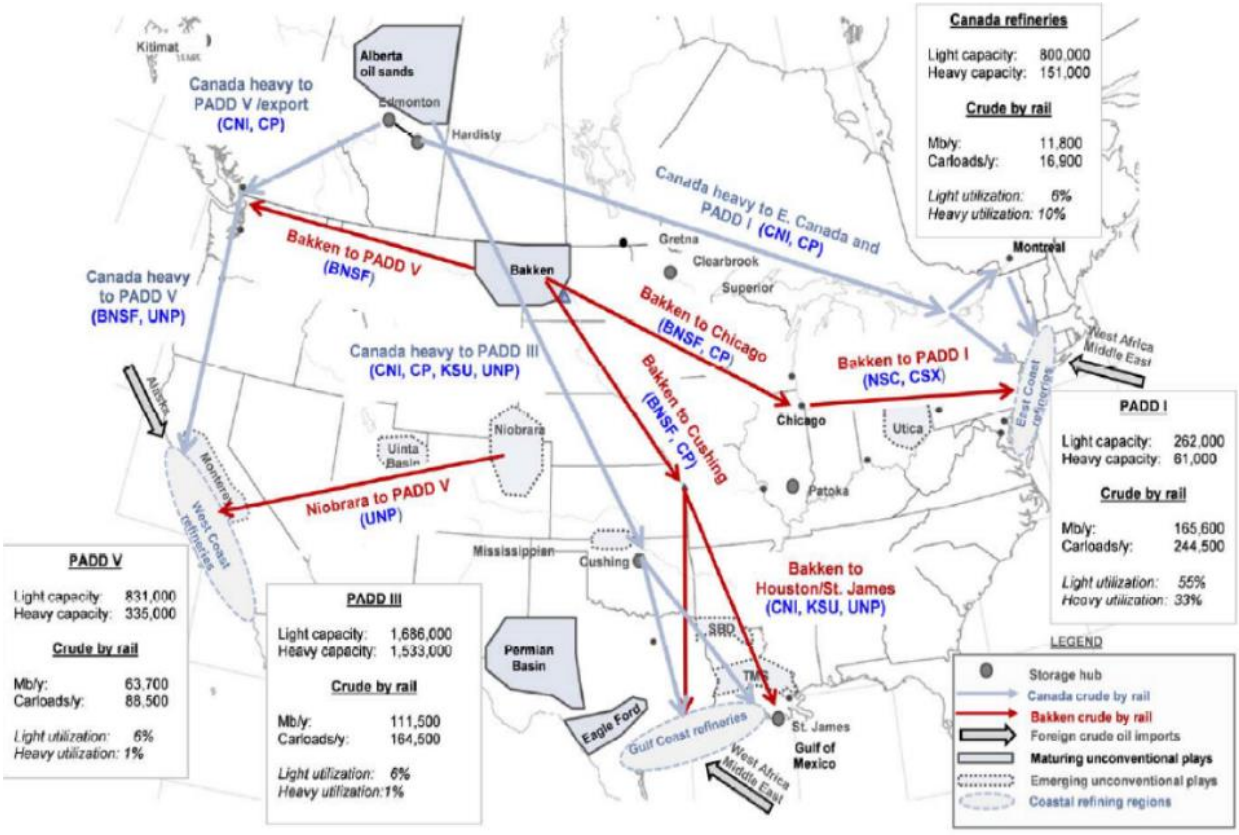


Source: EIA

Most refineries are located in traditional oil production areas such as Texas or Oklahoma, or in coastal areas where tanker ships can be unloaded and refined products shipped most cost-effectively by water. While new refinery capacity has been added in North Dakota, most crude oil must be shipped elsewhere to be refined.

When petroleum products were first refined in the nineteenth century, rail was the primary mode used to transport crude oil. However, through the end of the twentieth century, rail lost market share to pipelines. While pipelines are costly to build, the transportation cost averages about $5 per barrel nationwide compared to $10 or $15 per barrel moving oil by rail.[35] Even with the price differential, rail transportation re-emerged as a key transportation option for transporting oil from North Dakota. Pipeline capacity to transport crude oil from North Dakota has been inadequate to meet demand. In addition, railroads provide shipping flexibility as the rail network reaches nearly anywhere in the US. In addition, reduced extraction costs and the higher oil prices made shipping by rail economically competitive.

Figure 2-38. Crude Oil by Rail Shipping Patterns



Source: Goldman Sachs White Paper, "Crude by Rail Conundrum," May 28, 2015

[35] John Frittelli, et. al. of the U.S. Congressional Research Service, "U.S. Rail Transportation of Crude Oil: Background and Issues for Congress."

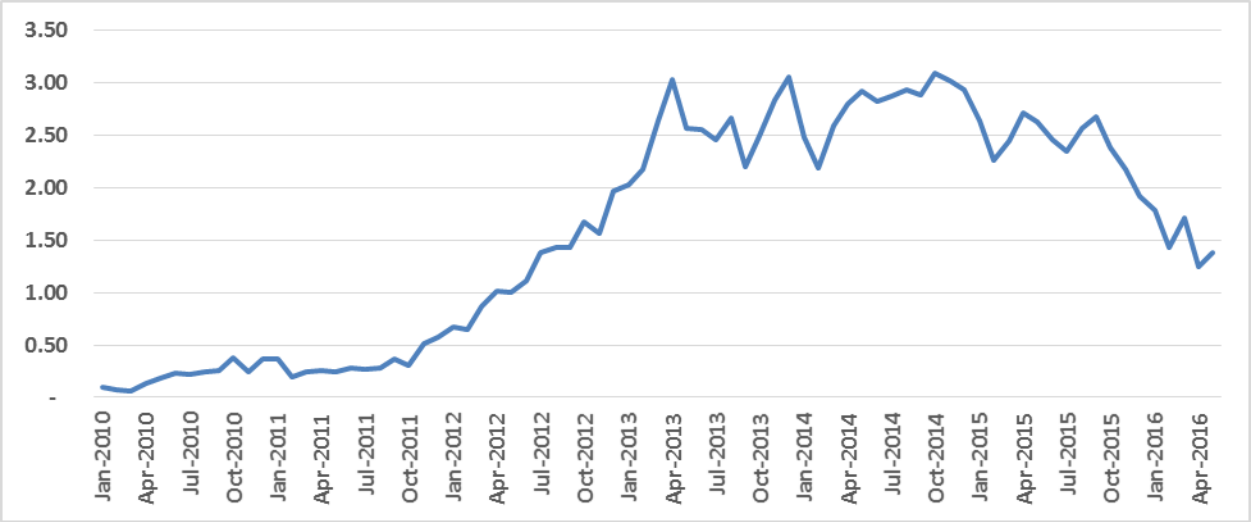
Table 2-26. Attributes of Shipping Oil by Rail vs. Pipeline

Selection Attributes	Railroad	Pipeline
Market Access / Optionality	Diverse; Flexible; On-Demand	Rigid; Inflexible
Capital Investment Required	Low (i.e. Terminal = $30-100 million)	Very High ($500 million – $5.0+ billion)
Development Lead Time	Low (12-18 months)	High (2-7 years)
Speed to Market	Fast (5-10 days)	Slow (30-50 days)
Product Quality Retention	High (complete separation)	Low (dilution, trans-mixing)
Backhaul Opportunities	High (Diluent Option)	Limited (10-20 year fixed commitments)
Scalability	High (start manifest; grow into unit)	Nil
Existing Infrastructure	Plentiful (Existing Rights of Way)	Limited (or full)
Delivery Cost, Light Oil (Bakken – USGC)	High ($14.00-19.00/bbl)	Low ($7.00-11.00/bbl)
Delivery Cost, Heavy Oil (Hardisty – USGC)*	High ($20.50-23.00/bbl)	Medium-High ($16.00-25.75/bbl)

Source: RBN Energy

New rail loading facilities can be built relatively quickly and rail transportation offers scalability that pipelines lack. Midwest crude by rail shipments jumped from 3 million barrels in 2010 to 53 million barrels in 2014, with most of the increase attributable to North Dakota production. According to the STB Waybill Sample, shipments of petroleum from North Dakota increased from 2.5 million tons in 2010 to 33.6 million tons in 2014. Prior to 2010, almost no crude oil was shipped from the state by rail. Crude by rail, however, has proven to be uncertain. Figure 2-39 uses EIA data on crude by rail shipments from the Midwest to estimate monthly North Dakota shipments. The results suggest that as of mid-2016, rail shipments of crude had shrunk to roughly half the 2014 peak.

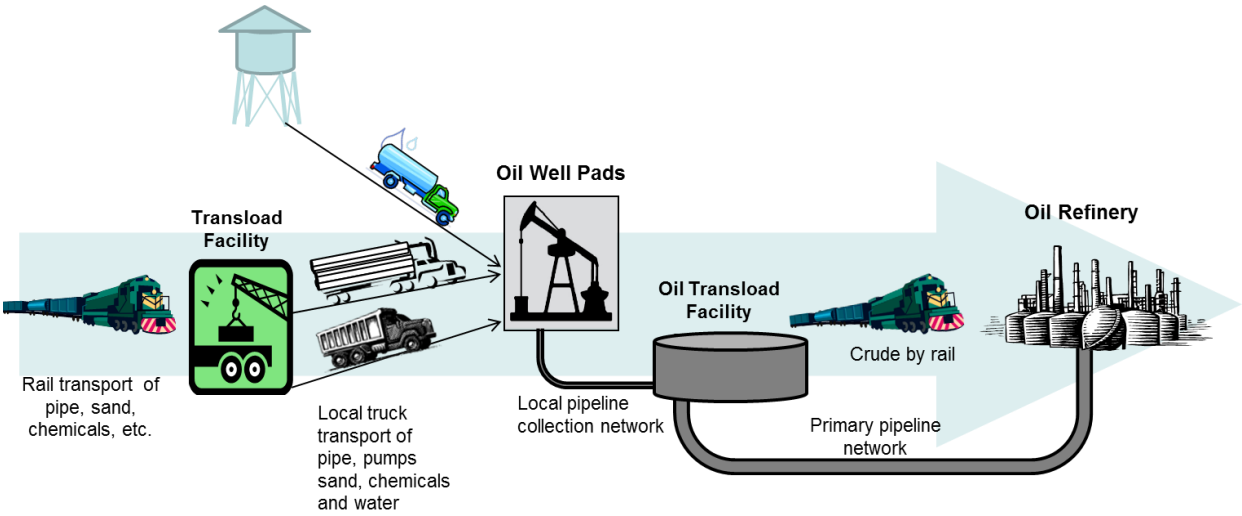
Figure 2-39. North Dakota Crude Oil Rail Shipments (millions of tons)



Source: STB Waybill Sample, EIA data

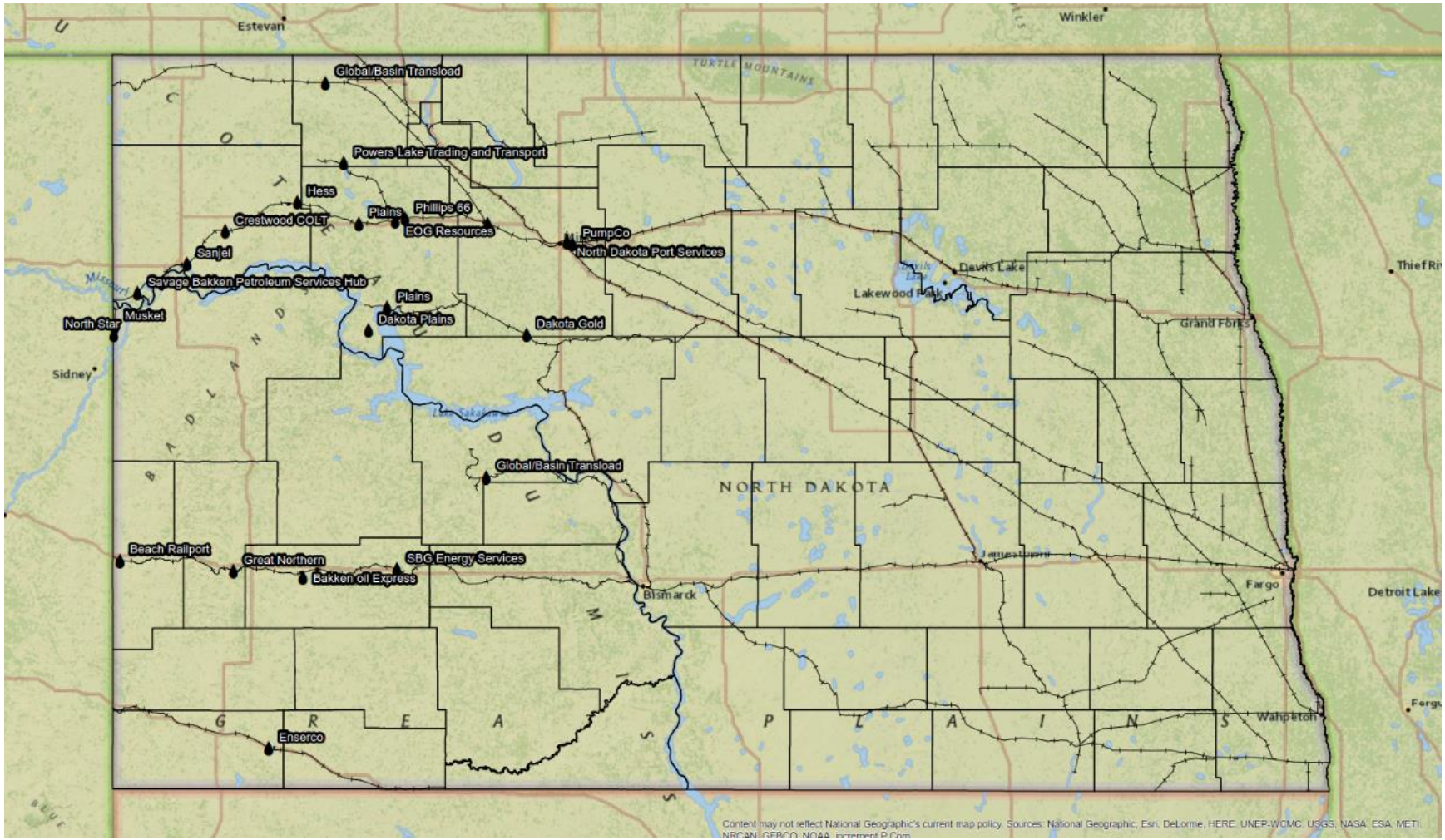
Energy exploration has also driven increases in inbound shipments for supplies. For example, industrial sand shipments by rail to North Dakota increased from 28,400 tons in 2004 to 2.5 million tons in 2013.

Figure 2-40. Petroleum Products Supply Chain



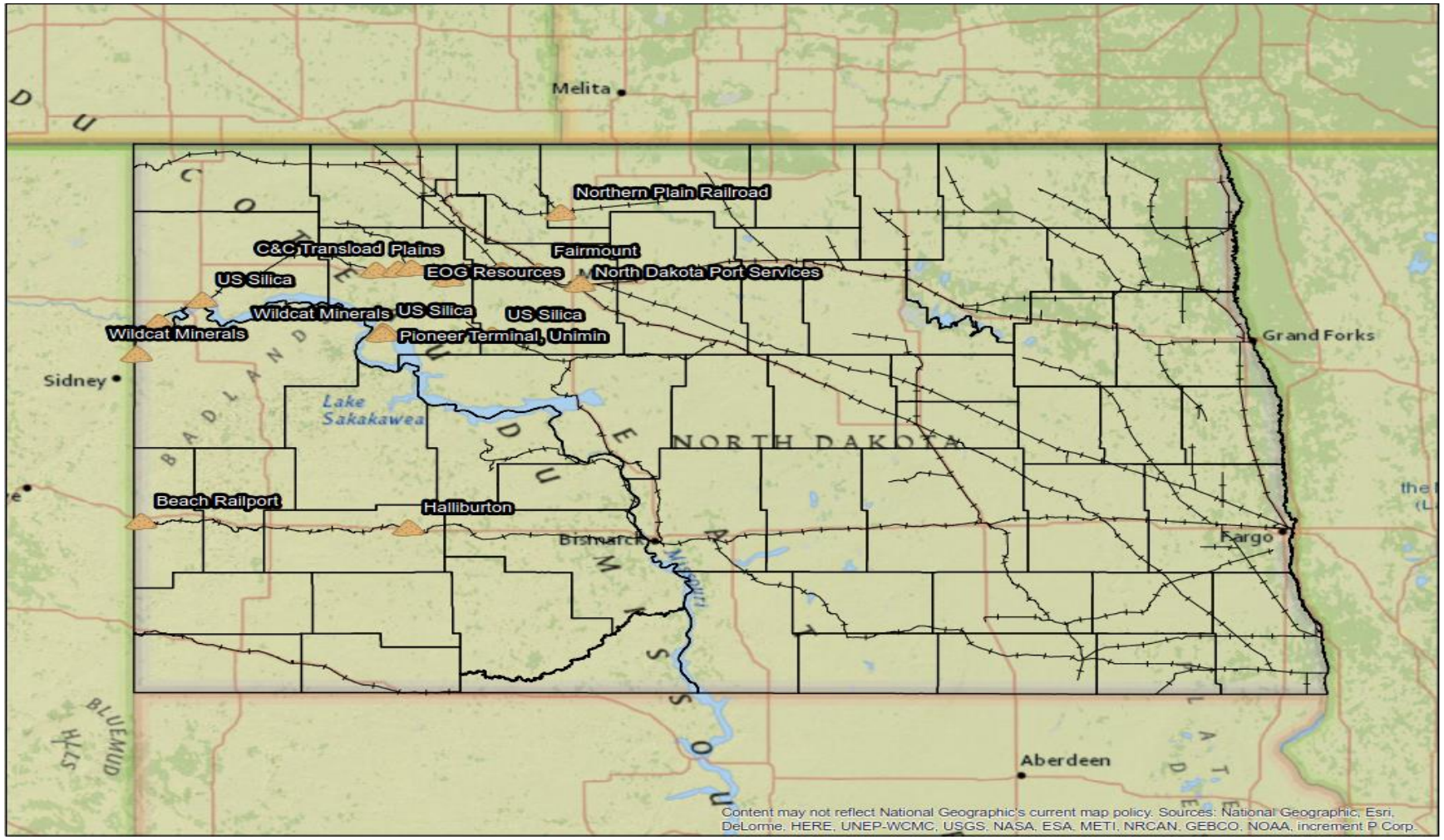
North Dakota's rail loading facilities are concentrated principally in the northwestern part of the state serving the Bakken region producing areas. Most of the facilities are located on BNSF, with two on the CP and one on a short line carrier (DMVW). Nearly all of the crude by rail traffic from North Dakota is carried in unit trains. Figure 2-41 through Figure 2-43 show the crude oil rail infrastructure system.

Figure 2-41. Transload Facilities: Crude Oil



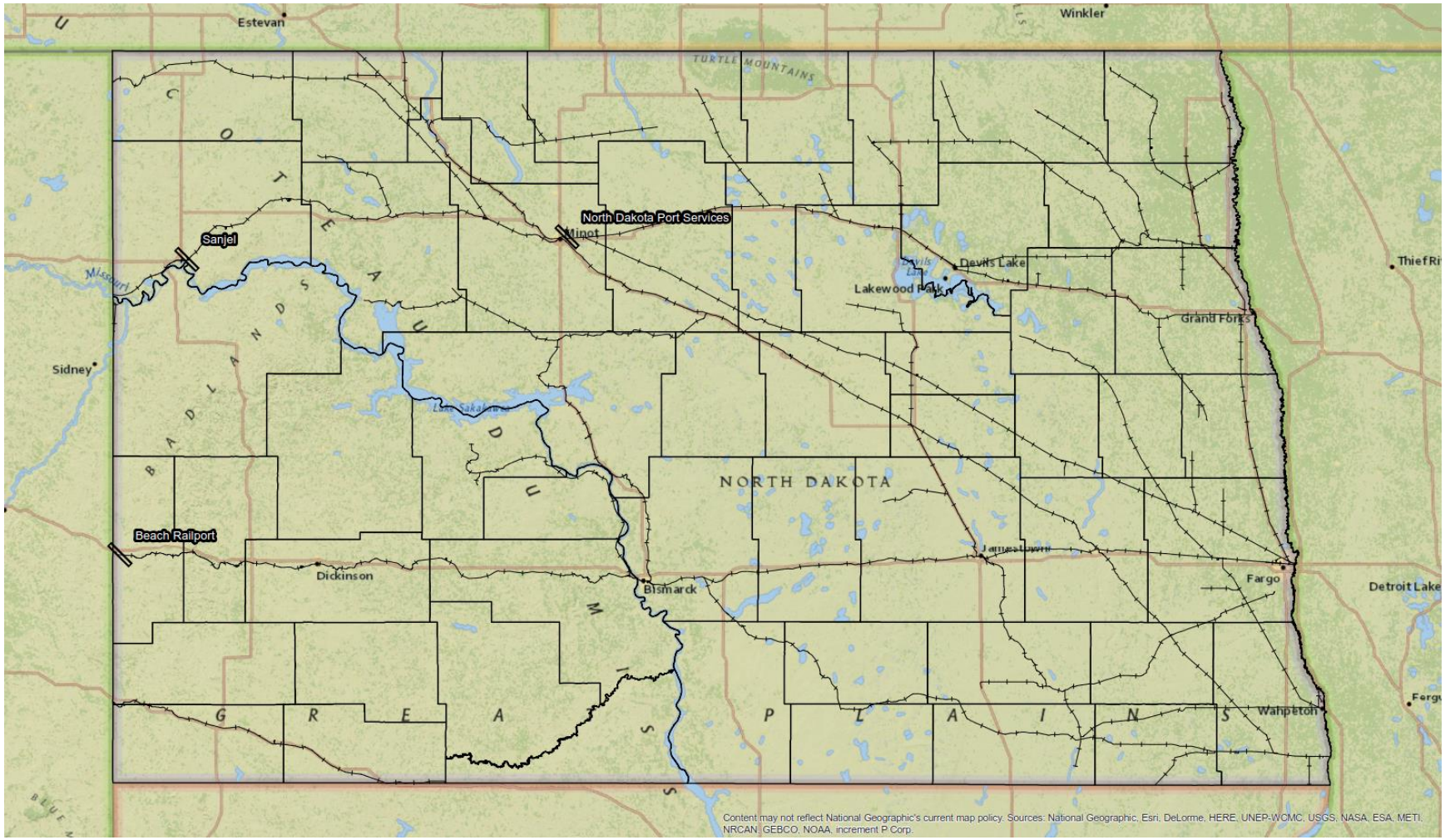
Source: North Dakota Department of Transportation

Figure 2-42. Transload Facilities: Sand



Source: North Dakota Department of Transportation

Figure 2-43. Transload Facilities: Pipe



Source: North Dakota Department of Transportation

Economic Impacts of Petroleum Industry

The petroleum industry and its growth have had major impacts on the North Dakota economy. An analysis by North Dakota State University estimates that the gross spending associated with the oil and gas industry in 2013 was $43 billion, including $25.3 directly associated with the industry and $17.7 associated with industries that supply the oil and gas industry, as well as oil and gas employee expenditures.[36]

Table 2-27. Economic Impact of North Dakota Oil and Gas Industry in 2013 (billions)

Item	Direct Impact	Secondary Impact	Total
Exploration	$7.6	$12.8	**$20.4**
Extraction/Production	$7.7	$7.6	**$15.3**
Transportation and Processing	$0.9	$1.9	**$2.8**
Infrastructure Spending	$1.5	$3.0	**$4.5**
Total	**$17.7**	**$25.3**	**$43.0**

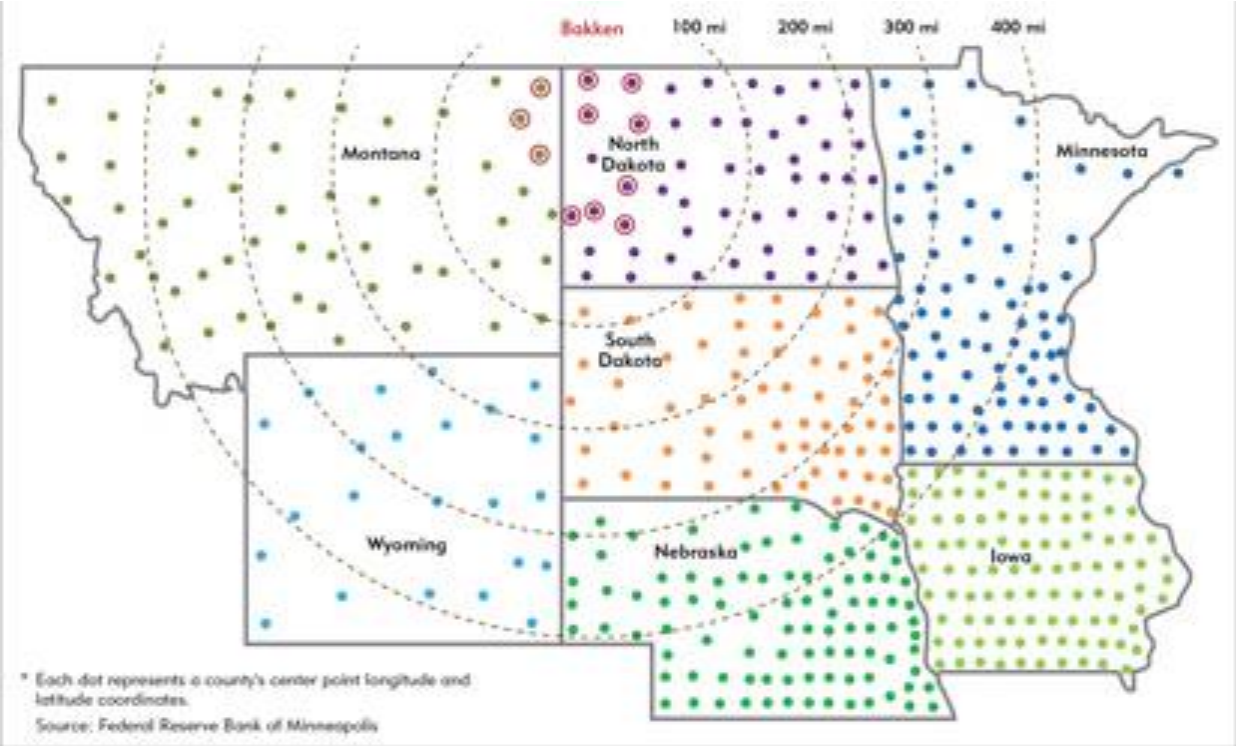
Source: North Dakota State University

Another analysis by the Federal Reserve Bank of Minneapolis examined the impact of the Bakken Shale oil boom on employment and wages.[37] The study found that for the 12 primary counties that constitute the Bakken region and counties within 100 miles, unemployment was lower and wages higher in 2012 than in other parts of the country. Unemployment was found to be higher in counties in the 100–300 mile range of the Bakken than counties within 100 miles. Unemployment within 300 miles of the Bakken counties, however, was lower than unemployment beyond the 300 miles. The Bakken oil development resulted in lower unemployment within a 300-mile radius of the Bakken area capturing the entire state of North Dakota. The availability of rail transportation has enabled this favorable economic impact.

[36] Dean A. Bangsund and Nancy M. Hodur, North Dakota State University, "Petroleum Industry's Economic Contribution to North Dakota in 2013," 2015.

[37] Bob Grunewald and Dulguun Batbold of the Federal Reserve Bank of Minneapolis, *Bakken activity: How wide is the ripple effect?*

Figure 2-44. Economic Influence of the Bakken Region

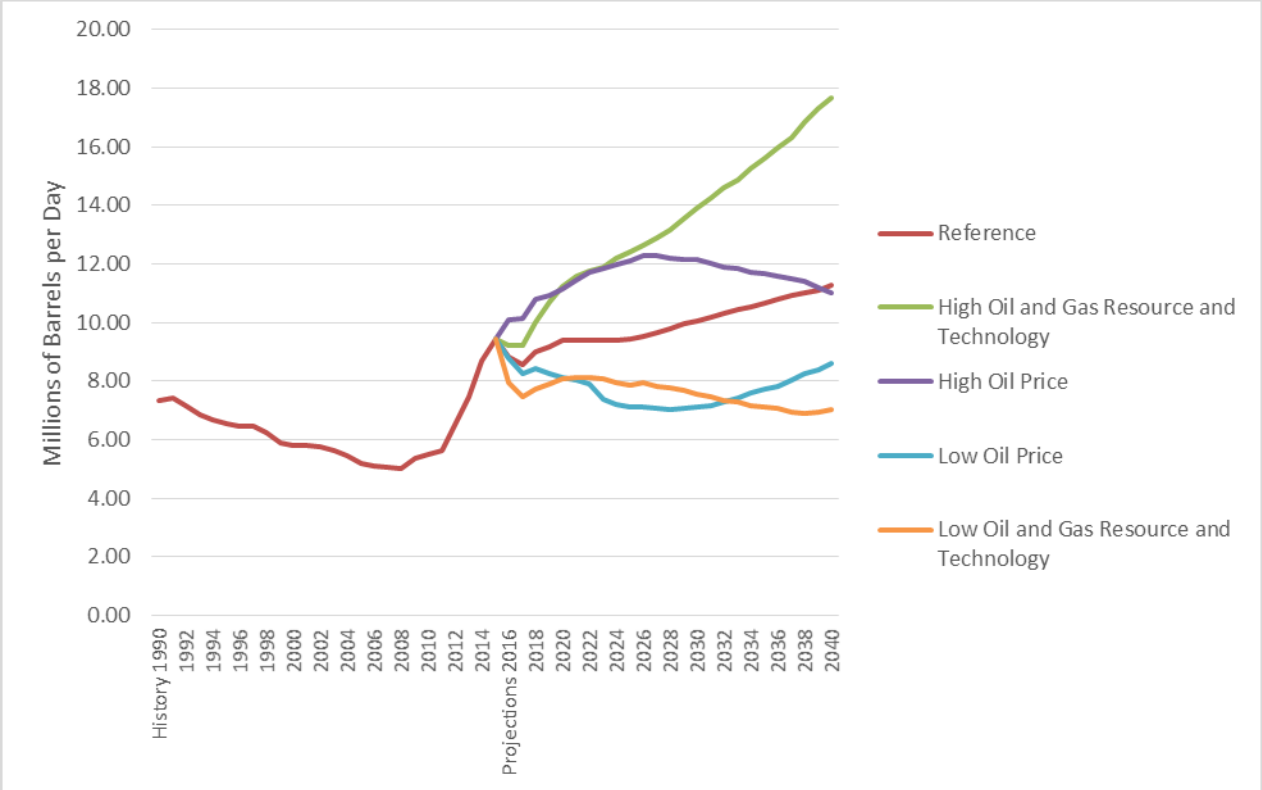


Source: Federal Reserve Bank of Minneapolis

Petroleum Industry Trends

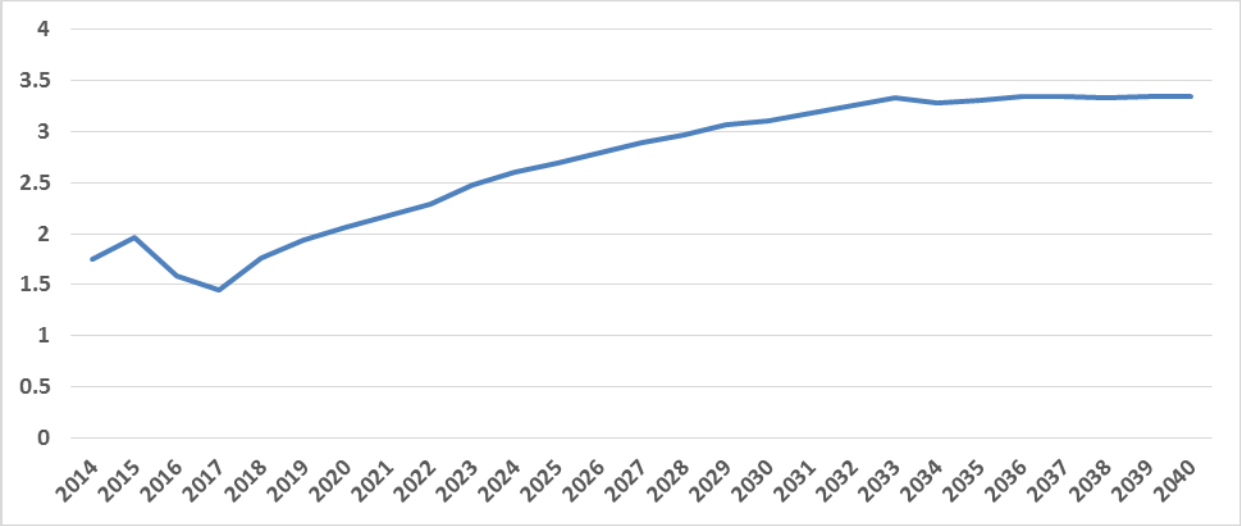
The EIA has produced widely differing forecasts for U.S. crude oil production based upon multiple scenarios for oil prices and technology shown in Figure 2-45. The Reference Case of the EIA *Annual Energy Outlook 2016* predicts that the U.S. oil production in the U.S. region that includes the Bakken oil fields will reach a low point in 2017 and then increase steadily as oil prices recover. In addition to rising oil prices, potential future oil technological improvements could reduce the cost of recovering Bakken region oil and further expand production. These include potential new extraction approaches using injections of carbon dioxide.

Figure 2-45. U.S. Crude Oil Production under Five Scenarios



Source: U.S. EIA, *Annual Energy Outlook 2016*

Figure 2-46. Crude Oil Production of the Dakotas/Rocky Mountains Region (million barrels per day)



Source: U.S. EIA, *Annual Energy Outlook 2016*

While the right circumstances could lead to a recovery of production in the Bakken oil fields, whether this translates to a recovery of rail volumes is uncertain. As shown in Table 2-28, pipeline and refinery projects are planned that would more than double refining and pipeline takeaway capacity in the region. Rail will always be a factor, since some areas within the Bakken region do not have access to pipelines, and not all

of the projects will necessarily be built. However, once built, pipelines are a less expensive option for moving oil than rail. The new pipeline capacity could take additional modals share from rail.

Table 2-28. Bakken Shale Total Takeaway/Refining Capacity

	Capacity (Barrels per Day)	Status
	Pipelines	
Butte	260,000	Online
Enbridge North Dakota	210,000	Online
Plains Bakken North	145,000	Online
Double H Pipeline	40,000	Online
Dakota Access	500,000	Late 2016/Early 2017
Enbridge Pipeline	225,000	2019
TransCanada Upland	300,000	On Hold
Total	1,766,000	
	Refineries	
Tesoro Mandan	68,000	Online
Dakota Prairie	20,000	Online
Thunder Butte	20,000	On Hold
Total	108,000	

Source: RBN Energy

Outlook for Crude by Rail

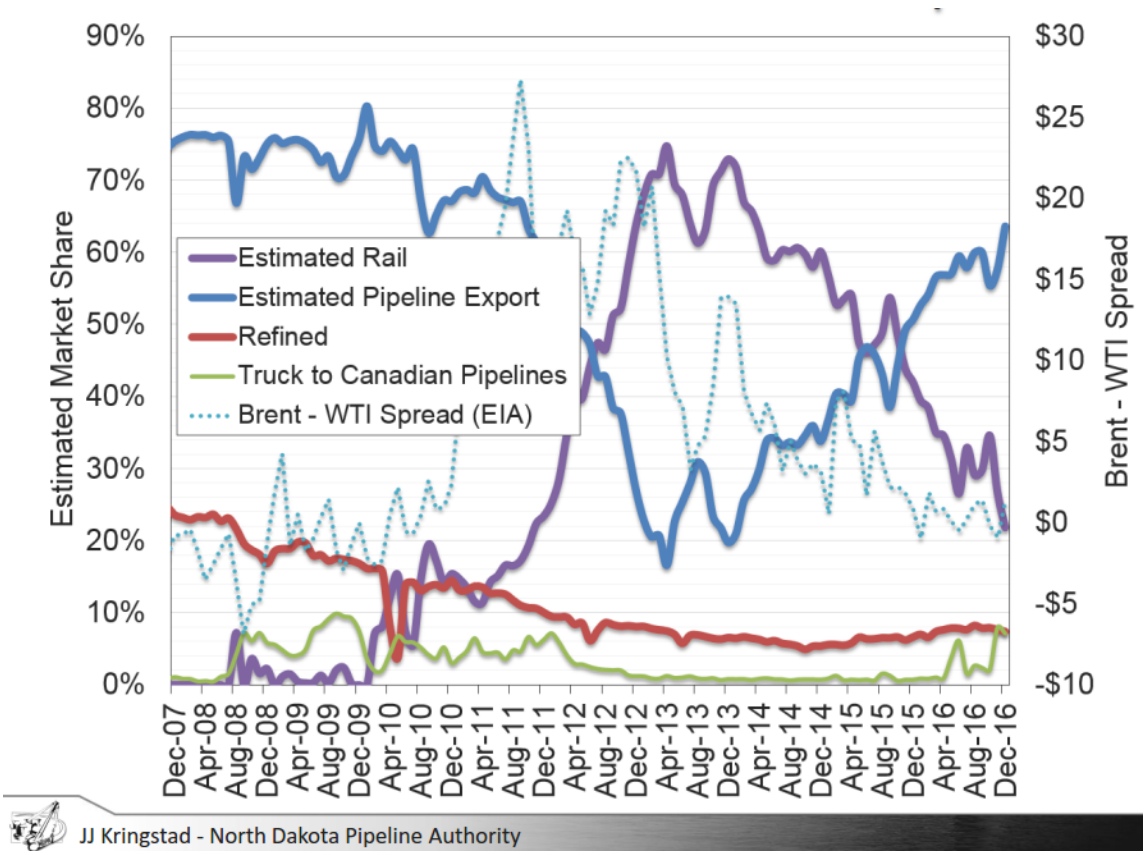
The future of crude by rail is uncertain. A resurgence of crude by rail shipments is dependent on several factors. New wells continue to be established in part to meet requirements of lease agreements but limited oil is produced from the new wells.

- **Low oil prices**. Shale energy development has been made possible by increases in oil prices. The Brent spot price of crude oil increased from a low $12.76 per barrel in 1998 to a peak average annual price of $111.63 per barrel in 2012. Producers have much more of an incentive to permit and drill new wells when oil prices are high than when they are low, so a continued slump in oil prices could reduce the permitting and drilling of new wells so that new wells do not replace those that are eventually exhausted. As of October 2015, however, oil prices fell to less than half their peak average of $48.43 per barrel for Brent spot pricing.
- **Inadequate pipeline capacity**. A number of interstate oil pipelines are currently going through the permitting process including: the Enbridge Sandpiper pipeline to Superior, WI estimated to transport up to 225,000 barrels of oil per day and the Energy Transfer Dakota Access pipeline to Patoka, IL which could transport up to 570,000 barrels of oil per day. The TransCanada Upland pipeline would transport 300,000 barrels of oil per day. The North Dakota Pipeline Authority notes that more pipeline capacity is currently in planning for the Bakken region than currently exists. If all of these projects were to be completed, enough pipeline capacity could be available to take away all oil produced in the Bakken area by 2018 based on mid-2015 production levels. Although the pipeline capacity to transport all oil from North Dakota may exist in the future, the flexibility rail provides would likely ensure that at least some continues to move by rail.

- **Price spreads.** Rail shipments of crude respond to spreads between U.S. domestic crude benchmark WTI and international equivalent Brent. Wider spreads encourage the use of rail to ship to coastal refineries when pipeline capacity is limited because the lower price of domestic crude permits the use of more costly rail transportation. Conversely, lower spreads reduce the incentive to move crude from inland basins to coastal refineries by rail because the latter is a more expensive transport option compared to pipelines.

These factors combine to create an uncertainty in shale oil's future impact on the North Dakota rail network. According to an analysis by the North Dakota Pipeline Authority, rail's modal share for shipping crude oil from North Dakota peaked at over 73 percent between late 2012 to early 2014 and then dipped below 50 percent in mid-2015 as the overall movement of crude oil decreased as prices collapsed. Tank car fleet has a surplus with cars used for storage. As of the mid of 2017, rail's modal share is about 27 percent of Williston Basin oil produced. The percentage of crude oil moved by rail in the future could dip to 10 percent as new pipeline capacity comes on line.

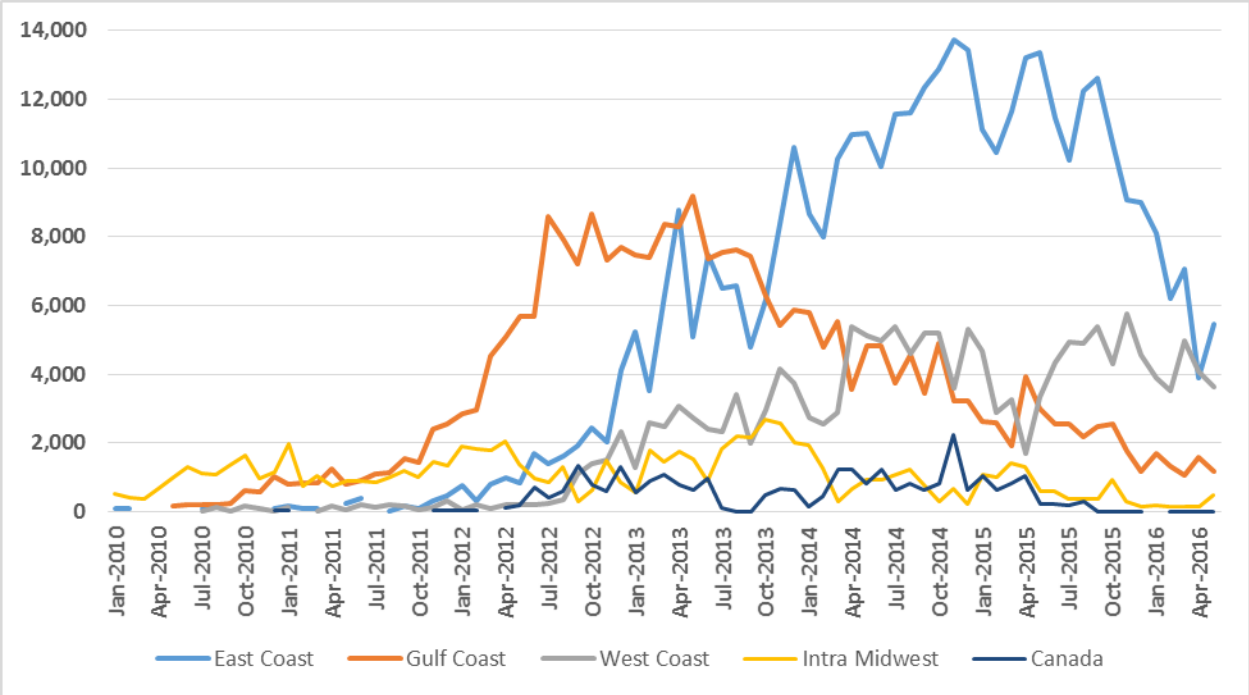
Figure 2-47. Estimated Williston Basin (Bakken) Oil Transportation



The destination of oil shipped from North Dakota has also changed. While the Gulf Coast had been the primary rail destination of North Dakota crude for many years, the East Coast became the principal area of crude by rail demand beginning in 2014. The combination of favorable price differentials and limited pipeline capacity to East Coast refiners resulted in a surge of rail shipments. East Coast shipments have

since declined as the price spread narrowed, so that shipments to the East Coast and West Coast are about even as of mid-2016.[38]

Figure 2-48. Trends in Destinations for Midwest Crude by Rail (thousands of barrels)



Source: US Energy Information Administration
Note: This data reflects movements between Petroleum Administration Defense Districts (PADD). In 2014, about 65 percent of the Midwest PADD oil production was in North Dakota.

2.12.2 Natural Gas Liquids

Natural gas liquids (NGLs) are condensable hydrocarbons associated with natural gas or crude oil extraction. They include ethane, propane, butane, isobutane, and pentane. Since they are condensable (may be referred to as condensates) they often form in natural gas wells when the pressure begins to lessen. Alternatively, they may form at the surface, or be formed through refrigeration and distillation.

NGLs have a number of uses. Ethane is used in the production of plastics and as petrochemical feedstock. End-use products include plastics, antifreeze, and detergent. Propane is used in residential and commercial heating, cooking fuel, and petrochemical feedstock. Butanes are used in petrochemical feedstock or blended with gasoline and propane. Products include synthetic rubber for tires. Isobutanes are used in refinery feedstock and petrochemical feedstock. Pentanes are used in natural gasoline and as a blowing agent for polystyrene foam.

Outlook for NGLs Shipped by Rail

The NGL industry is facing a situation similar to that the crude oil industry faced a few years ago. Pipelines are the preferred mode of transport, however, pipeline capacity is inadequate to ship the expected

[38] Carr, Housely, Slow Train Coming - What's Next for Crude-by-Rail (blog), *RBN Energy*, May 9, 2016, *https://rbnenergy.com/slow-train-coming-whats-next-for-crude-by-rail*

production. By 2020, the demand for NGLs will exceed the existing and planned pipeline capacity. Some of the surplus tank cars that were recently purchased could be used in this service.

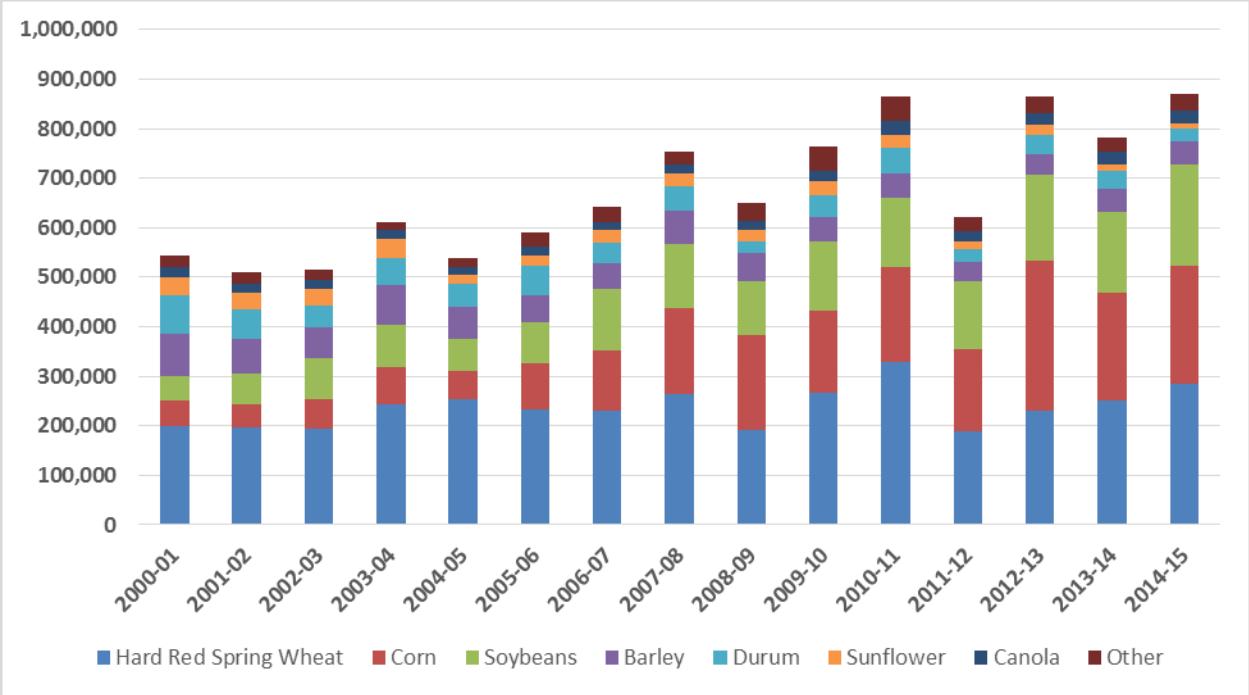
2.12.3 Agriculture Industry

Overview of North Dakota Agriculture

North Dakota is the eleventh largest state in agricultural products sold and the sixth largest in the value of crops according to US Department of Agriculture (USDA) data for 2012. The state is the second largest in wheat acreage, seventh in soybeans acreage, and ninth in corn acreage. In 2014, wheat was North Dakota's number one agricultural commodity with 8.0 million acres planted. Soybeans were second at 5.9 million acres. Wheat and soybeans each represented almost $2 billion in production value. Corn was the third largest crop in production value.

Bushels of grain and oilseed shipped from North Dakota's elevators grew by about 60 percent between the 2000/2001 crop year and the 2014/2015 crop year. The growth was primarily driven by increases in corn and soybean shipments, as well as increases in shipments of hard red spring wheat. By comparison, between 2000 and 2013, U.S. grain production increased by only 19 percent.

Figure 2-49. Shipments from North Dakota Elevators (thousands of bushels)



Source: Upper Great Plains Transportation Institute

Table 2-29. Crops – Planted, Harvested, Yield, Production, Price (MYA), Value of Production in 2014

Commodity	Planted All Purpose Acres	Harvested Acres	Yield	Production	Price per Unit	Value of Production in Dollars
WHEAT						
Wheat	7,960,000	7,490,000	46.3 bu/acre	347,068,000 bu	5.74 $/bu	1,961,592,000
Wheat, spring (excl. durum)	6,250,000	6,140,000	47.5 bu/acre	291,650,000 bu	5.42 $/bu	1,589,493,000
Wheat, spring, durum	840,000	795,000	35.5 bu/acre	28,223,000 bu	8.99 $/bu	248,362,000
Wheat, winter	870,000	555,000	49 bu/acre	27,195,000 bu	4.47 $/bu	123,737,000
SOYBEANS						
Soybeans	5,900,000	5,870,000	34.5 bu/acre	202,515,000 bu	9.49 $/bu	1,944,144,000
CORN						
Corn, grain		2,530,000	124 bu/acre	313,720,000 bu	3.34 $/bu	1,035,276,000
Corn	2,800,000					
Corn, silage		230,000	14.5 tons/acre	3,335,000 tons		
HAY						
Hay		2,700,000	2.02 tons/acre	5,460,000 tons	81.5 $/ton	410,235,000
CANOLA						
Canola	1,200,000	1,190,000	1,800 lb/acre	2,142,000,000 lb	16.9 $/cwt	364,140,000
BEANS						
Beans, dry edible	630,000	615,000	1,430 lb/acre	8,795,000 cwt	28.2 $/cwt	251,537,000
POTATOES						
Potatoes, fall	79,000	77,000	310 cwt/acre	23,870,000 cwt	9.4 $/cwt	224,378,000
SUNFLOWER						
Sunflower	665,000	649,000	1,306 lb/acre	847,420,000 lb	22.6 $/cwt	190,843,000
BARLEY						
Barley	620,000	535,000	67 bu/acre	35,845,000 bu	5.3 $/bu	186,394,000
FLAXSEED						
Flaxseed	275,000	270,000	21.5 bu/acre	5,805,000 bu	11.8 $/bu	69,660,000
PEAS						
Peas, dry edible	265,000	255,000	2,130 lb/acre	5,432,000 cwt	12.2 $/cwt	60,295,000
OATS						
Oats	235,000	105,000	73 bu/acre	7,665,000 bu	2.42 $/bu	18,779,000

Table 2-29. Crops – Planted, Harvested, Yield, Production, Price (MYA), Value of Production in 2014 (continued)

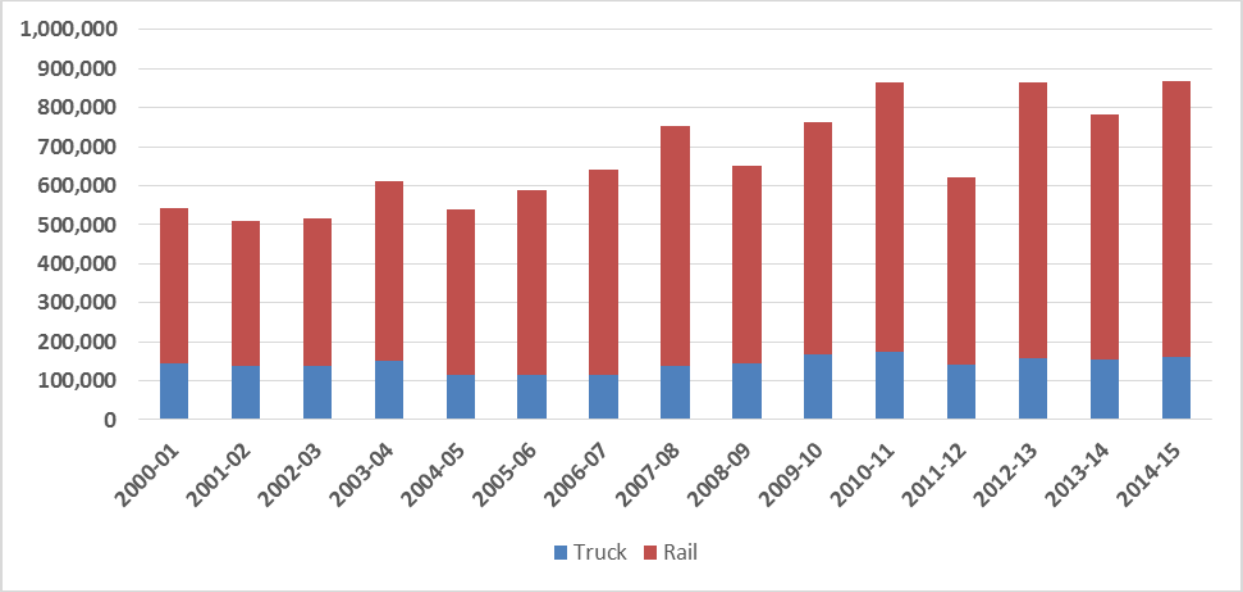
Commodity	Planted All Purpose Acres	Harvested Acres	Yield	Production	Price per Unit	Value of Production in Dollars
LENTILS						
Lentils	75,000	66,000	1,320 lb/acre	871,000 CWT	23.5 $/CWT	16,870,000
SAFFLOWER						
Safflower	14,000	9,500	1,000 lb/acre	9,500,000 lb	24.2 $/ CWT	2,309,000
SUGAR BEETS						
Sugarbeets	215,000	214,000	23.8 tons/acre	5,093,000 tons		

Source: US Department of Agriculture

Rail's Role in Transporting North Dakota Agriculture

Railroads transport most of North Dakota's agricultural production, varying between 72.8 and 82.3 percent of the output between the 2000/2001 crop year and the 2014/2015 crop year.

Figure 2-50. Shipments of Grains and Oil Seeds from North Dakota Elevators (thousands of bushels)

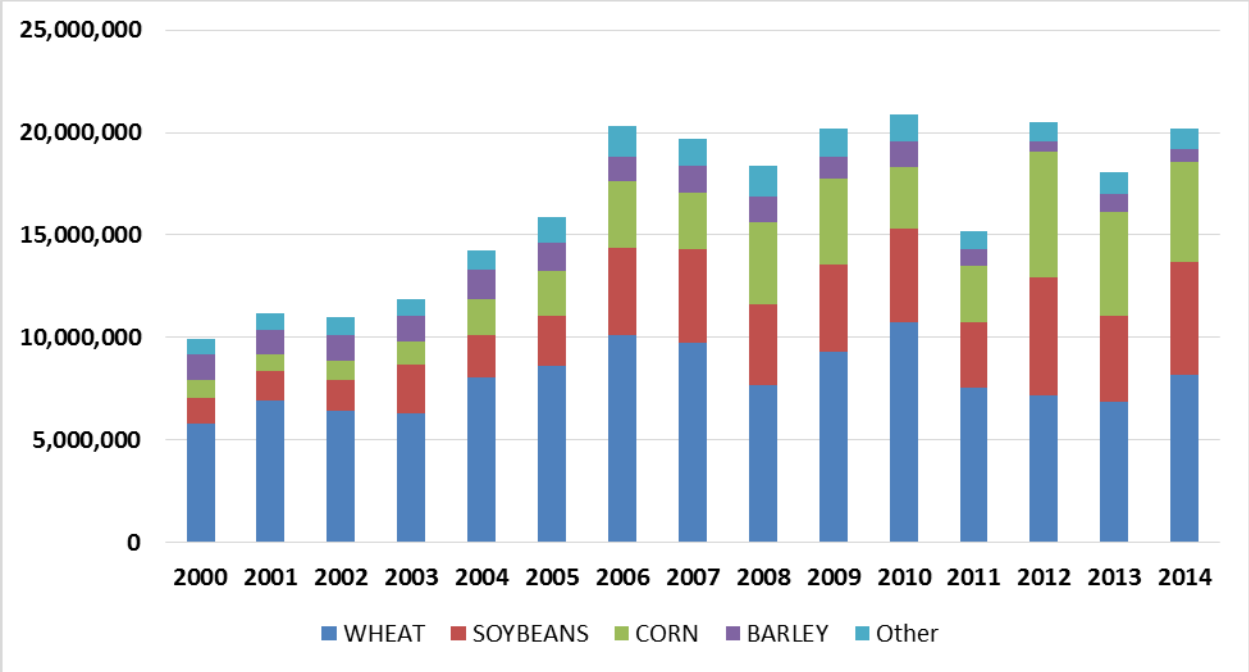


Source: UGPTI North Dakota Grain & Oilseed Transportation Statistics: 2014–15

Agricultural Commodities Carried by Rail in North Dakota

Wheat is the highest volume agricultural product to be shipped by rail from North Dakota, accounting for 43 percent of farm products rail shipments from the state. Rail shipments of soybeans and corn, however, have increased markedly since 2005, accounting for nearly 29 percent and 26 percent of farm product rail tonnage in 2014, respectively. Overall, agricultural shipments by rail from North Dakota doubled between 2000 and 2014.

Figure 2-51. Outbound North Dakota Agricultural Rail Shipments (millions of tons)

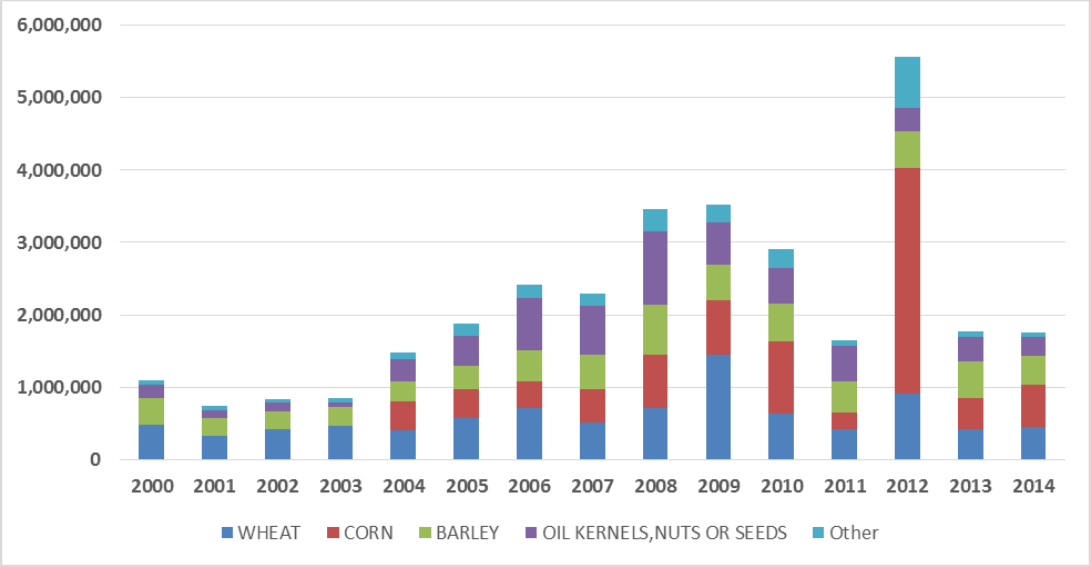


Source: Surface Transportation Board Waybill Sample

Agricultural products are shipped not only from North Dakota, but they also into North Dakota, albeit in smaller volumes than the outbound shipments. These shipments are destined for ethanol plans and food processors. The level of inbound shipments has been volatile, with large volumes of commodities shipped some years and quite less in others. It is likely that spikes in inbound tonnage are caused by temporary shortages in the local supply of commodities, which are typically shipped by truck. When ethanol plants, food manufacturers, or other major consumers of farm products are unable to obtain sufficient farm products from local sources they are obtained from markets that are more distant by rail.

Wheat and corn are generally the highest volume commodities shipped by rail into North Dakota, but in some years, barley, and/or sunflower seeds have shown the highest inbound rail tonnage (Figure 2-52.

Figure 2-52. Inbound North Dakota Agricultural Shipments (tonnage shipped by rail)

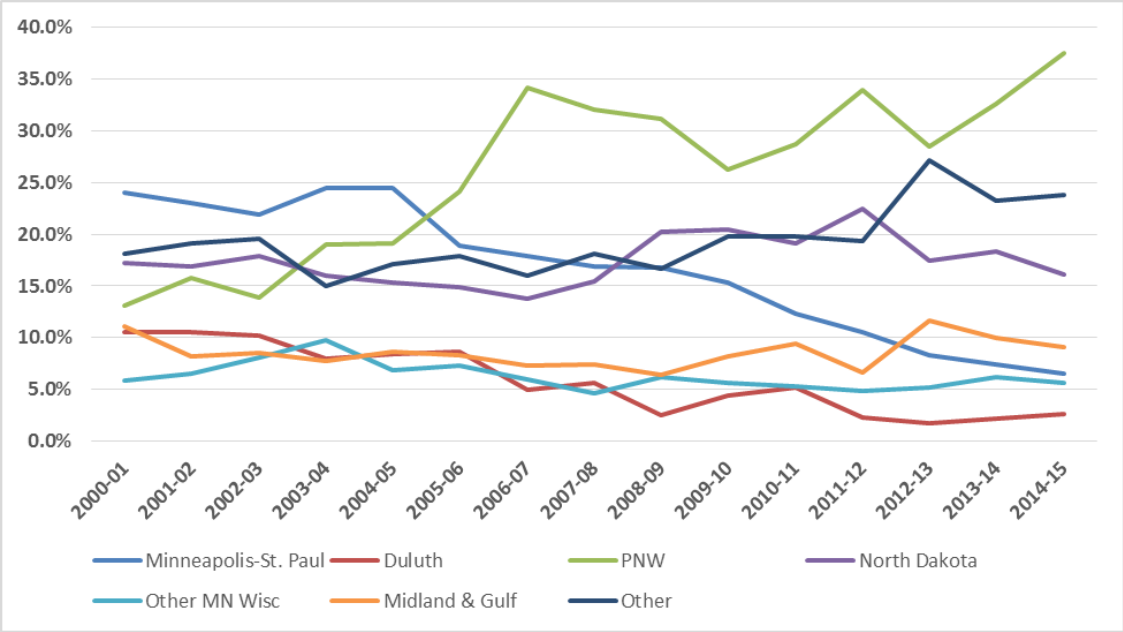


Source: Surface Transportation Board Waybill Sample

Destinations of North Dakota Agricultural Commodities

The destinations of grain and oilseed shipments from North Dakota have shifted over the years. As shown in Figure 2-53, the Pacific Northwest and non-traditional market states have gained in importance between the 2000/2001 and 2014/2015 crop years. Conversely, the importance of the Twin Cities and Duluth, MN, as destinations has diminished.

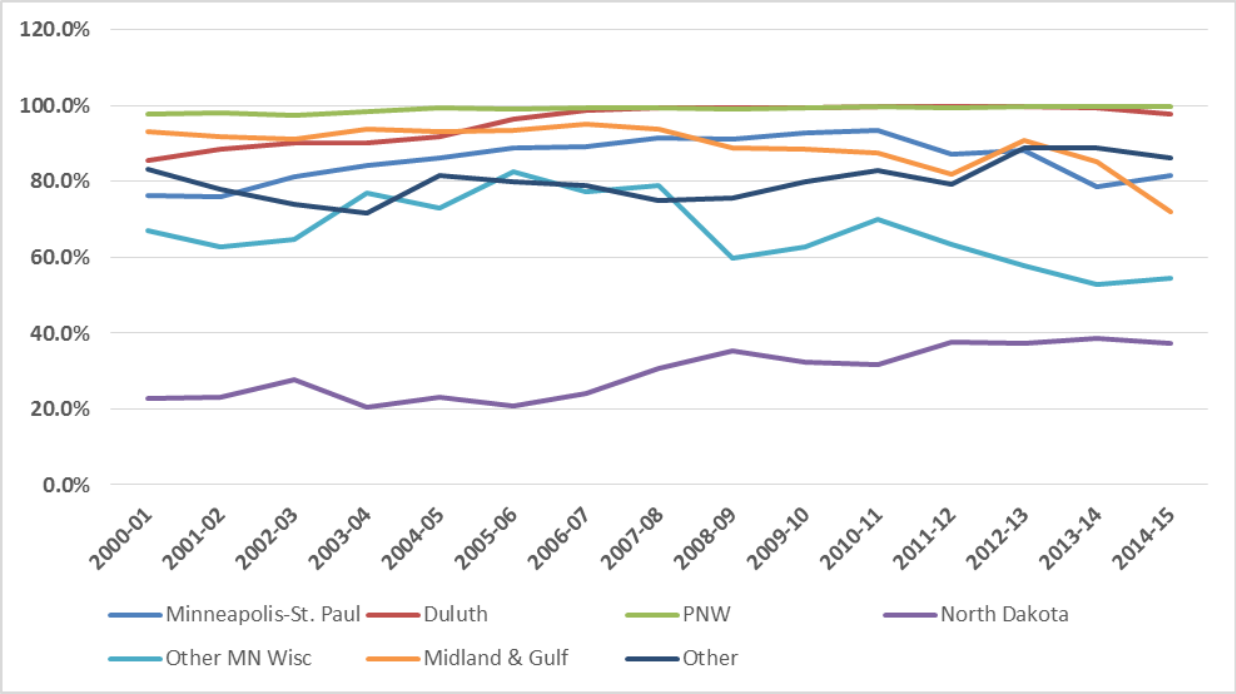
Figure 2-53. Destinations of North Dakota Grain and Oilseed Shipments



Source: UGPTI North Dakota Grain & Oilseed Transportation Statistics: 2014-15

As shown in Figure 2-54, rail modal share of North Dakota grains and oilseed varies widely by destination. Agriculture products moving to the Pacific Northwest and Duluth, MN, have historically been exclusively shipped by rail. Although motor carriers continue to dominate intra-North Dakota shipments, the rail share of those shipments has been increasing.

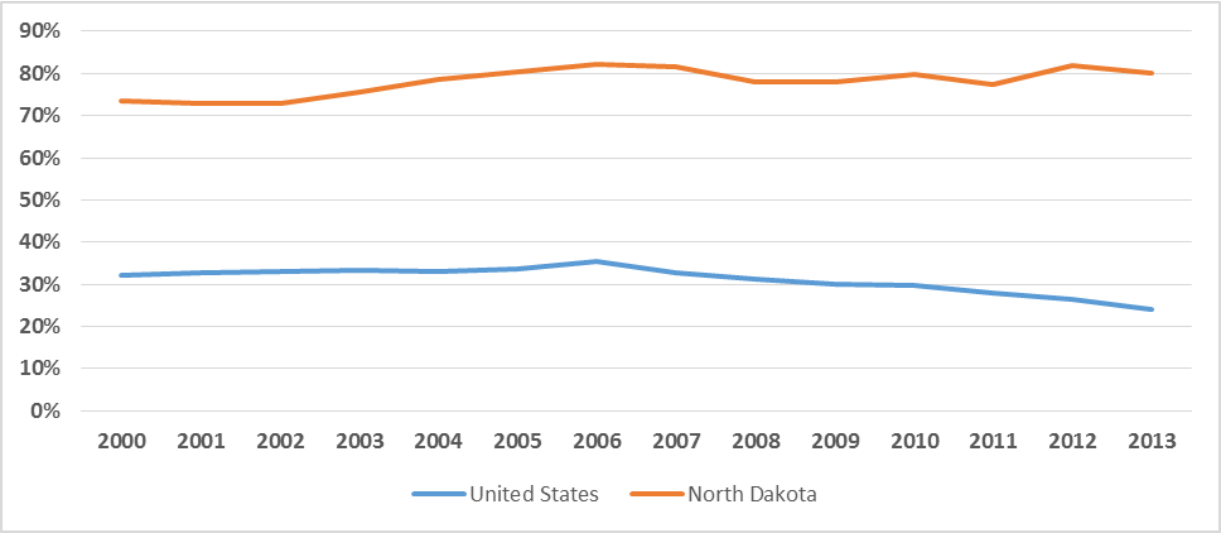
Figure 2-54. Rail Share of Grain and Oil Seed Shipments by Destination



Source: UGPTI North Dakota Grain & Oilseed Transportation Statistics

North Dakota agriculture relies on rail transportation more than other states. Rail's share of grain shipments is higher in North Dakota than in other parts of the country. Moreover, rail's modal share in North Dakota has been increasing in sharp contrast to elsewhere in the US. North Dakota shippers rely heavily on rail transportation because markets where North Dakota grain is sold are quite distant with no available water transportation alternatives. Reliance on rail has increased in recent years since volumes to markets with a high percentage of rail have grown, such as the Pacific Northwest. Rail's market share within markets has also grown, such as for North Dakota intrastate shipments and Duluth shipments above.

Figure 2-55. North Dakota Rail Market Share vs. U.S. Market Share – Agriculture



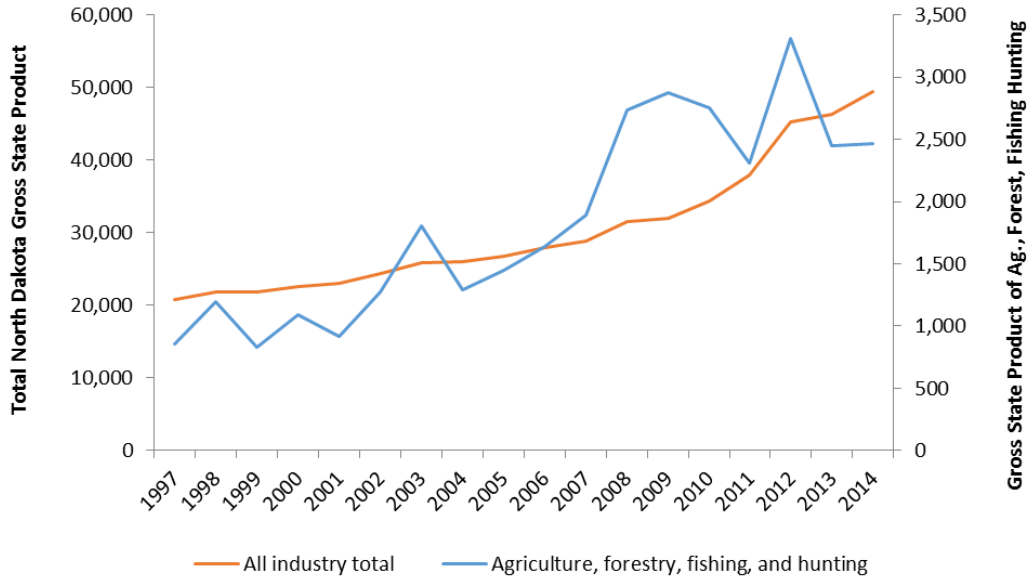
Source: UGPTI North Dakota Grain & Oilseed Transportation Statistics, USDA Transportation of U.S. Grains: A Modal Share Analysis

Agriculture's Contribution to the North Dakota Economy

Over the past two decades, agriculture has grown in importance in North Dakota's economy, growing from 4–5 percent of total real gross state product 1997–2002, to 7–9 percent 2007–2012. This trend slowed in 2013 and 2014 because of the rapid rise of output in the oil and gas extraction sector and a dip in farm output.

Food manufacturing, which is closely related to agricultural output, has accounted for another 2 percent of gross state product over the years.

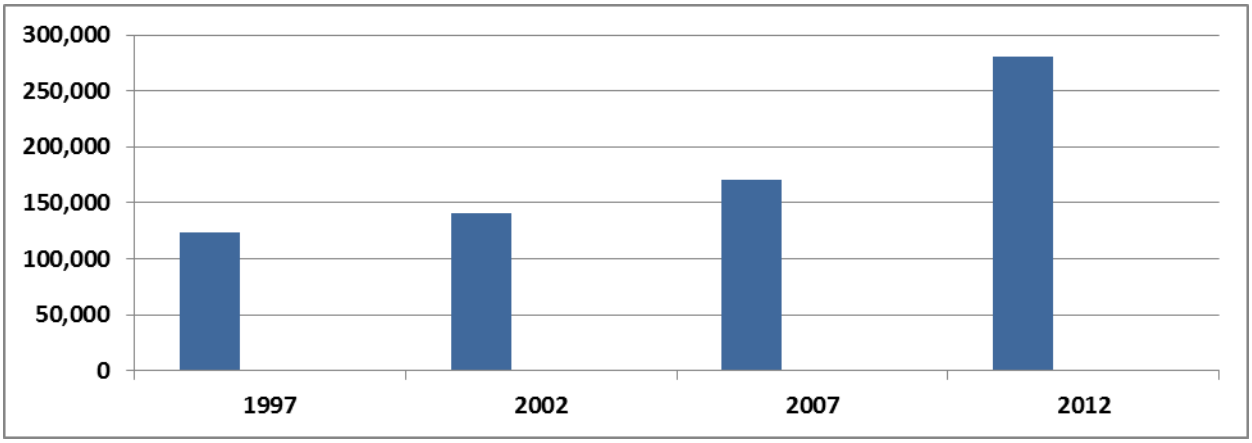
Figure 2-56. Real Gross State Product of North Dakota (millions of 2009 dollars)



Source: U.S. Bureau of Economic Analysis, WSP analysis

Agriculture is also a growing employer in North Dakota. While the number of farms declined by 1,387 from 32,348 to 30,961 over the 15-year period (1997 – 2012), the average acreage of farms and dollars expended on farm labor increased. The average farm grew by 41 acres, and spending on hired farm labor more than doubled from $123 million to more than $280 million during the period.

Figure 2-57. Dollars Spent in Hired Farm Labor in North Dakota (in thousands of dollars)



Source: USDA, National Agriculture Statistics Service – 2012 Census of Agriculture

The USDA predicts slow growth in U.S. production of wheat, corn, and soybeans. For example, the USDA forecasts that corn production in the U.S. will grow at an annual rate of 0.9 percent; wheat, 0.4 percent; and soybeans, 0.2 percent between the 2015/2016 crop year and the 2025/2026 crop year.[39] This compares to an average annual growth in shipments from North Dakota elevators of 15.4 percent for corn; 1.2 percent, wheat; and 11.9 percent for soybeans between 2004/2005 crop year and the 2014/2015 crop year.

The USDA's slow growth forecast is primarily driven by a fall-off in prices from their recent highs. U.S. and global production increased in response to earlier high prices. With more global production, prices have since declined. Furthermore, the U.S. dollar has recently increased in value. The dollar is expected to remain high, which will constrain growth in U.S. agricultural exports in the near term. The economies of third world countries have slowed down and are not growing as rapidly. All else being equal, North Dakota rail trends would be expected to follow national grain production trends, so growth should be slow.

In the longer term, some factors may continue to boost feed grain and soybean shipments, albeit at a more moderate pace. As they are better able to afford it, people in developing countries not only consume more food, but also shift the types of foods they eat—from grains to protein, including fish, dairy, meat, and poultry. According to a report for the Organization for Economic Cooperation and Development and the United Nation's Food and Agricultural Organization, global agricultural production should grow about 1.6 percent per year over the next decade compared to 2.5 percent over the last decade.[40] Most of the

[39] U.S. Department of Agriculture, Interagency Agricultural Projections Committee, *USDA Agricultural Projections to 2025,* February 2016.
[40] Organization for Economic Co-operation and Development and the United Nations, Food and Agriculture Organization, *OECD-FAO Agricultural Outlook 2016 – 2015.*

demand for this new production will come from the third world. Most of the growth in demand for coarse grains (excluding wheat and rice) will come from feed demand. In many countries, particularly in Asia, these nations are limited in terms of water, available land, and labor, and will not necessarily be able to meet increased demand on their own. The export opportunity for North Dakota producers could continue to grow.

On the other hand, the U.S. will face increasing competition from emerging producers as technology needed for high-productivity agriculture is adopted in developing countries. In particular, Brazil and Argentina have emerged as major exporters of crops used in animal feed.

Some industry watchers expect that demand for value-added products will continue to increase. As international competition increases, crop and livestock production will be transformed from commodity to differentiated product industries. Examples of differentiated products include high oil corn and soybeans, high protein wheat, soybeans with specific amino acid composition, and non-genetically modified organisms. If this trend comes to pass, the rail system will increasingly need to be able to accommodate identity-preserved grain and other supply chain practices that enable producers to maintain the identity of value-added products. This could increase demand for transportation options outside of the general bulk grain-handling system, by which grains from multiple sources are mixed together in elevators, on trains, on bulk ships.

Outlook for Agriculture by Rail

Due to the rapid rise of North Dakota agriculture, which increased by 44 percent between 2000 and 2013, coupled with an increase in rail mode share of 7 percent, North Dakota agriculture rail shipments have grown much faster than shipments in other parts of the country.

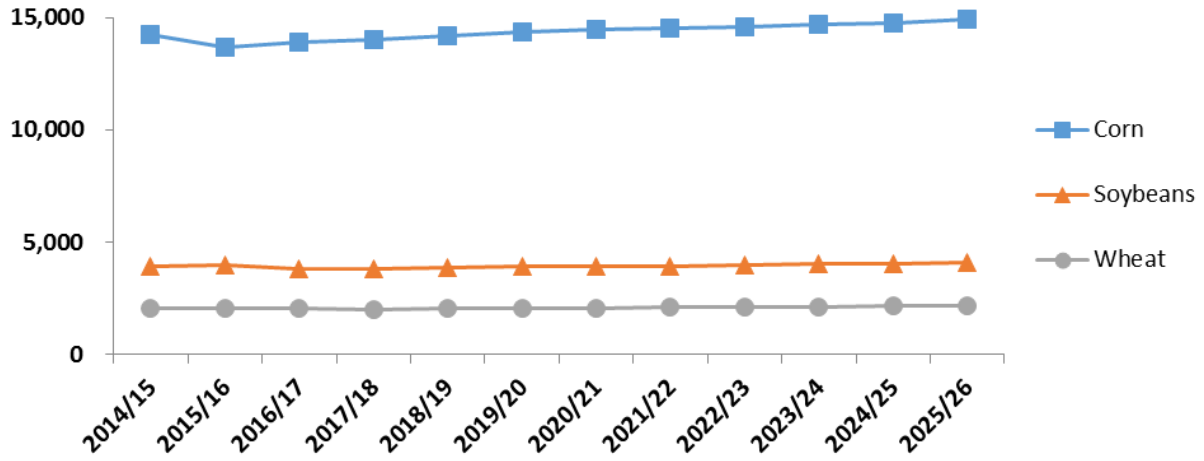
However, it is unlikely that above-average growth in North Dakota rail shipments will continue in the future. The fast growth of recent years was driven by factors not likely to repeat. High corn prices increased the amount of corn grown in North Dakota. In 2003, roughly 100,000 acres of corn were planted in the state, whereas 400,000 were planted in 2012. Corn yields more than double wheat or soybeans. High commodity prices caused acreage that had previously been part of the Conservation Reserve Program (CRP) to be placed into production. Farmers are paid to convert marginal croplands over to wild grassland by the CRP. As CRP contracts expired, land was placed back into production.

Because major crop price increases are not expected, nor is corn production expected to continue the dramatic rise of the past decade, forecasts consistent with national trends are a more realistic basis for estimating future growth in rail shipments of North Dakota agriculture. The USDA released selected forecasts of production of agricultural products in December 2015, covering major agricultural commodities that include grains and soybeans. Figure 2-58 displays the projections of principal commodities of importance to North Dakota.

- Wheat production is projected to grow 5.6 percent from 2014/15 to 2025/26.
- While production of corn is projected to decline in 2015/16, it is expected to grow 4.8 percent over the 11-year period shown.

- Soybean production is expected to increase 3.5 percent from 2014/15 to 2025/26.

Figure 2-58. USDA Projections of US Production of Major Grains and Soybeans (in millions of bushels)



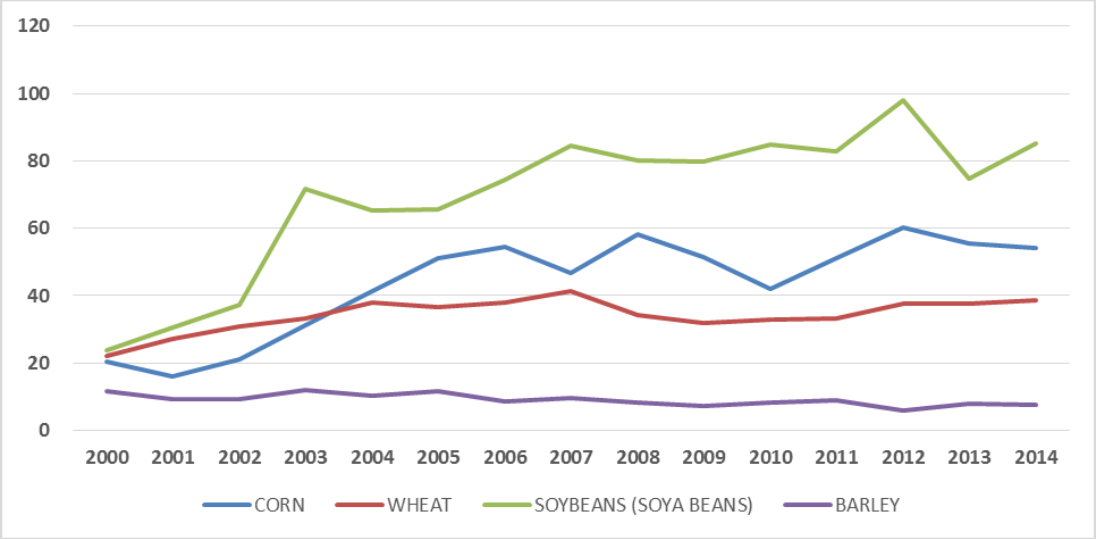
Source: US Department of Agriculture agricultural projections to 2025

Based on projected growth in U.S. production of grains and oilseeds, North Dakota's prominent position in producing these products, and a steady rail share for transporting these products, North Dakota agriculture rail volumes can be expected to grow at a steady but not rapid pace over the next decade.

Train Length Trends

The number of cars per shipment originating in North Dakota depends on the commodity. For example, barley is typically shipped in lots of 8 to 12 carloads. By contrast, soybean shipments tend to be over 70 carloads at a time. Consistent with other locations in the U.S., average shipment sizes of North Dakota agricultural products have been increasing (Figure 2-59). The increase points to a continued shift toward shuttle train operations, where entire trainloads of a single commodity are shipped from a single origin to a single destination, replacing trains carrying multiple commodities.

Figure 2-59. Average Number of Railcars per Shipment for Select Commodities Originating in North Dakota

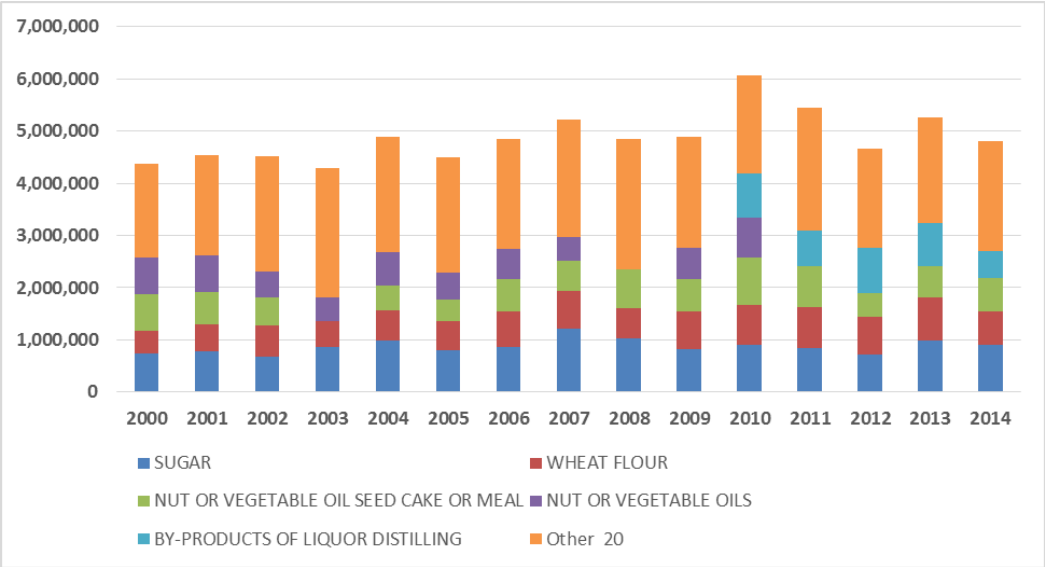


Source: Surface Transportation Board Waybill Sample

2.12.4 Food Manufacturing Industry

A broad range of food items is shipped by rail from North Dakota. As shown in Figure 2-60, the five commodities represented slightly half of the tonnage of food products shipped by rail. In 2014, sugar and flour were the highest volume food commodities shipped by rail, followed by seed cake or meal, and distilling byproduct (distiller's dried grains and solubles, used as animal feed).

Figure 2-60. North Dakota Outbound Food Rail Tonnage (2000–2014)

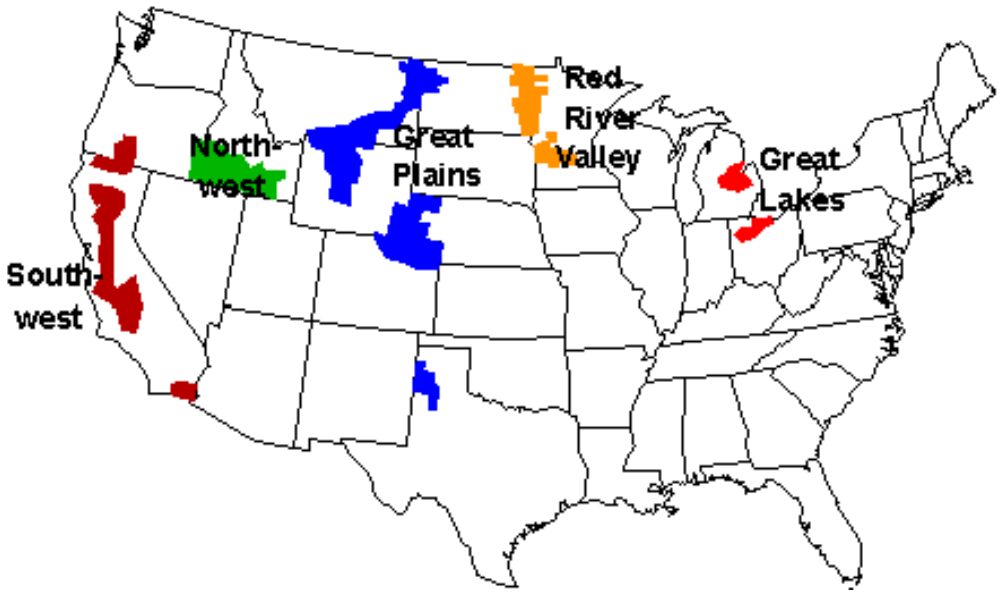


Source: Surface Transportation Board Waybill Sample

Food Products Contribution to North Dakota Economy and Outlook

In general, food manufacturing—which is closely related to agricultural output—has accounted for 2 percent of gross state product over the years. Sugar is produced from beets grown in the Red River Valley and other Great Plains beet production regions (Figure 2-61).

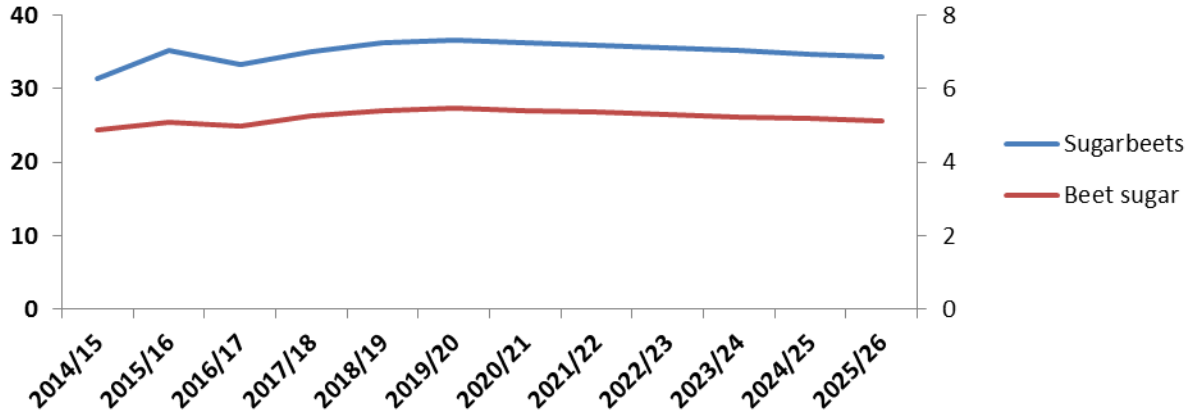
Figure 2-61. Sugar Beet Production Regions



Source: US Department of Agriculture

North Dakota produce five million tons of sugar beets in 2014. These sugar beets are processed into beet sugar. Sugar manufacturing accounts for 10 to 20 percent of food manufacturing employment in North Dakota according to U.S. Census County Business Patterns data. The USDA forecasts modest increases in beet sugar production through 2019/20 and small declines in subsequent years (Figure 2-62). Assuming that North Dakota's share of U.S. production remains steady, North Dakota shipments of sugar by rail should also remain steady at about one million tons.

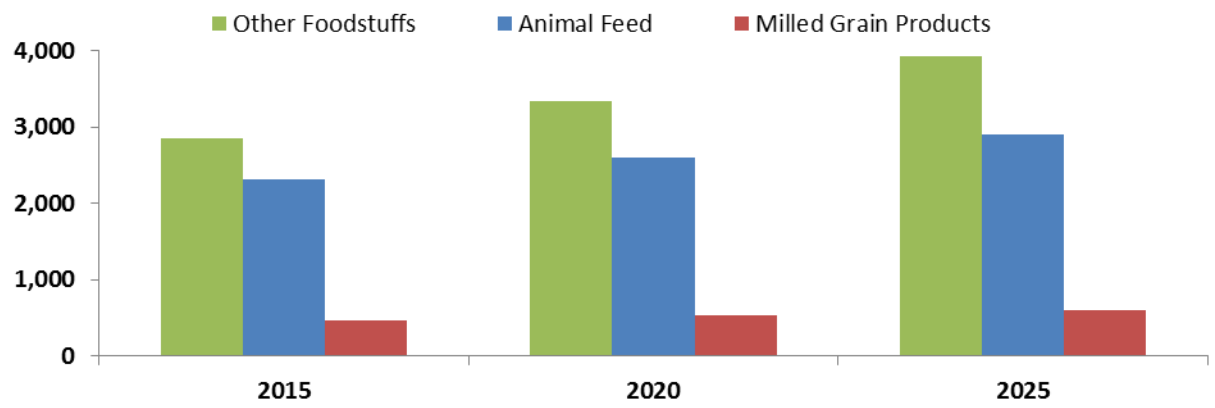
Figure 2-62. USDA Forecasts of Beet Sugar Production (millions of tons)



Source: US Department of Agriculture agricultural projections to 2025

The most recently available forecasts of commodity shipments from the Federal Highway Administration's Freight Analysis Framework database showed that shipments of animal feed, milled grain products and other foodstuffs would grow 32 percent over the ten years from 2015 to 2025.

Figure 2-63. Forecasted Rail Shipments of Milled Grain Products, Animal Feeds, Other Foodstuffs from North Dakota (thousands of tons)



Source: Federal Highway Administration Freight Analysis Framework database

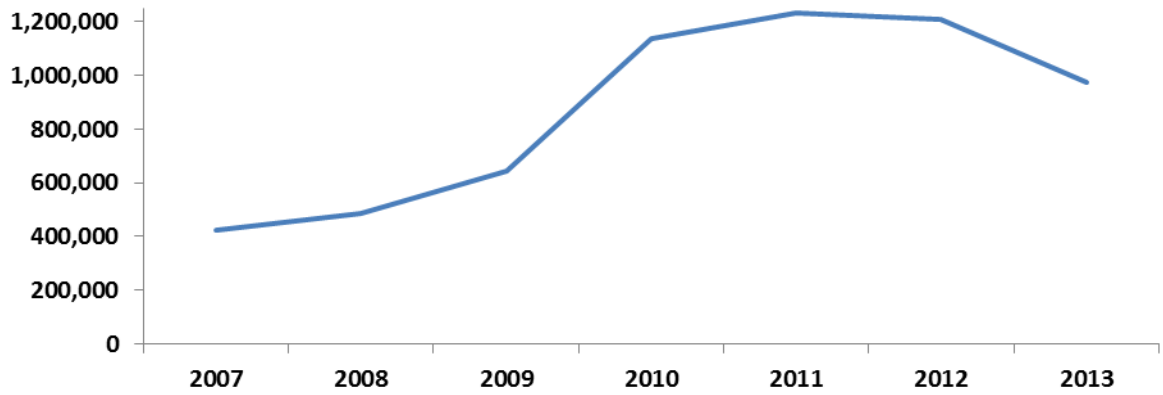
2.12.5 Ethanol Industry

Production of ethanol in North Dakota is closely linked to the state's corn production. According to the North Dakota Ethanol Council:

- North Dakota ethanol plants use approximately 140 million bushels of corn annually with more than 80 percent of the corn purchased from North Dakota farmers.
- North Dakota ethanol plants purchase 40–60 percent of North Dakota's total corn production annually.
- Approximately 11 percent (41.9 million gallons) of the 370 million gallons of ethanol produced annually in North Dakota in 2014 was blended with gasoline and sold within the state, while the remaining 89 percent was shipped primarily to the East or West Coasts.

In summary, a significant portion of North Dakota's corn production is converted into ethanol and the great majority of this ethanol is then shipped out of state. Figure 2-64 displays volumes of alcohols shipped from North Dakota. (Note that data prior to 2007 was suppressed due to non-disclosure requirements.)

Figure 2-64. Volume of Ethanol Originating in North Dakota by Rail (Tons)



Source: Surface Transportation Board Rail Waybill Sample

Ethanol Production Trends

The ethanol industry has faced some headwinds recently. Improved motor vehicle fuel efficiency and changing vehicle use patterns has dampened the demand for ethanol. The USDA forecasts a slight increase in corn based ethanol production through 2019 followed, however, by a moderate decline through 2025. This is driven by an overall forecast decline in gasoline consumption in the U.S. The USDA forecasts are also skeptical that the markets for E15 (15 percent ethanol blend) and E85 (85 percent ethanol blend) will grow. This would suggest that ethanol may not be a growth industry for North Dakota rail in the next decade, although ethanol production could change up or down with changes to the Renewable Fuel Standard Program.

Outlook for Ethanol Production

The USDA's most recent forecasts of corn production and uses indicate that overall use of corn in ethanol production will decline from 5.2 billion bushels in 2015 to 5.0 billion bushels in 2025. If North Dakota ethanol production mirrored national trends and rail maintained the same market share, North Dakota ethanol shipments by rail would show similar modest declines.

2.12.6 Coal Industry

According to the North Dakota Geological Survey, North Dakota has the single largest deposit of lignite coal known in the world—estimated to be 351 billion tons. With its lignite, North Dakota is one of the country's top 10 coal-producing states, mining approximately 30 million tons every year since 1988 with four mines currently in operation. About 79 percent of annual lignite coal production is used to generate electricity, 13.5 percent is used to generate synthetic natural gas, and 7.5 percent is used to produce fertilizer products (anhydrous ammonia and ammonium sulfate). The electricity generated from lignite is used by over two million consumers and businesses in the Upper Midwest, while the Great Plains Synfuels Plant supplies synthetic natural gas made from lignite to 400,000 homes and businesses in the Eastern U.S.

Of the 10 primary customers of North Dakota's four mines, eight are mine-mouth operations located adjacent to or near mines. Of the other two, the Leland Olds Power Station in Stanton receives coal

shipments from the Freedom Mine 30 miles away in Beulah, and Heskett Station in Mandan receives coal from the Beulah Mine 72 miles away by rail.

As noted by the North Dakota Department of Commerce, North Dakota's lignite industry "is an innovative and vital part of the state's economy" with a $3 billion economic impact. According to the North Dakota State University Economics Department, "lignite industry expenditures are $1.1 billion. Each dollar spent by the lignite industry circulates through the state's economy another three times" and as of 2012, accounts for 31.9 percent of North Dakota's economic base.[41]

Rail's Role in North Dakota Coal Transportation

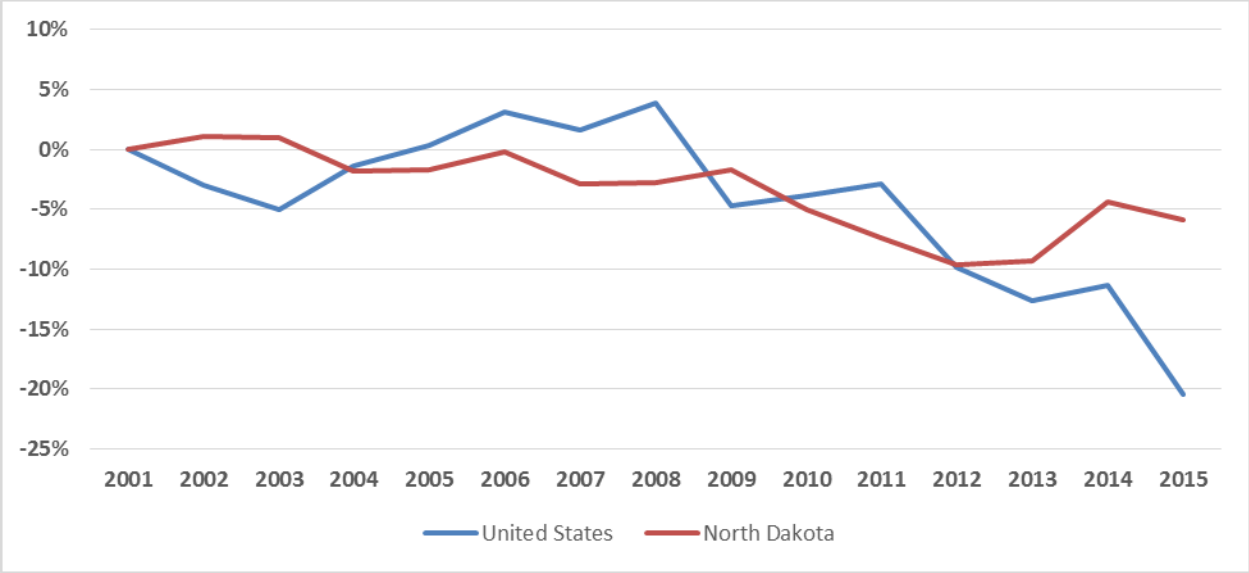
Coal is the top terminating commodity at nearly 5.5 million tons or 33 percent of all tons terminated by rail in 2014. Rail is also used for shipping coal from the Powder River Basin in Wyoming and Montana to North Dakota. It also constituted the largest source of intrastate rail traffic. However, the 15 percent of the lignite that is not consumed at the mine is principally shipped to nearby power stations by truck.[42]

Coal Production Trends

Coal production in North Dakota has not declined to the same extent as elsewhere in the U.S. As shown in Figure 2-65, coal production between 2001 and 2015 declined over 20 percent nationwide, but only 5 percent in North Dakota, primarily because North Dakota coal does not compete with natural gas as a fuel for electric generation to the extent that coal does in other parts of the nation. Much of the electricity generated in North Dakota is fueled by coal from mines adjacent to or in close proximity to the power plants. This proximity helps boosts the competitiveness of coal. In other areas, recent declines in natural gas prices have caused power generation to switch to natural gas instead of coal. The implications for rail in North Dakota are a reduction in coal volumes passing through between other states, but a smaller decline for shipments passing within the state.

[41] "North Dakota Lignite Energy Industry's Contribution to the State Economy for 2013 and Projected for 2014," June 2014, Randal C. Coon, Dean A. Bangs & Nancy Hodur, *NDSU Agricultural Economics Publication AAE 14002*
[42] *The Economics of North Dakota Lignite*, Jeffrey Beck, Magic City Campus, Minot ND for the Lignite Energy Council

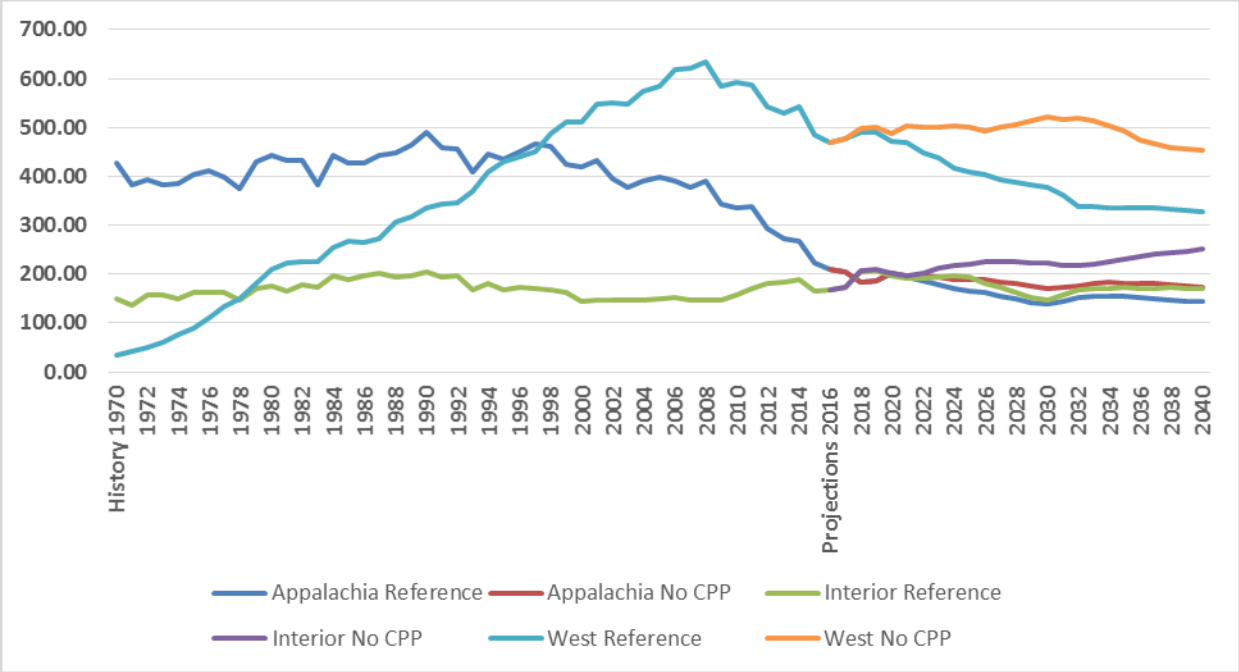
Figure 2-65. Cumulative Percentage Change in Coal Production (by tonnage)



Source: U.S. Energy Information Administration

Federal regulation could have a significant impact on coal production in North Dakota, and rail shipments of coal in North Dakota in general. As shown in Figure 2-66, the EIA forecasts of western coal production differ widely, depending on whether the CPP is implemented or not. Western coal product is forecast to decline by 30 percent from 2016 to 2040 if CPP is implemented but only by 4 percent if CPP is not implemented.

Figure 2-66. Past and Forecast Coal Production by Region (millions of short tons)



Source: U.S. Energy Information Administration

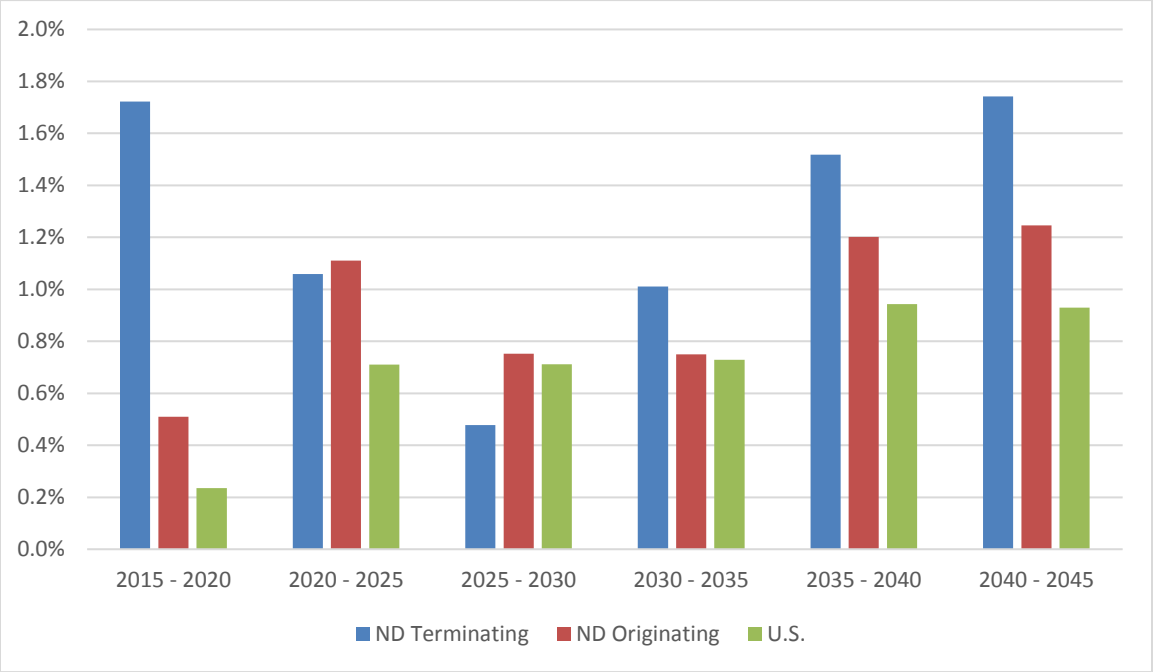
Outlook for North Dakota Coal Shipments

The outlook for North Dakota coal shipments is uncertain. On August 3, 2015, the U.S. Environmental Protection Agency (EPA) finalized new rules that would reduce carbon emissions from power plants. The new rules, known as the Clean Power Plan (CPP), were developed under the Act, which is regulated by the EPA. On February 9, 2016, amid concerns from several states, the Supreme Court placed a hold on the Clean Power Plan. This hold will stay in place until a lower court rules on the merits, and the Supreme Court either refuses to hear the case or rules on the merits. Various sources report that this hold is likely to last for about 18 months, depending upon how quickly the appellate process proceeds. Should the CPP be implemented, North Dakota would need to cut emissions by 45 percent by 2030, which could affect coal shipments by rail to and within North Dakota.

Overall Outlook for North Dakota Rail Freight Traffic

The Federal Highway Administration (FHWA) FAF-4 database predicts that rail traffic to and from North Dakota will grow at a faster pace than national increases in rail traffic, however at a slower pace than North Dakota rail traffic increases over the past decade. FAF-4 projects that North Dakota originating rail traffic will grow 24 percent between 2015 and 2040 while North Dakota terminating rail traffic will grow 33 percent. This compares to an overall increase in U.S. rail traffic projected to be 18 percent between 2015 and 2040. FAF-4 predicts that farm products originating by rail from North Dakota will grow by about a third; however, this growth will be somewhat balanced by declines in crude oil rail shipments, estimated to decline by a third. FAF-4 forecasts of North Dakota grain shipments are roughly consistent with USDA national crop production forecasts. Farm products and nonmetallic mineral products are forecast to be the largest source of terminating rail traffic growth. Coal shipments are estimated to shrink by 42 percent.

Figure 2-67. Forecasted Percentage Change – North Dakota Originating, North Dakota Terminating, United States Rail Tonnage



Source: WSP Analysis

The question is when will the growth emerge. The rail industry is in a recession. Nationwide, non-intermodal traffic fell 14.3 percent for the first four months of 2016 against the first four months of 2015. Much of that was attributable to the decline in coal, which fell 14.6 percent between the same two periods. Excluding coal, the downturn in rail traffic is a more moderate 2.4 percent. Intermodal traffic decreased by 0.8 percent. The two principal North Dakota products shipped by rail suffered more than the overall non-coal carload business base. Nationally, grain shipments fell by 4 percent while oil dipped 21.9 percent.

2.13 OTHER FREIGHT TRENDS

2.13.1 Intermodal Transportation Trends

Commodity based agriculture will continue to play a dominant role as a primary sector in North Dakota's economy. However, the growth of that sector is dependent on factors beyond the control of producers such as weather, price, trade agreements, production in other countries, etc. Part of the growth in agriculture within North Dakota is likely to be associated with value-added economic activities that utilize international and domestic containers. This market provides producers and processors greater control of pricing, market development, brand identity, food safety, and other business factors. Additionally, manufacturing, another primary sector, requires shipping containers for economic viability, both inbound and outbound.

This is the reason why there has been significant interest in bringing intermodal rail service to North Dakota. Currently, the closest intermodal terminals with regular service for most North Dakota shippers are located in the Minneapolis/St. Paul area. However, transporting the containers to/from these terminals by truck is costly, given that the shortest distance is slightly over 200 miles and greater than 500 miles from the Western part of the state.

Intermodal can benefit a range of shippers, including those receiving a variety of products such as consumer and manufactured goods. Intermodal pricing is usually less expensive than truck pricing and is most cost-effective for shipments to/from relatively distant markets. According to the USDA, about 28 percent of U.S. agricultural shipments are shipped in containers, and about 10 percent of U.S. grains are shipped in containers.43 Containerized transport can benefit agricultural shippers in several ways:

- Containerized transport can be an effective means by which shippers can maintain the identity of bulk agricultural products like grains. Identity-preserved grain and other value-added products can be inspected, sealed into a container at origin, and maintain identity through to their destinations. Identity preservation is impossible when grains from various sources are mixed together at elevators or onto bulk ships.
- Containerization of agricultural products also allows for maximizing food safety, and specialized marketing through cleaning, grading and sizing. What's more, containerization is critical in the

[43] Bruce Blanton, *USDA's Perspective on Agricultural Transportation Priorities*, Ag Transportation Summit, August 4, 2015, Rosemont, IL.

marketing of processed of agricultural commodities into intermediate products such as pea protein and pea flour.

- For shipments of distillers dried grains with solubles (DDGS), the byproduct of ethanol production, product maritime shipping is better suited to containerized transport than bulk transport. DDGS has high moisture content. If it remains in a vessel, it tends to "settle" or congeal. It is then difficult to remove from a bulk, ship, since it cannot be blown out or transferred by a belt system.
- Containerized transport allows customers to buy in small lot sizes and can be shipped to consignees in areas with a less developed grain-handling infrastructure.

Unfortunately, making intermodal service available in rural areas has been difficult for the following reasons:

- The economics of intermodal service typically require some degree of inbound/outbound container balance. Containers shipped to destinations in the United States most often contain consumer products. Therefore, the availability of empty containers is highest in populous areas where large populations consume large volumes of consumer products. However, areas with low population densities but high agricultural production such as in North Dakota tend to ship out more than they receive. It becomes necessary to pay to reposition empty containers to areas of predominantly outbound freight. These repositioning costs can undermine the cost effectiveness of intermodal service.
- Asia represents the largest source of imports to be shipped by container to North Dakota, as well as the largest potential of consumer of containerized exports from North Dakota. Both imports and exports mainly flow through West Coast ports. Nevertheless, shipping companies that serve West Coast ports earn far more revenue from eastbound transpacific movements than westbound transpacific movements. Therefore, shipping companies have an incentive to reposition containers back to Asia as quickly as possible, in some cases, even if this means that they return empty. If the cost of repositioning containers to North Dakota is not prohibitive, shipping companies still may nevertheless prefer that these containers not be delayed by repositioning.
- Limited container availability has potentially been exacerbated by the practice of transloading. International cargoes arrive and depart U.S. ports in International Organization for Standards "ISO" containers, which are 20, 40, or 45 feet long and have been built heavily enough to withstand stacking in container ships. By contrast, domestic containers are 53 feet long and are not as heavily built. Because they are bigger, and their lighter weight means that more product can be shipped before they "weigh out," domestic containers have higher capacities. A number of shippers at West Coast ports have found it efficient to transfer freight from ISO containers to domestic containers near port facilities in order to take advantage of the larger size of domestic containers and to better coordinate the domestic leg of international shipments. However, agriculture shipments, such as those that would be shipped from North Dakota would most efficiently be handled in 20-foot containers. Shipments of grain and other agricultural products are dense, and so would render a 40-foot container too heavy to be transported over the road or on rails before the container is half full. The practice of

transloading could put North Dakota shippers at a disadvantage, since the 20-foot containers that agriculture shippers need never move inland from port areas.

Traditionally, intermodal service has not been scalable. Western rail carriers hesitate to serve markets unless they generate sufficient demand to fill trains of containers at least several days per week. Intermodal service is point-to-point, so volumes should be sufficient to fill trains between, for example, North Dakota and Chicago or North Dakota and Seattle/Tacoma. Additionally, CSX has been experimenting with a new intermodal framework in which the carrier is developing hubs, analogous to airline hubs. No longer must specific origin/destination pairs generate sufficient container volume to fill trains. Rather, a market must only generate enough volume of containers going to or from somewhere, so that the rail carrier can fill trains to or from the hub. Once the containers arrive at the hub, they will be resorted onto trains to their final destination or transferred to another hub.

Figure 2-68. CSX Hubbed Intermodal Network

Source: CSX

The hub intermodal concept is made possible by new intermodal technology, namely widespan rail-mounted gantry cranes. In the past, gantry cranes spanned a single railroad track and a single lane of roadway next to the track. Now widespan gantry can cross over a half dozen tracks, and containers can now be stacked several deep next to the cranes. These developments improve railroads' ability to transfer containers between trains, thus enabling the hub concept.

Figure 2-69. Wide-Span Gantry Cranes

Source: CSX

The two Class I railroads that serve North Dakota—BNSF and CP—have not adopted a hub and spoke system. However, if one of these carriers were to adopt this system, it could point to a new potential for bringing intermodal service to markets in the state that would otherwise generate insufficient container shipments to justify an intermodal terminal.

2.13.2 Maritime Trends

East Coast ports have gained market share at the expense of West Coast ports in recent years, so that West Coast ports had an import market share of 56.8 percent in 2000 but 49.5 percent in 2015.[44] Some industry observers have predicted this trend to continue with the expansion of the Panama Canal, which was completed in June 2016. In addition to doubling the capacity of the canal, this major infrastructure project allows the passage of much larger ships. For container ships, the maximum vessel size has increased from a capacity of about 5,000 twenty-foot equivalent units (TEUs) to vessels able to carry in excess of 13,000 TEUs. Economies of scale from the increase in vessel size reduce the cost of all-water service via the canal between Asia and the East Coast. With lowered costs, some cargoes could shift from entering the U.S. through West Coast port to East Coast ports.

However, several factors will moderate impacts. The all-water transpacific service via the Panama Canal is much slower than shipments using West Coast ports and intermodal rail service to the eastern U.S. Transit times between North Asia to Chicago, Memphis, or the Ohio Valley are usually between 15 and 18 days, including the rail portion of the move. By contrast, transit times between North Asia and the East Coast by all-water route are 24 to 28 days. Products that are cost-sensitive could shift to the all-water service, but products that are more time-sensitive will continue to be transported by existing West Coast/inland rail routes. Furthermore, railroads and ports on the West Coast would likely react to any significant shifts toward the East Coast with lowered pricing in order to retain market share. The expansion

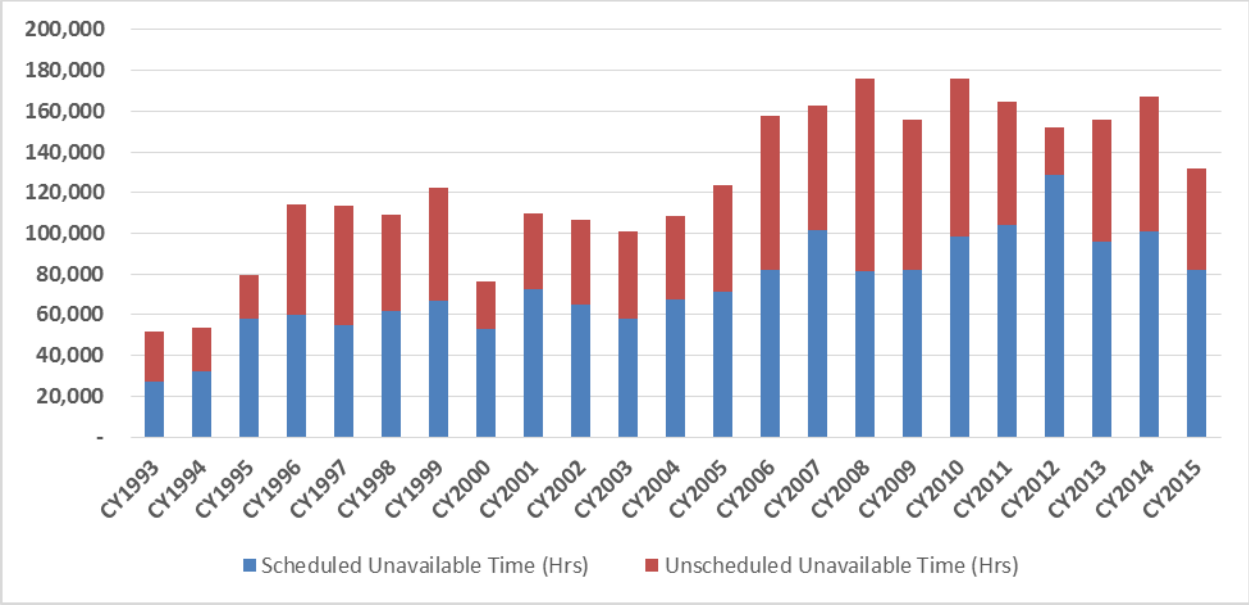
[44] Bill Morgelluzzo, "Rose East Coast port forecasts hinge on more than the Panama Canal," joc.com, September 19, 2016.

of the Panama Canal could lower or slow the increase of intermodal rail passing through North Dakota, but the impacts will likely be moderate.

The expansion of the Panama Canal could also change the competitive dynamics of agricultural trade. Currently, the lower Mississippi River has a 45-foot draft, and existing Panamax vessels can be loaded only to a 39.5-foot draft. The Panama Canal expansion allows vessels to be loaded to the full 45-foot draft that the lower Mississippi can accommodate, enabling around 13,300 additional tons to be loaded onto the same vessel. One model sponsored by soybean shippers estimates that this improvement in capacity would reduce the costs of shipping soybeans from the Central Gulf region to Japan by about 21 percent.[45] This could increase the competitiveness of shippers that rely on Gulf Coast ports to ship grain relative to North Dakota shippers.

On the other hand, other factors may increase the relative costs for shippers that rely of Gulf Coast ports. Many shippers rely on the inland waterway system to bring grain from the interior to Gulf Coast ports. Counteracting cost reductions associated with shipping grain in post-Panamax ships may be cost increases associated with the condition the inland waterway. As an example, Figure 2-70 displays the increased number of hours of lock outages on the U.S. inland waterway system. The American Society of Civil Engineers has estimated that in 2010, the cost of delays associated with the inland waterway system was $33 billion.[46]

Figure 2-70. Lock Outages on U.S. Inland Waterways



Source: U.S. Army Corps of Engineers

[45] United Soybean Board, U.S. Soybean Export Council, Soy Transportation Coalition, *Panama Canal Expansion: Impact on U.S. Agriculture*, September 2011.
[46] American Society of Civil Engineers, *Failure to Act – The Economic Impact of Current Investment Trends in Airports, Inland Waterways, and Marine Ports*, 2012

2.13.3 Reshoring Trends

Some believe that the offshore transfer of American manufacturing activity to Asia—especially to China—has begun to reverse. The original motivations for offshoring were much lower Asian wage rates backed by inexpensive transportation, and both are changing. Boston Consulting Group (BCG) reports[47] that increases in Chinese wages and benefits averaged 19 percent annually between 2005 and 2010 versus less than 4 percent in the U.S., with additional rises since then. Adjusted for productivity, the wage advantage of production in China will have been cut in half in that 10-year period. BCG expects three-quarters of the manufacturing reshored from China will come to the U.S. Acknowledging its lower labor costs, improving productivity, and the advantage of free trade, BCG believes the skilled labor supply, infrastructure, supplier networks, and safety risks in Mexico place it behind the U.S. especially for the manufacturing industries most likely to return. Therefore, manufacturing jobs returning to the North America will return to the U.S. and not Mexico (referred to as near-shoring). These so-called Tipping Point Industries account for almost $200 billion of U.S. imports from China, and fall in seven sectors:

- Computers & Electronics
- Machinery
- Transportation Goods
- Fabricated Metal Products
- Appliances & Electrical Equipment
- Furniture
- Plastics & Rubber Products

Some of these products—such as transportation goods, fabricated metal products, plastics & rubber products—use rail, particularly for the inbound raw materials. If these were to return to the U.S., they could presumably increase demand for rail, including in North Dakota.

However, since the original "Tipping Point" report, there has been disagreement over whether reshoring has actually taken place. BCG conducts annual surveys of senior manufacturing executives at companies with at least $1 billion in annual revenues. In the latest survey, 31 percent of executives said that they would likely add production capacity in the U.S. within five years for goods sold in the U.S., while 20 percent said they would add production capacity in China.[48] Nine percent said they were actively reshoring production. BCG contends that the reshoring trend is accelerating and that more recent surveys are showing a greater instance of reshoring than earlier surveys.

However, both the BCG and the A.T. Kearney approaches have their weaknesses. BCG relies on a survey of intentions, but executives might not actually follow through with these intentions. The A.T. Kearney survey does not actually measure the movement of manufacturing capacity between Asia and the U.S., but rather imports compared to U.S. manufacturing GDP, a very indirect measurement. If the reshoring

[47]The Boston Consulting Group, *U.S. Manufacturing Nears the Tipping Point*, March 2012.
[48] Boston Consulting Group, *Made in America, Again – Fourth Annual Survey of U.S.-Based Manufacturing Executives*, December 2015.

phenomena does occur, it could increase demand for rail in the U.S., including in North Dakota, but it is a trend to watch out for, and there is uncertainty whether it is actually happening.

2.13.4 Trucking Trends and Issues

Capacity and Labor Force

Trucking availability fluctuates with economic conditions and demand from industry and consumers. While recent supply levels have been largely sufficient, the long-term trend is for numbers of trucks to shrink.

The looming driver shortage is one factor in the equation, but other contributors including conditions that affect the utilization efficiency of equipment and drivers are also significant.

Driver and Employee Shortage

The American Trucking Associations estimate that the driver shortage in 2025 will exceed 175,000 positions nationally.[49] The shortage stems from an aging driver population and a lack of young people willing to enter the profession. A contributing factor is that the minimum driving age of 21 prevents a qualified group of applicants including military veterans from driving jobs. Some companies have an age limit higher than 21 due to insurance costs as the risk pool including younger drivers is more expensive. Relief has come from changing demographics of drivers to include minority populations and immigrants. The participation of women in the driver pool is only 6 percent; with women representing 47 percent of the national workforce, this indicates an untapped demographic.[50]

A shortage of qualified diesel technicians is also creating problems in the industry.[51] Students coming out of technical programs are seeking jobs in the automotive industry, bypassing the available positions for heavy truck mechanics.

Hours of Service

Federal regulations that determine allowable driving hours and enforced rest periods are intended to prevent or reduce fatigue-related accidents. The trucking industry documented the negative impact of the original 34-hour restart provisions that were first implemented in 2013. Those rules were suspended and replaced with a more moderate provision to allow for additional research on the effects on both accidents and utilization economics.

Uncertainty remains as to the outcome for these regulations and how they will affect the available driving time and therefore access to capacity.

[49] Truck Driver Shortage Analysis, American Trucking Associations, 2015.
[50] Truck Driver Shortage Analysis, American Trucking Associations, 2015.
[51] Critical Issues in the Trucking Industry 2016, October 2016, American Transportation Research Institute

Longer and Heavier Trucks

Working against the preceding three trends, which favor rail transportation, there is a trend towards longer and heavier trucks, slowed only by resistance of some states to allow their use. The longer, heavier trucks pose a particular threat to short line railroads because the favorable economics of the larger trucks.

2.14 ECONOMIC AND DEMOGRAPHIC TRENDS

2.14.1 Economic and Demographic Growth Factors

Economic and demographic factors will influence rail usage in the coming decades with impacts caused by shifts in gross state product, income, employment, and population, as well as the performance of freight-reliant industries.

Gross State Product

North Dakota's Gross State Product (GSP)—a measure of overall economic activity in the state— increased from $22.6 billion (2009$) in 2000 to $50.3 billion (2009$) in 2015.[52] That growth represents an increase of 123 percent, or an average compound annual growth rate of approximately 5.5 percent, compared to the U.S. average of 1.8 percent. This makes North Dakota by far the fastest growing state economy in the United States during this period.

Most of North Dakota's economic growth has been driven by shale drilling in the Bakken Formation. Discoveries of oil, as well as new drilling technologies like hydraulic fracturing ("fracking") and horizontal drilling, led to an oil boom in the state from 2007 to 2014, during which the state experienced real growth of 78.7 percent. In the mining sector (which includes oil and gas extraction), real growth was 787 percent and the average compound annual growth rate was 36.6 percent during this period. However, since 2014, there has been a sharp fall in oil prices, and North Dakota's economy contracted in 2015.[53]

In North Dakota, mining comprised 15.5 percent of GSP in 2015, compared to 2.4 percent in the United States. It has become a key industry in the state economy over the last decade and the primary driver of growth. In 2005, mining accounted for only 2.6 percent of GSP in the state. Growth in the industry has also had spillover effects into auxiliary industries, including transportation and warehousing, and wholesale trade, which have experienced real growth of 103 percent and 80 percent, respectively, from 2007 to 2015. These rates are slightly greater than the state economy's growth as a whole during this period. The shale boom led to induced demand and strong growth in most industries, particularly real estate, rental services, construction, professional and business services, recreation, accommodation, and food services. However, manufacturing and government have grown substantially slower than the state average.

Rail transportation output stagnated between 2007 and 2012, but from 2012 to 2014, the sector grew 37.6 percent, as rail was increasingly used to ship oil. In 2007, rail transportation represented 38.6 percent of the transportation and warehousing market in North Dakota, but in 2014, it represented only

[52] U.S. Bureau of Economic Analysis, *Real GDP by State (Chained 2009$)*
[53] U.S. Bureau of Economic Analysis, *Real GDP by State (Chained 2009$)*

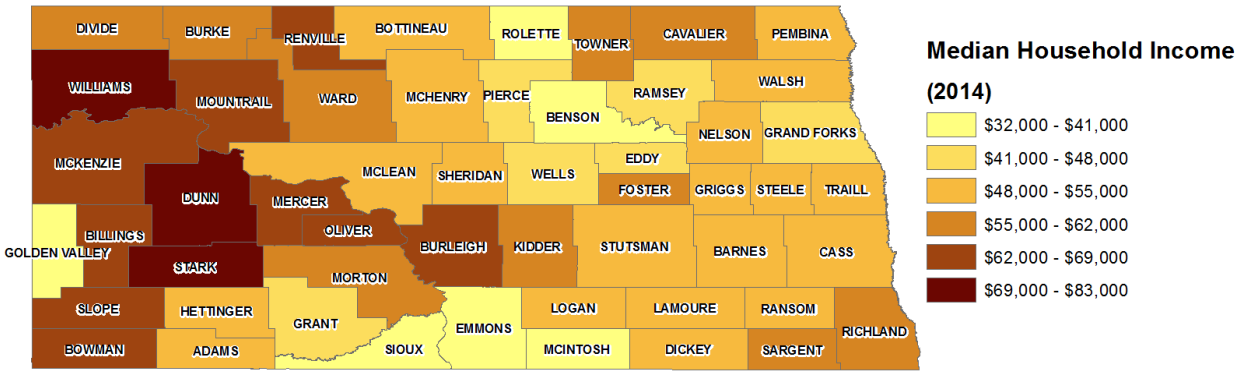
20.6 percent, mostly due to immense growth in truck transportation.[54] As described above, the future level of activity of the oil industry in North Dakota depends on a number of factors, and the future of crude by rail is less certain.

Personal Income

From 1975 up until 2008, North Dakota had a lower level of per capita personal income (PCPI) than the nation's average. In 2015, North Dakota's per capita personal income of $55,950 was 16 percent greater than the U.S. average of $48,112, reflecting the magnitude of the oil boom in the state over the past decade. The 2015 PCPI in the state represents a 54 percent increase from 2007, compared to a 21 percent increase nationally.[55]

Among all the state's counties, Williams County had the highest household personal income in 2014, estimated at $82,823, compared to the state average of $55,579.[56] Its county seat is Williston, the center of the shale boom in the state. Stark County ($70,243), Dunn County ($69,063), and McKenzie County ($67,578) followed just behind. All four counties lie on top of the Bakken Formation.

Figure 2-71. Median Household Income



Source: U.S. Census Bureau, American Community Survey Five-Year Estimates (2010-2014)

Employment

Total nonfarm employment in North Dakota stands at 441,500 as of September 2016, 16.9 percent greater than September 2010, and 23 percent greater than September 2007.[57] Real GSP grew over twice as much during this period, suggesting that workers are becoming increasingly productive and have a much higher value-add than before. It is also worth noting that total nonfarm employment, which measures jobs, was 28,000 greater than employment, which measures employed residents. Residents of other states working in North Dakota make up the difference between the two figures. The unemployment rate in North Dakota is 3.1 percent, the third lowest in the country, suggesting a tight labor market.[58]

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[54] Ibid.
[55] U.S. Bureau of Economic Analysis, *Personal Income Summary*
[56] U.S. Census Bureau, 2014 American Community Survey 5-Year Estimates, *Median Income in the Past 12 Months*
[57] Bureau of Labor Statistics, *Economy at a Glance*
[58] Bureau of Labor Statistics, *Local Area Unemployment Statistics*

North Dakota's largest economic sectors, measured by share of total nonfarm employment, are trade, transportation, and utilities (21.8 percent) and government (18.9 percent). Although mining makes up over 15 percent of GSP, it comprises only 3.76 percent of total nonfarm employment in the state. There are 16,600 people employed in the industry as of September 2016, down 46.5 percent from 31,000 in September 2014, when mining made up 6.6 percent of employment. The oil bust in 2015 and 2016 has led to a recent decrease in total nonfarm employment, down 1.4 percent from September 2015 to September 2016. Mining employment has decreased the most dramatically, followed by construction, and trade, transportation, and utilities. However, leisure & hospitality, education & health services, and other services have all shown strong year-over-year employment growth.

North Dakota's Workforce Intelligence Network, a government source for labor market information, projects employment growth between 2014 and 2024 to be greatest in healthcare-related fields. It projects employment to decline most severely in mining (33 percent) and truck transportation (29 percent).[59]

Population

Between 2000 and 2010, North Dakota's population grew by 4.7 percent (from 642,200 to 672,591)—well below the national average of 9.7 percent.[60] As of 2010, it was the third least populous state after Wyoming and Vermont. The 2010–2014 American Community Survey five-year estimates peg the state's population at 704,925, indicating that population growth has continued since 2010.[61]

While the state population grew slowly between 2000 and 2010, some of the larger counties grew quite rapidly. The population of Cass County grew 21.6 percent over this decade, from 123,138 to 149,778. The populations of Burleigh County and Williams County grew 17.1 percent and 13.3 percent, respectively.[62] Cass and Burleigh Counties contain Fargo and Bismarck, the state's two largest cities, reflecting the trend toward urbanization. In fact, 42 of 53 counties—largely rural—saw populations decrease during this decade.

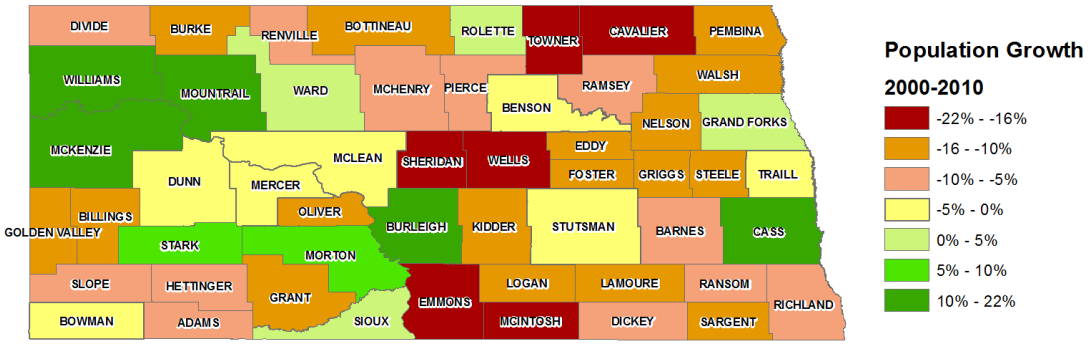
A 2016 report released by the census office of the North Dakota Department of Commerce projects the most likely state population to be approximately 824,000 in 2020. 932,000 in 2030, and 992,000 in 2040.[63] The office notes that between 2010 and early 2016, the state has gained an estimated 84,000 additional residents due to the shale boom. However, the report warns that volatility in the mining sector make the state's population projections particularly fallible. In 2005, the Census Bureau predicted that the state would continuously lose population.

According to the report, projected population growth between 2010 and 2030 will be greatest in McKenzie County (269 percent), Williams County (165 percent), Mountrail County (116 percent), Dunn

[59] North Dakota Workforce Intelligence Network, *North Dakota Employment Projections 2014–2024*
[60] U.S. Census Bureau, *Population Distribution and Change: 2000–2010*
[61] U.S. Census Bureau, 2014 American Community Survey 5-Year Estimates, *Demographic and Housing Estimates*
[62] U.S. Census Bureau, American Fact Finder, *Total Population*
[63] North Dakota Department of Commerce – Census Office, *Population Projections of the State, Regions, and Counties 2016*

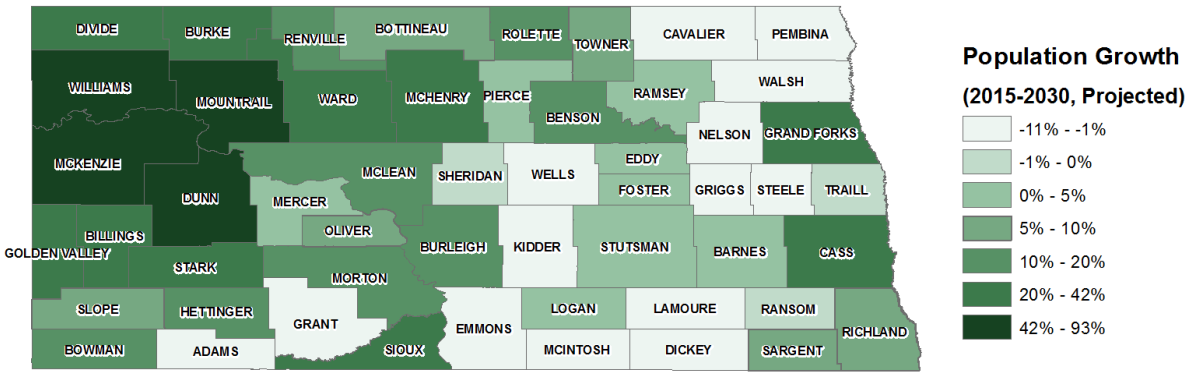
County (88 percent), and Stark County (87 percent)—all of which are active oil & gas producing counties atop the Bakken Shale play (Figure 2-72 and Figure 2-73).[64]

Figure 2-72. Population Growth 2000–2010 by County



Source: U.S. Census 2000, 2010

Figure 2-73. Population Growth by County 2015–2030 (Projected)



Source: North Dakota Department of Commerce – Census Office

2.14.2 Passenger Travel Demand and Growth

Demand for passenger travel continues to grow in North Dakota. According to FHWA, 10.5 billion vehicle miles were traveled in 2014—an increase of 28.8 percent from five years earlier and 38.2 percent from ten years earlier. This increase is due in large part to the population influx accompanying the shale boom. Sustained growth in passenger travel may increase demand for rail; however, passenger travel in North Dakota is largely vehicle-based because of the state's low density and population.

2.14.3 Fuel Cost Trends

Nationally, retail gasoline prices dropped over 50 percent from a June 2014 high of $3.69 per gallon to a February 2016 low of $1.76 per gallon. During the latter half of 2016, prices stabilized around $2.20/gallon. Near-term projections from EIA show gasoline prices hovering between $2.00 and $2.50 per gallon through the end of 2017.[65]

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[64] North Dakota Department of Commerce – Census Office, *Population Projections of the State, Regions, and Counties 2016*.
[65] U.S. Energy Information Administration, *Short-Term Energy Outlook*

Retail diesel prices followed a similar trend, dropping 50 percent from a March 2014 high of $4.00 per gallon to a February 2016 low of $2.00 per gallon, stabilizing at around $2.40 per gallon during the latter part of 2016. EIA forecasts steady growth throughout 2017, with prices expected to reach $2.80 per gallon by the end of that year.

Gasoline and diesel prices are forecasted to increase steadily over the next 25 years. According to EIA's *Annual Energy Outlook 2016* publication, motor gasoline prices are expected to increase an average of 1.7 percent per year (in real terms) from 2015 to 2040, with diesel fuel prices expected to increase at a slightly higher rate of 2.2 percent per year (Table 2-30).

Increases in future fuel costs will increase the marginal cost of highway transportation relative to rail due to the greater fuel intensity of automobile and truck transportation. Thus, the projected real increase in gas and diesel prices may boost passenger and freight rail demand in North Dakota.

Table 2-30. Motor Gasoline and Diesel Fuel Price Forecast

	2014	2015	2020	2025	2030	2035	2040	Annual growth 2015-2040 (percentage)
Motor Gasoline ($ / gal.)	3.42	2.52	2.74	2.97	3.19	3.47	3.81	1.7%
Diesel Fuel ($ / gal.)	3.82	2.72	3.18	3.55	3.85	4.25	4.68	2.2%

Source: U.S. Energy Information Administration *Annual Energy Outlook 2016*

2.14.4 Rail Congestion Trends

According to the AAR *Railroad Ten-Year Trends 2005–2014*, network velocity—average distance per hour for trains to operate between origin and destination, including stops—fluctuated between 17.6 and 21.3 freight train-miles per train-hour during this period. No clear trend was exhibited during this period. BNSF added significant rail line capacity following the service disruptions of 2014, but concerns linger over whether an adequate number of train and engine crews will be available if there is another surge in demand. BNSF was required to layoff or furlough numerous employees following the drop-off in crude oil and coal traffic. Railroad train and engine crews must undergo a rigorous training program before they can be safely allowed to operate trains. Finding and/or training crews would require a significant amount of time were another surge in demand for rail to occur again.

Table 2-31. Network Velocity

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Freight Train-Miles per Train-Hour	18.6	18.4	19.2	19.5	21.3	20.2	19.2	20.6	19.7	17.6

Source: Association of American Railroads, Ten-Year Trends 2005–2014

2.14.5 Highway and Airport Congestion Trends

At Fargo International Airport (FAR)—the busiest airport in the state, with 325 departures per month—82.5 percent of arrivals and 89.5 percent of departures were on time in September 2016. Arrival and

departure on-time figures were 87.3 and 93.6 percent for Bismarck (BIS), 95.0 and 96.7 percent for Minot (MOT), 98.8 and 96.3 percent for Grand Forks (GFK), and 91.4 and 93.6 percent for Williston (ISN).[66] These are some of the highest on-time percentages among airports throughout the country.

According to the Federal Aviation Administration's (FAA) categorization of airports, Fargo is a small-sized primary hub, meaning it carries between 0.05 percent and 0.25 percent of annual passenger boardings.[67] The other four airports are primary non-hubs, with more than 10,000 annual passenger boardings but a share of less than 0.05 percent of boardings nationally.[68]

The percentage of flights arriving on time to Fargo varied between 66 percent and 83 percent from 2007 to 2016 with no clear trend. Weather is often a major factor in airport delays, and this varies from year to year with little predictability. Annual arrival and departure delay statistics at all the aforementioned airports were largely similar—varying within a 15 to 20 percent range, and without any clear trend across time. There were certain years (2009, 2012, 2015) with a greater-than-average percentage of on-time departures and arrivals at all four airports. These reflected national trends.[69] Airport congestion is not a significant driver of intercity passenger rail demand in North Dakota, and intercity passenger rail would not have a significant impact on airport congestion.

The FHWA Freight Analysis Framework (FAF-4) freight flow database has assigned freight flows to the National Highway Planning Network. Using passenger traffic counts from the FHWA Highway Performance Monitoring System and capacity estimates from the Highway Economic Requirements System, and assignments of freight flows, the FAF-4 database estimates future volume to capacity ratios and associated levels of service. As shown in Figure 2-74, with no additions to the roadway network, the FAF-4 model predicts that the roadway network will exceed capacity in the area around Bismarck, Fargo, and to a lesser extent, Grand Forks by 2045. The area between Williston and Dickinson will also be over capacity. In the case of Bismarck and Fargo, rail could relieve roadway congestion by reducing long-haul truck traffic that passes through these areas. Forecast traffic congestion in the Williston–Dickinson area is presumably associated with Bakken shale oil and related development. The future level of Bakken oil production is uncertain. However, if Bakken region oil production returns to previous levels and grows, roadway congestion could increase. Crude oil is brought to rail or pipe loading facilities either by truck or small-diameter pipe gathering systems. Trucks also carry supplies to oil wells, haul a range of supplies and finished products of other associated industries. Development in the area would generate passenger vehicle traffic. Rail could reduce congestion to the extent that more supplies are brought to and from the area by rail instead of truck. But more oil shipped from the area by rail could translate to more truck trips between wellhead and loading facilities.

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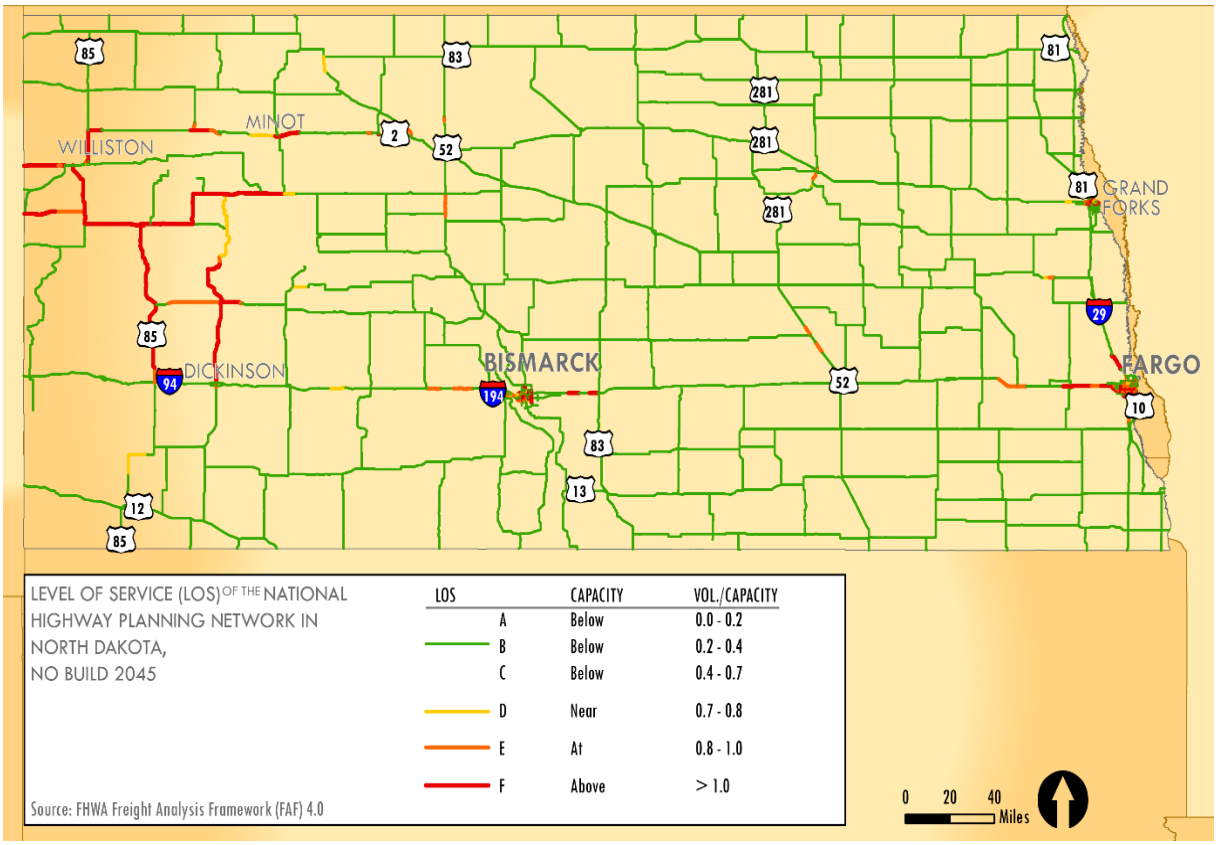
[66] U.S. Department of Transportation. *Air Travel Consumer Report.* November 2016. Pg. 15–19
[67] Federal Aviation Administration. *Airport Categories*
[68] Federal Aviation Administration. *Calendar Year 2015 Enplanements by State*
[69] U.S. Department of Transportation: Bureau of Transportation Statistics. *On-Time Performance – Flight Delays at a Glance*

Figure 2-74. Forecast Level of Service of North Dakota Highways in 2045



Source: Federal Highway Administration, Freight Analysis Framework (FAF-4)

Chapter 3. Passenger Rail Improvements

3.1 RECENT PASSENGER RAIL CHALLENGES AND IMPROVEMENTS

In recent years, two major challenges have affected Amtrak's *Empire Builder*: flooding and congestion. Episodic and long-term flooding issues have at times closed the rail line to traffic and required Amtrak to use bus substitution at several North Dakota rail stations.

In the summer of 2011, heavy rain combined with snow melt led to major flooding in Minot along the Souris River. This was a flood of the level thought to occur less than once every 100 years and it overtopped the levee. The flooding interrupted Amtrak service for almost a month, which forced Amtrak to run bus substitutions on the *Empire Builder* from Saint Paul, MN, to Havre, MT, with no service in between. In mid-July, Amtrak restored regular service following work by BNSF to repair the damaged rail; however, service could not resume to Minot until mid-November when repairs to platforms were complete. The rail depot was not fully repaired until spring 2013.

Additionally, in the spring and summer of 2011 there were major flooding issues near Devils Lake and to the west near Churchs Ferry—both related to the long-term rising water level in Devils Lake. For the past 25 years, the water levels in Devils Lake, nearby Lake Alice, and Lake Irvine—as well as many other small lakes within the Devils Lake basin—have been rising. The Devils Lake basin is a closed basin with one natural outlet that overflows in the Sheyenne River if the water level is high enough. Between 1991 and 2015, the lake has risen 30 feet. Because the topography in the area is so flat, rising water spreads out and floods a large amount of land. The lake has quadrupled in size, adding 135,000 acres to the lake's area.[70] The rising lake has consumed farmland, roads, and the BNSF rail line, which the *Empire Builder* travels in North Dakota. It is estimated that Devils Lake has breached its natural coulee twice in the past 2,000 years. As a result, the state of North Dakota has built pumping stations to attempt to keep the lake from rising to that level.

Between Devils Lake and Minot, the BNSF railroad parallels the northern side of US Route 2. Between 77th Avenue NE and 76th Avenue NE, Devils Lake has grown north towards Dry Lake, overwhelming a sluice connecting the two lakes and rising under the highway and rail. This lake level rose significantly in 2011 leading to damage to the rail line along Route 2. The water level rose in the spring and remained elevated through the summer, making repairs impossible for months. Figure 3-1 shows the rising water levels in the area of rail along Route 2 in 1991.

[70] *http://www.agweek.com/news/north-dakota/3809914-rising-devils-lake-takes-farmland-out-production*

Figure 3-1. Water Levels along Route 2 between 77th Ave NE and 76th Ave NE

1991 2013

Source: U.S. Geological Survey

Northwest of the flooding along Route 2 at 77th Ave NE where Route 2 meets 66th Ave NE is Churchs Ferry. This location has seen major changes as the Devils Lake water level has risen and consumed a lot of farmland and several roads in the immediate area. The rail was threatened and was at times underwater. If the water keeps rising, several miles of the railroad would be affected both northwest and southeast of Churchs Ferry.

Figure 3-2 shows the area around Churchs Ferry in 1991 and 2013. The rising water has consumed roads, forced a rebuild of Route 2, and in 2011 forced a rebuild and raising of the BNSF railway. The town is in the middle left side of the map, and the rail line is the thin white line crossing diagonally through the center of the town. The rebuilt railway can be seen in the image as a bright white line where new stone was laid on a higher embankment.

Figure 3-2. Churchs Ferry Water Levels

1991 2013

Source: U.S. Geological Survey

After the 2011 flooding, Amtrak and BNSF agreed to pay for two-thirds of the cost to make repairs and raise the rail bed near Churchs Ferry. A 2011 TIGER grant supplied $10 million. The total project, including the Churchs Ferry TIGER portion, was approximately 52 miles long and ran from west of Churchs Ferry to slightly east of the flooding at 77th Ave NE (Milepost [MP] 31.5 to MP 91 and MP 105.51 to MP 114.25). Between the first two mileposts, the improvements included continuous welded rail; between the second two mileposts the rail bed was raised five feet and engineered to run through the lake. The situation was serious; without the improvements and flood-readiness the line would have been shut down to all rail travel and would have possibly eliminated the *Empire Builder* service. Work started in June 2012 and ended in December 2012, and the rail in this section is now readied for further lake rise.

3.2 AMTRAK *EMPIRE BUILDER* PRIIA SECTION 210 PERFORMANCE IMPROVEMENT PLAN

PRIIA Section 210 stipulates that Amtrak is required to develop route-specific plans to improve the performance of long distance trains that failed to meet certain standards in 2008. The *Empire Builder* was one of the routes covered by the Section 210 mandates. Even before the service meltdown in 2014, trains experienced frequent late arrivals, with many of the delays attributable to freight operations and limited capacity on the corridor. In addition, rail passengers were less than satisfied with onboard service as onboard cleanliness was questionable and food service failed to meet customers' standards. In addition, the market reach of the *Empire Builder* was limited.

In September 2012, Amtrak published a Performance Improvement Plan (PIP) for the *Empire Builder,* which identified several actions that were undertaken:

- Analysis of dining car operations to determine if it could be made more efficient or if higher revenue generating opportunities existed
- Analysis of equipment maintenance to determine if performance improvements were possible by changing work locations
- Evaluation of new station locations to generate additional ridership

The principal recommendation of the PIP was to establish Amtrak-contracted bus service between Grand Forks and Winnipeg, Canada. This recommendation would allow passenger rail customers to use the *Empire Builder* and connect to several long-distance routes in Canada operated by VIA, the Canadian passenger rail service. The initiative was never implemented.

3.2.1 Amtrak Station Improvements

Over the next five years, Amtrak plans to upgrade stations around the nation to ensure a path of travel from the public right-of-way through stations to trains that comply with the Americans with Disabilities Act (ADA).

Amtrak recently completed an accessibility project at the Rugby Station by constructing accessible access, with curb cuts, from the public right-of-way and parking area to the platform and depot. In the parking lot, two accessible spaces received new paving, striping and wheel stops, while a new curb and pavers

were installed along the platform area. In the depot, restrooms were made ADA compliant. The Rugby Station platform is accessible, and there is a wheelchair lift available for customers.

The Fargo Station received $1.3 million in upgrades to its platform, doorways, bathrooms, water fountain, and other areas. The parking lot is also to be redone, and the ticket counter lowered for wheelchair users.

Figure 3-3. Fargo Station

3.3 INTERCITY PASSENGER RAIL PLANNING INITIATIVES

Recent Federal Railroad Administration (FRA) legislative and policy proposals have consistently prioritized the importance of rail planning at the regional level. Many recent federal and state passenger rail planning activities have focused on either individual corridors between major cities or comprehensive rail planning within individual states. However, a coordinated, multi-state approach to planning, construction, and operations of regional rail systems has been recognized as needed to establish regional priorities, outline investment needs, identify additional studies and develop an implementation strategy to advance projects within a network context.

FRA recently commissioned the development of a Midwest passenger rail plan that includes North Dakota. The proposed project will assist the Midwest stakeholders in developing a comprehensive vision for an integrated regional rail network and a governance model that could be used by the states to advance planning, procurement, and operations issues for passenger rail service and to build the regional framework for cost-effective, market-driven rail transportation in the Midwest mega-region. The network structure will drive the central planning questions of the study, including the extent to which the Midwest markets are solely focused on Chicago versus interconnected with each other; understanding the network effects of a multi-corridor rail system versus prioritizing the various routes to and from Chicago; and how a hub and spoke network impacts capital investment planning at the regional level, including operational considerations such as the use of equipment.

Chapter 4. Freight Rail Improvements

This chapter describes North Dakota's freight rail needs, which have been identified from a number of sources: stakeholder and public outreach meetings, shipper interviews, an online survey, desktop modeling, benchmarking other states, and prior studies. The needs cover a wide spectrum, from institutional changes to infrastructure upgrades. Chapter 4 presents the framework for the Rail Service and Investment Program described in Chapter 5.

4.1 INTERMODAL

Freight rail intermodal transportation is the movement of containers or trailers on flat cars. Intermodal transportation gained prominence only since 1980 when the rail industry was deregulated. Deregulation permitted the railroads not only to set prices that were competitive with trucking, but also to restructure the route network for greater profitability. Intermodal transportation provided the railroads with a platform to compete with the flexibility offered by motor carrier transportation.

Source:BNSF

The development of container-on-flatcar technology improved the cost effectiveness of intermodal transportation because eliminating the chassis and highway wheels reduced the weight on the railcar. The use of containers also opened international markets to intermodal transportation since boxes could be readily exchanged between the rail and ships.

Recognizing the growth opportunity of intermodal transportation, railroads invested heavily in the intermodal network. Railroads built terminals in major market areas and reengineered their networks to accommodate the taller double-stack shipments. Many bridges and tunnels obstructed the double-stack cars, particularly in the east. Today, double-stack cars can clear nearly all major rail routes, including the I-95 corridor along the East Coast, which was the last obstructed route.

Intermodal has continued to be a growing business area for freight railroads. Intermodal freight, primarily container-on-flatcar, has continued to grow and has become an increasingly important component in the U.S. transportation network, both for shipping goods domestically and internationally. In 2015, intermodal traffic accounted for 23 percent of railroad revenues.

As described in Chapter 2, North Dakota does not have dedicated intermodal train service. The North Dakota Port Services facility in Minot has the capability to handle containers. Minneapolis, however, is the closest location offering intermodal train service to a broad number of markets.

4.1.1 Benefits of Container Shipping to Grain Shippers

A variety of products is transported by containers. Imported consumer goods such as clothing and electronics are shipped in containers, as are many industrial products. One commodity that is increasingly being shipped in containers is grain, particularly identity-preserved (IP) crops. These crops include non-GMO and organic crops, and are frequently referred to as specialty, high-value, premium, or niche-market grains. They are produced with a specific end use in mind. IP grains are tracked from seed to harvest, and the grains are not mixed or co-mingled with other grains during any part of their handling. They are shipped in small lot sizes for which containers are ideal.

Containerization allows grain cargoes to be transferred from a railcar to a ship with minimal rehandling. Grain buyers also enjoy the consistent quality of products shipped in containers that is not always available when shipping in bulk. Because grains shipped via this method are minimally handled and stay separated in containers throughout the entire transport process, there are few occurrences of inappropriate blending and mixing. Containers are also very attractive and convenient for buyers of smaller quantities. They can get products to their overseas destinations in quantities that suit their purposes. The logistics of shipping grain in containers tend to favor smaller quantities.

4.1.2 Intermodal Terminal Requirements

Railroads generally have certain criteria for an intermodal terminal to be established:

- **Sufficient container volumes:** Western U.S. carriers typically require that new intermodal terminals generate trainload volumes of freight, which permit a reasonable frequency of service over a specific intermodal route at an acceptable cost. Ideally, service is daily or at least three days a week.
- **Inbound and outbound container balance:** If the predominant direction of containers is either inbound or outbound with few loads in the opposing direction, empty containers must be repositioned to balance supply and demand of containers. Repositioning empty containers is costly and undermines the economics of intermodal transportation.
- **Minimal terminal market area overlap:** Railroads prefer that the market area of intermodal terminals not overlap with other terminals on their systems. Class I railroad representatives have at times suggested 200 miles as an appropriate market area for terminals on their system. Railroads also prefer intermodal terminals that can facilitate relatively long-distance moves. For western carriers, such as Union Pacific (UP) and BNSF, these are moves of more than 500 miles, and preferably more than 750 miles. Due to the economics of rail intermodal, these services can compete more effectively with

trucking over longer distances. Railroads also prefer to maximize shipment distances to maximize revenues.

Shippers from various industries that currently ship by rail or could do so in the future participated in stakeholder interviews. Several interviewees from the agriculture sector indicated that an intermodal facility would benefit them, improving the process and efficiency for shipping products from the state. The same interviewees added that an intermodal facility could help improve the competitiveness of the Upper Midwest by making rail rates more competitive with other transportation services such as trucking, and could also help balance the need for containers coming into the state versus those leaving.

4.1.3 Economic Impacts from Development

The impact of an intermodal terminal on the local and regional economies is far greater than that attributable to the operations of the facility itself. Intermodal transportation provides shippers with economies that are not found in the competing truck transportation alternative. The consolidation of individual shipments into trainloads at intermodal terminals significantly reduces cost. The closer shippers can locate to the terminal, the greater the benefit since trucking costs to the terminal are reduced. Thus, terminals spawn new manufacturing activity near the facility. This includes transportation-dependent industries as well as their suppliers.

Warehouses and distribution centers also locate near intermodal terminals. One recent example of a facility that has helped to generate significant nearby development is the CSX Northwest Ohio Intermodal Container Transfer Facility (ICTF) near North Baltimore, Ohio. Both the ICTF and the surrounding area host several new or expanded distribution centers, including facilities owned by Home Depot and Calphalon that were constructed in 2013. FedEx, Walgreen's, Kohl's, Best Buy, UPS, Menards, BX Solutions, and Lowe's have developed new facilities or have expanded existing ones since the opening of the terminal.

4.2 NORTH DAKOTA INTERMODAL

4.2.1 2007 Regional Intermodal Freight Project

In 2007, NDDOT published a feasibility study on establishing intermodal service in North Dakota. The study examined a co-terminal concept to provide adequate container volumes to support required frequent, low cost train service. Terminals were proposed for Fargo/Dilworth and Minot. The study concluded the following:

- There was a high level of interest in, and support for the regional co-load intermodal service proposal from area shippers.
- Terminal infrastructure at the time was capable of supporting the proposed regional co-load intermodal service. The terminal in Dilworth, MN, was operating below capacity and had the ability to accommodate the study's projected three-year growth. The city of Minot was positioned to have terminal operations in place to support proposed regional co-load intermodal service within eighteen months or less should the concept have moved forward.

- First-year projected container volumes for the proposed regional intermodal co-load service were sufficient for one train per week service. Projected volumes for the second and third years of operation showed continued growth.
- The success of the proposed regional intermodal co-load service concept was feasible with a commitment from BNSF to reduce container repositioning fees to a level that would allow overall container transportation costs from Dilworth and Minot to be competitive with costs from Minneapolis, and Winnipeg and Regina, Canada. At overall rate levels in place at the time, the co-load concept would not be feasible.

The demand for IP grains continues to increase and the dynamics of the intermodal operation has changed since the 2007 study. Changes to North Dakota's roadway infrastructure to accommodate heavier weight vehicles and the ability to transport two containers by a single truck may create enhanced opportunities to containerized intermodal service for North Dakota's shippers as container drayage costs are reduced.

North Dakota Port Services in Minot provides a facility to move the grain. Opportunities exist to support the shipment of IP grain from Minot. Unlike 2007 when the study was completed, there is a potential for federal funding through programs such as TIGER or FASTLANE. Public benefits would need to be identified as well as questions about the current sufficiency of container volumes to support the required service at a competitive cost.

4.2.2 North Dakota Department of Commerce Intermodal Initiative

In 2015, the North Dakota Trade Office of the Department of Commerce convened the Intermodal Action Committee to evaluate the state's intermodal transportation requirements and the need for dedicated intermodal train service in the state. The efforts of this committee are ongoing.

4.3 RAILROAD SAFETY – HAZARDOUS MATERIALS TRANSPORT IMPROVEMENTS

The Federal Railroad Administration (FRA) has identified four major causes[71] for crashes involving passenger and freight rail: human error, track defects, equipment defects, and signal communication issues.

The growing demand for rail transportation has been surpassing the progress in safety to meet such demands. Although the industry is taking efforts to improve and upgrade railway infrastructure and equipment, it is not moving at the same pace as the increased traffic on the railroads and increased frequency of use of rail cars.[72] In addition, because of the significant growth in railway transportation, train crews work longer hours, which can result in operator fatigue as a contributing factor to crashes.[73]

[71] Although the FRA identifies four major causes of crashes, crash data reporting by the FRA categorizes each crash with one of more than 30 more specific accident causes (e.g. brakes, speed, loading procedure)
[72] American Society of Civil Engineers. (2013). *Report Card for Americans Infrastructure: Rail*. *http://www.infrastructure reportcard.org/a/#p/rail/conditions-and-capacity*
[73] Chabarria, N. (26 Jan 2015). Train Operators at Risk for Fatigue Related Accidents. *CBS KFVS-12 NEWS.* *http://www.kfvs12.com/story/27945773/i-team-train-operators-at-risk-for-fatigue-related-accidents*

FRA data shows that since 2005, crashes caused by human error are down 45 percent, by track defects – 52 percent, and by equipment defects – 36 percent.[74] Still, crashes related to human error and track defects account for more than 65 percent of all train crashes.

As a result of the most notable freight railroad disaster in recent history—the 2013 Lac-Mégantic railroad disaster—the National Transportation Safety Board (NTSB) issued a safety recommendation for the Pipeline and Hazardous Materials Safety Administration (PHMSA) to require railway carriers to implement comprehensive response plans to effectively respond to worst-case crashes involving the transportation of oil and petroleum products.

Specific to the recent boom in Bakken oil production and transportation of crude oil by rail, standing federal policy and regulations did not address the unique characteristics of certain types of crude oil and the risks they posed. In 2015, FRA and PHMSA issued several emergency orders and safety advisories addressing some of the causes of railway crashes in an attempt to reduce such incidents. These emergency orders and safety advisories came after several major crashes,[75] which had considerable impacts on the health and safety of people and the environment. Also in 2015, in response to concerns regarding crude oil, North Dakota passed new rules focused on oil conditioning prior to transportation.

In a September 2016 response by the NTSB to PHMSA, proposed changes to 49 CFR 130 requires rail carriers of petroleum products using High-Hazard Flammable Trains (HHFT), trains that have a continuous block of 20 or more tank cars loaded with a flammable liquid or 35 or more cars loaded with a flammable liquid dispersed throughout a train, to develop and submit Oil Spill Response Plans to the FRA for review and approval "to ensure that adequate provisions are in place to respond to and remove a worst-case discharge to the maximum extent practicable and to mitigate or prevent a substantial threat of a worst-case discharge"[76] If the modifications to the CFR are approved, collaborative plan review coupled with strategically placed response resources could alleviate some of the response burden on local North Dakota first responders who have limited staffing and capabilities to manage significant railroad incidents.

4.3.1 The State of North Dakota Concerns

The state also works in close coordination with the Upper Great Plains Transportation Institute (UGPTI), a research, education, and outreach center located at North Dakota State University. UGPTI conducts applied and advanced research on rail transportation that addresses critical issues of the state, region, and nation. The UGPTI is guided by representative from various state, local, and private sector organizations that either affect or are affected by transportation.[77]

4.3.2 The Local Concerns

Many of North Dakota's cities and towns are situated along active rail lines. The tracks often bisect the communities. Local leaders have expressed concerns about their ability to manage rail-related crashes,

[74] U.S.DOT FRA. (2015). *Rail Safety Fact Sheet*.
[75] List of major crashes retrieved from *https://www.fas.org/sgp/crs/misc/R43390.pdf*
[76] National Transportation Safety Board. (2014). *Safety Recommendation R-14-005*. *http://www.ntsb.gov/_layouts/ntsb.recsearch/Recommendation.aspx?Rec=R-14-005*
[77] Upper Great Plains Transportation Institute. *http://www.ugpti.org/about/*

should they occur in one of their communities. Concerns stemmed from rescue and protection of lives to the ability to access both sides of the track if an incident were to obstruct the limited grade crossings. In some cases, first responder response capabilities could be hindered if grade crossings are blocked.

Response capabilities of local firefighters and other first responders, particularly in rural areas, often cannot handle large-scale railway hazardous materials or mass-casualty incidents. Although most have at least minimal training to respond to such incidents, many local-level fire departments and emergency medical services do not have enough available, qualified staff or equipment to manage the response needs. In communities along the railroads, comprehensive response plans are often lacking rail response-specific incident management and activities. In a survey and interviews with fire departments around the state, the limited time and resources to regularly exercise a mass-casualty or hazardous materials response is also a preparedness concern.

4.3.3 Rail System Safety Improvements and Emerging Technologies

With the increase in rail traffic and the number of high-profile crashes over the last 30 years, there has been a push by both the government and industry to improve safety on the railway. According to the Association of American Railroads, railroad companies have invested more than $600 billion in improving the freight rail network and are committed to researching and implementing innovative technologies to increase safety.[78] This year alone, railroad companies expect to spend up to $29 billion on improvements—from installation of Positive Train Control (PTC), a sophisticated safety system that overrides human error, to the replacement of cars, track, and bridges. Technological and innovative improvements in the railroad industry have reduced the train crash rate by 85 percent since 1980 and 49 percent since 2000.[79] This commitment to safety requires a continued investment to address new hazards and vulnerabilities focusing on reducing risk. It is important to note that the majority of safety improvements and emerging technologies of the railroad industry focus on mitigation of impacts regardless of the commodity being transported. The exception is noted in Tank Car Standards section, which aims at reducing risk to Class 3 flammable liquids, specifically crude oil and ethanol.

Tank Car Standards

Recent changes in rail car standards are designed to decrease the risk of fire and explosion of petroleum products. All existing cars transporting crude oil with the Packing Group I designation will have to be retrofitted or replaced to meet the new USDOT-117 car standards. Under USDOT rule, railways have three years to retrofit or retire existing CPC-1232 compliant cars if they are to be used to haul crude oil. DOT-111 cars are no longer compliant for transportation of petroleum products.

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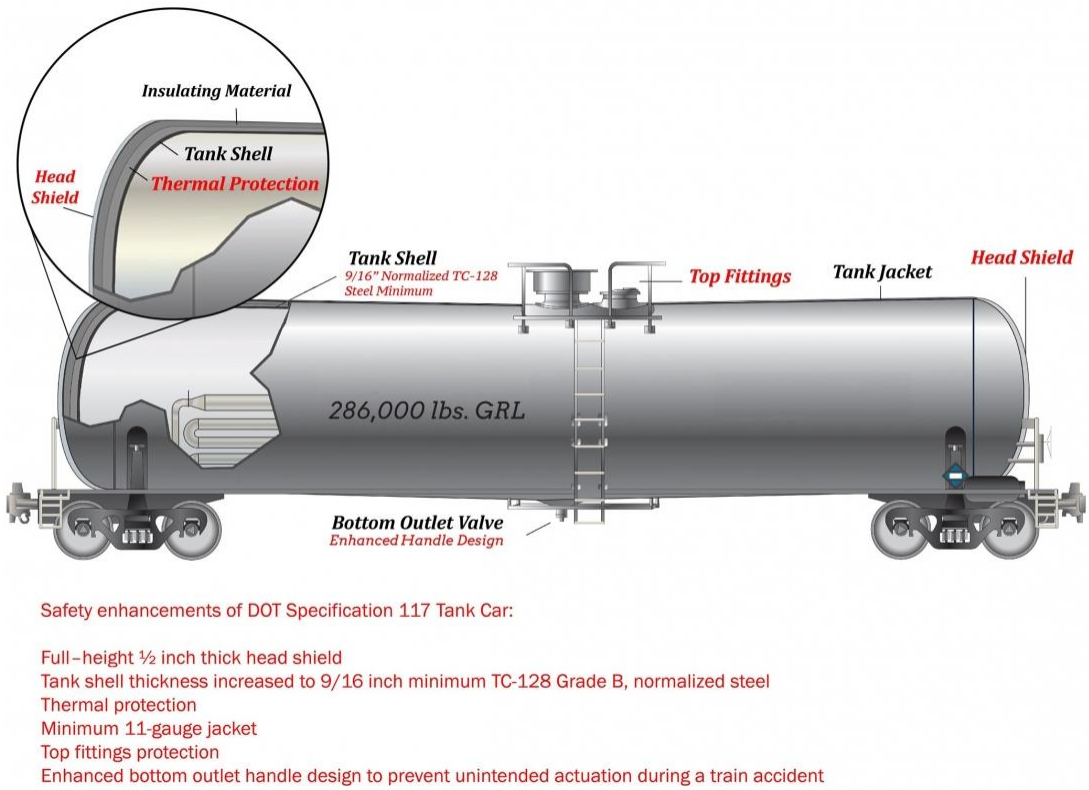
[78] Association of American Railroads. (2016). *Safety and Innovation Report.* *https://www.aar.org/report/Documents/AAR%20State%20of%20the%20Industry%202016%20Full%20Report.pdf*

[79] Association of American Railroads. (2016) *21st Century Railroads: Safety Through Technology*. Print. Retrieved from *https://www.aar.org/Lists/Slideshow%20List/Attachments/4/21st-Century-Railroads-Safety-Through-Technology.pdf*

Figure 4-1. USDOT-117 Specification Car



Source: Association of American Railroads

Specifications for the new USDOT-117 railcar include the following:

- A thicker steel covering to increase strength and prevent puncture during a derailment or crash
- A thermal jacket design to withstand heat and reduce the risk of tank failure by fire impingement,
- Sn enhanced bottom outlet valve designed to withstand impact from a crash or derailment, reducing the risk of leaks and spills

Train Braking Systems

The railroad industry has researched new types of braking systems but has found that the braking technology developed in the 1930s has proven to be generally reliable and is still the preferred rail braking system. The system is composed of a brake cylinder, brake shoes, a dual air reservoir, and a control or air brake valve. This system depends on air pressure being generated from the engine and must be at least 70 to 90 psi to operate properly. Air pressure is distributed through the brake pipe. This pipe runs the entire length of the train and supplies the air to the brakes on all cars. As a fail-safe design, a drop in brake pressure will cause a brake application on each car. Restoration of brake pressure allows the brakes on each car to release. There are several ways a train engineer can apply the brakes. Power braking is one form that engineers use to slow the train down without moving the throttle. Dynamic braking slows the train down by using the locomotives. Emergency braking is performed by releasing air pressure from the brake line that allows all of the brakes on the train to fully engage at nearly the same time.

Positive Train Control (PTC)[80]

PTC is a federally mandated set of technologies designed to slow or stop a train before certain types of crashes occur. The mandate originally required all private US railroads to install this new technology by December 31, 2015, but the Surface Transportation Extension Act of 2015 granted a three-year extension to 2018. PTC technologies are designed to prevent train-to-train collisions, derailments caused by excessive speed, unauthorized incursions by trains onto closed sections of track, and movement of a train through a track switch left in the wrong position. The technologies are not designed to prevent crashes resulting from track equipment failure, improper or illegal vehicular movement through a grade crossing, trespassing on tracks, and some types of operator error.

PTC uses onboard locomotive monitors that track train speed and position, combined with wayside systems that monitor signals, switches and track circuits to enforce speed restrictions and prevent unauthorized train movements. The technology can automatically activate braking if required.

Trackside Safety Technology[81]

In 2014, FRA amended the Federal Track Safety Standards to promote the safety of railroad operations by enhancing rail flaw detection processes. The final rule implements Section 403 of the Rail Safety Improvement Act of 2008 (RSIA). Through this ruling, FRA established minimum qualification requirements for rail flaw detection equipment operations, as well as revised requirements for effective rail inspection frequencies, rail flaw remedial actions, and rail inspection records. FRA also removed regulatory requirements concerning joint bar fracture reporting.

This ruling strengthens existing Federal Track Safety Standards by several means:

- Requires the use of performance-based rail inspection methods that focus on maintaining low rail failure rates per mile of track, generally resulting in more frequent testing.
- Provides a four-hour period to verify that certain less serious suspected defects exist in a rail section once track owners learn that the rail contains an indication of those defects.
- Requires that rail inspectors be properly qualified to operate rail flow detection equipment and test results.
- Establishes an annual maximum allowable rate of rail defects and rail failures between inspections for each designated inspection section of track.

While prior federal rail inspection standards included a maximum number of days and tonnage that could be hauled over a section of track between tests, the new regulations established internal flaw defect standards for each railroad while the technology used can reduce the number of known rail defects over time.

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[80] Association of American Railroads. (2016). *Policy Issues: Positive Train Control.* *https://www.aar.org/policy/positive-train-control*

[81] Association of American Railroads. (2016). *Safety Investment and Innovations.* *https://www.aar.org/todays-railroads/safety*

Trackside safety technologies have been, or will be, installed on freight lines in the near future, as the industry pushes toward a more advanced and resilient railway system:[82]

- *Detecting track flaws*: Internal flaws in railroad tracks are generally invisible to visual inspections. Railroads use defect detector cars and HiRail trucks with GPS, induction and ultrasound technology to help locate and identify internal rail defects that could cause a crash. In addition, the Transportation Technology Center Inc. (TTCI), a research facility in Pueblo, CO, is developing a new laser-based rail inspection system.
- *Maintaining track conditions*: Track inspections and maintenance include three-dimensional track geometry analysis systems that study the alignment and elevation of track to its curvature and track surface. Railroads have developed onboard computer systems to monitor and analyze track conditions, which then predict how the rail cars will respond to geometric deviations. The analysis helps railroad companies determine when and where track maintenance is necessary.
- *Ensuring a solid foundation*: Track ballast is the railroad bed, or foundation, for the track. Ballast transfers and dissipates the trainloads to the underlying foundation. Ballast also supports proper water drainage and minimizes vegetative growth that could interfere with track structure and stability. To ensure the integrity of the ballast and foundation, ground-penetrating radar is used to measure ballast thickness and make repairs as needed.
- *Maintaining rail bridge integrity:* TTCI researchers are developing new monitoring equipment that can be mounted on both trains and bridges. The new generation of equipment will provide data on the health of railroad bridges and the need for maintenance or repairs. TTCI is concurrently studying bridge design, component, and maintenance practices for ways to improve the lifespan of rail bridges.
- *Monitoring wheel safety*: Worn or defective journals (wheel bearings) can cause enough friction to heat up the journal box (wheel bearing box), and create what is known as a "hotbox." Hotboxes can cause fires along the rail track-beds and have led to mechanical failures and derailments. In the early days of railroading, oil-soaked wool would be placed in journal boxes to detect early signs of friction and overheating. When a journal box became overheated, the wool would smoke, alerting brakemen to an issue. Today, infrared technology and acoustic devices monitor the journals. Friction from a faulty journal causes a noisy rubbing sound. This acoustic signature can be recorded by trackside monitoring devices and used to alert railroads to early signs of journal stress.
- *Preventing freight car truck failures*: Rail car trucks are the assembly of the wheel axles and suspension components. When trucks become warped or misaligned, a rail car oscillation known as truck hunting can occur and lead to rail damage. Railroads use laser-based monitoring systems that measure the alignment of a rail car's truck and identify trucks that are not performing optimally to identify car maintenance needs and prevent rail damage that could lead to derailments.
- *Monitoring for wheel failure:* Automated trackside monitoring systems use lasers to detect worn wheel treads and flanges by measuring the vertical load and determining if wheels are warped. The

[82] Federal Railroad Administration Final Rail to Improve Rail Inspections. *https://www.fra.dot.gov/eLib/details/L04921*

monitors can send collected data to railroad control facilities indicating when wheels need replacement.

Track-Crossing Safety

Track-crossing safety is an issue recognized by most local and state officials as well as railroad operators. Grade crossing collisions occur approximately every three hours in the US. Although all public grade crossings are equipped with warning signs to alert motorists that they are approaching a rail crossing, not all grade crossings have active warning devices. Active warning devices include automatic crossing gates, flashing lights, and bells. These are more effective in preventing collisions than the passive devices, which include stationary crossbucks and signs. Active warning systems, where installed, are maintained by the owner of the rail line.

Rail companies and local public safety officials work with programs like Operation Lifesaver to educate the public about rail safety. Operation Lifesaver is a non-profit organization that provides public education programs in all 50 states. Operation Lifesaver's programs work to ensure the public is aware of the rules of the road and to always practice caution when using unmarked private crossings and active or passive marked crossings on public roads.

In addition to public safety awareness and training, technology is an additional tool being employed to increase public awareness of grade crossings. On June 29, 2015, FRA announced a partnership with Google that will integrate FRA's geographic information system data, providing the location of public and private railroad crossings into Google's navigation and mapping products.[83] This partnership will provide navigational warnings to drivers and passengers when approaching a crossing.

Lower Train Speeds

Operating at lower train speeds is a procedural safety measure, which is ultimately the responsibility of the train operator. PHMSA recently issued the final ruling, Hazardous Materials: Enhanced Tank Car Standards and Operational Controls for HHFTs, which implements speed reduction rules in certain defined urban areas.[84] These rules limit the speed of crude oil unit trains to 40 mph in high-population areas. Train operators must be cognizant of their geographic locations, in relation to a high-population area, to properly and safely maneuver the train through these areas. Class I railroad companies, including BNSF and CP, also have taken steps to assign slower speeds in high-risk areas with voluntary speed restrictions.

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[83] U.S. Department of Transportation, *Google, FRA team up for safety; will add rail crossing data to maps,* June 29, 2015, *http://www.transportation.gov/fastlane/fra-google-team-to-incorporate-rail-data-in-maps* (accessed June 30, 2015).

[84] US Department of Transportation, Pipeline Hazardous Materials Safety Administration, *Docket No. Pipeline Hazardous Materials Safety Administration-2012-0082 (HM-251), Hazardous Materials: Enhanced Tank Car Standards and Operational Controls of High Hazard Flammable Trains*, *http://www.transportation.gov/sites/dot.gov/files/docs/final-rule-flammable-liquids-by-rail_0.pdf* (accessed June 22, 2015).

Train Loads

Proper train loading is another procedural safety measure implemented to reduce the likelihood of a derailment or incident. Railroad companies are expected to address proper distribution in the lineup of loaded and unloaded cars, which have varying weights, to help prevent derailment. For example, if an unloaded car is placed before a loaded car and the brakes are applied, the loaded car may run into the unloaded car, causing it to jackknife. The makeup of a train with loaded and unloaded cars is also important in differing terrains such as hills or mountains.

4.3.4 Hazmat Safety Initiatives

Need to Consider Railroad Risk in Mitigation Plans

The 2016 North Dakota Crude Oil Response Preparedness Report (2016 Report), commissioned by the North Dakota Department of Emergency Services, identified recommendations for reducing risk and improving preparedness and response capabilities throughout the state. While these recommendations focused on crude oil transportation, the applicable railroad transportation recommendations can be used for all transported hazardous materials and, in some cases, passenger rail crashes. The following recommendations are founded in the 2016 Report with an expanded view to include an all-hazards approach to reducing railroad incident hazards and risks.

Under 44 CFR 201.6, the federal regulations for local hazard mitigation planning, local mitigation plans are not required to include human-caused or technological hazards. However, recognizing the risk and vulnerability associated with hazardous materials transportation and outlining strategies for reducing risk can help improve a community's resilience. County and municipal governments with active railroads should consider including railroad risks and vulnerabilities in their local mitigation plans. For example, the City of Bismarck has recognized train derailments as a historic and potential hazard and has included a full hazard profile, including mitigation measures, in its most recent mitigation plan update.

In another example, Morton County recognizes hazardous materials releases in its mitigation plan. It specifically addresses transportation incidents, and it has developed detailed mitigation strategies to address the hazard, including: mitigate [the] possibility of a train derailment and the potential for a hazardous materials release and/or explosion through decreasing train speed through [the City of] Hebron.

<u>Initiative</u>

In counties and tribal areas with active railroad transportation, local and tribal governments should foster improved resilience by including a full profile of the hazard, a local capability assessment, risk and vulnerability assessment, and defined protection and mitigation strategies. Mitigation plans are essential to long-term community planning and resiliency from recognized hazards.

Counties and municipalities, with support from the NDDES should identify, map, and assess the vulnerability of local critical infrastructure including schools, hospitals, and prisons located within 0.5 miles of railroad lines. Local jurisdictions may also include mapping of demographic factors to determine social vulnerability for planning and risk communication purposes.

LEPCs Need to Play an Active Role in Response Planning

Some of the local emergency managers interviewed during the discovery process of the 2016 Report stated that their LEPCs were not active in response preparedness planning. In certain cases, LEPCs reportedly only had one or two members.

Initiative

Local emergency managers should annually review the ND LEPC handbook and seek support of the SERC to develop better participation of local public safety, community leaders, and companies that produce, store, or transport hazardous materials, and to develop or enhance current hazardous materials transportation incident plans through active LEPC involvement.

Government and Railroad Industry Leaders Need to Develop Better Working Relationships

Only a few local emergency managers and first responders report having developed relationships with rail companies that operate in their jurisdictions. Some local authorities do not know the names of the railroad companies that operate in and through their counties.

Initiative

The state and local jurisdictions should work together to identify and engage crude oil transportation industry representatives so that communication and coordination processes are established in advance of an incident.

Private and public sector partners with a role in railroad transportation and related preparedness and response activities should develop and/or maintain communication forums through local, regional, or state meetings and conferences, LEPC meetings, or joint training opportunities provided by the state and industry.

Need to Improve Regional Emergency Response Planning and Capabilities

Many state and local officials report that there are verbal and/or written mutual aid agreements in place to provide support to local emergency response. However, regional (multi-county) planning for such incidents is not currently coordinated.

Initiative

NDDES has established emergency management regions and provides regional coordinators to assist local governments with planning and response efforts. Local emergency managers and response organizations should work with regional coordinators to develop and maintain regional hazardous materials transportation incident response capabilities, written mutual aid agreements, and multi-jurisdiction coordination strategies.

Need to Develop a Database of Federal, State, and Local Emergency Response Equipment and Resources

NDDES maintains a list of equipment purchased through state and federal grant funds, but does not currently maintain a database of equipment status, location, or a replacement schedule. Responses to hazardous materials incidents in the state may involve local, county, state, and federal agencies as well as

response assets from the carrier and its contractors. Coordination of these efforts to provide for an integrated and effective response can be challenging, particularly during critical initial phases, which can have significant impacts on outcomes and impacts of an incident. Having knowledge of what those capabilities are, where they are located, their availability, and procedures for accessing them could greatly benefit an effective, timely response.

Initiative

LEPCs should develop of a comprehensive database of applicable federal, state, and local equipment and resources, including location, availability, and procedure for activation, deployment, and mobilization within their response area. The database should include a listing of state-approved private spill management contractors including their capability. The database should also identify the assets, if available, of response agencies and organizations, both public and private.

Need to Improve First Responder Staffing and Capabilities in Rural Areas

Almost all first responder departments report limited response capabilities and staffing that would likely be exceeded in large-scale response incidents. In areas where volunteers serve as the primary response force, there are consistent concerns about staffing numbers, aging volunteers, and availability of first responders in an emergency.

Initiative

While mutual aid agreements exist between local jurisdictions, the availability and capability of mutual aid resources may not be enough to augment local response needs during disaster incidents. Purchasing additional equipment and tools are of limited utility without requisite staffing. Even small, otherwise-manageable incidents become more serious for understaffed departments. Local jurisdictions and NDDES should consider funding opportunities to support training of first responders as a preparedness and operational priority. The state should explore supporting additional regional resources that provide a broader complement of emergency services.

First Responders Need Real-Time Access to Manifest Data

In an oil incident, first responders often have to rely on drivers and train engineers to advise them of cargo on board. During an incident, communication and information sharing may be hindered if the vehicle operator is injured, killed, or otherwise unavailable. Having real-time access to cargo data would expedite public safety and response operations.

Initiative

The railroad and motor carrier industries have developed mobile applications –AskRail and QCMobile – that provide the real-time cargo manifest data first responders need. State and local authorities should work with industry to provide first responders the required training and security clearances to utilize the mobile applications and to enable each responding jurisdiction to have access to and training on those applications.

Trauma Care is Limited in the State of North Dakota

The oil boom in North Dakota generated an influx of population and high injury-risk jobs around the state, particularly in the Bakken field. Emergency managers reported that most of their local hospitals and emergency medical services are not equipped to provide urgent trauma care to crash-related injuries including respiratory exposure, crushing injuries, and burns. Emergency medical services in North Dakota are able to provide only limited advanced life support operations, and due to limited care and response times to trauma centers, air ambulances may be required to transport unstable and critical patients to out-of-state facilities. Transportation resources can also be limited by weather conditions or access to crash sites, leaving critical patients at greater risk.

Initiative

Hospitals should identify and seek trauma care funding through federal programs, such as the Patient Protection and Affordable Care Act (PPACA). The state should also explore avenues to increase funding to institute better trauma care capabilities for emergency medical services and emergency rooms at public regional and local hospitals.

4.4 INSTITUTIONAL IMPROVEMENTS

Chapter 2 described the institutional structure and authorities surrounding rail transportation in North Dakota. This chapter moves beyond describing to evaluating existing programs, planning efforts, processes, policies, and regulations. Based on this evaluation and based on best practices from other states, the following summarizes a technical memorandum that provides recommended changes. The information presented is based on feedback from stakeholder interviews, meetings, and discussion with state officials, and consultant staff experience with other states.

4.4.1 Coordination on Rail Issues

The coordination of state rail issues occurs at many different levels. Successful multimodal planning within a state transportation agency requires close coordination within the agency itself. In addition, it requires coordination with other state and federal agencies, local transportation agencies, railroads operating within the state, and the general public.

Coordination within State Government

A number of different agencies within the North Dakota state government play a role in railroad transportation, including the North Dakota Department of Transportation (NDDOT), the North Dakota Public Service Commission (NDPSC), and the North Dakota Department of Emergency Services. Additional agencies have a potential role in rail transportation. The North Dakota Department of Commerce seeks to attract and retain businesses in North Dakota. In many states, the state government supports infrastructure improvements, including rail access as part of incentive packages to attract/retain businesses. In this sense, the North Dakota Department of Commerce has an interest in rail. Other agencies such as the North Dakota Department of Agriculture and the North Dakota Pipeline Authority support or provide data analytics on important industries that use rail in the state. In addition, the UGPTI conducts rail-related research. Much of the coordination between state agencies is on an as-needed basis.

Initiative

NDDOT should continue to ensure that the North Dakota Department of Commerce is aware of the NDDOT State Rail Loan Program and that the North Dakota Department of Commerce is aware of NDDOT technical capabilities, such as in supporting grant applications that promote economic development through rail. Beyond that, however, is an opportunity to further economic development in the state through a multiagency rail economic development initiative. One example of such an initiative is the Vermont Rail Recruitment and Expansion Committee through which the Vermont Agencies of Transportation, Commerce and Community Development, and Natural Resources, are teaming with railroads to advance rail-oriented industrial development within the state. Early collaboration with the state's railroads is mandatory. During SRP stakeholder meetings, several stakeholders mentioned that locations served by multiple railroads are particularly valuable.

Coordination with Railroads

The NDPSC hosts semiannual meetings with railroads. These meetings are invitation only and include representatives from NDPSC, NDDOT, and other agencies. A draft agenda is distributed in advance of each meeting, and participants are allowed to propose new agenda items. Railroad attendance at these meetings is reported to be good. NDPSC and NDDOT report railroads operating in the state to be relatively responsive to agency contact.

Other states require railroads to submit annual reports for specific purposes. In some cases, the annual reports are required for tax purposes. For example, the Minnesota Department of Revenue requires railroads to report financial and statistical information so the agency can determine taxes for railroads operating within the state. In other cases, annual reports are intended to identify railroad needs, assess the vulnerability of the operation to business fluctuations, and assess railroads' economic impacts. For example, annual reports by Class II and Class III railroads to the Indiana Department of Transportation include information on ability of tracks and bridges to accommodate 286K-pound railcars, miles of FRA Class 1 and excepted track, employment by the railroads and their shippers, and the number of online shippers. The NDPSC requires railroads to file annual reports, which include summary financial information, operating statistics, equipment inventory, and traffic volumes by commodity. In other states, reports are often confidential, but due to North Dakota sunshine laws, they are published online.

Initiative

An opportunity exists for the state to be more proactive in identifying rail issues through improved information. NDDOT, NDPSC, and the North Dakota Office of State Tax Commissioner and other relevant agencies should periodically review the railroad annual reports, along with stakeholders such as the railroads to determine if the content of these reports still serves the state's needs; questions asked could or should be modified to make these reports more relevant in addressing rail-related issues.

Coordination with Metropolitan Planning Organizations

Within North Dakota are three metropolitan planning organizations (MPOs), each responsible for planning for North Dakota's metropolitan areas with populations in excess of 50,000. These MPOs include the Fargo-Moorhead Council of Governments, Grand Forks-East Grand Forks MPO and the Bismarck-Mandan MPO, the first two of which straddle the North Dakota/Minnesota border, while the Bismarck-Mandan

MPO is entirely within North Dakota. Interaction between NDDOT and the MPOs is facilitated by a formal agreement between the NDDOT and the three MPOs related to specifics on planning coordination. In addition, the NDDOT Local Government division has a single point of contact for MPOs, who facilitates conversations, sets up joint meetings, and ensures all three MPOs are informed of issues in a uniform manner. During discussions with the three MPOs, one representative believed that the MPOs had not been sufficiently engaged in the process of preparing the freight plan, and that the freight plan did not adequately reflect freight planning activity that MPOs have been doing. All MPOs reported difficulty in contacting railroads.

Initiative

NDDOT should ensure that the state's MPOs and other local agencies are included in all statewide planning processes. NDPSC and NDDOT should initiate assisting MPOs in contacting railroads. The Fargo-Moorhead Council of Governments and the Grand Forks-East Grand Forks MPO should be encouraged to participate in the Great Northern Corridor Coalition. MPOs should also be invited to the NDPSC semiannual meetings with railroads.

Coordination with Other States and Canada

North Dakota participates or has participated in the Great Northern Corridor Coalition, the Midwest Interstate Passenger Rail Commission, the Federal Highway Administration/Transport Canada Trans Border Work Group, and the Pembina/Emerson Land Port of Entry Inter-Agency Planning Group.

Initiative

It is recommended that the state continue to actively seek out opportunities to cooperate with states along the same strategic corridors and with similar interests.

Local Government-Railroad Coordination

The stakeholder outreach meetings revealed the concerns of several local authorities that there was little communication between railroads and local officials, particularly when, railroad maintenance activities interfered with roadway traffic.

Initiative

NDDOT should request that local railroad representatives contact local officials in advance of performing track maintenance. Maintenance program information should be provided to towns and counties when the programs are developed.

4.4.2 North Dakota Rail-Related Development Activities

Rail Planning

In other states, the level of rail planning relates to the state's involvement in rail funding. Because rail plans are now a requirement for federal funding, most states complete SRPs at roughly the prescribed five-year interval. However, states that actively fund rail projects typically conduct project-specific rail planning between rail plans. Work generally consists of feasibility studies, environmental reviews, and design work associated with ongoing rail initiatives. Other rail planning is driven by queries from the

states' legislatures. For the states that actively fund rail projects, the federally required SRP becomes a cataloging of the state's ongoing rail planning activities.

If the periodic SRPs are adequate to prepare the state to respond to competitive grant opportunities over each five-year period between rail plans, then this may be sufficient. Otherwise, a more frequent assessment of needs would be required. If needs change dramatically between rail plans due to a dramatic shift in rail network demand, a reassessment could be warranted.

Rail planning serves several important purposes:

- Meets legal requirement for state rail plans
- To create a capital program
- Helps to identify funding: federal, private, sectors other, and coordinate efforts among operators
- Monitor the health and demands of the rail network within the state, ensuring that the state is aware of any developing issues.

It is also useful to point out that states sometimes sponsor research that does not constitute "planning" per se, since it does not present an immediate state policy or recommend infrastructure projects. Rather, the research explores an issue in depth and points to potential state policies and practices. North Dakota is a good example. Some recent research conducted by the UGPTI and other transportation research organizations include the following:

- Research on the impact to short line and regional railroads of an industry shift to the 286K railcar standard
- Options for shipping identity-preserved grain and potential to bring intermodal shipping capabilities to rural areas to facilitate these shipments
- Managing the shipments of hazardous material by rail
- The value of local rail service to agricultural communities as the industry shifts from country elevators to unit loader service

Through the UGPTI, NDDOT sponsors research that is relevant to the North Dakota rail network.

<u>Initiative</u>

NDDOT should monitor changes in demand for rail, changes in the structure of the rail industry within North Dakota, and any logistics trends that will materially affect rail needs within the state. If these changes warrant a reassessment of the state's needs, NDDOT should consider rail planning activities beyond the completion of the five-year rail plan. NDDOT should also continue to monitor rail issues and help to sponsor timely research on rail issues.

NDDOT should continue its work on performance monitoring of the rail industry, making sure that among the measures is information that would allow the state to assess the condition and status of low density branch lines. The railroads should be encouraged to provide the required data.

Rail Infrastructure Development

The NDDOT administers the State Rail Loan Program, which is a financing mechanism funded through the repayment of past loans, which includes interest. NDDOT added a one-time appropriation for an additional $7 million to the loan program in 2015, but the loan program does not receive regular annual infusions of additional funds. North Dakota has also been the sponsor of several successful rail-related TIGER grant applications, including the Devils Lake Grade Raise Rail Improvement Project and the Minot Bypass Project. The state provided $10 million in funding for the Devils Lake Grade Raise Rail Improvement Project. The Minot Bypass was as much a highway project as a rail project, since it completed a highway/rail grade separation. North Dakota contributed $1.5 million in state funding to the $26.4 million Minot Bypass project.

Because no dedicated, consistent federal funding source for rail exists, North Dakota does not include rail projects, other than grade crossing improvements, in the state's Statewide Transportation Improvement Program (STIP). STIPs are a requirement for federal formula highway funding.

While North Dakota does not fund rail infrastructure improvements on an ongoing basis, the state undertakes periodic rail-related initiatives identified by the Legislature. In the mid-1990s, NDDOT completed a statewide crossbuck replacement program. In 2009, the North Dakota Legislature initiated an effort to implement quiet zones in municipalities throughout the state. As of 2016, the last of the North Dakota quiet zone program funds have been expended. North Dakota also administers the Federal Highway Administration's (FHWA) Railway-Highway Crossings (Section 130) Program, enhancing safety on public at-grade crossings. Section 130 funds can also be used to assist with funding of identified highway/rail grade crossing separations as part of its highway program.

North Dakota Rail Loan Program

The North Dakota Rail Loan Program has undergone significant changes over the past several years. For a time, few loan applications were received, and NDDOT was concerned that the program's loans were not competitive with other financing alternatives. As such, they were not fulfilling the program's mission to promote rail infrastructure in North Dakota. NDDOT then increased the percentage match, lowered the interest rates, and allowed for longer payback periods. NDDOT adopted a tiered system where the loan terms depend upon whether the project is considered to be system critical, relating to infrastructure improvement, or related to economic development.

In Table 4-1, the North Dakota Rail Loan Program application process, criteria, and tracking have been compared to loan programs in other states, including those in the following states:

- Idaho – Idaho Rural Economic Development and Integrated Freight Transportation Loan
- Minnesota – Minnesota Rail Service Improvement Program
- Montana – Montana Essential Freight Rail Loan Program
- New Hampshire – Class III Railroads and COG Railroads Revolving Loan Fund
- Ohio – Ohio Rail Development Commission (ORDC) Rail Improvement Program

These programs were selected for comparison to the North Dakota program because they are, for the most part, pure loan programs. ORDC funds can be granted or loaned, but the agency has established a different process for each, so was considered comparable to North Dakota's program.

Table 4-1. Comparison of State Rail Loan Programs

	North Dakota	Minnesota	Montana	Idaho	Ohio	New Hampshire
Interest rate	0% for system critical, ½ prime, 4.5% max infra improvement or econ development	Interest free for projects already rehabbed under the program, where carrier has invested >$10,000 in rehab, one-time fee of 10% otherwise	0% plus administrative costs	2% for loans paid within 3 years, 3% for loans paid within 8 years, 4% for loans paid within 15 years	2/3 prime rate, but can be negotiated. 1% of the loan to cover ORDC expenses plus $500 application fee.	Not specified
Payback period	15 years for system critical or infra improvement, 10 for econ development	15 years	10 years with up to 2 years deferred	Up to 15 years	Project-by-project but generally 5 years	5 – 20 years to match the useful life of improvement and/or equipment
Loan Share of project	80% system critical, infra improvement, 70% econ development	70% state, 10% user, 20% railroad for rehab projects, not specified for other	70% for rehab projects, 50% for construction projects	Up to 90%	Not specified	Not specified
Collateral Requirement, financial disclosure	None	Identified collateral, provide financial information	Collateral and financial information is required	Collateral and financial information is required.	Collateral, letter of credit, financial statements	Lien against improvements, business plan and financial information
Maximum Loan	$5 million (Can be greater with approval of Executive Staff)	$200,000	Not specified	Not specified	Flexible	Not specified

Table 4-1. Comparison of State Rail Loan Programs (continued)

	North Dakota	Minnesota	Montana	Idaho	Ohio	New Hampshire
Process	Available funding announced annually, will accept applications if funding left following initial selections. Loan application review conference.	Considered on a quarterly basis	Considers applications annually. Applicant submits a preliminary application to demonstrate that project and applicant are qualified, and ready to proceed. Once project is found to be eligible, applicant submits full application.	Applications considered on a quarterly basis.	Receive applications year-round. Strongly encourage applicants to discuss with ORDC before completing an application.	Applications considered on an annual basis
Eligible Applicants	Public and private excl Class I railroads	Priority to lines in program, Class I's can apply but only for <5 MGT lines, and are lower priority than Class II, III lines.	Public and private entities that derive revenue from railroad operations	Class III railroads, branch lines of class II railroads, lines owned by public entities, users of rail service.	Public and private entities	Class III railroads

	North Dakota	Minnesota	Montana	Idaho	Ohio	New Hampshire
Eligible Projects	Rail infrastructure, including projects that are system critical, infrastructure improvement, economic development	Can be used to purchase lines, rehabilitate lines. Can award as many as 2 loans for same project. Prioritizes projects where applicant has invested, rehabbed under the loan program. Rehab projects must be on lines <FRA Class 2, or non 263K compliant.	Projects related to corridor preservation, branch line rehabilitation, purchase maintenance, rehab of intermodal facilities, can include rolling stock. Lines <5 MGT although can be waived, public interest in project, line that is active and economically viable.	Rehab rail lines or improve rail lines for local service, purchase or rehab equipment for rail service, construction of loading, reloading facilities, coordinating intermodal traffic	Projects of public benefit, including economic development projects, track acquisition, passenger initiatives, rail tourism.	Track rehabilitation projects are top priority. Intermodal, industrial sidings, rolling stock improvements, other railroad facilities are also considered.

Table 4-1. Comparison of State Rail Loan Programs (continued)

	North Dakota	Minnesota	Montana	Idaho	Ohio	New Hampshire
Criteria	Carloads per mile, system connectivity, econ development, safety, environmental/ community	Availability of funds, probability of line being in service after investment, costs/benefits, rail carrier/user financial contribution, importance of line to state, impact on roadways if not completed.	Primarily BCA, feasibility, project viability including ability to repay, readiness. Secondarily, connectivity benefits, economic benefits, terms of loan, how project advances other Montana priorities.	Level of local financial commitment and project benefit/cost ratio.	The information that ORDC requests differs depending on whether the project is a rail improvement project, a rail spur/siding project, a rail line acquisition project.	Must commit to use line at least 80% of average of last three freight or passenger level for 5 years, BCA
Post award monitoring	None	Requires annual report that compares shipping prior to loan to shipping after loan	None	None	None	None

Source: WSP Analysis

Initiative

As in other areas, there is no set of "best practices" for state rail loan programs since each state has different needs, rules, and political environments. However, a review of other loan programs reveals some aspects for North Dakota to consider.

North Dakota's program is unique in not requiring any due diligence information or collateral for loans. NDDOT staff report that no loans have gone unpaid during the existence of the loan program. One recipient did not pay the loan, but the loan was eventually paid by the municipal government in whose jurisdiction the project was located.

Both ORDC and Montana suggest that applicants meet with agency staff or submit a preliminary application before submitting a complete loan application. This way, the agency can determine the eligibility of the proposed loan and provide feedback before time is expended on a full application. According to NDDOT, a similar process takes place informally in North Dakota where NDDOT staff track potential projects for the North Dakota Rail Loan Program before applicants request loans. If the quantity of loan applications grows so that NDDOT's informal approach of communicating with potential applicants is no longer practical, the agency should implement a similar two-step approach to evaluating loan applications, similar to that in Ohio or Montana.

Of the programs reviewed, Minnesota is the only state that requires loan grantees to provide annual reports on relevant rail volumes during the duration of each loan. NDDOT should ask loan recipients to voluntarily provide similar information. This would enable NDDOT to evaluate the success of the program in promoting rail in the state and enable the agency to communicate the impacts of the program to decision makers. Otherwise, it is impossible to determine whether the program contributed to job generation or boosting usage of the rail system in North Dakota.

The North Dakota Rail Loan Program is unique in excluding Class I railroads from applying for loans. Other states include the major railroads giving Class I applications low priority or requiring that Class I railroads only apply for projects on branch lines (typically defined as lines that handle less than five million gross tons per year). NDDOT may want to reconsider Class I eligibility for loans, given that a project on a low-density Class I branch line may fulfill NDDOT's criteria as well as that on a Class II or Class III railroad's line.

The North Dakota Rail Loan Program application instructions allow for applicants to supply information on a benefit/cost ratio. The application instructions then list representative types of data that can be included in a benefit/cost analysis. Most of the data listed enumerates reductions in railroad operating expense. It is recommended that NDDOT be more specific about the information needed to perform a benefit/cost analysis and that information requested is tied to the goals of the loan program. NDDOT may want to tailor the information requested to the type of project, i.e. system critical, infrastructure improvement, or economic development. Table 4-2 provides an example from Ohio of different information being requested of applicants depending on the type of project.

Table 4-2. ORDC Rail Improvement Program Requested Materials

Rail Improvement Projects	Rail Spur/Siding Projects	Acquisition Projects
▸ Map of project location ▸ Track charts of line ▸ Scope of proposed project (mile posts, type of work, cost, timing) ▸ Owner of section, responsibility for maintenance ▸ Cost breakdown by funding source ▸ Maintenance expense, capital expenditures, revenue last 3 years ▸ Benefit of project to railroad ▸ Contact info for each shipper online ▸ Car loadings of last 3 years, by commodity, inbound/outbound ▸ Explanation of how ORDC funding helps project completion ▸ Explanation of how project meets one or more of ORDC objectives	▸ Description of company, products shipped, etc. ▸ Description how plant fits into company's operation ▸ Investment broken out by building, land, equipment, description of building, etc. ▸ Products to be produced, services, markets served, competitors ▸ Description, cost estimate, timing estimate of rail construction ▸ Jobs created, retained, wages, new rail carloads, major origins-destinations, additional benefits to Ohio ▸ Statement that jobs not displacing those elsewhere in Ohio ▸ Incentives received by other sources ▸ Forecast cost of rail compared to trucking	▸ Acquisition cost and financing plan, why acquisition cannot be financed through private vendors ▸ Copy of rail line appraisal or evidence of valuation ▸ Pro Forma or business plan after acquisition ▸ Evidence of clear title by seller ▸ Description of rail line, including description of rail traffic over past three years, track rehabilitation needs, industrial sites ▸ Project benefits including importance of line to rail users, people employed by rail users, truck/rail cost differentials ▸ Future increased usage by existing customers, new customers ▸ Additional sources of revenue from property

Source: WSP Analysis

4.4.3 Role/Activities of the North Dakota Public Service Commission

The NDPSC represents the state's interests in negotiations with railroads and before federal agencies. The NDPSC regulates railroads according to state law to the extent that state law does not overlap or conflict with federal laws. Because state law is preempted by federal law in many cases, the jurisdiction of the NDPSC is relatively narrow. In practice, the NDPSC most frequently acts as a facilitator between railroads and stakeholders/the general public. When an individual has an issue with a railroad, NDPSC can direct that person to the correct railroad employee to talk to or can serve as a mediator, communicating with the railroad and individual until the issue is resolved. While the NDPSC plays a useful and important role for rail in North Dakota, the nature of this role as presented to the general public may be somewhat ambiguous.

<u>Initiative</u>

It is recommended that the NDPSC role be better clarified and presented to the public over the NDPSC website. Questions addressed in the website should include the following:

- What are the specific areas over which the NDPSC has jurisdiction?
- Where does the NDPSC not have jurisdiction?
- What types of issues the NDPSC resolve?

- Who at the NDPSC should the public contact?
- What matters should be addressed directly with the railroads?

NDPSC should provide a railroad contact directory.

4.4.4 North Dakota Public Service Commission State Rail Inspection Program

Stakeholders are positive about the NDPSC State Rail Inspection Program. Several reinforced the need for the program.

NDPSC staff pointed out that the 2013 train crash and explosion in Casselton was originally caused by the derailment of grain cars in an area with parallel tracks. One of the derailed grain cars crossed the other tracks and was struck by a crude oil train that was traveling in the opposite direction.

<u>Initiative</u>

The program should continue. Thirty other states have successfully implemented similar programs. NDPSC should also communicate to stakeholders through its website or other means information its prioritization process for a better understanding of the rationale used to select locations to inspect.

4.5 RECOMMENDED SUPPLEMENTAL NORTH DAKOTA GRADE CROSSING EVALUATION PROCEDURE

The *FHWA Railroad-Highway Grade Crossing Handbook* published in 2007 suggests that economic analyses may be performed to determine the possible alternative improvements that could be made at a highway-rail grade crossing. Since the publication of the handbook 2007, the increasing awareness of railroad safety has led to federal funding programs to support crossing improvements. In 2015, the Fixing America's Surface Transportation (FAST) Act was enacted. It authorized $305 billion over fiscal years 2016 through 2020 for highway, highway and motor vehicle safety, public transportation, motor carrier safety, hazardous materials safety, rail, and research, technology, and statistics programs. Although not stipulated by the act or the programs to under the act to date, it suggests a more comprehensive approach to the assessment of crossings than outlined in the *Grade Crossing Handbook* is required. Other than programs under the FAST Act dedicated specifically to crossing safety, crossing improvements will compete for funding against other types of infrastructure improvements. Further safety benefits alone may not be sufficient to produce a benefit-cost ratio greater than one.

This section describes an alternative methodology that provides a more comprehensive quantification of benefits.

4.5.1 Crossing Improvement Benefits

Traditional crossing improvement analyses focus on safety, and in some formulations, also focus on vehicle delays waiting for trains at crossings. The expanded benefits considered in the more comprehensive evaluation are listed in Table 4-3 for both grade separations and improving passively controlled crossings.

Table 4-3. Impacts Considered

Type of Impact	Separating Actively Controlled Crossing	Installing Gates and Lights in Passively Controlled Crossing
Reduction of injuries, fatalities, and crashes	X	X
Reduction of air particulates	X	
Reduction of greenhouse gas emissions	X	
Reduction of idling fuel consumption	X	
Reduction of passenger delay	X	

Source: WSP Analysis

Grade separations provide a wide range of benefits beyond reductions in train-vehicle crashes. These include the following attributable to decreased delays and idling at crossings:

- Reductions in particulate matter from vehicle exhaust while idling
- Reductions in greenhouse gas emissions from vehicle exhaust while idling
- Reductions in fuel consumption
- Reductions in vehicle delays

The benefits of the installation of gates and lights at passively controlled crossing are limited to safety benefits, a decrease in crashes.

4.5.2 Measures of Benefits

With the elimination or decrease in collisions come reductions in property damage, injuries, and deaths. Table 4-4 describes the impacts of crossing improvements drawn from an FHWA study that is often used as a reference in benefit-cost analyses supporting federal funding.[85] The current rate of collisions at crossings was obtained from an average of the FRA's Web Accident Prediction System.

Table 4-4. Safety Impact

Type of Impact	Separating Actively Controlled Crossing	Installing Gates and Lights in Passively Controlled Crossing
Assumed Reduction in Collisions only	100%	80%
Assumed Reduction in injuries	100%	95%
Assumed Reduction in Deaths	100%	90%

Source: WSP Analysis

Economic savings attributable to reduced crashes include: direct savings (e.g., reduced personal medical expenses, lost wages, and lower individual insurance premiums), and avoided costs to society (e.g., second party medical and litigation fees, emergency response costs, incident congestion costs, and litigation costs). The value of all such benefits – both direct and societal – could also be approximated by the cost of service disruptions to other travelers, emergency response costs to the region, medical costs, litigation costs, vehicle damages, and economic productivity loss due to workers' inactivity. The values of crashes avoided are shown in Table 4-5.

[85] *Guidance on Traffic Control Devices at Highway-Rail Grade Crossings*. Washington, DC: Federal Highway Administration, Highway/Rail Grade Crossing Technical Working Group, November 2002.

Table 4-5. Crash Values

Crash Type	Value
Fatal Crash	$9,600,000
Injury Crash	$201,785
Damage Crash	$4,198

Source: USDOT TIGER Guidance

With at-grade crossings, passenger vehicles have to idle while trains cross. Idling consumes fuel and generates both air pollutants and greenhouse gas emissions. Each minute idling is assumed to consume 0.01 gallons of fuel.[86] The value of excess fuel consumption was $1.87/gallon in 2016 with fuel prices expected to change over time. The additional consumption of fuel leads to the emission of criteria pollutants and greenhouses gases at the rate shown in Table 4-6**.**

Table 4-6. Idle Emission Rates

Emissions Type	Emission Rate (grams/hr)
NO_X	7.950
PM	3.295
VOC	0.081
CO_2	1402.700

Source: Mobile 6.2

The value of air pollution emissions is obtained from USDOT guidance on TIGER applications, which relies on a National Highway Traffic Safety Administration study that provided economic values for metric tons emitted of NOx, PM and VOC. These values are inflated to 2016 dollars using CPI.

Table 4-7. Non-CO2 Emission Costs (2016$/Metric Ton)

Emissions Type	Emissions Costs
NO_X	$8,010
PM	$366,414
VOC	$2,032

Source: USDOT TIGER Guidance

The per-ton costs of carbon emissions are also derived from USDOT guidance for TIGER applications. These values were in turn obtained from a Technical Support Document published by the Interagency Working Group on Social Cost of Carbon.[87]

Table 4-8. Social Cost of Carbon at 3 percent Discounting (2016$/Metric Ton)

	2016	2020	2030	2040
Social Cost of Carbon	$45.34	$52.39	$63.48	$74.56

Source: U.S. Enviromental Protection Agency, 2013

[86] Texas Transportation Institute: Urban Mobility Report
[87] *https://www.whitehouse.gov/sites/default/files/omb/assets/inforeg/technical-update-social-cost-of-carbon-for-regulator-impact-analysis.pdf*

Waiting at an at-grade crossing also creates passenger delays that too have a cost. Delays are assumed to be valued at $19.28/passenger-hour. It is assumed that the average occupancy of vehicles is 1.076.

4.5.3 Discount Rates

The discount rate to be used is 7.0 percent, consistent with USDOT guidance for TIGER grants[88] and OMB Circular A-94.[89] The social cost of carbon, however, is discounted at a 3 percent discount rate, which is also consistent with the USDOT's guidance.[90]

4.6 INFRASTRUCTURE NEEDS AND IMPROVEMENTS – SHORT LINE RAILROADS

Improving and upgrading infrastructure is key to the future success of the short line railroads. The infrastructure needs of the smaller railroads are twofold:

- Maintain a state of good repair.
- Increase the load limits on many lines.

4.6.1 State of Good Repair

The USDOT, in its TIGER grant application guidance, defines state-of-good-repair projects as those improving the condition of existing transportation facilities and systems, with particular emphasis on projects that minimize life-cycle costs. Improving state of good repair may also reduce operating costs and congestion by reducing the amount of time that the infrastructure is out of service due to maintenance and repairs, or may prevent a facility (such as a bridge) from being removed from service entirely.

Many of the short line railroads have had difficulty keeping up with maintenance requirements. Railroad operations are capital intensive, and track maintenance requires large investments in materials, equipment, and construction labor on a regular basis. In a number of cases, short line railroads were created through the acquisition of rail lines formerly owned by larger railroads. In many cases, maintenance had been deferred under the former owners, so that new owners face a significant maintenance backlog.

Deteriorating rail conditions place railroads in jeopardy of ceasing operations if left unresolved. They could also be shut down involuntarily by the FRA because of unsafe operating conditions. Loss of rail service would have a negative impact on many shippers and communities within the state. One way to gauge track condition is by the class of track. Each track class has a designated maximum operating speed:

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[88] U.S. Department of Transportation (2015), *Tiger Benefit-Cost Analysis (BCA) Resource Guide*, p.7-9. (*http://www.dot.gov/sites/dot.gov/files/docs/Tiger_Benefit-Cost_Analysis_%28BCA%29_Resource_Guide_1.pdf*)
[89] White House Office of Management and Budget, Circular A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs* (October 29, 1992). (*http://www.whitehouse.gov/omb/circulars_a094*).
[90] U.S. Department of Transportation (2015), *Tiger Benefit-Cost Analysis (BCA) Resource Guide*, p.7-9. (*http://www.dot.gov/sites/dot.gov/files/docs/Tiger_Benefit-Cost_Analysis_%28BCA%29_Resource_Guide_1.pdf*)

Classification	Freight Trains	Passenger Trains
Excepted	<10 mph	not allowed
Class 1	10 mph	15 mph
Class 2	25 mph	30 mph
Class 3	40 mph	60 mph
Class 4	60 mph	80 mph
Class 5	80 mph	90 mph

Source: FRA

Table 4-9 shows the number of miles in each of the track classifications for the North Dakota short line railroads.

Table 4-9. North Dakota Short Line Railroad Track Classification (Miles) – Excludes Trackage Rights

Railroad	Excepted	Class 1	Class 2	Not Reported	Total
Dakota, Missouri Valley and Western Railroad	0	239	109	164	512
Dakota Northern Railroad	0	29	19	2	48
Northern Plains	0	268	74	0	342
Red River Valley & Western Railroad	62	18	347	0	427
Total	**62**	**554**	**549**	**166**	**1,331**
Percentage of Total Track Miles	**4.7%**	**41.6%**	**41.2%**	**12.5%**	**100.0%**

Source: Short Line Railroad Survey

The short line mileage in the state is principally Class 1 and Class 2 track with less than 5 percent excepted track. The Red River Valley & Western infrastructure is in the best condition of the short lines with a high percentage of its track designated as Class 2 permitting operating speeds up to 25 miles per hour.

4.6.2 Rail Line Load Limits

On November 21, 1994, the Association of American Railroads issued a new standard (S-259), which increased the maximum gross-weight-on-rail[91] allowed per car from 263K to 286K . The 286K standard became effective on January 1, 1995.

The significance of the 286K standard is that by encouraging the evolution of freight cars with larger carrying capacities, the operating efficiency of the railroad improved. Cars with larger weight and/or cubic capacities allow railroads to carry the same amount of freight with fewer cars, thus decreasing the cost per each ton. In many instances, the decreases in operating costs have been shared with the rail customer in the form of reduced rates.

The industry has also moved quickly to adopt the standard. The average weight per rail car load has increased since the 286K standard was implemented. Discussions with railroad operators and users indicate that industrial sites without 286K access are no longer considered competitive for businesses or industries that require rail service.

[91] Empty weight of the rail freight car plus the weight of the load/lading therein.

Table 4-10 describes the capability of North Dakota's short line railroads to accommodate the larger freight cars. Nearly half the short line trackage falls short of the 286K standard. The Dakota Northern and the Northern Plains railroads, each have more than half their track below the larger car requirement. All the Dakota Northern's track is incompatible with the larger cars.

Table 4-10 North Dakota Short Line Railroad Load Limits (miles) – Excludes Trackage Rights

	Track			Bridges		
	Miles Less Than 286K	Total Mileage	Percentage Less Than 286K	Number of Bridges Less Than 286K	Total Bridges	Percentage Less Than 286K
Dakota, Missouri Valley and Western Railroad	239	512	46.7%	7	36	19.4%
Dakota Northern Railroad	0	48	0.0%	NA	NA	NA
Northern Plains	177	342	51.8%	25	40	62.5%
Red River Valley & Western Railroad	189	427	44.3%	20	66	30.3%
Total	**655**	**1331**	**49.2%**	**52**	**142**	**36.6%**

Source: Short Line Railroad Survey

Track condition is important to the transportation of the higher capacity cars with rail replacement a high priority. Structures are also important. Heavier cars can cause a bridge to collapse. The table also shows the status of structures in accommodating the 286K car. Thirty-seven percent of the short line bridges do not meet the standard with Northern Plains railroad demonstrating the lowest capability.

A study conducted by UGPTI in 2014 evaluating North Dakota's rail infrastructure needs determined that a representative cost to upgrade existing track to accommodate 286K railcars was $590,000 per mile, less $63,000 in scrap value. Given the 655 miles of track in North Dakota that are unable to accommodate 286K railcars, an approximate cost of upgrading the track is $345 million. This only an approximation since any number of factors could make the actual cost of upgrading these lines different from $345 million.

4.6.3 Short Line Railroad Needs

The four North Dakota short lines were surveyed to determine their needs. Table 4-11 shows the priorities of each railroad arrayed from top to bottom by importance. All the short lines identified grade crossings as their most significant concern. This was followed by rail car availability, poor track conditions, and service provided by the connecting Class I carrier. The lowest ranking concerns were collecting customer demurrage and lack of traffic.[92]

[92] It should be noted that the survey was conducted during a period of high rail traffic volumes.

Table 4-11. North Dakota Short Line Railroad Needs Survey

Concern	DMVW	DN	NP	RRVW	Consensus
Rail/highway crossings	1	1	1	1	4
Availability of railcars	1	1	1	2	5
Poor track conditions	2	1	1	1	5
Service from interchange carriers	1	1	1	2	5
Trespassers	2	1	1	2	6
Poor bridge conditions	2	1	1	2	6
Availability of funds to properly maintain rail lines	3	1	1	1	6
Ability to handle 286K or higher weight railcars	2	1	2	1	6
Lack of state/federal-funded programs for construction or rail line rehabilitation	3	1	2	1	7
Poor condition of equipment and support facilities	2	1	2	3	8
Availability of funds for emergency repairs	3	1	2	2	8
Insufficient traffic, traffic development	2	3	2	2	9
Customer demurrage	2	3	3	3	11

Source: Short Line Railroad Survey
1 - Very Important 2 - Moderately Important 3 - Unimportant

Table 4-12 provides insight on the short line crossing problem. All the short lines scored the need to consolidate crossings as their major concern. Following consolidations as needs were poor roadway surface conditions at crossings and availability of funding to maintain the crossings.

Table 4-12. North Dakota Short Line Railroad Load Needs Survey - Crossings

Issue	DMVW	DN	NP	RRVW	Consensus
Crossing consolidation	1	1	1	1	4
Poor roadway surface conditions	2	1	1	2	6
Availability of funds to properly maintain crossings	2	1	1	2	6
Number of crossings unprotected or under-protected	2	1	2	2	7
Sight obstructions (e.g., trees, bushes outside railroad right-of-way)	2	2	1	2	7
Availability of in-cab camera to record incidents	1	3	1	2	7

Source: Short Line Railroad Survey
1 - Very Important 2 - Moderately Important 3 - Unimportant

4.6.4 Short Line Infrastructure Program

The short line railroads identified $105.3 million in rehabilitation projects. (Chapter 5 describes these projects.) The projects are intended to restore the short lines to a state of good repair with track rated at FRA Class 2 or better. Many of the projects operate 286K industry standard freight cars. These projects not only improve the efficiency and operations of short lines, but also help rail corridor preservation by ensuring that these rail lines can continue operations.

4.7 RAIL CUSTOMER ISSUES

4.7.1 Customer Perspectives

From the perspective of the customer, rail will continue to be the preferred mode for shipping agriculture, energy, and some manufacturing products. Shipments that are local to North Dakota are typically more economical by truck, and out-of-state shipments are more efficiently made by rail, including international shipments through West Coast ports. Agriculture and energy are two sectors whose products are well-suited for rail. The manufacturing sector in North Dakota uses rail to some extent for inbound shipments, but the outbound volumes typically warrant shipping by truck.

For the energy sector, there is some interest to reduce their use of rail in the longer-term and rely on pipelines, but this depends on the development of interstate pipelines. The modal choice in this sector depends on a variety of factors, including but not limited to the price of oil, the cost to ship the oil, and the location of the oil refiners.

Depending on the commodity, some shipping costs are similar between truck and rail, but trucks are typically viewed as more dependable in terms of expected delivery time. For shipments where there is a choice between rail and truck, rail can be the more favorable choice if the price is less, there are consistent transit times, the shipper can find and lease adequate equipment, and the product integrity can be maintained during loading and unloading. In many cases, the products shipped are time-critical—either perishability of the product or the timing for when it must be used by the customer (e.g., a seasonal fertilizer application in the agriculture sector).

Rail shippers commonly agreed that the service quality from the railroads was much better now than during the oil boom of 2008–2012, but there was still room for improvement. Shippers are also concerned that if/when the oil industry takes off again, rail service and turnaround times will again degrade. Currently, there are few issues regarding rail chokepoints or bottlenecks in the state; however, rail congestion in Chicago was noted. Also, outside of the state, port labor union strikes on the West Coast, were cited as external factors that had an adverse impact on rail shipments.

Shippers' concerns generally focused on the Class I railroads serving the state. Service from the short lines was generally well regarded. Some shippers are captive to a particular railroad and believe they have higher freight rates as a result.

Some shippers also expressed interest in constructing an intermodal facility within North Dakota; Fargo and Minot were cited as two potential locations. This issue affects the broader region of the Upper Midwest, and proponents state that such a facility could improve the process and efficiency of shipping products from North Dakota. Several shippers noted the inefficiency of sending finished product east to Minneapolis to be transferred to rail, which adds to the receipt time and shipping cost. Shippers noted the trend toward more identity-preserved exports from the state, and as this grows, it could further exacerbate the need for a distribution center or warehouse within North Dakota to help balance out the need for containers. The Class I railroads have not expressed their support for this type of a project.

4.7.2 Customer Issues and Needs

Specific issues and needs cited by the shippers cover a wide variety of areas, but generally focus on the following areas:

- Equipment availability
  - Not knowing when the cars will be received
  - Not having the cars ready when they need them/receiving cars later than expected
  - Being charged fees by the railroad when the cars are not filled within 24 hours (demurrage)
- Transit times
  - Inconsistent service to customers
  - Currently better than during oil boom, but still unpredictable
- Communication and coordination
  - Switching from CP to BNSF
  - Notifying shipper when cars will be received or picked up
  - Need for more transparency with the railroads
- Staffing and resources
  - Lack of daily switching service, which may be a trend toward less frequent switching
  - Issues with a local trainmaster
  - Staff or crew unavailability
- Selected Class I railroad infrastructure
  - Bridge rating in Bismarck requires trains to travel west to Mandan Yard to lighten the load for certain types of cars
- Tank car certification facilities
  - Need for one locally, as the nearby ones in other states are limited in what they can do and this increases the cost for empty movements

As a result of these issues, shippers have made investments in rail in order to address these perceived deficiencies in service from the Class I's. In general, shippers noted the extra effort required on their part in order to make up for these shortcomings through investments in infrastructure and having the staff on hand to perform train car movements. Specific investments noted include the following:

- Building yards to store rail cars and increase the ability to handle more products and shipments, thereby providing direct benefit to the shipper
  - Additional capacity on the main rail line
  - Ability to stockpile rail cars so they are ready when needed
- Grain elevators to store grain
- Ardoch Coal Handling Facility to ensure they have enough coal on hand at all times for their operations

These improvements allow the shippers to have more control and flexibility in how they run their operations. Partnerships with economic development organizations such as Minot Area Development Corporation and North Dakota Port Services have been beneficial in advancing the facilities needed by these businesses to efficiently ship their products.

4.8 NATIONWIDE FREIGHT RAIL ISSUES AFFECTING NORTH DAKOTA

4.8.1 Competition and Access

The implementation of the Staggers Rail Act in 1980 served to deregulate the railroad industry in the U.S. and has worked to the benefit of both shippers and railroads by reducing railroad industry costs and rates. However, despite this progress, some shippers remain frustrated with the implementation of the regulatory requirements in the act, and concerned that too much attention has been given to protecting the earnings of the railroads and too little attention given to ensuring that railroads supply responsive service at reasonable rates. Extensive research has been conducted on the topic of competition in the railroad industry and increases in railroad rates:

- The Surface Transportation Board (STB) 2008 study found that rate increases were driven by fluctuating fuel prices and other costs, and does not appear to reflect a greater exercise of railroad market power over shippers.[93]
- The 2014 TRB Committee for a Study of Competition in the Railroad Industry and Analysis of Proposals that Might Enhance Competition concludes that railroads subscribe to competitive markets practice, using differential pricing to recover their total costs. While different commodity groups and shippers experience different markups of rates over marginal costs, captive shippers are protected by the regulatory process.[94]
- More recently, TRB *Special Report 318: Modernizing Freight Rail Regulation* (2015) is a congressionally requested report that provides recommendations on how to update outdated regulatory programs through more appropriate, reliable, and usable procedures.[95] The study recommends new screening tools for disputed rates, arbitration hearings for resolution of rate cases, and that periodic studies of economic and competitive conditions in the industry are conducted. Use of data on market-based rates can be used to support these decisions.

The STB announced a proposed rule in July 2016 that would permit shippers without access to other transportation options to request that their freight be moved to a competing rail line if another Class I railroad is reasonably accessible.[96] If granted, the shipper, not the railroad, would pay for the railcar switch. Supporters of the proposed ruling believe this is a positive step in promoting competition via competitive switching.[97]

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[93] *https://www.stb.gov/stb/elibrary/CompetitionStudy.html*
[94] *http://onlinepubs.trb.org/onlinepubs/railtransreg/Greene011014.pdf*
[95] *http://onlinepubs.trb.org/onlinepubs/sr/sr318highlights.pdf*
[96] *https://www.freightrailreform.com/488-2/*
[97] *https://www.enotrans.org/article/guest-op-ed-stb-proposal-makes-right-switch-toward-rail-competition/*

Opposition to the proposed rulemaking cites the potential for railroad service deterioration due to decreases in revenue, reducing the railroad's ability to expand or improve capacity.[98] There is also concern that widespread forced switching will create inefficiencies in the overall rail network by creating unnecessary movements of rail cars in yards and slow the overall movements of goods.

4.8.2 Crew-Size Reductions

Another rail issue of national interest that affects North Dakota is the potential FRA regulation to require minimum crew sizes. Current FRA regulations do not stipulate locomotive crew size. The majority of Class I railroads in the US use at least a two-person crew, a certified locomotive engineer, and a certified conductor, with occasions where single-person jobs are conducted using remote control locomotives, typically off of the mainline tracks.

Following the Lac-Mégantic tank car explosion in Quebec in 2013, the U.S. House of Representatives introduced legislation in 2014 to mandate, in perpetuity, a minimum crew size of two. Two-person train crews would be required on crude oil trains, and minimum crew sizes standards would be established for most main line freight and passenger rail operations.[99]

Several states also subsequently introduced bills to require minimum train crew sizes. Critics of this state legislation cite that individual state laws mandating crew size will interfere with the ability of railroads and unions to fully bargain the best and safest crew size for each assignment. Further, this would also put industries and shippers in those states at a competitive disadvantage with respect to other states that do not have these restrictions. Interstate commerce would also be affected because of operational challenges associated with differing state crew-size requirements. Concerns on altering terms of collective bargaining agreements could also threaten the integrity of ratified local labor agreements and compromise future cooperation and negotiations on the issue.[100]

Supporters of the federal legislation argue that public perception rings strong regarding a minimum of two-person crews to better allow for safe operations. Supporters also contend that the implementation of PTC will require additional train crew interaction in order to achieve effective use—putting more demands on the crew because of the attention required for PTC.[101]

For the railroads, crew size is a collective bargaining matter.[102] The railroads contend that no data shows that a one-person crew would adversely affect railroad safety. Combined with the implementation of PTC, along with other technological advances and changes in operating practices, the railroads take the position that a one-person crew is safe where PTC is in use.

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[98] *https://www.aar.org/policy/economic-regulation*
[99] *https://www.fra.dot.gov/eLib/Details/L04999*
[100] *http://www.wsj.com/articles/regulators-industry-debate-how-many-it-takes-to-run-a-train-1468515766*
[101] *http://thehill.com/blogs/congress-blog/labor/273916-fra-rule-gives-us-chance-to-bar-most-one-person-crew-trains*
[102] *https://www.aar.org/policy/crew-size-regulations*

Chapter 5. Rail Service and Investment Program

This chapter describes North Dakota's Rail Service and Investment Program. It includes the state's (1) rail vision, goals, and objectives, (2) rail projects, and (3) available funding alternatives.

5.1 VISION, GOALS, AND OBJECTIVES

The vision, goals, and objectives reflect the input of a cross section of rail stakeholders that include the State Rail Plan (SRP) Executive Steering Committee, the SRP Executive Advisory Committee, North Dakota Department of Transportation (NDDOT) project staff, rail users, service providers, government agencies, and the interested public. Goals were developed first. They are the broad areas of focus for the future. The development of goals was followed by identification of measurable objectives to meet the goals. Finally, a vision was built from the goals and objectives.

5.1.1 North Dakota's Rail Vision

An efficient rail system that safely connects North Dakota's people and products with the world

5.1.2 North Dakota's Rail Transportation System Goals

- **SAFETY**: A rail transportation system that is safe and secure
- **ECONOMY**: A rail transportation system that supports strong economic growth with consideration of environmental, cultural, and social impacts
- **SERVICE**: A rail transportation system that provides reliable mobility for North Dakota's people and products
- **COMMUNICATION**: A rail transportation system that operates with coordination, collaboration, communication among all stakeholders and the public

5.1.3 North Dakota's Rail Transportation System Objectives

- **SAFETY**: A rail transportation system that is safe and secure
  - Advance railroad technology to protect people and property.
  - Promote efforts to reduce derailments by ensuring railroad lines are maintained according to regulatory standards.
  - Strengthen the capability to respond to incidents in areas adjacent to rail.
  - Support rail safety improvements at roadway crossings.
  - Support efforts to enhance resiliency of the rail system.
  - Collaborate with transportation providers to share knowledge on hazardous materials shipped by rail through the state.
- **ECONOMY**: A rail transportation system that supports strong economic growth with consideration of environmental, cultural, and social impacts
  - Support rail projects to increase freight capacity and capabilities for growth industries and regions within North Dakota.

- Investigate additional opportunities for rail service to benefit commerce.
- Assist in the development of rail's role in emerging industries that could rely on rail transportation.
- Continue to support rail freight access to smaller communities.
- Prepare for increases in domestic intermodal demand, encouraging partnerships between truck and rail.
- Consider the expansion of rail industrial access to improve connections to industrial or commercial sites.
- Promote opportunities to lower transportation costs for North Dakota shippers.
- Minimize the environmental, cultural, and social impacts of rail transportation paying particular attention to sensitive land uses such as, homes, hospitals, and schools.
- Encourage proactive smart growth land use planning for land adjacent to rail infrastructure that does not conflict with freight rail operations.

- **SERVICE**: A rail transportation system that provides reliable mobility for North Dakota's people and products
  - Support the elimination of capacity constraints and barriers to improve the efficiency of the rail system.
  - Initiate efforts to preserve the existing rail network.
  - Promote diversity of freight rail services to meet a wide-range of shipper needs.
  - Support projects that reduce transit times and make passenger and freight rail more competitive with other forms of transportation.
  - Support efforts to ensure passenger stations provide sufficient accessibility and connectivity for all population groups.
  - Work cooperatively with Amtrak and Amtrak communities to ensure that station facilities are in a state of good repair and have good lighting and parking for the safety of passengers
  - Encourage efforts to upgrade rail lines to industry weight standards permitting use of efficient, high capacity freight cars.
  - Evaluate any initiatives to establish freight rail intermodal terminals giving consideration to the needs of the marketplace.
  - Explore opportunities for diversified, stable, and sufficient future funding for rail in the state.
  - NDDOT and Amtrak communities should work together to establish or improve intermodal connectivity at stations.
- **COMMUNICATION**: A rail transportation system that operates with coordination, collaboration, communication among all stakeholders and the public
  - Establish partnerships to collaboratively advance rail projects, through a variety of resources.
  - Provide education and awareness of rail interactions with adjacent land uses.

- Continually evaluate state rail related institutional structures, programs, and policies for effectiveness.
- Seek opportunities to enhance communication among rail operators, government agencies, rail dependent entities, and the public.

5.2 STATEWIDE RAIL PERFORMANCE MEASURES

Performance measures can be used as benchmarks to determine needed improvements in the North Dakota rail network. The measures can point to needs of the rail network, gauge the success of improvement initiatives, or be used to prioritize projects or initiatives. Generally, performance measures are tied to goals and objectives developed through a planning process, and provide a means to evaluate whether these goals and objectives are being met.

One consideration in establishing performance measures relates to the frequency with which performance data are gathered and the difficulty in obtaining such data. Certain freight rail-related performance data are publicly available and can be accessed over the Internet. However, other data are proprietary and can be made available only with the agreement of private railroad companies. Some agencies request annual reports of small railroads operating in their states to obtain information about the condition of their systems. However, it may be more difficult to reach agreement with railroads in North Dakota. Given the state's sunshine laws, it is doubtful whether these reports could be kept confidential.

The North Dakota Public Service Commission (PSC) collects annual reports from all railroads in North Dakota, some elements of which could provide input to performance measures, but there are several issues:

- Some information necessary to determine if a railroad is in a state of good repair (FRA Track Class, ability to accommodate 286K railcars) is not available.
- Much of the information presented pertains to the railroads as a whole and not specifically to that portion within North Dakota. For some short line and regional railroads operating in North Dakota, this is not an issue, since their operations are entirely or mostly within North Dakota. However, the extent to which data are specifically applicable to North Dakota is inconsistent.
- Information presented does not apply to specific rail lines segments but instead represents a system average. However, most short line and regional railroads in North Dakota are sufficiently large that systemwide statistics do not capture variations across line segments. For example, it is useful to know the number of carloads per mile as an indication of a rail line's ability to be self-supporting, but one section of a short line may be busy while another is underutilized and at risk. The systemwide average would not capture this dynamic.

Table 5-1 presents several potential statewide performance measures that could measure progress toward North Dakota rail transportation system goals. Some of these could be developed using publicly available information sources, while others would require periodic questionnaires to railroads.

Table 5-2 displays a potential application of performance measures. In this case, a subset of the performance measures listed in Table 5-1 has been selected. Initial data have been collected to assess North Dakota rail freight network performance, and targets have been established. Where possible, the performance of the North Dakota rail network from 2011 to 2015 is evaluated against the performance targets.

Table 5-1. Potential Performance Measures for North Dakota

Goal	Measure	Source
A rail transportation system that is safe and secure	Number of crossing crashes, injuries, fatalities	Federal Railroad Administration (FRA) Rail Safety Database
	Number of fatalities at crossings	FRA Rail Safety Database
	Number of train crashes, including derailments	FRA Rail Safety Database
	Number of violations found on inspection reports	North Dakota Public Service Commission (PSC)
Rail transportation system that supports strong economic growth with consideration of environmental, cultural, social impacts	Completion of annually identified industrial access projects	Communication with rail carriers
	Rail carrier investment in North Dakota	Proprietary data to be obtained from rail carriers
	Carloads handled by rail for targeted commodities in North Dakota as defined by NDDOT	PSC Railroad Annual Reports
Rail transportation system that provides reliable mobility for North Dakota's people and products	Change in railroad route miles, miles abandoned by type (Class I, III), size of abandonments	PSC Railroad Annual Reports
	Mileage of rail line that is out of service or used solely for car storage but not abandoned	Proprietary data to be obtained from rail carriers
	Percentage or number of rail miles unable to accommodate 286K railcars	Proprietary data to be obtained from rail carriers
	Percentage of short line rail network with FRA Excepted or Class 1 track	Proprietary data to be obtained from rail carriers
	Average number of days late for grain car orders	Surface Transportation Board (STB) Ex Parte 724 Performance Measures

Note: All measures are statewide

Table 5-2. Potential Application of Performance Measures for North Dakota

Criteria	Measure	Source	Target	Status (2011 – 2015)
A rail transportation system that is safe and secure	Number of crossing crashes, injuries, fatalities	FRA Rail Safety Database	No more than 15 per year, which is the average between 2006 and 2010, before the big increases in rail traffic	Target met in 2015 only
	Number of fatalities at crossings	FRA Rail Safety Database	Two or less per year	Target met in 2011 only
	Number of train crashes, including derailments	FRA Rail Safety Database	Less than 22, which is the average between 2006 and 2010, before the big increases in rail traffic	Target met in 2012, 2013, and 2015
Rail transportation system that supports strong economic growth with consideration of environmental, cultural, social impacts	Completion of industrial access projects listed in the rail service investment program	Communication with rail carriers	Five of the 11 listed in plan	N/A
Rail transportation system that provides reliable mobility for North Dakota's people and products	Change in railroad route miles, miles abandoned by type (Class I, III), size of abandonments	PSC Railroad Annual Reports, filings with STB	No abandonments beyond minor spur tracks or industrial leads (less than five miles, not connecting networks)	Target not met. BNSF abandoned 7.5 miles of track in 2011 at Hunter, ND.
	Percentage or number of rail miles unable to accommodate 286K railcars	Proprietary data to be obtained from rail carriers	Increase of 30 miles to 286K capacity every five years	Data unavailable
	Percentage of short line rail network with FRA Excepted or Class 1 miles	Proprietary data to be obtained from rail carriers	Decline over 2016 level (5 percent Excepted, 41 percent Class 1)	NA
	Weekly average number of days late for grain car orders in ND	STB Ex Parte 724 Performance Measures	Maximum weekly average number of days late for grain car orders in ND does not exceed seven.	Target not met in 2016. Over four weeks in late 2016, CP average days late exceeded seven.

5.3 RAIL INVESTMENT PROJECTS OF INTEREST

The rail investment program comprises short line improvement programs, industrial access improvement programs, and local agency rail improvement programs.

5.3.1 Proposed Short Line Projects

Three of the state's short line railroads identified 21 projects, with only two targeted for federal funding. The projects are predominately short- and mid-term timeframes (1 to 4 years). The projects will be undertaken as the profits from operations are realized or funds from the federal short line tax credit become available (Table 5-3).

5.3.2 Proposed Industrial Access Projects

This SRP includes 11 industrial access projects that would provide connectivity to the rail network (Table 5-4). All but three of the projects are preliminary. They range from development of a new transload facility to industrial spurs to existing or planned industrial parks.

5.3.3 Proposed State and Local Agency Projects

North Dakota's State Transportation Improvement Program (STIP) does not include rail projects, but does include grade-crossing improvements over rail (Table 5-5). The 2017–2020 draft STIP includes eight projects to be funded through a combination of federal, state, and local funding.

The SRP process also involves coordination with regional and local entities and considers rail-related projects initiated by metropolitan planning organizations (MPOs) and municipal plans. These projects can be long-range transportation plans (LRTPs) or project-specific documents. This SRP includes 17 projects being initiated by local agencies in the state (Table 5-6).

5.3.4 Class I Railroad Projects

Neither of the Class I railroads planned any projects for North Dakota. Both BNSF and CP made significant investments in upgrading the North Dakota rail infrastructure between 2011 and 2015 to expand capacity in the state.

Table 5-3. Proposed Short Line Railroad Projects

	Project Name	Location	Project Description and Purpose	Relevant Goal(s)	Project Timeframe or Schedule	Project Cost	Anticipated Funding Source(s)	Federal Funding	Project Status	Comments
Dakota, Missouri Valley and Western Railroad										
1	Coal Creek rail upgrade	MP508.5–MP504.6	Upgrade to heavier rail for faster track speeds	Service	Near	$2.5M	Self funded	None	Active	
2	Coal Creek to Bismarck	MP509–MP 532	Upgrade ties and ballast	Service	Mid	$900K	Self funded	None	Starting spring 2017	Depends on the railroad tax credit
3	McKenzie to Wishek	MP404–MP336	Upgrade ties and ballast	Service	Mid	$900K	Self funded	None	Starting spring 2017	Depends on the railroad tax credit
4	System Wide	All subdivisions	Approx. 300 ballast cars/year	Economy, Service	Near-Long	TBD	Self funded	None	TBD	Many projects will depend on railroad tax credit
5	System Wide	All subdivisions	Small Rail projects	Service, Safety	Near-Long	TBD	Self funded	None	TBD	Many projects will depend on railroad tax credit

Table 5-3. Proposed Short Line Railroad Projects (continued)

	Project Name	Location	Project Description and Purpose	Relevant Goal(s)	Project Timeframe or Schedule	Project Cost	Anticipated Funding Source(s)	Federal Funding	Project Status	Comments
Northern Plains Railroad										
1	Mohall Sub Rehab	Lansford ND to Mohall ND -14.18 miles	Upgrading of mismatched light rail (#90, #85, #77, #68) to #115 conventional. To include 500 ties/mile and 500 tn ballast/mile	Economy, Service	Mid > 2-4 years	$7.1M	Internal	North Dakota DOT Rail Loan fund-applied 7/13	2019	Will increase efficiency to grain elevator in Mohall and a possible trans load facility in Mohall
2	Gilby Sub Rail Relay	Forest River ND to Honeyford ND- 12.7 miles	Upgrading of light rail (#85) to #115 conventional	Economy, Service	Mid > 2-4 years	$5.4M	Internal	No Federal funding is anticipated	2019	Will ensure safe and efficient operation to current grain facilities in Johnstown and Honeyford ND
3	Sarles Sub Tie Gang	Alsen Junction ND to Calvin ND- 16.2 miles	Tie replacement/ Surface rehab to include 500 ties/mile, 600 tn ballast/mile and 16.2 miles surfacing	Service, Safety	Mid > 2-4 years	$1.04M	Internal	No federal funding is anticipated	2020	Will enhance grade stability on Sarles sub serving a Shuttle Loading Facility in Calvin ND
4	Devils Lake Sub Tie Gang	Fordville ND to Devils Lake ND- 54.5 miles	Tie replacement/ Surface rehab to include 800 ties/mile, 600tn ballast/mile and 54.5 miles surfacing	Service, Safety	Mid > 2-4 years	$5 M	Internal	No Federal funding is anticipated	2020	To ensure serviceability of the sub division serving grain and aggregate markets in Devils Lake, with possible new business in Southam and Whitman

Table 5-3. Proposed Short Line Railroad Projects (continued)

	Project Name	Location	Project Description and Purpose	Relevant Goal(s)	Project Timeframe or Schedule	Project Cost	Anticipated Funding Source(s)	federal Funding	Project Status	Comments
Red River Valley & Western Railroad										
1	Rail Replacement (46.5 miles) including Sledding, Ties and Ballast - 6th Sub	RRVW 6th Sub MP 2-48.5	Rehabilitation and capacity expansion to handle 286k cars	Economy, Service	Short Term	$32.5M	Combination of internal, state, federal funds.	Uncertain	Limited sledding, tie, ballast work completed in 2016.	Limited Sledding, Tie, Ballast work to continue in 2017,
2	Bridge Reconstruction/ Rehabilitation - 6th Sub	RRVW 6th Sub MP 2-48.5	Replace / rebuild / upgrade 10 bridges to 286k car capacity as needed.	Economy, Service	Mid Term	$6.2M	Combination of internal, state, federal funds.	Uncertain	Project planning and cost estimates, engineering have begun.	Entire Project Contingent on Availability of Funds.
3	Rail Replacement (15 miles) including Tie and Ballast Replacement - Carrington-New Rockford	RRVW 7th Sub MP 42-58.5	Replace 72 lb rail to accommodate 286k loads.	Economy, Service	Mid Term	$11.5M	Combination of internal, state, federal funds.	Uncertain	Project anticipated within the next 3-10 years.	Heavy traffic to / from shippers south of New Rockford is prohibited due to light rail.
4	Rail Replacement (1.4 miles) including Tie and Ballast Replacement	Wahpeton, MP 215.2-216.6	Rail replacement for safety improvement	Safety, Economy, Service	Mid Term	$1.1M	Internal and state of ND	Not anticipated	Planned for 2017 or 2018	Rail is within 2-4 years of expected life.

Table 5-3. Proposed Short Line Railroad Projects (continued)

	Project Name	Location	Project Description and Purpose	Relevant Goal(s)	Project Timeframe or Schedule	Project Cost	Anticipated Funding Source(s)	federal Funding	Project Status	Comments
				Red River Valley & Western Railroad (continued)						
5	Independence Line Rail Replacement	RRVW 3rd Subdivision - MP 0.0 - 15.4 (Independence Line)	Replace older jointed rail with new welded heavier rail	Service, Safety	Mid Term	$11M	Internal and state of ND	Uncertain	Planning stage only	Jointed Rail is Worn and Various Sizes.
6	Rail Weld-in-Place 2nd Sub - 33.3 Miles	RRVW 2nd Sub - MP 1.4 - MP 34.7	Weld existing rail to eliminate joints	Service, Safety	Mid Term	$6.6M	Internal and state of ND	Uncertain	Planning stage only	Joint maintenance is increasing, rail is good candidate for welding.
7	Replace turnouts	Various Locations	Safer operations and increased speed	Safety, Service	Mid Term	$1.5M	Internal and state of ND	Not anticipated	Planned for 2017 or 2018	Turnouts are reaching end of life.
8	Interchange Track Addition	Casselton ND	Increased yard crew safety, increase efficiency	Safety, Service	Mid Term	$2.5M	Internal and state of ND	Not anticipated	Wish List	Increase capacity at interchange
9	Storage track construction	Carrington ND	Reduce network delays from yard congestion	Service, Economy	Mid Term	$2.6M	Internal and state of ND	Not anticipated	Wish List	Prospective track to improve switching and staging of cars.

Table 5-3. Proposed Short Line Railroad Projects (continued)

	Project Name	Location	Project Description and Purpose	Relevant Goal(s)	Project Timeframe or Schedule	Project Cost	Anticipated Funding Source(s)	federal Funding	Project Status	Comments
Red River Valley & Western Railroad (continued)										
10	Shop upgrade	Carrington ND	Business expansion, economic developmen t	Economy, Service	Mid Term	$3 M	Internal and state of ND	Not anticipated	Wish List	Possible repair facility.
11	Transload / multimodal facility construction	Wahpeton ND	Business expansion, Economic developmen t	Economy, Service	Mid Term	$2 M	Internal and state of ND	Not anticipated	Planned for 2017 or 2018	Possible transload facility.
12	Positive Train Control Equipment	System	Compliance with federal Regulations	Safety	Mid Term (2018)	$2 M	Internal, state, federal	Uncertain	Planning for 2017 Underway	Federal mandate - expect to equip 4-8 locomotives in 2017-18.

Table 5-4. Industrial Access Projects

	Project Name/Title	Location	Railroad	Project Description and Purpose	Relevant Goal(s)	Project Timeframe or Schedule	Project Cost	Anticipated Funding Source(s)	Federal Funding
1	Devils Lake Industrial Park Expansion Rail Spur	Twp 154 Rge 64 Devils Lake	NP or BNSF	City has 130 acres of land under contract for deed to new industrial park	Economy, Service	TBD	$5.5M total; incl $1M spur cost	CBDG; EDA grant; City bond	Planned EDA grant
2	North Dakota Mill Unit Train Track	Grand Forks	BNSF	New track to hold 135 car train sets	Economy, Service	3-7 years	$7.5–$8.5M	Private	No
3	Grand Forks Transload	TBD	BNSF	Proposed transload facility	Economy, Service	TBD	$2.1M–$3.4M	TBD	TBD
4	Berea Industrial Site	Berea Industrial Site - 3 miles west of Valley City	BNSF	Rail infrastructure to support site development: mainline switches, rail spurs, passing tracks	Economy, Service	TBD	TBD	TBD	No
5	Northwest Industrial Park	Northwest Industrial Park - Valley City	BNSF	Rail spur needs to be extended west and mainline switches installed	Economy, Service	TBD	TBD	TBD	No
6	I-94 Exit 288-T	Off I-94 Exit 288-T extend across HWY 22	BNSF	Rail infrastructure to support site development: mainline switches, rail spurs, passing tracks	Service, Economy	TBD	TBD	TBD	No
7	Northwest of Berea	3 miles west of Valley City on the north side Co Hwy 22	BNSF	Rail infrastructure to support site development: mainline switches, rail spurs, passing tracks	Service, Economy	TBD	TBD	TBD	No

Table 5-4. Industrial Access Projects (continued)

	Project Name/Title	Location	Railroad	Project Description and Purpose	Relevant Goal(s)	Project Timeframe or Schedule	Project Cost	Anticipated Funding Source(s)	Federal Funding
8	Rogers/ Sanborn Linkage	Rogers/Sanborn	BNSF/ CP/ Short Line	Reinstall tracks/switches etc. to connect mainlines of BN and CP	Service, Economy	TBD	TBD	TBD	No
9	Peak 3	Peak - I-94 Exit 296; 3 sites west and east of Hwy 27	BNSF	Rail infrastructure to support site development: mainline switches, rail spurs, passing tracks	Service, Economy	TBD	TBD	TBD	No
10	Northwest Industrial Park	Northwest Industrial Park - Valley City	BNSF	Rail infrastructure to support site development: mainline switches, rail spurs, passing tracks	Service, Economy	TBD	TBD	TBD	No
11	Mandan Industrial Park	Old Red Trail east of 25, Mandan	BNSF	Proposed rail-served industrial park	Economy, Service	TBD	TBD	TBD	TBD

Table 5-5. North Dakota DOT 2017–2020 Draft STIP Rail-Related Projects

FY	Project Number	Location	Work Type	Total Cost	Fed Funding	State Funding	Local Funding	Other Funding
2017	9013 RSS	Individual Projects – Statewide	Crossing Improvements	$2,612	$2,350	$131	$131	$0
2017	9014 RPS	Various Locations – Statewide	Protection Devices	$2,612	$2,350	$131	$131	$0
2018–2020	9105 RSS	Individual Projects – Statewide	Crossing Improvements	$2,612	$2,350	$131	$131	$0
2018-2020	9106 RPS	Various Locations – Statewide	Protection Devices	$2,612	$2,350	$131	$131	$0
2018-2020	9203 RPS	Individual Projects – Statewide	Crossing Improvements	$2,612	$2,350	$131	$131	$0
2018-2020	9215 RPS	Various Locations– Statewide	Protection Devices	$2,612	$2,350	$131	$131	$0
	9308 RPS	Various Locations– Statewide	Protection Devices	$2,612	$2,350	$131	$131	$0
	9314	Individual Projects – Statewide	Crossing Improvements	$2,612	$2,350	$131	$131	$0

Table 5-6. Local Agency Rail Investment Plan

	Project	Location	Relevant Goal(s)	Plan	Cost
1	Railroad Quiet Zones - downtown	Dickinson	Communication, Safety	Dickinson 2035	NA
2	New grade-separated rail crossing at State Avenue	Dickinson	Safety, Service, Communication	Dickinson 2035	$32.4M
3	New grade-separated rail crossing at 10th Avenue SE	Dickinson	Safety, Service, Communication	Dickinson 2035	NA
4	Improvements to Highway 22 railroad underpass	Dickinson	Safety, Communication	Dickinson 2035	$40.0M
5	8th Street/11th Street Railroad Grade-Separated Crossing	Fargo	Safety, Service, Communication	Metro 2040	$40.0M
6	21st Street Railroad Grade-Separated Crossing	Fargo	Safety, Service, Communication	Metro 2040	$30.0M
7	2nd Ave NE grade separation from railroad, creating continuous N-S corridor	Grand Forks	Safety, Service, Communication	2040 Update to the Long Range Transportation Plan	$14.9M
8	42nd St grade-separated rail crossing	Grand Forks	Safety, Service, Communication	2040 Update to the Long Range Transportation Plan	$21.4M
9	Quiet Zone at at-grade crossing	Grand Forks	Communication, Safety	Quiet Zone Assessment	$517K
10	NW 3rd Street, install gates and CWT	Grand Forks	Safety, Communication	Quiet Zone Assessment	$236K
11	Central Avenue NW, install gates and CWT	Grand Forks	Safety, Communication	Quiet Zone Assessment	$236K
12	2nd Avenue NE, install CWT	Grand Forks	Safety, Communication	Quiet Zone Assessment	$290K
13	Washington Street Underpass Upgrade	Grand Forks	Safety, Communication	NA	$11.9M
14	SW Bypass Alternative C - has implications for railroad ROW at trestle bridge at County Road 12	Minot	Safety, Service	2035 Transportation Plan	TBD
15	General concerns: … railroad crossing opportunities are limited on both the east and west sides of town”	Minot	Safety, Service	2035 Transportation Plan	TBD
16	Grade separation project at 66th Street over BNSF	Bismarck	Safety, Service, Communication	Lincoln to Bismarck Roadway Connection, Bismarck-Mandan Metropolitan Planning Organization	TBD
17	Northeast Truck Reliever Route (TRR) Potential Grade Separation over BNSF	Williston	Safety, Service, Communication	NDDOT future projects, Williston NE TRR Handout	TBD

Table 5-7. Completed Class I Railroad Projects: BNSF Railway

Project	Division	Subdivision	Project Category	Sub Category
	2011			
Construction of 2,900' pipe to reduce the level of Sanborn Lake between 5-7'	Twin Cities	Jamestown	Construction	Division Request
Gavin Yard, Minot, ND. Built new car shop.	Twin Cities	KO	Construction	Capacity Improvement
	2012			
Extend tracks 6201, 6202, 6203 in Old Yard to stage unit trains.	Twin Cities	KO	Construction	Capacity Improvement
Williston, ND. Williston Yard "infill tracks"- construct two new yard tracks between existing track	Montana	Glasgow	Construction	Capacity Improvement
Berthold, ND. Extend existing Glasgow Sub siding westward by 4,000.	Montana	Glasgow	Construction	IBU - Marketing Operations Support
Near Tagus, ND. Add new 10,000' capacity siding on the Glasgow sub from MP 30.0 - 32.2	Montana	Glasgow	Construction	Capacity Improvement
	2013			
Glasgow DT - Segment 3	Montana	Glasgow	Construction	Capacity Improvement
Glasgow DT - Segment 2	Montana	Glasgow	Construction	Capacity Improvement
Glasgow DT - Segment 1	Montana	Glasgow	Construction	Capacity Improvement
Gavin Yard Expansion - Phase 2	Montana	KO	Construction	Capacity Improvement
Northgate, ND. Construct a new track from the west end of Northgate Yard across the Canadian Border	Montana	Niobe	Construction	IBU - Marketing Operations Support
Gavin Yard Expansion, Minot, ND - Phase 5	Montana	KO	Construction	Capacity Improvement
Install CTC at Towner siding.	Twin Cities	Devils Lake	Construction	Capacity Improvement
East of Tioga, ND. Add new 10,000' siding to be named "Iroquois"	Montana	Glasgow	Construction	Capacity Improvement
Manitou, ND. Add 13,000' passing siding (10,000' clear cap) MP 66.0 to MP 68.6.	Montana	Glasgow	Construction	Capacity Improvement
Extend Glen Ullin siding east	Montana	Dickinson	Construction	Capacity Improvement
Devils Lake, ND. Install #20 power switches and CTC at Devils Lake siding.	Twin Cities	Devils Lake	Construction	Capacity Improvement
CPR 1177 east of Williston, ND. Install double crossover between main lines on the Glasgow Sub at MP	Montana	Glasgow	Construction	Capacity Improvement
Mandan Yard Expansion	Twin Cities	Dickinson	Construction	Capacity Improvement
West Lead Extension in Williston Yard, Williston, ND. Extend west end switching lead	Montana	Glasgow	Construction	Capacity Improvement

Table 5-7. Completed Class I Railroad Projects: BNSF Railway (continued)

Project	Division	Subdivision	Project Category	Sub Category
2013 (continued)				
Emerado, ND. Upgrade Emerado siding on the Devils Lake sub. Install power switches	Twin Cities	Devils Lake	Construction	Capacity Improvement
Palermo, ND. Add new passing siding near MP 46 on the Glasgow sub.	Montana	Glasgow	Construction	Capacity Improvement
Hillsboro, ND. Install CTC on Hillsboro siding and extend east for 10,000 clear capacity.	Twin Cities	Hillsboro	Construction	Capacity Improvement
Gavin Yard Expansion - Phase 1, Minot, ND	Montana	KO	Construction	Capacity Improvement
2014				
KO Sub Access road Improvements.	Twin Cities	KO	Construction	Division Request
Gavin Yard - Westward Lead, M1 LH XO	Montana	KO	Construction	Capacity Improvement
Glasgow DT - Phase 2 (seg 4, 5, and 6)	Montana	Glasgow	Construction	Capacity Improvement
New Siding known as “Urbana” (near Spiritwood, MP 85.52-87.32)	Twin Cities	Jamestown	Construction	Capacity Improvement
Lyons - New Salem (Judson siding)	Montana	Dickinson	Construction	Capacity Improvement
Hebron siding extension	Montana	Dickinson	Construction	Capacity Improvement
Sanger Siding	Twin Cities	Zap Line	Construction	Capacity Improvement
2015				
Stabilization KO - MP 69	Twin Cities	KO	Construction	Stabilization
Sanborn Upgrades	Twin Cities	Jamestown	Construction	Capacity Improvement
Devils Lake - Hillsboro connection	Twin Cities	Devils Lake	Construction	Capacity Improvement

Table 5-8. Completed Class I Railroad Projects: Canadian Pacific

Project		Location	Cost	Project Category
2011				
Flaxton Siding Extension	Extend Siding	Flaxton, ND	$5.6M	Network Capacity
Harvey Yard Extension	Extend Two Yard Tracks	Harvey, ND	$6.8M	Network Capacity
Newtown Runaround Track	Construct New Siding	New Town, ND	$2.3M	Network Capacity
Max Siding & Yard Tracks Phase 1	Extend Yard Tracks	Max, ND	$2.4M	Network Capacity
Enderlin Siding	Extend Yard/ Construct Siding Year 1 of 2	Enderlin, ND	$0.7M	Network Capacity
Newtown Subdivision Upgrade 2011-2014	Upgrade Entire Newtown Sub: Rail/Ties/Ballast	Drake - New Town, ND	$25.4M (does not include spending covered in the other listed projects)	Network Capacity/Increase speed
2012				
Enderlin Siding:	Extend Yard Tracks / Construct Siding Year 2 of 2	Enderlin, ND	$7.2M	Network Capacity
Harvey East Yard	Extend Switching Lead to keep yard switching off main track	Harvey, ND	$1.3M	Network Capacity
Max Siding & Yard Phase 2	Two Yard Track Extensions to 7000'+, Drainage Improvements	Max, ND	$2.1M	Network Capacity
New Town Hotbox Detectors	Safety, Improved Operations	New Town, ND	$ 0.4M	Safety, Improved Operations
New Town Radios	Improved Operations	New Town, ND	$0.2M	Improved Communications/ Operations
Drake Siding	New Siding /Upgrade New Town Main/ Reconfigure Yard Tracks	Drake, ND	$7.3M	Network Capacity
Replace Red River Bridge Spans NPR	Replace Bridge Spans	ND/MN Border Red River	$2.5M	Maintain Service/Upgrade Capacity
Replace Bridges MP 554.8 & 557.3 Western Subdivision DMVW	Replace Two Bridges	North Dakota Leased Lines	$1.2M	Increased line capacity to 286K

Table 5-8. Completed Class I Railroad Projects: Canadian Pacific (continued)

Project		Location	Cost	Project Category
2013				
Enderlin Siding & PGA Yard Improvements	Extend & Improve Track Alignment	Enderlin, ND	$1.3M	Network Capacity
Drake Siding & Yard Improvements	Extend & Improve Track	Drake, ND	$0.6M	Network Capacity
Red River Bridge Span Replacement (2 Year)	Replace Bridge Span NPR	ND/MN Border	$1.6M	Maintain Service/Upgrade Capacity
NPR Grade Stabilization	Stabilize Grade	North Dakota Leased Lines	$0.7M	Stable Track/Maintain Service
2014				
Minot - Extension West End Switching/ New Siding	Extend Track & Build New Siding	Minot, ND	$3.6M	Network Capacity
CTC - Glenwood to Portal Year 1	Signals & Communications CTC	Glenwood, MN to Portal ND	$14.3M	Network Capacity
Dry Lake - New Siding Year 1 of 2	New Siding	Dry Lake, ND	$2.2M	Network Capacity
Wyndmere - Extend Siding Year 1 of 2	Extend Siding	Wyndmere, ND	$1.0M	Network Capacity
2015				
Dry Lake Siding Year 2 of 2	New Siding	Dry Lake, ND	$2.3M	Network Capacity
Valley City Siding Extension	Extend Siding	Valley City, ND	$2.5M	Network Capacity
Wyndmere Siding Extension Year 2 of 2	Extend Siding	Wyndmere, ND	$1.4M	Network Capacity
Prairie Junction New Siding - Grading	Grading for New Siding	New Prairie, ND	$1.4M	Network Capacity
Portal Yard Lead Extension - Grading	Grading for Extending Siding/Yard Track	Portal, ND	$1.0M	Network Capacity
Portal Sub Improvements (2 Year)	Yard Air Installation	Portal, Flaxton, Drake & Harvey, North Dakota	$ 1.0M	Network Capacity/Improved Operations
Carrington Siding Extension	Extend Siding	Carrington, ND	$1.9M	Network Capacity
Mud Lake Siding Extension	Extend Siding	Wimbeldon, ND	$1.7M	Network Capacity
Emrick Siding Extension	Extend Siding	Emrick, ND	$1.2M	Network Capacity
Eagle Siding Extension	Extend Siding	Cuba, ND	$2.4M	Network Capacity
Oswald Siding Extension	Extend Siding	Oswald, ND	$1.4M	Network Capacity

Table 5-8. Completed Class I Railroad Projects: Canadian Pacific (continued)

Project		Location	Cost	Project Category
2015 (continued)				
Max Yard Track Extension	Extend Two Yard Tracks to 7,000', Drainage Improvements	Max, ND	$4.0M	Network Capacity
Drake Yard Reconfiguration	Improve Track/Expand Yard	Drake, ND	$2.3M	Network Capacity
Flaxton Crossover	Install Dual Crossovers	Flaxton, ND	$0.8M	Network Capacity
CTC - Glenwood to Portal Year 2	Signals & Communications CTC	Glenwood, MN to Portal ND	$19.9M	Network Capacity

5.4 STATE RAIL PLAN IMPACTS

The completion of these projects will have several positive impacts:

- **Rail Capacity:** Capacity will be increased by both permitting the operation of larger freight cars and allowing higher train speeds.
- **Transportation System Capacity**: Most of the projects could divert freight or passengers to rail, which could increase available capacity of other modes, particularly highway.
- **Transportation System Congestion Relief**: Because the projects will remove freight from highways, available highway capacity will increase.
- **Transportation System Safety**: Grade-separation projects will eliminate vehicle-train crashes as well as fatalities from pedestrians being struck by trains while crossing tracks. Grade separations also eliminate blocked crossings that interfere with emergency vehicles.
- **Environmental**: Rail transportation is a relatively fuel and environmentally efficient mode of transportation, so diverting to freight will reduce emissions and fuel consumption.
- **Economic Efficiency**: The proposed projects will reduce rail operating costs to the potential benefit of rail shippers.
- **Employment**: Rail can attract and/or retain existing employers and thereby boost employment within North Dakota. Many of the initiatives and projects of this SRP will boost job creation.

5.5 RAIL PROJECT FUNDING

Private-sector companies and freight railroads are self-funding; however, several sources can supplement internal funds.

5.5.1 Federal Transportation Funding Programs Relevant to Rail

Transportation Investment Generating Economic Recovery

The first round of the Transportation Investment Generating Economic Recovery (TIGER) grant program was included in the American Recovery and Reinvestment Act of 2009 (ARRA). Since then, there have been seven additional rounds of TIGER grant funding. These grants were awarded on a competitive basis for surface transportation projects that the US Department of Transportation (USDOT) believed would have a significant impact on the nation, a metropolitan area, or a region. For the first time in 2014, a portion of the funds could be used for planning and studies, although most of the available funding was restricted to publicly accessible transportation infrastructure. Infrastructure projects must have independent utility (i.e., they must be ready for their intended use upon completion of project construction).

Fiscal Year (FY) 2016 funds available through the TIGER program were $500M, while collectively $5.1 billion in funding was made available between FY 2009 and FY 2016. These grants are extremely competitive, so much so that applications for projects totaling $9.3 billion were received for the $500 M of funding available in FY 2016. North Dakota has received four TIGER grants including two focusing on rail:

- In 2010, a $14.14 million grant was awarded in 2010 to construct a grade-separated pass over BNSF mainline and service tracks in Minot.
- In 2011, a $10 million grant was received for Devils Lake Rail Improvements to raise a 15.4-mile section of the BNSF mainline track between Devils Lake and Churchs Ferry to prevent flooding.

Section 130 Highway/Rail Grade Crossing Program

This program provides federal support for projects that improve safety at public highway/rail grade crossings. States may use funds for installing or upgrading warning devices, eliminating grade crossings through grade separation, or consolidating or closing grade crossings. The federal share of these funds is 90 percent, while the local share is 10 percent. North Dakota has received, on average, $3.3 million in Section 130 funds for each of the last four federal fiscal years.

Moving Ahead for Progress in the 21st Century Act Programs with Selected Rail Application

Moving Ahead for Progress in the 21st Century Act (MAP-21) was signed into law in 2012 and continues to serve as the nation's long-term transportation authorization to fund surface transportation programs. Extensions to the act were signed in 2014 and 2015. Summaries of rail-related provisions follow.

Congestion Mitigation and Air Quality (CMAQ) Improvement Program

Funding for this program is available for areas that do not meet the National Ambient Air Quality Standards (NAAQS) (nonattainment areas) as well as former nonattainment areas that are now in compliance (maintenance areas). As of February 2017, there are no nonattainment areas in North Dakota, but the state does receive CMAQ funding. The funding amount for 2017 is $10.6 million. The program funds transportation projects and programs that improve air quality by reducing transportation-related emissions of criteria pollutants under the Clean Air Act's NAAQS. These include ozone, carbon monoxide, and particulate matter. Examples of CMAQ -funded rail projects include diesel-engine retrofits, idle-reduction projects in rail yards, and projects that help substitute rail for truck transportation such as intermodal terminals or rail sidings. New language from MAP-21 emphasizes selected project types, including electric and natural gas vehicle infrastructure and diesel retrofits. State departments of transportation and MPOs select and approve projects for funding. The federal share is 80 percent with a non-federal match of 20 percent.

Surface Transportation Program

The Surface Transportation Program is a general grant program available for improving federal-aid highway, bridge, or transit capital projects. Eligible rail improvements include lengthening or increasing the vertical clearance of bridges, eliminating crossings, and improving intermodal connectors. The federal share is 80 percent with a non-federal match of 20 percent.

Transportation Alternatives Program (TAP)

The TAP provides funding for specific activities related to service transportation, of which several are relevant to rail. These include rail corridor preservation and preservation of historic rail buildings.. For most TAP projects, the federal share is 80 percent, and the non-federal share is 20 percent.

FASTLANE

The FAST Act contains several provisions focusing on the efficient movement of goods, including creating two forms of dedicated freight funding for the first time:

- $6.3 billion in National Highway Freight Program "Formula" funds, up to 10 percent or $630 million of which may be used for rail or port projects.
- $4.5 billion in Nationally Significant Freight and Highway Projects (NSFHP) competitive grant funds for FY2016 through FY2020.
  - $500 million purposed for intermodal projects including rail and port related projects.
  - Highway freight projects also qualify for NSFHP grants, but only the rail and port portion is committed to freight.
  - Projects must be able to commence within 18 months. Minimum grants are usually $25 million, but $5 million grants are allowed.
  - Highway Trust Fund resources can be diverted to freight rail projects up to a maximum of $500 million over the next 5 years.

Applications for FY2017 were due in December 2016.

5.5.2 Other Federal Funding Programs Relevant to Rail

U.S. Department of Commerce Economic Development Administration

The Economic Development Assistance Programs under the Economic Development Administration (EDA) provides grants for projects in economically distressed areas. The program can provide from 50 to 80 percent of the total project cost, depending upon the level of economic distress in the area. The Public Works program aims to help areas improve physical infrastructure to attract new industry, encourage business expansion, diversify local economies, and generate or retain long-term, private-sector jobs, and investment. The Economic Adjustment program helps communities that are experiencing economic disruptions such as natural disasters, military base closures, trade-related disruptions, and major private-sector employer restructurings. Examples of rail-related EDA grants include the reconstruction of damaged rail infrastructure, rail spur, and access projects. According to the American Short Line and Regional Railroad Association, more than $55 million in EDA grants went to rail projects with an average per project grant amount of $1.9 million since 2008. Many other EDA grants were not specifically for rail-related projects, but had rail-related components. Many areas of North Dakota would qualify for these grants, particularly rural areas within the state.

U.S. Environmental Protection Agency, Diesel Emission Reduction Act National Funding Assistance Program

Funding is available for projects that lower locomotive emissions through the Diesel Emission Reduction Act National Funding Assistance program. These include retrofit technologies, idle-reduction technologies, aerodynamic technologies, and early replacement or repower. The bill authorized up to $100 million annually for FY 2012 through FY 2016. The extent of federal match depends upon the type of project. There is no requirement that the project be in a nonattainment area for NAAQS, but

applications are scored higher if the project is in a high-priority area. High-priority areas are those that have the highest emissions from diesel engines.

5.5.3 Federal Financing Programs Relevant to Rail

5.5.4 Railroad Rehabilitation and Improvement Financing Program

The Railroad Rehabilitation and Improvement Financing program provides direct federal loans and loan guarantees to finance the development of railroad infrastructure. Eligible applicants include railroads, state and local governments, government-sponsored authorities and corporations, joint ventures, and shippers served by one railroad who wish to build a connection to a competing carrier. Eligible projects include improvements to, rehabilitation, or acquisition of freight and passenger railroad equipment, track and structures, new multimodal facilities, and refinancing of associated debt. Direct loans can provide up to 100 percent of project cost with repayment periods up to 35 years. Interest rates are equal to the U.S. Treasury rate, but fees must be paid to defray the cost to the government of making the loan. These fees include a Credit Risk Premium, which depends upon the level of risk of the loan, and an investigative fee if outside professional services are necessary to issue the loan. Under this program, FRA is authorized to provide direct loans and loan guarantees up to $35.0 billion to finance development of railroad infrastructure. Up to $7.0 billion is reserved for projects benefiting freight railroads other than Class Is.

Transportation Infrastructure Finance and Innovation Act

The Transportation Infrastructure Finance and Innovation Act (TIFIA) program provides credit assistance for large projects. Eligible applicants include state and local governments, transit agencies, railroads, special authorities, special districts, and private entities. TIFIA provides three types of financial assistance.

- **Secured direct loans.** These loans have a maximum term of 35 years after project completion. Repayment may begin up to five years after project completion.
- **Loan guarantees.** The federal government guarantees a borrower's repayments to a non-federal lender. Loan repayments to the lender must begin no later than five years after completion of the project.
- **Standby line of credit.** A federal loan serves as a contingent source of cash to supplement project revenues. Standby financing is available during the first ten years after project completion.

Federal credit assistance cannot exceed 33 percent of project costs. Interest rates are equal to treasury rates and are fixed. All projects eligible for Surface Transportation Program funds are eligible for TIFIA, as well as intercity passenger rail facilities and vehicles, publicly owned freight rail facilities, intermodal freight transfer facilities, access to intermodal freight transfer facilities, and projects located within the boundary of a port terminal under certain conditions. Projects must be included in the state's Transportation Improvement Program. TIFIA loans have helped to establish a commuter rail service, in addition to several passenger intermodal projects, of which commuter and intercity rail were components.

Private Activity Bonds

A private activity bond is issued by or on behalf of a local or state government to finance the project of a private user. These bonds enjoy the same tax-exempt status as other state and local bonds. Up to $15 billion can be used for transportation infrastructure, and freight transfer facilities, such as rail-truck facilities, qualify among the types of private activities for which these bonds may be issued.

State Infrastructure Banks

State Infrastructure Banks (SIB) are revolving infrastructure investment funds for surface transportation that are established and administered by states. The federal government originally authorized SIBs in 1995 and then expanded SIBs in 1997. Previous federal-aid highway bills have allowed the use of federal funds to capitalize an SIB. MAP-21 has not allowed new 2013–2014 funding to be used to capitalize SIBs.

Public-Private Partnerships

There are several forms of public-private partnerships (P3). The FHWA defines public-private partnerships as the following:

> "contractual agreements formed between a public agency and a private sector entity that allow for greater private sector participation in the delivery and financing of transportation projects."

The Association of American Railroads (AAR) defines P3s differently, as the following:

> "arrangements under which private freight railroads and government entities both contribute resources to a project—offer a mutually beneficial way to solve critical transportation problems."

Each definition implies participation by both the private and public sector in a transportation infrastructure project. The FHWA version focuses on increasing private-sector participation in roadway and other projects, which traditionally have been financed by the public sector. The AAR focuses more on public financing of freight rail projects, which have traditionally been financed by the private sector. Generally, the public sector participates in P3s where the public benefits exceed the public investment, while the private sector participates when a positive return is expected on private investment. P3s are also feasible for passenger rail projects, such as situations where developers or other local businesses help to pay for construction of or improvements to passenger rail stations.

5.5.5 North Dakota State Rail Loan Program

NDDOT's low-interest, revolving loan program supports infrastructure improvements to the state's rail system. Funding for NDDOT's rail loan programs is limited and is intended to be used primarily to upgrade and enhance rail infrastructure that maintains or improves rail service. Funds may also be used to support rail-related projects that promote economic development. With maximum loan amounts of $5 million or less, NDDOT categorizes the project proposals in descending order of priority as follows:

- **System Critical (railroads and rail authorities only eligible)** – These projects are critical to a railroad's existence because they maintain or expand service, improve system connectivity, and/or enhance

financial stability. These projects may include rail relay, major structure rehabilitation or construction, new rail connections, track realignment, etc. Loan terms are zero percent interest with a rail cost share maximum of 80% and repayment in 15 years.

- **Infrastructure Improvement (railroads, units of government, and rail authorities only eligible)** – Projects may include structure repairs, tie and ballast replacement, switches, short segments of rail replacement, etc. Loan terms are half of prime; however, never more than 4.5 percent interest with rail cost share maximum of 80 percent and repayment in 15 years.
- **Economic Development (all applicants eligible)** – Projects may include new sidings, siding extensions or upgrades, switches, loop and ladder tracks, access roads, active warning devices for new facility crossings, equipment—locomotives, maintenance of way equipment—and roadway safety improvements adjacent to existing rail infrastructure. These projects may improve safety and result in decreased trucking impacts on state and local roadway infrastructure. Loan terms are half of prime (never more than 4.5 percent) interest with rail cost share maximum of 70 percent and repayment in 10 years.

5.6 IMPLEMENTATION PLAN

Table 5-9 describes the implementation of the various initiatives identified in earlier sections of the plan:

Table 5-9. North Dakota State Rail Plan Initiative Implementation Matrix

	Initiative	Actions	Participants
		Ongoing Initiatives	
1	Coordination with railroads: leverage NDPSC information to be more proactive in identifying rail issues	▶ Review NDPSC railroad information ▶ Periodically review the railroad annual report content	▶ North Dakota Department of Transportation (NDDOT) ▶ North Dakota Public Service Commission (NDPSC)
2	Review annual report content to ensure information is adequate for regulatory purposes	▶ To be conducted in conjunction with #1	▶ North Dakota Public Service Commission ▶ North Dakota Department of Transportation
3	Coordination with Metropolitan Planning Organizations/local agencies: invite MPOs/local agencies to the NDPSC annual meetings with railroads	▶ Include MPOs, local agencies as participants	▶ North Dakota Department of Transportation ▶ North Dakota Public Service Commission ▶ North Dakota MPOs
4	Coordination with other states and Canada: actively seek out opportunities to cooperate with states – GNCC participation	▶ Continue NDDOT role in GNCC	▶ North Dakota Department of Transportation ▶ Canadian provinces
5	Rail loan program: examine the need to improve the program; evaluate realized benefits to recipient	▶ Consider including Class I railroads in the loan program ▶ Request that recipients provide traffic volume information over life of loan	▶ North Dakota Department of Transportation

Table 5-9. North Dakota State Rail Plan Initiative Implementation Matrix

	Initiative	Actions	Participants
Ongoing Initiatives (continued)			
6	Local government-railroad coordination: encourage railroads to provide track maintenance program information to towns and counties when the programs are developed	▶ NDPSC facilitate communications between railroads and local agencies	▶ North Dakota Public Service Commission
7	Local government-railroad coordination: request railroads to contact local officials in advance of performing track maintenance	▶ NDPSC facilitate communications between railroads and local agencies	▶ North Dakota Public Service Commission
8	State inspection program: continue communicating to shippers the rationale NDPSC uses to select locations to inspect through the NDPSC's annual meeting with shippers and the railroads and other venues.	▶ NDPSC communications	▶ North Dakota Public Service Commission
9	Local hazardous material spill mitigation plans: include railroad risks	▶ Initiate statewide program to address railroad risk in local mitigation plans	▶ North Dakota Department of Emergency Services (NDDES) ▶ Local authorities
10	Government and railroad industry leaders working relationships: encourage local agencies coordination with rail carriers in advance of incidents	▶ Facilitate the development of relationships between local authorities and railroads	▶ North Dakota Department of Emergency Services ▶ Local authorities
11	Equipment and resource availability information: develop a centralized source of federal, state, and local emergency response equipment and resources	▶ Develop specifications for database ▶ Develop database	▶ North Dakota Department of Emergency Services

Table 5-9. North Dakota State Rail Plan Initiative Implementation Matrix

	Initiative	Actions	Participants
Near Term			
12	Coordination within state government: continue to ensure that ND Department of Commerce leverages NDDOT rail related economic development capabilities	▶ Establish cross-agency working group on rail-related economic development	▶ North Dakota Department of Transportation ▶ North Dakota Commerce Department
13	Coordination with railroads: leverage NDPSC information to be more proactive in identifying rail issues	▶ Establish objectives of NDDOT-railroad relationship ▶ Review NDPSC railroad information in context of objective	▶ North Dakota Department of Transportation ▶ North Dakota Public Service Commission
14	Coordination with other states and Canada: actively seek out opportunities to cooperate with states – GNCC participation	▶ Encourage Canadian membership	▶ North Dakota Department of Transportation ▶ Canadian provinces
15	Rail planning: monitor changes in rail demand, industry structure, and logistics trends	▶ Introduce rail planning activities in addition to FRA rail plan updates ▶ Monitor rail industry issues that affect North Dakota	▶ North Dakota Department of Transportation ▶
16	Improved information: update NDPSC website to better explain and clarify the agency's roles in regulating the railroads and provide contact information for railroads and other regulatory agencies.	▶ Revise NDPSC website outlining jurisdiction and functions of NDPSC ▶ Develop and provide directory of rail contacts	▶ North Dakota Public Service Commission
17	Response planning effectiveness: develop multi-jurisdiction coordination strategies to improve regional emergency response planning and capabilities:	▶ Facilitate the development of coordination strategies	▶ North Dakota Department of Emergency Services ▶ Local authorities

Table 5-9. North Dakota State Rail Plan Initiative Implementation Matrix

	Initiative	Actions	Participants
Long Term			
18	Coordination with Metropolitan Planning Organizations/local agencies: ensure that MPOs and other local agencies are included in all statewide planning processes	▶ Establish railroad planning advisory committee: NDDOT, MPOs, local government agencies, EDAs, railroads	▶ North Dakota Department of Transportation ▶ North Dakota MPOs
19	Coordination with Metropolitan Planning Organizations/local agencies: encourage MPO/local agency participation in GNCC	▶ Promote GNCC participation to local agencies	▶ North Dakota Department of Transportation ▶ North Dakota MPOs
20	Rail planning: monitor changes in rail demand, industry structure, and logistics trends	▶ Implement performance measures – work with railroads to obtain required information	▶ North Dakota Department of Transportation
21	Local Emergency Planning Committee role in response planning: develop local incident specific response plans	▶ Develop incident response planning committee to guide local incident specific response plans	▶ North Dakota Department of Emergency Services ▶ Local authorities
22	First responder effectiveness: improve first responder staffing and capabilities in rural areas through increased funding	▶ Identify and evaluate funding alternatives for improved capabilities	▶ North Dakota Department of Emergency Services ▶ Local authorities
23	Facility improvement: hospitals should seek federal trauma care funding	▶ Identify funding sources	▶ North Dakota Department of Emergency Services ▶ Local authorities

Chapter 6. Coordination and Review

North Dakota Department of Transportation (NDDOT) is committed to engaging rail stakeholders and the public in the development of the North Dakota State Rail Plan. Our approach to this commitment is described below.

6.1 APPROACH

A stakeholder and public participation plan describing the outreach program was prepared early in the plan development process. Stakeholder and public input to the rail plan focused on both informing the plan and providing feedback on the plan. The input was gathered in the several ways shown in Table 6-1.

Table 6-1. Elements of the Outreach Program

Outreach Element	Role/Activity
Plan Development Committees	To obtain guidance from North Dakota state agencies and representatives of stakeholder groups
Stakeholder interviews	To inform individual stakeholders of the plan and obtain their input by interview.
Questionnaires sent to/discussions with ND's urban areas, counties, League of Cities and Chambers of Commerce	Questionnaires were distributed to and discussions held with various stakeholders to gain information regarding their planned rail projects in North Dakota
Short line railroad questionnaires with follow-up interviews	Questionnaires were distributed to short line railroads to gain information regarding their systems, as well as rail issues in North Dakota.
Class I railroad interviews	Discussions were held with the Class I railroads to gain information regarding their systems, as well as rail issues in North Dakota.
Stakeholder briefings/expert workshops	To meet with, inform and obtain input from stakeholder groups and agencies on the purpose of the statewide rail plan, as well as to solicit specific issues which impact rail operations. Workshops were both geographic and specific industry focused.
Open houses	To meet with, inform and obtain input the general public on the purpose of the state rail plan, as well as to solicit views on specific issues which impact rail operations.
Selected stakeholder meetings	Attended ND League of Cities and ND Manufacturing Forum sponsored by the ND Chamber of Commerce to promote the planning process
Website/On-line survey	To inform stakeholders and the public about the Plan. The website included an online survey tool.

6.1.1 Plan Development Committees

Three committees guided development of the plan: Executive Steering Committee, Project Steering Committee, and Executive Advisory Committee.

Executive Steering Committee

The Executive Steering Committee consisted of senior representatives from North Dakota state agencies. The committee provided executive level guidance in the development of the study. Representation comprised the Director/Chairperson (or designee) of the NDDOT, the North Dakota Public Service Commission, the North Dakota Industrial Commission, the North Dakota Department of Commerce, the North Dakota Department of Emergency Services, and the Upper Great Plains Transportation Institute. This committee met three times during the project. Members were:

Alan Anderson/Jay Schuler ..... North Dakota Department of Commerce
Greg Wilz ..... North Dakota Department of Emergency Services
Grant Levi/Tom Sorel ..... North Dakota Department of Transportation
Justin Kringstad ..... North Dakota Pipeline Authority
Julie Fedorchak ..... North Dakota Public Services Commission
Denver Tolliver ..... Upper Great Plains Transportation Institute

Besides playing an advisory role, the Executive Steering Committee was instrumental in the development of the state's railroad goals and objectives.

Project Steering Committee

While NDDOT staff managed the day-to-day plan development, the Project Steering Committee ensured that executive-level guidance was translated into the detailed development of the plan. Members were:

Kevin Sonsalla ..... North Dakota Department of Commerce
Jeff Thompson ..... North Dakota Department of Emergency Services
Ben Ehreth ..... North Dakota Department of Transportation
Justin Kringstad ..... North Dakota Pipeline Authority
Darrell Nitschke ..... North Dakota Public Services Commission
Alan Dybing ..... Upper Great Plains Transportation Institute

Executive Advisory Committee

A targeted group of stakeholders with intimate knowledge of rail issues was established to provide detailed input related to the trends, issues, and needs of rail-transport in North Dakota. The Executive Advisory Committee consist of key stakeholder groups identified by the Executive and Project Steering Committees and the study partners.

Michael Bachmeier ..... Federal Railroad Administration
Stephanie Hickman ..... Federal Highway Administration – North Dakota
Dan Bernhardson ..... American Crystal Sugar Company
Derrick James ..... Amtrak
Russ Ormiston ..... Bobcat Company
Colleen Weatherford ..... BNSF Railway (BNSF)
Tyler Hamman ..... Lignite Energy Council
Mark Johnson ..... North Dakota Association of Counties
Rebecca Geyer ..... North Dakota Department of Transportation
Jim Styron ..... North Dakota Department of Transportation
Tricia Kriel ..... North Dakota Emergency Management Association

Sarah VanDeVelde ..... North Dakota Emergency Management Association
Dan DeRouchey..... North Dakota Grain Dealers
Blake Crosby.....North Dakota League of Cities
Arik Spencer .....North Dakota Motor Carrier Association
Kari Cutting ..... North Dakota Petroleum Council
Greg Johnson ..... North Dakota Port Services
Scott Rising.....North Dakota Soybean Council
Daniel Zink ..... Red River Valley & Western RR
Bob Sinner..... Sinner Brothers & Bresnahan

6.1.2 Stakeholder Interviews

Stakeholder interviews were conducted in two rounds. Early in the project, team members conducted a "listening tour" to gain initial insights for the plan. Meetings were held with:

- Greater North Dakota Chamber of Commerce
- Lignite Energy Council
- North Dakota Department of Agriculture
- North Dakota Grain Dealers Association
- North Dakota Grain Growers Association
- North Dakota Indian Affairs Commissioner
- North Dakota League of Cities (NDLC)
- North Dakota Petroleum Council (NDPC)

The second round of interviews comprised meetings with:

- ADM
- Bismarck MPO
- Bobcat Company
- CF Industries
- Crystal Sugar
- Dakota Gasification Company
- Dakota Specialty Milling
- Fargo-Moorhead MPO
- Grand Forks-East Grand Forks MPO
- Great River Energy
- Hess Corporation
- Marathon Oil
- Minot Area Development Corporation
- North Central Research Extension Center-North Dakota State University
- North Dakota Ethanol Council/Midwest AgEnergy Group

- North Dakota Mill and Elevator
- North Dakota Port Services
- North Plains Steel
- Oasis Petroleum
- SB&B Foods

6.1.3 Railroad Requests for Information/Interviews

Each of the state's railroads were provided with a detailed questionnaire addressing its infrastructure, traffic, needs, and future projects. Follow up interviews were conducted with each. Because of the scale of its operations in the North Dakota, a meeting was held with BNSF at its headquarters in Fort Worth.

6.1.4 Workshops

Five workshops were held. Two were structured along specific industry lines. Three focused on particular geographies and were attended by stakeholders representing a cross-section of interests. Attendance at each workshop was by invitation. The project team made a presentation at each meeting describing the objectives of the plan and the planning process. It was followed by a roundtable discussion.

Industry Forums

The two industry meetings, both held in Bismarck, were directed towards the agriculture and energy industries. Six key questions were addressed:

- What is the near term and long term outlook for the industry and demand for rail services?
- What are the strengths of North Dakota's rail system?
- What are the deficiencies of North Dakota's rail system?
- What should be the state's rail priorities?
- What improvements are required?
- What specific projects?

Organizations represented at the meetings were:

<u>Agriculture Forum:</u>

- CF Industries
- Fessenden Coop Association
- North Dakota Agriculture Coalition
- North Dakota Ethanol Council
- North Dakota Grain Growers Association
- United Sugars
- US Durum Growers

Energy Forum:

- Basin Electric
- EOG Resources
- Great River Energy
- Hess Corporation
- Marathon Oil
- MDU Resources
- Midwest Energy
- North Dakota Association of Rural Electric Cooperatives
- North Dakota Petroleum Marketers Association
- WPX Energy

Geography-Focused Roundtable Meetings

The three regional roundtable meetings were held in Bismarck, Fargo, and Minot. Six questions were posed to the attendees.

- What are the strengths of North Dakota's rail system?
- What are the deficiencies of North Dakota's rail system?
- What should be the state's rail priorities?
- What opportunities does rail transportation provide?
- What improvements are required?
- What specific projects?

Organizations represented at the meetings were:

Bismarck:

- Bismarck MPO
- BNSF Railway
- Bobcat Company
- BOE Midstream
- Dakota Gasification Company
- DMVW Railroad
- Emergency Management-Burleigh County
- Emergency Management-Morton County
- Federal Railroad Administration
- FHWA-North Dakota
- Great River Energy
- North Dakota Department of Agriculture

- North Dakota Department of Commerce-Tourism
- North Dakota Homeland Security
- North Dakota Indian Affairs Commissioner
- North Dakota League of Cities
- North Dakota Public Services Commission
- South Central Dakota Regional Council
- Stark Development Corporation

Fargo:

- BNSF Railway
- City of Fargo Emergency Management
- Fargo Moorhead Council of Governments
- Greater Fargo Moorhead Economic Development Corporation (GFMEDC)
- North Dakota Grain Growers

Minot:

- ADM Processing
- AGT Foods
- Berthold Farmers/North Dakota Grain Dealers
- BNSF Railway
- City of Minot
- Dakota Midland Grain
- Minot Area Development Corporation
- Minot Chamber of Commerce
- Minot Police Department
- North Dakota Port Services, Inc.
- Visit Minot

6.1.5 Public Open Houses

Three public open houses were held: Bismarck, Fargo, and Minot. Information regarding the rail plan was made available to attendees, through a self-guided tour of display boards. NDDOT staff and members of the consultant team were available to answer questions and discuss rail topics. The public open houses were sparsely attended, likely due to rail issues that had affected the public had been addressed by the time the planning process had begun.

6.1.6 Website

A website was developed to communicate to the public and stakeholders information about the state rail plan and its content, and advise the public about developments. The website also included an online survey. A total of 110 responses were received for the North Dakota State Rail Plan survey.

6.2 KEY ISSUES RAISED DURING PLAN DEVELOPMENT

Several issues were raised several times in the planning process during discussions and in the on-line survey. They can be summarized along the following themes.

6.2.1 Safety and Community Issues

- Condition of many of the state's rail lines need to be improved to prevent derailments
- First responders need to be adequately trained in dealing with railroad incidents
- Although the crude by rail shipments have decreased significantly, there is still a concern over the safe shipment of hazardous materials in the state
- Concerns remain over blocked crossings particularly in view of the trend towards longer trains for cost reduction reasons
- Grade crossing safety is high priority for the state
- Safety and community interests need to be considered in setting maximum train speeds

6.2.2 Operational Issues

- Rail capacity bottlenecks will need to be addressed as they occur in the future when rail traffic increases
- Reliability of rail service for various rail dependent industries needs to be consistent
- Condition of many of the state's rail lines need to be improved and upgraded to handle larger freight cars
- Capacity and service needs to be made available to all rail customers during periods of high freight rail demand
- Rail access needs to be improved by increasing rail served industrial locations and expanding truck-rail transfer facilities

6.2.3 Institutional Issues

- Communication between the rail industry and government and private rail dependent industry is critical and can be improved
- The advantages of rail transportation such as the reduction in the demand for public roadway infrastructure needs to be communicated
- Shippers are concerned about being captive or dependent on one railroad

6.2.4 How Issues Raised by Stakeholders Were Addressed in the North Dakota State Rail Plan

The issues raised by stakeholders are addressed in Chapters 4 and 5 of this plan.

6.3 COORDINATION BETWEEN RAIL PLAN AND OTHER NORTH DAKOTA PLANNING EFFORTS

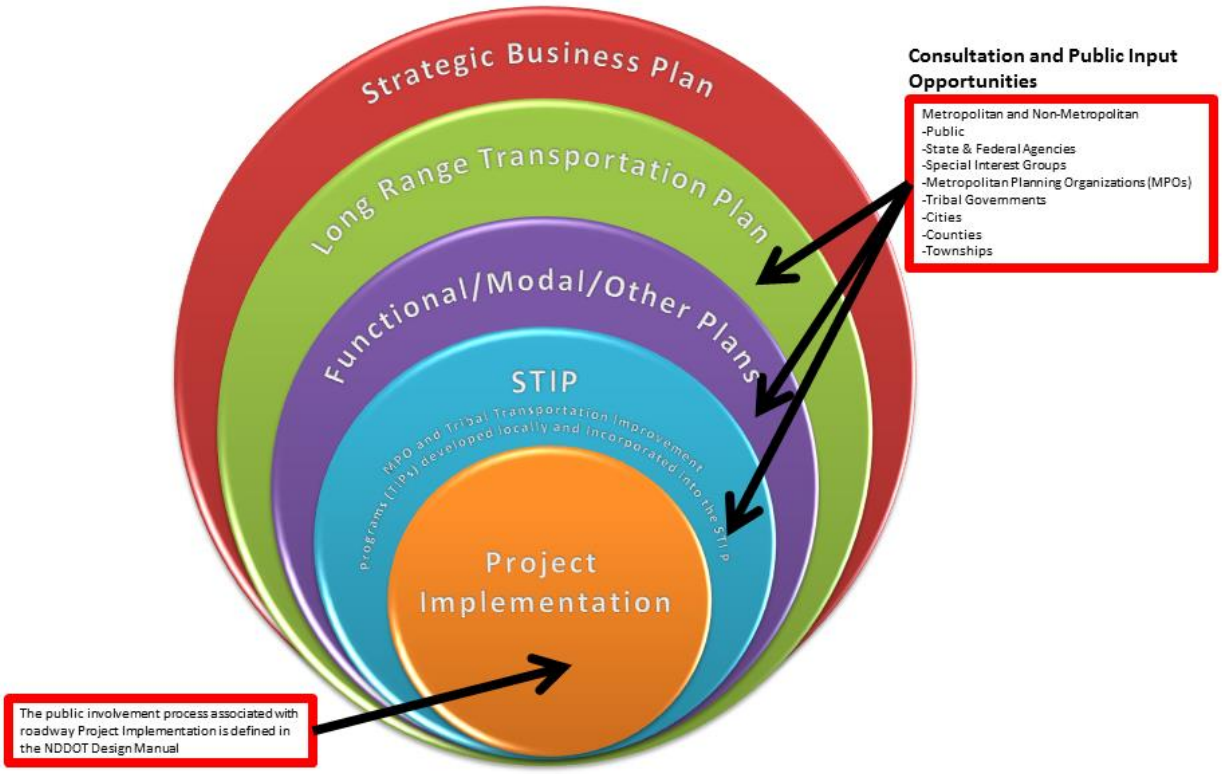
The North Dakota Freight Plan was published in April 2015, six months before the rail planning process began. Relevant information from the Freight Plan was included in the state rail plan. North Dakota's

MPOs were consulted during the development of the rail plan, both as participants in the round table discussions and through individual MPO interviews. In addition, the Rail Plan fits into the North Dakota Integrated Planning Process as one of NDDOT's Functional/Modal Plans and therefore relevant plans were reviewed with pertinent information introduced into the plan.

Figure 6-1. North Dakota Integrated Planning Process

6.4 DRAFT FINAL PLAN REVIEW

The plan has been posted on the ND Department of Transportation for a thirty-day comment period.



This section will be completed after that period.

Appendix A – Public and Stakeholder Comments

Commenter	Organization	Comment	Disposition
Andrew Weber	Narstco	Inquiry on steel ties	Addressed outside of plan
Keith Korman	Jamestown Sun	Interest in a newspaper story	Completed
Colleen Weatherford	BNSF	Found instances where conclusions are based on assumptions and the conclusions are debatable o "The growth in agriculture within North Dakota is likely to be associated with the value-added economic activities that utilize international and domestic containers." o "The last four years in particular have seen much higher accident rates than the average since 2000 likely due to the increase in rail traffic through the state."	Text inserted to pg. 2-104 Text inserted to pg. 2-49
Colleen Weatherford	BNSF	1.3.3 North Dakota's Rail Transportation System Objectives Minimize the environmental, cultural, and social impacts of rail transportation paying attention to sensitive land uses such as homes, hospitals and schools. Recommend this objective be amended or an objective be added that also encourages proactive smart land use planning for land adjacent to freight rail lines and terminals that does not conflict with freight rail.	Text inserted to pg. 5-2
Colleen Weatherford	BNSF	Support any initiatives to establish freight rail intermodal terminal. This initiative is vague and may encourage initiatives that are not practical or feasible for establishing intermodal terminal service. Please reference "Private Intermodal Facilities" General Guidelines, and "Intermodal Marketing Studies Critical Information" provided to the state rail plan project team January 2016.	Text inserted to pg. 5-2
Colleen Weatherford	BNSF	Pg. 1-14-15 "Since 2013, ridership has decreased due to late and cancelled trains attributable to significant freight traffic related congestion and extremely harsh winters." Could the decline also be attributed to the decline of activity in the Bakken region? Ridership was highest to Willison and Minot – which is probably attributed to Bakken. So, when Bakken activity declined, it would seem reasonable that the ridership would also decline.	Text inserted to pg. 1-15

Commenter	Organization	Comment	Disposition
Colleen Weatherford	BNSF	Pg. 2-49 "The last four years in particular have seen much higher accident rates than the average since 2000 likely due to the increase in rail traffic through the state." The conclusion that accident rates are higher "likely due to the increase in rail traffic through the state" is an assumption and should be removed. There could be many factors that could attribute to the higher accident rates such as an increase of AADT, lack of crossing protection or the unfamiliarity of drivers to the crossing. For example, the sentence below regarding truck-trailers could lead one to believe that these drivers are delivering goods in unfamiliar areas with unprotected crossings. "A surprising find is truck-trailers are involved in almost as many deaths and injuries as automobiles, while representing a much smaller percent of traffic volumes."	Text on modified to describe correlation between rail traffic and accidents; Text on truck accidents made descriptive Pg. 2-49
	Adjacent States	Question regarding the what the commodity forecast was based upon	Addressed in a conference call
	Adjacent States	Question regarding how involved Class I Railroads were in the development of the document	Addressed in a conference call
	Adjacent States	Comment that communication was a challenge with Class I Rail operators from state perspective within the region	Addressed in a conference call
	Adjacent States	Question regarding how South Dakota SHRP2 methodology was used in the development of the ND State Rail Plan	Addressed in a conference call
	Adjacent States	Comment that one of the regional provinces liked the scope of work and process	Addressed in a conference call
	Adjacent States	Question regarding the trespasser issue raise by the Short Line railroads	Addressed in a conference call
	Project Executive Advisory Committee	Comment that in 2014 73% of crude oil moved by rail in contrast to 2017 where 27% of crude oil moved by rail o It is believed the amount of crude oil moved by rail could be even less in the future possibly 10%-15% o Dakota Access Pipeline capacity is roughly 500,000 barrels of oil per day o It is believed that there will likely be sufficient pipeline capacity to move all oil produced in North Dakota for the for foreseeable future	Addressed in Crude Oil section
	Project Executive Advisory Committee	Comment that rail cars are currently being used for storage	Edits to pg. 2-84

Commenter	Organization	Comment	Disposition
	Project Executive Advisory Committee	Comment that there is interest in ISO tanks for the movement of natural gas liquids	Edits to pg. 2-86
	Project Executive Advisory Committee	Comment that although the percentage of freight moved by truck may be lower the total truck traffic has increased	No action necessary as already addressed in plan pg. 1-9
	Project Executive Advisory Committee	Comment that there is interest in moving freight by container directly into North Dakota rather than another state and transporting by truck into North Dakota	Addressed on pg. 2-104
	Project Executive Advisory Committee	Comment that there appears to be a trend to longer and heavier trucks which may be a threat to Short Line rail operators. (This should be a trend identified in the ND State Rail Plan)	Section added to pg. 2-110
	Project Executive Advisory Committee	Comment that in general rail replacement is likely a bigger priority for Short Line rail operators than bridge replacement to handle 286,000 pound cars.	Edit to pg. 4-29
	Project Executive Advisory Committee	Comment that each Short Line in North Dakota has some fleet of rail cars.	Short line car issues not included in Plan
	Project Executive Advisory Committee	Question about projected ethanol decrease	USDA report projects a decrease
	Project Executive Advisory Committee	Comment that state rail related policies and programs have the greatest ability to influence Short Lines in North Dakota	Insert to pg. 1-27
	Project Steering Committee	Comment that Dakota Access pipeline has a capacity of approximately 520,000 barrels of oil per day	Changed to 500,000 per above; estimates vary

Commenter	Organization	Comment	Disposition
	Project Steering Committee	Comment that Upland Pipeline is put on hold	Edit to pg. 2-83
	Project Steering Committee	Comment that Thunder Butte Refinery is put on hold	Edit to pg. 2-83
	Project Steering Committee	Suggestion to remove the recommendation identified in the Draft ND State Rail Plan regarding a common fire foam (remove recommendation from the ND State Rail Plan) This appears to be a concern among various emergency service operators and it is unlikely to reach a common agreement regarding the issue	Deleted pg. 5-29
Barry E. Green	National Association of Railroad Passengers (NARP)	One other item that I forgot mention. I see that the ND State Rail Plan was put together by Parsons Brinkerhoff. I've critiqued some of their other plans from previous years and I'm sure that your department paid good money for their services. I just want to say that the plan for North Dakota was extremely in depth and informational and should last for some time before having to update it again. I feel that it was very well done and will be an excellent working document for referencing North Dakota's rail system. Have a good weekend.	No action required
Barry E. Green	NARP	Tech Summary Pg. 16 – Item 2.7 Intercity Passenger Rail in North Dakota – Amtrak no longer provides a bus that connects Missoula, MT to stations in Minot and Williston. The service was being provided by Jefferson Lines over a circuitous route from Bismarck to Minot to Williston to Glendive, MT and points west. I believe, due to the downturn in the oil field business, this bus route was eliminated.	Deleted Tech Summary pg. 16 and Plan pg. 1-14
Barry E. Green	NARP	Tech Summary Pg. 17 – Item 2.7 Intercity Passenger Rail in North Dakota – The sentence, "Check baggage is also provided" is not 100% accurate. Checked baggage service is only offered at the Amtrak Stations in Williston, Minot and Fargo, ND.	Corrected Tech Summary pg. 17 and Plan pg. 2-34
Barry E. Green	NARP	Pg. 1-14 – Item 1.7 Role of Intercity Passenger Rail in North Dakota - Amtrak no longer provides a bus that connects Missoula, MT to stations in Minot and Williston. The service was being provided by Jefferson Lines over a circuitous route from Bismarck to Minot to Williston to Glendive, MT and points west. I believe, due to the downturn in the oil field business, this bus route was eliminated.	Deleted pg. 1-14
Barry E. Green	NARP	Pg. 1-19 – Item 1.8.4 Passenger Rail Operations – Within the paragraph that begins with "Chapter 8-11.1 of the NDC provides for membership……, the "Midwest Interstate Passenger Rail Compact" should read the "Midwest Interstate Passenger Rail Commission" (http://miprc.org/).	Corrected pg. 1-19

Commenter	Organization	Comment	Disposition
Barry E. Green	NARP	Pg. 1-19 It also states that "North Dakota participates in the MIPRC as a non-voting associate member." Since North Dakota is part of the MIPRC, why is it a non-voting associate member and not a voting member? I would encourage the state to consider becoming a voting member of this organization.	Corrected pg. 1-19; The State of North Dakota is a voting member of MIPRC through the Governor designee.
Barry E. Green	NARP	Pg. 1-34 – 1.10.4 Current and Proposed Rail Planning Efforts - Midwest Interstate Passenger Rail Commission (MIPRC) – The last sentence in this segment that references ND participation in the MIPRC as a non-voting associate member. Again, since North Dakota is part of the MIPRC, why is it a non-voting associate member and not a voting member? I would encourage the state to consider becoming a voting member of this organization.	Corrected pg. 1-19; The State of North Dakota is a voting member of MIPRC through the Governor designee.
Barry E. Green	NARP	Pg. 2-34 – Item 2.6 North Dakota Passenger Rail Service – Last paragraph, the sentence reading, "Checked baggage is also provided." is somewhat misleading. Checked baggage is only available for passengers at Williston, Minot and Fargo, ND.	Corrected pg. 2-34
Barry E. Green	NARP	Pg. 2-38 – Item 2.6.4 Passenger Rail Performance – Reference on this page is made to "Business Class" on Amtrak's Empire Builder. While Amtrak does offer "Business Class" on some of their trains across the country, there is not a specific "Business Class" fare offered to passengers traveling on the Empire Builder. There is only a "Coach Class" and a "First Class" or "Sleeping Car Accommodation" fare structure for the Empire Builder.	Corrected pg. 2-38
Barry E. Green	NARP	Pg. 2-40 – Figure 2-18 Amtrak Station Connecting Services – Searching the Internet, I can no longer find an intercity bus service that operates into or out of Minot. It may have been Jefferson Lines which I believe no longer serves Minot, ND.	Corrected pg. 2-40
Barry E. Green	NARP	Pg. 2-41 – Table 2-11 Stations and Amenities – There is no longer an open Ticket Office for the station at Rugby. Efforts should be made to provide Wi-Fi services at all North Dakota Amtrak Stations or at least for the staffed stations at Williston, Minot and Fargo, ND.	Corrected pg. 2-41
Barry E. Green	NARP	Pg. 3-4 – Item 3.3 Intercity Passenger Rail Planning Initiatives – Personal opinion. For whatever the reason(s), it's extremely difficult for multiple states to all come together on the same page and with the same goal of establishing a regional rail system. There just seems to be too many individual state factors that come into play which makes it problematic to develop such a plan.	Midwest Rail Study currently being conducted by FRA – noted in the Plan

Commenter	Organization	Comment	Disposition
Barry E. Green	NARP	Pg. 4-33 – Item 4.7.2 Customer Issues and Needs - Under Staffing and resources, 2nd bullet point, the word "train master" should be changed to read "trainmaster".	Corrected pg. 4-33
Barry E. Green	NARP	Pg. 4-35 – Item 4.8.2 Crew Size Reductions – Personal opinion. It should be kept in mind that the majority of Class 1 railroads want to increase the number of cars that they handle within each train. This, in turns, means that it takes that much longer for a train to pass through town and possibly over several public crossings that divide the town in half. Should the train break down while traveling through the middle of town and there is only one crew member on the train, that employee is not going to be able to leave the locomotive to find the problem and possibly correct it as he is only one person and there is no one on the lead locomotive to move the train, if necessary to make any repairs. Now, you have an in-town emergency and it just so happens that your emergency services can't get to the location they need to go account of the stopped and extra-long train that has divided the town in half. You may end up losing the person or persons you are trying to save. By having a second crew person on the train, you at least have two employees working together to either repair the problem and depart of cut a highway/rail grade crossing to allow emergency services to get to where they are going.	The Plan has not taken a position
Barry E. Green	NARP	Pg. 5-2 – Item 5.1.3 North Dakota's Rail Transportation System Objectives – Under the heading of Service; 5th bullet point – The state of North Dakota, along with the individual seven communities that have Amtrak service, should work cooperatively with Amtrak to see that all Amtrak stations within the state have good lighting and parking for the safety of passengers. Each station should be maintained in a state of good repair for passengers that includes safe platforms and a building to find shelter from inclement weather. Other states and towns with Amtrak service around the country have taken ownership of the station buildings and have taken pride with maintaining and keeping up with the building and grounds that passengers see when they arrive or depart by train.	Insert to pg. 5-2
Barry E. Green	NARP	The state of North Dakota along with the communities that have Amtrak stops should work with other public forms of transportation, i.e., intercity bus, taxi service, para-transit, Uber, etc. to see if there are ways that these providers could interconnect with the arrival and departure of Amtrak's passengers. It may not work in all cases due to the arrival/departure times of the train but it should be explored where it makes sense. Interconnectivity among the modes is an important feature.	Insert pg. 5-2

Commenter	Organization	Comment	Disposition
Barry E. Green	NARP	In closing, the states of North Dakota and Montana have a large elderly population in which many can no longer drive or fly for a variety of reasons. There are also Baby-Boomers retiring in droves and they likewise would rather have someone else do the driving than fight with traffic or with the TSA when boarding a plane. Amtrak's service is important to these groups of individuals as well as to the college students studying within the state; those that need to travel to larger cities for specialized medical services; and for those areas of the state that have little to no other forms of public transportation. Personal visits are also important for those that want to see family and friends somewhere in the country and Amtrak provides that travel choice that many Americans want.	No action required
Barry E. Green	NARP	It would be beneficial if Amtrak was to return long distance passenger service through southern North Dakota and Montana as once was provided by Amtrak's North Coast Hiawatha which was eliminated in 1979. Granted, the southern part of our states has the Interstate highway along with intercity bus and airline service but, again, not everyone wants to travel this way and Amtrak provides that alternate form of public transportation. It's fully understood that if you need to get someplace in a hurry, then flying is usually the mode of choice. However, the more travel choices available to the traveling public, the better we can connect to the various modes to reach or destination.	The Plan does not take a position since not identified in stakeholder meetings
	Federal Railroad Administration (FRA)	1. Here is the recommended process for the completion of the North Dakota State Rail Plan (SRP), now that we have completed the initial conversation about the SRP: · ND DOT staff reviews FRA comments (this document with the following FRA's comments) along with the other stakeholder comments. · ND DOT prepares final SRP. · ND DOT proceeds to get the Director's approval of the final SRP. · ND DOT sends the final version to FRA. · FRA will review and send the acceptance letter, approximately a 4-week process.	ND DOT is following the process

Commenter	Organization	Comment	Disposition
	FRA	2. FRA's 2013 SRP guidance is still applicable until FRA updates the guidance in 2017 or 2018. Section 11315 of the FAST Act (2015) amended the statutory requirements under 49 U.S.C. Chapter 227 pertaining to State rail plan (SRP) requirements. Under the FAST Act, the SRP requirements for eligibility of the capital grants was eliminated. The three relevant changes to the SRP statutory requirements are described and referenced as follows: · 49 U.S.C. Section 22702 (b) (4) was amended by striking "5 years for reapproval by the Secretary" and inserting "4 years for acceptance by the Secretary". · 49 U.S.C. Section 22705 (a) was amended by striking paragraph (12) eliminating the SRP as a requirement for eligibility of the capital grants. · The new FRA funding program under FAST Act, Consolidated Rail Infrastructure and Safety Improvements (CRISI), does not require the project to be in a State rail plan, under project eligibility under 49 U.S.C. 24407.	ND DOT is aware of guidance
	FRA	3. The FRA's SRP guidance recommends that the "State rail plans are to be coordinated with, and incorporated within, as appropriate, other State transportation planning programs for the purpose of considering a statewide multimodal context when identifying the long and short-term rail service and investment needs and requirements of States. In addition, where appropriate, State rail plans should be coordinated with the transportation planning programs of neighboring States and others within the megaregion." During the call on Wednesday, we discussed the strategic relationship between the Freight Plans and SRP. FRA recommends that ND DOT coordinate the rail policy and program into a multi-modal context in order to meet the state's goals and overall transportation vision (in other words, coordinate with the LRSTP).	Action to be taken outside of plan document
	FRA	4. The format of the ND SRP followed the main chapter format of the SRP guidance, but draft SRP the subsections titles and content deviated from how it was outlined in the guidance. Would you like to comment on that approach? Do have any recommended changes to the FRA's SRP guidance to improve, simplify or streamline the SRP guidance? If there is a better method, we are open to your input for the next version.	No recommendations to be included in the plan.
	FRA	5. Section 2.6 Passenger Rail services sections. a. This section provides OTP metrics. Is there a measure of how much capacity, or available seats are available for ND customers? Does ND want to highlight any other Amtrak customer feedback? Does Amtrak or ND DOT have a sense for how ND passengers and visitors are using the Amtrak service, and what are the projections for the future ridership and service?	No information is publicly available or not collected

Commenter	Organization	Comment	Disposition
	FRA	b. The FRA guidance recommends conducting a performance evaluation of intercity passenger services operating in the State. Are intercity passengers combining IC bus services with Amtrak? How can bus services and passenger be coordinated?	No information is publicly available or not collected; NDDOT to consider a study
	FRA	c. ND DOT reported on parking supply at the passenger rail station. Is that parking availability adequate? How are these spaces managed? Do customers have to pay for parking? Is adequate parking an identified barrier to Amtrak users?	No information is publicly available or not collected
	FRA	d. How are passengers accessing stations in ND? Are there ND policy recommendations for transit, taxi, bicycle access, and programming at the rail stations? The Meridian, MS example of a station on the Crescent corridor where the city is very proud of how they made a multi-modal station and community asset. Does ND have a comparable example or model for stations? Does one region or city do a good job of programming or coordinating services at the station?	No information is publicly available or not collected; NDDOT to consider a joint study with Amtrak
	FRA	e. Does ND coordinate with Amtrak on a regular basis? Who is the Amtrak Liaison/POC? What about with the local city/government unit?	NDDOT coordinates on an ongoing and as needed basis with Amtrak
	FRA	There is some excellent analysis in chapter 3 about Amtrak's ADA improvements. That recognition is important to coordinate with the local government entity as well.	No action required. NDDOT works with Amtrak to ensure ADA requirements are implemented
	FRA	6. Section 4.4.2 Rail Planning section – I see that the SRP states that there are two purposes for planning. I note from page 6 of the FRA's guidance that SRP are: (1) Required by law, strategic plans, set policy (2) create a capital program, (3) Helps identify funding: federal, private, sectors other, and coordinate efforts among operators. Overall, we hope that this planning process and preparation of the SRP will allow the state and stakeholders to look strategically at the long-term view of rail from which for that the stakeholders can work toward improving the system in a coordinated and efficient manner to maximum public benefit.	Text inserted to pg. 4-17

Commenter	Organization	Comment	Disposition
	FRA	Section 2.11 describes 5.1 Vision 5.2 Program Coordination 5.3 Rail Agencies 5.4 Program Effects 5.5 Passenger Element 5.6 Freight Element 5.7 Rail Studies and Reports: 5.8 Passenger and Freight Rail Capital Program (4-year and 20-year project or corridor programs) See criteria on page 26 of the FRA SRP guidance.	FRA requirements for Chapter 5 are included but arranged differently for better flow of the plan
	FRA	8. FRA recommends that this SRP Plan can identify in Chapter 5 the link between the SRP and grants programs and financing. ND DOT could update the plan to describe FAST Act related capital programs such as CRISI as well as the potential eligibility for FHWA programs: freight, etc. This chapter could also describe previous grant efforts such as the experience with 2010, 2011 TIGER grants and if ND DOT intend to continue to look for federal funding. As we discussed on the call, it would be a good cross check of the SRP to see if it identifies good candidate projects for potential funding from discretionary program in the upcoming four-year cycle.	NDDOT uses discretionary grant programs but relies primarily on other sources
	FRA	9. FRA recognizes that ND DOT did good work on several sections of the plan. As discussed during the call, the plan provided an analysis of the character and potential impacts of the energy market demand as well as describing some analysis of the freight situation. Are there overall conclusions spelled out enough with respect to rail network investment? What conclusions can be teased out of the analysis in terms of potential scenarios? (from chapters 2 and 4) I remember on the call we had that you explained that pipeline capacities have changed the role of rail, and that I just may have missed that section of the analysis.	Section 2.12 provides a perspective on key rail dependent industries
	FRA	10. At this point, FRA staff recommends that this draft SRP meets the minimum required SRP requirements. FRA recommends a more robust chapter 5, specifically a Passenger and Freight Rail Capital Program (4-year and 20-year project or corridor programs) see item 8 above. FRA anticipates receiving the final SRP from ND DOT during the 2017 calendar year whereupon the FRA will accept the plan when submitted by ND DOT. The FRA will note acceptance by electronic letter after final review of the SRP. (The process is outlined in item 1 above.)	North Dakota does not have a 20 year program

Commenter	Organization	Comment	Disposition
	Federal Highway Administration (FHWA)	What is the basis for this conclusion about pipeline tonnage? (P 1-9)	Based on data collected by ND Pipeline Authority
	FHWA	Should be moved to FHWA section 1.9.3. and state the statutory funding of 23 USC 130, or just combine FRA and FHWA sections all within Federal Agencies. It states FHWA, but shows up under FRA section. It may be important to draw alignment with the HSIP/SHSP/HRRR too. (P 1-22)	Corrected
	FHWA	You may want to differentiate between this and the NHS. This network is for planning purposes only and has limited applicability otherwise. (pg. 2-115)	Not relevant to Plan
	FHWA	Would it be beneficial to mention the rail derailment that took place near Casselton, ND? Is it appropriate to include "lessons learned" or initiatives taken from above accident? (pg. 4-5)	No benefit
	FHWA	A lot of this same information on funding programs and PSC occur earlier in the document. Is there a way to combine the information to avoid redundancy and potential reader misunderstandings? Question only. (pg. 4-24)	Redundancy required for context

Appendix B – Chronology of Recent Federal Activities

Federal changes to hazardous materials transportation by rail are provided in the Pipeline Hazardous Materials Safety Administration and Federal Railroad Administration chronology:

PHMSA and FRA Safe Transportation of Energy Products Chronology September 2012 – November 2015	
September 2012	PHMSA Administrator Quarterman visits North Dakota Bakken Region to observe operations at rail loading facilities and the application of US DOT regulations.
October 2012	PHMSA Bakken Field Working Group established to increase inspection focus on hazmat shipments by truck and rail from the Bakken region and increase awareness within the emergency response community.
December 2012	FRA initiated several steps to address the risks related to increases in rail traffic in the Bakken Oil Region, the point of origin for most crude oil by rail shipments in the US Under the Bakken Rail Accident Mitigation Project (RAMP), FRA conducted additional hazardous materials safety inspections in the area as well as facilitating hazardous materials safety training seminars with shippers, consignees, contractors, and sub-contractors. In addition, as a result of increased commercial motor vehicle traffic in the region associated with crude oil production, FRA worked with stakeholders, participating agencies, local officials and rail carriers on highway-rail grade crossing safety and trespass prevention, to increase law enforcement patrols at grade crossings and expanded educational outreach to professional drivers (including public service announcements and advertisements at major truck stops in the area).
July 18, 2013	FRA and PHMSA announced a two-day public meeting on August 27 and 28 in Washington, DC, to receive public input on improving the safe transport of hazardous materials by rail, including a discussion on enhanced design specifications for the DOT-111 tank cars commonly used to transport petroleum crude oil and ethanol and operational issues related to the rail transportation of hazardous materials.
July 29, 2013	In a letter to the American Petroleum Institute, FRA informed industry that it will use PHMSA's test sampling program to ensure that crude oil is being properly tested and classified.
August 2, 2013	FRA issued Emergency Order No. 28, requiring railroads to properly secure rolling equipment. FRA also published a Safety Advisory recommending additional actions.
August 29, 2013	Administrator Quarterman and Administrator Szabo addressed the Railroad Safety Advisory Committee during an emergency session.
August 29, 2013	FRA and PHMSA launched Operation Classification in North Dakota's Bakken oil region to verify that crude oil is being properly classified.

PHMSA and FRA Safe Transportation of Energy Products Chronology September 2012 – November 2015	
September 6, 2013	PHMSA published an Advance Notice of Proposed Rulemaking seeking public comment on a proposed rule requiring comprehensive improvements to rail safety of flammable liquids.
October 1, 2013	FRA Administrator Szabo sent a letter to the Association of American Railroads asking it to detail actions it has taken in response to the Safety Advisory issued August 2.
November 20, 2013	PHMSA and FRA issued a safety advisory reinforcing the importance of proper characterization, classification, and selection of a packing group for Class 3 materials.
January 2, 2014	PHMSA issued a safety alert to notify the general public, emergency responders, shippers, and carriers that the type of crude oil being transported from the Bakken region may be more flammable than traditional heavy crude.
January 16, 2014	Secretary Foxx met with railroad company CEOs and rail and energy association leadership as part of the Department's Call to Action to discuss how to maintain the industry's safety record even as domestic crude oil production and movement have increased.
January 22, 2014	Secretary Foxx issued a follow-up letter to Call to Action participants summarizing industry commitments.
February 4, 2014	PHMSA issued $93,000 in proposed civil penalties after investigation into the transportation of Bakken crude oil finds companies improperly classified shipments.
February 10, 2014	PHMSA met with emergency response stakeholders and industry groups to discuss training and awareness related to the transport of Bakken crude.
February 12, 2014	In response to the Secretary's Call to Action, the American Short Line and Regional Railroad Association (ASLRRA) identified five actions that it believes small railroads can voluntarily take to contribute to a safer national rail network: 1. Train Speed: Unit trains of crude oil to operate at a top speed of no more than 25 mph on all routes. 2. Emergency Response: Railroads to develop a program of best practices to ensure a seamless system of timely and effective emergency response to crude oil spills. 3. Recovery and Environmental Remediation: Railroads to sign master service agreements with qualified environmental cleanup providers to ensure prompt and effective remediation in all areas subjected to unintentional discharge of crude oil. 4. Tank Car Standards: ASLRRA to support and encourage the development of new tank car standards. 5. Risk Reduction Program: Contingent upon securing a 6-12-month pilot project grant from FRA, ASLRRA plans to create the Short Line Safety Institute.

PHMSA and FRA Safe Transportation of Energy Products Chronology September 2012 – November 2015	
February 20, 2014	Transportation Secretary Foxx sent a letter to the Association of American Railroads (AAR) with a list of actions to be voluntarily taken immediately by industry to dramatically improve the safety of railroads transporting crude oil and the communities they move through. AAR President and CEO Edward Hamberger signed the agreement that same day, subsequently followed by individual member railroads. Other railroad signatories included: Genesee & Wyoming, Inc., the Iowa Interstate Railroad, Iowa Pacific Holdings, Wheeling and Lake Erie Railway Company.
February 25, 2014	USDOT issues Emergency Order requiring stricter standards to transport crude oil by rail.
March 6, 2014	To provide further clarity for shippers and to prevent attempts to circumvent the requirements in the recent Emergency Order concerning the safe transport of crude oil by rail, the Department issued an amended version that specified which tests are required, while also prohibiting shippers from switching to an alternative classification that involves less stringent packaging.

PHMSA and FRA Safe Transportation of Energy Products Chronology September 2012 – November 2015	
April 1, 2014	As an outgrowth of the Working Groups established at the August 2013 Emergency Meeting of FRA's RSAC, two of the working groups produced recommendations that were adopted by the full RSAC for consideration in future rulemakings. Based upon the efforts of the Securement Working Group and the approval of the full RSAC, the FRA planned to issue a Notice of Proposed Rulemaking (NPRM) later this year. The RSAC recommendations on train securement prohibited certain unattended freight trains or standing freight cars on main track or sidings and required railroads to adopt and implement procedures to verify securement of trains and unattended equipment for emergency responders. It also required locomotive cabs to be locked and reversers to be removed and secured. Railroads were also required to obtain advance approval from FRA for locations or circumstances where unattended cars or equipment may be left. Additionally, the full RSAC approved four recommendations of the Hazardous Materials Issues Working Group relating to identification, classification, operational control and handling of certain shipments. The four recommendations, directed to PHMSA, included amending or revising the definitions of "residue" and "key train," and clarifying its regulatory jurisdiction over the loading, unloading and storage of hazmat before and during transportation. (See May 1, 2014 entry below.). The third Working Group, established to consider Appropriate Train Crew Size requirements was unable to reach a consensus. However, the input received during their deliberations allowed FRA to move forward with developing a proposed rule on train crew size that would protect the public while recognizing the nuance of railroad operations. A Notice of Proposed Rulemaking requiring two-person train crews on crude oil trains and establishing minimum crew size standards for most main line freight and passenger rail operations was targeted for later in the year.
May 1, 2014	DOT sent a comprehensive PHMSA rulemaking package to the White House Office of Information and Regulatory Affairs (OIRA). The proposal included options for enhancing tank car standards and retrofitting.
May 7, 2014	PHMSA and FRA issued a Safety Advisory requesting companies to take all possible steps to avoid the use of DOT 111 tank cars when transporting Bakken crude oil.
May 7, 2014	USDOT issued Emergency Order requiring railroads to inform first responders about crude oil being transported through their towns and communities.

PHMSA and FRA Safe Transportation of Energy Products Chronology September 2012 – November 2015	
May 7, 2014	PHMSA and FRA issued a Safety Advisory requesting companies to take all possible steps to avoid the use of DOT 111 tank cars when transporting Bakken crude oil.
May 13, 2014	Transportation Secretary Foxx dispatched a letter to 48 state governors and selected city mayors alerting them to the issuance of Emergency Order OST-2014-0067 and urging them to facilitate coordination between the rail industry, State Emergency Response Commissions and local first responders.
July 23, 2014	USDOT released comprehensive rulemaking proposal to improve the safe transportation of large quantities of flammable materials by rail, including a Notice of Proposed Rulemaking for enhanced tank car standards, an Advance Notice of Proposed Rulemaking seeking to expand oil spill response planning requirements for shipments of flammable materials, and a report summarizing the analysis of Bakken crude oil data gathered by PHMSA and FRA.
October 2014	Operation Safe Delivery was renamed "Safe Transportation of Energy Products" to reflect the expanded focus on the transport of ethanol and other flammable liquids by rail in addition to crude.
February 5, 2015	USDOT submitted a draft Final Rule on the safe transportation of flammable liquids (including crude oil) by rail to the Office of Management and Budget for formal review.
April 17, 2015	PHMSA issued a Safety Advisory to remind hazardous materials shippers and carriers of their responsibility to ensure that current, accurate and timely emergency response information is immediately available to first responders. PHMSA and FRA issued a Safety Advisory to remind railroads operating a high-hazard flammable train that certain information may be required by PHMSA and/or FRA personnel during the course of an investigation immediately following an accident. FRA issued an Emergency Order to require that trains transporting large amounts of Class 3 flammable liquid through certain highly populated areas adhere to a maximum authorized operating speed of 40 mph. FRA issued a Safety Advisory recommending that railroads use highly qualified individuals to conduct the brake and mechanical inspections and recommends a reduction to the impact threshold levels the industry currently uses for wayside detectors that measure wheel impacts to ensure the wheel integrity of tank cars in those trains. FRA issued a Notice and comment request seeking to gather additional data concerning rail cars carrying petroleum crude oil in any train involved in an FRA reportable accident. FRA Acting Administrator sent a letter to the Honorable Edward Hamberger, president of the Association of American Railroads, asking continued commitment of its member railroads to address the safety issues presented.
May 1, 2015	USDOT announced final rule to strengthen the safe transportation of flammable liquids by rail. The Final Rule applies to trains transporting large volumes of flammable liquids and will make significant and extensive changes to improve accident prevention, mitigation, and emergency response.

PHMSA and FRA Safe Transportation of Energy Products Chronology September 2012 – November 2015	
May 14, 2015	PHMSA invited comments on the topic of Flammable Hazardous Materials by Rail Transportation. In the final rule entitled "Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains" PHMSA and FRA adopted a risk-based timeline for the retrofit of existing tank cars to meet an enhanced CPC-1232 standard when used as part of an HHFT. The retrofit timeline focuses on two risk factors, the packing group and differing types of DOT-111 and CPC-1232 tank cars. The timeline provides an accelerated risk reduction that more appropriately addresses the overall risk. The timeline is provided in the §§ 173.241, 173.242, and 173.243 tables of the final rulemaking (80 FR 26643) and includes a January 1, 2017 deadline for of non-jacketed DOT-111 tank cars in PG I service in an HHFT. Not adhering to the January 1, 2017 deadline would trigger a reporting requirement. This reporting requirement would require owners of non-jacketed DOT-111 tank cars in Packing Group I service in an HHFT to report to DOT the following information regarding the retrofitting progress: • The total number of tank cars retrofitted to meet the DOT-117R specification; • The total number of tank cars built or retrofitted to meet the DOT-117P specification; • The total number of DOT-111 tank cars (including those built to CPC-1232 industry standard) that have not been modified; • The total number of tank cars built to meet the DOT-117 specification; and • The total number of tank cars built or retrofitted to a DOT-117, 117R, or 117P specification that are Electronically Controlled Pneumatic (ECP) brake ready or ECP brake equipped. Although this reporting requirement applies to individual owners of non-jacketed DOT-111 tank cars in PG I service in an HHFT, DOT would accept a consolidated report from a group representing the affected industries. Furthermore, while not adhering to the January 1, 2017 retrofit deadline triggers an initial reporting requirement, it would also trigger a requirement that would authorize the Secretary of Transportation to request additional reports of the above information with reasonable notice.
May 28, 2015	DOT announced that the May 2014 Emergency Order regarding emergency response notifications for shipments of petroleum crude oil by rail would remain in full force and effect until further notice while the agency considered options for codifying the May 2014 disclosure requirement on a permanent basis.
June 9, 2015	FRA issued a Safety Advisory to stress to passenger railroads and railroads that host passenger service and their employees the importance of compliance with Federal regulations and applicable railroad rules governing applicable passenger train speed limits. The safety advisory made recommendations to these railroads to ensure that compliance with applicable passenger train speed limits is addressed by appropriate railroad operating policies and procedures and signal systems.

PHMSA and FRA Safe Transportation of Energy Products Chronology September 2012 – November 2015	
July 9, 2015	The U.S. Department of Energy released a Crude Oil Characteristics Research Sampling, Analysis and Experiment (SAE) Plan, which contained recommendations on research needed to improve understanding of transport-critical crude oil and especially tight crude oil properties.
August 18, 2015	PHMSA invited comments on the topic of Hazardous Materials Shipping Papers and Emergency Response Information. This information collection was for the requirement to provide a shipping paper and emergency response information with shipments of hazardous materials.
August 20, 2015	FRA issued a Safety Advisory to emphasize the importance of timely repairing ballast defects and conditions on main tracks. FRA noted that ballast defects and ballast conditions that are not repaired in a timely manner could lead to future defects.
September 28, 2015	DOT announced $5.9 million in first responder grants to help protect communities from flammable liquids by rail incidents.
October 14, 2015	PHMSA invited comments on the topic of Flammable Hazardous Materials by Rail Transportation. This information collection pertained to requirements for the creation of a sampling and testing program for unrefined petroleum-based products and rail routing for high hazard flammable trains (HHFTs), routing requirements for rail operators, and the reporting of incidents that may occur from HFFTs. This reporting requirement required owners of non-jacketed DOT-111 tank cars in Packing Group I service in an HHFT to report to DOT the following information regarding the retrofitting progress: • The total number of tank cars retrofitted to meet the DOT-117R specification; • The total number of tank cars built or retrofitted to meet the DOT-117P specification; • The total number of DOT-111 tank cars (including those built to CPC-1232 industry standard) that have not been modified; • The total number of tank cars built to meet the DOT-117 specification; and • The total number of tank cars built or retrofitted to a DOT-117, 117R, or 117P specification that are Electronically Controlled Pneumatic (ECP) brake ready or ECP brake equipped.

PHMSA and FRA Safe Transportation of Energy Products Chronology September 2012 – November 2015	
November 6, 2015	PHMSA issued its response to the appeals to the final rule for Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains**.** PHMSA denied the appellants' (DGAC, ACC, AAR, AFPM, and Treaty Tribes) appeals on Scope of Rulemaking, Tribal Impacts and Consultation, Retrofit Timeline and Tank Car Reporting Requirements, Thermal Protection for Tank Cars, and Advanced Brake Signal Propagation Systems, and it reasonably determined how to apply new regulations and provided the regulatory analysis to support those decisions. While PHMSA understood that shippers, carriers, and tank car manufacturers for Class 3 flammable liquids would face new challenges in the wake of these regulations, it maintained that they are capable of complying with the final rule.
August 27-28, 2013	FRA and PHMSA hosted a joint public meeting to receive public input on improving the safe transport of hazardous materials by rail.

Appendix C - Proposed Federal Legislation

The US Congress also has become involved in the transportation of hazardous commodities. The following table outlines the proposed hazardous materials rail transportation related House Resolutions and Senate Bills in the 114th Congress. These bills have been introduced and referred to committees for additional review but are noted as potential emerging policies for safer hazardous materials transportation by rail.

Number	Name	Sponsor	Date Introduced	Date Referred to Committee	Summary
H.R. 2834	To enact certain laws relating to the environment as title 55, United States Code, "Environment"[103]	Rep. Tom Marino [R-PA]	6/18/2015	House Judiciary Committee 6/18/2015 Mark up 10/27/2015	The purpose of this Act is to codify certain existing laws relating to the environment as a positive law title of the United States Code.
S. 1462	Eliminating Dangerous Oil Cars and Ensuring Community Safety Act[104]	Sen. Charles Shumer [D-NY]	5/22/2015	Senate Commerce, Science, and Transportation 5/22/2015	Bill to improve the safety of oil shipments by rail and for other purposes.
H.R. 2379	To prohibit the transportation of certain volatile crude oil by rail.[105]	Rep. Nita Lowey [D-NY]	5/15/2015	Railroads, Pipelines and Hazardous Materials 5/18/2015	To prohibit the transportation of certain volatile crude oil by rail

[103] US Congress, *H.R.2834 - To enact certain laws relating to the environment as title 55, United States Code, "Environment."* https://www.congress.gov/bill/114th-congress/house-bill/2834/text (accessed June 29, 2015).
[104] US Congress, *S.1006 - Eliminating Dangerous Oil Cars and Ensuring Community Safety Act* https://www.congress.gov/bill/114th-congress/senate-https://www.congress.gov/bill/114th-congress/senate-bill/1462/text?q=%7B%22search%22%3A%5B%22%5C%22s1462%5C%22%22%5D%7D (accessed June 29, 2015).
[105] US Congress, *H.R.2379 - To prohibit the transportation of certain volatile crude oil by rail.* https://www.congress.gov/bill/114th-congress/house-bill/2379/text?q=%7B%22search%22%3A%5B%22%5C%22hr2379%5C%22%22%5D%7D (accessed June 29, 2015).

Number	Name	Sponsor	Date Introduced	Date Referred to Committee	Summary
S. 1175	Hazardous Materials Rail Transportation Safety Improvement Act of 2015[106]	Ron Wyden [D-OR]	4/30/2015	Senate Finance 4/30/2015	To improve the safety of hazardous materials rail transportation, and for other purposes
H.R. 2074	The Toxics by Rail Accountability and Community Knowledge (TRACK) Act[107]	Rep. Donald Norcross [D-NJ]	4/28/2015	Railroads, Pipelines and Hazardous Materials 4/29/2015	Bill to "improve hazmat-by-rail safety by implementing a series of recommendations made by the National Transportation Safety Board (NTSB) following the 2012 train derailment in Paulsboro, NJ.
S. 1041 H.R. 1930	End Polluter Welfare Act of 2015[108]	Sen. Bernard Sanders [I-VT]/ Rep. Keith Ellison [D-MN]	4/22/2015	4/22/2015 Referred to the House Subcommittee on Environment 08/18/15	Amends a variety of environmental acts, including, the Oil Pollution Act to eliminate the limitation on liability for offshore facilities and pipeline operators for oil spills
S. 1006	Positive Train Control Safety Act[109]	Sen. Dianne Feinstein [D-CA]	4/16/2015	Commerce, Science, and Transportation 4/16/2015	Bill to modify specific sections of Section 20157 (a) (1) of title 49, U.S. Code. Among the changes is incentivizing early adoption of positive train control.

[106] US Congress, *S.1175 - Hazardous Materials Rail Transportation Safety Improvement Act of 2015*, https://www.congress.gov/bill/114th-congress/senate-bill/1175/text?q=%7B%22search%22%3A%5B%22%5C%22s1175%5C%22%22%5D%7D (accessed June 29, 2015).
[107] US Congress, *All Bill Information for S. 546 – RESPONSE Act of 2015*, https://www.congress.gov/bill/114th-congress/senate-bill/546/all-info#summary (accessed June 29, 2015).
[108] US Congress, *S.1041 - End Polluter Welfare Act of 2015,* https://www.congress.gov/bill/114th-congress/senate-bill/1041?q=%7B%22search%22%3A%5B%22%5C%22s1041%5C%22%22%5D%7D (accessed June 29, 2015).
[109] US Congress, *S.1006 - A bill to incentivize early adoption of positive train control, and for other purposes* https://www.congress.gov/bill/114th-congress/senate-bill/1006?q=%7B%22search%22%3A%5B%22%5C%22s1006%5C%22%22%5D%7D (accessed June 29, 2015).

Number	Name	Sponsor	Date Introduced	Date Referred to Committee	Summary
H.R. 1804	Crude-By-Rail Safety Act[110]	Rep. Jim McDermott [D-WA]	4/15/2015	Railroads, Pipelines, and Hazardous Materials 4/16/2015	Bill to protect the public, communities across America, and the environment by increasing the safety of crude oil transportation by railroad, and for other purposes.
H.R. 1789	Tank Car Safety and Security Act of 2015[111]	Donald Payne [D-NJ]	4/14/2015	Transportation Security 4/27/2015	Directs the Secretary of Transportation (DOT) to revise federal regulations regarding DOT-111 tank cars used to move flammable liquids. Directs the Administrator of the Transportation Security Administration to issue regulations to require that all rail safety coordinators ensure that no tank car containing crude oil is left unattended during any period that it is being transferred between railroad carriers or between a railroad carrier and a shipper. Directs the Secretary to submit to Congress a plan to phase out older-model DOT-111 tank cars that are not retrofitted to meet the new federal requirements.

[110] US Congress, *H.R.1804 - Crude-By-Rail Safety Act*, https://www.congress.gov/bill/114th-congress/house-bill/1804?q=%7B%22search%22%3A%5B%22%5C%22hr1804%5C%22%22%5D%7D (accessed June 29, 2015).
[111] US Congress, *H.R.1789 - Tank Car Safety and Security Act of 2015*, https://www.congress.gov/bill/114th-congress/house-bill/1789?q=%7B%22search%22%3A%5B%22%5C%22hr1789%5C%22%22%5D%7D (accessed June 29, 2015).

Number	Name	Sponsor	Date Introduced	Date Referred to Committee	Summary
H.R. 1679	Bakken Crude Stabilization Act of 2015[112]	Rep. John Garamendi [D-CA]	3/26/2015	Railroads, Pipelines, and Hazardous Materials 3/27/2015	This bill authorizes Bakken crude oil to be transported by rail only if it has a Reid vapor pressure of not more than 9.5 pounds per square inch (the maximum volatility set by the New York Mercantile Exchange for crude oil futures contracts).
H.R. 1290	To provide for a study by the Transportation Research Board of the National Academies on the impact of diverting certain freight rail traffic to avoid urban areas, and for other purposes.[113]	Rep. Keith Ellison [D-MN]	3/4/2015	Railroads, Pipelines, and Hazardous Materials 3/5/2015	To provide for a study by the Transportation Research Board of the National Academies on the impact of diverting certain freight rail traffic to avoid urban areas, and for other purposes.
H.R. 1804	Crude-By-Rail Safety Act	Rep. Jim McDermott [D-WA]	4/15/2015	Railroads, Pipelines, and Hazardous Materials 4/16/2015	Bill to protect the public, communities across America, and the environment by increasing the safety of crude oil transportation by railroad, and for other purposes.

[112] US Congress, *H.R.1679 - Bakken Crude Stabilization Act of 2015*, https://www.congress.gov/bill/114th-congress/house-bill/1679?q=%7B%22search%22%3A%5B%22Bakken+Crude+Stabilization+Act+2015%22%5D%7D (accessed June 29, 2015).
[113] US Congress, *H.R.1290 - To provide for a study by the Transportation Research Board of the National Academies on the impact of diverting certain freight rail traffic to avoid urban areas, and for other purposes*. https://www.congress.gov/bill/114th-congress/house-bill/1290/titles?q=%7B%22search%22%3A%5B%22provide+for+study+the+Transportation+Research+Board+National+Academies+impact+diverting+certain+freight+rail+traffic+avoid+urban+areas%22%5D%7D (accessed June 29, 2015).

Number	Name	Sponsor	Date Introduced	Date Referred to Committee	Summary
H.R. 2074	The Toxics by Rail Accountability and Community Knowledge (TRACK) Act[114]	Donald Norcross (NJ-01)	4/28/2015	Railroads, Pipelines, and Hazardous Materials 4/29/2015	Bill to "improve hazmat-by-rail safety by implementing a series of recommendations made by the National Transportation Safety Board (NTSB) following the 2012 train derailment in Paulsboro, NJ.
H.R. 2379	To prohibit the transportation of certain volatile crude oil by rail.[115]	Nita Lowey [D-NY]	5/15/2015	Railroads, Pipelines, and Hazardous Materials 5/18/2015	To prohibit the transportation of certain volatile crude oil by rail
S. 859	Crude-by-Rail Safety Act	Sen. Maria Cantwell [D-WA]	3/25/2015	Commerce, Science, and Transportation 3/25/2015	Bill calls for enhanced breaking mechanisms, raising the standards for tank car safety, increasing crude-by-rail inspections, increasing penalties for non-compliance, considerable changes for all rail oil spill response plans, and further research on tank car design and oil-volatility levels. The bill also includes many changes to emergency response resource inventories and would mandate reporting on "close-call" incidents.

[114] US Congress, *All Bill Information for S. 546 – RESPONSE Act of 2015*, https://www.congress.gov/bill/114th-congress/senate-bill/546/all-info#summary (accessed June 22, 2015).
[115] US Congress, *H.R.2379 - To prohibit the transportation of certain volatile crude oil by rail.* https://www.congress.gov/bill/114th-congress/house-bill/2379/text?q=%7B%22search%22%3A%5B%22%5C%22hr2379%5C%22%22%5D%7D (accessed June 29, 2015).