South Dakota State Rail Plan

Volume 2 – Technical Report

prepared for

South Dakota Department of Transportation

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Preface

South Dakota has a vast multimodal transportation system that serves the State's residents, travelers and businesses. The State's nine railroads, with 1,851 track miles and 2,992 public and private railroad crossings, are a critical component of this system, serving the businesses that drive the State's economy and providing connectivity both within the State and to national and international markets.

This State Rail Plan is used to facilitate the rail elements of South Dakota's Long-Range Statewide Transportation Plan and ensure that rail policy and planning is coordinated with other planning efforts. This State Rail Plan also sets forth a vision and goals, which were developed in conjunction with an independent Advisory Committee, that closely match and build on those found in the LRSTP. This chapter discusses these aspects of the State Rail Plan in more detail.

Cover photo: Ethanol train rests over the falls at Sioux Falls Park, Sioux Falls, South Dakota

Photo this page: Grain train at Oneida, South Dakota

THE ROLE OF RAIL IN STATEWIDE TRANSPORTATION

Rail is a critical component of South Dakota's multimodal transportation system, serving the businesses that drive the State's economy and providing connectivity both within the State and to national and international markets. Recognizing this importance, South Dakota ensures that rail is integrated into all long-range transportation planning processes and activities.

THE ROLE OF RAIL IN SOUTH DAKOTA'S MULTIMODAL TRANSPORTATION SYSTEM

As shown in Table 1, South Dakota's multimodal transportation system serves the State's residents, travelers and businesses in a number of ways. Intermodalism is a primary component of an effective transportation system; the linkages, interactions, and movements on each mode work in conjunction to serve the State's transportation needs.

The rail system in South Dakota plays a critical role in the State's economic and transportation "big picture." For example, the rail system serves as the conduit for local agricultural products traveling to both domestic destinations and export markets. However, no transportation system operates in a vacuum - in order for the rail system to operate most effectively, it must have seamless connectivity with each of the other modes both inside and outside the state, and be accessible by South Dakota's industry and other rail users.

Table 1. South Dakota's Multimodal Transportation System

Mode	Extent of System in South Dakota	Serves Freight	Serves Passengers
Road/Highway System	7,841 miles of Interstate and State highways handling 69 of vehicle miles traveled. 76,381 miles of county and municipal streets	●	●
Public Transit System	22 rural transit providers with 1.86 million rides in 2009 and 2 urban transit providers with 1.4 million rides.		●
Railroad System[a]	Nine railroads with 1,851 track miles and 2,992 public and private railroad crossings. The State owns 316.9 active miles which are leased to regional authorities.	●	
Aviation System	72 public-use airports, 57 of which qualify for Federal funding, and 6 providing commercial passenger service.	●	●

Source: Adapted from South Dakota Statewide Long-Range Transportation Plan, 2010.

[a] *Could serve passengers in the future if there is market demand.*

SOUTH DAKOTA'S MULTIMODAL TRANSPORTATION GOALS

The South Dakota Department of Transportation (DOT) periodically develops the Long-Range Statewide Transportation Plan (LRSTP) to identify new opportunities, trends, and technologies to

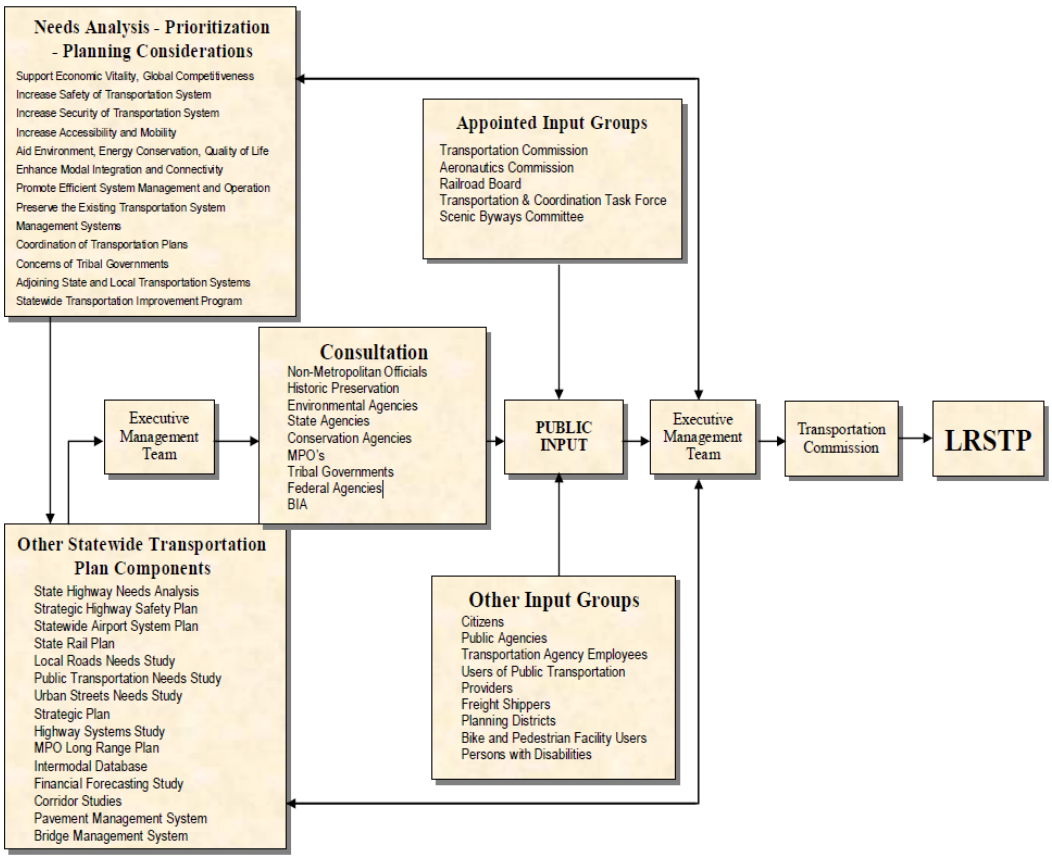
facilitate the planning process for all modes of transportation and their interconnections with each other. This document, last updated in 2010, guides annual decision-making for the Statewide Transportation Improvement Program (STIP). It also guides the development of the South Dakota DOT Strategic Plan and coordinates with Metropolitan Planning Organizations (MPOs), Tribal governments, local governments, and other entities.

The goal of the LRSTP is not to provide specific improvements and needs, but rather to address opportunities and trends and to provide general action items. Detailed descriptions of future conditions and methodologies of improvement are provided through other planning documents. By extension, the following plans are components of the LRSTP:

- South Dakota DOT Strategic Plan;
- Statewide Transportation Improvement Plan;
- State Aviation System Plan;
- State Rail Plan;
- Strategic Highway Safety Plan;
- State Highway Needs Analysis;
- Local Roads Needs Study;
- Public Transportation Needs Study;
- Urban Streets Needs Study;
- Highway Systems Studies;
- MPO's Long-Range Plans;
- Intermodal Data;
- Financial Forecasting Study; and
- Corridor Studies.

These various Statewide Transportation Plans are a key element of the planning process for South Dakota's transportation system. Figure 1 shows the relationship of these and other inputs into the final LRSTP.

Figure 1. South Dakota's Integrated Transportation Planning Process



Source: Adapted from South Dakota Statewide Long-Range Transportation Plan, 2010.

More specifically, this State Rail Plan has been developed to address the elements of the LRSTP guidance related to rail, and ensure that rail policy and planning is in sync with the foundation provided by the LRSTP. This State Rail Plan also sets forth a vision and goals, described in the next subsection, which were developed in conjunction with an independent Advisory Committee to closely match and build on those found in the LRSTP. The LRSTP goals are:

- **Goal 1 –** Preserve and maintain South Dakota's transportation system;
- **Goal 2 –** Promote transportation safety;
- **Goal 3 –** Support access and connectivity to important facilities like grain elevators, ethanol plants, pipeline terminals, wind energy facilities, airports, freight terminals, large employment and retail generators, and intermodal facilities;
- **Goal 4 –** Promote transportation efficiencies within and among all transportation modes;
- **Goal 5 –** Promote transportation facility enhancements within our authority and financial constraints;
- **Goal 6 –** Support economic growth;
- **Goal 7 –** Provide mobility and transportation choices;
- **Goal 8 –** Preserve South Dakota's quality of life; and
- **Goal 9 –** Promote transportation security.

South Dakota State Rail Plan Vision Statement and Goals

The South Dakota State Rail Plan vision statement has been developed as a forward-looking statement to shape the future of the State's rail system and ensure the beneficial outcomes of rail are realized.

The 2014 South Dakota State Rail Plan Vision Statement

The South Dakota rail system provides competitive and efficient service, in the safest manner possible, to connect South Dakota businesses and industries with domestic and international markets, and support statewide economic development activities.

This vision is carried out through the State Rail Plan's goals, investment program and supporting actions. Five goals and goal statements have been developed for the South Dakota State Rail Plan, which are to:

- Support economic growth and development;
- Ensure connectivity for critical industries;
- Maintain State railroad assets in a state of good repair;
- Reduce highway impacts; and
- Improve railroad safety, security, and resiliency.

Each of these goals are briefly elaborated on in the goal statements below, ordered based on Advisory Committee indication of importance.

Support Economic Growth and Development

South Dakota business, industry, and government leaders continue to emphasize the importance of statewide economic growth and development activities. The State's rail plans, investments, and policies should support these local and regional economic development efforts by seeking to increase local freight handling capacity and capabilities, developing and promoting local freight connections, and linking rail investments to actions that support economic development.

Ensure Connectivity for Critical Industries

Providing competitive, efficient, and reliable rail connections to existing and emerging industries helps lower the cost of doing business in the State, broadens the market reach for South Dakota products, and is a critical component of business attraction and retention strategies. Through competitive rail access, targeted infrastructure investments, coordination with neighboring states, and rail-focused policy development, South Dakota should ensure that key State industries have competitive and efficient links to the transcontinental freight rail network, can operate reliably on that network, and have access to all domestic and international markets.

Maintain State Railroad Assets in a State of Good Repair

Over the years, the State of South Dakota has acquired numerous small rail lines that primarily provide local service and serve as last-mile connections for local industries to the transcontinental freight rail network. The State purchased these lines as they were threatened for abandonment, and today many have significant capital and ongoing maintenance needs. The State of South Dakota should ensure that rail-focused asset management programs are in place and rail investments made to preserve these rail assets and increase their value to the public.

Reduce Highway Impacts

There are areas within South Dakota that can be described as "transportation disadvantaged" due to their lack of rail service. This situation results in two key outcomes: the lack of access to rail and rail-served facilities (e.g., grain elevators) leads to higher transportation costs for producers in the region who must rely on trucks to get product to market; and the use of truck transportation in lieu of rail places a higher burden on the highway system, both in terms of weighted load and truck vehicle miles traveled. The State should support investments and policies that both encourage local economic development and reduce the use of the highway system for long-distance moves that may more cost-effectively be served by rail.

Improve Railroad Safety, Security, and Resiliency

Ensuring the safety, security, and resiliency of South Dakota's railroads goes hand in hand with the goal of supporting economic growth and development. The State's rail policies should seek to improve railroad operations by developing and implementing rail safety measures, conducting rail safety public awareness programs, improving the safety of highway-rail grade crossings, assessing the system for external vulnerabilities, and protecting the security of rail technology, assets, and people.

Further discussion of each of these five goals as related to rail system needs and issues is included in Chapter 5. Plan recommendations to support each goal are found in Chapter 8.

2

2 – State and Local Rail Programs

Preface

This chapter provides a high-level overview of the historical development of rail and rail related planning in South Dakota. The rail system has played an important role in South Dakota's history, from the first railroad constructed in 1872 by the Winona and St. Peter Railroad to Gary, through the rail-dependent era of the 1920s–1940s, to the bankruptcies and abandonments of the rail lines in the 1980s.

The State of South Dakota has been a key player in maintaining and improving its rail system assets and operations since the late 1970s. Nine State Rail Plans were developed between 1978 and 1997. Key legislative actions during this time frame include development of a state organizational structure for rail, largely intact an active today, through the 1978 passage of the "Iowa Plan" and a second bill allowing Regional Rail Authorities. In 1979-1980, the Legislature furthered the State's role in railroads, transferring railroad functions to the South Dakota DOT and creating the South Dakota Railroad Authority.

State and local South Dakota rail agencies have worked in conjunction with federal agencies, particularly the Federal Railroad Administration on rail related issues in the State. In terms of funding mechanisms, South Dakota has historically relied upon the now defunct Local Rail Service Assistance and Local Rail Freight Assistance programs. Recent trends in federal and state funding have led to the State seeking rail funding through mechanisms such as the Transportation Investment Generating Economic Recovery (TIGER) grant program.

Photo this page: Ethanol plant at Huron, South Dakota

SOUTH DAKOTA RAIL HISTORY

OVERVIEW OF RAILROADS IN SOUTH DAKOTA'S HISTORY

The following section provides a high-level overview of the role the rail system has played in South Dakota's history. A substantial portion of this overview has been adapted from *South Dakota's Railroads: An Historic Context*, a document developed in 1998 and most recently revised by the South Dakota State Historic Preservation Office in 2007.

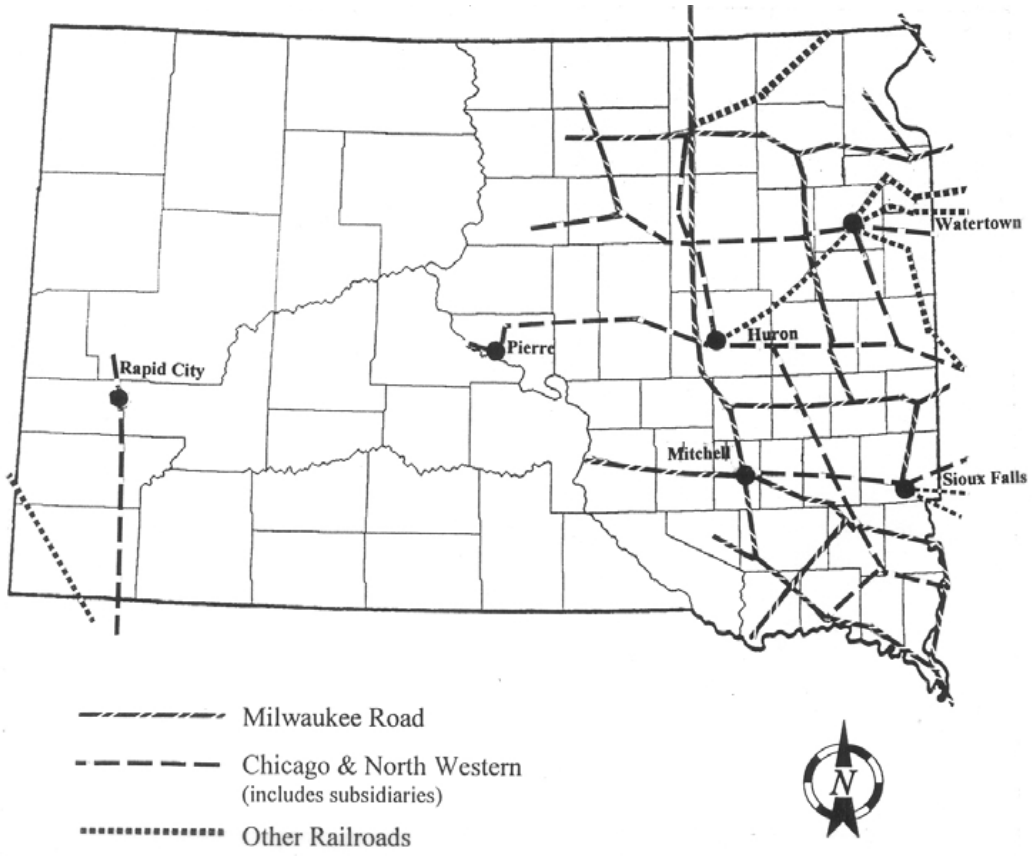
DEVELOPMENT AND EXPANSION (1880 THROUGH 1920)

In South Dakota, as with most of the Midwestern and Western U.S., development of rail lines in the 1870s was a key driver of State development, providing a conduit for settlement and business, community and economic growth. Railway companies directly influenced the shape and location of that growth in South Dakota by actively recruiting homesteaders and by platting town sites to serve as community centers for the new arrivals. Much of South Dakota's initial settlement was directly or indirectly related to agriculture, primarily the establishment of thousands of family farms on homestead allotments of 160 or 320 acres. These settlements were prevalent in the eastern half of the state, where virtually all the available land was taken up by small farms by the end of the 19th century. In the west settlements were much more dispersed and coexisted with the open-range ranches which had preceded the farmers, requiring only a skeletal rail network.

The "Great Dakota Boom" saw the first development of railroad lines in the Black Hills. The Black Hills are South Dakota's only significant mountain group and provide the sole major historic exception to the State's farm- and ranch-based economy. Here, mining and logging activities helped create a strong industrial base which was less common elsewhere in the State, and which served as a local focal point for railway developers.

The first railroad constructed in South Dakota was in 1872 by the Winona and St. Peter Railroad to Gary, followed with a line to Watertown in 1873. The Chicago, Milwaukee, St. Paul and Pacific (later known as the Milwaukee Road), constructed a line stretching from Sioux City, Iowa to Vermillion, extending to Yankton in 1873, and continuing all the way to Mitchell by 1880 bringing people, animals and supplies to the area. It was not until 1878 that two lines were built into what is today Sioux Falls – The Chicago, Milwaukee, St. Paul, and Pacific Railroad arrived from the southeast (Sioux City) and the Chicago, St. Paul, Minneapolis and Omaha Railway (later known as the Chicago and Northwestern) from Worthington, Minnesota. Figure 2 and Figure 3 show the rapid expansion of rail lines in South Dakota in the late 19th Century.

Figure 2. Map of South Dakota's Railroad Network, 1889



Source: South Dakota's Railroads: An Historic Context, South Dakota State Historic Preservation Office.

Figure 3. Map of South Dakota's Railroad Network, 1920

Source: South Dakota's Railroads: An Historic Context, South Dakota State Historic Preservation Office.

The Farm Crisis and Great Depression (1920-1941)

After South Dakota's initial period of settlement had passed, the railroads served for decades as the primary provider of transportation services in the State. Nearly every community boasted one or more railway stations with grain elevators and warehouses lining the railroad sidings. Through these and other services, all taken for granted during South Dakota's early years, the railway companies made themselves indispensable to nearly all of the State's residents.

After World War I, demand for farm commodities dropped and triggered the rural economic downturn of the 1920s, resulting in significant revenue loss for railroads serving rural communities. As a result, in 1925 the Milwaukee Road was pushed into a two-year bankruptcy due to the heavy debt load it carried.

The stock market crash of October 1929 and the years of depression that followed caused a further strain on South Dakota's economy. To make matters worse, shortly thereafter, severe drought, resulting in the "Dust Bowl," displaced thousands of farmers and small town residents. The population of South Dakota declined from a high of nearly 700,000 in 1930 to under 600,000 by 1945. South Dakota farms fell from an all-time high of just over 100,000 in 1915 to under 70,000 by 1945, a decrease of 30 percent. During this time, the Milwaukee Road reentered bankruptcy in 1935, joined by the Chicago and Northwestern (C&NW). Many of the Midwest's other railroads suffered similar fates.

World War II, Post-War Decline, and Abandonment (1941 to Present)

The start of World War II in 1941 placed enormous demands on the national transportation – and railroad – networks to transport troops and wartime freight cargo. However, this resurgence of rail was not to last. The glory years of the U.S. rail system ended after World War II, as automobiles and trucks took their turn as the primary providers of transportation services in the U.S. The expanding airline industry also diverted passenger, freight, and mail traffic from the railroads.

In the decades that followed, a majority of South Dakota's railway lines were abandoned. Most of the State's rail lines lost passenger service by the end of the 1950s, and the last railway-operated passenger train serving South Dakota was discontinued in 1969. Compounding these national trends, the region's farm economy continued to contract and consolidate during the 1960s and 1970s. By 1974, the number of farms in the State had declined to under 45,000. As the rural economy changed, the branch lines which had served rural communities became unprofitable. The 1960s and 1970s saw the beginning of a massive contraction in South Dakota's railway infrastructure and the wholesale abandonment of hundreds of miles of track. South Dakota had a maximum rail mileage of approximately 4,400 miles around 1948. Through bankruptcies, consolidations, and abandonments South Dakota's rail mileage now consists of under 1,900 miles.

SOUTH DAKOTA'S RAIL FUTURE IS UNCERTAIN. IT IS IMMINENTLY POSSIBLE THAT THE STATE WILL NEED TO STEP IN PRESERVE ADDITIONAL RAIL INFRASTRUCTURE.

While the rail system continued to contract into the 1980s, a bright spot appeared when the Dakota, Minnesota and Eastern Railroad (DM&E) – today the Rapid City, Pierre & Eastern (RCP&E), and prior to June 2014 the Canadian Pacific (CP) – purchased the C&NW's main South Dakota line from the Mississippi River, on the east to Rapid City, preventing abandonment. Further purchases occurred in 1996 ending over 120 years of C&NW operations in South Dakota, and positioning the DM&E as a major Midwestern railroad.

A major DM&E announcement in 1997 changed the tone of railroad news in South Dakota from that of abandonment to one of potential growth. That year, the DM&E revealed plans to extend its route westward, constructing new trackage into the productive coal country of Wyoming's Powder River Basin. The DM&E plan featured a rehabilitation of most of the railroad's South Dakota main line, and the construction of an entirely new route from Wall, around the southern end of the Black Hills, and into Wyoming.

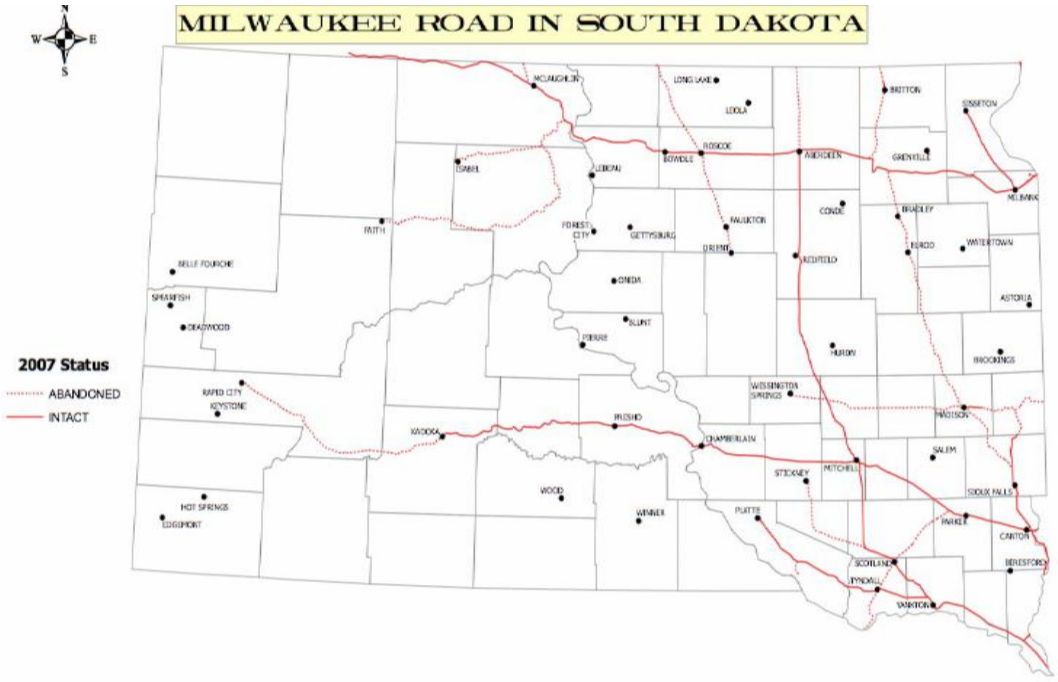
Struggles to obtain financing and regulatory approval for the project occupied the railroad for the next decade, and the economy shifted to one that is less dependent on coal for power generation, resulting in the CP exploring options to sell the former DM&E trackage west of Tracy, Minnesota, which includes all CP/DM&E trackage in South Dakota.

South Dakota's rail future is uncertain. The State's once-massive branch line network is almost completely gone, and local railroading is now thoroughly dominated by the Burlington Northern Santa Fe (BNSF) and, until recently, CP – two corporate entities that did not exist during the historic period. In 2014 the DM&E line was sold by CP to Genesee & Wyoming (G&W), a New York-based rail company that is the nation's largest operator of short line rails. G&W has indicated that it will continue to operate this line, rebranded as the RCP&E. Nevertheless, the possibility of South Dakota having to step in to preserve additional rail in the State appears to be imminent.

SOUTH DAKOTA STATE RAIL INTERVENTION

As noted in Overview of Railroads in South Dakota's History, the Milwaukee Road entered bankruptcy numerous times during its existence; first in 1925, and again in 1935. During the 1960s and 1970s when railroads were aggressively shedding their infrastructure, the Milwaukee Road did not pursue line abandonment with the same vigor, even though the railroad was on very shaky financial ground. The combined effects of increased competition and its unprofitable network returned the Milwaukee Road to bankruptcy in 1977. As part of the company's reorganization efforts, the railroad's bankruptcy trustee announced that the railroad hoped to abandon all of its South Dakota trackage. In March 1980 the Milwaukee Road ceased operations on 853 miles of rail in South Dakota, representing over 30 percent of the of track in the State. The remaining 346 miles of Milwaukee Road track in the State (the main line between Ortonville, Minnesota and Miles City, Montana) were abandoned in March 1982. Figure 4 shows the Milwaukee Roads' expansion and contraction in South Dakota, as of 2007.

Figure 4. Milwaukee Road in South Dakota



Source: South Dakota's Railroads: An Historic Context, South Dakota State Historic Preservation Office.

Recognizing that much of the rail in the State was vulnerable to abandonment, in 1980 the South Dakota Legislature created the South Dakota Railroad Authority and authorized the acquisition of up to 1,254 miles of track and rail facilities, primarily lines that the Milwaukee Road had planned to abandon. The State of South Dakota instituted a temporary sales tax increase to raise $25 million for the purpose of purchasing rail assets to preserve a core rail network in the State and prevent the total loss of rail service to many communities.

With the $25 million, the State of South Dakota acquired 836.5 miles of Milwaukee Road track and related railroad property for $24,860,100 in 1980. Then, in 1981, the Legislature authorized the South Dakota Railroad Authority to issue bonds/notes to acquire the Milwaukee Road's east-west main line. Subsequently, in 1982 the State purchased 479.9 miles of track between Ortonville, Minnesota and Terry, Montana for $30.4 million. In total, the State acquired 1,316.4 miles of track

in South Dakota, Iowa, Minnesota, Montana, and North Dakota for $55 million. All but 20 miles were acquired from the Milwaukee Road; the remainder were purchased from the C&NW.

When the State acquired these rail lines, it placed its purchases in three categories, as described, below:

Main Line	479.9 miles
Core System	435.2 miles
Local Option	398.9 miles
Total	**1,314.0 miles**

- **Main Line.** The main line is the cornerstone of South Dakota's rail system providing access to east and west coast ports, service to the Big Stone power plant and the shortest rail route to the coal fields of Montana to Minnesota. Today this line is owned and operated by BNSF.
- **Core System.** The core system, core to the State's economic development, was originally comprised of the north-south spine through eastern South Dakota – today, owned and operated by BNSF – and the Mitchell to Chamberlin line – today, owned by the State and operated by Dakota Southern. In the mid-2000s, the State transferred the Mitchell to Chamberlin line to local option status.
- **Local Option.** Local option lines are lines that were thought to be less important to broader State needs, yet were essential to ensuring service to local communities. Today, all but one of these lines has been restored to local service through the efforts of the State, regional railroad authorities, and private industry.

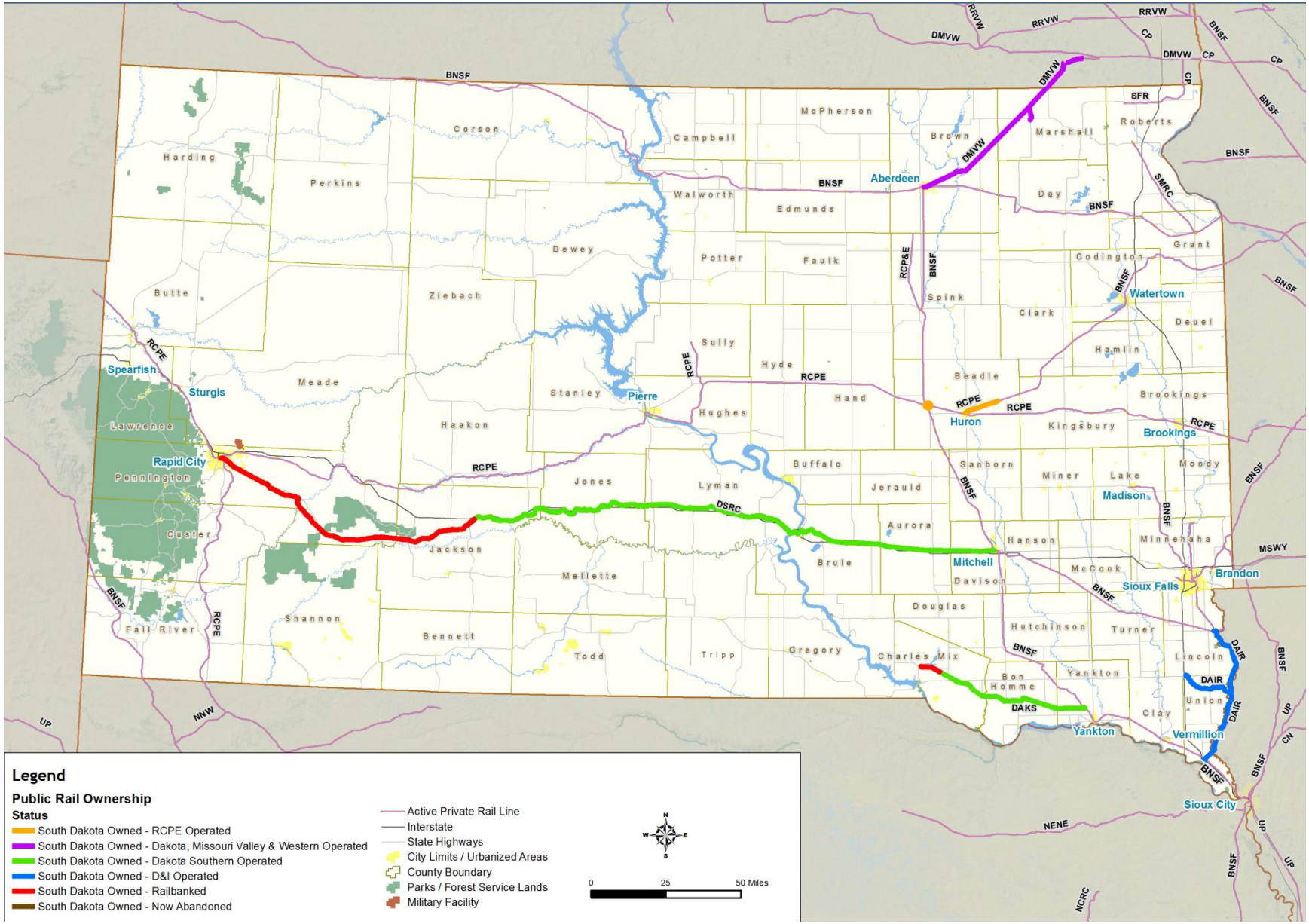
As shown, over the years the State of South Dakota has owned substantial rail infrastructure, however, the State is not interested in owning rail assets for the sake of ownership, alone. The State desires to purchase assets with the intent of preserving rail infrastructure and corridors until a suitable operator or purchaser can be contracted. This was the case of the State's 1982 purchase of the Milwaukee Road's east-west main line (Main Line) across northern South Dakota. The Burlington Northern Railroad (later becoming the Burlington Northern Santa Fe or BNSF) was contracted to provide service over key components of the State-owned network, and in December 2005 it exercised its right to purchase outright much of the trackage it had been contracted to operate.

Other former Milwaukee Road routes saw renewed life as independent shortlines. The largest of these, the Dakota Southern Railway, is licensed to operate the State-owned route from Mitchell through Chamberlain to Kadoka – a segment of the Milwaukee Road's former Rapid City line. The line had been largely moribund in recent years, though, and is now only operable east of Presho (190.9 miles), with the Kadoka to Rapid City portion rail banked (98.5 miles). A second former Milwaukee Road line, running from a point near Yankton to Platte, was also operated by the Dakota Southern between 1985 and 1987; idle for the last two decades, a portion of that route may reopen to serve a proposed ethanol plant near Wagner. Dakota Southern is still the licensed operator of the portion between Napa Junction and Ravinia (54.5 miles), however the portion between Ravinia and Platte currently is not leased (26.6 miles), and is rail banked.

Several other small railroads have been established in far eastern South Dakota since 1980, operating segments of former Milwaukee Road, C&NW and/or Great Northern trackage. These new shortlines, with their relatively low operating costs, were able to preserve service on lightly trafficked lines that had been unprofitable for the larger railroads. The Dakota, Missouri Valley and Western (DMVW) operates the 76.7-mile, State-owned stretch between Geneseo Junction,

North Dakota and Aberdeen. The Dakota and Iowa (D&I) Railroad operates the 68.6-mile, State-owned stretch between Canton and Elk Point with a branch near Hawarden that leads to Beresford and the CP operates the 15.3-mile, State-owned stretch between Huron and Yale. In total, the State of South Dakota currently owns 316.9 active rail miles, as shown in Figure 5.

Figure 5. Public Rail Ownership in South Dakota



STATE RAIL PLANNING HISTORY

South Dakota has a long history of state rail planning that was driven in part by Federal requirements. The nine State Rail Plans developed between 1978 and 1997, detailed in Appendix A, show that over the years South Dakota has continuously explored and had an awareness of rail system assets and operations. The following text summarizes the key rail issues faced by South Dakota described in these historical plans.

Key Issue – Core System and Individual Lines

In the early days of rail planning, the main focus was on designating a core system of rail lines which needed to be preserved. With many lines subject to potential abandonment and almost all requiring financial assistance of some sort, the State needed to prioritize lines based on the needs of the State, the users, and the rail lines themselves. Rail Plans developed in the late 1970s and early 1980s focused on all rail links, assessing traffic volumes, revenues, and improvement needs. This planning was hindered by the Milwaukee Road bankruptcy in which all former track owned by this rail line in the State of South Dakota was not designated for future service as part of the company's reorganization plan. For this reason, the 1978, 1980, and 1981 Rail Plans all had frequent addendums due to the rapidly changing structure of the rail system. This led to the state purchase of several hundred miles of the core system and local option lines. Once this core system was designated with a secure future, the focus shifted to the analysis of only a few lines at a time, with heavy emphasis on lines subject to abandonment. By 1983, Rail Plans became less frequent as the rail system went through fewer changes. In fact, the 1983 Rail Plan consisted of an addendum focusing on an economic evaluation of five rail lines, and a freight transportation study of the Watertown area. After this update, Rail Plans were only published every few years and without multiple updates a year.

Key Issue – Line Ownership

The earliest Rail Plans developed by the State of South Dakota were responsive to rapidly changing rail infrastructure. In trying to keep a useful and profitable rail system in the State, the main focus was on developing a core system. With the Milwaukee Road bankruptcy, the ownership of the line became an important factor. At the time, Milwaukee Road owned the most track in the State, yet none of it was designated for future service as part of bankruptcy reorganization schemes. In order to preserve important rail linkages, the State purchased much of what was considered the core system, a somewhat untraditional move considering the predominately privately owned industry. This network was then operated by Burlington Northern (later Burlington Northern Santa Fe) allowing rail users in the State to connect to this operator's expansive nationwide network.

Beyond purchase and operation agreements, the type of operator plays a factor in usage of each line. Through the years, rail lines were sold amongst companies, most typically with the Class I operators selling their collector lines to focus on the more profitable main lines. This has led to the growth of shortline and regional railroads within South Dakota, who can provide dependable and responsive service. In 1997, five of the eight railroad companies providing freight service in the State were shortline operators.

Key Issue – Weather Events

With such a large portion of rail traffic coming from agriculture, weather events have had a significant impact on the rail system, affecting content of rail plans depending on current conditions. Most significant was the drought highlighted in the 1978 Rail Plan. The statewide average for major field crops in 1976 was a mere one-third of the 1967-1974 average.

Rail shipments of farm commodities originating in South Dakota declined 35 percent in 1975. Given the extent of the rail system at the time and the number of potential abandonments, such a sharp decline in farm production had a pronounced effect on rail system economics. Throughout the years, weather events became less of an issue due to the increased use of irrigation on South Dakota acreage, which also fueled a transportation demand for more fertilizer. Weather did not hinder the strength of the rail system again until the spring of 1993. As reported in the 1997 Rail Plan, heavy rains caused widespread flooding in eastern South Dakota resulting in extensive damage to rail lines and disruption of service. The FRA provided a $1.4 million grant to South Dakota to repair the damaged track.

Key Issue – Agricultural Needs

As evidenced by the impact of the drought in the mid-1970s, agriculture has a significant impact on the State rail system. Most lines in need of severe maintenance at the time were light density branch lines. These lighter weight rail lines prevented the use of modern jumbo hopper cars which are more efficient and cost-effective for moving grain and fertilizer than the outdated boxcar. Due to this, many former rail users switched to motor carriers, reducing traffic volumes on the State rail system and increasing wear and tear on the roadways. Earlier Rail Plans highlighted the need to update rail lines in order to accommodate these larger cars. Indeed, as the rail lines began to improve and handle heavier loads, some were able to make the switch to the hopper cars. As a result, the number of cars moved on the rail system decreased over the years, yet volume remained relatively stable. Later Rail Plans identified unit trains and consolidated grain loading facilities as being responsible for reversing the trend of a decreased market share of grain transportation. Instead of long-haul trips out of state, trucks were being used for short-haul trips to unit train terminals, giving grain producers better prices from lower transportation costs. Private industry also built new elevators and updated existing ones to take advantage of these trends. Between the 1986 and 1989 Rail Plans alone, 16 unit train facilities were created to meet agricultural needs within the State.

Key Issue – Legislation and Funding

In order to preserve South Dakota's rail system in the 1970s and 1980s, the State Legislature enacted a series of bills to aid the rail system. The Railroad Revitalization and Regulatory Reform Act of 1976 (4-R Act), created the Local Rail Assistance Program, a Federal loan program that led the way to the development of the Rail Plan South Dakota (the program required periodic State-level rail planning activities). The 1978 State Legislature passed two bills to help the government invest in rail facilities. The "Iowa Plan" allowed for South Dakota to pay one-third of the cost of rail rehabilitation. The second bill allowed for local governments to form bonding districts as a way to raise money. The 1980 Rail Plan highlighted further legislation to aid the State rail system, including increasing the budget for the Division of Railroads, creating the South Dakota Railroad Authority, and the appropriation of $25 million to implement the purchase of some of the core system and local option lines.

Once the core system was designated and the future of the South Dakota rail system was deemed more secure, fewer major legislative actions were highlighted in the Rail Plans. In fact, the focus shifted to the lack of funding due to the expiration of recent legislative and funding programs. In 1988 and 1995 respectively, the Local Rail Service Assistance (LRSA) program and the authorization for the Local Rail Freight Assistance (LRFA) program expired. The 1997 Rail Plan highlighted that the availability of Federal assistance for rehabilitation had been problematic since 1988 due to uncertainties in the Federal budget process. The State did not have the resources to

replace the loss of such Federal funds and the shortline operations which depended upon them have limited capital for improvements.

Key Issue – Organization and Planning

As the needs of the rail system evolved, so too did the agencies behind it. Rail planning began with a Railroad Seminar in 1973, leading to the designation in that same year of the Railroad Policy Task Force by the Governor. This Task Force recommended the creation of a Division of Railroads within the South Dakota Department of Transportation. Within this Division, the Railroad Advisory Committee became a permanent replacement of the Task Force to represent the people of South Dakota. Other organizational changes were also highlighted in the Rail Plans. 1980 saw the creation of the South Dakota Railroad Authority, which was quickly abolished (along with the Division of Railroads) by the time of the 1983 Rail Plan. Afterwards, the agency responsible for rail planning within the State varied over the years. Most often, the responsibility fell under the Division of Planning with the Department of Transportation.

While government planning and organization had been key to the preservation of the rail system in South Dakota, each Rail Plan also stressed the importance of public participation to this cause. The early stages of the Rail Plan development included ten meetings with the general public to get feedback on the Rail Plan and the prioritized lines. This information was especially important in the early days of the Rail Plan when limited funding was available and the various planning organizations needed to know how the users felt about the rail lines in their communities.

Other Rail Plan Considerations

Rail Grade Crossings

By the 1980s, with so many abandoned lines within the State and increased traffic on the remaining lines, safety at rail grade crossings emerged as a concern. In 1984, instead of a Rail Plan, a Rail/Highway Grade-crossing Study was completed for the City of Aberdeen. Solutions for dealing with the crossings were either to abandon the tracks, block off the street, or construct grade separations. In many cases, the rail lines already were abandoned, yet the signals, signing, and crossing remained intact, creating confusion for drivers. All remaining active crossings were examined to determine risk factors and estimated costs of improvement. More recently, a similar study was performed in 2011 through the Pierre/Fort Pierre area with representatives of the State, County, City, and Railroad (DM&E) participating.

Passenger Service

Nearly every Rail Plan briefly mentioned the lack of passenger rail service within the State. This lack results in lines being completely dependent upon freight movements to sustain rail operations, and limits passenger mobility throughout the State. The option of passenger service was never studied in depth in previous Rail Plans as it was believed that a service such as Amtrak was unlikely to be extended to South Dakota. With that being said, the 1997 Rail Plan mentions that in 1994 the Northern Hills Regional Railroad Authority discussed passenger rail service between Deadwood and Rapid City, but the concept was dismissed due to lack of funding.

SOUTH DAKOTA RAIL PROGRAMS

STATE AND LOCAL RAIL PROGRAM LEGISLATION

Beginning in the late 1970s, the South Dakota Legislative acted several times to intervene in the rail abandonment crisis faced by the State. Two important pieces of legislation to aid railroads were passed in South Dakota in 1978. The first bill was patterned after the "Iowa Plan," a State of Iowa program that required the State, shippers, and the railroad to each contribute one-third of the cost to rehabilitate a rail line. As all three parties share in the expense, they each share a vested interest in ensuring rail service is continued and efficient. This legislation is codified as South Dakota Codified Law (SDCL) 49-17 – State Aid To Railroad Construction and Maintenance.[1] The second 1978 bill made it possible for the local units of government to form Regional Rail Authorities, enabling them to share in the "Iowa Plan" or to enter into a project on their own. This legislation is codified as SDCL 49-17A – Regional Railroad Authorities.[2]

In 1979, the Legislature transferred all functions of the Public Utilities Commission relating to the abandonment, consolidation, and mergers to the South Dakota DOT, providing the DOT with the planning, project implementation and legal authority to address railroad matter in the State. This legislation is codified as part of SDCL 49-16A – Intrastate Railroad Regulation.[3]

In 1980, the Legislature created the South Dakota Railroad Authority to plan, establish, acquire, develop, construct, purchase, enlarge, maintain, equip, and protect railroads, facilities, and rolling stock in the public interest. This legislation is codified as part of SDCL 49-16B – South Dakota Railroad Authority.[4] Through a one-cent sales tax increase the South Dakota Railroad Authority raised $25 million to execute the purchase plan of the "Core System." The 1980 Legislature also created the South Dakota Railroad Board to act as a policy board to the DOT to assist in managing the purchased system. In 1981, the Legislature authorized the South Dakota Railroad Authority to issue bonds/notes to acquire the Milwaukee Road's east-west "Main Line."

The structure established nearly four decades ago is still largely intact and active today. Figure 6 illustrates the current South Dakota DOT structure, with the Office of Air, Rail and Transit serving as the liaison for the DOT on rail-related issues.

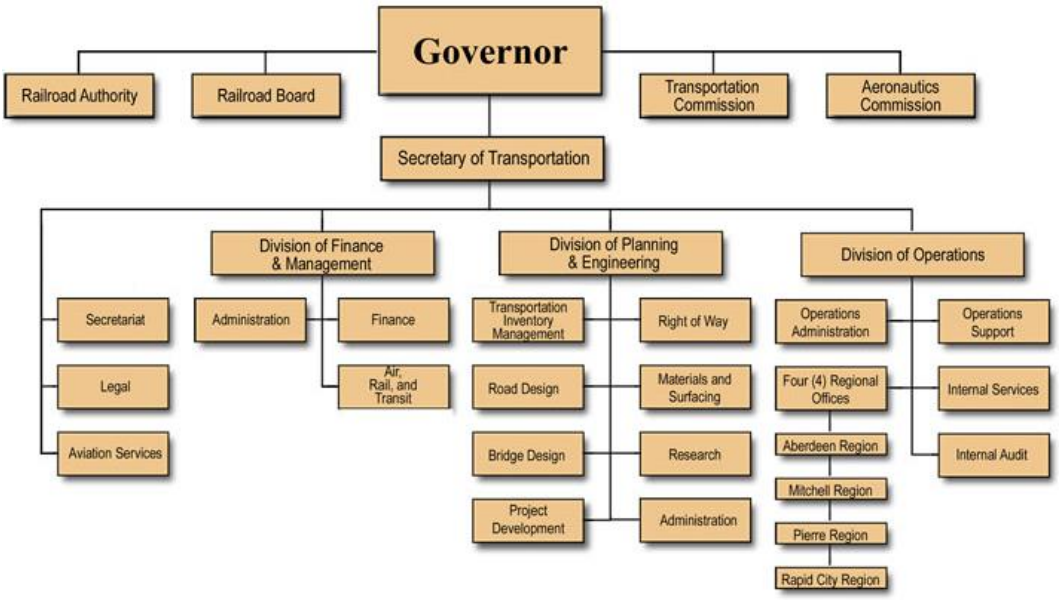
[1] http://legis.sd.gov/Statutes/Codified_Laws/DisplayStatute.aspx?Type=Statute&Statute=49-17

[2] http://legis.sd.gov/Statutes/Codified_Laws/DisplayStatute.aspx?Type=Statute&Statute=49-17A

[3] http://legis.sd.gov/Statutes/Codified_Laws/DisplayStatute.aspx?Type=Statute&Statute=49-16A

[4] http://legis.sd.gov/Statutes/Codified_Laws/DisplayStatute.aspx?Type=Statute&Statute=49-16B

Figure 6. South Dakota DOT Organizational Chart



Source: South Dakota DOT.

RAIL PROGRAM ADMINISTRATION

Federal Agencies

There are numerous Federal departments, agencies, and boards involved in rail-related matters. The U.S. Department of Transportation (U.S. DOT) is the Federal agency with the most extensive involvement, both directly with the carriers and indirectly in conjunction with state DOTs and regional jurisdictions. The following is information on key Federal agencies within and outside the U.S. DOT with a role in rail program administration.

Federal Railroad Administration (FRA). As one of the modal agencies within U.S. DOT, the FRA holds responsibility for developing and enforcing railroad safety rules, managing the Railroad Rehabilitation and Improvement Financing (RRIF) program, providing oversight of Amtrak for U.S. DOT, and managing a small research program. With the passage of the Passenger Rail Improvement and Investment Act (PRIIA) in 2008, and the subsequent provision of capital funding for intercity passenger rail in the American Recovery and Reinvestment Act (ARRA), the FRA was tasked with managing these programs. Traditionally, the vast majority of FRA personnel and financial resources have been devoted to safety enforcement activities.

Within the FRA, the Office of Railroad Safety promotes and regulates safety throughout the nation's railroad industry. It employs more than 415 Federal safety inspectors, who operate out of eight regional offices nationally. FRA inspectors specialize in five safety disciplines and numerous grade-crossing and trespass-prevention initiatives: Track, Signal and Train Control, Motive Power and Equipment, Operating Practices, Hazardous Materials, and Highway-Rail Grade-Crossing Safety. This office collects and compiles accident/incident data from the railroads.

Federal Highway Administration (FHWA). A modal agency within U.S. DOT, the FHWA's Section 130 program provides dedicated funding for rail/highway grade-crossing safety improvements and assigns state DOTs the task of disbursing these funds within their jurisdiction. This includes determining the locations where active crossing devices will be installed, and

assembling the funding necessary for the improvements. Costs associated with installation, upgrading, or replacement of an active device are, generally, the responsibility of public agencies, with the operation and maintenance of the device the responsibility of the railroad. Many states augment Federal grade-crossing funds with state resources.

Federal Transit Administration (FTA). A modal agency within U.S. DOT, the FTA provides financial and technical assistance to state and local commuter rail providers (as well as other local public transit modes). The FTA oversees grants to transit providers, ensuring that grant recipients are managing their programs in accordance with Federal, statutory, and administrative requirements. Whereas, rolling stock is typically a state cost for intercity passenger rail service, the FTA can provide financial support to commuter railroads for rolling stock. South Dakota's interaction with the FTA on rail matters is limited, as there currently is no passenger rail service in the State.

Surface Transportation Board (STB). Established in 1996 as the successor to the long-lived Interstate Commerce Commission (ICC), the STB adjudicates disputes over rates and services between shippers and carriers, and has administrative authority over rail restructuring transactions, including oversight of mergers and acquisitions, new line construction, rail line abandonment, and use of rail lines as recreational trails; railroad rate regulation; and rate and service disputes involving shippers and railroads. In 2008, the PRIIA expanded its role to mediate conflicts between passenger rail operators with freight rail owners. The STB functions as an independent agency, but is administratively affiliated with the U.S. DOT.

National Transportation Safety Board (NTSB). The NTSB is an independent agency responsible for investigating the cause of transportation accidents (all modes) and promoting transportation safety. With respect to rail, it is charged with investigating all railroad accidents involving passenger trains or any accident that results in at least one fatality or major property damage. While the NTSB can make recommendations aimed at preventing future accidents, it has no funding or regulatory enforcement authority.

Pipeline and Hazardous Material Safety Administration (PHMSA). The PHMSA under the U.S. DOT regulates the rail transportation of poison inhalation hazard (PIH) materials for tank cars. A 2009 rule mandates commodity-specific improvements in safety features and design standards for newly manufactured DOT specification tank cars. The rule also imposes a 50-mile-per-hour maximum speed restriction on all loaded PIH tank cars and allows for increase in gross weight of tank cars to accommodate enhanced safety measures. Recently, the PHMSA has been involved in safety in issues related to crude oil transport by rail, such as updating tank car standards and classification of oil products.

Transportation Security Administration (TSA). The TSA, housed within the Department of Homeland Security (DHS) and in cooperation with the U.S. DOT, is responsible for strengthening the security of the nation's transportation systems while ensuring the freedom of movement for people and commerce. As a result of the increased transportation security following the September 11, 2001 terrorist attacks, the Implementing Recommendations of the 9/11 Commission Act of 2007 established requirements for conducting a nationwide risk assessment of a terrorist attack on railroad carriers and the identification of risks to passenger and cargo security. The Act also required the TSA, in coordination with the U.S. DOT and other Federal agencies, to develop a national strategy for railroad transportation security. As part of this role, the TSA funds security initiatives for freight rail carriers that transport security-sensitive materials through high-threat urban areas.

State Agencies

There also are several State entities involved in rail-related matters. The South Dakota DOT's Office of Air, Rail and Transit has the most extensive involvement, serving as a liaison to all other entities. The following is information on key State agencies with a role in rail program administration.

South Dakota Department of Transportation. The Office of Air, Rail and Transit within the Division of Finance and Management, administers a variety of railroad programs and is the Departments' liaison to the South Dakota State Railroad Authority, South Dakota State Railroad Board, and the South Dakota Transportation Commission. Planning functions of the Office include monitoring rail traffic and commodity flow, performing detailed analyses on lines threatened by abandonment or in need of financial assistance, evaluating changes in status, condition and service on rail lines, and analyzing State-owned rail operations. The Office also handles the management of all real and personal property acquired by the State for railroad purposes, includes leasing of property, utility installation, track rehabilitation, industrial track expansion and construction. And, annually, the Office prepares a document which outlines rail improvements that the State intends to complete for each year.

South Dakota State Railroad Authority. The South Dakota State Railroad Authority was authorized when the State purchased the "Core System" and has the power to acquire property and to construct, maintain and equip railroad facilities as the Legislature declares to be in the public interest for railroad purposes. The Authority also may conduct planning studies to determine the full scope of rail system needs. There are seven members on the Authority that are appointed to three-year terms by the Governor.

South Dakota State Railroad Board. The South Dakota State Railroad Board approves matters related to operation, management, finance, marketing and development of rail service over all properties and facilities acquired, leased or controlled by the State. The Board also may, upon written approval of the Governor, make loans from the Railroad Trust Fund. There are seven members on the Board that are appointed to four-year terms by the Governor.

Local Agencies

Regional Rail Authorities. In 1978, the South Dakota Legislature allowed two or more subdivisions to unify to establish Regional Rail Authorities. A Regional Rail Authority may plan, establish, acquire, develop, construct, purchase, enlarge, improve, maintain, equip, operate, regulate, and protect railroads and railroad facilities used or useful in the operation of the railroad. They also may have taxing power through the subdivisions through which the Authority was established. The Authority serves as a legal entity to accept State Railroad Trust Fund dollars. The Authority concept is in wide use in South Dakota, with 27 Railroad Authorities established in the State, shown in Appendix B, although these Authorities are not all currently active.

SOUTH DAKOTA RAIL FUNDING PROGRAMS

This section describes currently available funding programs for rail in the State of South Dakota, organized by Federal and State funding programs.

Federal Rail Funding

U.S. DOT provides numerous rail-related funding sources that may be applied to both freight and passenger rail system needs. South Dakota has historically had the most success with the now

defunct Local Rail Service Assistance (LRSA) and Local Rail Freight Assistance (LRFA) programs, which expired in 1988 and 1995, respectively. These programs provided much needed funding to the State so it could rehabilitate its newly acquired, deteriorating rail lines and bring them back into service. Table 2 provides an historic overview of Federal funds for rail purposes received by South Dakota prior to the expiration of these two programs, with State and other matching funds noted.

Table 2. Federal and Matching Funds for Railroad Rehabilitation in South Dakota (LRSA and LRFA Programs)

Year	Federal Funds	State Funds	Other Funds	Total Funds
1979	$1,840,000	–	$460,000	$2,300,000
1980	$2,000,000	–	$500,000	$2,500,000
1981	$1,760,000	$2,370,000	$1,540,000	$5,670,000
1982	$8,156,404	$2,065,369	$1,097,817	$11,319,590
1983	$648,933	–	$278,114	$927,047
1984	$495,914	$212,535	–	$708,449
1985	$852,347	$810,413	–	$1,662,760
1986	$626,143	–	$268,347	$894,490
1987	$447,318	–	$255,918	$703,236
1988	$132,245	$17,815	$64,312	$214,372
1989	–	–	–	–
1990	$256,333	–	$135,167	$391,500
1991[a]	$36,000	–	$8,209	$44,209
1992	$298,200	–	$127,800	$426,000
1993	$274,194	–	$117,513	$391,707
1994	$2,457,951	–	$428,572	$ 2,886,523
1995	$536,000	–	$237,827	$773,827
Total	**$20,817,982**	**$5,476,132**	**$5,519,596**	**$31,813,710**

Source: South Dakota Rail Plan, 1997.

[a]South Dakota DOT. This is new information, provided to augment the 1997 South Dakota Rail Plan data, and may not be inclusive of all local match funds.

In recent years, other Federal funding sources for rail related programs have been available, although none have been as successful in South Dakota as the LRSA and LRFA. The following text provides an overview of potential funding sources:

- **Federal High-Speed Rail Grants**. In October 2008, Congress enacted the Passenger Rail Investment and Improvement Act of 2008, authorizing capital grants for high-speed rail and intercity passenger rail projects. Later, in February 2009, Congress enacted the Federal American Recovery and Reinvestment Act of 2009, which allocated $8 billion to jumpstart the

development of improved high-speed intercity passenger rail service in the U.S.[5] No high-speed and intercity passenger rail funding has been appropriated since the 2010 fiscal year.

- **Rail Line Relocation Capital Grants**. Section 9002 of SAFETEA-LU added Section 20154 of Title 49 U.S. Code, which authorized up to $350 million annually for a grant program to provide financial assistance for local rail line relocation and improvement projects. Congress has appropriated a total of only $90.1 million for these projects from FFY 2006 through FFY 2011, some earmarked directly to projects and others selected in a competitive process. This program was not reauthorized by MAP-21 (which did not include a separate rail title).
- **Railroad Rehabilitation and Repair.** The Consolidated Security, Disaster Assistance, and Continuing Appropriations Act 2009 allows U.S. DOT $20,000,000 for necessary expenses to make 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. Under this program, a state may apply for a grant from the FRA to cover up to 80 percent of the cost of projects such as repair and rehabilitation of railroad rights-of-way, bridges, signals and other infrastructure that are part of the general railroad system. At least 20 percent of the project cost must be covered by non-Federal sources. Grantees must exhaust all other Federal and state resources prior to seeking assistance under this program.
- **TIGER.** The Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grant program, administered by the U.S. DOT, solicits applications for road, rail, transit, and port projects that promise to achieve critical national objectives such as repairing existing infrastructure, connecting people to jobs, and contributing to economic growth. Since Fiscal Year 2009, Congress has dedicated over $3.6 billion to fund projects that have a significant impact on the Nation, a region or a metropolitan area. In 2010, the South Dakota DOT received a $16 million grant through this program to reconstruct the MRC Railroad.
- **RRIF.** The Railroad Rehabilitation and Improvement Financing (RRIF) program authorized and extended in TEA-21 and SAFETEA-LU, is a loan and credit enhancement program administered by the FRA. The FRA has up to $35 billion in financing authority, and to date has issued $1.7 billion in loans. According to the FRA, RRIF loans can be used for:
  - Acquisition, improvement, or rehabilitation of intermodal or rail equipment or facilities, including track, components of track, bridges, yards buildings, and shops;
  - Refinancing outstanding debt incurred for these listed purposes; and
  - Development or establishment of new intermodal or railroad facilities.

  Loan applicants must pay the credit risk premiums for each loan, unlike the TIFIA program, and also pay for loan analysis and review by FRA contractors. In 2004, the DM&E received a $233 million loan to refinance debt and make track upgrades and in 2007 the DM&E was awarded a $48 million loan through this program to rehabilitate its entire system.
- **TIFIA.** The Transportation Infrastructure Finance and Innovation Act (TIFIA) of 1998 provides credit assistance in the form of direct loans, loan guarantees and credit assistance to major surface transportation projects with dedicated revenue streams. In 2005, SAFETEA-LU opened the TIFIA program to freight projects, and projects like the Reno Rail Corridor in Nevada have been funded. Rather than providing grant funding, TIFIA provides projects with supplemental

[5] This $8 billion ARRA appropriation was for programs authorized in PRIIA, but exceeded the amounts for capital funding authorized in the earlier legislation.

or subordinate debt in order to leverage available Federal resources. As of December 2012, the TIFIA program had provided $10.5 billion in credit assistance, leveraging projects with a total project value of $42.1 billion nationally. MAP-21 authorized $1.75 billion for FFY 2013 and another $1 billion for FFY 2014. This program is administered by the U.S. DOT TIFIA Joint Programs Office. Credit risk premiums for TIFIA debt (the cost to the Treasury for issuing the tax-exempt debt and adjusted for the risk profile of the loan) are directly appropriated by Congress.

- **Projects of National Significance.** In 2005, Section 1301 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users or SAFETEA–LU established funding for projects that have "national and regional benefits, including improving economic productivity by facilitating international trade, relieving congestion, and improving transportation safety by facilitating passenger and freight movement." Although Congress authorized a competitive grant process for allocating these funds, Congress also directly earmarked all the funding to 26 projects. National projects included rail yard relocation, multistate rail corridor improvements, and urban rail congestion relief projects in California and Illinois. The most recent authorization bill, Moving Ahead for Progress in the 21st Century, or "MAP-21" authorized $500 million in 2013 for these projects, but did not directly earmark the projects.
  - **MAP-21 National Freight Network.** While not a funding program, MAP-21 authorizes the designation of a National Freight Network of up to 27,000 miles of highways that will strategically direct resources to highways to move freight. The designation of this network also will include strategies to improve intermodal connectivity, which can include access and connections to rail facilities.
- **Shortline Tax Credits.** In 2004, Congress enacted Section 45G of the Tax Code to provide a tax incentive for shortline railroad improvements. Under this program, which has been extended through December 2013, shortline railroads are allowed a 50 percent Federal tax credit for every dollar invested in track rehabilitation, subject to a total cap based on total track miles. The program may provide up to $160 million in annual benefits for the shortline railroad industry nationally.[6]
- **Private Activity Bonds.** Private Activity Bonds (PAB) have been used by state and local governments to issue tax-exempt public debt for projects with substantial private involvement, including housing, ports, and water projects. With the 2005 passage of SAFETEA-LU, PABs also were extended to highway and freight transfer projects. A total of $15 billion in this particular transportation authority was allowed, and is subject to the approval of U.S. DOT. As of 2012, over $8 billion of the $15 billion cap had been issued or allocated to highway and freight facilities. Freight transfer facilities using PABs include: CenterPoint Intermodal Center in Joliet, Illinois; CenterPoint Intermodal Center in Kansas City, Missouri; RidgePort Logistics Center, Will County, Illinois; and I-80 RailPort, Seneca, Illinois.

Build America Bonds. Build America Bonds (BAB), authorized in ARRA, were taxable bonds in which the U.S. Treasury provided a direct 35 percent subsidy to issuers to reduce issuance costs. Between April 2009 and the expiration of the program in December 2010, 2,275 separate BABs were issued totaling over $181 billion, representing an overall 23 percent of the total municipal bond

[6] According to Congressional budget "scoring" of previous 45G extension legislation, as reported by the American Shortline and Regional Railroad Association at http://www.aslrra.org/legislative/Short_Line_Tax_Credit_Extension/.

market.[7] The program opened the taxable bond market to public issuers, and also served to reduce tax-exempt yields, reducing tax-exempt borrowing costs.

Table 3 provides an overview of Federal funds received in South Dakota since the LRSA and LRFA program expirations. Funds have been received from FRA due to the damage caused by severe weather events in the State. South Dakota also was successful in obtaining a TIGER grant in 2010 to reconstruct the State-owned MRC line.

Table 3. Post-LRFA Federal Funding in South Dakota (Various Sources)

Year	Amount/Sources	Receiving Entity(ies)	Purpose
1993	$1,422,951/FRA	Sisseton-Milbank Railroad: $49,794 D&I Railroad: $223,257 CP Rail: $141,000 DM&E Railroad: $1,008,900	Repair of flood-damaged track
1997	$7,836,045/FRA	BNSF Railway: $3,947,509 D&I Railroad: $731,208 Sisseton Milbank Railroad: $550,942 MRC: $387,571 DM&E Railroad: $1,695,324 DM&E Railroad: $409,491 South Dakota DOT: $144,000	Repair of flood-damaged track
1998	$1,095,918/FRA	Dakota Southern Railway: $66,000 Sisseton Milbank Railroad: $93,200 DM&E Railroad: $490,800 South Dakota DOT: $136,923 BNSF Railway: $308,995	Repair of flood-damaged track
2004	$233,601,000/RRIF	DM&E Railroad	Refinance debt and reconstruct track
2007	$48,320,000/RRIF	DM&E Railroad	Track upgrades and siding construction across the entire DM&E system
2010	$16,000,000/TIGER II	South Dakota DOT	Reconstruction of MRC Railroad replacing existing 65-pound rail with 115-pound or heavier rail
2012	$1,800,000/FRA	South Dakota DOT	Relocate a section of railroad that runs along the side of a hill near the Big Sioux River at the South Dakota/Iowa border

Source: South Dakota DOT and other sources.

[7] Data reported by the U.S. Department of the Treasury at http://www.treasury.gov/initiatives/recovery/Pages/babs.aspx.

STATE RAIL FUNDING

The State of South Dakota has two primary funding programs, as described below:

- **Railroad Crossing Improvement Program.** The Railroad Crossing Improvement Program (RCIP) is funded through the FHWA Federal Section 130 Program. Reauthorized in MAP-21 with a $220 million annual set-aside, Section 130 program funds may be used on projects at all public rail crossings, including roadways, bike trails and pedestrian paths. Fifty percent of a State's apportionment is dedicated for the installation of protective devices at crossings. The remainder of the funds apportionment can be used for any hazard elimination project, including protective devices. The funds also may be used as incentive payments for local agencies to close public crossings provided there are matching funds from the railroad. There currently are over 1,800 public at-grade intersections and 133 separation structures eligible for this assistance in South Dakota. Typically, Section 130 projects are funded at a 90 percent Federal share; however, certain projects allow for up to a 100 percent Federal share. These include the closure of a grade crossing and the installation of traffic signs and signals. Approximately $2 million is allocated to South Dakota through this program each year, which may result in up to 20 crossing projects programmed each year in the Statewide Transportation Improvement Program (STIP).

- **Railroad Trust Fund.** For the purpose of planning, enlarging, maintaining, equipping, and protecting railroads and railroad facilities, the State has a special fund known as the South Dakota Railroad Trust Fund. The South Dakota State Railroad Board may make loans from the Fund to regional railroad authorities, based on terms and conditions set by the State Railroad Board. These funds may be used to match Federal railroad rehabilitation funds, and also can be spent directly on State-owned rail lines.

  The Fund was established in 1981 and primarily sustains itself through loan repayments, however dollars have entered the Fund in several other ways over the years. For example, when the BN purchased a significant portion of the State-owned track it operated on in 2005, $40+ million was infused into the Fund. Later in 2006, the Legislature diverted $38 million to the State's Property Tax Reduction Fund, leaving a balance of $14 million to allocate to railroad improvement projects. The South Dakota State Railroad Board is continuously faced with numerous worthy applications for Trust Fund dollars, and so in an effort to work toward restoring the "lost" funds, in 2012 the Legislature appropriated $4,000,000 for the Trust Fund from General Funds as part of Senate Bill 48.[8] This raised the Trust Fund to $7,000,000; however in March 2012, the South Dakota State Railroad Board approved $6,615,600 in loans, significantly reducing the balance. Again in 2013, another $1,000,000 was added to the Trust Fund as part of House Bill 1185.[9]

SINCE THE 1980S, FEDERAL FUNDING ASSISTANCE FOR RAIL LINE REHABILITATION HAS BEEN PROBLEMATIC. THE STATE'S OWN RESOURCES ARE BEING STRETCHED TO ACCOMMODATE THE LONG LIST OF RAIL INFRASTRUCTURE NEEDS.

Federal funding assistance for basic line rehabilitation has been problematic since the late 1980s. While the State has made creative use of Legislation to secure, operate and maintain a core rail system to serve key South Dakota industries, the States' own resources are being stretched to the limit. South Dakota continually faces a long list of needs against a short list of funding and financing alternatives.

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[8] bfm.sd.gov/budget/BiB/SD_BIB_FY2014.pdf

[9] bfm.sd.gov/budget/BiB/SD_BIB_FY2014.pdf

3

3 – Existing System Description and Infrastructure Inventory

Preface

South Dakota has over 1,800 miles of railways, including two Class I railroads, the Burlington Northern Santa Fe and Canadian Pacific Railways[10], and seven Class III or "Shortline" railroads. A summer tourist train line also operates within the state. This chapter provides a detailed inventory and description of the physical assets of South Dakota's statewide rail system, and describes how the railroad system is used today and expected to be used in the future. Projections show that the State is likely to see growth in overall rail volumes, with inbound and outbound rail volumes growing about 1.5 percent annually. Also discussed in this chapter are socioeconomic and industry trends key to freight and (potential) passenger rail service in South Dakota, for example employment in rail-related freight industries such as agriculture and mining has increased significantly in South Dakota since 2002, even though these industries have seen declining employment nationwide.

Photo this page: CP/DM&E train hauling bentonite on the PRC line at Huron, South Dakota

[10] In 2014, the CP/DM&E line was sold to Genesee & Wyoming to become the Rapid City, Pierre and Eastern (RCP&E). CP currently owns only a small section of track in northeastern South Dakota.

SOUTH DAKOTA RAILROADS

There are 1,851 miles of railroad in South Dakota, shown in Figure 7. Until the 2014 sale of the CP/DM&E line to Genesee & Wyoming (G&W), two Class I railroads, BNSF Railway (BNSF) and Canadian Pacific Railway (CP), owned 80 percent of the State's railroad miles. Seven Class III or "Shortline" railroads operate on the remaining 20 percent of the system which is partially State-owned.

CLASS I RAILROADS

The two Class I railroads operating in South Dakota, BNSF and CP, are the result of mergers of different railroads within the state, yet each has a unique story. BNSF's nearly 900 miles of trackage in South Dakota are the result of a myriad of mergers and acquisitions over decades. Conversely, CP's recent position within the state emerged relatively overnight with the purchase in 2007 of the 2,500-mile regional railroad Dakota, Minnesota, and Eastern (DM&E) and its affiliate Iowa, Chicago, and Eastern (ICE). CP's presence was dramatically reduced in 2014 with the sale of the same line to G&W to form the RCP&E.

BNSF RAILWAY

The BNSF Railway is South Dakota's largest railroad by a number of measures, including miles of active track owned, South Dakota counties served, number of rail yards, most trains per day, and total volume of freight carried. The Fort Worth, Texas-based Class I railroad owns nearly 900 miles of track in South Dakota and holds trackage rights over nearly 85 more miles. The railway operates 10 yards, serves more than 60 grain facilities, and has a presence in seven of the 10 largest cities in South Dakota. A summary of BNSF's operations is provided in Table 4, and the BNSF's South Dakota system is shown in Figure 8. The majority of the BNSF rail network is centered on a region east of the Yankton-Aberdeen line. In total BNSF's network contains 11 subdivisions, described below and summarized in Table 5. BNSF's trackage rights are summarized in Table 6.

Figure 7. The South Dakota Railroad System

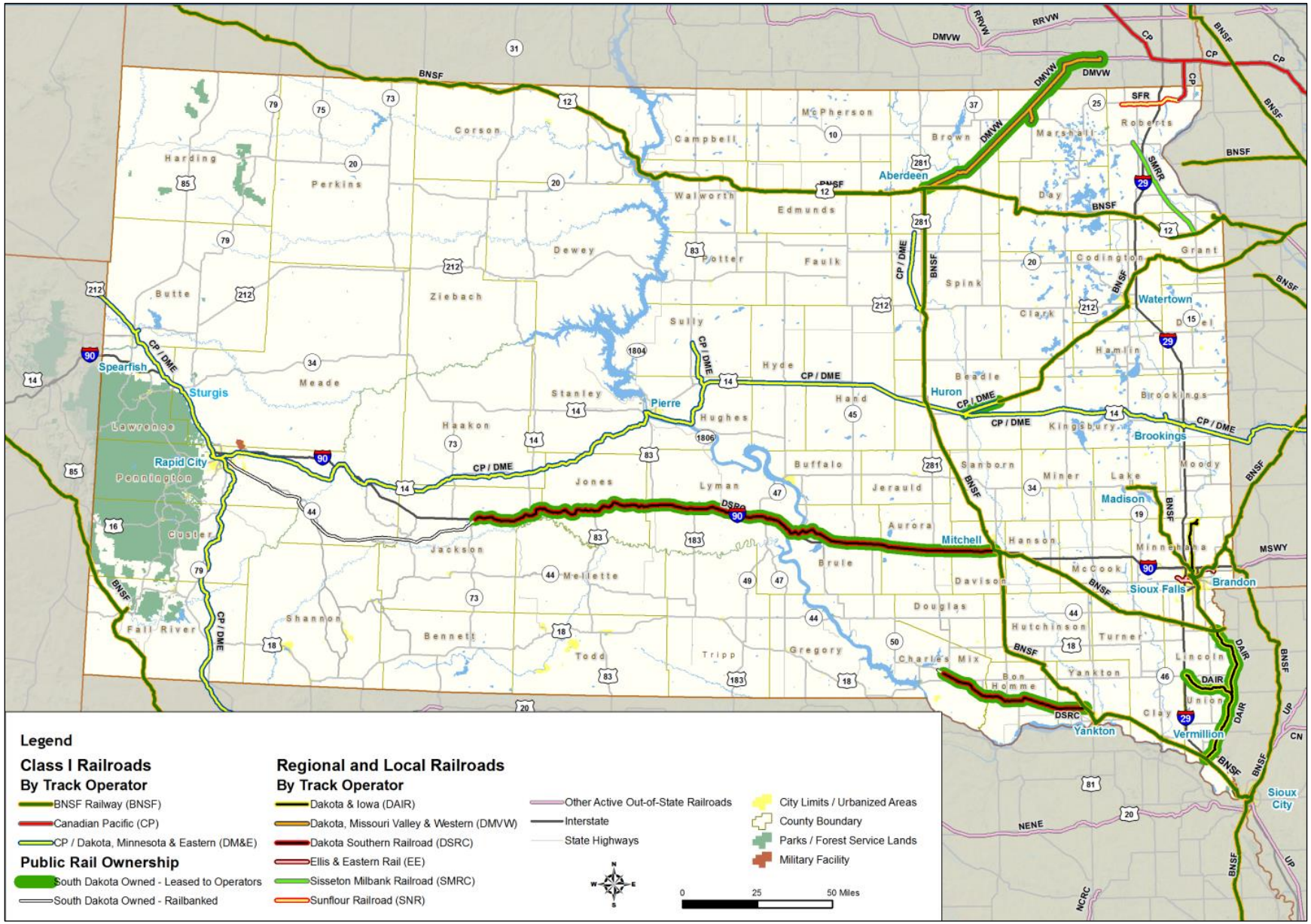


Figure 8. BNSF Railway, South Dakota

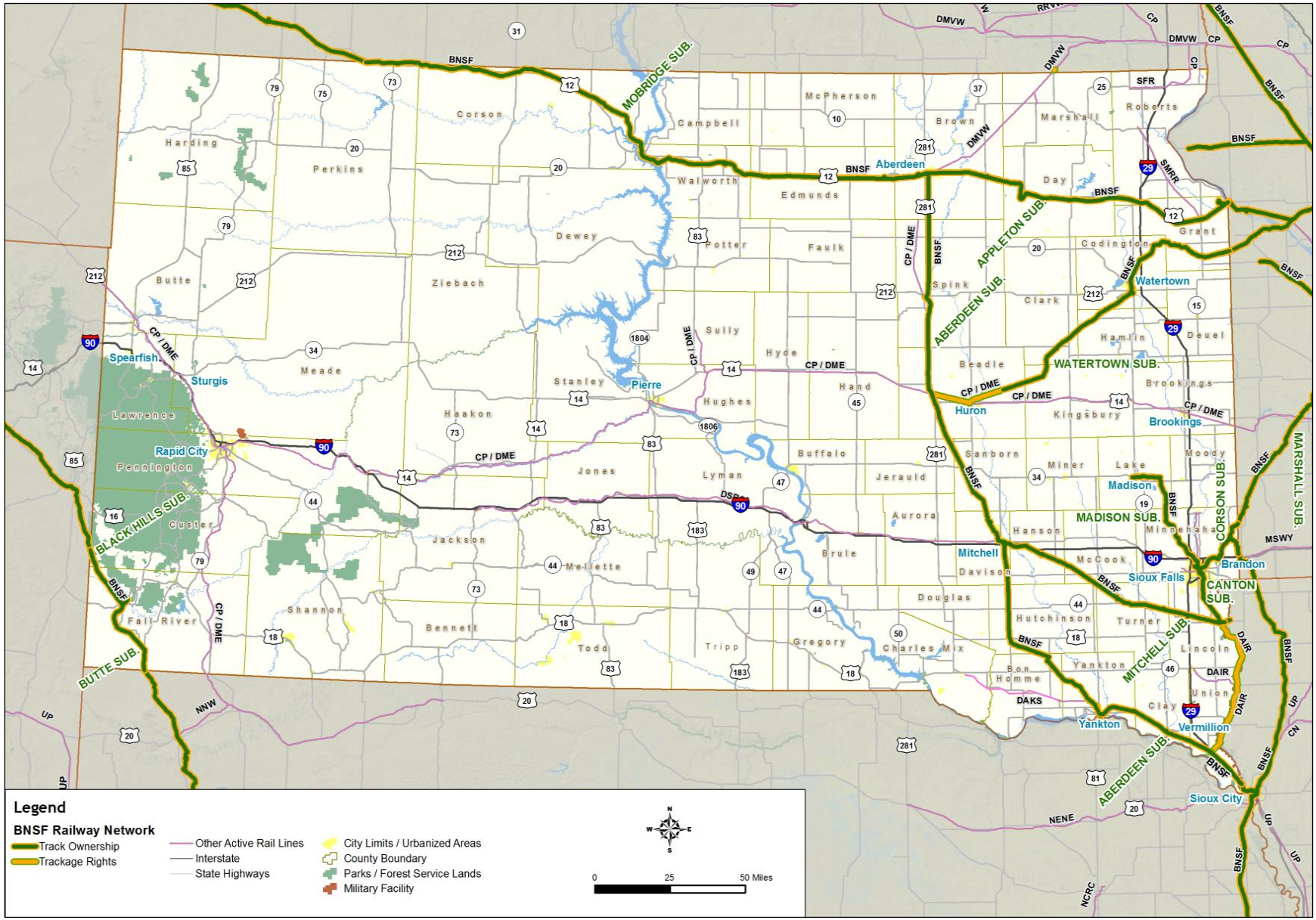


Table 4. BNSF Railway Operating Details

STB Classification	Class I
Ownership	Burlington Northern Santa Fe, LLC (dba BNSF Railway), a fully owned subsidiary of Berkshire Hathaway; Warren Buffett, Chairman, President, CEO
Rail miles owned in South Dakota	888.5
Miles trackage rights in South Dakota	84.7
Railyard locations	Aberdeen, Corson, Edgemont, Garretson, Madison, Mitchell, Mobridge, North Sioux City, Sioux Falls, Wolsey
Other facilities (transload, intermodal)	Wind energy transload facility at Worthing, three "Team Track" transload facilities at Aberdeen, Edgemont, and Sioux City

Source: South Dakota DOT, BNSF

As shown in Figure 8, three of BNSF's subdivisions – the Aberdeen, Mitchell, and Canton subdivisions - are along the BNSF Core Line, a former Milwaukee Road route that historically connected South Dakota's highly productive soybean, corn, and spring wheat regions with other interstate rail lines in Sioux City, Iowa. The Core Line subdivisions also contain the highest concentration of both ethanol plants and 110-car grain shuttle train elevators on BNSF's South Dakota network.

- The **Aberdeen Subdivision,** which serves seven 110-car grain shuttle facilities, three existing ethanol plants and one proposed plant. The city of Aberdeen is the northern terminus for the Aberdeen Subdivision and the Core Line, with Sioux City, via Mitchell, as the southern terminus.
- The Core Line branches off and interchanges with the Aberdeen Subdivision at the **Mitchell Subdivision**. The eastern terminus of the Mitchell Subdivision is Canton, is where the line meets the Dakota and Iowa Railroad (DAIR). BNSF trains have trackage rights over the DAIR southward along the Big Sioux River toward Sioux City.
- The Core Line continues north from Canton as the **Canton Subdivision**, terminating after 20 miles at the Sioux Falls Rail Yard. This yard is in the process of being removed as part of a $40 million redevelopment project involving downtown Sioux Falls and the east bank of the Big Sioux River.

All three subdivisions of the Core Line are unsignaled "dark" territory and lack automated wayside signal systems and advanced traffic control systems. Over the course of the entire Core Line, trains operate under Track Warrant Control (TWC) rules and occasionally under restricted limits. Train volumes are light, with segments carrying between one and five trains per day, with the most train traffic occurring on the Aberdeen Subdivision northwest of Sioux City.

The other eight BNSF Subdivisions in the State, roughly from south to north are:

- The **Madison Subdivision**, a 42-mile line extending north from the Sioux Falls Rail Yard to the Lake County town of Madison, where it serves one ethanol plant and one 110-car shuttle grain train. Several sidings off the line serve a number of manufacturing customers in the vicinity of

the Sioux Falls Regional Airport. The subdivision operates under track warrant control and has only one daily train.

- The **Corson Subdivision**, which links the Garretson downtown yard, several adjacent rail lines and manufacturers, and the busy Marshall Subdivision near the Minnesota border. The Corson Yard is located along this subdivision, as is a proposed 110-car shuttle grain train facility. The subdivision operates under track warrant control and has only one daily train.
- The **Marshall Subdivision**, a north-south route linking BNSF's Great Northern Corridor at Willmar, Minnesota, with Sioux City, Iowa, and Lincoln, Nebraska and points south. The Marshall line briefly enters South Dakota on its 200-plus-mile run, accumulating only 12.9 miles of in-state distance. The line is a core part of BNSF's primary main line network. In South Dakota, the line is unsignaled and relies on TWC for traffic management.
- The **Mobridge Subdivision**, another former Milwaukee Road property, progresses west from Aberdeen in a northwesterly direction into North Dakota and Montana where it links up with BNSF's former Northern Pacific transcontinental main line at Terry. This line provides the East River region the most direct access to the west coast. A one-third-mile-long bridge built in 1961 carries the line across the Missouri River.
- Continuing east from Aberdeen towards Minneapolis-St. Paul is the **Appleton Subdivision**, which gives shippers access to BNSF's primary network east and north of the State.
- The **Watertown Subdivision** provides service to several 54-car capacity grain elevators between the town of Yale and the Minnesota city of Appleton, where trains can switch to a higher capacity BNSF or Twin Cities and Western Railroad (TCWR) line. The Watertown line uses track warrant control and has modest traffic volumes.
- The **Black Hills Subdivision** accesses the northern end of the Powder River Basin. The line, which handles approximately 50 trains per day, connects with the Powder River lines at Campbell, Wyoming and then heads in southeasterly direction into South Dakota. The subdivision's eastern terminus is Edgemont, where BNSF has a yard.
- The **Butte Subdivision** continues south-southeast from Edgemont to BNSF's coal train hub at Alliance, Nebraska.

Table 5. BNSF Railway Subdivisions, South Dakota

Subdivision	To	From	South Dakota Miles	Division	Notes
Aberdeen	Aberdeen	Sioux City, Iowa	263.4	Twin Cities	Part of Core Line system
Appleton	Aberdeen	Benson, Minnesota	110.9	Twin Cities	Connects with BNSF's Great Northern Corridor at Willmar, Minnesota
Black Hills	Edgemont	Campbell, Wyoming	22.7	Powder River	Busiest sub (along with Butte Sub.) in State; carries coal trains from Powder River Basin
Butte	Edgemont	Alliance, Nebraska	26.4	Powder River	Busiest sub (along with Black Hills Sub.) in State; carries coal trains from Powder River Basin
Canton	Canton	Sioux Falls	20.4	Twin Cities	Part of Core Line system
Corson	Garretson	Sioux Falls	17.6	Twin Cities	Most Sioux Falls Yard inbound/ outbound trains arrive/depart via the Corson Sub
Madison	Sioux Falls	Madison	42.1	Twin Cities	
Marshall	Willmar, Minnesota	Sioux City, Iowa	12.9	Twin Cities	North-south line slips briefly into State; connects with Corson Sub
Mitchell	Mitchell	Canton	78.6	Twin Cities	Part of Core Line system
Mobridge	Aberdeen	Bluffport, Montana	191.7	Montana	Only direct connection to the Pacific Northwest in South Dakota
Watertown	Yale	Appleton, Minnesota	101.8	Twin Cities	Connects with BNSF Appleton Sub, at Appleton, Minnesota, along with TCWR line

Table 6. BNSF Trackage Rights, South Dakota

Subdivision	To	From	South Dakota Miles	Division	Notes
Hawarden	Canton	Elk Point (East Wye Switch)	57.3	DAIR	Fills gap between BNSF Canton Sub and BNSF Aberdeen Sub is State-owned
Pierre	Wolsey	Huron	14.1	RCP&E, (formerly CP/DM&E)	Together with Yale Spur, fills gap between Aberdeen and Watertown Subs
Yale Spur	Huron	Yale	13.3	RCP&E, (formerly CP/DM&E)	Together with Pierre Sub fills gap between Aberdeen and Watertown Subs

CANADIAN PACIFIC RAILWAY

Until 2014, the Calgary, Alberta-based CP had the second largest network of railroad lines in South Dakota. With nearly 600 miles of track ownership, CP trailed only BNSF in terms of total miles of railway within the State. As noted previously, CP's footprint in South Dakota was the result of the 2007 purchase of regional railroad Dakota, Minnesota, and Eastern (DM&E) and its affiliate, the Iowa, Chicago and Eastern (ICE).[11] At the time of the DM&E transaction, CP's presence in South Dakota was confined to one short branch line in the State's northeastern most county. A summary of CP's operations prior to the CP/DM&E sale is provided in Table 7, and the CP's South Dakota system is shown in Figure 9.

[11] Ironically, the ICE had been spun off by the CP in 1997, and had passed through several owners prior to its reacquisition.

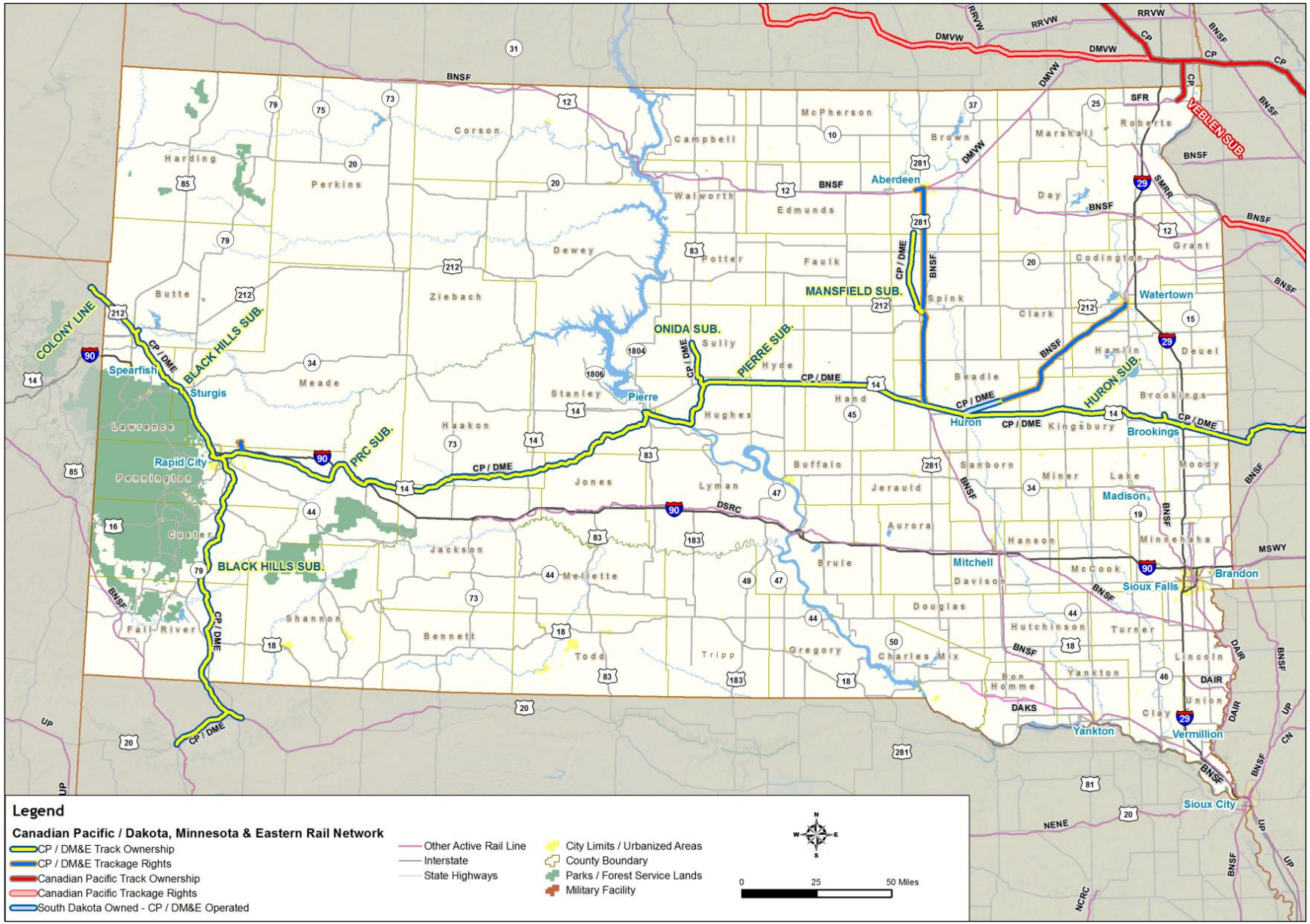
Table 8 and Table 9 describe CP's nine subdivisions, as of 2013, and trackage rights, respectively.

Table 7. Canadian Pacific Operating Details, Prior to DM&E Sale

STB Classification	Class I
Ownership	Canadian Pacific Railway Limited, publically traded company
Rail miles owned in South Dakota	598.3
Miles trackage rights in South Dakota	136.9
Employees in South Dakota	61
Rail yard locations	Huron (major yard), Brookings, Rapid City, Belle Fourche.
Other facilities (transload, intermodal)	Rapid City transload facility.

Source: South Dakota DOT, CP.

Figure 9. Canadian Pacific, South Dakota (Pre-sale of CP/DM&E Line)



Until 2014, CP's operational geography in South Dakota consisted of approximately five main line and three branch line subdivisions. A primary piece of CP's South Dakota network from 2007 to 2013 was the DM&E line. Now operating as the RCP&E, DM&E's network consisted of the remnants of a once extensive network of C&NW's lines located in South Dakota and southern Minnesota. From 1996 onward until the acquisition by CP, a primary focus of the DM&E was the development of an extension west into Wyoming's Powder River Basin coal fields. As of the 2014 sale of the DM&E line to G&W, only the Veblen Subdivision remains part of CP's rail network. CP's current and previous subdivisions are as follows:

- The **Veblen Subdivision** is currently the only rail line operating by CP in South Dakota. A short 14-mile branch, the Veblen Subdivision connects CP's main line at Fairmont, North Dakota with Rosholt in Roberts County, after only 6 miles in the State. At Rosholt, a farming community of 500, it interchanges with the Sunflour Railroad (SFR), which operates the westernmost portion of the Veblen Subdivision to Claire City. The subdivision operates under TWC rules and has light traffic. Just across the North Dakota border, the Veblen Subdivision connects with CP's Elbow Lake Subdivision, part of CP's main route between Chicago, Minneapolis-St. Paul, Portal, North Dakota, and western Canada.
- The **Black Hills Subdivision** (UP and also RCP&E) links Colony, Wyoming with Rapid City and Dakota Junction. This single-tracked line, known by some as the **Colony Line**, provides access to an industrial and natural resource extraction area northwest of Rapid City. At Rapid City, the subdivision continues south, following the eastern edge of the Black Hills to Dakota Junction, Nebraska. The Black Hills line was acquired from the Union Pacific in 1994.
- The **PRC, Pierre and Huron Subdivisions** (now RCP&E) make up the South Dakota portion of main line between Rapid City, South Dakota and Winona, Minnesota. The PRC subdivision, which stands for Pierre-Rapid City, gives way to the **Pierre Subdivision** at Fort Pierre, opposite the State capital city of Pierre at the Missouri River. East of Huron, the **Huron Subdivision** continues east to Tracy, Minnesota.
- The **Onida Subdivision** (now RCP&E) just north of the Pierre Subdivision at Blunt and serves agribusiness interests along a 16-mile branch line to the East River town of Onida.
- The **Mansfield Subdivision** (now RCP&E) serves a similar purpose for the communities of Redfield, Northville, and Mansfield. CP trains reach the Mansfield Subdivision using trackage rights between Wolsey and Redfield over BNSF's Aberdeen Subdivision.
- The **15.3-mile Yale Spur** is owned by the State of South Dakota, but leased and operated by CP (now RCP&E). It connects the city of Huron with the town of Yale and the BNSF Watertown line, over which CP holds trackage rights to Watertown.

All of CP/RCP&E lines in South Dakota are unsignaled, presently carrying traffic consisting mostly of grains and agricultural products, including ethanol and minerals. The core 378-mile route between Rapid City and Tracy, Minnesota, coupled with the Black Hills line provide the only rail service to shippers located in the West River region. This access is particularly beneficial for the ethanol plants and 110-car grain shuttle train elevators found along the Pierre Subdivision and east.

Table 8. RCP&E Railroad Subdivisions, South Dakota

Subdivision	To	From	South Dakota Miles	Division	Notes
Black Hills	Colony, Wyoming	Dakota Junction, Nebraska	155.9	Union Pacific/RCP&E (formerly CP)	
Huron	Huron	Tracy, Minnesota	91.7	RCP&E (formerly CP)	
Mansfield	Redfield	Mansfield	26.8	RCP&E (formerly CP)	
Onida	Blunt	Onida	16.2	RCP&E (formerly CP)	
Pierre	Huron	Fort Pierre	119.7	RCP&E (formerly CP)	
PRC	Fort Pierre	Rapid City	167.3	RCP&E (formerly CP)	PRC stands for Pierre-Rapid City
Redfield	CP/DM&E Pierre Subdivision at Wolsey	BNSF Aberdeen Subdivision at Wolsey	1.4	RCP&E (formerly CP)	The siding adjacent to the Pierre Sub at Wolsey that transitions traffic from the DM&E to the BNSF Aberdeen Sub
Veblen	Veblen Junction, North Dakota	Rosholt	6	CP	Once part of Soo Line
Yale Spur	Huron	Yale	13.3	RCP&E (formerly CP)	Owned by State of South Dakota, but operated by CP

Table 9. CP/DM&E (now RCP&E) Trackage Rights, South Dakota

Subdivision	To	From	South Dakota Miles	Division	Notes
Redfield/BNSF Aberdeen	Wolsey	Aberdeen	80.8	BNSF	CP uses the Redfield Sub designation to describe their use of their trackage rights over the BNSF Aberdeen Sub and the DM&E passing siding and transition at Wolsey
Watertown	Yale	Watertown	56.1	BNSF	Trackage rights over the BNSF Watertown Sub

SHORTLINE RAILROADS

The Surface Transportation Board classifies seven railroads in South Dakota as shortline railroads, not including the recently designated RCP&E line operated by G&W (described in the previous subsection). These railroads operate common carrier freight service in the State and connect shippers, grain elevators, and other on-line customers to the national network via BNSF and RCP&E, previously CP.

D&I Railroad Company

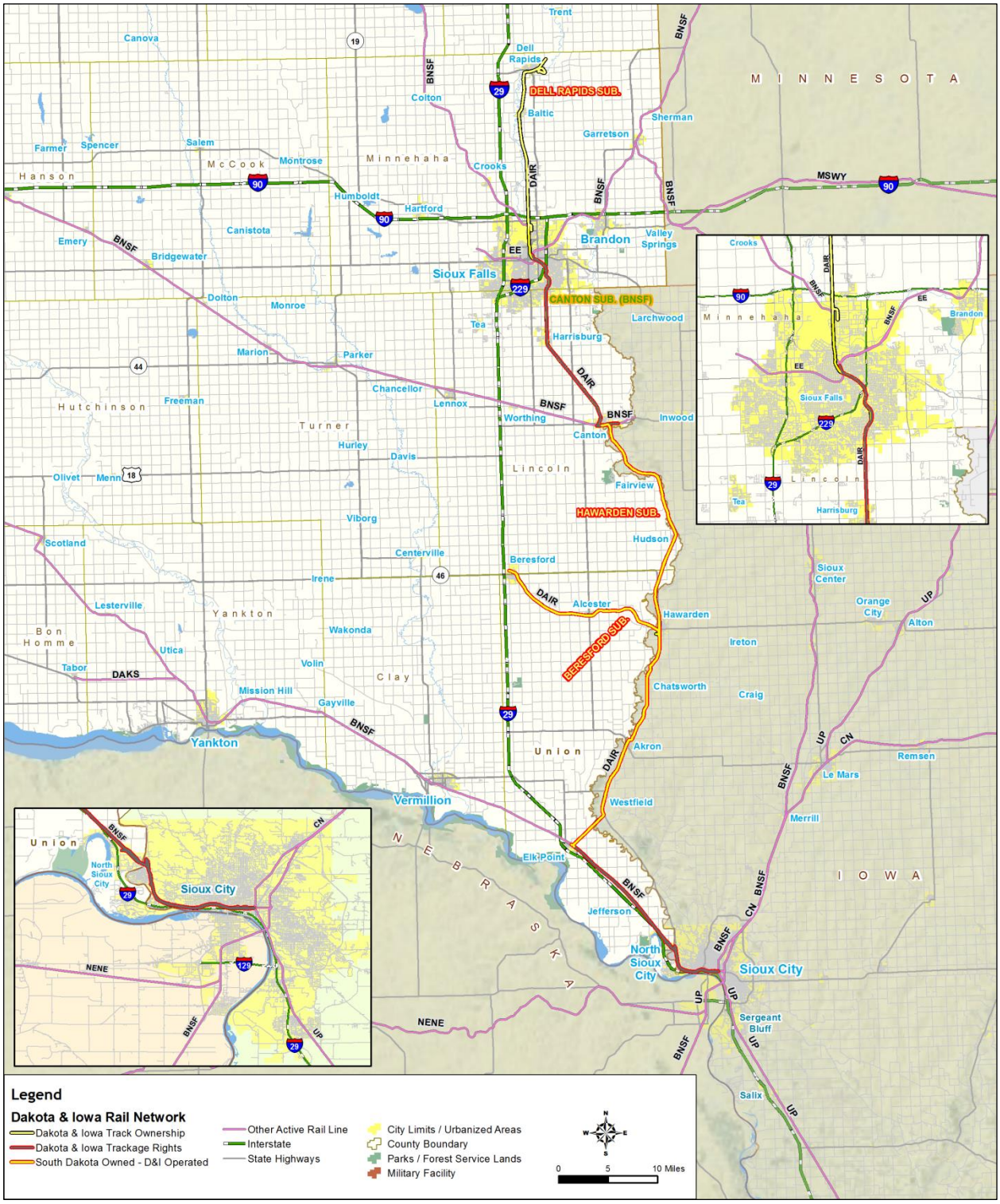
The D&I Railroad Company (DAIR) operates three rail lines comprising of nearly 90 miles of track in the Big Sioux River Valley, split almost evenly between South Dakota and Iowa. The DAIR owns one of these three lines – a branch line to Dell Rapids – and leases from the State of South Dakota the other two railroads – the Beresford branch line and the mainline Hawarden Subdivision into Iowa. The DAIR has an additional 38 miles of trackage rights over the BNSF's Core Line on the Aberdeen and Canton Subdivisions. A summary of DAIR's operations is provided in Table 10, and DAIR's South Dakota system is shown in Figure 10. Table 11 describe DAIR's subdivisions and Table 12 where the railroad has trackage rights.

Table 10. D&I Railroad Operating Details

STB Classification	Class III
Ownership	Wholly owned subsidiary of L.G. Everist, Inc., based in Sioux Falls
Rail miles owned in South Dakota	54.2 (out of 89.6 miles)
Miles trackage rights in South Dakota	38.2
Rail yard locations	Sioux City, Iowa, North Sioux City, South Dakota (leased), Hawarden, Iowa and Dell Rapids, South Dakota
Other facilities (transload, intermodal)	L.G. Everist transload facilities at Sioux City, Iowa and Hawarden, Iowa

The Sioux Falls-based rail company is a wholly owned subsidiary of L.G. Everist, Inc. (LGE), a large Midwest aggregates producer headquartered in Sioux Falls. As a result of this arrangement, DAIR's services are strongly flavored by its work for LGE, which generates a large amount of aggregates and construction materials for shipment by rail. LGE operates transload facilities in Sioux City and Hawarden, Iowa to aid this process. Approximately 65 to 70 percent of the rail traffic on the DAIR network is to facilitate the movement of LGE aggregates from the quarries in the middle and upper Big Sioux River Valley to the LGE transload operations in the rail hub of Sioux City, and Hawarden. Additional carloads are generated by servicing a POET ethanol plant and Siouxland Energy's Ethanol Transload, both located in Hudson, South Dakota, the GCC Dacotah Cement terminal, and POET's Corn Oil transload at Hawarden, Iowa. In addition to the above, other commodities currently handled by the DAIR include plastic pellets, magnesium and calcium chloride, fertilizer, lumber, and telephone poles.

Figure 10. D&I Railroad, South Dakota



- The 18-mile **Dell Rapids Subdivision** serves two L.G. Everist quartzite quarries directly. DAIR trains attempting to access the Iowa transload facility the other parts of its network and cross into the lower Big Sioux River Valley south of Sioux Falls must utilize 20 miles of trackage rights on the BNSF Canton Subdivision.
- The **Hawarden Subdivision**, leased to DAIR from the State, begins in Canton and follows the winding course of the Big Sioux River south to Elk Point, also known as East Wye Switch, where a wye junction marks the DAIR's interchange with the Core Line and the BNSF Aberdeen Subdivision. The DAIR has an additional 18 miles of trackage rights over BNSF rails to their own yard in Sioux City, thus completing its journey over the entire length of the valley.
- The **Beresford Subdivision**, an 18-mile branch line from the Iowa town of Hawarden, where L.G. Everist has another facility, to the agricultural community of Beresford, is also leased to DAIR by the State of South Dakota.

The entire 90-mile DAIR network, plus the BNSF lines over which it has trackage rights, are all dark territory, governed by TWC rules. Train volumes are light. The system is capable of handling the 286K-pound freight cars appropriate for heavy hauling. DAIR owns 10 bridges that cross the Big Sioux River.

Table 11. D&I Railroad Subdivisions, South Dakota

Subdivision	To	From	South Dakota Miles	Division	Notes
Beresford (Total)	Hawarden, Iowa	Beresford	18.3	17.8	
Beresford (Iowa)	–	–	0.5	–	From Hawarden, Iowa across Big Sioux River
Beresford (South Dakota)	–	–	17.8	17.8	
Dell Rapids	North Sioux Falls	Dell Rapids	18.8	18.8	Sub provides service for parent company's manufacturing facility in Dell Rapids and other shippers
Hawarden (Total)	Canton	Elk Point (East Wye Switch)	52.5	17.6	The Hawarden Sub crosses the Big Sioux River seven times
Hawarden (Iowa)	–	–	34.9	–	

Table 12. D&I Railroad Trackage Rights, South Dakota

Subdivision	To	From	South Dakota Miles	Division	Notes
BNSF Aberdeen	Elk Point (East Wye Switch)	Sioux City, Iowa	17.8	–	Via BNSF track
BNSF Canton	Canton	Sioux Falls	20.4		Via BNSF track

Dakota, Missouri Valley and Western Railroad

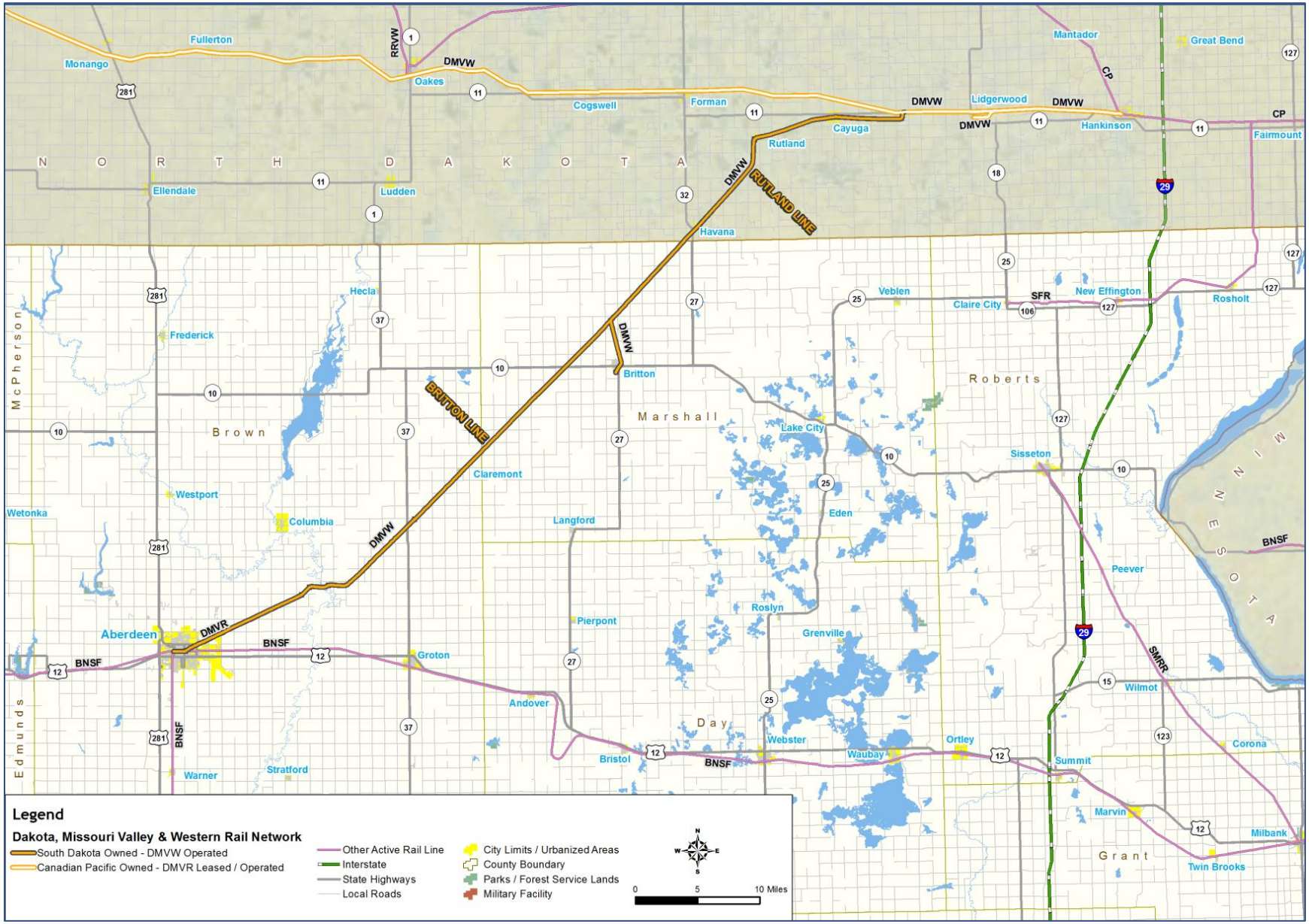
The State of South Dakota owns 78.5 miles of former Milwaukee Road track known as the Britton Line, which connects the rail hub of Aberdeen with southeastern North Dakota and three different rail networks. This lightly used rail line is leased by the State to the Bismarck-based Dakota, Missouri Valley and Western Railroad (DMWR), which owns and operates an extensive shortline network of track in North Dakota that roughly parallels the Missouri River. The DMWR system also provides linkages to both the BNSF Railway and the RCP&E. A summary of DMWR's operations is provided in Table 13, and the DMWR's South Dakota system is shown in Figure 11

South Dakota owns all of the 78.5 miles of track from Aberdeen to Geneseo Junction, although the names of the subdivisions comprising this line are not clear. Some sources suggest the Britton Line is the name of the track in South Dakota, while the North Dakota extent is the Rutland Line. In the North Dakota Rail Plan, the line is named the Aberdeen Subdivision of the DMWR. Of the 78.5 miles of track, 22.1 miles lay outside of the State of South Dakota, in a situation similar to the DAIR Hawarden Subdivision in the Big Sioux River Valley. A branch line to the town of Britton is included in this network and a proposed 110-car grain shuttle train facility is planned for this line.

Table 13. Dakota, Missouri Valley and Western Railroad Operating Details

STB Classification	Class III
Ownership	State of South Dakota, leased to the Dakota, Missouri Valley and Western Railroad of Bismarck, North Dakota.
Rail miles owned in South Dakota	56.4
Miles trackage rights in South Dakota	0
Rail yard locations	None
Other facilities (transload, intermodal)	None

Figure 11. Dakota, Missouri Valley, and Western Railroad, South Dakota



Dakota Southern Railway

The Dakota Southern Railway (DSRC) leases two former Milwaukee Road rail lines from the State of South Dakota in the southern half of the State. The longest and most active of these lines extends west from Mitchell roughly parallel to I-90 for 122 miles. The line links Mitchell to the West River town of Kadoka via Chamberlain and one of the oldest, longest bridges on the upper Missouri River. The bridge is nearly a mile long and once was considered the longest bridge on the Milwaukee Road rail network. As described in Chapter 2 – State and Local Rail Programs, South Dakota received a Federal grant to reconstruct the Mitchell to Chamberlain rail line with heavier rail in 2010. The track west of Kadoka to Rapid City has been removed. Dakota Southern's operating details and system map are shown in

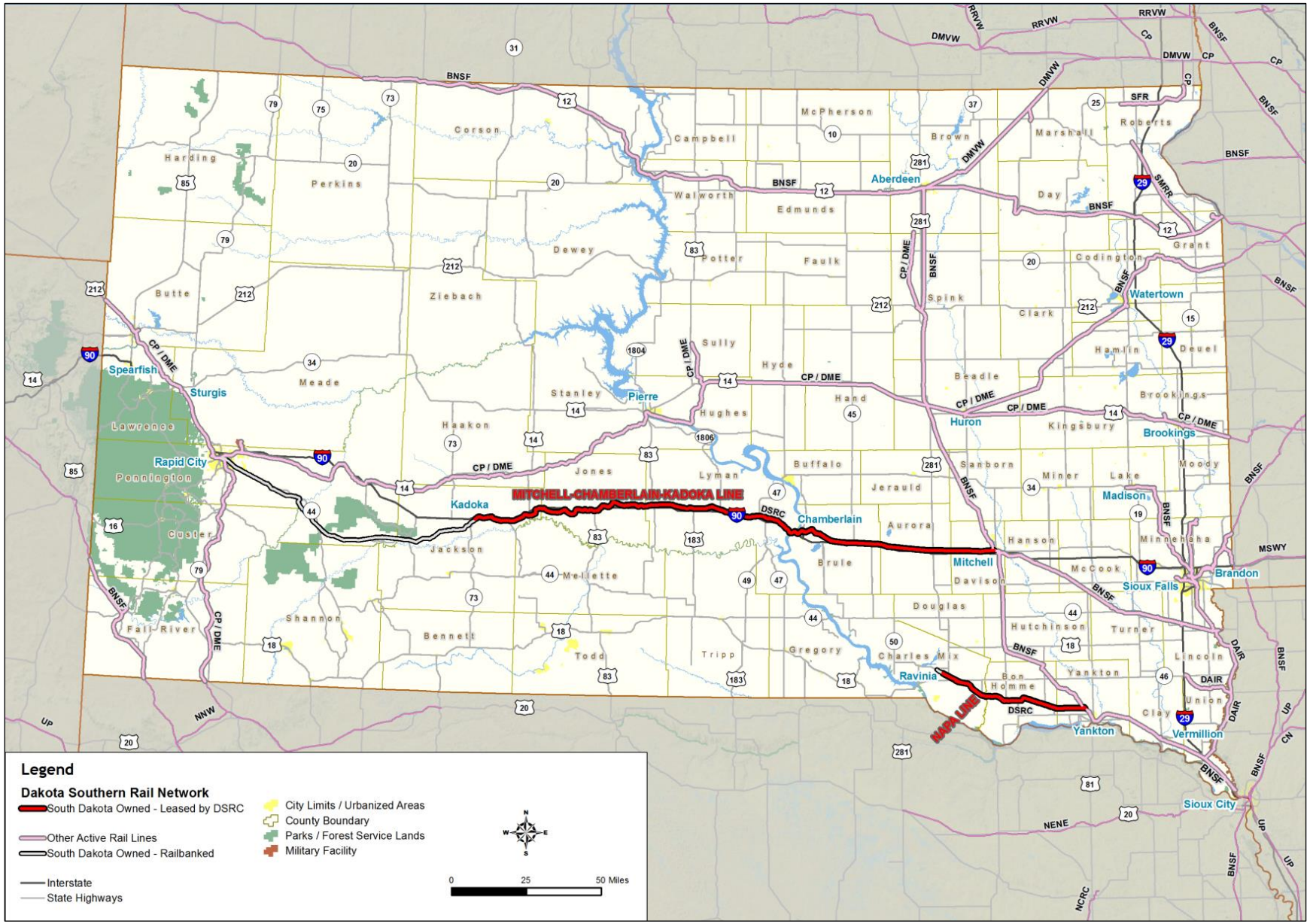
Table 14 and Figure 12.

Dakota Southern leases another semiactive rail line to the south of the Mitchell-Chamberlain-Kadoka line. Originally a 60-mile line linking the current BNSF Aberdeen Subdivision to a string of farming communities northeast of the Missouri River, a series of official and unofficial abandonments have left a behind a smaller rail line from Napa Junction just north of Yankton to Wagner, where Dakota Southern hopes to attract an ethanol plant to stabilize the financial fortunes the Napa Line. A 26.6-mile segment between Platte and Ravinia was recently rail banked and at most the Napa Line could have 54.4 active rail miles between Napa and Ravinia. Both Dakota Southern Railway lines operate under track warrant control. While the Mitchell-Chamberlain line is experiencing a resurgence in activity due to a new grain elevator near Kimball, the Napa-Platte line has no train traffic.

Table 14. Dakota Southern Railway Operating Details

STB Classification	Class III
Ownership	State of South Dakota-owned rail lines; Mike Williams and Stan Patterson, partnership own Dakota Southern; based in Chamberlain
Rail miles owned in South Dakota	168.5
Miles trackage rights in South Dakota	A haulage agreement allows Dakota Southern trains to access the Sioux City, Iowa, rail hub on BNSF track. This agreement was signed in 2005 as part of the Core Line sale and is effective for 50 years from that date.
Rail yard locations	Chamberlain, Wagner
Other facilities (transload, intermodal)	N/A

Figure 12. Dakota Southern Railway, South Dakota



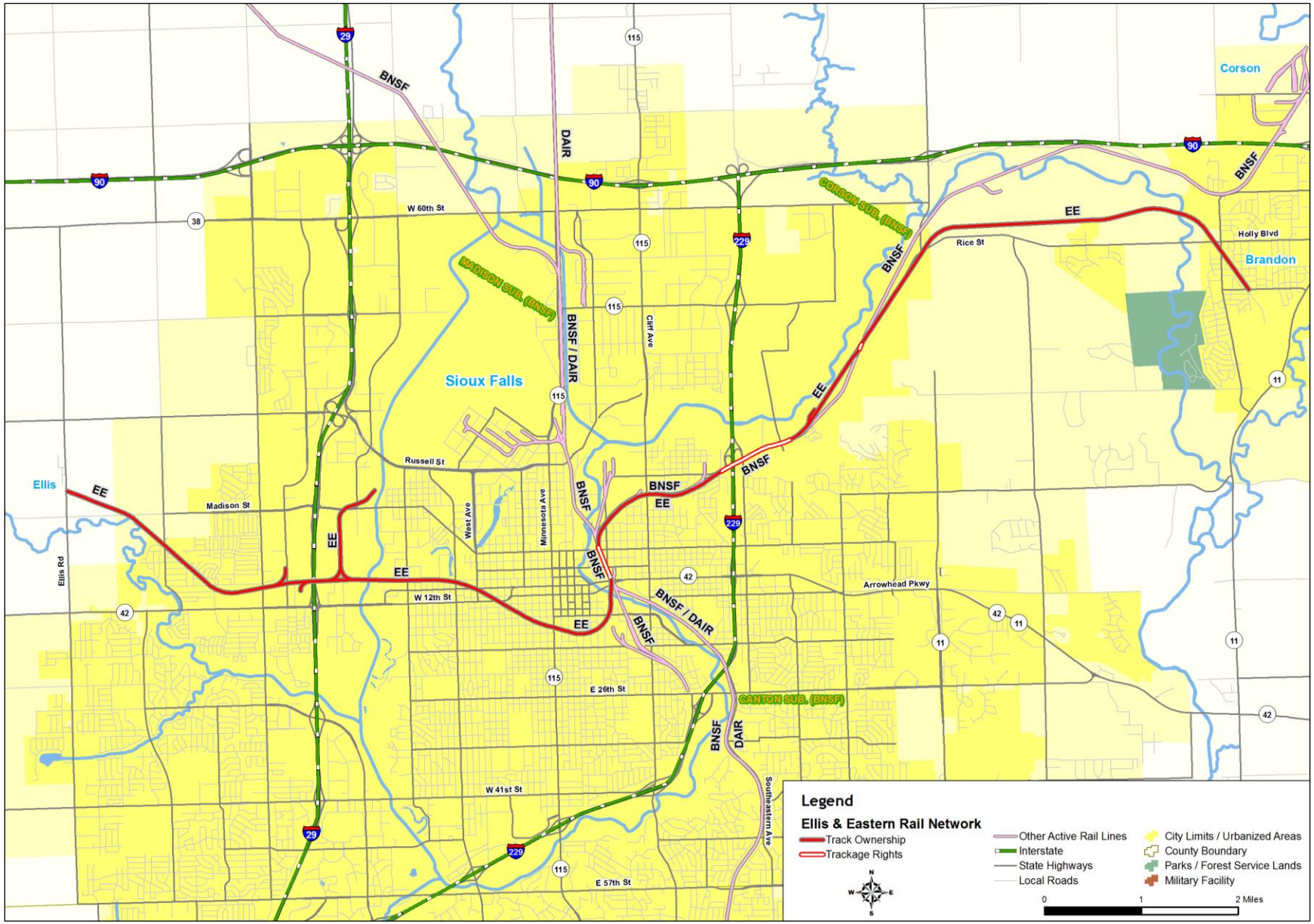
Ellis and Eastern Railroad

The Ellis and Eastern Railroad (EE), described in Table 15 and Figure 13, is owned by Sweetman Construction for the purpose of providing regional rail shipments to the construction company's customers. The 14.3-mile railroad spans the Sioux Falls metro area over old Chicago and Northwestern lines. The EE has a west and an east side subdivision of roughly equal length. The EE west side line terminus is at the town of Ellis, while the east side terminus is the city of Brandon. Both lines terminate at the downtown Sioux Falls Rail Yard, which is scheduled to undergo a major redevelopment which will require the realignment of the EE, DAIR, and BNSF rail lines.

Table 15. Ellis and Eastern Railroad Operating Details

STB Classification	Class III
Ownership	Sweetman Construction Company
Rail miles owned in South Dakota	14.3
Miles trackage rights in South Dakota	5.6
Major commodities	Concrete, construction material, aggregates, lumber, scrap, farm products, and chemicals
Rail yard locations	Sioux Falls Rail Yard
Other facilities (transload, intermodal)	None

Figure 13. Ellis and Eastern Railroad, South Dakota



Sisseton Milbank Railroad

The Sisseton Milbank Railroad (SMRR) is a 37.1-mile branch line serving a series of agricultural and manufacturing customers between the county seats of Sisseton and Milbank in northeastern South Dakota, as shown in Table 16 and Figure 14. The SMRR hauls primarily wheat, corn, soybeans, and plastics, including plastic pellets to a Dakota Western Corporation factory in the town of Agency Village near Sisseton. The rail line serves two mid-sized 50-car capacity grain elevators and two small-sized 25-car capacity grain elevators along the route. The SMRR also has freight stations in the communities of Peever, Wilmot, and Corona, which are between Sisseton and Milbank.

Table 16. Sisseton Milbank Railroad Operating Details

STB Classification	Class III
Ownership	A subsidiary of the Twin Cities and Western Railroad Company, Mark J. Wegner, President
Rail miles owned in South Dakota	37.1
Miles trackage rights in South Dakota	0 – as SMRR; 10.7 through TCWR
Employees in South Dakota	5 (in 2007), based in Milbank
Rail yard locations	Milbank
Other facilities (transload, intermodal)	Transload facilities along the SMRR are available

Originally built as part of the Milwaukee Road in 1892, the SMRR today is still dark territory, using track warrant controls to govern traffic on the line. Trains with car loads of 286K pounds are permitted on the SMRR.

In July 2012, the Twin Cities and Western Railroad (TCWR) purchased the previously independently owned and operated SMRR, which had been headquartered at Milbank. The SMRR now operates as a subsidiary of the TCWR and is the farthest west of any asset in TCWR's network. The Sisseton Milbank line is not connected directly to the TCWR network, but through trackage rights that the TCWR holds on the BNSF Appleton Subdivision. By agreement, the TCWR can use 33.5 miles of the Appleton Subdivision from Appleton, Minnesota, where the TCWR mainline terminates, to Milbank in South Dakota, where the SMRR line ends. Of the 33.5 trackage miles on the Appleton line, 10.7 miles are in South Dakota.

The absorption of the Sisseton Milbank rail line into the TCWR network has potential benefits for SMRR customers in the Prairie Pothole and Glacial Lakes region. The TCWR operates the former Milwaukee Road's Pacific Northwest transcontinental mainline from Appleton almost directly east to the Twin Cities rail hub. According to TCWR, the SMRR station at Milbank currently receives two to three weekly TCWR trains.

Figure 14. Sisseton Milbank Railroad, South Dakota

SUNFLOUR RAILROAD

The Sunflour Railroad (SFR) consists of one 19.4-mile railway in the far northeastern corner of the State in Roberts County. Completed in 1913 and operated as the Fairmount and Veblen Railway, the shortline had access to the primary transcontinental mainline of the Milwaukee Road by virtue of its connection to the transcon at Veblen Junction in North Dakota. Extending south from Veblen Junction, the original shortline crossed into South Dakota and turned west at the town of Rosholt. From Rosholt, the alignment remained generally westward and continued through the towns of Victor, New Effington, Claire City, and Veblen. Past Veblen, the rail line turned south, navigating the prairie pothole lakes until terminating at Grenville.

Eventually, ownership of the entire line from Veblen Junction to Grenville fell to the Milwaukee Road. All track west and south of Veblen was abandoned and when the Milwaukee Road collapsed into bankruptcy in 1986, the Soo Line purchased the remains of the short line, which was known then as the Veblen Subdivision. In 2000, when the Soo Line, now partnered with CP, filed to abandon the section of the Veblen Subdivision west of Rosholt, another railroad operator from Colorado organized around the Sunflour name and bought the Rosholt-Veblen segment from the Soo Line. The Veblen Junction to Rosholt section was reorganized by CP, Soo Line's parent company, into the Veblen Subdivision. Sunflour successfully petitioned to abandon the Veblen to Claire City portion of the network in 2012 and now the western terminus of the railroad is one mile west of Claire City.

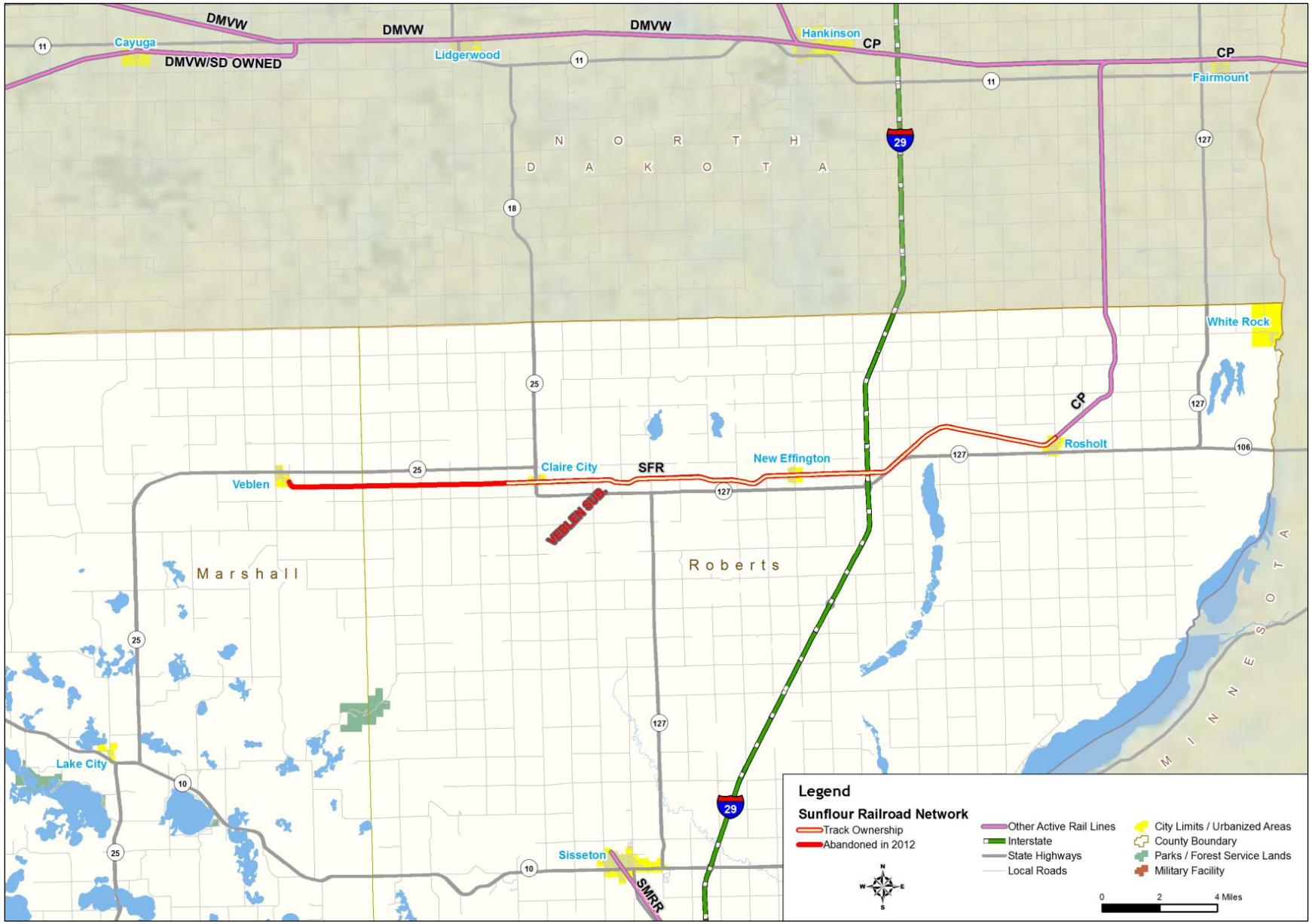
The eastern terminus of the Sunflour Railroad is Rosholt, where it interchanges with the CP Veblen Subdivision. However, recent published newspaper accounts have indicated that the Sunflour Railroad is being used by the railroad's parent company in Colorado to store rail cars for other rail companies. When operating, the railroad uses track warrant control to manage its trains, although it is unclear how often trains run on the line.

Sunflour's operating details and system map are shown in Table 17 and Figure 15.

Table 17. Sunflour Railroad Operating Details

STB Classification	Class III
Ownership	Under common control of the Denver Rock Island Railroad; Thomas Mars, President of the DRIR and SFR
Rail miles owned in South Dakota	19.4
Miles trackage rights in South Dakota	0
Rail yard locations	None
Other facilities (transload, intermodal)	None

Figure 15. Sunflour Railroad, South Dakota



Twin Cities and Western Railroad

The Twin Cities and Western Railroad (TCWR) is a regional Class III railroad operating over 229 miles of track from the Twin Cities area of Minnesota west into South Dakota. The TCWR was formed in 1991 after the acquisition of the Milwaukee Road's former Pacific Northwest transcontinental mainline from Appleton almost directly east to the Twin Cities rail hub in St. Paul, Minnesota, by Soo Line (now CP) in 1985. There, the TCWR interchanges with four Class I railroad companies.

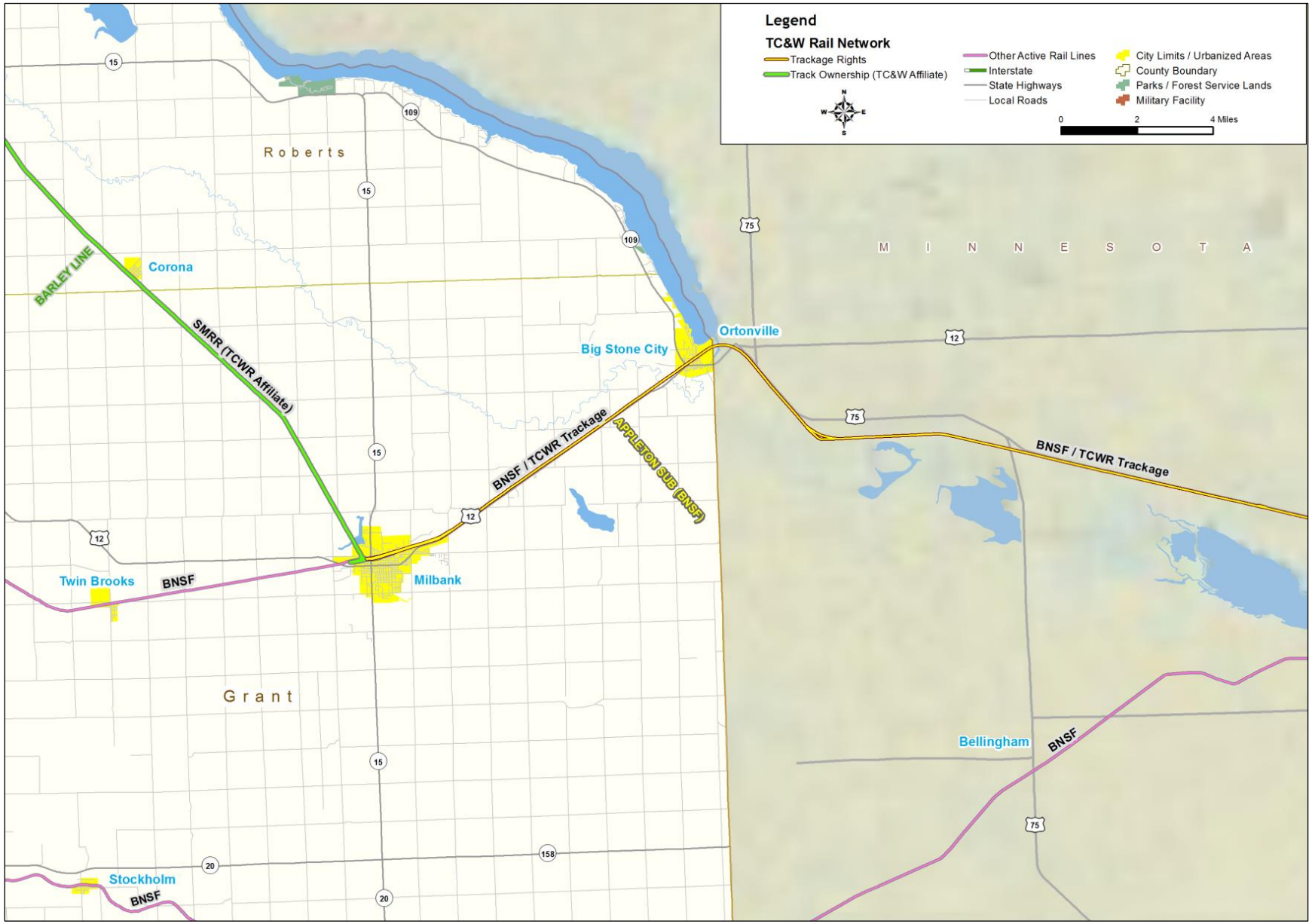
The TCWR does not own any track in South Dakota directly, but does own a subsidiary – the Sisseton Milbank Railroad (SMRR) – which owns and operates 37.1 miles of track in the State between the communities of Milbank and Sisseton. The TWCR has trackage rights over BNSF track that acts like a bridge between the end of the TCWR mainline in Appleton and the terminus of the SMRR at Milbank 33.5 miles to the west, summarized in Table 18 and mapped in Figure 16. Of the 33.5 miles of trackage rights negotiated with BNSF for use of their Appleton Subdivision, 10.7 miles are in South Dakota. The TCWR operates two to three trains weekly outbound from Appleton to Milbank.

The TCWR is considered to be the largest shortline railroad in Minnesota. The rail firm is based in Glencoe, Minnesota, but has other offices on its line, including at Milbank as the SMRR. The TCWR shares common ownership, but is separately managed with another large Class III railroad – the Red River Valley and Western (RRVW), which is based in Wahpeton, North Dakota.

Table 18. Twin Cities and Western Railroad Operating Details

STB Classification	Class III
Ownership	Twin Cities and Western Railroad Company, privately held, Mark J. Wegner, President
Rail miles owned in South Dakota	0
Miles trackage rights in South Dakota	10.7
Employees in South Dakota	0
Rail yard locations	Several in Minnesota
Other facilities (transload, intermodal)	Several in Minnesota

Figure 16. Twin Cities and Western Railroad Map, South Dakota



PASSENGER RAILROADS

This Plan did not explore passenger rail service, but rather leaned on the recommendations provided as part of Minnesota's 2010 State Rail Plan[12]. That plan focused on the development of intercity passenger rail service to link the Twin Cities with the Chicago Hub high-speed rail network, the national Amtrak system, and major regional trade centers in Greater Minnesota and the upper Midwest, while coordinating fully with independent and shared freight improvements. The Minnesota Plan explored connections in both Sioux Falls, SD and Sioux City, IA, as described below.

BNSF: Minneapolis-Willmar-Sioux Falls Corridor

This corridor was proposed by the National Association of Rail Passengers (NARP) as part of its vision for a national passenger train network. The section of the corridor between Minneapolis and Willmar is referred to as the Little Crow Transit Way, and was proposed by two Minnesota State Representatives. In addition, the section between Minneapolis and Willmar serves as a back-up/reliever route to the more heavily traveled Minneapolis-Coon Rapids-Big Lake-St. Cloud-Fargo/Moorhead corridor. This corridor is included in the Iowa DOT Statewide Rail Plan with service continuing through Sioux City to Omaha, Nebraska from Garretson, South Dakota.

The Minnesota Plan placed this corridor in their "Phase II" group of projects which is considered "longer term" after the Phase I corridors are realized by 2030. This corridor has challenges to implementation including the part of the corridor between Willmar and Sioux Falls is single track and not signalized; significant upgrades would be necessary to introduce passenger rail service along this corridor. The annual operating subsidies were estimated to be the highest for this line of all examined, at over $450 per rider/day (for service through to Sioux Falls).

UP: Minneapolis-Mankato-Worthington-Sioux City Corridor

A study of passenger and commuter rail service was proposed by a Minnesota State Representative along the UP corridor (with a small portion on the BNSF railroad) between Minneapolis and Mankato under the name "Minnesota Valley Line," with continued service to Sioux City, Iowa. The Iowa DOT has included part of this corridor, between Le Mars, Iowa and Sioux City, in its Statewide Rail Plan. Iowa DOT's mapping showed the connection between the Twin Cities and Le Mars following the BNSF line through Willmar. Although coordination with existing freight service is one challenge to implementation, significant capital improvements have been made to the corridor in recent years.

This corridor has low potential ridership. Sioux City is a relatively small metropolitan area that is a significant distance (more than 250 miles) away from the Twin Cities. This corridor is not as viable in comparison to other city pairs examined and was not recommended as part of Minnesota's phased corridors. The goal of the Minnesota Plan was to evaluate potential connections to other states, but not entire multistate routes; in this instance, a likely service would continue on to Omaha, which may result in higher ridership volume than was estimated with the line terminating in Sioux City.

[12] Minnesota Comprehensive Statewide Freight and Passenger Rail Plan, Minnesota Department of Transportation, 2010. http://www.dot.state.mn.us/planning/railplan/resources.html

TOURIST RAILROADS

Throughout much of the 20th century, two tourist railroads operated in South Dakota: the Black Hills Central and Whetstone Valley Express Railroads. The Whetstone Valley Express ceased operation in 2008.

BLACK HILLS CENTRAL RAILROAD

The Black Hills Central Railroad is a summer tourist train operating from early May and early October over a 10-mile line in the Black Hills southwest of Rapid City. Known as the 1880 Train, the Black Hills Central operates over track built by the Chicago, Burlington, and Quincy Railroad for mining operations between Hill City and Keystone. BNSF eventually acquired the line and tourist train operations commenced in 1957.

Figure 17. Black Hills Central Railroad Rolling Stock

Source: James G. Howes.

WHETSTONE VALLEY EXPRESS TOURIST RAILROAD

Prior to 2008, during the Milbank Trainfest in August, an excursion train operated on the Sisseton Milbank Railroad, named the Whetstone Valley Express. The excursion included characters in costumes and a dramatized train robbery. The Trainfest ceased operations in 2008, eclipsed by another summer festival, Farley Fest in July.

Figure 18. Whestone Valley Express Rolling Stock

RAILROAD INFRASTRUCTURE FEATURES

A number of factors will affect the capacity of any railroad network. Key variables constraining or increasing a rail line's ability to handle train traffic include amount of double mainline track, the frequency and length of passing sidings, the quality and stability of the track, the type of signalization and track control, the types of trains operated on a given segment, and the presence of bottlenecks or restrictions.

One of the most practical variables of rail capacity is double mainline track. Figure 19 shows the location of double mainline track and passing sidings in-state. Track ratio, a measure of functional capacity as related to single mainline track, is nearly 1.0 for every corridor in the State, with the exception of the downtown Sioux Falls area, where six rail lines operated by three different railroads converge, and an area west of Wolsey, where the CP's Redfield Subdivision acts as an extended passing siding for one mile as it parallels the its Pierre Subdivision, before turning north. The only rail lines featuring double mainline capacity are those lines serving the Powder River Basin and its single-unit coal trains, lines with considerable train volumes and revenue potential.

To understand the practical limitations of a near-statewide network of single-track railroads, consider the challenges facing an automobile driver coming to a narrow, single-lane bridge on a rural county road. Now imagine how much more difficult it would be to drive on a single-lane road across the State without shoulders – that is the operational challenge facing the operator of a single-line railroad. The railroad operator will use passing sidings (sections of adjacent track connected to the main line by switches) or industrial spurs leading to rail shippers to store trains to allow oncoming trains to meet and pass each other. In the absence of passing sidings, the train operator must control access to a given section of track to a single train at a time. The rail line's signal and train control system (discussed below) becomes the means of communicating to the train engineer that his/her train has permission to move along a track segment.

Certified track class is another metric used to evaluate the capacity and supply of a freight rail network. The track class rating is based upon the condition of the track as determined by regulations and confirmed by inspections conducted by the FRA. Several variables are examined and track segments found to be in excellent condition by FRA inspectors are given higher track classifications, while track in poor condition is given a lower classification. Each track classification carries an accompanying FRA restriction on maximum train speed, beyond which trains cannot operate safely.

An analysis of the track classifications demonstrates strengths and weaknesses of South Dakota's rail system. One strength is BNSF's ability to maintain important mainlines in its system. Three BNSF subdivisions on opposite ends of the State – the Black Hills and Butte subdivisions in Custer and Fall River counties near Rapid City, and the Marshall Subdivision in Minnehaha County near Sioux Falls – were each rated Track Class IV, which allows for a maximum freight train speed of 60 miles per hour. These three BNSF subdivisions were the highest FRA-rated rail lines in the State. And like the distribution of double mainlines in the State, the distribution of Track Class IV lines were confined to the State's edges.

South Dakota's west river rail lines pose a weakness. With the exception of the BNSF subdivisions on the margins of the region – the Mobridge, Black Hills, and Butte lines – most rail lines operate at lower speeds and efficiencies. All rail traffic destined for or originating in Rapid City, for example, must navigate at least one Track Class 1 segment – 10 miles per hour maximum speed – to leave or enter the region by rail. The RCP&E's (previously CP's) assets are vital for West River interests, but track condition deteriorates from the midsection of the State from east to west. The RCP&E's Huron and Pierre Subdivisions have overall track classification of 3, with maximum freight train speeds of 40 miles per hour, between the Minnesota border and Pierre. Once the line crosses the Missouri River, however, the track class drops to the lowest grade possible – 1. Additionally, media reports stated some segments between Fort Pierre and Wall did not even obtain the minimum classification rating of 1, thus requiring CP to obtain a special FRA exception so that trains can still cautiously operate. This track operates at a maximum speed of 10 miles per hour.

Signalization and track control are another variable affecting the functional capacity of freight railroads. Track control mechanisms can range from Positive Train Control (PTC), in which global positioning system (GPS) technology and advanced signalization software maintains train separation and appropriate engine speeds, to having no controls or signals at all. Higher capacity rail corridors generally require more sophisticated signalization and track control mechanisms. Figure 20 confirms that many rail lines with higher train frequencies and better track condition also have either Centralized Traffic Control (CTC) or Automatic Block Signaling (ABS). CTC involves train movements across an entire region controlled by an operations center using signals and other advanced methods, and ABS is characterized by an automated system keeps trains separated through block signalization controlled by a dispatcher.

Likewise, those railroads with fewer trains and lower track ratings have less elaborate train control measures. The busy BNSF Powder River Basin coal lines as well as the BNSF Mobridge-Appleton line across the northern portion of the State all employ CTC or a mixture of CTC and ABS, while the BNSF Watertown Subdivision, a line with less capacity, uses Track Warrant Control (TWC) rules. Under the TWC system, a dispatcher grants permission for a train to occupy a block of track. No costly signal and software systems are utilized with the TWC system, which could prove appropriate for lightly used rail lines.

The distribution of railroad yards and sidings also impacts railroad operations and flexibility in serving rail shippers. Figure 21 shows the spatial distribution of these railroad support assets. Additional sidings not evident on the figure include one at Aberdeen on the Britton Line, at Redfield and Alpena on BNSF's Aberdeen Subdivision, and north of Sioux City, Iowa.

Figure 19. Number of Tracks, South Dakota Railroad Network

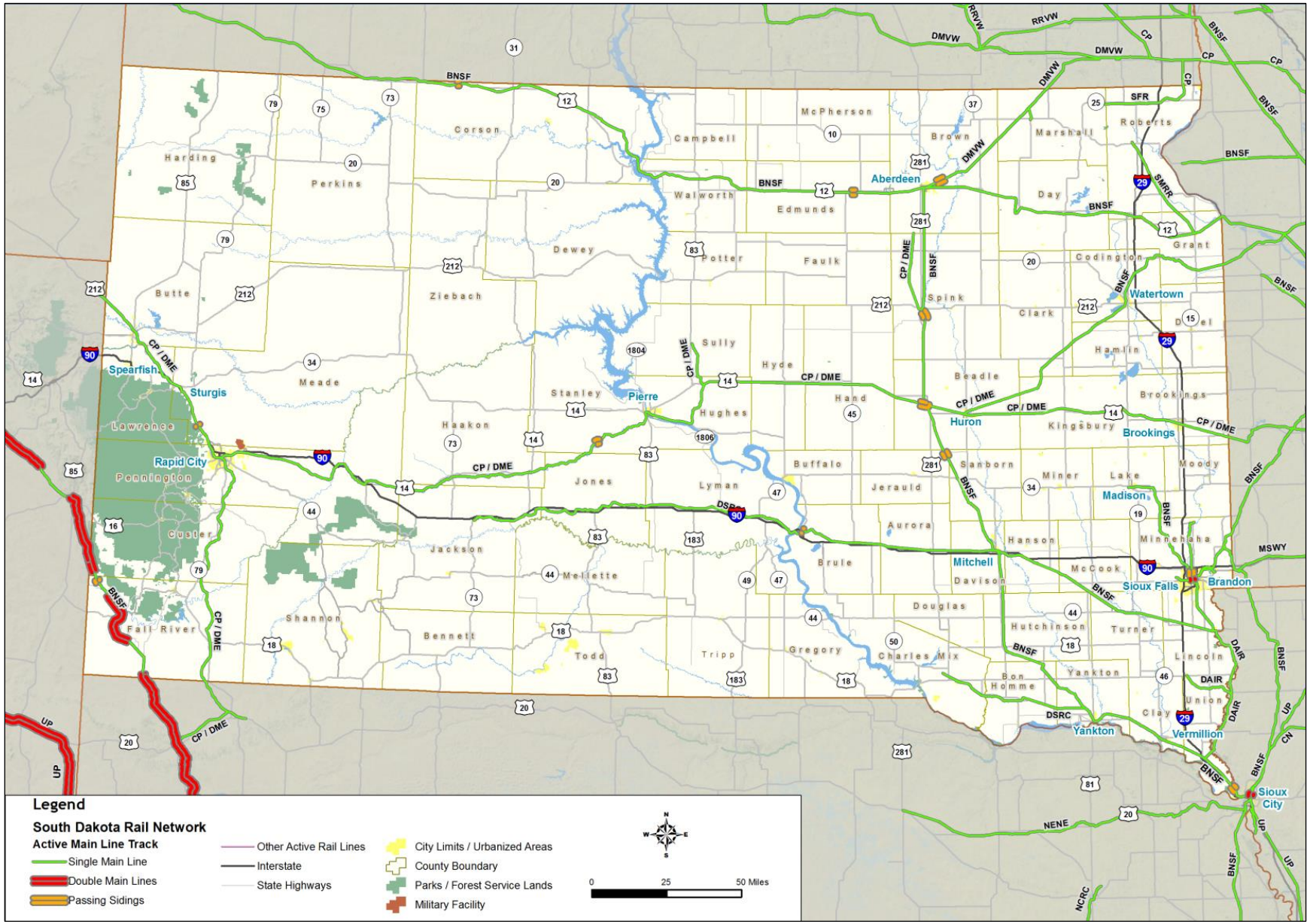


Figure 20. Train Control and Signal Systems, South Dakota Railroad Network

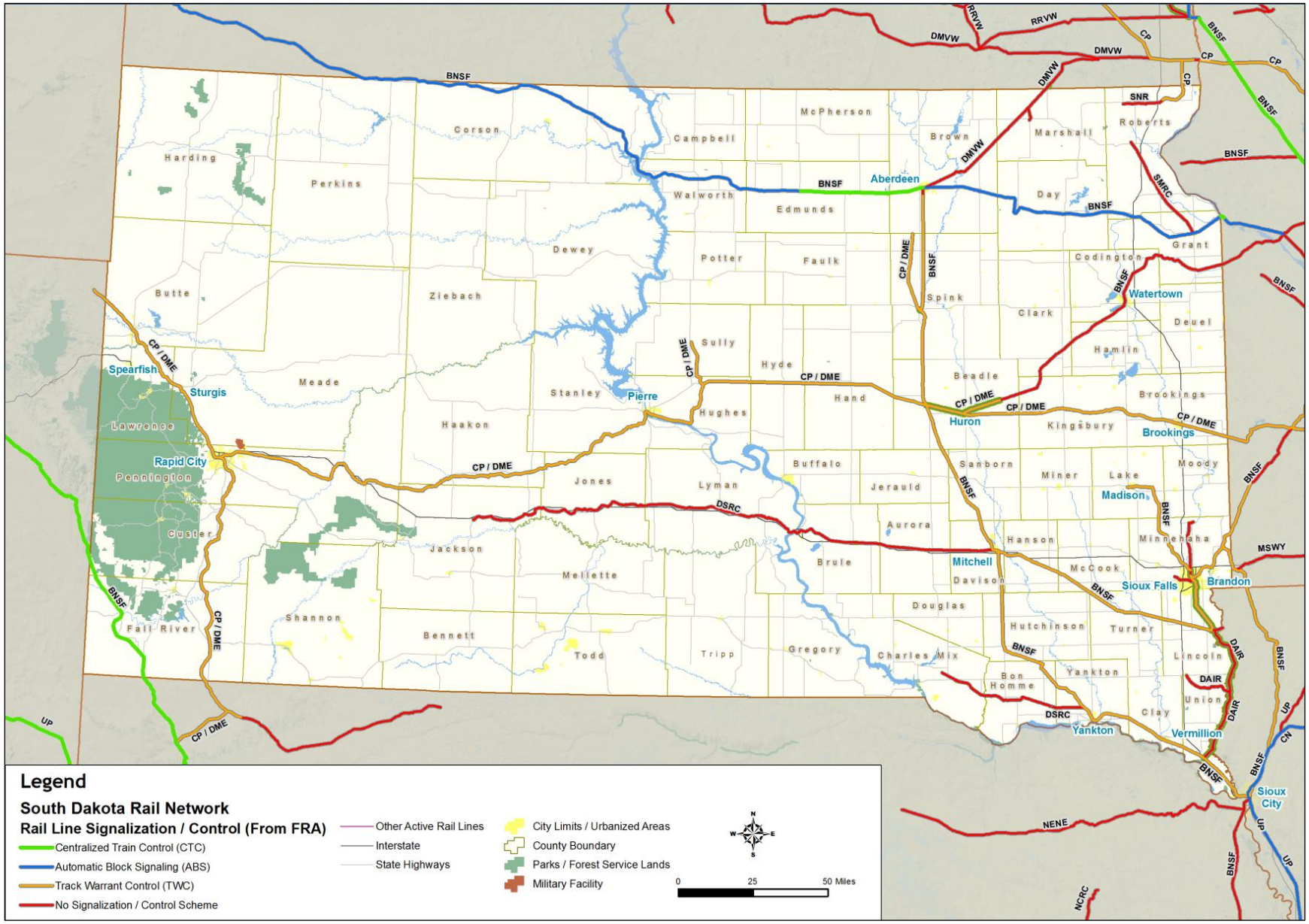


Figure 21. Yards and Sidings, South Dakota Railroad Network

SOUTH DAKOTA RAIL SYSTEM DEMAND – CURRENT AND FUTURE

To place the South Dakota rail system within a national and statewide context, this section characterizes the national significance of South Dakota's rail system and describes national and state trends that could impact freight rail demand and change the role of South Dakota rail in the future. It also describes how the system is used, outlining key commodities, volumes, and trading partners, today and in the future.

DATA SOURCES USED IN THIS CHAPTER

A variety of data sources are utilized in this chapter. The discussion on South Dakota's economy draws most extensively from material produced by the U.S. Departments of Commerce and Agriculture, along with several South Dakota state agencies. Information on South Dakota's current and projected transportation demand was provided primarily by the FHWA's Freight Analysis Framework and, for rail traffic, the STB's confidential Carload Waybill Sample.

- The Freight Analysis Framework (FAF3) provides estimates of freight tonnage moving within and between major markets by commodity and mode, for 123 U.S. regions that consist of major metropolitan areas, state remainders, and 16 entire states. The underlying source of data for FAF3 is the 2007 Commodity Flow Survey, a survey of shipping practices by 100,000 U.S. manufacturers and wholesalers. This data is augmented by several other mode-specific data sources. FAF3 includes a forecast to 2040 that was produced by IHS (formerly Global Insight) using Q2 2012 as the base period.

  Although FAF3 is considered to be reasonably reflective of general freight traffic, there are three significant limitations to note when interpreting this data:

  - The base year of 2007 precedes the recession of 2008-2009, and with it some significant changes that have occurred in shipping patterns over the last six years that are not captured in the data.
  - Historical traffic volumes reported in FAF3 for 2008 through 2011 are wholly synthetic and do not take into account variations in crop production by region, shifts in markets, etc.
  - FAF3 tends to underreport certain types of traffic. This includes traffic moving short distances, such as municipal solid waste and field crops moving from farm to market. Given the importance of agricultural production in South Dakota, this limitation is most evident in the estimated volumes of agricultural production moving by truck.
- The Carload Waybill Sample is a statistically stratified sampling of rail shipments that is assembled annually. Carriers terminating a minimum of 4,500 carloads or moving 5 percent or more of any state's total traffic must report detailed information on each of the sampled shipments, which are then compiled into a database representing approximately 1.8 percent of all rail shipments throughout the U.S.[13]

[13] *Reference Guide for the 2011 Surface Transportation Board Carload Waybill Sample*, Railinc, 2012 (http://www.stb.dot.gov/stb/industry/econ_waybill.html).

The Carload Waybill Sample accurately reflects traffic handled by Class I railroads. However, the 4,500-car minimum reporting threshold for terminating carriers can and does cause some underreporting of shortline traffic. The degree to which this may affect reporting for South Dakota's rail traffic is not readily apparent.

THE ROLE OF SOUTH DAKOTA IN THE NATIONAL RAIL SYSTEM

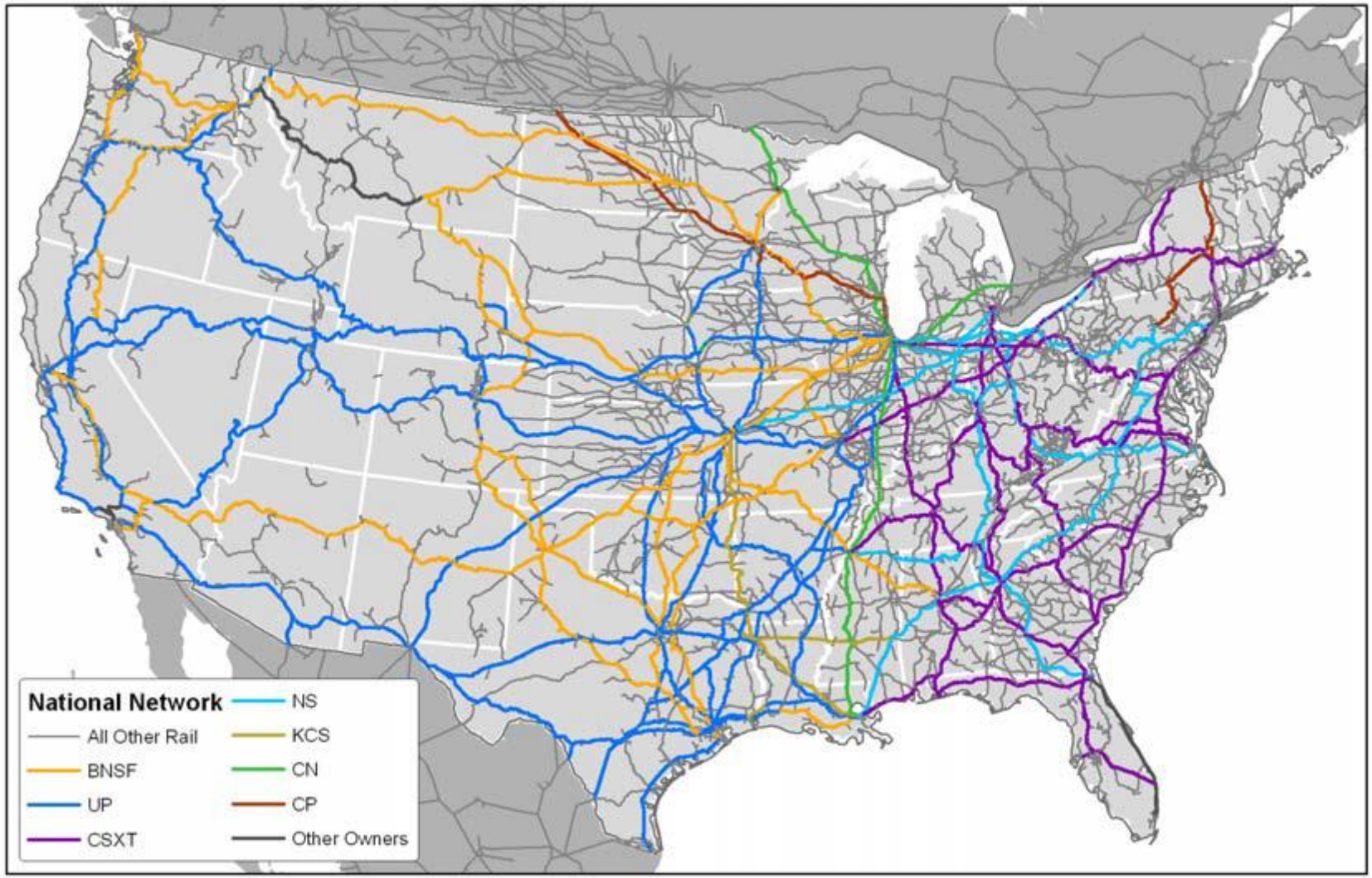
A national rail freight capacity study conducted by the AAR in 2007 identified a network of primary rail freight corridors, shown in Figure 22.[14] These primary corridors were designated based on the fact that they carry a larger proportion of overall freight rail movements. These corridors also are a result of freight railroad ownership changes over the past 50 years, including consolidation and mergers, bankruptcies and abandonments, and legislative changes. This primary network moves through most states; however the only portion designated in South Dakota is BNSF's line moving Powder River Basin coal through the southwest corner of the State. The disproportionately large number of trains and tons along this route affect the State's total railroad statistics.

MOST SOUTH DAKOTA RAIL SHIPPERS DO NOT HAVE DIRECT ACCESS TO THE NATIONAL RAIL CORRIDORS, AS DEFINED BY THE ASSOCIATION OF AMERICAN RAILROADS. THE STATE'S RAILROAD SYSTEM IS PRIMARILY ORIENTED TO CONNECT SHIPPERS TO THIS NETWORK VIA CONNECTIONS OUTSIDE THE STATE.

South Dakota railroad shippers do not have direct access to these national rail corridors. As such, the State's railroad system is primarily oriented in connecting rail shippers in the State to the national rail network for outbound and inbound shipments. Rail shippers access that national rail network within the BNSF and RCP&E systems, which comprise about 80 percent of the State's rail miles, and through interchanges with other Class I railroads.

[14] National Rail Freight Infrastructure Capacity and Investment Study, Association of American Railroads, 2007.

Figure 22. National Rail Network and Primary Rail Freight Corridors



Source: Association of American Railroads, National Rail Freight Infrastructure Capacity and Investment Study, 2007.

SOUTH DAKOTA CONTEXT

This section describes the socioeconomic and industry trends that support freight and passenger rail service in South Dakota and outlines the policy and institutional context in which the system operates.

STATE GEOGRAPHY AND KEY INDUSTRIES

South Dakota's geography, like many states in the Midwest, varies in topography and fertility from west to east. The Missouri River runs north-south across the approximate center of the State. East of the Missouri river, South Dakota's terrain is relatively flat and fertile, and is largely utilized for growing corn, wheat, soybeans, and similar crops. West of the Missouri River, South Dakota's terrain is more uneven, arid and less fertile. Much of this land is used for grazing, although small pockets of cultivation exist. The Black Hills, a range running north-south along the State's western border, is South Dakota's only significant mountain group, and a place where mining and logging industries were established (in and around Rapid City) as early as in the 19th Century. These are further discussed below in the current day context.

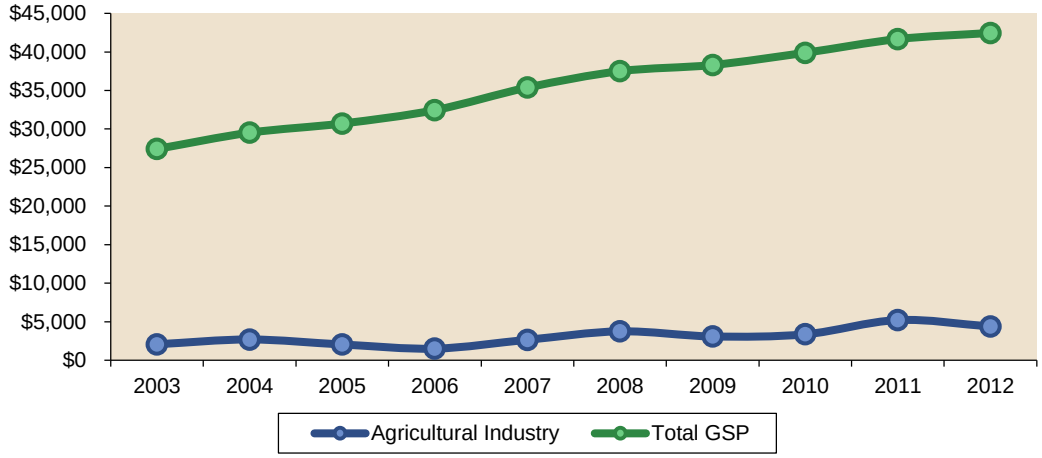
The 2007 Census of Agriculture State Profile,[15] ranked South Dakota 17th in the U.S. in terms of the total value of agricultural products sold, and 9th in terms of the value of sales of the commodity group of grains, oilseeds, dry beans, and dry peas. South Dakota also ranked in the top 10 on livestock and animal products, such as sheep, goats, cattle and calves, and hogs and pigs. Figure 23 depicts how the State's agricultural sector contributes roughly 10 percent of the State's Gross State Product. In 2011, farming in South Dakota produced agricultural commodities, including field and miscellaneous crops ($7.8 billion by value of production), corn for grain ($4.0 billion), soybeans, hay all (dry) ($1.0 billion), wheat all ($0.8 billion), hay alfalfa (dry) ($0.8 billion), and other.[16] In 2012, South Dakota's agriculture industry contributed 10.3 percent of the State's Gross State Product,[17] shown historically in Figure 23. Figure 24 describes the State's planted and harvested acres and value of agricultural crops.

[15] The United States Department of Agriculture's National Agricultural Statistics Service (NASS) delayed publication of the 2012 Census of Agriculture. The new release date has been set for February 20, 2014. This section will be updated when that information is available.

[16] United States Department of Agriculture – South Dakota Agricultural Statistics Service. *2011 State Agricultural Overview.* Available at: http://www.nass.usda.gov/Statistics_by_State/Ag_Overview/AgOverview_SD.pdf (last accessed on September 30, 2013).

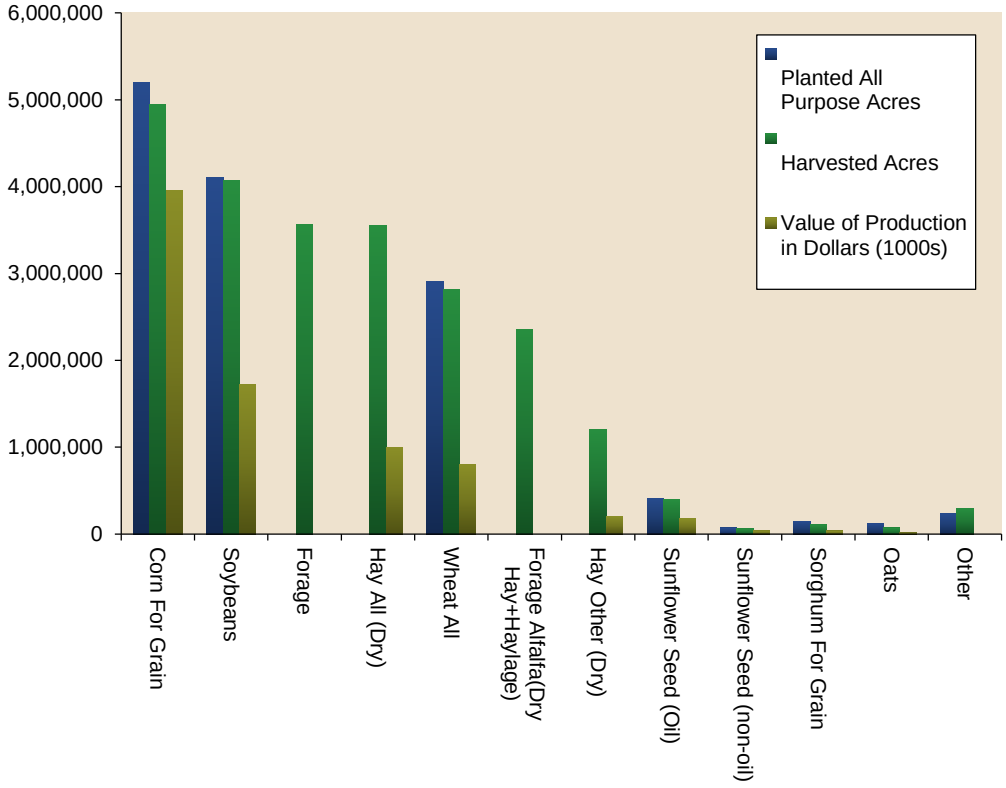
[17] Governor's Office of Economic Development. 2012 South Dakota Profile – Ready to Work.

Figure 23. Growth in South Dakota GSP and Contribution from the Agricultural Sector (Millions of Chained Dollars)



Source: Governor's Office of Economic Development. 2012 South Dakota Profile – Ready to Work.

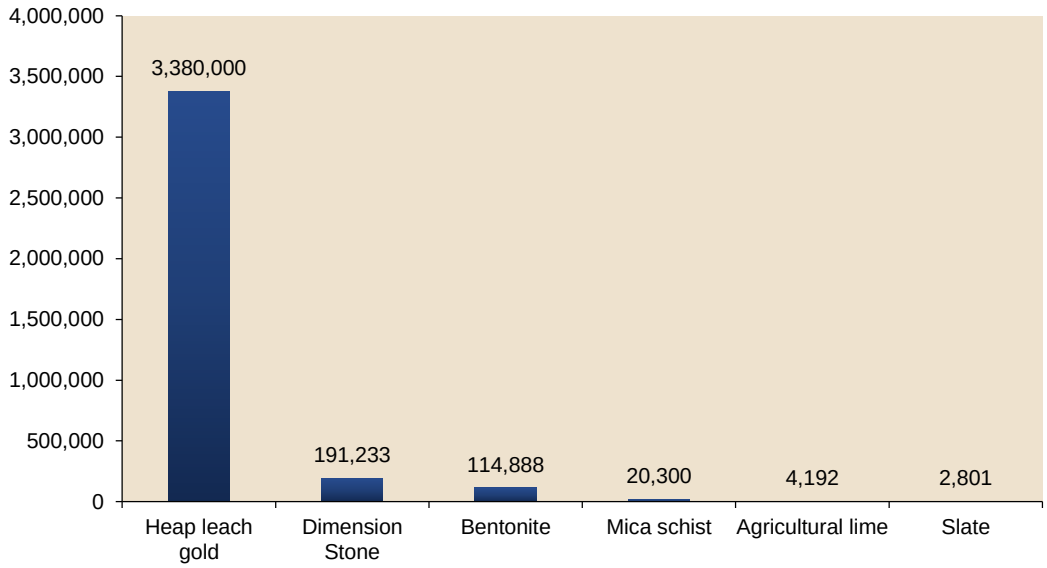
Figure 24. South Dakota Planted and Harvested Acres with Value of Production, 2011



Source: South Dakota 2011 State Agricultural Overview. http://www.nass.usda.gov/Statistics_by_State/Ag_Overview/AgOverview_SD.pdf

As shown in Figure 25, at the end of 2011, a total of 47 mine permits covered mining of minerals in the State, including gold ore (3.38 million tons), dimension stone (191,233 tons), bentonite (114,888 tons), mica schist (20,300 tons), agricultural lime (4,192 tons), and slate (2,801 tons).[18] In 2008, over 13 million tons of sand and gravel, over 3 million tons of quartzite and over 3 million tons of limestone also were mined in the State.[19] Within South Dakota, mining, logging, and construction saw an increase in employment by about 10.7 percent between 2002-2012, while at the same time there was a decline of 15.4 percent nationally,[20] shown in Figure 26.

Figure 25. Tonnage of Major Mineral Resources in South Dakota, 2011



Source: South Dakota Department of Environment and Natural Resources, Summary of the Mining Industry in South Dakota – 2011, *May 2012.*

In 2012, the manufacturing industry in South Dakota comprised approximately 9.4 percent of the State's GSP. The manufacturing sectors that show growth include beverage and tobacco products, transportation equipment, machinery, and fabricated metal products manufacturing. Employment in manufacturing increased by about 7.5 percent between 2002-2012, while at the same time it declined for U.S. as a whole by 21.8 percent. 3M in Aberdeen and Brookings, Adams Thermal Systems, Inc. in Canton, Dakota Provisions in Huron, Daktronics, Inc. in Brookings and Sioux Falls, John Morrell and Co. in Sioux Falls, Link Snacks, Inc. in Alpena, Raven Industries, Inc. in Sioux Falls, and Twin City Fan in many statewide locations are some of the many major manufacturing companies in the State.[21]

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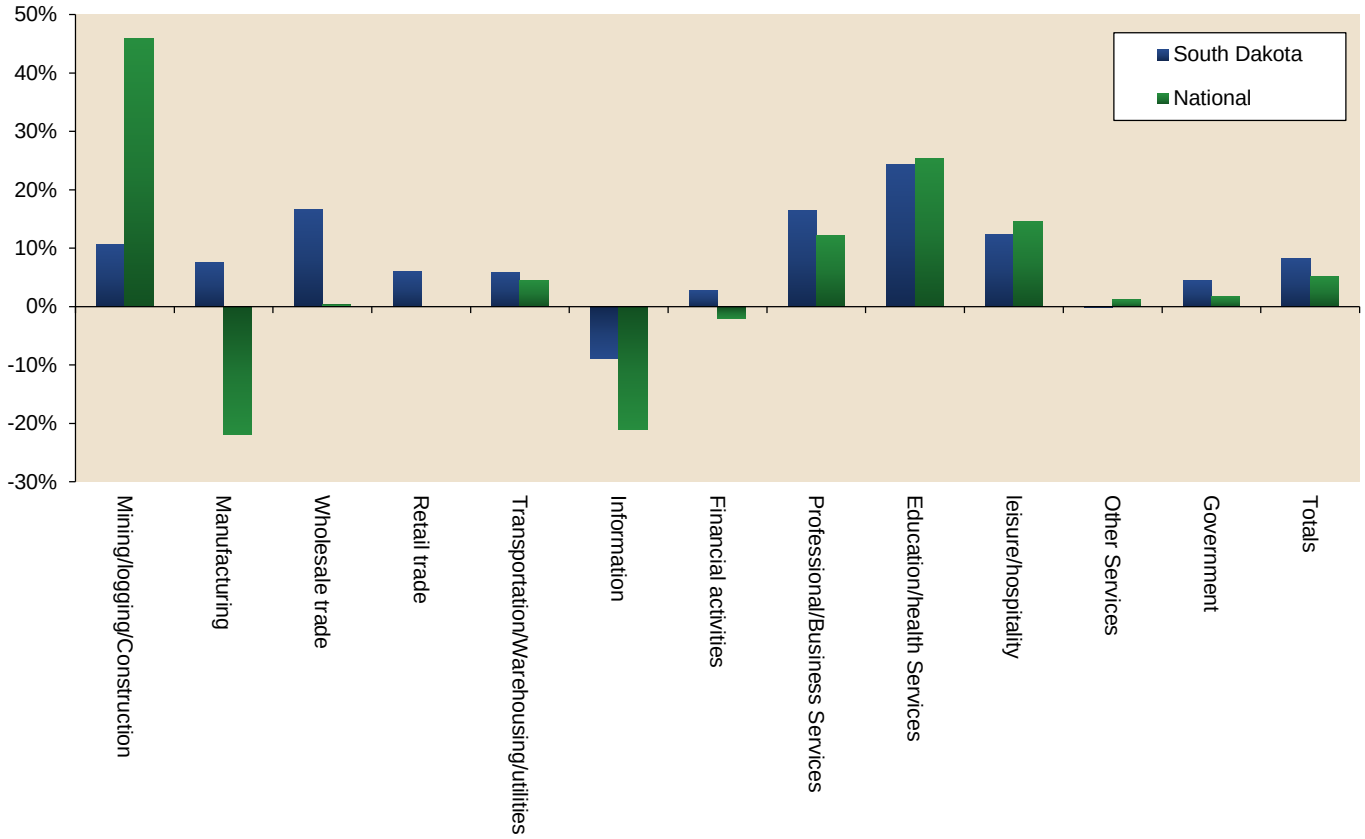
[18] South Dakota Department of Environment and Natural Resources, *Summary of the Mining Industry in South Dakota – 2011*, May 2012.

[19] South Dakota Department of Environment and Natural Resources, South Dakota – 2008 Mineral Summary Production, Exploration and Environmental Issues, 2008.

[20] Governor's Office of Economic Development. 2012 South Dakota Profile – Ready to Work.

[21] Governor's Office of Economic Development. 2012 South Dakota Profile – Ready to Work.

Figure 26. Nonfarm Workers 10-Year Growth, 2002-2012



Source: Governor's Office of Economic Development. 2012 South Dakota Profile – Ready to Work.

Demographic Trends

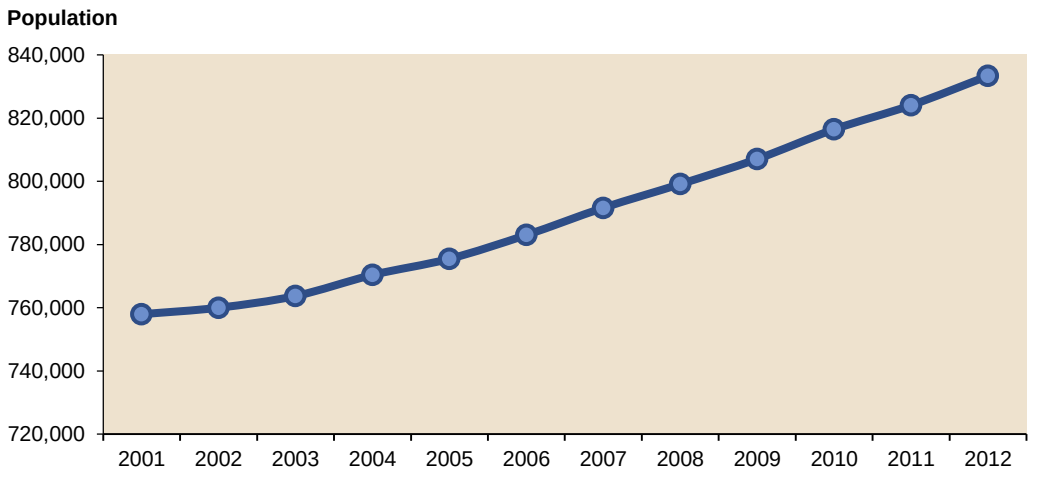
According to the U.S. Census, the population of South Dakota in 2010 was 814,180 compared to 754,844 in 2000, a growth of 7.9 percent. This is slightly lower than the U.S. total population increase of about 10 percent in the same period.[22] Between 2010 and 2012, the State population further increased by 2.4 percent to 833,354. Figure 27 illustrates population change from 2002 to 2012. In 2012, the State had a population density of just 11.0 persons per square mile, and ranked 47th in the U.S. The 2012 population density of the U.S. was 89 persons per square mile.[23]

Figure 28 compares changes in the national GDP and the South Dakota GSP from 2001 – 2012. South Dakota's change in GSP from 2011 to 2012 as compared to its neighboring states is illustrated in Figure 29.

[22] U.S. Department of Commerce, Economics and Statistics Administration, U.S. Census Bureau. Population Distribution and Change 2000 to 2010 – 2010 Census Briefs, 2011.

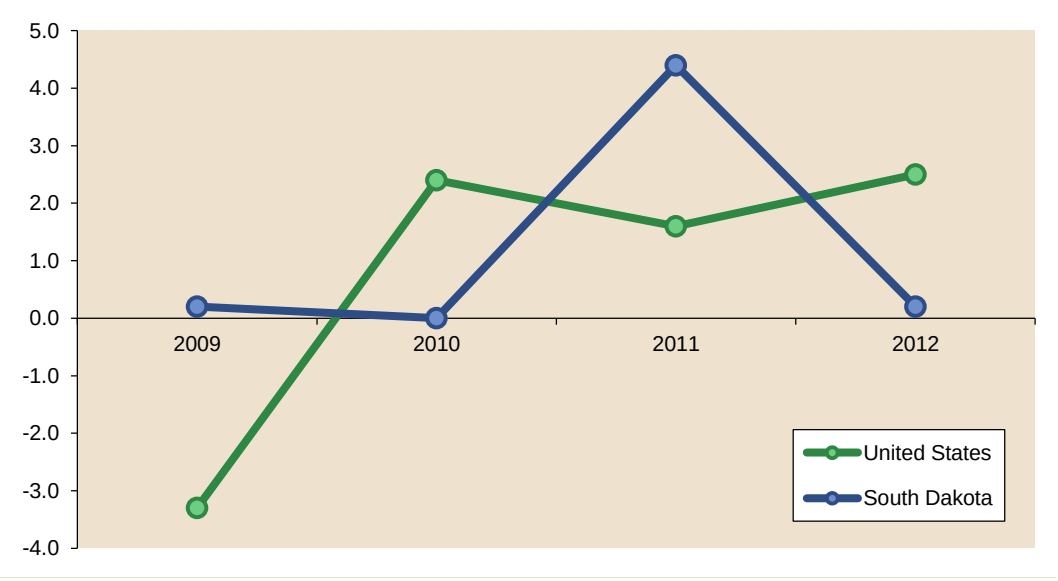
[23] U.S. Census Bureau, Population Division, Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2012.

Figure 27. South Dakota Population Growth, 2002-2012



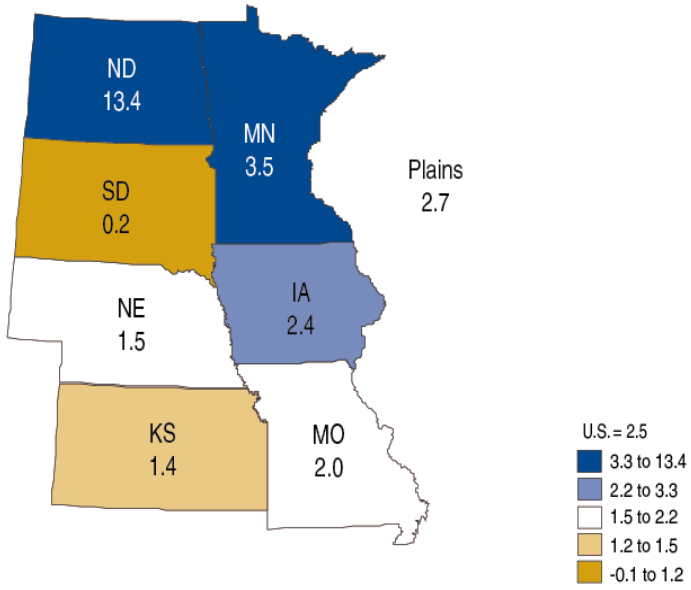
Source: U.S. Census.

Figure 28. Change in GSP for South Dakota and GDP for the U.S., 2009-2012



Source: U.S. Bureau of Economic Analysis.

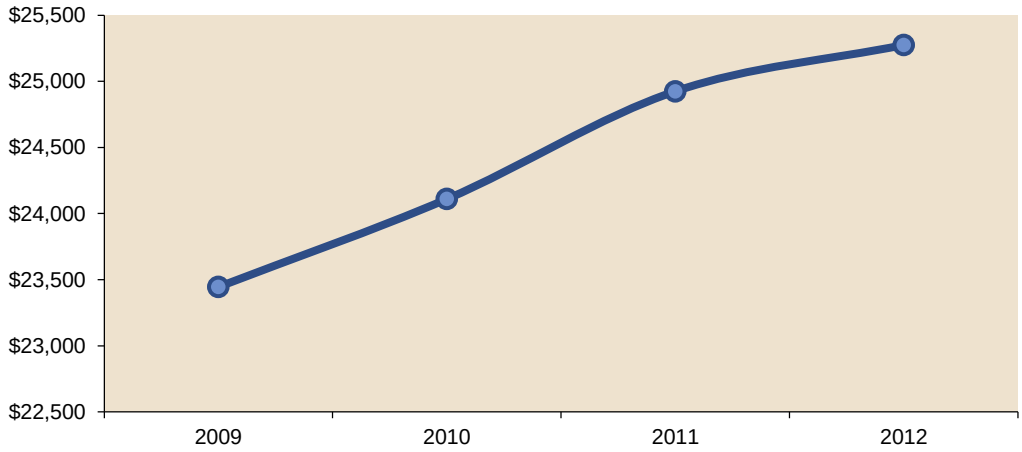
Figure 29. Growth in 2012 State GDP for Plains Region States



Source: U.S. Bureau of Economic Analysis.

In 2012, the State's per capita personal income in current dollars was $45,381, ranking South Dakota 18th in the U.S., and slightly higher than the U.S. average of $43,735.[24] Figure 30 shows recent trends in per capita income in the State. Figure 31 represents the distribution of household incomes.

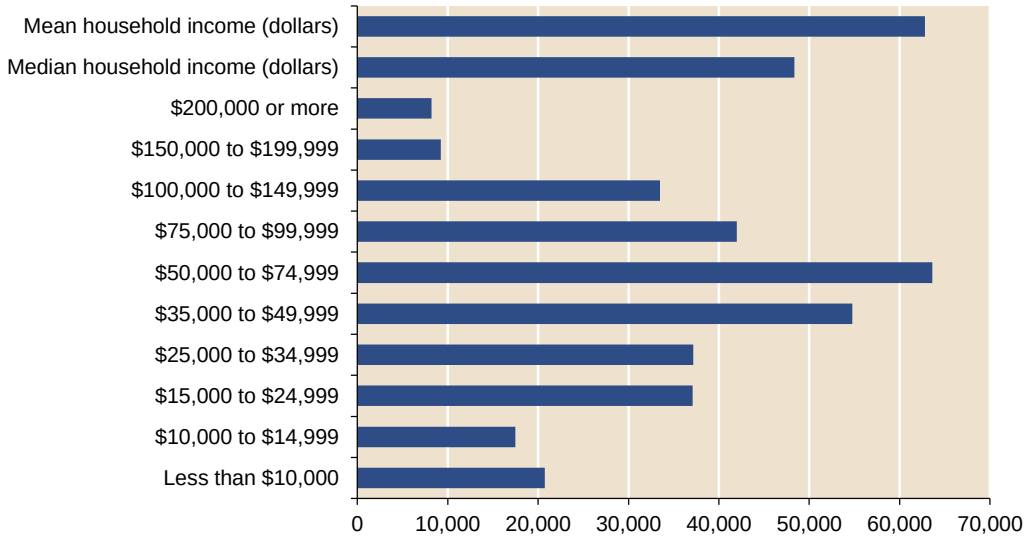
Figure 30. South Dakota Per Capita Income, 2009-2012



Source: U.S. Census, American Community Survey Five-Year Estimates: B19301, Per Capita Income, American FactFinder, 2012 American Community Survey One-Year Estimates.

[24] U.S. Bureau of Economic Analysis Data SA1-3 Personal income summary – Per capita personal income (total personal income divided by total midyear population) by state.

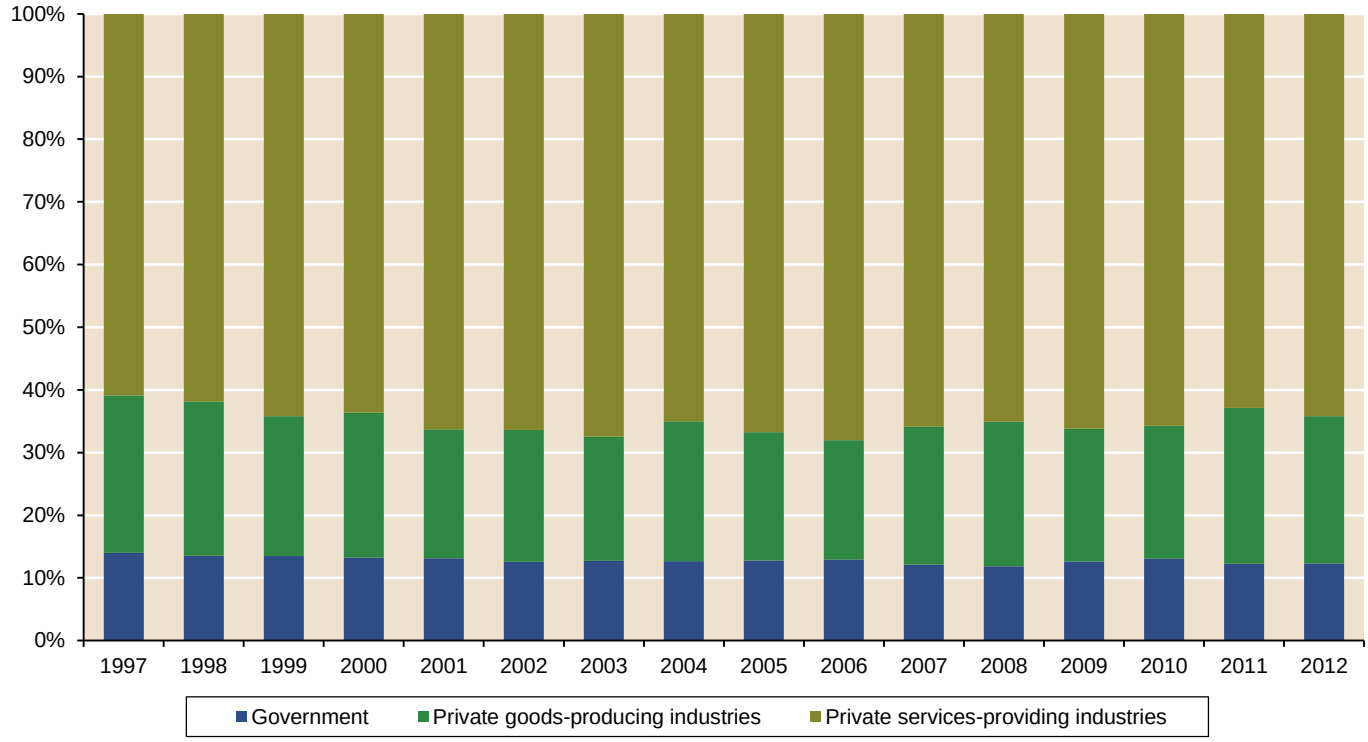
Figure 31. Profile of South Dakota Household Income (Numbers of Households, 2012)



Source: U.S. Census Bureau, 2012 American Community Survey.

The makeup of the State's economy has shifted in the past 15 years, with more GSP in private services than private goods producers or government. Figure 32 shows the changes in percentages of total State GSP from 1997 to 2012. Starting in 1999, the financial services industry in South Dakota grew as more banking card processing operations moving to the State. By 2003, financial services made up 20 percent of the State's GSP. During drought years in 2005 and 2006, agriculture's percentage of State GSP decreased to 6 percent and 5 percent respectively, before rebounding in 2011 and 2012. Wholesale and retail trade have remained stable as a percent of State GSP during this overall time period, so the increase in population and GSP has proportionally and gradually increased consumer goods brought to the State. However, trends in government and private services have less effect on freight transportation demand than the private goods-producing industries, which have slightly decreased as a percentage of total economic activity over the time period.

Figure 32. Major Economic Sector Percent of State Gross State Product, 1997-2012



Source: U.S. Bureau of Economic Analysis.

KEY COMMODITY FLOWS

Approximately 512 million tons of freight was moved into, out of, through, and within South Dakota in 2011, as shown in Table 19. The vast majority of these shipments (75 percent) were handled by truck. Furthermore, the vast majority of freight tonnage – 74 percent for all modes – was through traffic moving through the State.

Table 19. Freight Movements over All Modes by Direction and by Mode, 2011 Weight (Thousands of Tons)

	Freight Movements (in thousands of tons)								
Mode	**Inbound**	**Percent**	**Outbound**	**Percent**	**Through**	**Percent**	**Intrastate**	**Percent**	**Total**
Truck	24,500[a]	6.4%	21,900[a]	5.7%	267,800[c]	70.1%	67,800[a]	17.7%	**382,000**
Rail	3,600[b]	2.8%	14,800[b]	11.3%	111,500[b]	85.4%	700[b]	0.5%	**130,600**
Air	1[a]	56.0%	2[a]	44.%	0	0%	0	0%	**3**
Water	14[a]	33.3%	11[a]	66.7%	0	0%	0	0%	**25**
TOTAL	**28,115**	**5.5%**	**36,713**	**7.2%**	**379,300**	**74.0%**	**68,500**	**13.4%**	**512,628**

Sources: [a] *FHWA FAF3 2011 Provisional estimates.*

[b] *STB 2011 Confidential Carload Waybill Sample data.*

[c] *Cambridge Systematics' estimation of flows through South Dakota: FHWA FAF3 does not directly provide truck through tons; therefore, estimation was done using both FHWA FAF3 2011 Provisional estimates and STB 2011 Confidential Carload Waybill Sample data. For this, origin-destination (OD) pairs that are indicated by Carload Waybill Sample data to have between them the highest through tons were first identified. Then, the data on the current truck-rail mode split was collected from FAF3 data for this restricted set of OD pairs. The data for rail through tons, and the mode splits were used together to estimate the likely truck through tons.*

Note: Pipeline movements not included.

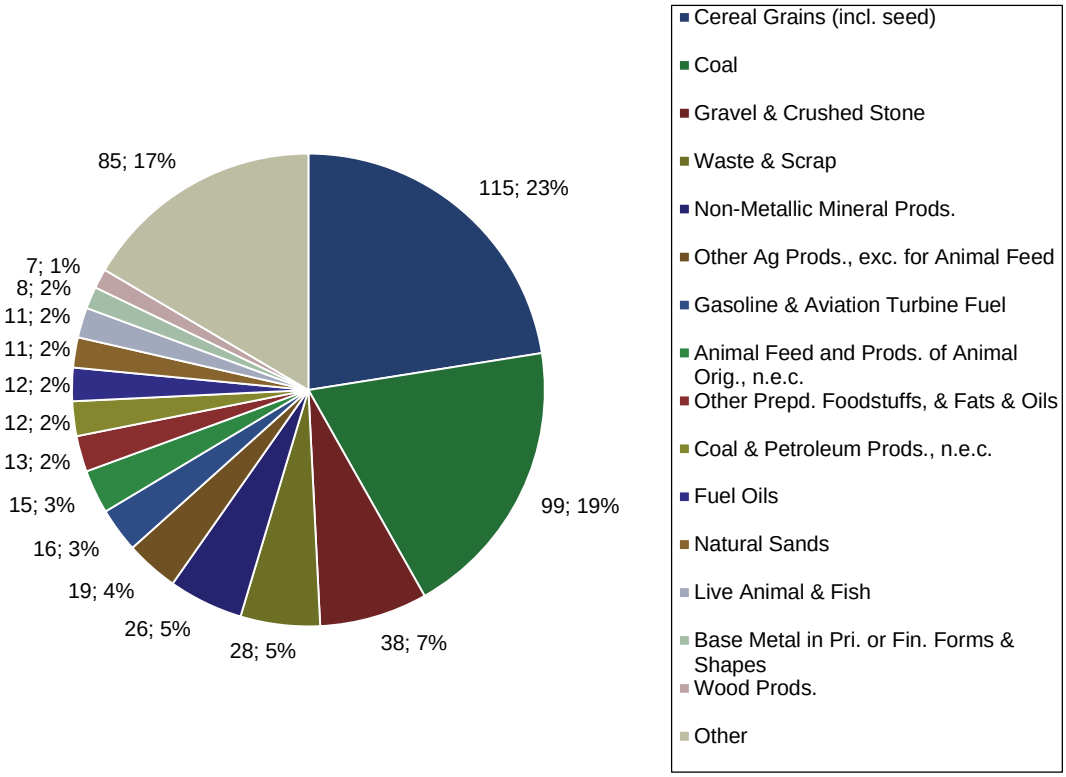
As shown in Figure 33, key commodities include:

- Cereal grains (including seeds) originating from South Dakota and also from the other Midwestern states that pass through South Dakota, produced both for domestic consumption and international exports, led the list of top commodities.
- The Western Coal Region (that includes the Powder River Basin) in Wyoming houses vast coal deposits, and currently supplies more than half of the coal consumed in the U.S.[25] Due to geography, large quantities of this commodity moves by rail across the southwestern corner of the State.
- Gravel and crushed stone, natural sand and nonmetallic mineral products were moved mainly by trucks for construction and cement manufacturing in South Dakota and its nearby states.
- Waste and scrap from manufacturing in South Dakota and nearby states, especially scrap iron and steel is regularly exported through the Pacific Coast ports to Eastern Asian countries that use them in auto parts and other manufacturing. Also, a sizeable amount of waste generated by industries and population was moved within South Dakota.

[25] http://www.eia.gov/energyexplained/index.cfm?page=coal_where (last accessed on September 30, 2013).

The total demand and distribution by movement of the other top commodities in 2011 also are shown in Table 20.

Figure 33. Top Commodities, All Modes, All Movements, 2011 (Millions of Tons)



Source: FHWA FAF3 2011 Provisional estimates; STB 2011 Confidential Carload Waybill Sample data; Cambridge Systematics' estimation of flows through South Dakota.

Note: Pipeline movements are not included in the figure.

Table 20. Top 15 Commodities, All Modes, 2011 (Millions of Tons)

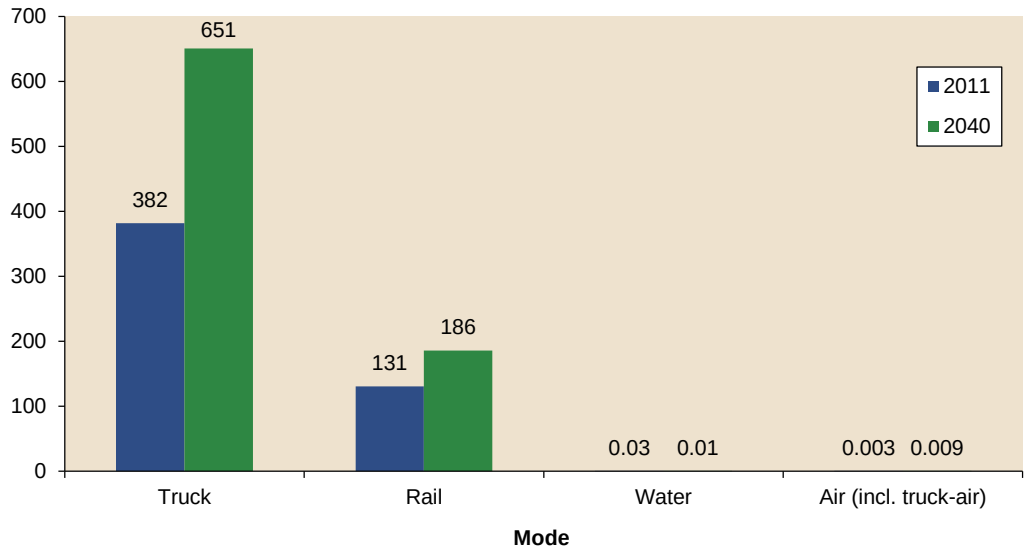
Commodity Class	Freight Movements (in Millions of Tons)					Percent
	Inbound	Outbound	Through	Intrastate	Total	
Cereal Grains (including seed)	10	17	45	43	115	23%
Coal	2	0	97	0	99	19%
Gravel and Crushed Stone	0	1	31	6	38	7%
Waste and Scrap	0	1	25	2	28	5%
Nonmetallic Mineral Products	1	1	22	2	26	5%
Other Agricultural Products, except for Animal Feed	0	5	11	3	19	4%
Gasoline and Aviation Turbine Fuel	0	0	14	1	16	3%
Animal Feed and Products of Animal Origin, n.e.c.	1	4	8	3	15	3%
Other Prepared. Foodstuffs and Fats and Oils	1	1	10	1	13	2%
Coal and Petroleum Prods., n.e.c.	1	0	11	0	12	2%
Fuel Oils	0	0	10	1	12	2%
Natural Sands	0	0	10	1	11	2%
Live Animals and Fish	4	0	5	2	11	2%
Base Metal Forms and Shapes	1	0	7	0	8	2%
Wood Products	1	0	6	0	7	1%
Other	6	6	68	4	85	17%
Total	**28**	**37**	**379**	**69**	**513**	

Source: FHWA FAF3 2011 Provisional estimates; STB 2011 Confidential Carload Waybill Sample data; CS' Estimation of flows through South Dakota.

Note: Pipeline movements are not included in the table.

Figure 34 shows a comparison of the current and projected freight system demand by mode of transportation. Trucks are expected to increase in share by tonnage to about 78 percent of the total demand with growth at 1.9 percent annually, while rail is expected to decrease in share to about 22 percent of the total demand with growth at 1.2 percent annually. The total demand for goods movement on South Dakota's freight system is projected to grow at a compounded annualized growth rate of about 1.7 percent and reach 837.2 million tons by 2040. This includes not only the freight originating or terminating in South Dakota but also passing through the State, but does not include freight movements by pipeline. The estimate is made using the 2011 provisional estimates and 2040 tonnage forecasts of FAF3[26] and the 2011 tonnage data on rail demand from the STB Confidential Carload Waybill Sample.

Figure 34. South Dakota Freight Movements, by Mode, 2011 and 2040 (Millions of Tons)



Source: *FHWA FAF3 2011 Provisional estimates; STB 2011 Confidential Carload Waybill Sample data; Cambridge Systematics' Estimation of flows through South Dakota.*

Note: *Pipeline movements are not included in the figure.*

CURRENT RAIL SYSTEM DEMAND

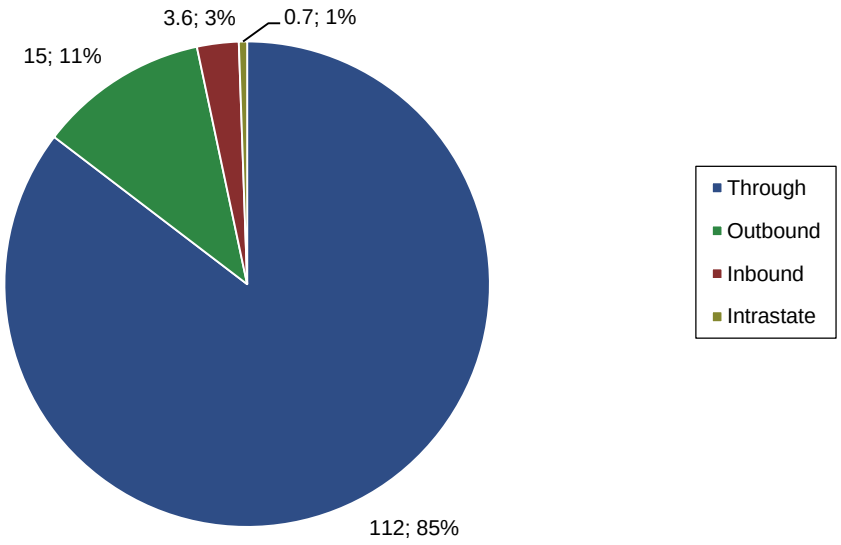
The current demand on the rail system is described below in terms of 2011 tonnage estimates of total rail demand, rail demand by direction of movement, top rail commodities, and trading partners for the top most inbound, outbound, through, and intrastate commodities.

Rail Volumes – Total and by Direction

The total demand for goods movement on South Dakota's rail system in 2011 was about 130.6 million tons in total as shown in Figure 35. In terms of rail tonnage, South Dakota is first a through state, and secondly an export state.

[26] FHWA FAF3 *version 4* released on January 10, 2013.

Figure 35. Rail Volume by Direction, 2011 Weight (Millions of Tons, Percentage)



Source: STB 2011 Confidential Carload Waybill Sample data.

TOP RAIL COMMODITIES

The top commodities that used rail in 2011 are as shown in Table 21. Coal comprised a very large share (72.6 percent) of the total tons moved by rail in the State and dwarfs the volumes of the other commodities; therefore, in Figure 36 the commodity contributions *except* those attributed to coal are indicated. Both geographical and market reasons contribute to the high amount of coal movements over the rail system in South Dakota.

The rail demand and distribution by movement of the other top commodities in 2011 is shown in Table 21. Similar to the distribution of demand over all modes (Figure 33), there was substantial use of rail for transporting farm products, including cereal grains (including seed), other agricultural products, animal feed, and animal products and fertilizers. Alcohol (mainly ethanol) produced from corn in the Midwestern states and South Dakota was also an essential contributor to the rail system demand. Additionally, raw materials such as crude petroleum produced in states such as North Dakota and Wyoming[27] were sent by rail to states with refining industries through South Dakota.

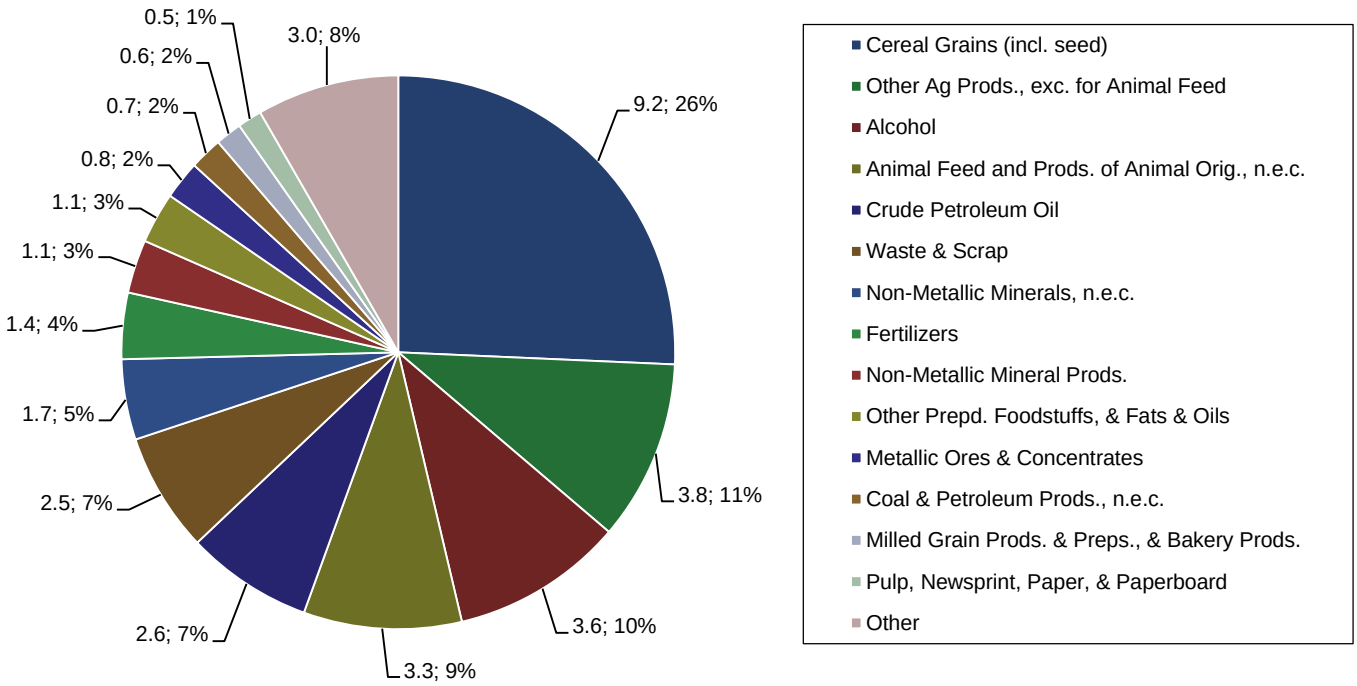
[27] http://www.eia.gov/dnav/pet/pet_crd_crpdn_adc_mbblpd_a.htm (last accessed on September 30, 2013).

Table 21. Top 15 Rail Commodities, 2011 (Thousands of Tons)

Commodity Class	Freight Movements (in Thousands of Tons)					Percent
	Inbound	Outbound	Through	Intrastate	Total	
Coal	1,604	0	93,264	0	94,868	72.6%
Cereal Grains (including seed)	0	6,442	2,366	380	9,187	7.0%
Other Agricultural Products, except for Animal Feed	0	2,498	1,226	43	3,767	2.9%
Alcohol	0	3,176	425	0	3,601	2.8%
Animal Feed and Products of Animal Origin, n.e.c.	0	1,750	1,391	159	3,300	2.5%
Crude Petroleum Oil	0	0	2,645	0	2,645	2.0%
Waste and Scrap	0	307	2,184	0	2,491	1.9%
Nonmetallic Minerals, n.e.c.	31	0	1,649	0	1,680	1.3%
Fertilizers	1,001	0	375	8	1,383	1.1%
Nonmetallic Mineral Products	352	105	548	110	1,115	0.9%
Other Prepared Foodstuffs and Fats and Oils	4	168	885	8	1,065	0.8%
Metallic Ores and Concentrates	0	0	800	0	800	0.6%
Coal and Petroleum Products, n.e.c.	23	7	655	0	685	0.5%
Milled Grain Products and Preparations and Bakery Products	0	0	552	0	552	0.4%
Pulp, Newsprint, Paper, and Paperboard	146	0	362	0	508	0.4%
Other	464	314	2,186	8	2,972	2.3%
Total	**3,624**	**14,766**	**111,513**	**717**	**130,620**	

Source: STB 2011 Confidential Carload Waybill Sample data.

Figure 36. Top Rail Commodities (Excluding Coal), 2011 Weight (Millions of Tons)



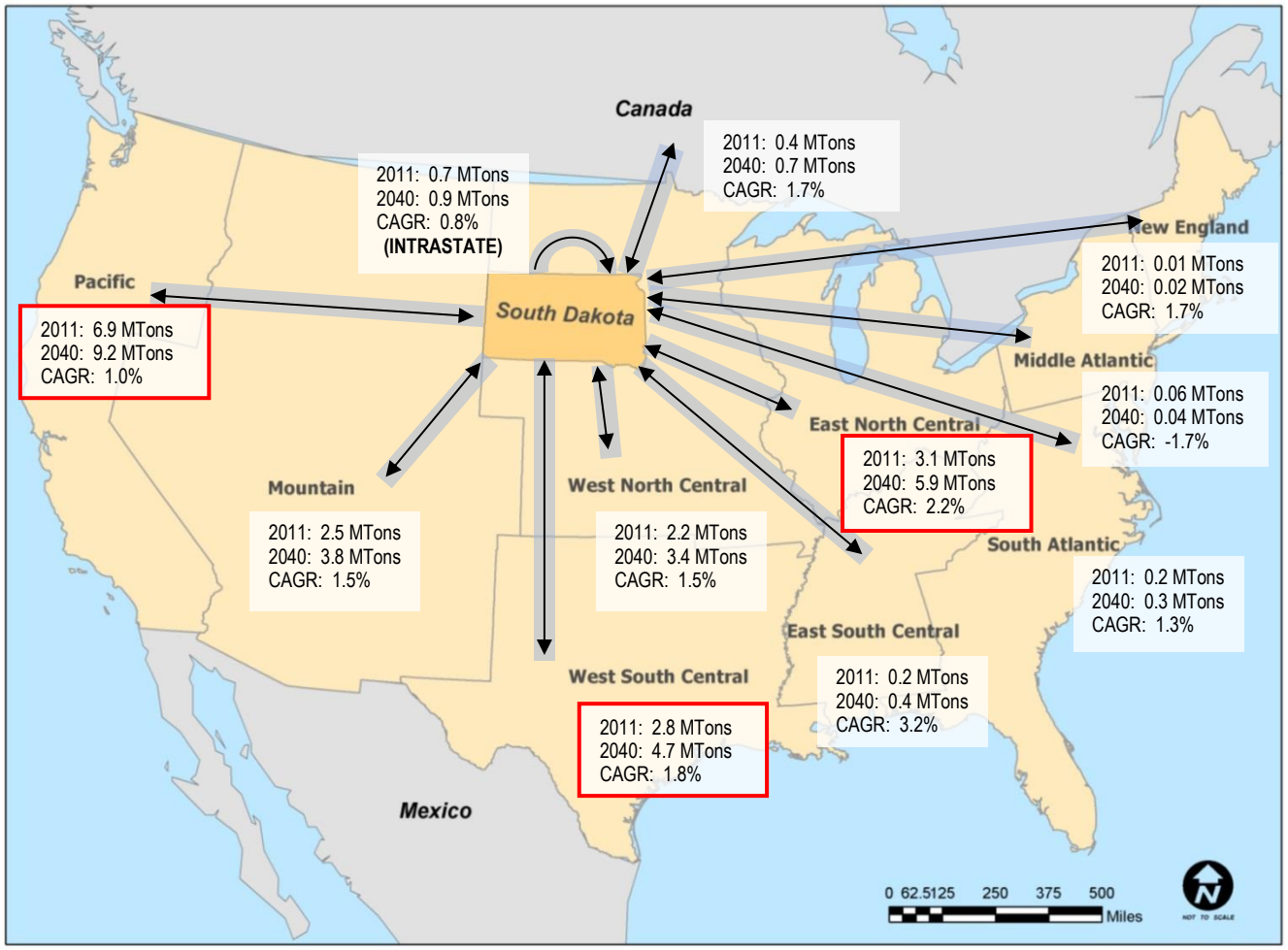
Source: STB 2011 Confidential Carload Waybill Sample data.

Note: The commodity coal is not included in the chart above. Coal contributes 94,868 total tons to the rail volumes for South Dakota.

Top Rail Trading Partners

Figure 37 shows the 2011 bidirectional tonnage distribution with South Dakota's domestic trading partners regions. The top three trading partner regions for South Dakota were the Pacific (about 36 percent of the total State trade), East North Central (16 percent), and West South Central (15 percent) regions.

Figure 37. Rail Flows Distribution among Trade Partners, 2011 and 2040 Weight (Millions of Tons)

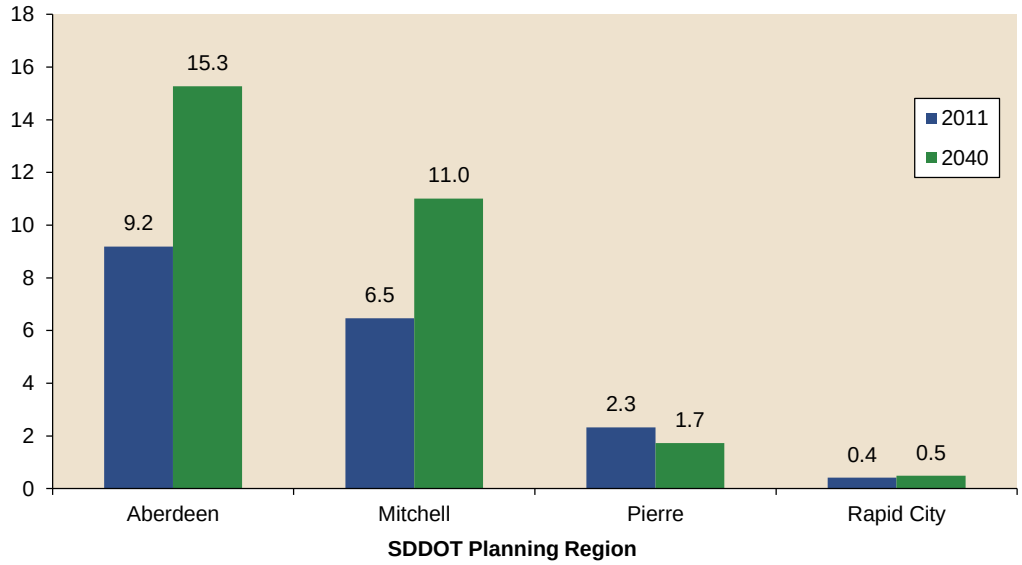


Source: STB 2011 Confidential Carload Waybill Sample data; FHWA FAF3 2011 provisional estimates and 2040 forecasts.

NOTE: CAGR = Compounded Annualized Growth Rate, MTons = Millions of Tons.

Figure 38 shows the distribution of rail tonnage in 2011 among South Dakota DOT's four planning regions (illustrated in Figure 39) for inbound and outbound freight movements only. The vast majority – 85 percent – of rail traffic is generates or terminates within the eastern regions of the State, largely reflective of agricultural production and nonmetallic mineral extraction. The modest volumes generated in the western regions is partially due to the sparse rail network and inferior service available in the western half of the State. A substantial amount of traffic (primarily nonmetallic minerals such as bentonite, clay and others) that does travel through western South Dakota actually originates in Colony, and simply passes through the State.

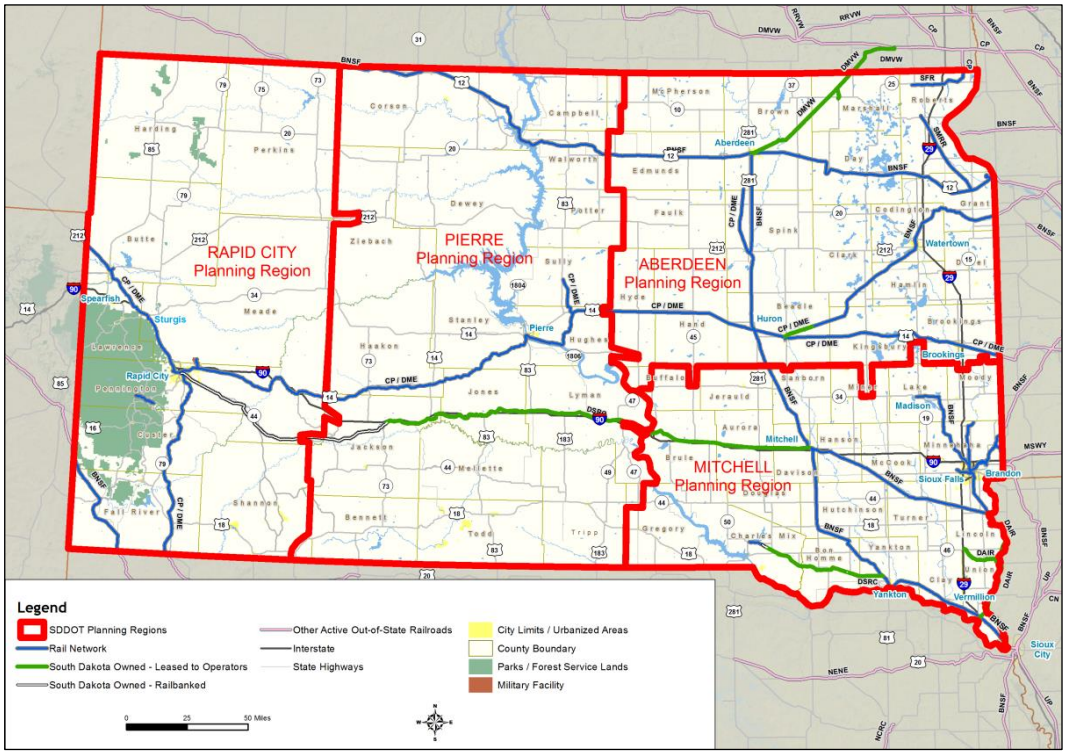
Figure 38. Inbound and Outbound Rail Flows by Planning Regions in South Dakota, 2011 and 2040 (Millions of Tons)



Source: *STB 2011 Confidential Carload Waybill Sample data; FHWA FAF3 2011 provisional estimates and 2040 forecasts; http://www.sddot.com/dot/region/Default.aspx*

Note: *The above graph includes only inbound and outbound freight movements. Significant volumes are generated on the western end of the CP/DM&E Black Hills Subdivision that terminates in Colony, Wyoming. Traffic from Wyoming is considered through traffic and is not included in this figure.*

Figure 39. South Dakota DOT Planning Regions



Top Rail Commodities by Direction and Their Trading Partners

South Dakota's top rail commodities, by direction, are shown in Table 22. In 2011, coal was the largest inbound commodity, all of which came from the Western Coal Region. Fertilizers were the second commodity in terms of tonnage. South Dakota's agricultural sector received fertilizers from several parts of the U.S., chiefly the West North Central (30 percent) and West South Central (26 percent) regions of the U.S. Nonmetallic minerals were the third highest in inbound rail movements; these came mainly from Mountain region (about 66 percent) and West North Central region (29 percent) of the U.S.

The majority of outbound commodities moved by rail were related to agriculture. In 2011, the top outbound commodity was cereal grains (including seed), mainly sent to the Pacific (48 percent) and East North Central (23 percent) regions in the U.S. A large portion of farm products are also exported through the ports in the Pacific Northwest. Alcohol (mainly ethanol) was the second highest in outbound tonnage, chiefly destined for the East North Central (42 percent), Pacific (31 percent) and West South Central (17 percent) regions.

The through movements in 2011 were mainly in the form of coal from the Western Coal Region destined to several locations in the U.S., such as the West North Central (43 percent), West South Central (34 percent) and East North Central (11 percent) regions. Crude petroleum movements moving through South Dakota in 2011 were almost entirely between the West North Central and West South Central regions of the U.S. Cereal grains (including seeds), were the third highest in movements through South Dakota, these mainly originated from the West North Central and Mountain regions and headed to varied destinations in the U.S.

The smallest tonnage of rail movements in South Dakota in 2011 is comprised of intrastate movements. This consisted mainly of small quantities of farm products moved from the Pierre State DOT planning region and the Aberdeen State DOT planning region to other parts of the

Aberdeen State DOT planning region, and nonmetallic mineral products moved from the Rapid City State DOT planning region to the Aberdeen State DOT planning region.

Table 22. Top Rail Commodities by Direction, 2011 Weight (Thousands of Tons)

Commodity Class	Tons	Percent
Inbound		
Coal	1,604	44.3%
Fertilizers	1,001	27.6%
Nonmetallic Mineral Products	352	9.7%
Pulp, Newsprint, Paper, and Paperboard	146	4.0%
Plastics and Rubber	126	3.5%
Wood Prods.	125	3.5%
Other	270	7.4%
Total	**3,624**	
Outbound		
Cereal Grains (including seed)	6,442	43.6%
Alcohol	3,176	21.5%
Other Agricultural Products, except for Animal Feed	2,498	16.9%
Animal Feed and Products of Animal Origin, n.e.c.	1,750	11.9%
Waste and Scrap	307	2.1%
Other Prepared Foodstuffs and Fats and Oils	168	1.1%
Other	426	2.9%
Total	**14,766**	
Through		
Coal	93,264	83.6%
Crude Petroleum Oil	2,645	2.4%
Cereal Grains (incl. seed)	2,366	2.1%
Waste and Scrap	2,184	2.0%
Nonmetallic Minerals, n.e.c.	1,649	1.5%
Animal Feed and Products of Animal Origin, n.e.c.	1,391	1.2%
Other Agricultural Products, except for Animal Feed	1,226	1.1%
Other Prepared Foodstuffs and Fats and Oils	885	0.8%
Metallic Ores and Concentrates	800	0.7%
Coal and Petroleum Products, n.e.c.	655	0.6%
Milled Grain Products and Preparations and Bakery Products	552	0.5%

Commodity Class	Tons	Percent
Nonmetallic Mineral Products	548	0.5%
Other	3,348	3.0%
Total	**111,513**	
Intra		
Cereal Grains (including seed)	380	53.0%
Animal Feed and Products of Animal Origin, n.e.c.	159	22.2%
Nonmetallic Mineral Products	110	15.4%
Other	68	9.5%
Total	**717**	

Source: STB 2011 Confidential Carload Waybill Sample data.

Train Volumes by Rail Segment

Train volumes were estimated by rail segment in South Dakota using a methodology similar to that used in the 2007 Association of American Railroads' (AAR) National Rail Freight Infrastructure Capacity and Investment Study.

The methodology for estimating South Dakota train volumes includes:

- Annual carloads data from the STB Carload Waybill Sample data, along with the information on its origin, destination, and transporting railroad for each leg of the Waybill move;
- Adjustments for empty rail car moves, based on empty return ratios provided in the 2011 Surface Transportation Board's (STB) Uniform Rail Costing System (URCS);
- The 2007 AAR study assumptions for converting annual to approximate 85th percentile day traffic and cars per train by train service type which include:
  - **Auto Train Service –** For assembled automobiles, vans, and trucks moving in multilevel cars;
  - **Bulk Train Service –** For grain, coal, and similar bulk commodities moving in unit trains;
  - **Intermodal Train Service –** For commodities moving in containers or truck trailers on flat cars or specialized intermodal cars; and
  - **General Merchandise Train Service –** Everything else, including commodities, moved in box cars and tank cars.
- A rail network model-based assignment is done to automatically estimate the total daily freight train volumes by rail segment. The rail network used for assignment was developed as part of the 2007 AAR study.

In some cases, estimated train volumes are lower or higher than the actual train volumes. This can happen due to the following reasons: 1) the Carload Waybill Sample data uses expansion factors to estimate the annual train volumes, which may not be accurate; 2) there are simplifications to the rail network model and assignment method in the AAR approach resulting in incorrect routing; and 3) the general railroad assumptions made in the AAR study for estimation of number of daily trains from carloads, including cars per train and empty return ratios, do not reflect current

operations of railroads in South Dakota. To mitigate these issues, recent daily train volume counts at several locations in South Dakota were collected from Burlington Northern Santa Fe Railway (BNSF), and carload data was collected from few of the shortline railroads. Figure 40 shows the 2011 daily train volume estimates over the rail network in South Dakota after making adjustments based on the train counts and carloads.

The key findings from the analysis of train volumes by rail segment in South Dakota include:

- About 51 daily trains, the highest daily number in South Dakota, were estimated to travel over BNSF's Butte subdivision between Alliance, Nebraska and Edgemont, continuing as BNSF Black Hills subdivision between Edgemont and Gillette, Wyoming. These rail segments are located at the southwest corner of the State and less than 50 miles are located within South Dakota. The vast majority of this traffic consisted of trains handling coal from Wyoming's Powder River Basin. A small number of general merchandise trains also moved on this corridor.
- Another very short corridor (less than 15 miles) of BNSF Marshall subdivision, which is located on the eastern edge of the State and very near the tri-state boundary between Iowa, Minnesota, and South Dakota, was estimated to carry the second highest train volume in South Dakota of about 10 daily trains. This segment was estimated to have an even mix of bulk and general merchandise trains.
- Most of the remaining rail segments in South Dakota were estimated to carry five or less trains on a daily basis. Among them, the important rail segments that carried bulk trains that move grain from/to/within the State, alcohol (mainly corn ethanol), aggregates and nonmetallic mineral products from the State, and coal, fertilizers and nonmetallic minerals to the State include: a) BNSF Mobridge subdivision between Aberdeen and Hettinger, North Dakota; b) BNSF Aberdeen subdivision between Aberdeen and Sioux City, Iowa via Mitchell; c) BNSF Appleton subdivision between Aberdeen and Benson, Minnesota; d) BNSF Mitchell subdivision between Mitchell and Canton; e) RCP&E (formerly CP/DM&E) Pierre and Huron subdivisions between Pierre and Tracy, Minnesota via Huron; f) DAIR main line between Dell Rapids, South Dakota to Sioux City, Iowa; and g) RCP&E (formerly CP/DM&E) Black Hills and PRC subdivisions between Dakota Junction and Pierre via Rapid City. Most of these segments also carry general merchandise trains.

Figure 40. Rail Volumes by Rail Line Segment, 2011 (Average Daily Trains)

Source: STB 2011 Confidential Carload Waybill Sample data; Cambridge Systematics' Rail Network Analysis.

PROJECTED RAIL SYSTEM DEMAND

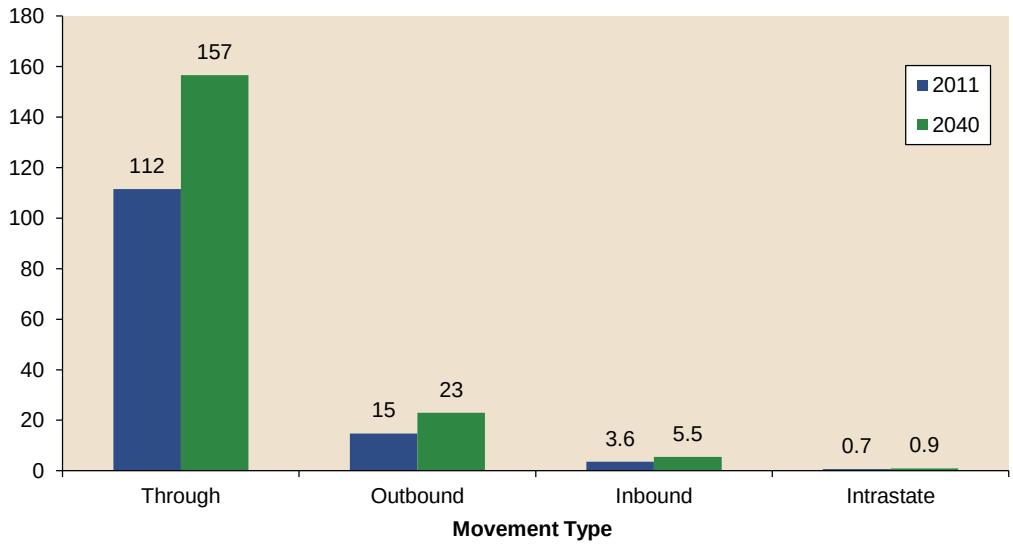
The future demand on the South Dakota rail system is described in this section. Tonnage projections of total rail demand, projected rail demand by direction of movement, anticipated top rail commodities, and trading partners for the expected top most inbound, outbound, through, and intrastate commodities for 2040 are included in the analysis.

RAIL VOLUMES TOTAL AND BY DIRECTION

Applying FAF3 forecasts to the current rail volume from 2011 STB's Confidential Carload Waybill Sample, rail volumes were projected to increase from 130.6 million tons in 2011 to 186.1 tons in 2040, at a compounded annualized growth rate of 1.2 percent.

Figure 41 shows the growth in rail volumes by direction. Through movements will likely remain the dominant component of South Dakota's rail demand at about 84 percent of the total, with a growth of about 1.2 percent annually. Outbound movements will make up about 12 percent of the total, with a growth of about 1.5 percent annually. Inbound and intrastate movements will make up small portions of the total (3 percent and 1 percent, respectively), with growth rates of about 1.5 percent annually and 0.8 percent annually, respectively.

Figure 41. Rail Volumes by Direction, 2011 and 2040 (Millions of Tons)



Source: STB 2011 Confidential Carload Waybill Sample data; FHWA FAF3 2011 provisional estimates and 2040 forecasts.

TOP RAIL COMMODITIES

The top commodities that will use rail in 2040 are shown in Table 23. Alcohol (mainly ethanol) produced in Midwestern states, and primarily in South Dakota, will surpass cereal grains (including seed) and other agricultural products to take the second spot in the top rail commodities. Farm products, including cereal grains (including seed), animal feed and animal products, other agricultural products, and fertilizers would continue their substantial use of rail. Waste and scrap, nonmetallic minerals and nonmetallic mineral products mainly in the form of through movements also will be among the top contributors. Although, the growth rate is small (0.9 percent annually), coal will still comprise a disproportionately large share (65.5 percent) of the

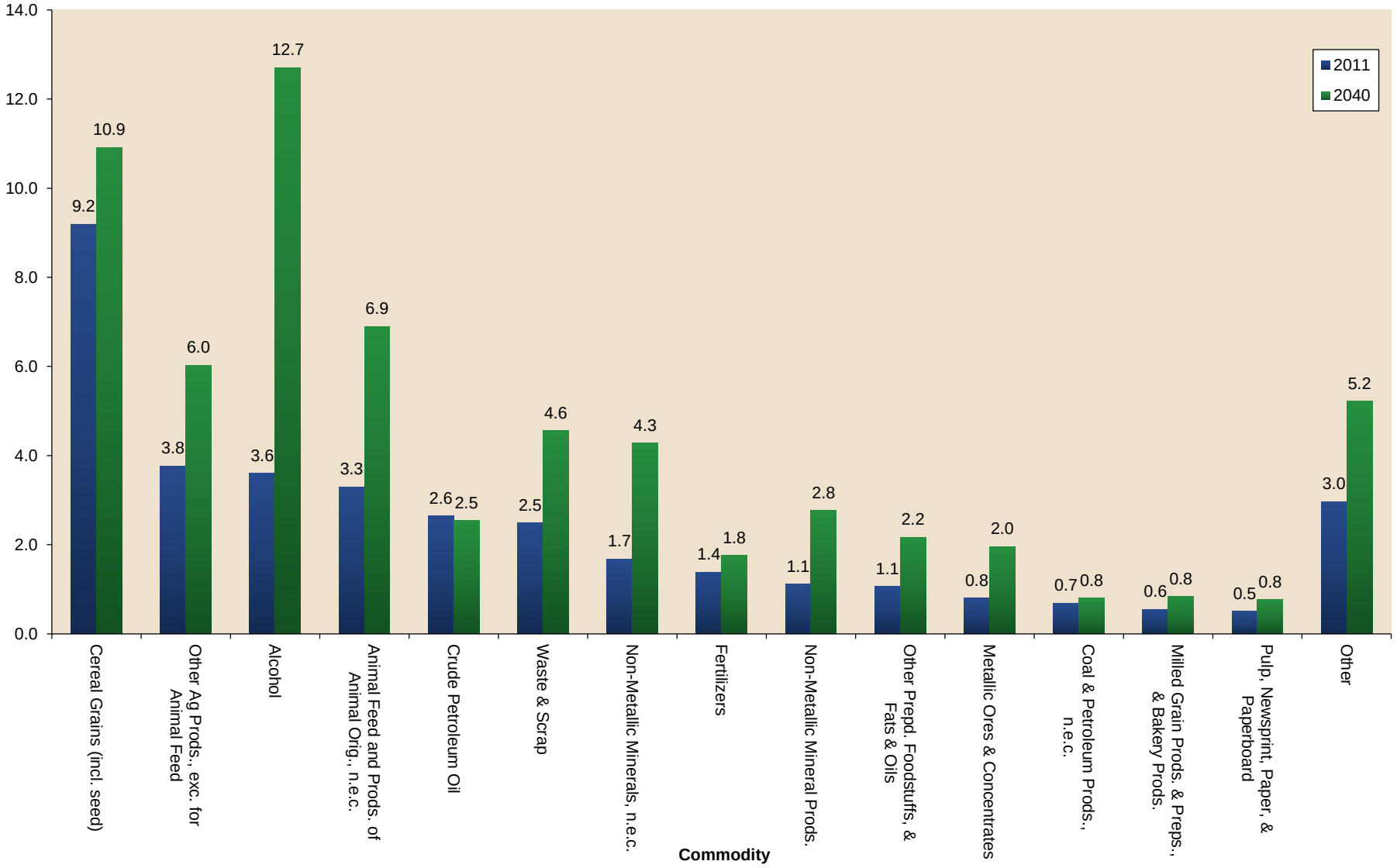
total rail system demand. Figure 42 illustrates contributions by all commodities, except those attributed to coal, in 2011 and 2040.

Table 23. Top 15 Rail Commodities, 2040 Weight (Thousands of Tons)

Commodity Class	Freight Movements (in thousands of tons)					Percent	CAGR 2011-2040
	Inbound	Outbound	Through	Intrastate	Total		
Coal	1,806	0	120,030	0	121,836	65.5%	0.9%
Alcohol	0	11,046	1,660	0	12,706	6.8%	4.4%
Cereal Grains (including seed)	0	3,319	7,417	182	10,919	5.9%	0.6%
Animal Feed and Products of Animal Origin, n.e.c.	0	3,805	2,743	343	6,892	3.7%	2.6%
Other Agricultural Products, except for Animal Feed	0	3,120	2,839	72	6,032	3.2%	1.6%
Waste and Scrap	0	562	3,998	0	4,560	2.5%	2.1%
Nonmetallic Minerals, n.e.c.	80	0	4,199	0	4,280	2.3%	3.3%
Nonmetallic Mineral Products	875	261	1,361	273	2,769	1.5%	3.2%
Crude Petroleum Oil	0	0	2,539	0	2,539	1.4%	-0.1%
Other Prepared Foodstuffs and Fats and Oils	6	301	1,846	15	2,168	1.2%	2.5%
Metallic Ores and Concentrates	0	0	1,960	0	1,960	1.1%	3.1%
Fertilizers	1,395	0	360	5	1,760	0.9%	0.8%
Milled Grain Products and Preparations, and Bakery Prods.	0	0	837	0	837	0.4%	1.4%
Coal and Petroleum Products, n.e.c.	25	8	770	0	804	0.4%	0.6%
Articles of Base Metal	8	7	754	0	769	0.4%	2.8%
Other	1,337	539	3,325	18	5,218	2.8%	
TOTAL	**5,533**	**22,969**	**156,638**	**909**	**186,049**		**1.2%**

Source: STB 2011 Confidential Carload Waybill Sample data; FHWA FAF3 2011 Provisional estimates and 2040 Forecasts.

Figure 42. Top Rail Commodities (Excluding Coal), 2011 and 2040 Weight (Millions of Tons)



Source: STB 2011 Confidential Carload Waybill Sample data; FHWA FAF3 2011 provisional estimates and 2040 forecasts

Top Rail Trading Partners

Previously, Figure 37 indicated the 2040 bidirectional tonnage distribution with South Dakota's trading partner regions. The top three trading partner regions for South Dakota in 2040 are projected to be the Pacific (about 31 percent of the total State trade), East North Central (20 percent) and West South Central (16 percent) regions, with compounded annualized growth rates of 1.0 percent, 2.2 percent, and 1.8 percent, respectively.

Figure 38 (also previously shown) indicates the 2040 bidirectional tonnage distribution among the four South Dakota DOT planning regions for inbound and outbound freight movements only. Tonnage is likely to be distributed among the regions as Aberdeen (53 percent), Mitchell (39 percent), Pierre (6 percent) and Rapid City (2 percent), with compounded annualized growth rates of 1.8 percent, 1.9 percent, 1.0 percent, and 0.6 percent, respectively. The decline in inbound movements is responsible for the overall decline in Pierre region rail volumes.

Top Rail Commodities by Direction and Their Trading Partners

Top rail commodities expected in 2040 by direction are shown in Table 24. Coal and fertilizers will remain the most important inbound commodities, yet the growth rates for these commodities will be small. Coal will continue to come from the Western Coal Region, while fertilizers will primarily arrive from the West South Central (25 percent), West North Central (23 percent) and Mountain (21 percent) regions of the U.S., and Canada (17 percent). Inbound volumes of nonmetallic mineral products, ranked third, are projected to grow the fastest at 3.2 percent annually. This commodity will mainly arrive from the Mountain (66 percent) and West North Central (29 percent) regions.

In demand projections, alcohol (mainly corn ethanol) has a high growth rate of 4.4 percent annually and is indicated to take the first spot on the top rail outbound commodities list by 2040. However, recent action removing ethanol subsidies is not reflected in this forecast, and while it is expected that corn production will continue at the projected pace, ethanol production may not. As ethanol is produced, it is expected to be traded with the East North Central (44 percent), Pacific (32 percent) and West South Central (17 percent) regions in the U.S. Animal feed and animal products also are expected to increase and the rail moves are anticipated to travel primarily to the West South Central (41 percent) and Pacific (40 percent) regions of the U.S. Outbound flows of cereal grains (including seed) from South Dakota are on a decline and will be distributed between the Pacific (48 percent), West North Central (23 percent), and East North Central (17 percent) regions of the U.S. Lastly, other agricultural products are showing low growth of about 0.8 percent annually, with a majority of the moves to the Pacific (71 percent) and West North Central (16 percent) regions.

Through rail movements in 2040 will consist substantially of coal from the Western Coal Region. However, coal growth will slow to 0.9 percent annually, and be primarily transported to the West North Central (35 percent), West South Central (26 percent) and East South Central (25 percent) regions of the U.S. Cereal grain (including seeds) is growing at about 4.0 percent annually, and is projected to be the second highest commodity in rail flows through South Dakota. These flows will originate in the West North Central and Mountain regions of the U.S. and head to varied destinations in the U.S. Nonmetallic minerals also are on the rise, growing 3.3 percent annually, and will be shipped by rail mainly from the Mountain Region of the U.S. to Canada (22 percent) and to the East North Central (28 percent), West North Central (22 percent), and Pacific (16 percent) regions.

Lastly, similar to in 2011, the intrastate movements by rail in 2040 will consist of small quantities of farm products and nonmetallic mineral products. Cereal grains (including seeds) that move within

the Aberdeen State DOT planning region and from the Pierre State DOT planning region to the Aberdeen State DOT planning region, will likely decline. Animal feed and animal products, that move within the Aberdeen State DOT planning region, and nonmetallic mineral products, that move from Rapid City State DOT planning region to Aberdeen State DOT planning region, will likely rise at steady rates.

Table 24. Top Rail Commodities by Direction, 2040 Weight (Thousands of Tons)

Commodity Class	Tons	Percent	CAGR 2011-2040
Inbound			
Coal	1,806	32.6%	0.4%
Fertilizers	1,395	25.2%	1.2%
Nonmetallic Mineral Products	875	15.8%	3.2%
Wood Products	255	4.6%	2.5%
Pulp, Newsprint, Paper, and Paperboard	252	4.6%	1.9%
Plastics and Rubber	226	4.1%	2.0%
Other	725	13.1%	
Total	**5,533**		**1.5%**
Outbound			
Alcohol	11,046	48.1%	4.4%
Animal Feed and Products of Animal Origin, n.e.c.	3,805	16.6%	2.7%
Cereal Grains (including seed)	3,319	14.5%	-2.3%
Other Agricultural Products, except for Animal Feed	3,120	13.6%	0.8%
Waste and Scrap	562	2.4%	2.1%
Other Prepared Foodstuffs and Fats and Oils	301	1.3%	2.0%
Other	815	3.5%	
Total	**22,969**		**1.5%**
Through			
Coal	120,030	76.6%	0.9%
Cereal Grains (including seed)	7,417	4.7%	4.0%
Nonmetallic Minerals, n.e.c.	4,199	2.7%	3.3%
Waste and Scrap	3,998	2.6%	2.1%
Other Agricultural Products, except for Animal Feed	2,839	1.8%	2.9%
Animal Feed and Products of Animal Origin, n.e.c.	2,743	1.8%	2.4%
Crude Petroleum Oil	2,539	1.6%	-0.1%
Metallic Ores and Concentrates	1,960	1.3%	3.1%
Other Prepared Foodstuffs, and Fats and Oils	1,846	1.2%	2.6%

Commodity Class	Tons	Percent	CAGR 2011-2040
Alcoholic Beverages	1,660	1.1%	4.8%
Nonmetallic Mineral Products	1,361	0.9%	3.2%
Milled Grain Products and Preparations, and Bakery Products	837	0.5%	1.4%
Other	5,208	3.3%	
Total	**156,638**		**1.2%**
Intra			
Animal Feed and Products of Animal Origin, n.e.c.	343	37.8%	2.7%
Nonmetallic Mineral Products	273	30.1%	3.2%
Cereal Grains (including seed)	182	20.1%	-2.5%
Other	110	12.1%	
Total	**909**		**0.8%**

Source: STB 2011 Confidential Carload Waybill Sample data; FHWA FAF3 2011 provisional estimates and 2040 forecasts.

Train Volumes by Rail Segment

Train volumes by rail segment in 2040 were estimated using the same methodology as described in the section on current rail system demand. Projected annual carloads were converted into daily trains by rail service type and assigned on the rail network. To account for the adjustments made to the current year train volumes, annualized growth factors were calculated using the current year and projected year raw train volumes by rail segment, and then applied on the adjusted current year train volumes to estimate the projected train volumes. Figure 43 shows the 2040 projected daily train volumes over the rail network in South Dakota.

Rail traffic projections are primarily meant to understand some systemwide trends, but for individual rail segments, a more detailed economic analysis of the dependent businesses and the operating railroad(s) would be required. When analyzing projections, the following limitations should be noted:

- The rail network and its routing constraints are assumed to remain the same as that in the current year;
- Market investments and opportunities beyond those accounted by the rail flow forecasts could affect the train volumes; and
- Market risks and uncertainties that are associated with changes in the ownership of railroads, rail abandonments and/or industry closures, cannot be fully anticipated. For example, at the time of the forecast, CP was seeking parties interested in purchasing the DM&E main line track from Tracy, Minnesota west into South Dakota, Nebraska, and Wyoming. This line was later

purchased by G&W to form the RCP&E line, which may have significant implications on future rail service.[28]

Key findings from the analysis of future projected rail traffic in South Dakota include:

- BNSF Butte subdivision between Alliance, Nebraska and Edgemont and BNSF Black Hills subdivision between Edgemont and Gillette, Wyoming continue to be the busiest rail segments in the State. However, the slow growth of coal is reflected in the slow train volume growth around 1.0 percent annually, reaching about 69 daily trains by 2040.
- The BNSF Marshall Subdivision will continue to have the second highest in train volumes in South Dakota, increasing at 2.0 percent annually and reaching about 17 daily trains. This segment would have the fastest growth in bulk trains other than coal.

Among the key rail segments for South Dakota, the expected changes are as follows:

- BNSF Mobridge subdivision is expected to grow about 1.0 to 1.5 percent annually. Trade of cereal grains (including seeds) to the Pacific region of the U.S. will grow at a lower rate, but general merchandise train increases will partially offset the trends in agricultural shipments;
- BNSF Aberdeen subdivision would have moderate growth in train volumes, on average about 2.0 percent annually. General merchandise trains are expected to overtake bulk trains on this segment;
- The growth in train volumes on BNSF Appleton subdivision is higher east of Milbank (about 2.8 percent annually) than to the west of it (about 1.6 percent annually), likely due to the growth in general merchandize trains contributed by SMRR;
- The RCP&E (formerly CP/DM&E) Pierre and Huron subdivisions are likely to face agricultural shipment trends similar to BNSF Aberdeen subdivision;
- DAIR main line is expected to have a high growth of about 3.2 percent annually, contributed by both bulk and general merchandize trains; and
- The growth on the RCP&E (formerly CP/DM&E) Black Hills and PRC subdivisions is relatively high, especially west of Philip, about 3.2 percent annually, due to the high growth in general merchandise trains.

[28] http://www.cpr.ca/en/news-and-media/news/Pages/CP-expression-of-interest-for-DME.aspx (last retrieved on October 25, 2013).

Figure 43. Rail Volumes by Rail Line Segment, 2040 (Average Daily Trains)

Source: STB 2011 Confidential Carload Waybill Sample data; FHWA FAF3 2011 Provisional estimates and 2040 Forecasts; Cambridge Systematics' Rail Network Analysis.

DEMAND EVALUATION FINDINGS

Key points from the demand evaluation are summarized as follows:

- The State is likely to see growth in overall rail volumes, with inbound and outbound rail volumes growing about 1.5 percent annually.
- The data show that outbound flows of alcohol (mainly corn ethanol) and animal feed and animal products are expected to sharply increase (however, as the Projected Rail System Demand section notes, ethanol production may be overly aggressive in the current forecast). Rail handles these commodities well. However, there are other high-growth commodities such as nonmetallic mineral products, gasoline, and fuel oils where there is an opportunity for rail to improve its market share.
- The rail-based trade with the Pacific, East North Central, and West South Central regions of the U.S. is likely to become stronger, due to the growth in State outbound commodities of alcohol (mainly corn ethanol) and animal feed and animal products.
- Through movements on the multimodal freight system in South Dakota are expected to grow from 379 to 601 million tons (or about 1.6 percent annually), while the through rail movements are expected to grow from 112 to 157 million tons (or about 1.2 percent annually). The percentage share of rail is not likely to increase, according to national FAF3 projections.
- The growth in through truck shipments will affect the condition of the State's highway network as Federal highway funding programs will be less dependable or predictable. As South Dakota DOT proceeds with a statewide long-range transportation plan and statewide freight planning, further research may identify whether these truck shipments could be diverted to the rail system.

4

4 – Impacts of Rail Transportation

Preface

The rail system in South Dakota contributes to the State's economic vitality and quality of life by providing an efficient, safe, and environmentally sustainable transportation mode to convey goods. However, the ability of this system to effectively serve the industries and markets of South Dakota and the future rail investment needs are affected by several internal and external forces. Internal forces include railroad business model shifts, rail service shifts (between carload and unit train), aging infrastructure and deterioration, labor productivity gains, and technological changes. External forces include growing population, demographical shifts, global economic trends, evolution of industries and their supply chains, changes in agricultural production, climate change, new safety and environmental regulations and considerations, and interactions with non-freight land uses. This chapter focuses on the rail system impacts and various effects of the external forces on the rail service in South Dakota.

The chapter is organized into three sections:

- **Economic Impacts.** This section describes economic impacts of South Dakota's rail system and discusses trends and forecasts (in some cases) in the external economic forces, and their possible effects on future rail service in South Dakota.
- **Safety Impacts.** This section describes safety in the past five years on South Dakota's rail system, summarizes the roles and responsibilities of Federal and the State agencies to promote and regulate rail safety, and discusses the impacts of some of the recent safety regulations on the railroads and community quality of life.
- **Environment, Energy Use, and Land Use Considerations.** This section describes the environmental impacts of South Dakota's rail system, including the environmental and energy use benefits of rail relative to other modes of transportation. Railroad responsibilities and considerations due to new emissions regulations and alternate energy sources, as well as the interrelationship between the rail system and land use are also discussed.

Photo this page: Grain storage at Gavilon's Liberty Grain facility near Kimball, South Dakota

ECONOMIC IMPACTS

The rail system in South Dakota contributes to the State's economic vitality in many different ways, including impacting total employment, employee compensation,[29] contribution to the State's real Gross Domestic Product[30] (GDP) and other factors. In particular, the rail system provides a viable alternative to trucking for long-distance transportation of goods from/to the State.

The demand for freight rail service is affected by many demographic and economic variables. Of these, the important ones for South Dakota include:

- **Population and per capita income –** growth in population leads to increased demand for goods and services; with higher disposable per capita income, people tend to purchase more goods and services.
- **Employment and contribution to the State's real GDP of key rail-dependent industries –** in Chapter 3, certain commodities and associated industries were identified as forming the essential market base for railroads in South Dakota, a number of which exhibit future growth potential in terms of volume. The employment and contribution to the State's real GDP trends indicates the economic welfare of these industries.
- **Global economic trends –** these affect the trade patterns and supply chains for South Dakota.
- **Crop production trends and patterns –** the agricultural sector is the most important source of livelihood for residents of South Dakota, and historically rail has played an important role to support this sector. Rail infrastructure (both for storage and transport) needs vary by crop type, and it is therefore important to examine and understand trends in crop demand and production. It also is important to note the changes in distribution patterns of high-growth potential crop(s). Although, mining also is important in the State, it is less pervasive than agriculture. Hence, a separate discussion of this industry is not included.

For each of these, the possible effects of the observed trends and forecasts on future rail service in South Dakota are presented.

RAIL TRANSPORTATION ECONOMIC IMPACTS

In 2012, South Dakota's rail transportation industry employed about 840 people, which accounts for only 0.15 percent of the State's total economy. However, rail employees, due to the specialized nature of labor skills, were paid on average about $103,000, which is roughly three times the average annual employee compensation statewide of about $35,000.[31]

[29] Compensation of employees is the sum of wages and salaries and supplements to wages and salaries (otherwise, also called benefits).

[30] Real GDP by state is an inflation-adjusted measure of each state's gross domestic product that is based on national prices for the goods and services produced within the state. U.S. Bureau of Economic Analysis measures this in chained (2005) dollars. State's gross domestic product, in turn, is the value added in production by the labor and capital located in a state.

[31] U.S. Department of Commerce's Bureau of Economic Analysis data for South Dakota.

In 2011, the railroad industry's contribution to South Dakota's real GDP was estimated as $111 million (2005 dollars), which represents about 0.31 percent of the State's total economy.[32] Additionally, rail transportation indirectly impacts the economy. According to the Association of American Railroads (AAR), nationwide, each freight rail job supports on average of 4.5 jobs elsewhere in the economy and each $1 billion in new rail investment supports more than 17,000 jobs.[33] Therefore, freight rail in South Dakota is likely to have significant ripple effects on the State's economy.

Aside from the benefits to rail employees and contribution to the State's economy, freight rail is a viable alternative to trucking for long-distance (typically, over 500 miles) transportation of goods for South Dakota's shippers/receivers. On a per ton-mile basis, rail transportation rates are usually lower than for truck, as indicated by a comparison of national data on operating revenue per ton-mile for the two modes.[34,35] In addition, freight rail, similar to trucking, can efficiently provide specialized handling required for grain, ethanol, and construction-related products that are key to the State's economy.

ACCORDING TO THE ASSOCIATION OF AMERICAN RAILROADS, EACH FREIGHT RAIL JOB SUPPORTS 4.5 JOBS ELSEWHERE IN THE ECONOMY. EACH $1 BILLION IN NEW RAIL INVESTMENT SUPPORTS MORE THAN 17,000 JOBS.

Distance, volume, and commodity characteristics are commonly the most important factors in determining the use of rail by shippers/receivers. Rail is most efficient for long hauls and high volumes. Thus, the predominance of rail in handling bulk commodities such as grain and coal between producing regions and markets that are 500 miles or more distant. Short hauls are generally better suited for truck due to rail's considerably longer travel times and greater service variability that more than offsets the potential available cost savings. There are exceptions to these limitations, such as when volumes are sufficiently high to justify dedicated service, or the service requirements are suitable for rail.

Since the previous South Dakota State Rail Plan (1997), the economic variables relating to the rail industry have changed. Figure 44 shows the trends for the industry's total employment and contribution to the State's real GDP. The total employment rose and fell twice, prominently once around 1999 and again around 2007. The contribution to South Dakota's real GDP increased through 2004-2005 but declined since then, the sharpest fall was during the 2008-2009 global recession. Since the recession, the contribution to State's real GDP has somewhat stabilized.

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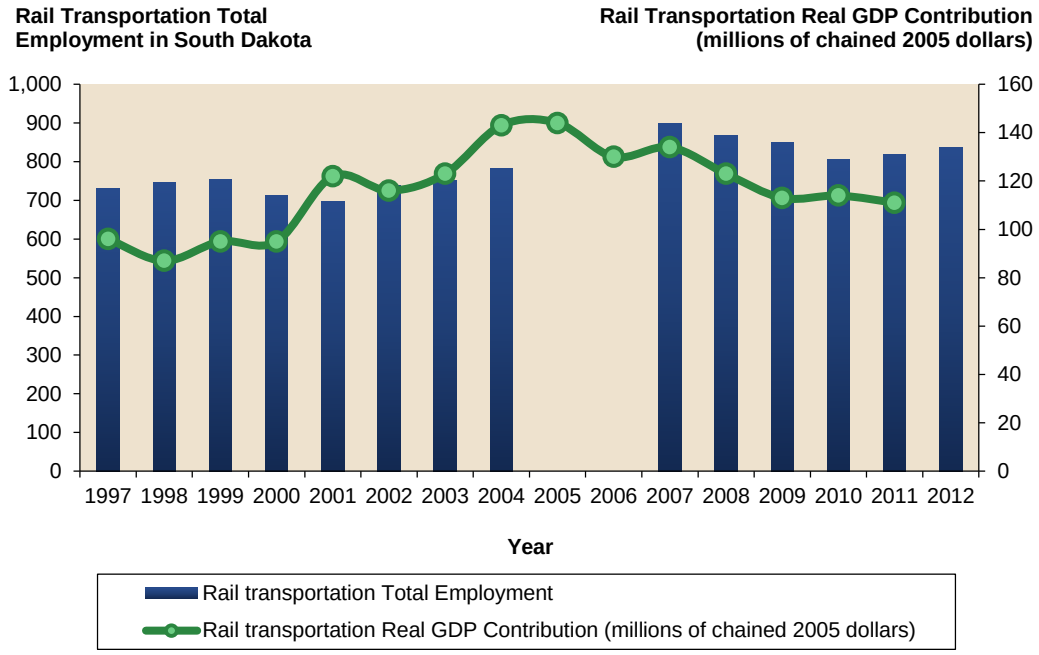
[32] Ibid.

[33] http://www.aar.org/keyissues/Documents/Railroads-States/South-Dakota-2010.pdf.

[34] http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_statistics/html/table_03_21.html.

[35] http://www.rita.dot.gov/bts/publications/multimodal_transportation_indicators/2013_10/end_user/freight_rail.

Figure 44. Statewide Trends in Rail Transportation Industry's Total Employment and Contribution to State's Real GDP, 1997-2012



Source: U.S. Department of Commerce's Bureau of Economic Analysis data for South Dakota.

Note: 2005 and 2006 Rail Transportation Total Employment Data for South Dakota were not published.

Table 25 summarizes the numerical changes in the economic variables in the period of 2002-2012 and also makes a comparison with the national data. The State has grown faster in terms of rail employment and average annual employee compensation than the U.S. as a whole. However, the real GDP contribution has declined in the State by about 4.3 percent, whereas that of the U.S. has increased by about 2.5 percent.

Table 25. Changes in Rail Transportation Employment, Average Annual Employee Compensation and Real GDP Contribution, State versus the U.S., 2002-2012

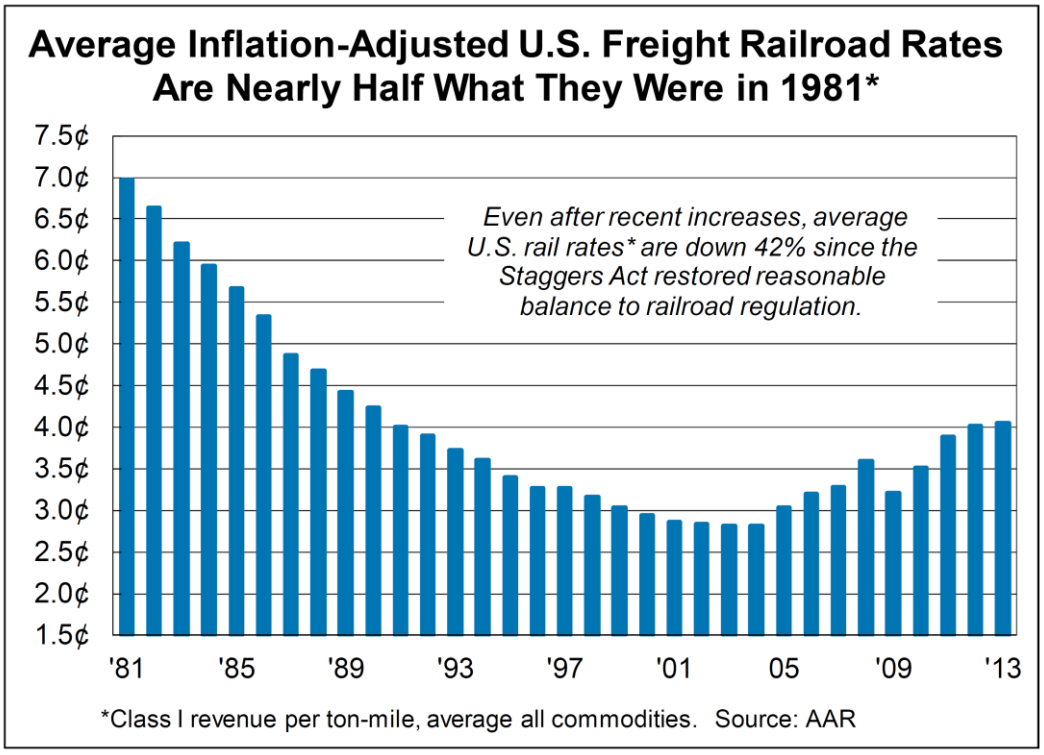
	South Dakota				U.S.			
Economic Variable	2002	2011	2012	Percent Change[a]	2002	2011	2012	Percent Change[a]
Rail Transportation Total Employment	738	819	838	13.6%	196,900	198,200	202,200	2.7%
Rail Transportation Average Employee Compensation (in thousands of dollars)	75	102	103	56.1%	82	106	108	31.5%
Rail Transportation Real GDP Contribution (in millions of 2005 dollars)	116	111	NA	-4.3%	24,303	24,899	NA	2.5%

Source: U.S. Department of Commerce's Bureau of Economic Analysis data for South Dakota and the U.S.

[a] *Percent change is computed between 2002 and 2012 for Total Employment and Average Annual Employee Compensation, while percent change is computed between 2002 and 2011 for Real GDP Contribution.*

The relative value of a product, such as transportation, is indicated in the price that buyers are willing to pay and sellers are willing to produce. Following the onset of economic deregulation in 1980, the railroad industry regained competitiveness by reducing costs and exiting some markets (such as branch lines) while expanding in others (e.g., intermodal). By 2000, inflation-adjusted rates had dropped by more than half. During the decade that followed, prices leveled off and then began to increase in response to rising demand, changing commodity and service mix, as well as an evolving competitive landscape. Following the 2008-2009 global recession, which caused a temporary dip, rates resumed their increase during the recovery that followed (see Figure 45).[36] However, even with these increases, average inflation-adjusted U.S. freight rail rates were only little more than half of what they were in 1981.

Figure 45. National Trends in Class I Railroad Average Inflation-Adjusted Revenue per Ton-Mile, 1981-2013



Source: Association of American Railroads, The cost-effectiveness of America's Freight Railroads, June May 2014

TRENDS INFLUENCING FUTURE FREIGHT RAIL SERVICE

STATE DEMOGRAPHIC TRENDS

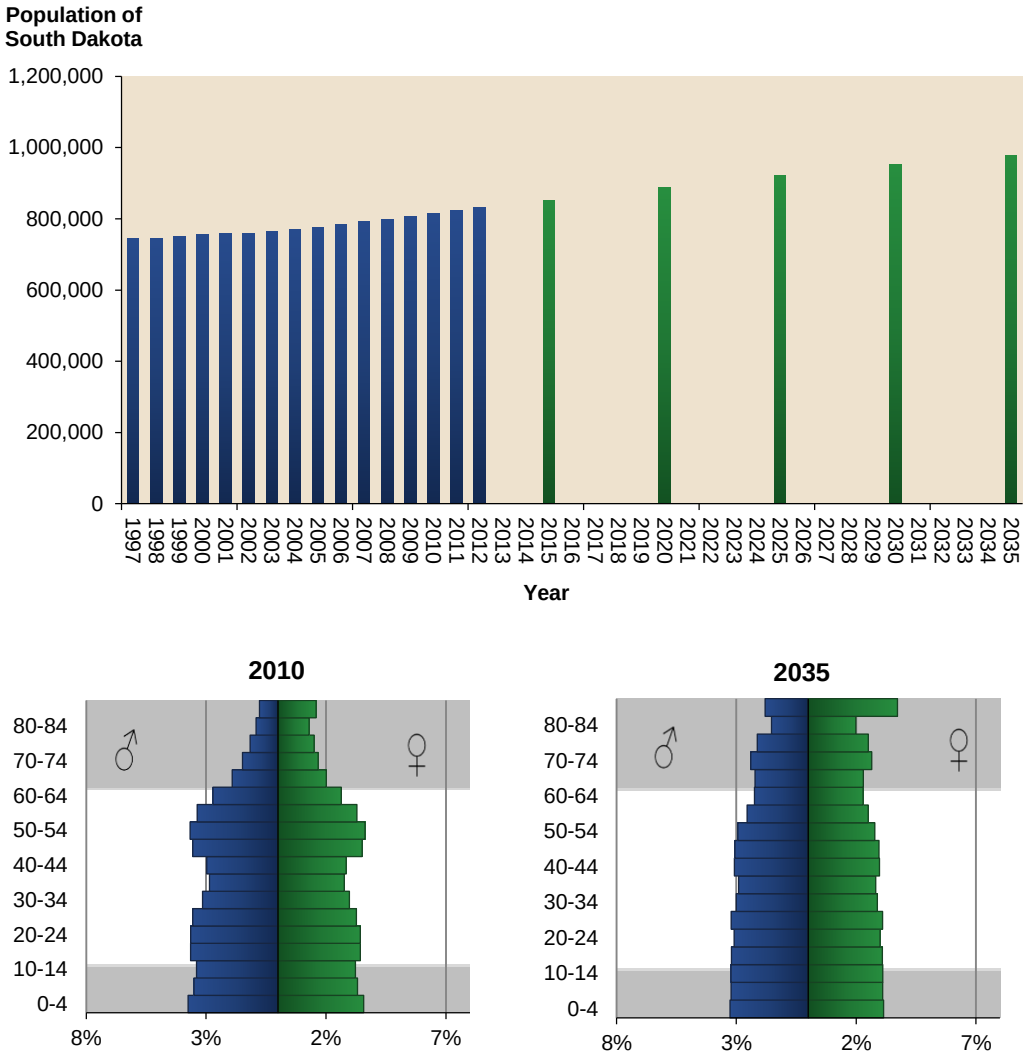
In Chapter 3, a snapshot was provided of two demographic factors influencing freight demand, namely, population and per capita income. The trends and forecasts for these factors are further examined here.

[36] Association of American Railroads, The cost effectiveness of America's Freight Railroads, June 2012.

Figure 46 shows historical population trends in South Dakota since 1997, along with projections to 2035 in five-year intervals, as developed by the South Dakota Department of Labor and Regulations (DLR). This figure also provides a comparison of 2010 and projected 2035 age and gender distribution of South Dakota's population. The population has gradually grown in the State, a trend that is expected to continue through 2035; the demand for goods and services is likely to follow similar growth trends.

South Dakota's population is expected to age during this period; the percentage of total population in the age groups of 65 or more years (65+ years) is likely to grow by 2035, while the working population as a percentage of total population is likely to shrink. Younger population as a percentage of the total population is expected to remain the same. These demographical changes are likely to result in a shift in demand patterns for goods. In the future there is likely to be a higher demand for drugs and medicines, medical instruments, and other health-related products in the State. Most of these goods are moved by truck.

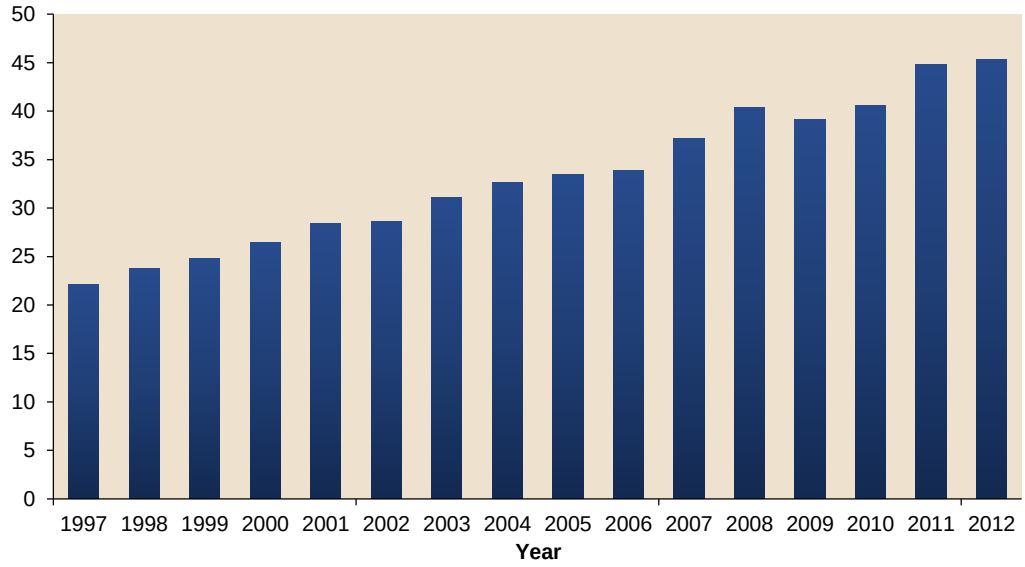
Figure 46. Statewide Trends and Projections in Population, 1997-2035



Source: U.S. Department of Commerce's Bureau of Economic Analysis data for South Dakota; South Dakota Department of Labor and Regulations (DLR) population projections, 2010-2035.

Figure 47 shows the historical trends in per capita income in current dollars (not adjusted for inflation) since 1997. Per capita income has increased gradually, with only two exceptions of 2002 and 2009, corresponding to the U.S. recession in 2001 and global recession in 2008-2009. A general inflation factor was estimated between 1997 and 2012 as 1.4,[37] whereas the per capita income growth factor between 1997 and 2012 was roughly about 2.0, higher than the inflation factor. Therefore, the State had an increase in per capita income beyond just keeping current with price inflation. With higher disposable per capita income, in general, people tend to purchase more goods and services. This is likely to be true in South Dakota; however, most consumer goods are transported in the State via truck.

Figure 47. Statewide Trends in Per Capita Income (Current Dollars, in Thousands), 1997-2012



Source: U.S. Department of Commerce's Bureau of Economic Analysis data for South Dakota.

Table 26 summarizes the numerical changes in the demographic factors in the period of 2002-2012 and also makes a comparison with national trends. South Dakota has grown in population at almost the same rate as the U.S. as a whole. However, the State's per capita income has grown faster than the U.S. While in 2002, the State lagged behind the national average per capita income; by 2012, the State has overtaken the national average per capita income.

[37] U.S. Bureau of Labor Statistics, Consumer Price Index – All Urban Consumers (CPI-U) – U.S. city average – All Items for 1997 and 2012 are 160.5 and 229.594, and inflation factor computed as (229.594/160.5) ~ 1.4, ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt.

Table 26. Changes in Population and Per Capita Income, State versus the U.S., 2002-2012

Demographic Variable	South Dakota			U.S.		
	2002	2012	Percent Change	2002	2012	Percent Change
Total Population	760,020	833,354	9.6%	287,625,193	313,914,040	9.1%
Per Capita Income	$28,606	$45,381	58.6%	$31,798	$43,735	37.5%

Source: U.S. Department of Commerce's Bureau of Economic Analysis data for South Dakota and the U.S.

STATE ECONOMIC TRENDS

The snapshot of the economic factors influencing freight demand and rail commodity flows in Chapter 3 indicated that the key industries that use rail in South Dakota include farming, mining, construction and various types of food and chemicals manufacturing (including alcohol and other agricultural products, animal feed and animal products), nonmetallic mineral products manufacturing and wood products manufacturing. Scrap metal produced mainly by activities related to machinery manufacturing and fabricated metal products manufacturing also are moved by rail.[38] In this section the trends and forecasts for these industries' employment and contribution to State's real GDP are presented.

Productivity, in terms of labor units needed to produce a unit output for an industry, has historically improved over time. So, although an increase in employment of an industry that uses rail can generally indicate increased production of rail-based goods, a decline in employment in the same industry may not always indicate a decline in production of goods. In case of an industry with declining employment, the changes in contribution to a State's real GDP have been used to assess the economic health of the industry. However, it is important to note a limitation, that high dollar value changes in production may not necessarily translate to high tonnage increases over the transportation system.

Figure 48 shows a comparison of the employment in the key rail served industries between 2002 and 2012. This figure also shows 2020 employment projections made by the South Dakota DLR for these industries. Employment in farming (a leading sector in 2002 and in 2012) has declined between 2002 and 2012, and will continue to drop going towards 2020. Employment in the construction industry, on the other hand, has increased between 2002 and 2012, and is likely to overtake employment in farming by 2020.

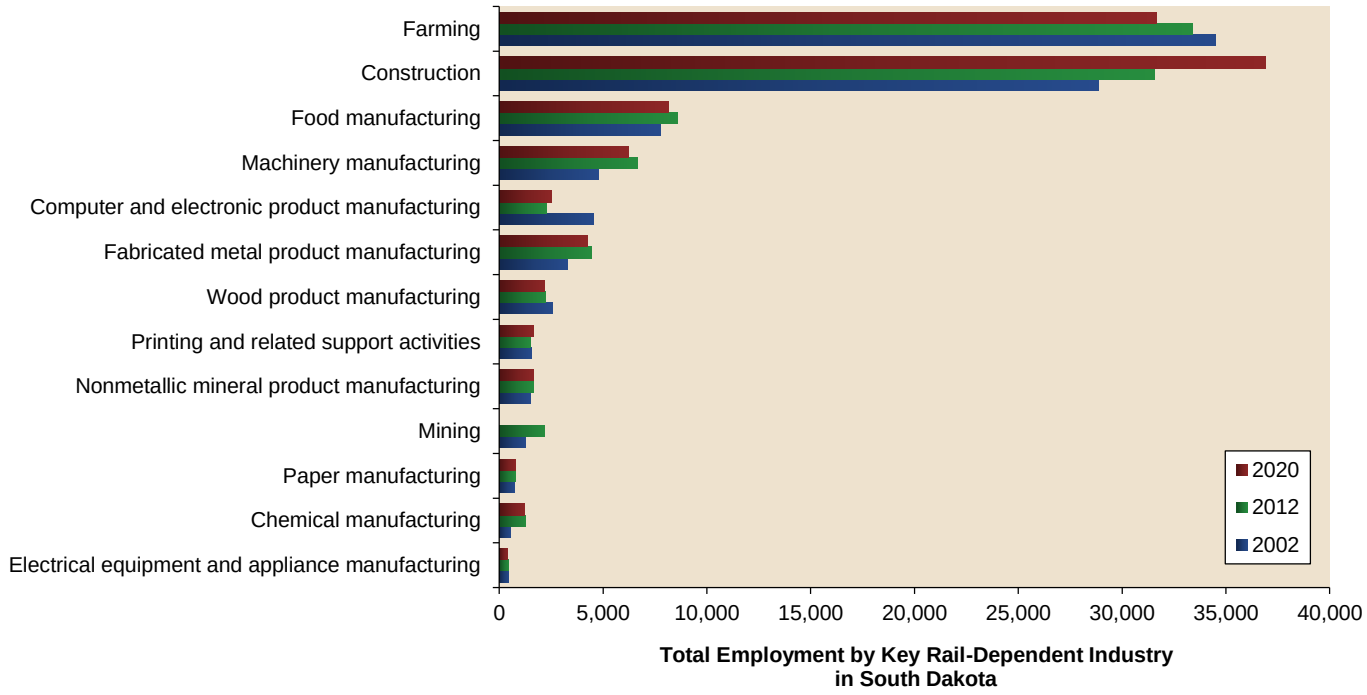
Many of the other key rail served industries showed an increase in employment between 2002 and 2012, including food manufacturing, machinery manufacturing, fabricated and metal product manufacturing, nonmetallic mineral products manufacturing, mining, paper manufacturing, and chemicals manufacturing. However, growth is not likely to continue to 2020 for many of these sectors. Employment in food manufacturing, machinery manufacturing, fabricated and metal product manufacturing, and chemicals manufacturing are likely to decline between 2012 and 2020.

[38] Note that while these industries may be served by rail, many are not "rail dependent" and most also are well served by the trucking industry in South Dakota.

At the same time, employment in computer and electronic product manufacturing and printing and related support activities are likely to grow between 2012 and 2020. While this growth is positive for the State it does not make up for the lost jobs in these sectors between 2002 and 2012.

Lastly, employment in wood product manufacturing and electrical equipment and appliance manufacturing, similar to farming, are declining in both 2002-2012 and 2012-2020.

Figure 48. Statewide Total Employment by Rail Served Industry – Actual and Projected, 2002, 2012 and 2020



Source: U.S. Department of Commerce's Bureau of Economic Analysis data for South Dakota; South Dakota Department of Labor and Regulations (DLR) employment by industry projections, 2010 and 2020; Cambridge Systematics' calculations.

Note: 2020 Mining Total Employment Projection for South Dakota are missing in DLR employment projections.

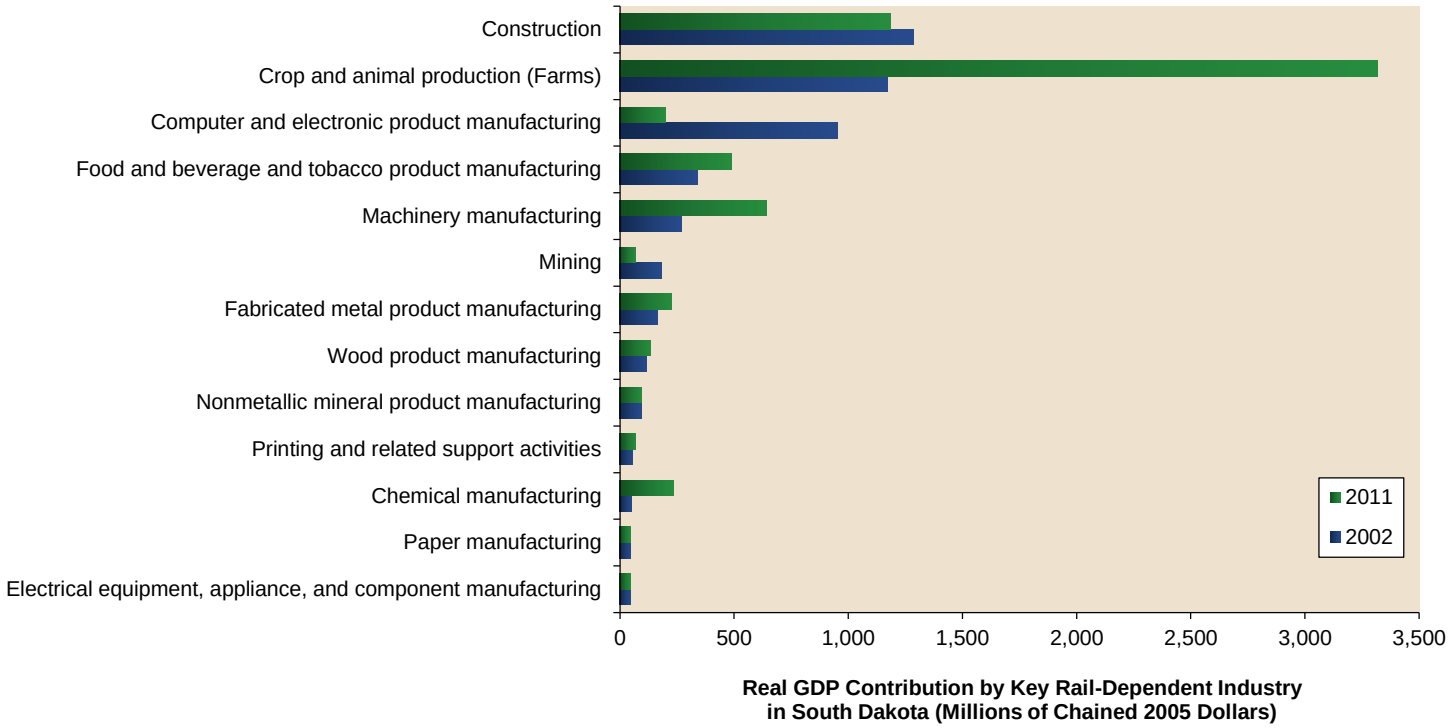
From this data, and from a future rail use perspective, more attention is needed on the following key rail served industries, to more fully understand the trends:

- Projected (2012-2020) declining employment industries: farming, food manufacturing, machinery manufacturing, fabricated and metal product manufacturing, wood product manufacturing, chemicals manufacturing, and electrical equipment and appliance manufacturing.
- Projected (2012-2020) growing employment but not sufficient to overcome past decline (2002-2012) in employment industries: Computer and electronic product manufacturing.

Figure 49 shows the change in contribution of the rail served industries to the State's real GDP. The contribution by farm production rose sharply between 2002 and 2011. This is due to substantial increases in both crop production and prices resulting from rising global demand. If this trend continues, then the projected decline in farming employment will not adversely impact future rail revenues, as rail volumes will continue to grow. This reasoning also applies to food manufacturing, machinery manufacturing, fabricated metal product manufacturing, wood product

manufacturing, chemicals manufacturing, and electrical equipment and appliance manufacturing, which showed increases in contribution to the State's real GDP between 2002 and 2011. Notable is the strongly declining contribution to employment and GDP of the State's computer and electronic product manufacturing between 2002 and 2011. Overall, the economic trends of the key rail-dependent industries show positive signs for future rail use. However, the trends contributing to the State's real GDP for some industries needs to be followed more closely.

Figure 49. Statewide Contribution to State's Real GDP Contribution by Rail Served Industry, 2002 and 2011



Source: U.S. Department of Commerce's Bureau of Economic Analysis data for South Dakota.

Table 27 summarizes the changes in employment and GDP for the rail-oriented industries (combined together), other goods movement-dependent industries and service sectors and governments in South Dakota and the U.S. overall between 2002 and 2012. Both in terms of employment growth and contribution to real GDP, the State outperformed the U.S. as a whole for both key rail-dependent industries and other freight-intensive industries. Notably, both categories saw employment growth in the State, while they declined in the U.S. overall. The State performed on par with the U.S. as a whole in the government and service sectors, which combined accounted for 59 percent of GDP in South Dakota and 68 percent of GDP for the U.S. overall in 2012.

Table 27. Changes in the Total Employment and Contribution to State's Real GDP by Industry Group, State versus the U.S., 2002-2012

Industry Group	Economic Variable	South Dakota				U.S.			
		2002	2011	2012	Percent Change[c]	2002	2011	2012	Percent Change[c]
Key Rail-Oriented Industries[a]	Total Employment (in thousands)	92.4	94.3	97.0	5.0%	23,179	20,736	20,956	-9.6%
	Real GDP Contribution (in billions of 2005 dollars)	4.8	6.8	NA	41.4%	1,814	1,917	NA	5.7%
Other Goods Movement-Dependent Industries[b]	Total Employment (in thousands)	112.5	120.1	122.3	8.7%	36,990	35,558	36,180	-2.2%
	Real GDP Contribution (in billions of 2005 $)	6.2	7.9	NA	28.4%	2,435	2,665	NA	9.5%
Service Sectors and Governments	Total Employment (in thousands)	303.5	347.3	353.2	16.4%	104,989	120,049	122,478	16.7%
	Real GDP Contribution (in billions of 2005 dollars)	18.8	21.2	NA	13.0%	7,311	8,526	NA	16.6%

Source: U.S. Department of Commerce's Bureau of Economic Analysis data for South Dakota and the U.S.

[a] *Key Rail-Oriented Industries include: Farming, Mining, Construction, Wood product manufacturing, Nonmetallic mineral product manufacturing, Fabricated metal product manufacturing, Machinery manufacturing, Computer and electronic product manufacturing, Electrical equipment and appliance manufacturing, Food manufacturing, Paper manufacturing, Printing and related support activities, Chemical manufacturing.*

[b] *Other Goods Movement-Dependent Industries include the North American Industry Classification System (NAICS) industries belonging to the following industry sectors: Agriculture, Forestry, Fishing and Hunting (NAICS 11), Mining, Quarrying, and Oil and Gas Extraction (NAICS 21), Utilities (NAICS 22), Construction (NAICS 23), Manufacturing (NAICS 31-33), Wholesale Trade (NAICS 42), Retail Trade (NAICS 44-45), and Transportation and Warehousing (NAICS 48-49); however, not including the Key Rail-Dependent Industries mentioned above.*

[c] *Percent change is computed between 2002 and 2012 for Total Employment, while percent change is computed between 2002 and 2011 for Real GDP Contribution.*

In summary, the employment and contribution to the State's real GDP for combined goods movement-related industries (which includes goods that are both rail favorable and rail dependent) indicate that most of these industries are likely to see increases in production, which may favorably impact South Dakota's rail system.

Global Economic Trends

Several global trends affect the trade patterns and supply chains for South Dakota. These are qualitatively described on the following page:

- **Slow, yet steady, recovery in world economies from the 2008-2009 global recession** as indicated by the world GDP[39] and world merchandise trade (as percentage of GDP)[40] in recent years[41] shows near-term growth in trade in all markets, including domestic trade, imports, and exports by rail for South Dakota.
- **Manufacturing shifts** from China and other Pacific Rim countries to the NAFTA region, particularly Mexico. A Boston Consulting Group study[42] showed that this is due to a variety of factors, including rising production costs in China, and lack of first-rate infrastructure, well-developed supply networks and worker productivity in China's inland industrial zones and other Asian countries. Additionally, the same study states that Mexico and Canada have advantages of shorter lead times than Pacific Rim countries due to their proximity, bordering the U.S., as well as the fact that goods can be imported duty-free via the North American Free Trade Agreement (NAFTA). The study expects that high-end (high-valued) manufacturing is expected to return to the U.S. This reshoring would directly result in an increase in the use of land-based surface transportation modes, including rail, and could lead to increases in traffic through South Dakota due to its location and infrastructure.
- **Emergence of new energy sources and new markets for alternative fuels** is likely to drive future rail moves. Industries in South Dakota produce ethanol to mix with refined fuels to create blends that serve as lower emitting and alternative fuels. These products are well suited for transport by rail. Rail is increasingly being used for the transport of crude petroleum from the Bakken formation and Canadian tar sands in northern Alberta to various parts of the U.S.[43] Thus far, South Dakota's rail lines have not seen a substantial portion of this traffic, but the impact has been felt indirectly with the rerouting of some coal and grain traffic that typically went around the State.
- **Resurgence of housing (see Figure 50) and industrial real estate[44] in the U.S.** is likely to raise demand for construction-related materials that are heavy and "rail-friendly," serving as an opportunity for the cement, aggregates and other nonmetallic mineral products manufacturing industry in South Dakota.
- **Recycling and reuse of scrap and waste materials will increase due to the fact that natural resources are limited** and resource extraction and construction costs are rising worldwide. Use of scrap and waste materials is becoming common for manufacturing and energy generation industries. Due to their low value and a global demand, scrap and waste materials, especially metals, plastic, and rubber, are commonly shipped by rail, and have the potential to become a larger export commodity for South Dakota.

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[39] World GDP is the sum of gross value added by all resident producers in the economies of the world plus any product taxes and minus any subsidies not included in the value of the products.

[40] Merchandise trade as a share of GDP is the sum of merchandise exports and imports divided by the value of GDP, all in current U.S. dollars.

[41] http://data.worldbank.org/indicator/ (last retrieved on December 6, 2013).

[42] Boston Consulting Group. Made in America, Again – Why manufacturing will return to the U.S., August 2011.

[43] Rail Energy Transportation Advisory Committee. Outlook for Rail Crude Oil Transport, Presentation made on March 14, 2013.

[44] http://www.areadevelopment.com/logisticsInfrastructure/August2012/key-themes-U.S.-industrial-property-resurgence-272728113.shtml (last retrieved on December 6, 2013).

Figure 50. Annual Rate for New Single-Family Houses Sold in the U.S., 1997-2013

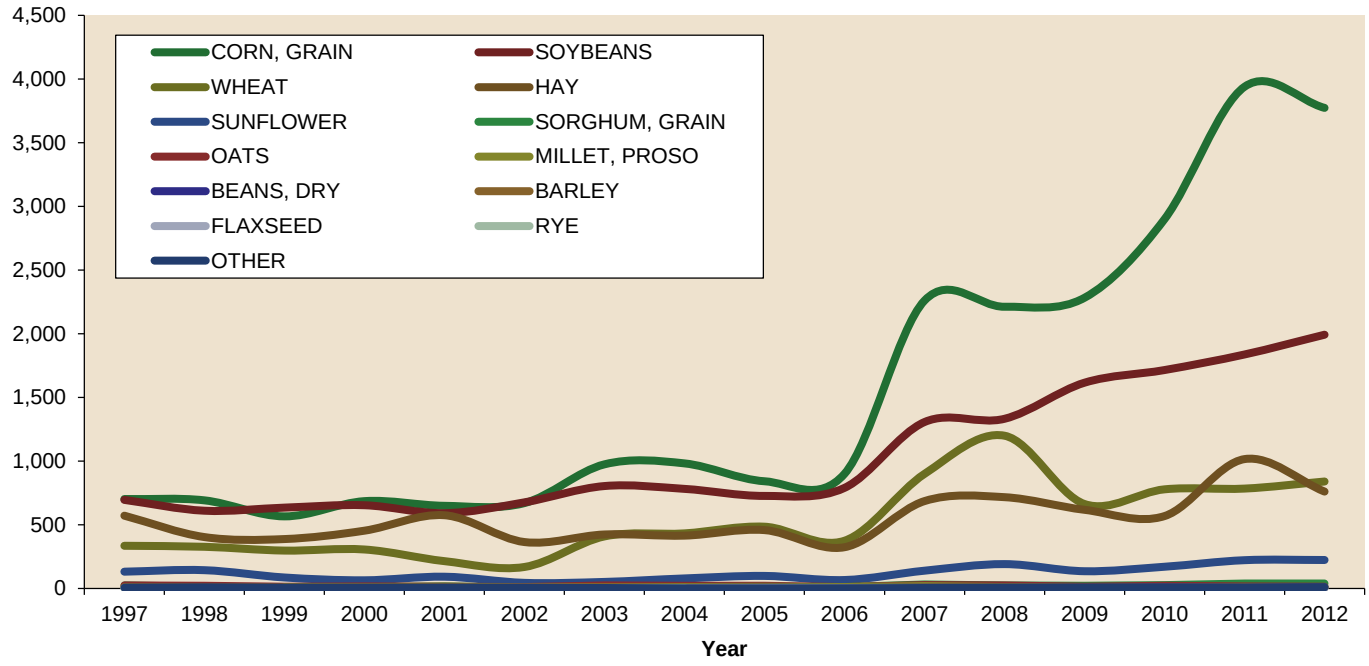
Source: U.S. Census Bureau.

Crop Production Trends

Figure 51 shows the historical trends in field crops production in millions of dollars in South Dakota since 1997. The top field crops by production consist of corn, soybeans, wheat, hay, and sunflower, with the rest making up a small portion of total crop production. Whereas annualized general inflation between 1997 and 2012 amounted to 1.4 percent,[45] the annualized growth factors between 1997 and 2012 for the primary field crops were roughly 5.4 for corn, 2.9 for soybeans, 2.5 for wheat, and 1.7 for sunflowers. The only major crop with a growth lower than inflation was hay at 1.3.

[45] U.S. Bureau of Labor Statistics, Consumer Price Index – All Urban Consumers (CPI-U) – U.S. city average – All Items for 1997 and 2012 are 160.5 and 229.594, and inflation factor computed as (229.594/160.5) ~ 1.4, Source: ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt (last retrieved on December 6, 2013)

Figure 51. Statewide Trends in Crop Production (Not Adjusted for Inflation) (Millions of Dollars), 1997-2012



Source: U.S. Department of Agriculture's National Agricultural Statistics Service data for South Dakota.

Since 2002, corn, grain, and sunflowers have shown the greatest increase in the percentage of harvested land at 65 percent and 45 percent, respectively. Hay – which declined in price relative to the other high-volume feed crops – saw a reduction in harvested land. On the other hand, wheat and sunflower have shown the highest growth percentage in yield since 2002, of about 73 percent and 71 percent, respectively. Soybeans had a slight reduction in yield. Looking towards 2022, the U.S. Department of Agriculture anticipates continued strong growth in corn for grain yields at about 47 percent, and soybeans at about 22 percent.

Overall, U.S. and international demand for South Dakota's agricultural commodities, especially corn, remains strong. The U.S. share of world corn exports dropped in recent years, yet recovered some of its market share in 2013 and the U.S. Department of Agriculture (USDA) projects a modest increase in corn exports through 2022. Corn represents the single largest net contribution to U.S. agricultural exports, accounting for up to 12 percent of the value. Domestic demand for corn also is growing for food, feed, energy, and industrial uses. The ethanol market had significantly increased the use of corn for U.S. fuel alcohols, and ongoing research continues to expand the industrial uses for corn and corn byproducts.[46] However, these expanding markets in the last few years also have led to an increase in the corn supply. In 2014, projected price reductions for corn have resulted in some farmers shifting to other crops, a reversal of the trend of increasing corn production linked to the increased production of ethanol since 2008.[47]

[46] USDA Economic Research Service, 2013. http://www.ers.usda.gov/topics/crops/corn.aspx#.Uvqv24WGdVD.

[47] Associated Press, 2014. "Farmers switching from corn to soy as market shifts." *The Mariette Daily Journal.* http://mdjonline.com/pages/full_story/push?article-Farmers+switching++from+corn+to+soy++as+market+shifts+&id=24495854.

Table 28. Actual Harvested Area and Yield by Top Field Crop in South Dakota, 2002 versus 2012

	2002		2012		Percent Change	
	Acres Harvested	Yield	Acres Harvested	Yield	Acres Harvested	Yield
Corn for Grain	3,250,000	95 bu./acre	5,300,000	101 bu./acre	63%	6%
Soybeans	4,090,000	31 bu./acre	4,720,000	30.5 bu./acre	15%	-2%
Wheat	1,677,000	26.4 bu./acre	2,235,000	45.8 bu./acre	33%	73%
Hay	3,850,000	1.25 tons/acre	3,100,000	1.32 tons/acre	-19%	6%
Sunflower	430,000	837 lbs./acre	623,000	1,431 lbs./acre	45%	71%

Source: [1] *U.S. Department of Agriculture, National Agricultural Statistics Service, Crop Production Annual Summary, Archived Documents – Publication Dates: December 18, 1964 to January 11, 2013;*

[2] *U.S. Department of Agriculture, Long-term Projections Report OCE-2013-1, February 2013.*

Corn, with anticipated improvements in yield and more acreage in production than any other crop in 2012, is positioned to remain South Dakota's single-most important crop. Assuming continuation of these trends, demand for transportation of these crops would increase by 50 percent over 2012 levels by 2022. For soybeans, assuming no change in planted acreage, transportation needs are likely to increase by about 20 percent. Wheat production is expected to remain static, with any growth largely dependent on increasing planted acreage.

The U.S. Department of Agriculture divides the State into nine Agricultural Districts for statistical purposes. To further understand the geographic development of corn production in South Dakota, Figure 52 and Figure 53 show corn production in 2002 and 2012 by District, respectively. The data show, upon visual inspection, that corn production is intensifying in the East and has begun to expand in the West Central and Northwest Agricultural Districts, indicated by very large percentage changes.

Figure 52. South Dakota Corn for Grain Production by Agricultural District, 2002

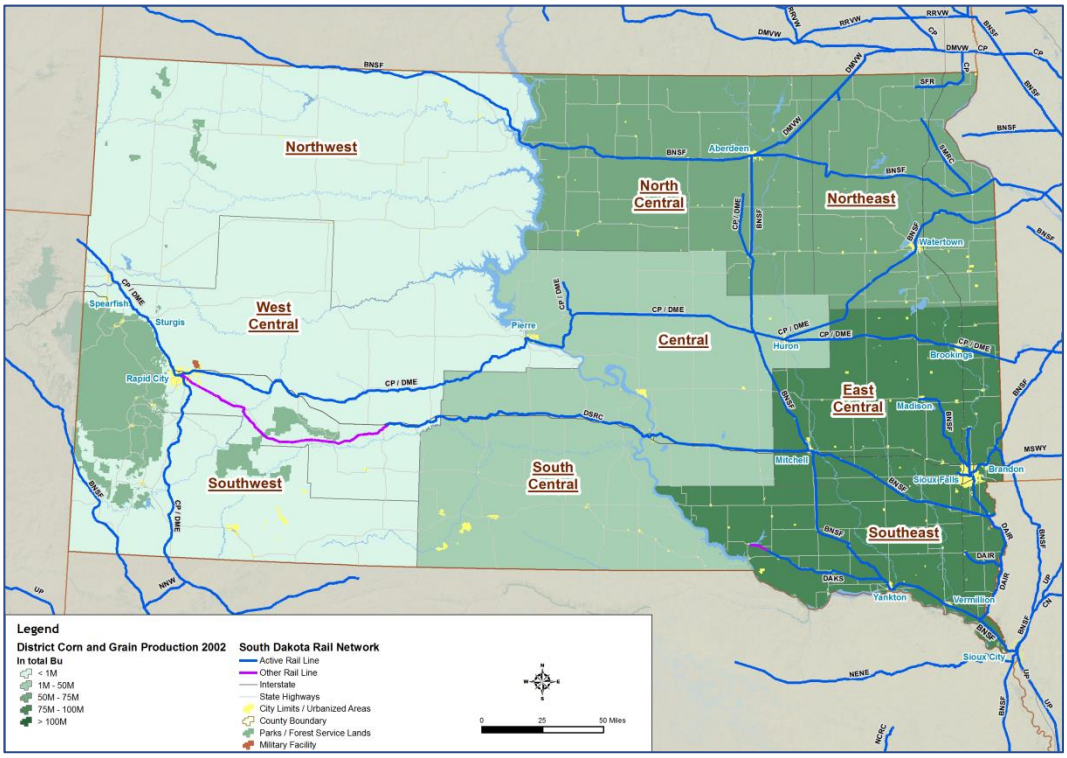
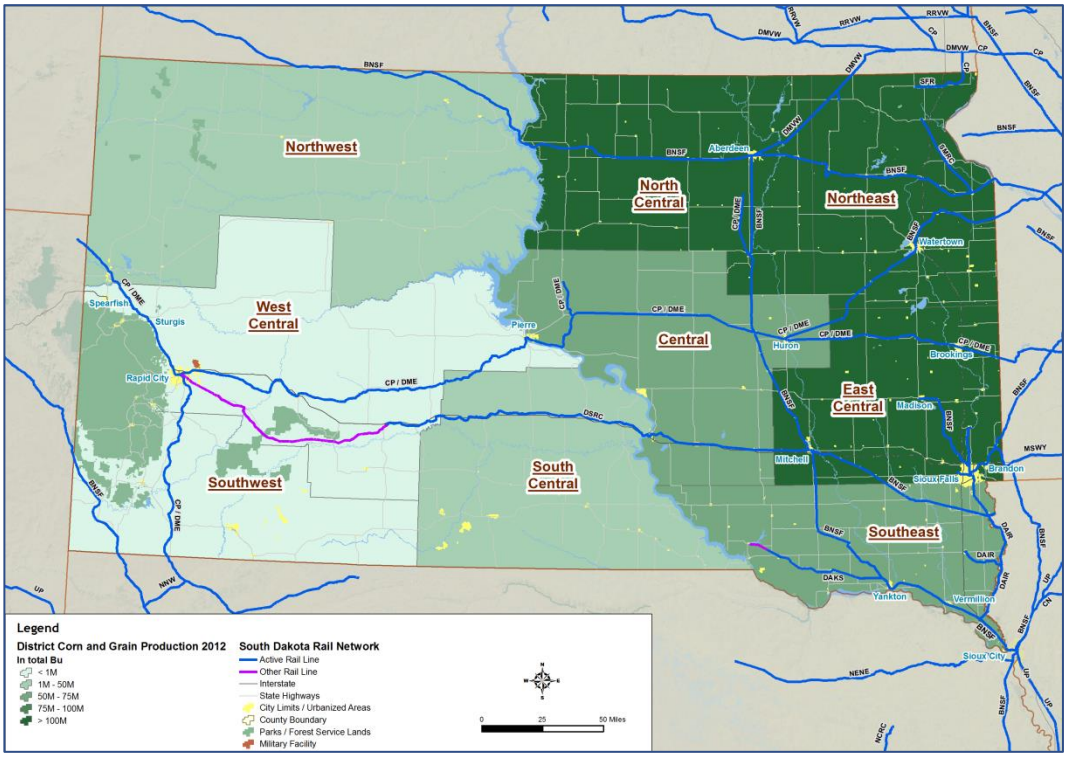


Figure 53. South Dakota Corn for Grain Production by Agricultural District, 2012



IF ALL OF SOUTH DAKOTA'S CORN WAS SHIPPED BY RAIL IN 2012, IT WOULD HAVE TAKEN OVER 1,500 100-CAR TRAINS. IF IT WAS SHIPPED BY TRUCK IT WOULD HAVE TAKEN OVER 600,000 TRIPS.

The transportation needs for this volume of grain is significant. Ideally, grain is shipped out of the state to domestic and export markets via rail. A railroad jumbo hopper car holds approximately 100 tons or 3,500 bushels of grain. In the 2012 harvest season, if all corn and soybeans were transported by rail, this would have equated to 194,000 rail cars. If corn production increases as predicted in 2022 by at least 47-percent, and soybean production increases by 22-percent, the rail car need would increase to 275,000 rail cars, if all corn and soybeans were transported by rail. This equates to 2,750 100-car grain trains in South Dakota. If these goods were transported via truck, alone (which can carry 875 bushels, each), this would equate to 1.1 million trucks in 2022.

Figure 54. South Dakota Grain Awaiting Transport

SAFETY IMPACTS

This section describes the safety performance of South Dakota's rail system over the last five years. This section then summarizes the roles and responsibilities of various agencies at the Federal and State levels that promote and regulate rail safety and develop and implement safety and security measures. Finally, the effects of recent safety regulations, including positive train control (PTC) implementation, hours of service changes, quiet zone, and hazardous materials (HazMat) transportation are reviewed.

RAIL INCIDENTS PROFILE

Rail Incidents Overview

Rail incidents can be classified into three main types:

- **Train accident –** Train accidents involve a train and are defined as those that occur at locations other than highway-rail at-grade crossings, such as mainline tracks, yard tracks, etc.
- **Highway-rail at-grade crossing incidents –** Highway-rail at-grade crossing incidents take place at highway-rail at-grade crossings, and involve an auto or pedestrian and a train.
- **Other incidents –** All other types of incidents are classified as "other incidents"; these include trespassing railroad property, employee on-duty (not operating train) incidents, etc.

Rail incident rates have been declining nationally since the 1970s. Between 2000 and 2012, the train accident rate fell 44 percent, rail employee injury rate fell 51 percent and grade-crossing collision rate fell 45 percent.[48] Similar long-term trends also are seen with truck crash rates.[49]

Table 29 shows that over the five-year period between January 2008 and December 2012, 192 total rail incidents occurred in South Dakota, of which 53 were train accidents, 63 were highway-rail at-grade incidents and 76 were other incidents. There are no passenger rail services in the State; therefore, all of the incidents are attributed to freight rail.

Comparing the incidents data for South Dakota and the U.S. as a whole, about 0.6 percent of highway-rail at-grade crossing incidents, 0.5 percent of the train accidents, and only 0.2 percent of other incidents took place in the State.

[48] Association of American Railroads. Railroads: Moving America Safely. May 2013.

[49] http://www.fmcsa.dot.gov/facts-research/LTBCF2011/LargeTruckandBusCrashFacts2011.aspx (last retrieved on December 6, 2013).

Table 29. Data on Rail Incidents and Their Characteristics, State versus the U.S., 2008-2012

	South Dakota (2008-2012)			U.S. (2008-2012)			South Dakota as Percent of U.S. Totals		
Incident Type	Total Incidents	No. of Fatalities	No. of Injuries	Total Incidents	No. of Fatalities	No. of Injuries	Total Incidents	No. of Fatalities	No. of Injuries
Train Accidents	53	0	0	10,062	54	1,230	0.5%	0.0%	0.0%
Highway-Rail At-grade Crossing Incidents	63	7	27	10,441	1,282	4,598	0.6%	0.5%	0.6%
Other Incidents	76	4	73	37,727	2,292	36,296	0.2%	0.2%	0.2%
Total	**192**	**11**	**100**	**58,230**	**3,628**	**42,124**	**0.3%**	**0.3%**	**0.2%**

Source: FRA Office of Railroad Safety Database.

Train Accidents

From 2008 to 2012, a majority of the train incidents (49 out of 53) were derailments. The causal factors for train accidents are: train track (60 percent of the train accidents), human factor (19 percent), motive power/equipment (11 percent) and miscellaneous (10 percent). Twenty-six of the total train accidents occurred on main line track, while 11 occurred on yard track, and the remaining occurred on other tracks. There were no fatalities and no injuries reported in train accidents in South Dakota. From 2008 to 2012, 211 cars carrying hazardous materials were involved in accidents in the State, nine of the cars were derailed/damaged and one released hazardous materials.

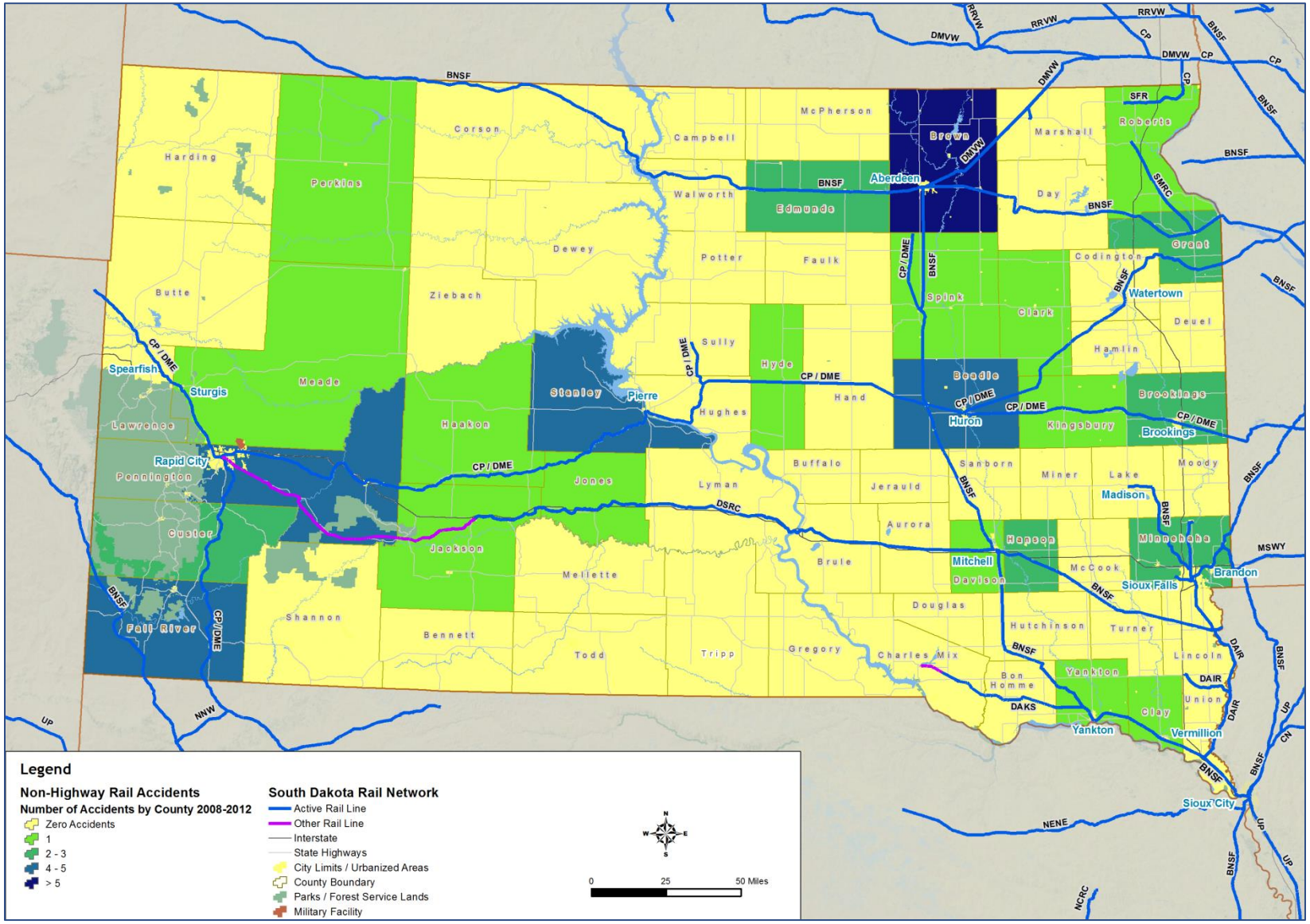
Figure 55 shows incidents by county for train accidents for the five-year period of 2008 to 2012. The highest number of train accidents were in Brown (9), Beadle (5), Stanley (5), Fall River (4), and Pennington (4) Counties.

Highway-Rail At-Grade Crossing Incidents

From 2008 to 2012, a majority of the highway-rail at-grade crossing incidents in the State (61 out of 63) occurred at public at-grade crossings in which there were seven fatalities and 27 injuries.

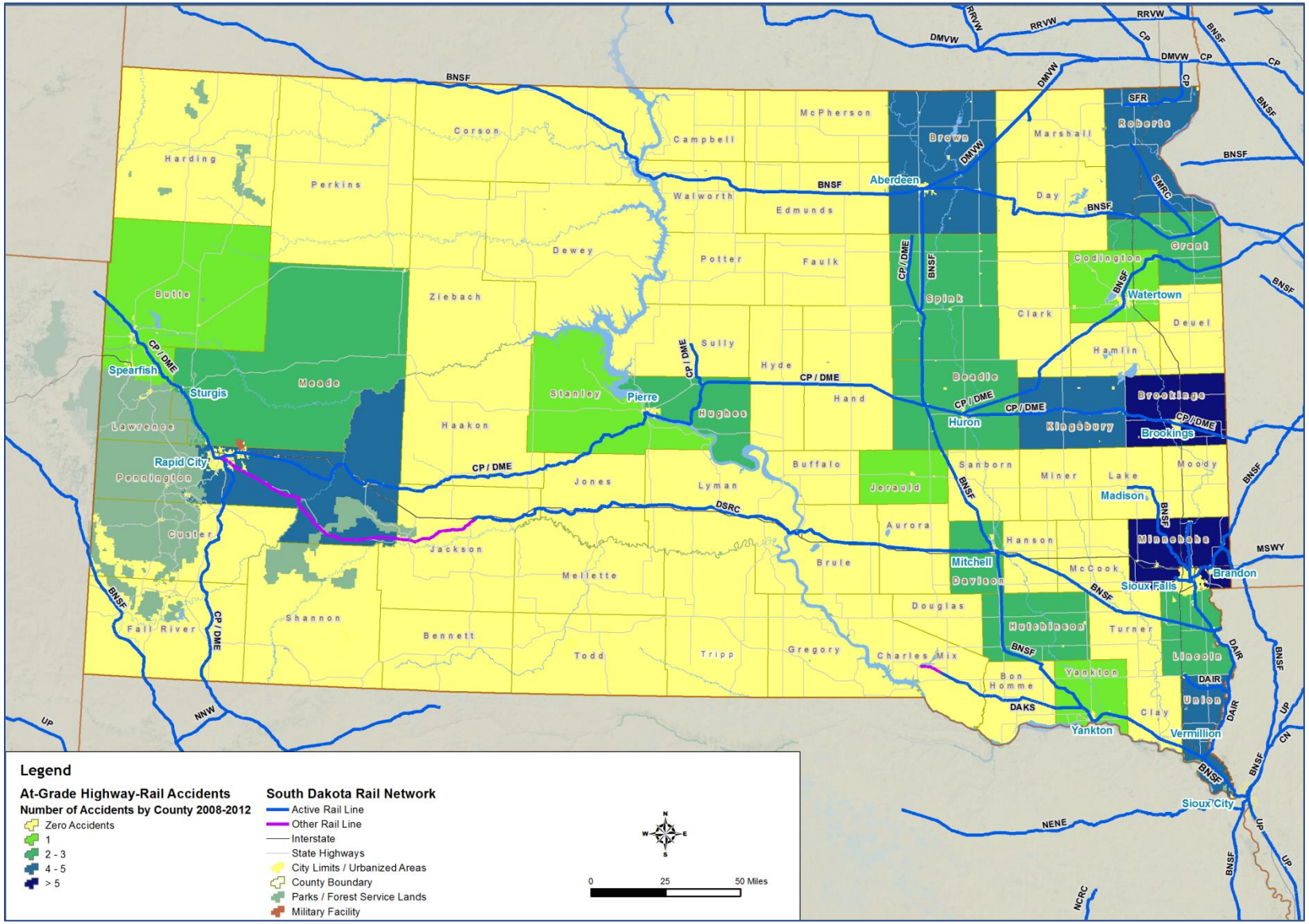
Figure 56 shows incidents by county for highway-rail at-grade crossings incidents for the five-year period of 2008 to 2012. The highest number of train accidents was seen in Minnehaha (9), Brookings (6), Pennington (5), Brown (4), Kingsbury (4), Roberts (4), and Union (4) Counties.

Figure 55. South Dakota Train Accidents by County, 2008-2012



Source: FRA Office of Railroad Safety Database; South Dakota GIS Database.

Figure 56. South Dakota Highway-Rail At-Grade Crossing Incidents by County, 2008-2012



Source: FRA Office of Railroad Safety Database; South Dakota GIS Database.

To understand which at-grade crossings may be problematic in the State in the future, the Federal Rail Administration's (FRA) web-based accident prediction system (WBAPS)[50] was used to analyze the top 50 crossings in South Dakota, described in Table 30. The table shows crossings that have the highest number of predicted collisions in a year, with the number of predicted collisions dependent not only on the physical and operational characteristics of a crossing, but also on historical incidents data for a recent five-year period (2008-2012) at the crossing. The physical and operational characteristics are voluntarily reported and updated by states and railroads, including type of warning device (e.g., gates, crossbucks, etc.), vehicular traffic in average annual daily traffic (AADT) and daily train volumes. All data used for this evaluation came directly from the FRA system.

Another factor in crossing safety is the condition of the crossing, as shown in Figure 57.

Figure 57. Wood Plank At-Grade Crossing

Other Incidents

Other incidents comprised about 40 percent of South Dakota rail incidents in 2008-2012. During this time, trespasser incidents not at highway-rail crossings led to 4 fatalities and 4 injuries, and 61 employee on-duty injuries were reported. All of these figures are low, due primarily to the relatively low volume of train operations in the State.

[50] Federal Rail Administration's Web Based Accident Prediction Systems (WBAPS). http://www.fra.dot.gov/Page/P0114 (last retrieved on December 6, 2013).

Table 30. Statewide Top Highway-Rail At-Grade Crossings based on Predicted Collisions Probability, 2008-2012

Rank	Predicted Collisions	FRA Xing ID	Railroad	Crossing Street	City	County	Number of Highway-Rail At-Grade Crossing Incidents (2008-2012)	Warning Device Code	Total Daily Trains	Average Annual Daily Traffic
1	0.093559	190277T	RCP&E	Mountain View	Rapid City	Pennington	2	FL	4	15,414
2	0.078719	193788N	RCP&E	Cornell Avenue	Elkton	Brookings	2	XB	5	300
3	0.068103	199693B	RCP&E	Park Road	Sturgis Ball	Meade	2	XB	2	540
4	0.059453	382116E	BNSF	325 Street	Elk Point	Union	1	XB	5	1,100
5	0.055716	190271C	RCP&E	Mount Rushmore/ 8th	Rapid City	Pennington	1	FL	4	10,474
6	0.054368	393715F	BNSF	423 Avenue	Bristol	Day	0	SS	5	600
7	0.054113	394793R	BNSF	Main Street	Tulare	Spink	0	XB	5	732
8	0.053828	394747P	BNSF	U.S. 281	Wolsey	Beadle	0	XB	4	1,000
9	0.053763	197525N	RCP&E	U.S. 14	Brookings	Brookings	2	FL	2	4,013
10	0.052804	186672V	EERZ	2nd Avenue	Sioux Falls	Minnehaha	1	XB	4	5,000
11	0.051201	189847G	RCP&E	Ree Street	Pierre	Hughes	1	XB	4	1,020
12	0.049753	097870V	BNSF	Rice Street	Sioux Falls	Minnehaha	2	FL	4	1,631
13	0.049624	197452F	RCP&E	Main Street N.	Arlington	Kingsbury	1	SS	4	630
14	0.047694	075587Y	BNSF	8th Street	Sioux Falls	Minnehaha	1	FL	4	10,000
15	0.047112	199764V	RCP&E	8th Street	Belle Fourche	Butte	1	FL	15	3,282
16	0.046707	382085H	BNSF	N Westshore Drive	Jefferson	Union	1	XB	6	251
17	0.046021	189860V	RCP&E	Second Avenue	Fort Pierre	Stanley	1	XB	3	756
18	0.044019	190114J	RCP&E	S Elsworth Road	Box Elder	Pennington	1	XB	4	322
19	0.041449	197508X	RCP&E	450 Avenue	Arlington	Kingsbury	1	SS	5	151
20	0.040902	382360B	BNSF	SD 44	Parkston	Hutchinson	0	XB	3	638
21	0.040356	189848N	RCP&E	Highland Avenue	Pierre	Hughes	1	FL	3	6,045

Rank	Predicted Collisions	FRA Xing ID	Railroad	Crossing Street	City	County	Number of Highway-Rail At-Grade Crossing Incidents (2008-2012)	Warning Device Code	Total Daily Trains	Average Annual Daily Traffic
22	0.040105	199670U	RCP&E	Stagebarncany	Black Hawk	Meade	1	XB	2	610
23	0.038778	097874X	BNSF	Bahnson Avenue	Sioux Falls	Minnehaha	1	XB	4	150
24	0.037967	199776P	RCP&E	5th Street	Belle Fourche	Butte	0	GT	16	14,921
25	0.037929	393658U	BNSF	465 Avenue	Milbank	Grant	1	XB	5	87
26	0.036756	197493K	RCP&E	U.S. 14	Volga	Brookings	1	FL	5	3,650
27	0.036613	381656W	BNSF	Cliff Avenue	Sioux Falls	Minnehaha	1	FL	1	8,700
28	0.036215	382353R	BNSF	282 Street	Tripp	Hutchinson	1	XB	3	128
29	0.036168	394728K	BNSF	392 Avenue	Alpena	Jerauld	1	XB	4	130
30	0.036007	394653N	BNSF	State Street	Letcher	Sanborn	0	XB	4	342
31	0.034752	199715Y	RCP&E	Laurel Street	Whitewood	Lawrence	1	FL	6	2,335
32	0.034591	189732M	RCP&E	374th Avenue	Wessington	Beadle	1	SS	2	187
33	0.034287	197451Y	RCP&E	U.S. 81	Arlington	Kingsbury	1	FL	4	1,350
34	0.033415	394819R	BNSF	Main Street	Ashton	Spink	1	XB	5	182
35	0.033396	189698H	RCP&E	Dakota Avenue	Huron	Beadle	0	FL	14	11,185
36	0.032997	382269H	BNSF	306 Street	Utica	Yankton	1	XB	3	90
37	0.032929	197483E	RCP&E	6th Street	Brookings	Brookings	1	XB	6	206
38	0.03274	382094G	BNSF	Lincoln Street	Jefferson	Union	1	XB	5	156
39	0.031945	382391A	BNSF	257 Street	Mitchell	Davison	1	XB	3	70
40	0.031341	097559G	BNSF	464 Avenue	South Shore	Codington	1	SS	1	241
41	0.030664	382212G	BNSF	Alumax Road	Yankton	Yankton	0	XB	3	300
42	0.029974	382330J	BNSF	Main Street	Kaylor	Hutchinson	1	XB	3	41
43	0.029861	393645T	BNSF	475 Avenue	Milbank	Grant	1	XB	5	73

Rank	Predicted Collisions	FRA Xing ID	Railroad	Crossing Street	City	County	Number of Highway-Rail At-Grade Crossing Incidents (2008-2012)	Warning Device Code	Total Daily Trains	Average Annual Daily Traffic
44	0.029119	382363W	BNSF	Glynn Drive	Parkston	Hutchinson	1	XB	3	23
45	0.02907	393660V	BNSF	146 Street	Marvin	Grant	1	XB	5	57
46	0.028815	394614X	DMVW	Main Street	Britton	Marshall	0	XB	8	2,158
47	0.028094	097856A	BNSF	259th Street	Garretson	Minnehaha	1	XB	4	61
48	0.027665	197478H	RCP&E	22nd Avenue	Brookings	Brookings	0	FL	6	13,830
49	0.027577	190148D	RCP&E	Omaha Avenue	Rapid City	Pennington	0	FL	4	11,870
50	0.027567	393668A	BNSF	Chestnut Street	Summit	Roberts	1	XB	4	50

Source: FRA Office of Railroad Safety Database; South Dakota GIS Database.

NOTE: The type of warning device (WD) shown on the current Inventory record for the crossing where: FQ=Four Quad Gates; GT = All Other Gates; FL = Flashing lights; HS = Wigwags, Highway Signals, Bells, or Other Activated; SP = Special Protection (e.g., a flagman); SS = Stop Signs; XB = Crossbucks; OS = Other Signs or Signals; NO = No Signs or Signals.

EFFECTS OF RECENT SAFETY REGULATIONS

Table 31 summarizes the roles and responsibilities of various Federal and State agencies in rail safety regulation, as well as the role and responsibilities of the railroads in managing safety and security risks, and developing and implementing safety and security measures. Aside from performing track and equipment inspections, following procedures for safe materials handling and tracking shipments, the railroads have to comply with some recent safety regulations, including positive train control (PTC) implementation, hours of service changes, train horn noise rule and quiet zone, and HazMat transportation. In this section, a brief discussion of safety regulations is provided along with their possible effects on the railroads and community quality of life.

Table 31. Roles and Responsibilities of Various Agencies in Rail Safety and Security

Agency	Scope of Activity	Authorities/Responsibilities
FRA	Train/Track Safety	• Develop and enforce basic operating rules for train safety, tank car safety, railroad industrial hygiene, rail equipment safety, and grade-crossing safety and trespass prevention. • Oversee employee hours of service regulations and signal and train control regulations. • Responsible for track inspection/audit. • Rail movement of spent nuclear fuel and radioactive waste. • Manage the Rail Safety Improvement Act of 2008 (RSIA).
Transportation Security Administration (under Department of Homeland Security)	Rail Security	• Establish requirements for national rail security strategy and risk assessment. • Track hazardous materials (HazMat) shipments. • Create railroad requirements for developing institutional risk assessments. • Conduct programs for rail security training. • Conduct rail security research and development (R&D).
Pipeline and Hazardous Material Safety Administration (PHMSA)	Hazardous Materials Safety	• Regulate and enact rules that ensure safe movement of HazMat. • Track data on HazMat. • Permit, inspect, and enforce safety of HazMat.
National Transportation Safety Board (NTSB)	Rail Safety Investigation	• Investigate railroad incidents involving a fatality or major property damage. • Promote transportation safety.

Agency	Scope of Activity	Authorities/Responsibilities
SDDOT	Rail Safety	• Oversee rail operations and conduct physical inspections in coordination with FRA. • Inspect railroad crossings and investigate complaints or accidents. • Resolve complaints (Quiet Zones and trespassing complaints, for example). • Ensure employee safety through employee regulations. • Fund rail safety projects through the Rail Crossing Improvement Program (RCIP). • Publish general rail safety principles and rules. • Fund grade-crossing protection improvements from FHWA dedication (Section 130). • Distribute information on-line for public education. • Promote public awareness as a partner in the Operation Lifesaver Program.
Railroad Companies		• Comply with safety regulations. • Conduct safe rail operations. • Maintain train/track/railroad crossings safety. • Maintain rail safety management plan and guidelines and train workforce. • Identify and manage security risks. • Manage incidents and emergencies. • Manage workforce safety. • Protect railroad property, assets and the environment from damage. • Provide safety data to FRA and cooperate in safety investigations by NTSB. • Assist FRA, TSA and SDDOT in public education and awareness activities.

Positive Train Control Implementation[51, 52]

Positive train control is an integrated command, control, communications, and information systems for controlling train movements (automatically stop or slow a train) before certain accidents occur. In particular, PTC systems are designed to prevent train-to-train collisions, derailments caused by excessive speed, unauthorized incursions by trains onto sections of track where repairs are being made and movement of a train through a track switch left in the wrong position. PTC systems also

[51] https://www.aar.org/safety/Pages/Positive-Train-Control.aspx#.UqhNruIQSok (last retrieved on December 6, 2013).

[52] https://www.fra.dot.gov/Page/P0621 (last retrieved on December 6, 2013).

may interface with tactical and strategic traffic planners, work order reporting systems, and locomotive health reporting systems.

Prior to October 2008, PTC systems were voluntarily tested or installed by various Class I railroads, however, at a slow pace. The Rail Safety Improvement Act of 2008 (RSIA) mandated Class I railroads to install PTC systems on tracks that carry passengers or toxic inhalation hazard (TIH) materials and put into service by the end of 2015. This affected approximately 63,000 miles of U.S. freight rail lines.

PTC systems require installation of new digital data link (wireless) communications networks, continuous and accurate positioning systems, on-board computers, in-cab displays, throttle-brake interfaces on locomotives, many thousands of wayside interface units at switches and wayside detectors, and control center computers and displays. The enactment of legislation thus meant significant labor and financial resource commitments for the Class I railroads to develop a fully functioning PTC system.

PTC deployment in South Dakota will be minimal, as most mileage falls under the threshold train volume and hazmat requirements for its implementation. In general, most railroads are expected to meet the current 2015 deadline for PTC implementation, due primarily to the complexities of developing the PTC technology.[53] However, it is known that BNSF leads the industry in developing and testing PTC systems and already has petitioned the FRA for PTC Safety Plan approval and system certification of the Electronic Train Management System (ETMS).

Changes in Hours of Service[54]

The Federal Hours of Service Act was enacted by Congress on March 4, 1907, to promote the safety of employees and travelers on railroads by limiting the hours of service of railroad employees. The Hours of Service Act was amended several times, and in 1994, it was recodified, and referred to as the hours of service laws (HSL). Significant changes to the HSL were made by RSIA, with the aim to reduce the potential for railroad employee fatigue. Most of the changes were to §21103, including limitations on duty hours of train employees and a monthly time limit on all service performed for a railroad and time spent waiting for or in deadhead transportation from duty to a point of final release after the 12-hour point in a consecutive service duty tour. The new provisions also restrict a train employee to 6 or 7 consecutive days of initiating on-duty periods followed by 48 or 72 consecutive hours off duty, and require a minimum statutory off-duty period of 10 hours.

Although this may not be relevant to South Dakota, in addition to changing some provisions and adding several more, the HSL, as amended by the RSIA, gave FRA the authority to create regulations governing the hours of service of train employees of commuter and intercity passenger railroad carriers.

In December 2013, FRA released an hours of service compliance manual for freight operations to provide guidance on the hours of service requirements in the RSIA. This is intended to reduce

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[53] http://www.progressiverailroading.com/ptc/article/Class-I-railroads-rate-the-state-of-positive-train-control-35442 (last retrieved on December 6, 2013).

[54] Federal Railroad Administration (FRA). Hours of Service Compliance Manual—Freight Operations, December 2013.

misinterpretations of the complex HSL requirements, during compliance by railroads and regulation and enforcement by FRA and the State DOT, which was previously a challenge.

Train Horn Rule and Quiet Zone[55]

Public highway-rail at-grade crossings are important from safety considerations, from 2008 to 2012, almost 33 percent of the rail incidents in the State took place at highway-rail at-grade crossings. Under the Federal Train Horn Rule, locomotive engineers must begin to sound train horns at least 15 seconds, and no more than 20 seconds, in advance of all public at-grade crossings. If a train is traveling faster than 60 miles per hour, engineers will not sound the horn until it is within a quarter-mile of the crossing, even if the advance warning is less than 15 seconds. At some locations engineers cannot precisely estimate their arrival at the at-grade crossing, in such cases, the engineer is expected to sound the horn no more than 25 seconds before arriving at the crossing. The Federal rule says that train horns must be sounded in a standardized pattern of two long, one short, and one long blasts. The pattern must be repeated or prolonged until the lead locomotive or lead cab car occupies the grade crossing. A new requirement is that the maximum volume level for the train horn is 110 decibels. The minimum sound level remains 96 decibels.

Quiet zones are opportunities for communities nationwide to mitigate the effects of train horn noise. The FRA guidance is that quiet zones should be at least a half-mile long, and have cooperation from all affected jurisdictions. Train horns may still be used in emergency situations or to comply with other Federal regulations or railroad operating rules. Quiet Zones are created from either pre-rule quiet zone (horns were not sounding on October 9, 1996 and December 18, 2003 because of State/local law or community agreement with the railroads), or at new locations by evaluating a quiet zone risk index (QZRI) developed by FRA and comparing it with a national significant risk threshold (NSRT) (also given by FRA) and the level of risk that would exist if the train horns were still sounded. To achieve a QZRI lower than the latter two, supplementary safety measures or engineering alternative safety measures may need to be installed at some of the crossings that are a part of the quiet zone. Most freight railroads consider quiet zones as compromising the safety of railroad employees, customers, and the general public; however, they comply with provisions of the Federal law.

HazMat Transportation[56, 57]

Railroads have a strong record for safely moving hazardous materials (HazMat), with nearly 100 percent of all shipments reaching their destination without a release caused by an accident. However, the movement of hazardous materials still is highly regulated. It involves specialized employee and local first responder training, and is done with the utmost care to reduce safety and security risks.

The Federal government has comprehensive regulations covering the safety and security of the movement of hazmat by rail – including the FRA, Pipeline and Hazardous Materials Safety Administration (PHMSA), and Transportation Security Administration (TSA). The Federal government also directs railroads to route HazMat on lines posing the least overall safety and

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[55] https://www.fra.dot.gov/Page/P0104 (last retrieved on December 6, 2013).

[56] https://www.aar.org/safety/Pages/Hazardous-Materials-Transportation.aspx#.Uqhj6uIQSok (last retrieved on December 6, 2013).

[57] https://www.fra.dot.gov/Page/P0444 (last retrieved on December 6, 2013).

security risk, and identifies the risk factors railroads should take into account in determining the best routes.

In addition, the railroads also support customer efforts to replace Toxic Inhalation Hazard (TIH) materials, a subset of hazmat, with less hazardous substitutes wherever possible. Safer substitutes already are feasible for many TIH materials today.

The AAR North American Tank Car Committee is comprised of the AAR, rail car owners and manufacturers as well as shippers of HazMat, rail customers, the U.S. DOT, Transport Canada and the National Transportation Safety Board (NTSB). The committee works together to develop technical standards for how rail cars, including tank cars used to move HazMat, are designed and constructed.

On July 6, 2013, a catastrophic accident involving a freight train with loaded tank cars of petroleum crude oil from the Bakken formation occurred in the town of Lac-Mégantic, Quebec, on the Montreal, Maine, and Atlantic Railway. FRA responded to the incident by releasing an Emergency Order No. 28 that contained an additional list of recommendations from FRA and PHMSA to the railroads. Separately, BNSF Railway developed a requirement for any connecting railroad shipping HazMat with BNSF to operate with two-man crews. FRA supports BNSF's new requirement.[58] Since the Lac-Mégantic incident, three additional catastrophic incidents involving unrefined Bakken shale oil (including the December 30, 2013 collision between a derailed grain train and a unit oil train in Castleton, North Dakota), have resulted in even greater scrutiny of commodity reporting, safe handling, and tank car design.

Lastly, many thousands of emergency responders from all across the country receive free hazmat training from railroads each year to help ensure that local emergency personnel will be prepared in the event of an accident. This training takes place at the Security and Emergency Response Training Center (SERTC) at the Transportation Technology Center, Inc. in Pueblo, Colorado (a subsidiary of the AAR). FRA too conducts training seminars, interactive webinars, and guidance intended to increase regulatory awareness and compliance.

[58] https://www.fra.dot.gov/Page/P0670 (last retrieved on December 6, 2013).

Environment and Energy Use Considerations

This section describes the energy use and environmental impacts of South Dakota's rail system and discusses the environmental and energy use benefits of rail relative to other modes of transportation. This section shows how rail can lessen the effects of some recent environmental regulations, mainly relating to the emissions and fuel used, on the railroads and community quality of life. This section also discusses the interrelationship between the rail system and land use.

Air Quality Impacts and Regulations

Air quality is a key concern for South Dakota's policy-makers and residents. Air quality problems are identified through ambient air quality monitoring at potentially high air pollution areas across the State as well as citizen complaints.

Criteria Pollutants for Air Quality

According to the U.S. Environmental Protection Agency (EPA), there are six criteria pollutants that can cause significant impacts to human health, the environment, and property: Ozone (O_3), Particulate Matter (PM), Carbon Monoxide (CO), Nitrogen Oxides (NO_x), Sulfur Dioxide (SO_2), and Lead (Pb).[59] At this time, South Dakota is not facing nonattainment of the national ambient air quality standards for any of these pollutants.[60] However, it is still important to understand the levels of contribution by the transportation sector and nature of the emissions, by the different modes in the State and identify opportunities to improve air quality for better health.

Gasoline and diesel consumption from South Dakota's mobile sources[61] (mainly belonging to the transportation sector) results in the emission of several of these criteria pollutants, though different modes tend to produce different pollutants. For example, trucks tend to contribute to NO_x and PM Statewide total emissions, while freight rail operations contribute to CO, NO_x, VOC, and PM Statewide total emissions. Marine vessels contribute to SO_2 emissions; however, due to a lake of barge traffic on South Dakota's inland waterway system, this mode is not a contributor to the State's total. NO_x and VOCs also combine together in the presence of sunlight to create Ozone. Table 32 summarizes the criteria pollutants. Also indicated in the table are the percentages that the mobile sources contribute to South Dakota's statewide totals.

[59] http://www.epa.gov/air/urbanair/ (last retrieved on December 6, 2013).

[60] http://www.epa.gov/oaqps001/greenbk/ancl.html (last retrieved on December 6, 2013).

[61] Mobile sources include a wide variety of vehicles, engines, and equipment. "On-road" or highway sources include vehicles used on roads for transportation of passengers or freight. "Nonroad" (also called "off-road") sources include vehicles, engines, and equipment used for construction, agriculture, recreation, and many other purposes. http://www.epa.gov/otaq/standards/basicinfo.htm (last retrieved on December 6, 2013).

Table 32. Goods Movement Sector Contribution to Criteria Pollutants

Pollutant	Sources (Contributions from all types of mobile sources)
Ozone (O_3)	Ozone is not directly emitted as a pollutant, but is formed when NO_x and Volatile Organic Compounds (VOC) react in the presence of sunlight. Sources of the precursor pollutants that create ozone include vehicle exhaust, solvents, gasoline vapors, and industrial processes. While there are no reliable estimates of the proportion of ozone attributable to passenger and freight rail activities, it is known that diesel engines are a significant source of NO_x, which is a precursor to ozone.
Particulate Matter ($PM_{2.5}$ and PM_{10})	Particulate matter is composed of a variety of small airborne particles, including chemicals, dust, and metals. Some are emitted as a byproduct of engine combustion, some are formed in the atmosphere by reactions in exhaust plumes, and some are kicked up from farming operations and as road dust. In South Dakota, all mobile sources combined are responsible for about 22 percent of all $PM_{2.5}$ emitted, as well as 4 percent of the PM_{10}. Dust is a more important contributor for $PM_{2.5}$ (58 percent) and PM_{10} (about 93 percent) emissions in South Dakota.
Carbon Monoxide (CO)	Carbon monoxide is a colorless gas formed from incomplete combustion of carbon compounds. In South Dakota, all mobile sources combined are responsible for about 95 percent of CO emissions.
Nitrogen Oxides (NO_x)	Nitrogen oxides (NO_x) are reactive gases produced when fuel is burned at high temperatures. Transportation and electricity generation are the primary contributors of NO_x. NO_x is a precursor to ozone and also contributes to the formation of acid rain. In South Dakota, all mobile sources combined are responsible for about 75 percent of NO_x emissions.
Sulfur Dioxide (SO_2)	Sulfur dioxide (SO_2) is formed when fuel containing sulfur is burned. Coal-fired power plants are the largest contributors to SO_2 emissions in the U.S. In South Dakota, all mobile sources combined are responsible for about 5 percent of SO_2 emissions. Industrial, commercial and institutional, residential, and power generation sources are more important contributors for SO_2 (about 95 percent) emissions in South Dakota.
Lead (Pb)	Lead is a naturally occurring metal that also is found in many manufactured products. The transportation sector used to be a major source of lead pollution, but the phase-out of leaded gasoline for on road uses in the 1980s resulted in a major decrease in airborne lead pollution.

Source: U.S. EPA. http://www.epa.gov/oaqps001/urbanair/, http://www.epa.gov/air/emissions/index.htm

In general, rail is a more efficient mode in terms of fuel consumption (compared to trucks) for moving goods. On a per-ton basis, rail is the most efficient way to move large, heavy loads – in fact rail fuel efficiency ranges from 156 to 512 ton-miles per gallon, while truck fuel efficiency ranges

from 68 to 133 ton-miles per gallon.[62] Therefore, use of rail reduces fuel consumption necessary for each ton-mile. Since the primary driver of emissions is fuel consumption, the reduced use of fuel associated with freight rail (as opposed to trucks) can lead to reduced emissions of CO, PM, NO_x, and O_3.

Another consideration is that communities surrounding fixed rail infrastructure can be disproportionately impacted by poor air quality and pollutant emissions. The activities of idling, switching, or slow moving trains in rail yards can serve as localized emissions "hot spots," where there are elevated levels of CO, NO_x, VOC, and PM. Over time, this can bring localized impacts such as increased risk of asthma and other respiratory diseases, cancers, and other ailments to the communities directly surrounding rail infrastructure. These localized impacts are one of the key reasons that freight and land use integration is important to consider during the transportation planning process. Limiting the impacts of freight land uses on surrounding communities is one of the driving forces behind the freight and land use considerations discussed later in this section.

Fugitive Dust

South Dakota is located in the high plains and is subject to periods of droughts and high winds resulting in fugitive dust problems. However, the transportation sector and particularly rail operations are likely small contributors to the fugitive dust problem. Some of the ways that they contribute include traffic on gravel roads and loading/unloading activities at unpaved rail yards and sanding and salting of roads during winter weather.

Greenhouse Gas Emissions and Climate Change

Greenhouse gases (GHG) such as CO_2, CH_4, N_2O, and HFCs trap infrared radiation and prevent heat from leaving the atmosphere. This leads to a gradual increase in earth's temperature, likely to cause climate change. The transportation sector contributes to about 43 percent of the total GHG emissions in the State. Table 33 shows statewide CO_2 emissions by fuel type for transportation sector in 2010 and a comparison between the State and the U.S. as a whole. South Dakota contributes just about 0.3 percent of the nation's total CO_2 emissions. Motor gasoline used by passenger vehicles, trucks (mostly light-duty) and recreational boats, and distillate fuel oil (diesel) used by trucks (mostly medium- and heavy-duty), and rail contribute the majority of about 53 percent and about 37 percent to statewide total emissions, respectively. Jet fuel and aviation gasoline used by aircraft carriers and general aviation contribute about 4.2 percent to statewide total emissions. Natural gas is mainly used for pipeline transportation, and contributes about 5 percent to statewide total emissions. Gasoline and jet fuel shares of the total emissions are lower in South Dakota than in the U.S. as a whole; on the other hand, the diesel and natural gas shares of the total emissions are higher in the State.

[62] ICF International, U.S. Department of Transportation, Federal Railroad Administration, *Comparative Evaluation of Rail and Truck Fuel Efficiency on Competitive Corridors,* November 2009. http://www.ontrackamerica.org/files/Comparative_Evaluation_Rail_Truck_Fuel_Efficiency.pdf.

Table 33. GHG Emissions by Fuel Type for Transportation Sector, South Dakota versus U.S., 2010

Fuel Type	2010 GHG Emissions (Billion Grams of CO_2)				
	South Dakota	Percent Contribution in South Dakota	U.S.	Percent Contribution in U.S.	State as Percent of U.S.
Motor Gasoline	3,449	54.0%	1,125,000	60.0%	0.3%
Distillate Fuel Oil	2,369	37.0%	429,000	23.0%	0.6%
Natural Gas	310	5.0%	38,000	2.0%	0.8%
Jet Fuel	288	4.0%	210,000	11.0%	0.1%
Aviation Gasoline	10	0.2%	2,000	0.1%	0.5%
LPG	9	0.1%	2,000	0.1%	0.5%
Residual Fuel Oil	0	0.0%	70,000	3.7%	0.0%
Electricity	0	0.0%	5,000	0.3%	0.0%
Total (Transportation Sector)[a]	**6,435**		**1,881,000**		**0.3%**
Total (All Sectors)	**15,140**		**5,817,000**		**0.3%**
Transportation Sector as Percent of All Sectors	**43%**		**32%**		

Source: U.S. Energy Information Administration's (EIA). http://www.eia.gov/environment/emissions/state/state_emissions.cfm, http://www.eia.gov/environment/data.cfm#summary.

[a] *The total for Transportation Sector represented in the above table does not include lubricants used in transportation.*

In terms of greenhouse gases emission, national data shows that rail is the least polluting mode per ton-mile (Table 34). Freight rail on average emits 24 grams of carbon dioxide equivalents[63] (g of CO_2 Eq.) per ton-mile, which is just about 8 percent of the total GHG emissions for domestic freight transportation in the U.S., while handling 37 percent of the ton-miles in the U.S. In comparison, trucks emit 295 g of CO_2 Eq. per ton-mile, domestic commercial aircrafts emit 1,389 g of CO_2 Eq. per ton-mile, and domestic ships and other boats emit 1,389 g of CO_2 Eq. per ton-mile. Therefore, though freight rail contributes to the GHG emissions, using this measure it is the most efficient mode (among traditional transportation modes) by which to transport goods.

[63] Carbon dioxide (CO_2) equivalents is the concentration of CO_2 that would cause the same level of greenhouse effect as a given type and concentration of greenhouse gases.

Table 34. National Greenhouse Gas Emission Rates for Freight Transportation (g CO_2 Eq. per ton-mile)

	GHG Emissions (Teragrams)			Percent Contribution in GHG Emissions	Ton-Miles (Millions)	Percent Contribution in Ton-Miles	GHG Emission Rate (g CO_2 Eq./ Ton-Mile)
Mode	2009	2010	2011	2011	2009	2009	2009
Domestic Commercial Aircraft[a]	16.7	16.3	16.5	3%	12,027	0.3%	1,389
Trucking	389.2	402.9	401.1	76%	1,321,396	31.0%	295
Freight Rail	37.2	40.0	42.0	8%	1,582,093	37.0%	24
Domestic Ships and Other Boats[a]	23.9	27.3	31.4	6%	477,122	11.0%	50
Pipelines[b]	36.7	37.1	37.7	7%	909,682	21.0%	40
Total	**503.7**	**523.6**	**528.7**		**4,302,320**		

Source: U.S. Environmental Protection Agency (EPA), Draft Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011 (April 2013), Table A-115 Greenhouse Gas Emissions from Domestic Freight Transportation (Tg CO_2 Eq.); U.S. Bureau of Transportation Statistics, Table 1-50: U.S. Ton-Miles of Freight (BTS Special Tabulation).

[a] *International air cargo and marine GHG emissions are excluded because of the lack of ton-mileage data for these modes, and emissions from international bunker fuel related are not included.*

[b] *Pipelines reflect CO_2 emissions from natural gas powered pipelines transporting natural gas.*

Climate change due to the increase in the concentration of greenhouse gases will have a number of impacts on the Great Plains, as described most recently in the 2009 U.S. Global Change Research Program's *Global Climate Change Impacts in the United States*.[64] According to this report, temperature is projected to increase 5 to 10° Fahrenheit by the year 2100 in the Great Plains. Climate change will also bring more frequent extreme events such as heat waves, droughts, and heavy rainfall. For South Dakota's freight network, a number of climate impacts described could affect the State's rail system, as summarized in Table 35.

[64] U.S. Global Change Research Program (USGCRP) (2009), *Global Climate Change Impacts in the United States*, T. R. Karl, J. M. Melillo, and T. C. Peterson, (eds.), Cambridge University Press, New York.

Table 35. Potential Impacts of Climate Change on South Dakota's Rail System

Climate Event	Potential Impacts to Rail
Increase in drought frequency and reemergence of dust storms	• May require additional cleaning of tracks and equipment maintenance. • Could curtail barge and other waterborne freight movements on inland waterway system, causing the loss of opportunities to create an intermodal partnership with freight rail.
Increased precipitation during winters	• May require redesign of culverts, bridges and storm water management rail facilities.
Impacts to agriculture and forestry	• Shifts in optimal land for growing crops and raising animals (livestock) towards north may require new rail facilities or the abandonment of existing facilities.
Extreme temperature events	• Rising temperatures could exacerbate the failure of aged infrastructure such as bridges and rail lines. • Hotter working conditions could shorten the construction season, or cause heat-related safety concerns for construction and maintenance workers. • Hotter temperatures could increase the incidence of track buckling or "sun kinks" on rail. This is essentially heat-driven lateral replacement, which can result in taking the line out of service or having to run slower trains over it.

Source: U.S. Global Change Research Program (USGCRP) (2009), Global Climate Change Impacts in the United States, T. R. Karl, J. M. Melillo, and T. C. Peterson, (eds.), Cambridge University Press, New York.

Effects of Environmental Regulation

The Federal government is promulgating regulations that will lower emissions from railroad operations. The U.S. EPA adopted a comprehensive regulation on locomotive and marine diesel engine air quality in 2008.[65] These regulations call for new lower-emission locomotives in 2009 (Tier 3), ultralow-sulfur diesel fuel in 2012 (a separate regulation), and Tier 4 engines starting from 2015. Tier 4 locomotives, that require exhaust gas after treatment technologies, will reduce diesel particulate matter by 85 percent compared to 2007 Tier 2 locomotives, and reduce nitrogen oxides by 76 percent in 2017. These reductions in locomotive emissions will take place over time after 2015, as the locomotive fleet turns over through engine replacements and new locomotive purchases. This means that rail-related emissions are likely to be further reduced through the application of this new national regulation. Since any national regulation would be applied to South Dakota, this regulatory context may bring changes to the technologies in use on South Dakota freight rail services.

[65] Final Rule: Control of Emissions of Air Pollution from Locomotives and Marine Compression-Ignition Engines Less Than 30 Liters per Cylinder, 40 CFR Sections 9, 85, et al., June 2008, U.S. Environmental Protection Agency.

ENERGY USE AND SOURCE CONSIDERATIONS

ENERGY CONSUMPTION

The transportation sector contributed 25 percent to total energy consumption in South Dakota in 2010. Table 36 shows statewide energy consumption by fuel type for the transportation sector for that year. The State contributes about 0.4 percent of the nation's total energy consumption. Motor gasoline and distillate fuel oil (diesel) consumption have major contributions of about 56 percent and 33 percent to total energy consumption, respectively. On the other hand, jet fuel and aviation gasoline consumed contribute about 4.1 percent, and natural gas consumed contributes about 6 percent to statewide total energy consumption. Table 36 also provides a comparison of South Dakota to the U.S. As a whole, gasoline and jet fuel shares of the total energy consumption are lower in the State and diesel and natural gas shares of the energy consumption are higher.

Table 36. Energy Consumption by Fuel Type for Transportation Sector, South Dakota versus U.S., 2010

	2010 Energy Consumption (in Trillions of BTU)				
Fuel Type	South Dakota	Percent Contribution in South Dakota	U.S.	Percent Contribution in U.S.	State as Percent of U.S.
Motor Gasoline	53.4	56.0%	16,807	61.0%	0.3%
Distillate Fuel Oil	31.6	33.0%	5,879	21.0%	0.5%
Natural Gas	5.8	6.0%	721	3.0%	0.8%
Jet Fuel	4.1	4.0%	2,963	11.0%	0.1%
Aviation Gasoline	0.1	0.1%	27	0.1%	0.4%
LPG	0.1	0.1%	29	0.1%	0.3%
Residual Fuel Oil	0.0	0.0%	892	3.3%	0.0%
Electricity	0	0.0%	80	0.3%	0.0%
Total (Transportation Sector)[a]	**95.1**		**27,398**		**0.3%**
Total (All Sectors)	**379.9**		**97,981**		**0.4%**
Transportation Sector as Percent of All Sectors	**25%**		**28%**		

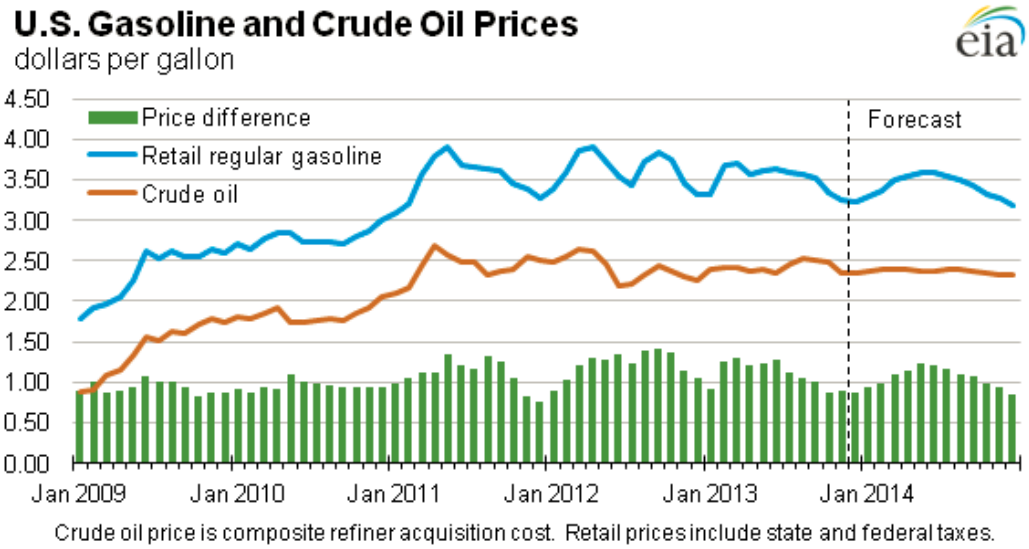
Source: U.S. Energy Information Administration's (EIA). http://www.eia.gov/state/seds/seds-data-complete.cfm?sid=U.S., http://www.eia.gov/state/seds/seds-data-complete.cfm?sid=SD.

[a] *The total for Transportation Sector represented in the above table does not include lubricants used in transportation.*

Existing Fuel Cost Trends

In the U.S., domestic oil production is at the highest levels since 2003, with discoveries in the Bakken shale formation in North Dakota expected to produce one million barrels a day in 2014.[66] This has led to a decrease in the amount of oil imported from other countries, and made the U.S. one of the fastest growing oil production economies in the world.[67, 68] However, oil prices are still high relative to 2009 levels or before, and have fluctuated substantially in the last five years, as shown in Figure 58. Fluctuating fuel prices impact transportation costs in several ways. First, rising costs may trigger changing distribution systems and logistics chains in order to shorten the supply chains, save fuel, and save money. This can have ripple effects to the markets previously served by these supply chains, as well as the relative competitiveness of the different modes that serve those markets. In addition, rising transportation costs may lead businesses to pass on the costs to consumers in the form of higher prices. This could potentially result in a decrease in overall demand for goods and services.

Figure 58. Gasoline and Crude Oil Prices, January 2008 to January 2013



Source: U.S. Energy Information Administration's (EIA) Gasoline and Diesel Fuel Update, Released on December, 2013.

[66] Article in *The Bakken Magazine* dated January 15, 2014: http://thebakken.com/articles/478/nd-30-000-barrels-of-oil-per-day-away-from-reaching-1-million

[67] Article on *LA Times* dated March 12, 2012: http://articles.latimes.com/2012/mar/12/news/la-pn-report-us-oil-imports-down-domestic-production-highest-since-2003-20120311.

[68] White House Report: "Blueprint for a Secure Energy Future," March 30, 2011: http://www.whitehouse.gov/sites/default/files/blueprint_secure_energy_future.pdf.

Effects of Alternatives Fuels Prices and Incentives

The discovery of the Marcellus and Bakken shale formations, and other oil and natural gas-rich deposits, has driven down the prices of natural gas from a high of about $13 per million British thermal units (2008) to about $3.40 per million British thermal units.[69] This lowering of natural gas prices has made Compressed Natural Gas (CNG) and Liquefied Natural Gas (LNG) viable alternatives to conventional motor fuels in some applications.

LNG also may prove to be a viable fuel source to power trains. In 2013, BNSF reported that it will begin testing LNG as a fuel on a small number of locomotives. BNSF notes that this is an important first step to evaluate the technical and economic feasibility of using LNG as a train fuel. The stated goals for this change are to reduce fuel costs, reduce GHG emissions, and deliver environmental and energy security benefits to the nation.[70]

This is not a completely new phenomena – BNSF tested the potential of LNG in the 1980s and 1990s. At that time, LNG conversion was not economically viable. However, improved economics (i.e., cheaper sources) and improved technology may make LNG a feasible option today.[71] It is unknown whether portions of South Dakota's rail system would be part of the pilot project. However, in the long term, if LNG proves to be a viable fuel source it would positively impact every state where BNSF utilizes LNG locomotives.

In addition to the price trends of mature alternative fuels markets such as LNG, there are several Federal and state incentives available to emerging alternative fuels. State incentives include Biodiesel Blend Tax Credit, Ethanol Infrastructure Funding, and others. Similarly Federal incentives include Advanced Biofuel Production Grants and Loan Guarantees, Ethanol Infrastructure Grants and Loan Guarantees, and others.[72]

Railroads continue to research and test alternative fuels for locomotives and switchers, including biodiesel, "green" diesel, ultralow-sulfur diesel fuel, battery power, dual-engine diesel, and ethanol. However, there has been limited success so far in finding alternative fuels that are practicable for a large-scale implementation for railroads. There are various factors to consider, including cost, carbon footprint, land use factors such as "food versus fuel" debate, combustion emissions, and ability to meet the oncoming Tier 4 locomotive standards, energy intensity, water intensity, regional availability, volume availability, and infrastructure needs.[73]

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[69] http://www.ft.com/intl/cms/s/0/ac8b0726-6894-11e2-9a3f-00144feab49a.html#axzz2OskJ0P4W.

[70] *BNSF to test LNG Locomotives in Pilot Program*. The Journal of Commerce, March 6, 2013: http://www.joc.com/rail-intermodal/class-i-railroads/bnsf-railway/bnsf-test-lng-locomotives-pilot-program_20130306.html.

[71] *BNSF to Test LNG in Road Locomotives*. Employee communications, March 6, 2013. http://m.bnsf.com/employees/communications/bnsf-news/2013/march/2013-03-06-a.html.

[72] http://www.afdc.energy.gov/ (last retrieved on December 6, 2013).

[73] Railtec. 2012 Railroad Environmental Conference. Spoken and Poster Presentation Summaries. October 16-17, 2012.

LAND USE AND COMMUNITY IMPACTS

Freight rail can have positive and negative impacts on land use and the communities through which it operates. The positive impacts in South Dakota include its high capacity and low cost compared to other available modes, thereby facilitating economic growth. It can provide critical transportation for the movement of agricultural products from farm to market, and economic welfare to communities in direct and indirect ways. The positive impacts of rail have been reinforced by railroads' substantial investments that have led to improved performance. On the other hand, rail operations can and do produce undesirable impacts, including noise, air and light pollution, and interference with highway traffic. Finally, there are issues such as encroachment and incompatible land uses that can impact rail operations, but also the communities through which they operate. In all cases, well-coordinated land use and transportation planning can help to maximize the positive benefits of rail, while minimizing the negative impacts.

Positive Land Use and Community Impacts

From the 1870s onwards, rail was critical to the development of South Dakota, as with most of the Midwest and Eastern U.S. The construction of railroads defined early patterns of settlements, development of communities and cities, and commerce. By the 1930s, the advent of the reliable and higher capacity trucks, combined with a rapidly expanding and improving road network led to reduced dependence on railroads for freight and passenger transport. Following World War II this trend accelerated, and rail traffic began a decline that continued largely unabated until the 1980s. As a result many rail lines were abandoned and fewer communities remained dependent on railroads. Nevertheless, even today, there is a strong linkage between rail and the trade of commodities, especially through the numerous grain elevators serving farm to market movements. The State's rail system is still very important for mobility and livability of communities. With improvements in infrastructure, higher capacity cars, and more efficient operations brought about by unit trains and intermodal services, the efficiency and safety in the movement of goods by rail vastly improved. The Staggers Rail Act of 1980 deregulated the railroads and simultaneously brought down the railroad rates. Today, rail is considered as a part of the solution for handling growing volumes of freight without overburdening the highway system.

SOUTH DAKOTA'S RAIL SYSTEM HAS STRONG LINKS TO THE LIVABILITY OF URBAN AND RURAL COMMUNITIES. RAIL IS ESSENTIAL FOR HANDLING GROWING VOLUMES OF FREIGHT WITHOUT OVERBURDENING THE HIGHWAY SYSTEM.

One way that freight rail contributions can be maximized is by the development of inland ports. Taking advantage of rail's natural synergies with the "triple bottom line" of economic, social, and environmental concerns, inland ports are becoming an increasingly popular alternative for U.S. manufactured and agricultural exports as well as imports of manufactured goods, energy equipment, and other containerized cargo to move via a combination of truck, rail, and ultimately ship. Inland ports are strategically designed to provide low-cost, quick delivery of products to consumption zones while decreasing the overall emissions footprint and shortening supply chains. One example of an inland port is the Northern Montana Multimodal Hub Center, which received a $10 million TIGER III grant in 2011.[74] Built in 1987, BNSF's Intermodal Terminal at Shelby, Montana sees 45 to 50 daily BNSF trains pass through this location, but the original facility did not have the capacity to handle unit trains or large-volume

[74] Federal Railroad Administration, 2013, Press Release. "U.S. Transportation Secretary Foxx Awards $10 Million for the Port of Northern Montana Multimodal Hub." http://www.fra.dot.gov/eLib/details/L04664.

containerized cargo. The relocated inland port in Shelby will enable the shipment and receipt of traditional and renewable energy equipment; containerized agricultural commodities and regionally manufactured goods for export; and large industrial equipment and materials, while providing safety, efficiency, and economic benefits to the region.

Other Community Impacts and Land Use Issues

Rail facilities and operations can negatively impact the communities within which they operate. For example, residents living near rail yards tend to be sensitive about trains blocking roads at grade crossings, noise or light pollution concerns, as well as raise issues of environmental and air pollution. Air quality impacts and safety impacts at grade crossings were described earlier in this section; further descriptions on other community impacts are provided here:

- Noise pollution is described by the U.S. EPA as "unwanted or disturbing sound." Noise pollution can contribute to significant public health impacts, including annoyance, sleep disturbance, reduced productivity, hearing loss and tinnitus, cardiovascular disease, and effects on the immune system, among others.[75] Noise-Induced Hearing Loss (NIHL) is the most common health impact,[76] though research has shown that there are numerous other negative impacts on public health. Noise pollution associated with railroad activities can occur at a single source (i.e., rail yard, maintenance facility, or intermodal center) or from the use of train whistles, horns, and train movement along rail tracks. One of the ways to overcome noise pollution at sensitive locations of a community is through creation of quiet zones as discussed earlier.
- Light pollution causes such adverse health outcomes as headaches; sleep deprivation and associated health effects, decreased mental capacity, a compromised immune system, depression, hypertension, and weight gain.[77] Light pollution also can have environmental consequences, such as disrupting delicate ecosystems by confusing animal navigation or changing predator-prey relationships.[78] It also can waste energy if not being used for an active and necessary purpose. Light pollution associated with railroad activities can include station and yard areas or crossing lighting, as well as the lights from the moving locomotives themselves. Several states, including Arizona, New Jersey, and Maine, have adopted legislation designed to limit light pollution from buildings, streetlights, and other fixtures. For example, Arizona's Department of Environmental Quality regulates and defines light pollution in Arizona Revised Statutes 49, Chapter 7.[79] South Dakota currently is not one of these states. However, light pollution at sources such as railyards can be mitigated by simple actions that seek to minimize the light that spills on adjacent properties. For example, glare can be reduced by locating lights at an angle that minimizes disturbance to drivers, or through the use of flat-lens lighting fixtures that direct light downward, and reduce the glare from individual fixtures.
- Rail facilities also can find themselves constrained by encroaching residential or commercial land uses, or find their operations harmed by land uses that are too close to their rights-of-way,

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[75] http://www.epa.gov/air/noise.html.

[76] http://www.epa.gov/air/noise.html.

[77] *Atlanta Regional Freight Mobility Plan: Community & Environmental Impact Scan and Assessment:* http://www.atlantaregional.com/transportation/freight/Freight-Mobility_Plan.

[78] Ibid.

[79] http://www.azleg.gov/ArizonaRevisedStatutes.asp?Title=49.

requiring slower train speeds or otherwise limiting operations. Integration of rail facilities into communities can be accomplished through careful consideration of elements, such as site design, freight operations, and other mitigation techniques. If done correctly, it is possible to incorporate rail facilities in a manner that both maximize the benefits of rail while minimizing their impacts. Some of the key rail and land use integration issues include:

- The close proximity of rail yards, lines, and facilities to sensitive land uses (residential areas, schools, etc.) may result in negative impacts to residents. These impacts could include pollutant emissions from idling or moving trains, noise and light pollution from facility operations, and a number of other negative impacts.
- Efforts to preserve community values may impose constraints on nearby rail facilities and rail-related operations, such as nighttime restrictions on operations. These efforts may limit the scope of industrial activities, may inhibit the business's competitiveness, and may initiate efforts at relocation.

Additionally, the projected growth in demand for rail in South Dakota may sharpen some of the existing negative impacts to local communities and the natural environment. More commodity demand leads to more trains using State's rail system, leading to increased incidence of noise and lighting complaints, increased potential for right-of-way conflicts, and increased episodes of trains crossing at highway-rail at-grade crossings.

5 – Needs, Issues and Opportunities

Preface

South Dakota's physical rail infrastructure consists of both publicly and privately owned rail lines and privately owned and operated cargo loading/unloading facilities. This system serves the needs of shippers and contributes to South Dakota's gross state product by providing jobs and carrying rail cargo critical to the State's economy such as agricultural products, nonmetallic mineral products, consumer goods, and raw and semiprocessed inputs destined for South Dakota's industries.

This chapter presents physical infrastructure and supporting needs of South Dakota's rail-based goods movement system, organized by the five South Dakota State Rail Plan goals stated in Chapter 1. Additionally, the chapter summarizes findings from the stakeholder outreach conducted as part of the South Dakota State Rail Plan.

Photo this page: RCP&E track west of Pierre, South Dakota

SOUTH DAKOTA'S RAIL SYSTEM NEEDS

In this chapter, the needs of South Dakota's rail-based goods movement system are discussed. Physical infrastructure and supporting needs and issues are organized by the five South Dakota State Rail Plan goals stated in Chapter 1:

- Support economic growth and development;
- Ensure connectivity for critical industries;
- Maintain State railroad assets in a state of good repair;
- Reduce highway impacts; and
- Improve railroad safety, security, and resiliency.

In the second half of this chapter, the needs and opportunities identified by stakeholders interviewed as part of the State Rail Plan are presented.

NEED TO SUPPORT ECONOMIC GROWTH AND DEVELOPMENT

South Dakota business, industry, and government leaders continue to emphasize the importance of statewide economic growth and development activities. As such, there is interest by economic development organizations to increase local and regional freight handling capacity and capabilities, develop and promote local freight connections, and generally link rail investments to actions that support economic development.

RAIL TERMINAL NEEDS WITHIN SOUTH DAKOTA

There is a need for additional rail terminal facilities to serve the needs of South Dakota businesses. Two different types of rail terminals that could be explored are intermodal terminals to serve the container market and transload/consolidation facilities where rail cars may be sorted, stored, and built into trains. Some also have rail car/locomotive repair facilities.

Intermodal Terminals

Currently, there are no intermodal terminal facilities in South Dakota. In order to use intermodal rail services, shippers in Rapid City have to dray as far as Denver, Colorado (about 400 miles away), shippers in Yankton have to dray as far as Omaha, Nebraska, St. Paul, Minnesota, or Kansas City, Kansas (about 165 miles, 325 miles, and 340 miles away, respectively). Although intermodal rail service costs lower than trucking on a per ton-mile basis, drayage can offset the cost benefits of rail.

Shippers (e.g., Bentonite Performance Minerals, LLC) and economic development agencies (e.g., Yankton EDA) have both expressed interest in constructing a terminal to serve South Dakota industries. Traditionally, intermodal containers have been used for more high-value, time-sensitive goods, but today many agricultural producers report that they are shipping grain or other commodities via containers for export. Raw materials producers also are utilizing the container market. South Dakota businesses understand the economic benefits of containerization, which include higher safety and security, lower damage rates and lower insurance costs of goods, lower storage requirement and inventory costs (as container is its own storage unit), and higher service

levels due to less time in handling. Also, railroads generally prioritize intermodal trains meant for imports/exports over other trains.[80] Increased market pressures have led to a container shortage in the region, in part due to a lack of inbound demand and reluctance to send empty containers to the State, leading to a lack of needed containers for outbound shipments. As one example, bentonite shipments currently are being drayed to Denver, the closest location with container availability, for shipments out to the West Coast.

The Panama Canal expansion project, projected to be completed in 2016, may play a part in shifting the markets for South Dakota, as more containerized goods may make their way via rail and inland waterway markets to and from the State and the Gulf of Mexico onto Asian markets. Since opening in 1914, the Panama Canal has been a critical element of the global transportation network. It now serves over 140 maritime trade routes to over 80 countries; an estimated 5 percent of global maritime cargo transits the Panama Canal every year.[81] The expansion project will increase the annual capacity of the canal by more than 75 percent. The effect of the expansion on U.S. ports and trade is a hotly debated topic. Many factors, such as port physical attributes, connections to the surface transportation system, and access to inland markets are among many factors that will influence how the expansion of the Panama Canal will affect U.S. trade. The use of larger ships will likely lead to fewer and more concentrated ship calls at larger ports that can accommodate larger vessels and have good access to inland markets. New Orleans, along with many East Coast and Gulf ports, is conducting a study as part of a plan to increase channel depth from 45 feet to 50 feet to accommodate these larger ships.[82] It is unclear whether or not this will shift South Dakota's existing export supply chain focused on the Pacific Northwest to the Gulf or East Coast ports.

Rail Consolidation Facilities

Another issue with rail service in South Dakota is that the demand for goods movement is highly fragmented. There are several small to medium-sized farms, businesses and industries that, on their own, are not able to generate enough rail cars of demand to build a complete train. The demand also fluctuates seasonally, especially for agriculture. As a result, businesses and industries are continually trying to find ways to partner and consolidate their demands to become eligible for increased access to rail service, allowing them to reach new markets and to lower their costs.

Across many parts of the U.S., access to the rail system is becoming more challenging for smaller customers as the Class I carriers have increased their focus on transporting oil and other major commodities unit trains. Across the country, Class I railroads are requiring shortline railroads and other customers to provide longer trains, of 100 cars, or longer, which is difficult for shortline railroads that do not have switching and storage facilities to handle this volume of cars. In particular, smaller agricultural producers and grain elevators are challenged by a lack of access to the current rail system, and need consolidation facilities and/or shortline rail or transload access to the rail system. Farmers also have created their own associations to actively manage demand consolidation during the harvest season. The ongoing Belle Fourche Industrial Park Development with access to rail service is a clear example that meets the stakeholders' demand for rail

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[80] http://people.hofstra.edu/geotrans/eng/ch3en/conc3en/benefits_containerization.html (last accessed on April 9, 2014).

[81] Panama Canal Authority, *2009 Annual Report*. https://www.pancanal.com/eng/general/reporteanual/2009/pdf/InformePDFingles.pdf.

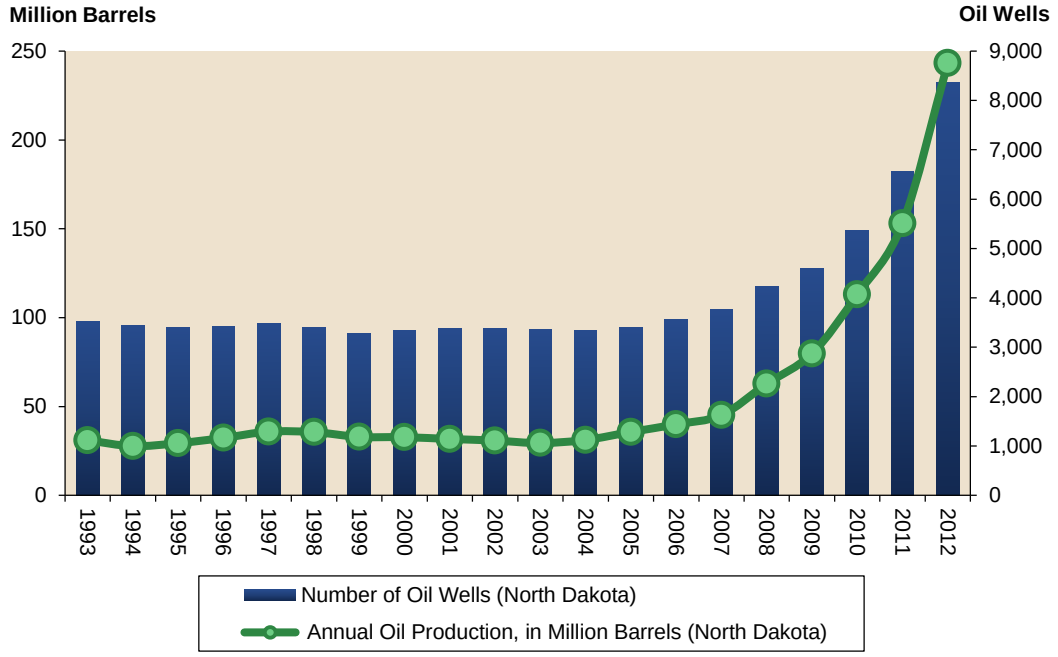
[82] U.S. DOT Maritime Administration. *Panama Canal Expansion Study Phase I Report*, November 2013. http://www.marad.dot.gov/documents/Panama_Canal_Phase_I_Report_-_20Nov2013.pdf.

consolidation/transload facilities. There also is discussion of a facility of this kind being developed in west central South Dakota to serve the needs of oil and gas companies and supporting industry serving the Bakken region of North Dakota.

Opportunity to Support the Oil and Gas Industry

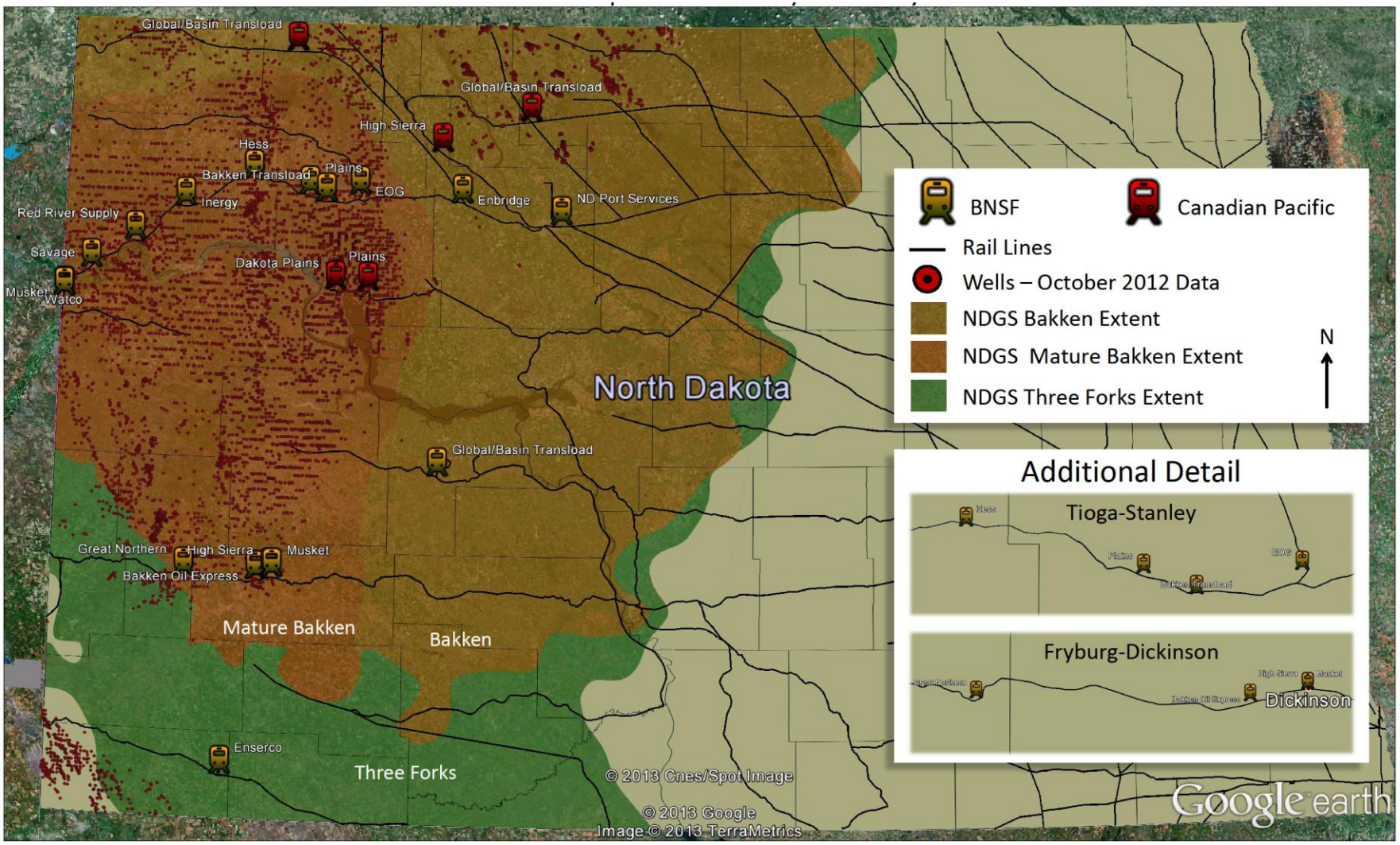
The oil and gas industry in the Upper Plains has increased exponentially in the last decade, particularly due to fracking and other activities in the Bakken region of North Dakota. As shown in Figure 59, North Dakota's annual oil production reached over 313 million barrels in 2013. Some oil is shipped via pipeline, but increasingly unit trains are carrying oil to market. Additionally, the need to bring raw materials to drilling sites and transferring petroleum products to refineries have strained existing road and rail transportation systems in North Dakota. Figure 60 shows the locations of rail facilities serving the North Dakota oil market.

Figure 59. North Dakota Oil Production and Wells



Source: North Dakota Department of Mineral Resources, 2014.

Figure 60. North Dakota Crude Oil Rail Loading Facilities



Source: North Dakota Pipeline Authority, January 2013 http://northdakotapipelines.com/maps/.

According to the AAR, in 2008, U.S. Class I railroads originated just 9,500 carloads of crude oil. In 2012, they originated nearly 234,000 carloads and were forecast to originate around 400,000 carloads in 2013.[83] Although transportation costs for shipment by train are higher, rail offers competitive advantages over pipeline transfer. Rail serves major refineries on the coasts, as well as inland and Gulf markets, allowing companies the flexibility to ship their products to the highest-margin market. In addition, rail allows for uncontaminated shipment of different grades of petroleum, whereas pipeline shipments may result in mixing grades of oil.

However, as volumes of crude shipped via rail increase, the capacity of those rail lines decrease and present challenges for other commodities using those rail lines, including the raw materials that are inputs into the crude extraction process. For example, a single horizontal well typically uses between 3,000 and 10,000 tons of sand. A typical rail car of frac sand contains around 100 tons. In 2009, Class I railroads originated nearly 112,000 carloads of sand and are on track to originate approximately 375,000 carloads in 2013, likely driven by increased frac sand use at drilling wells.[84]

Municipalities and businesses along the rail lines are positioning themselves to continue to support the oil production industry in North Dakota, as well as the industry in Wyoming and Montana. Most recently, an oil tank manufacturing plant became the first tenant in a new rail industrial park in Belle Fourche, and there is potential for other facilities of this kind being developed in west central South Dakota to serve the expected North Dakota growth.

Grain Elevator Capacity Needs

Grain elevators are locations where grain trains are loaded and are an essential component of moving grain out of South Dakota to domestic and international markets. Insufficient elevator capacity to meet crop production demand can lead to additional on-farm storage (at locations away from grain elevators) and even loss of business opportunities for South Dakota farmers during peak harvest months. Appendix C provides estimation methodologies for determining the demand and throughput of grain elevators in South Dakota. Table 37 shows the results of the capacity needs assessment. The table shows that the total capacity shortfall in the peak month for South Dakota is estimated to be about 731,000 bushels, and is likely grow to about 11.2 million bushels by 2022. The South Central, Southwest and Northwest agricultural districts are likely experiencing shortage in grain elevator capacity under existing conditions, whereas, all agricultural districts except the Central, Southeast and West Central may have a capacity shortfall by 2022. The East Central, North Central and Northeast agricultural districts may each face a peak month capacity shortfall of over a million bushels.

[83] Association of American Railroads, https://www.aar.org/keyissues/Documents/Background-Papers/Crude-oil-by-rail.pdf.

[84] Association of American Railroads, December 2013. *Moving Crude Oil by Rail.* https://www.aar.org/safety/Pages/crude-by-rail-facts.aspx#.UxdfuIXYO_c.

Table 37. Grain Elevator Capacity Shortfalls in Peak Month in South Dakota by Agricultural District

Agricultural District	Expected Peak Month Outbound Rail Demand in Bushels		Estimated Monthly Throughput of Grain Elevators in South Dakota in Bushels	Expected Peak Month Capacity Shortfall in Bushels	
	2012	Projected 2022	Existing and Proposed	2012	Projected 2022
Central	6,337,572	9,059,763	12,272,966	0	0
East Central	6,733,245	10,869,748	9,710,700	0	1,159,049
North Central	10,377,481	15,900,312	11,389,111	0	4,511,200
Northeast	7,710,994	12,080,615	8,226,287	0	3,854,327
Northwest	1,319,274	1,661,537	1,235,214	84,060	426,323
South Central	1,766,757	2,250,908	1,404,834	361,923	846,074
Southeast	4,000,966	6,026,811	11,151,443	0	0
Southwest	285,075	376,687	0	285,075	376,687
West Central	1,309,385	1,547,297	1,796,471	0	0
Total	**39,840,749**	**59,773,678**	**57,187,026**	**731,058**	**11,173,661**

Source: USDA, Economic Research Service, USDA Agricultural Projections to 2023; Upper Great Plains Transportation Institute, North Dakota State University, Fargo, North Dakota. Trip Generation Rates for Large Elevators: A North Dakota Case Study, Final Report, December 2006; BNSF Grain Terminals Data for South Dakota available at: http://www.bnsf.com/customers/grain-facilities/elevators/menu/sdlist.html (last accessed on April 9, 2014); Cambridge Systematics analysis.

Opportunities for Increased Siding Lengths

Siding length determines the length and type of train that can be accommodated at the siding; greater length provides more flexibility to the operator, creating opportunities for minimizing systemwide delay and number of extreme train delay events. Currently, Class I railroads are increasing their focus on serving unit trains, which are typically 100+ cars and do not interchange cars between origin and destination. To accommodate today's longer trains, as well as providing a high level of service to short and medium length trains, a siding track greater than 8,000 feet is required. These long sidings are generally required at locations, such as:

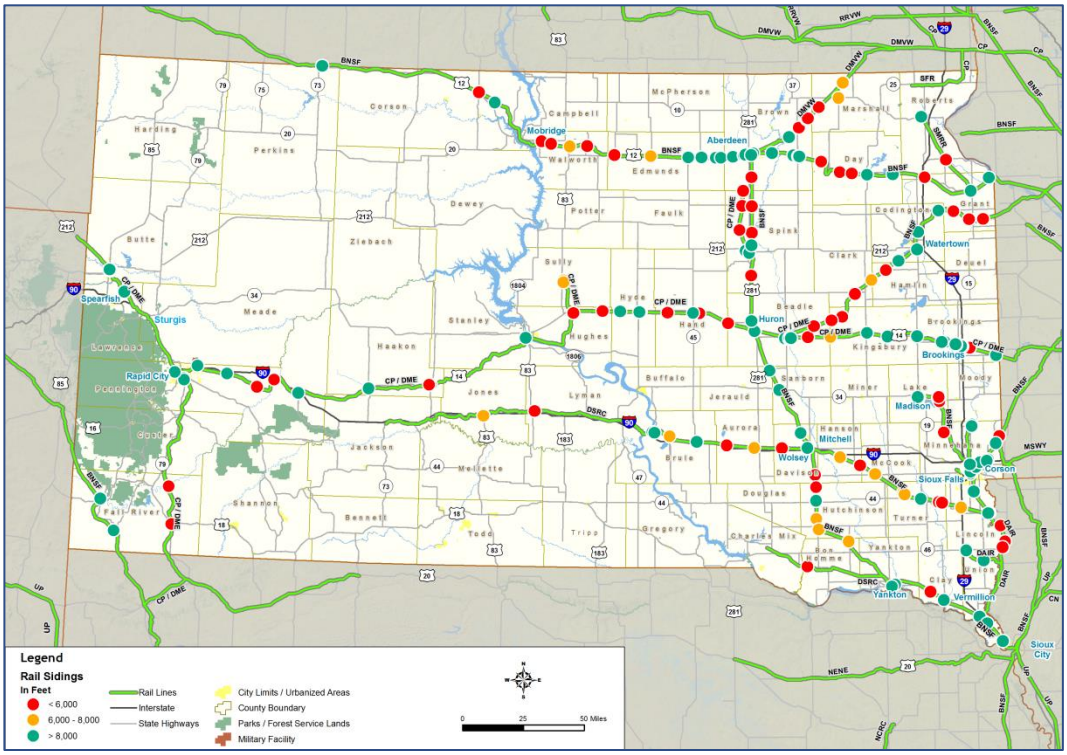
- Lines where traffic volumes are at the maximum practical capacity and flexibility in operations is essential;
- Near major rail yards capable of building longer trains to relieve yard tracks;
- At locations where scheduling changes are not sufficient to eliminate recurring delays experienced by shorter trains; and/or

When shorter trains frequently carry high-valued or time-sensitive goods.

Figure 61 shows the sidings below and above 8,000 feet in South Dakota. There is a cluster of long sidings on BNSF's Mobridge/Appleton Subdivisions around Aberdeen that are likely related to the rail yard and junction, but very few of them are located far west of Aberdeen. On BNSF's Aberdeen Subdivision, there is a cluster of long sidings around Redfield Junction and Yankton.

Although Huron-Mitchell and Yankton-Sioux City, Iowa segments seem to have long sidings at regular intervals, the segments of Aberdeen-Huron and Mitchell-Yankton have less frequent long sidings. However, the latter segment is complemented by some medium (6,000 – 8,000 ft.) length sidings. In addition, there is a cluster of long sidings around Sioux Falls, likely related to the rail yard. The RCP&E line between Huron and Brookings also has long sidings at fairly regular intervals.

Figure 61. Short, Medium, and Long Rail Siding Lengths in South Dakota



Source: SDDOT's Rail GIS Data; Cambridge Systematics' GIS Analysis.

Land Use and Transportation Planning

South Dakota currently has a decentralized planning and zoning structure, with counties and municipalities having significant powers for zoning and development. Budget shortfalls and lack of funds at the local level have made it difficult for agencies at the county level to keep up with existing infrastructure needs, let alone pursue new economic development projects. The State faces challenges in getting projects approved at the local level due to these stringent planning and zoning requirements, and it can be hard to get buy-in at the local level. The State and counties need to increase their efforts to work together to the mutual benefit of both: so that the State can continue working on long-term economic and infrastructure development projects that benefit the State's residents, and that counties can, through partnership with the State, have access to resources necessary to maintain their infrastructure and promote economic development.

NEED TO ENSURE CONNECTIVITY FOR CRITICAL INDUSTRIES

Providing competitive, efficient, and reliable rail connections to existing and emerging industries helps lower the cost of doing business in the State, broadens the market reach for South Dakota products, and is a critical component of attracting and retaining businesses. Competitive rail access, targeted infrastructure investment, coordination with neighboring states, and rail-focused policy development, can help South Dakota ensure that key State industries have competitive and efficient links to the transcontinental freight rail network, can operate reliably on that network, and have access to all domestic and international markets.

Class I Railroad Connectivity Needs

Absent being directly served by BNSF, the ability and ease of South Dakota's industry to connect to the Class I rail network is dependent on which rail line the business has "last-mile" access to. BNSF is the only railroad in the State that provides a direct connection to the Class I network and transcon lines that connect to deep water and export markets. Businesses located on State-owned lines, that have originating or terminating shipments, can be served by BNSF as well as Class I and other railroads because of the 2005 "core" rail line sale to BNSF. One of the terms of the sale was that other rail carriers could have trackage rights to help ensure competitive access to rail service; however, those connections typically occur beyond the State border. A recent example of this is the introduction of service by CN to the Gavilon grain facility located on the State-owned MRC line, outside of Kimball.[85]

Beyond Class I access provided by BNSF and for businesses located adjacent to State-owned rail lines, there are no track use agreements with other Class I railroads and access currently can only be done through drayage. However, this will change with the introduction of service via the RCP&E; the RCP&E will provide access to UP at Mankato, Minnesota and to CP at Tracy, Minnesota.

Recent rail trends, such as those in the oil and agriculture industries, and the fact that South Dakota shippers are beholden to BNSF almost exclusively for transporting State-produced product to west coast exports ports, have led to system congestion, influenced the way that railroads and their customers do business, and have created bottlenecks outside of South Dakota's borders that pose significant threat to the competitiveness, efficiency and reliability of the rail system within the State.

In the winter of 2013-14, increasing crude-by-rail traffic in North Dakota in conjunction with a record harvest, drove up demand for rail service and led to significant congestion on the railway system. The combination of intense winter weather and ongoing construction and maintenance efforts undertaken to improve service and capacity left farmers and grain elevator operators facing challenges in getting their product to export ports in the Pacific Northwest.[86] Due to slower travel times and longer turn-arounds, there was a lack of rail cars available for grain shipment, leading to grain being stored on the ground at facilities while waiting for shipment.

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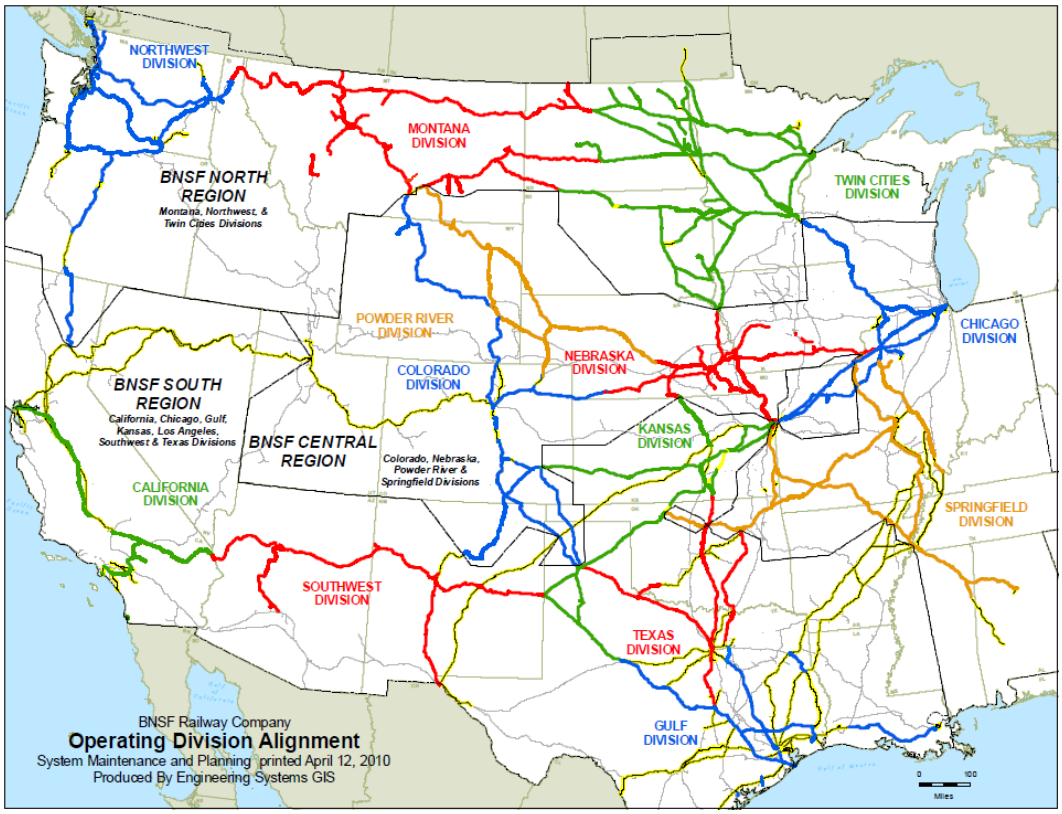
[85] Prairie Business, December 23, 2103. *New rail carrier to service Gavilon Liberty Grain facility*.

[86] Vock, Daniel. March 11, 2014. "Oil trains, cold snap put planes state farmers in a bind." *Stateline* http://www.pewstates.org/projects/stateline/headlines/oil-trains-cold-snap-put-plains-state-farmers-in-a-bind-85899541820.

Capacity Needs Related to Grain Traffic to Pacific Northwest

North Dakota has three BNSF lines (see Figure 62), all of which are single-track and faced significant congestion-related issues in 2013-14 due to peak demand repeatedly exceeding the single-track capacity.[87, 88, 89] The issues on the north two lines (ex-Great Northern rail corridor through Minot, North Dakota and through Bismarck, North Dakota) are mainly due to the "Crude Oil by Rail" boom, and exacerbated by record agricultural production in the Midwest, growing intermodal cargo imports and sustained bad weather. The crude oil traffic also had an effect on the grain traffic from South Dakota and the Midwest on the third BNSF line (ex-Northern Pacific rail corridor through Aberdeen, South Dakota, Hettinger, North Dakota and Billings, Montana) west of Sandpoint, Idaho; as west of this location the BNSF lines join to form a single line with two tracks. If the yield of crude oil generated at the Bakken Oil Fields continues to grow, the economics of "Crude Oil by Rail"[90] show that there will likely be continued growth in usage of rail and pipeline, with nominal changes in international imports of crude oil.

Figure 62. BNSF's National Rail System Map



Source: http://www.bnsf.com/customers/pdf/maps/network-map.pdf (last accessed on April 9, 2014).

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87 Argus Leader, Rail bottleneck for grain, ethanol shippers, Article by Peter Harriman dated March 27, 2014.

88 Prairie Business, South Dakota delegation presses railroads for better service, Article by Denise Ross, April 3, 2014.

89 North Dakota DOT, North Dakota State Rail Plan, December 2007.

90 Congressional Research Service. U.S. Rail Transportation of Crude Oil: Background and Issues for Congress, Final Report, February 6, 2014.

Between Billings, Montana and Sandpoint, ID the grain traffic on the BNSF line competes for capacity mainly with coal traffic from the Powder River Basin. Overall, the southern BNSF line (ex-Northern Pacific rail corridor) has sharp curves and grade-related issues, leading to a lower capacity than the northern BNSF route (ex-Great Northern rail corridor).

Unlike oil and coal, the demand for agricultural products is seasonal. As such, the capacity needs are typically met by railroads through operational changes. However, there has been evidence that for recent combinations of traffic, operational changes are insufficient, resulting in large economic losses, in particular for agricultural products such as corn for grain and ethanol. In the short term, track realignments and siding improvements to increase train speeds should be considered, however, if the congestion issues persist, mainline track capacity investments may have to be considered by BNSF to benefit not only South Dakota shippers but all agricultural shippers in the Midwest.

The STB had been closely monitoring the rail industry's performance metrics and expressed concern about service problems across the nation's railroad network, particularly on the CP and BNSF systems. As a result, they coordinated the hearing on April 10, 2014 in Washington D.C., to provide interested persons the opportunity to report on recent railroad service issues, review proposed solutions to existing service problems, and discuss additional options to improve service. Numerous representatives from South Dakota participated in that hearing, including U.S. Senator John Thune, South Dakota Department of Agriculture, and several local businesses. Senator Thune remarked that "Dakota Mill and Grain, headquartered in Rapid City, with a total of seven rail facilities serving 500 customers, calculated the cost of poor rail service. If the poor rail service lasts for six months and during that time producers see grain prices drop by 10 percent and agriculture inputs, like feed and fertilizer increase by 10 percent – something they are expecting – it will cost its customers approximately $3.5 million."[91]

An informal follow-up meeting was held in Sioux Falls to allow the STB to discuss directly with shippers regarding railroad service delays. As a result of these hearings, CP and BNSF were ordered to file their plans to timely resolve their backlogs of grain car orders, as well as weekly status reports pertaining to grain car service, and to file weekly status reports on their plans to ensure delivery of fertilizer shipments for spring planting, and to provide weekly status reports regarding fertilizer delivery over their respective networks. As a result of limited progress to serve South Dakota's grain backlogs, in September 2014 Senator Thune introduced bi-partisan legislation to reform the STB, including providing the agency the ability to initiate investigations versus only responding to complaints.[92]

Capacity Needs Related to Other Traffic to/from South Dakota

The crude oil traffic from the North Dakota's Bakken Oil Fields has replaced some of the international imports previously made in the eastern parts of the U.S. and the domestic supply of crude oil from Oklahoma's oil fields. Additionally, the Bakken Oil Fields require fracking sand, lumber, steel and specialized equipment for their drilling operations. As a result, the BNSF lines

[91] Thune to Deliver Remarks at STB Hearing on South Dakota Rail Service Issues. April 10, 2014. http://www.thune.senate.gov/public/index.cfm/press-releases?ID=ced94069-af04-4e14-83f4-ea1da164656f.\

[92] Thune Announces Commerce Committee Markup of STB Reform Bill. September 15, 2014. http://www.thune.senate.gov/public/index.cfm/press-releases?ID=300de3df-84ac-4a7a-8118-a1f6d6bdee9b

have added trains between Fargo, North Dakota to Minneapolis, Minnesota through Willmar, Minnesota and eastwards, and Fargo to Sioux Falls, South Dakota through Willmar, Minnesota and southwards. This surge in traffic has increased competition for other traffic from/to South Dakota in terms of track capacity. The other competing traffic includes inputs to agricultural production such as fertilizers, animal feed, chemicals and specialized equipment; inputs to nonmetallic mineral extraction such as lumber, steel and specialized equipment, and nonmetallic mineral products such as bentonite, aggregates; and wind energy turbines and parts. In order to reduce adverse impacts to other traffic from/to South Dakota, operational changes and limited siding improvements may need to be considered. Although the surge in oil traffic also affects the BNSF line between Fargo, North Dakota and Minneapolis, Minnesota on which Amtrak's Empire Builder operates, it is mostly double-tracked (except a 10-mile stretch) and is not related to the other traffic to/from South Dakota.

BNSF has announced a major capital improvement program[93,94] in which they will invest $5 billion systemwide, and approximately $1 billion to improve and expand rail capacity in states along the Northern Corridor, between the Pacific Northwest and Chicago. Nearly $400 million will be invested directly in North Dakota and will be used to complete construction of a second mainline track between Minot, North Dakota and Glasgow, Montana, as well as construct new sidings to expand capacity by enabling more trains to meet and pass one another on the predominately single track routes.

Stakeholders have identified other bottlenecks on BNSF tracks at Sioux City, Iowa and on RCP&E tracks at Tracy, Minnesota causing train delays. Some track realignments and operational changes may likely improve train speeds of through traffic.

Port Terminal Needs outside South Dakota

According to the USDA[95] and as shown in Figure 63, a majority of South Dakota's top crops are transported via rail to the deepwater seaports of Seattle-Tacoma, Portland-Vancouver and Houston-Galveston. All of these ports are located in heavily populated or environmentally sensitive areas, so there is limited land available for expansion. In addition, these ports handle commodity types other than grain exports, including a significant amount of container imports. When it comes to allocation of available land for expanding rail infrastructure at port terminals or allocation of investment for increasing throughput, the ports and the railroads tend to give more attention to containerized imports than grain exports. This is due to a higher revenue per ton handled or ton-mile moved of containerized cargo, and the customer need for "just in time" inventory of such cargo. The expansion of Panama Canal has only heightened the need for expanding containerized cargo facilities on the Gulf Ports. However, it is noted that grain exports are still in a better position than most other types of dry bulk cargo in terms of dedicated facilities and service performance.

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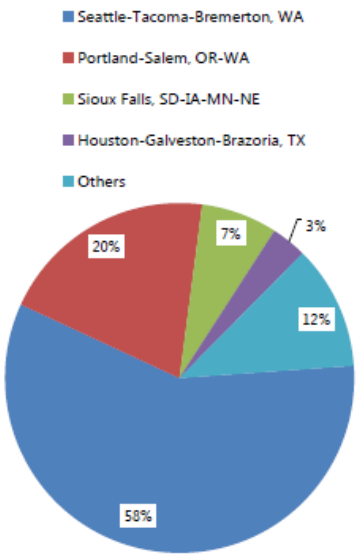
[93] http://www.bnsf.com/media/news-releases/2014/february/2014-02-04a.html.

[94] http://www.bnsf.com/media/news-releases/2014/may/2014-05-01a.html.

[95] USDA, State Grain Rail Statistical Summary, June 2013.

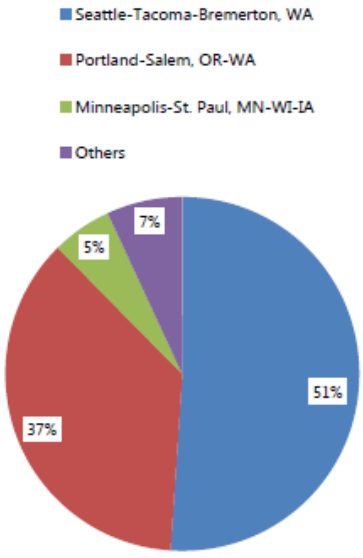
Figure 63. Distribution of Bushels Traded to Business Economic Areas for Top Crops Produced in South Dakota

Figure SD-1. Business Economic Areas Receiving South Dakota Corn by Rail, 2006–2010



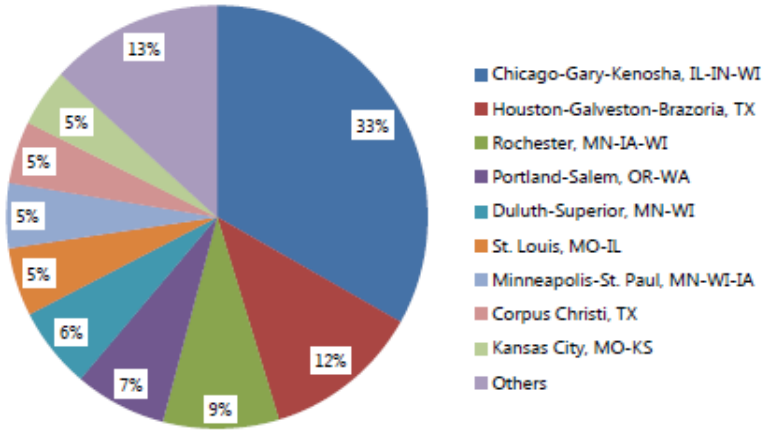
Source: USDA analysis of Surface Transportation Board Confidential Waybill Samples

Figure SD-3. Business Economic Areas Receiving South Dakota Soybeans by Rail, 2006–2010



Source: USDA analysis of Surface Transportation Board Confidential Waybill Samples

Figure SD-5. Business Economic Areas Receiving South Dakota Wheat by Rail, 2006–2010



Source: USDA analysis of Surface Transportation Board Confidential Waybill Samples

Source: USDA, State Grain Rail Statistical Summary, June 2013.

NEED TO MAINTAIN STATE RAILROAD ASSETS IN A STATE OF GOOD REPAIR

The backbone of the rail system in South Dakota is owned, operated, and maintained by two railroads; the BNSF and RCP&E (former CP/DM&E). These systems currently comprise approximately 80 percent of the rail mileage in the State. While the mileage of the private- and State-owned rail lines is not as extensive, the function of these rail lines to provide local service and last-mile connections is no less significant. These rail lines provide efficient connections for local industries to the transcontinental freight rail network, as well as to other destinations within South Dakota. The State purchased many of these lines as they were threatened for abandonment. Today, many have significant capital and ongoing maintenance needs. In order to meet future demand and continue to provide service efficiently, physical issues on both private- and State-owned rail lines within the State have been identified.[96]

BNSF System

Track capacity and level of service for various train types (i.e., unit intermodal train, unit bulk train, other bulk train, general merchandise train, etc.) depends on factors including number of tracks, signaling system, length and spacing between sidings, and scheduling priority given to the train type. The rail system in South Dakota is substantially single-track main line, including BNSF's system, as shown in Figure 64. Both the BNSF east-west main line (Mobridge and Appleton Subdivisions) and the north-south core system (Aberdeen Subdivision) have a single main line track, similar lengths and spacing of sidings, and similar train mixes (the east-west corridor carries a few additional pass-through intermodal unit trains). The key difference between these lines is that the north-south core system lacks automated wayside signal systems and advanced traffic control systems; trains operate under Track Warrant Control (TWC) rules, as shown in Figure 65. In comparison, the east-west main line operates trains under either Centralized Traffic Control (CTC) or Automatic Block Signaling (ABS). This allows trains to be scheduled more frequently on the east-west line than the north-south line. Although train volumes on the north-south rail line currently are below current track capacity, the volumes are projected to grow, and under peaking conditions (i.e., during harvest time), volumes are expected to approach the line's maximum practical capacity, which is in the range of 16 to 20 trains a day.[97] As the demand warrants, an effective way to provide flexibility to handle fluctuations in train volumes is to upgrade the signal system to either CTC or ABS, and adjust the priority rules for train scheduling. This also would increase safety of train operations on the north-south line.

Rapid City, Pierre, and Eastern System

The competitiveness of rail service over truck transportation is strongly dependent on train speeds and the ability of the rail line to carry heavy loads. While the line is a critical link to markets for the bentonite industry in Colony, Wyoming; a significant industrial park is under development in Belle Fourche; and the line will provide a connection with the UP at Mankato, Minnesota and CP at

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[96] Class I and other privately owned railroads are in the business of serving their customers and ensuring that their system infrastructure is sufficient to serve those needs. Both private- and State-owned rail lines have been assessed as part of this Plan to provide South Dakota comprehensive information on the current status of all rail infrastructure in the State, and not to imply that privately owned rail systems are not serving customer needs. As is typically the case, as customer needs increase, private railroads will make investments in their systems to serve those customer needs.

[97] Association of American Railroads. National Freight Rail Infrastructure Capacity and Investment Study, September 2007.

Tracy, Minnesota, the RCP&E has several physical system needs that limit the lines ability to provide competitive service. The track between Rapid City and Pierre (the approximately 165-mile-long PRC Subdivision), is FRA Track Class I or II with deferred maintenance. Although the majority of rail is 100 pounds or heavier, there are 20 miles of 90-pound rail that should be replaced. This light rail limits the speed at which heavier rail cars (that are commonly seen on the Class I system) can be moved on the tracks. In addition, the Pierre Shale subgrade makes for constantly changing track conditions, including sinking. The average train speeds on this subdivision are less than 15 miles per hour, leading to significant time requirements to traverse the line. There is a need to improve the train speeds while improving safety by replacing the rail and ties for the tracks, strengthening the subgrade beneath the tracks. Another issue for the PRC Subdivision is the load carrying capacity of the bridge structures. The existing structures cannot handle 286,000 pounds (286K) fully loaded, standard rail cars, as shown in Figure 66, these need to be retrofitted or replaced for efficient interchange with BNSF, UP, and CP.

Figure 64. Number of Tracks, South Dakota Railroad Network

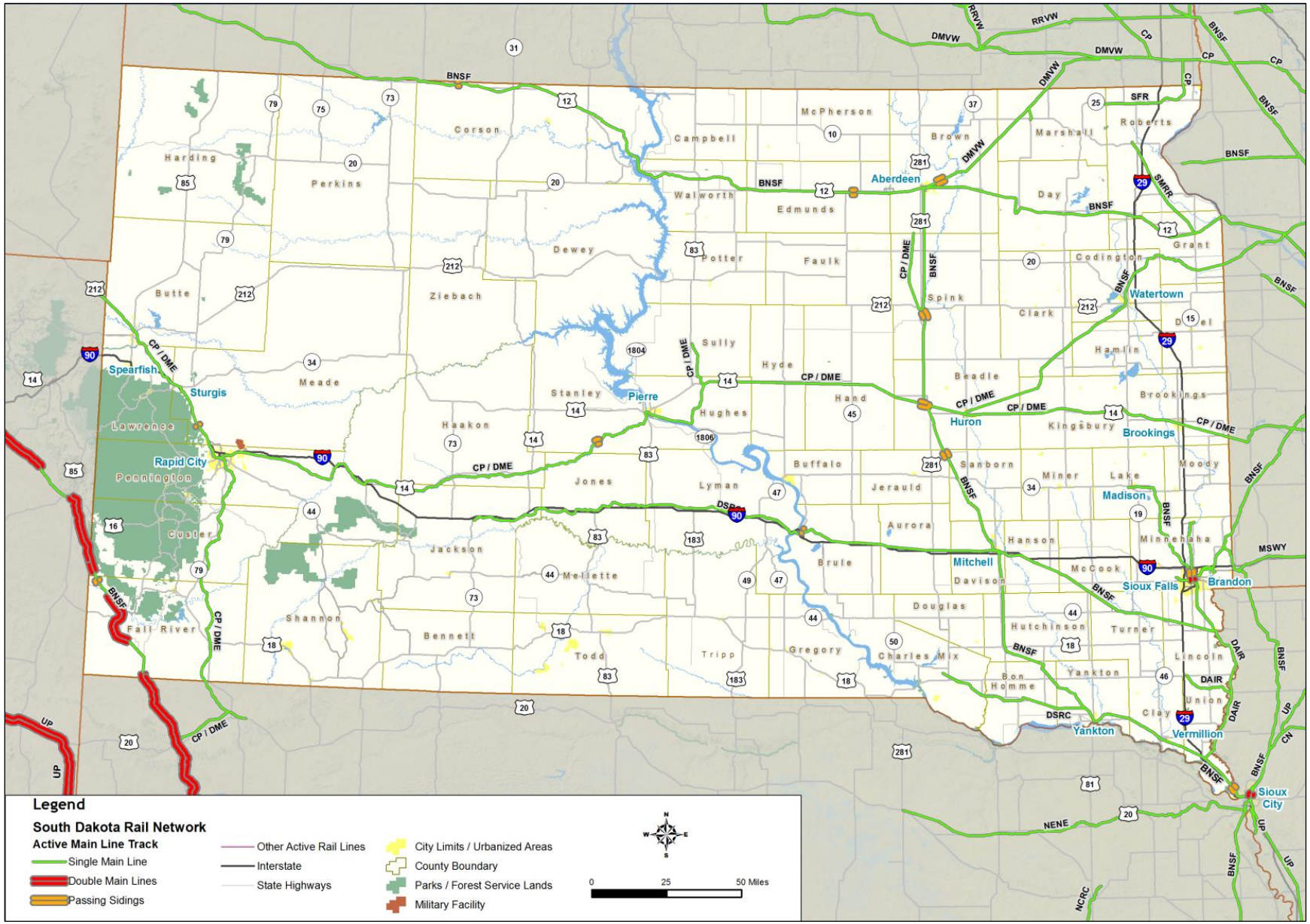


Figure 65. Train Control and Signal Systems, South Dakota Railroad Network

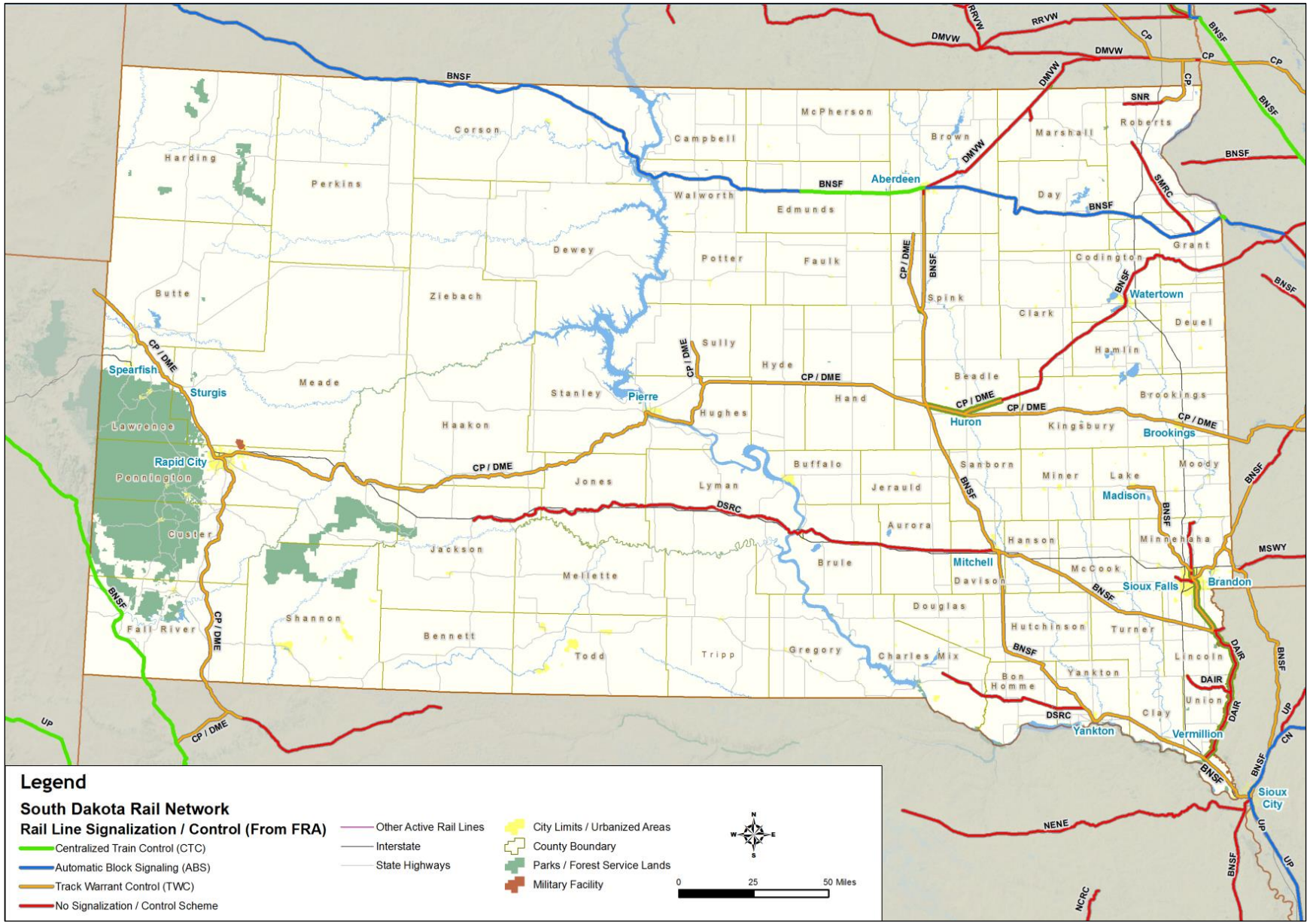


Figure 66. Maximum Allowable Gross Weight and Other Restrictions, South Dakota Railroad Network

South Dakota's State-Owned Rail System

Similar to those described for BNSF and RCP&E, there are maintenance needs on South Dakota's State-owned rail system. In particular, there are several segments where existing structures are unable to handle 286K fully loaded, standard rail cars, and where light rail prevents heavier rail cars moving on the tracks. As shown in Figure 66, State-owned lines that are not 286K-compliant include:

- **RCP&E –** the Huron to Yale Line;
- **Dakota and Iowa Railroad (D&I) –** the Sioux Valley Subdivision;
- **Dakota Southern Railway (DSRC) –** the Mitchell to Rapid City Line (in partial service); and
- **DSRC –** the Napa to Platte Line (not in active service).

Additional segments have light rail that should be upgraded to 115-pound rail and include:

- **RCP&E –** the Huron to Yale Line;
- **Dakota, Missouri Valley, and Western Railroad (DMVW) –** the Britton Line;
- **D&I –** the Sioux Valley Subdivision; and
- **DSRC –** the Napa to Platte Line (not in active service).

While in large part the State-owned system has a single track mainline and has no automated signal control, this does not pose a threat to capacity today, as the volumes on these lines are relatively low. Should traffic increase, the addition of sidings and operational strategies to extend line capacity should be considered.

NEED TO REDUCE HIGHWAY IMPACTS

There are areas within South Dakota that can be described as "transportation disadvantaged" due to their lack of rail service. This situation results in two key outcomes: the lack of access to rail and rail-served facilities (e.g., grain elevators) leads to higher transportation costs for producers in the region who must then rely on trucks to get product to market; and, a higher burden on the highway system, both in terms of weighted load and truck vehicle miles traveled, due to the use of truck transportation in lieu of rail. Figure 67 is a picture of a typical truck that transports grain.

Figure 67. Tractor and Twin Grain Trailers at Weigh Scale

Preferential Truck Network Needs

As freight traffic on South Dakota's roads increase, it will put increasing strain on State and County authorities to maintain these roads. Of particular concern to South Dakota is the sufficiency and condition of the Preferential Truck Network (PTN), shown in Figure 68, which was designed to provide connectivity to grain elevators in South Dakota and to the oil and natural gas industry in North Dakota.

Overweight trucks in particular cause increased damage on the system, as well as increased safety hazards for drivers. Each axle passing over the roadway causes compression and bending of the pavement to a certain degree. These forces eventually lead to rutting and cracking. Extensive road tests over the past 50 years have shown that the amount of pavement life consumed by heavy axles greatly exceeds the amount of life consumed by light axles, and as weight increases the damage to pavement increases about four-fold.

South Dakota allows legal weights using a per-axle weight system (defined by the Federal Bridge Formula), but does not limit trucks to 80,000 pounds (the Interstate weight limitation) on non-Interstate highways. To help operators in the State, an on-line legal weight calculator is available for operators to determine the maximum allowable weight for specific truck configurations. Vehicles hauling agricultural products in certain situations are given a 5 or 10 percent tolerance in weight restrictions. The oil and gas industry also utilizes significant amounts of raw materials and heavy machinery which can produce heavy loads.

Maintenance Needs on Preferential Truck Network Providing Connectivity to Grain Elevators

Grain elevators redistribute the wear and tear needs from long-distance highways, such as I-90, to "last-mile" access roadways. Although this Plan does not identify specific road maintenance needs, Table 38 provides estimates of peak month average weekday grain truck traffic generated by grain elevators that can be used in planning for these roadways. A study[98] developed by the Upper Great Plains Transportation Institute was used as a guide. That study classified elevators on the basis of track capacity and noted: shuttle-train elevators typically consign 110-car trains; unit-train elevators consign 50- to 100-car trains; and multicar type grain elevators are typically not designed

[98] Upper Great Plains Transportation Institute, North Dakota State University, Fargo, North Dakota. *Trip Generation Rates for Large Elevators: A North Dakota Case Study,* Final Report, December 2006.

to handle large volumes. While the terms "shuttle" and "unit" train are often interchangeable, they are used distinctly here to clarify the different capacities of the facilities.

The Upper Great Plains Transportation Institute analysis shows that large shuttle-train elevators may generate 35,000 to 40,000 loaded and empty truck trips per year, and a large unit-train elevator may generate 20,000 annual trips. Based on the estimates, shuttle train grain elevators in South Dakota most frequently saw about 64 trucks on an average weekday in a peak month in 2012, whereas unit train grain elevators in South Dakota most frequently saw about 30 trucks on an average weekday in a peak month in 2012. This is likely to go up to about 124 trucks and 44 trucks by 2022, respectively. The truck volumes can fluctuate around the values shown in Table 38. To illustrate shuttle train operation, a case study example of a recently constructed grain facility at Kimball follows.

CASE STUDY: Kimball Facility and Dakota Southern Rehabilitation Projects

Ground-level view of the new Gavilon elevator nearing completion in early November, one week after a ribbon-cutting open house and already receiving grain. Ground-level photos by Ed Zdrojewski.

Gavilon Liberty Grain, LLC opened its first high-speed grain and dry fertilizer shuttle train elevator in South Dakota at Kimball on November 1, 2012.

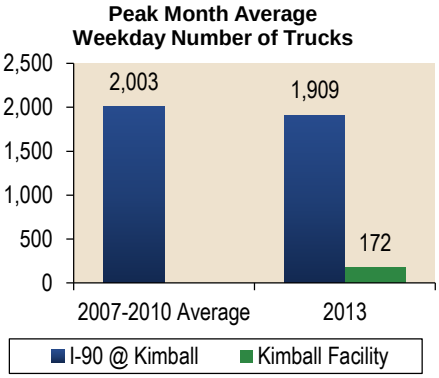
Kimball is located near the intersection of I-90 and State Highway 45 in Brule County, South Dakota. The grain facility handles corn, soybeans, milo and wheat, and has a fertilizer facility distribute urea, monoammonium phosphate, and potash. The greenfield project received Federal and State grants and private investments, and included a 2.2 million bushel, upright concrete grain elevator, a 42,000-ton dry fertilizer facility and a 1.5-mile loop track large enough to accommodate 125 cars.

The Kimball facility cuts 82 miles of truck round trips which were otherwise traveling on I-90. The graph below shows that Kimball's grain and fertilizer facilities are estimated to divert just under 200 trucks from I-90 on an average weekday in the peak harvest month of 2013.

In the peak harvest month, the facility generates at least four grain trains. Transporting grain by rail rather than truck, reducing transportation costs to farmers by 10 to 30 cents per bushel, reducing fuel costs, and improving air quality by reducing emissions per mile of goods moved.

The Kimball facility project was facilitated by a two-year $28 million rehabilitation project on a 61.6-mile state-owned rail line between Mitchell and Chamberlain, which was funded by the South Dakota DOT, the Dakota Southern Railway, and a TIGER grant. The rail rehabilitation project provided the capability to handle unit trains and a track that is of Class II rating (or maximum freight train speed up to 25 miles per hour) to the Kimball facility.

The State and the railroad also would like to rehabilitate the line west of Chamberlain to Presho, restoring rail service to Lyman County and providing the capability to handle unit trains. South Dakota DOT estimated the cost of this new rehabilitation project as $30 million dollars (for a TIGER grant application in 2014). The funds will be used to provide for material, labor, shipping, and installation of track materials for 41.6 miles from Chamberlain to Presho. The new rail rehabilitation project is expected to be completed in two years. This would provide opportunities to build more shuttle facilities; however, the State and the railroad recommend that any new shuttle facility should be built far enough from the existing Kimball facility to maintain the overall system effectiveness. Overall, economic development projects on State-owned rail lines such as this help improve the return of investment to the State.



Source: SDDOT Traffic Counts, Kimball Facility data and Cambridge Systematics analysis.

Figure 68. South Dakota Preferential Truck Network and Railroad Network

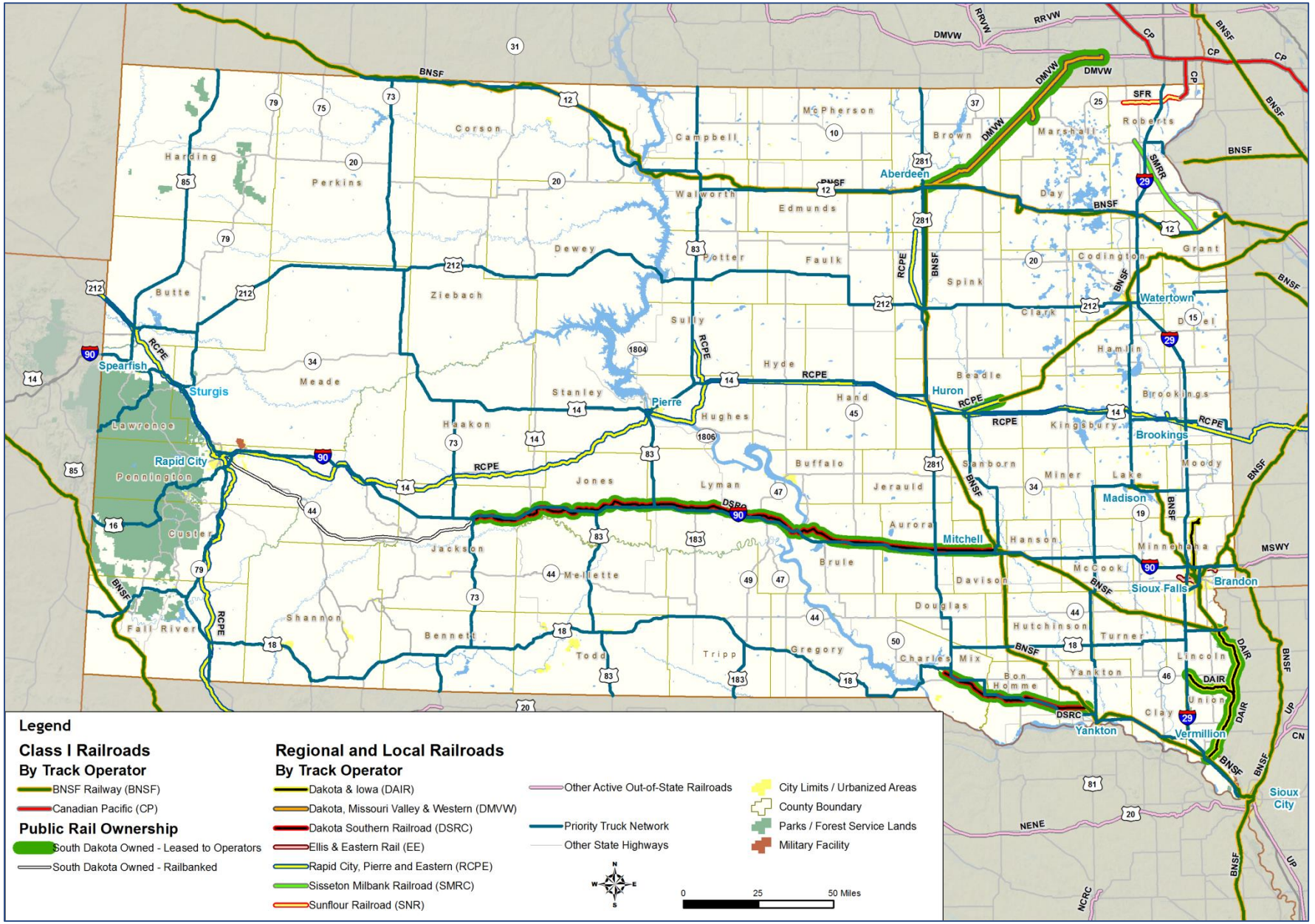


Table 38. Peak Month Average Weekday Grain Truck Volumes at Grain Elevators in South Dakota, Estimated 2012, Projected 2022 and Estimated Maximum (Based on Throughput)

Location	Status	County	Ag District	Region	Source Type	Estimated Storage Capacity In Bushels	Estimated Track Capacity In Cars	Estimated Annual Throughput In Bushels	Estimated 2012 Facility Peak Month Average Weekday Grain Truck Volume	Projected 2022 Facility Peak Month Average Weekday Grain Truck Volume	Estimated Maximum Daily Grain Truck Volume (Throughput Based)
Shuttle Train Type											
Wolsey	Existing	Beadle	Central	Aberdeen	Data	5,200,000	110	16,998,385	77	110	149
Yale	Existing	Beadle	Central	Aberdeen	Estimate	3,640,000	110	14,206,203	64	92	124
Kimball	Existing	Brule	Central	Mitchell	Data	6,200,000	110	18,571,110	84	120	163
Harrold	Existing	Hughes	Central	Pierre	Estimate	3,640,000	110	14,206,203	64	92	124
Highmore	Existing	Hyde	Central	Aberdeen	Estimate	3,640,000	110	14,206,203	64	92	124
Alpena	Existing	Jerauld	Central	Mitchell	Data	3,400,000	110	13,726,988	62	89	120
Onida	Existing	Sully	Central	Pierre	Estimate	3,640,000	110	14,206,203	64	92	124
Onida	Existing	Sully	Central	Pierre	Estimate	3,640,000	110	14,206,203	64	92	124
Volga	Proposed	Brookings	East Central	Aberdeen	Estimate	3,640,000	110	14,206,203	86	124	124
Mitchell	Existing	Davison	East Central	Mitchell	Data	1,685,000	110	9,642,589	59	84	84
Emery	Existing	Hanson	East Central	Mitchell	Data	1,506,000	110	9,112,877	55	80	80
Lake Preston	Proposed	Kingsbury	East Central	Aberdeen	Estimate	3,640,000	110	14,206,203	86	124	124
Madison	Existing	Lake	East Central	Mitchell	Data	4,814,000	110	16,351,422	99	143	143
Corson	Proposed	Minnehaha	East Central	Mitchell	Estimate	3,640,000	110	14,206,203	86	124	124
Grebner	Existing	Brown	North Central	Aberdeen	Data	8,277,000	110	21,476,635	171	188	188
Bowdle (West Bowdle)	Existing	Edmunds	North Central	Aberdeen	Data	2,500,000	110	11,759,617	94	103	103
Craven	Existing	Edmunds	North Central	Aberdeen	Data	2,485,000	110	11,724,067	93	103	103
Roscoe (SDWGA)	Existing	Edmunds	North Central	Aberdeen	Estimate	3,640,000	110	14,206,203	113	124	124
Hitchcock-Tulare	Existing	Spink	North Central	Aberdeen	Estimate	3,640,000	110	14,206,203	113	124	124
Mellette	Existing	Spink	North Central	Aberdeen	Data	5,400,000	112	17,324,213	138	152	152
Selby	Existing	Walworth	North Central	Pierre	Data	860,000	110	6,874,488	55	60	60
Andover	Existing	Day	Northeast	Aberdeen	Estimate	3,640,000	110	14,206,203	117	124	124
West Milbank	Existing	Grant	Northeast	Aberdeen	Data	2,096,000	110	10,761,734	88	94	94

Location	Status	County	Ag District	Region	Source Type	Estimated Storage Capacity In Bushels	Estimated Track Capacity In Cars	Estimated Annual Throughput In Bushels	Estimated 2012 Facility Peak Month Average Weekday Grain Truck Volume	Projected 2022 Facility Peak Month Average Weekday Grain Truck Volume	Estimated Maximum Daily Grain Truck Volume (Throughput Based)
Shuttle Train Type (continued)											
Britton	Proposed	Marshall	Northeast	Aberdeen	Estimate	3,640,000	110	14,206,203	117	124	124
Lemmon	Existing	Adams	Northwest	Rapid City	Data	776,000	110	6,528,059	57	57	57
McLaughlin	Existing	Corson	Northwest	Pierre	Data	1,000,000	110	7,416,407	65	65	65
Beardsley	Existing	Hutchinson	Southeast	Mitchell	Data	1,200,000	110	8,128,845	26	38	71
Canton	Existing	Lincoln	Southeast	Mitchell	Data	5,100,000	216	16,833,135	53	80	147
Marion	Existing	Turner	Southeast	Mitchell	Data	8,500,000	180	21,765,813	68	103	190
Parker	Existing	Turner	Southeast	Mitchell	Data	890,000	110	6,994,105	22	33	61
Beresford	Existing	Union	Southeast	Mitchell	Data	6,803,000	120	19,458,834	61	92	170
Jefferson	Existing	Union	Southeast	Mitchell	Data	4,100,000	110	15,082,695	47	71	132
Napa Junction	Proposed	Yankton	Southeast	Mitchell	Estimate	3,640,000	110	14,206,203	45	67	124
Fort Pierre	Existing	Stanley	West Central	Pierre	Estimate	3,640,000	110	14,206,203	91	107	124
Unit Train Type											
Huron	Existing	Beadle	Central	Aberdeen	Data	3,600,000	54	6,414,363	29	41	56
Chamberlain	Existing	Brule	Central	Mitchell	Estimate	2,200,000	54	5,006,713	23	32	44
Harrold	Existing	Hughes	Central	Pierre	Estimate	2,200,000	54	5,006,713	23	32	44
Pierre	Existing	Hughes	Central	Pierre	Estimate	2,200,000	75	5,006,713	23	32	44
Bancroft	Existing	Kingsbury	East Central	Aberdeen	Estimate	2,200,000	54	5,006,713	30	44	44
Lake Preston	Existing	Kingsbury	East Central	Aberdeen	Estimate	2,200,000	54	5,006,713	30	44	44
Wentworth	Existing	Lake	East Central	Mitchell	Estimate	2,200,000	54	5,006,713	30	44	44
Corson	Existing	Minnehaha	East Central	Mitchell	Estimate	2,200,000	54	5,006,713	30	44	44
Aberdeen	Existing	Brown	North Central	Aberdeen	Data	2,200,000	60	5,006,713	40	44	44
Claremont	Existing	Brown	North Central	Aberdeen	Estimate	2,200,000	54	5,006,713	40	44	44
Bowdle (Downtown)	Existing	Edmunds	North Central	Aberdeen	Data	1,124,000	54	3,571,275	28	31	31
Sun Terminal	Existing	Edmunds	North Central	Aberdeen	Data	2,100,000	54	4,890,898	39	43	43
Northfield	Existing	Spink	North Central	Aberdeen	Estimate	2,200,000	75	5,006,713	40	44	44

Location	Status	County	Ag District	Region	Source Type	Estimated Storage Capacity In Bushels	Estimated Track Capacity In Cars	Estimated Annual Throughput In Bushels	Estimated 2012 Facility Peak Month Average Weekday Grain Truck Volume	Projected 2022 Facility Peak Month Average Weekday Grain Truck Volume	Estimated Maximum Daily Grain Truck Volume (Throughput Based)
Unit Train Type (continued)											
Redfield	Existing	Spink	North Central	Aberdeen	Data	3,000,000	54	5,852,187	47	51	51
Vienna	Existing	Clark	Northeast	Aberdeen	Data	2,059,000	62	4,842,623	40	42	42
Willow Lake	Existing	Clark	Northeast	Aberdeen	Data	865,000	54	3,130,378	26	27	27
Grover	Existing	Codington	Northeast	Aberdeen	Estimate	2,200,000	54	5,006,713	41	44	44
Watertown	Existing	Codington	Northeast	Aberdeen	Data	1,002,000	54	3,370,698	28	30	30
Watertown	Existing	Codington	Northeast	Aberdeen	Data	4,125,000	54	6,869,054	56	60	60
Bristol	Existing	Day	Northeast	Aberdeen	Data	3,629,000	54	6,440,306	53	56	56
Britton	Proposed	Marshall	Northeast	Aberdeen	Estimate	2,200,000		5,006,713	41	44	44
Rosholt	Existing	Roberts	Northeast	Aberdeen	Estimate	2,200,000	100	5,006,713	41	44	44
Sisseton	Existing	Roberts	Northeast	Aberdeen	Estimate	2,200,000	54	5,006,713	41	44	44
Murdo	Existing	Jones	South Central	Pierre	Estimate	2,200,000	54	5,006,713	44	44	44
Kennebec	Existing	Lyman	South Central	Pierre	Estimate	2,200,000	54	5,006,713	44	44	44
Presho	Existing	Lyman	South Central	Pierre	Estimate	2,200,000	54	5,006,713	44	44	44
Howard	Existing	Sioux	Southeast	Mitchell	Estimate	2,200,000	54	5,006,713	16	24	44
Vermillion	Existing	Clay	Southeast	Mitchell	Data	1,380,000	54	3,959,634	12	19	35
Yankton	Existing	Yankton	Southeast	Mitchell	Data	1,230,000	70	3,736,919	12	18	33

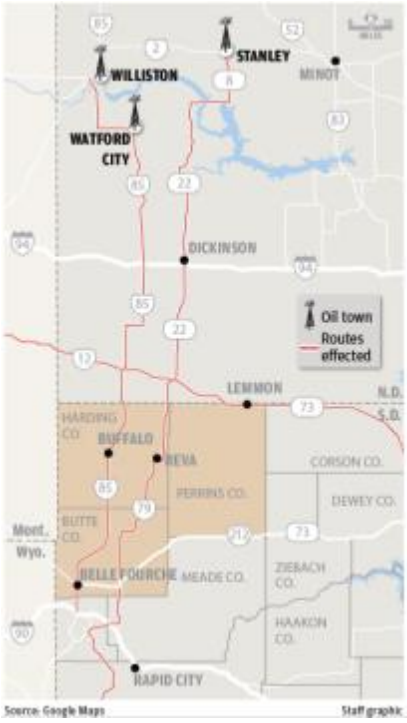
Source: *USDA, Economic Research Service, USDA Agricultural Projections to 2023; Upper Great Plains Transportation Institute, North Dakota State University, Fargo, North Dakota. Trip Generation Rates for Large Elevators: A North Dakota Case Study, Final Report, December 2006; BNSF Grain Terminals Data for South Dakota available at: http://www.bnsf.com/customers/grain-facilities/elevators/menu/sdlist.html (last accessed on April 9, 2014); Cambridge Systematics analysis.*

Note: *The agricultural grain by rail demand (by district) was distributed among facilities in the agricultural district in the proportion of their throughput. Using a 50/50 split of bushels among single unit trucks and single – trailer trucks with 600 bushels per truck and 900 bushels per trucks, the demand in bushels was converted to trucks. To estimate average weekday truck volumes, a peak month factor of 15 percent was applied on annual demand in bushels, a weekday peak factor of 1.15 was used to adjust the daily demand. Lastly, an empty return factor of 2 was used to estimate the average weekday grain truck volumes at the facility.*

Maintenance Needs on Preferential Truck Network Providing Connectivity to Oil and Natural Gas Industry in North Dakota

U.S. 85 (CanAm Highway) is a north-south two-lane highway facility in western South Dakota, shown in Figure 69, which is part of the Preferential Truck Network. This corridor provides connectivity to North Dakota's oil and natural gas industry, and as such is utilized by South Dakota businesses supporting these industries. According to the Department of Environment and Natural Resources in South Dakota,[99] ongoing oil exploration and development has resulted in increases in truck traffic on some parts of U.S. 85 of approximately 50 percent over the five years of 2007-2012, and the overall traffic volumes increased by close to the same amount. Projections indicate that the heaviest traffic volumes on U.S. 85 could double to nearly 3,000 ADT. However, even at these levels, the traffic would not exceed capacity of the existing State highway system, and there is room for increased capacity. Therefore, increased road maintenance is the main need for this highway.

Figure 69. U.S. 85 in South Dakota Location Map



Source: Rapid City Journal Article, North Dakota oil traffic impacts northwestern South Dakota, by Holly Meyer, dated July 22, 2012.

NEED TO IMPROVE RAILROAD SAFETY, SECURITY AND RESILIENCY

Ensuring the safety, security and resiliency of South Dakota's railroads goes hand in hand with the goal of supporting economic growth and development. The State has the opportunity to improve railroad operations by developing and implementing rail safety measures, conducting rail safety public awareness programs, improving highway-rail grade-crossing safety, assessing the system for external vulnerabilities, and protecting the security of rail technology, assets, and people.

[99] https://denr.sd.gov/des/og/documents/OilGasWorkGroupSummary2012.pdf.

Crude-by-Rail Safety

Moving crude by rail presents mixed safety benefits versus pipeline movements. The AAR reports that the "spill rate" for oil moving by train is about one-third as high as that for oil moving by pipeline; however, several recent disasters have occurred on BNSF rail in North Dakota,[100] Genesee and Wyoming in Alabama[101] and Montreal, Maine, and Atlantic Railway, Inc. in Lac-Mégantic, Quebec.[102] Safe movements of petroleum products via rail is an ongoing and challenging issue. The U.S. President's 2014 budget proposal includes $40 million to be spent over two years to support multimodal prevention and response efforts designed to improve the safe transportation of energy products.

In the U.S., Federal regulations pertaining to tank cars are set by the U.S. DOTs Pipeline and Hazardous Materials Safety Administration (PHMSA). In November 2013, Freight railroads urged PHMSA to increase Federal tank car safety by requiring all tank cars used to transport certain types of hazardous materials, including crude oil, be built to a higher standard and all existing cars be retrofitted or phased out. PHMSA and the FRA also have worked to increase the accuracy in classifying oil products, in order to ensure that appropriate actions are taken to prevent accidents. In 2013, tests of oil from the Bakken region, PHMSA found that 11 of 18 samples were not properly categorized, leading to the U.S. DOT issuing an Emergency Order increasing the requirements for shippers to test and ensure proper packing of crude oil products from the Bakken region.[103]

At-Grade Crossing Safety

Highway-rail at-grade crossing incidents take place at highway-rail at-grade crossings, and involve an auto or pedestrian and a train. From 2008 to 2012, almost 33 percent of rail incidents in the State took place at highway-rail at-grade crossings. A majority of the highway-rail at-grade crossing incidents in the State (61 out of 63) occurred at public at-grade crossings, resulting in seven fatalities and 27 injuries. The location of these incidents is shown in Figure 70, with the highest number in eastern South Dakota around Brookings and Sioux Falls. To increase awareness and safety around at-grade crossings, the Federal Train Horn Rule was implemented, requiring locomotive engineers to begin to sound train horns at least 15 seconds, and no more than 20 seconds, in advance of all public at-grade crossings.

In addition to safety concerns, residents living near rail yards tend to be sensitive about trains blocking roads at at-grade crossings, in addition to the environmental noise or light pollution concerns, as well as raise issues of environmental and air pollution.

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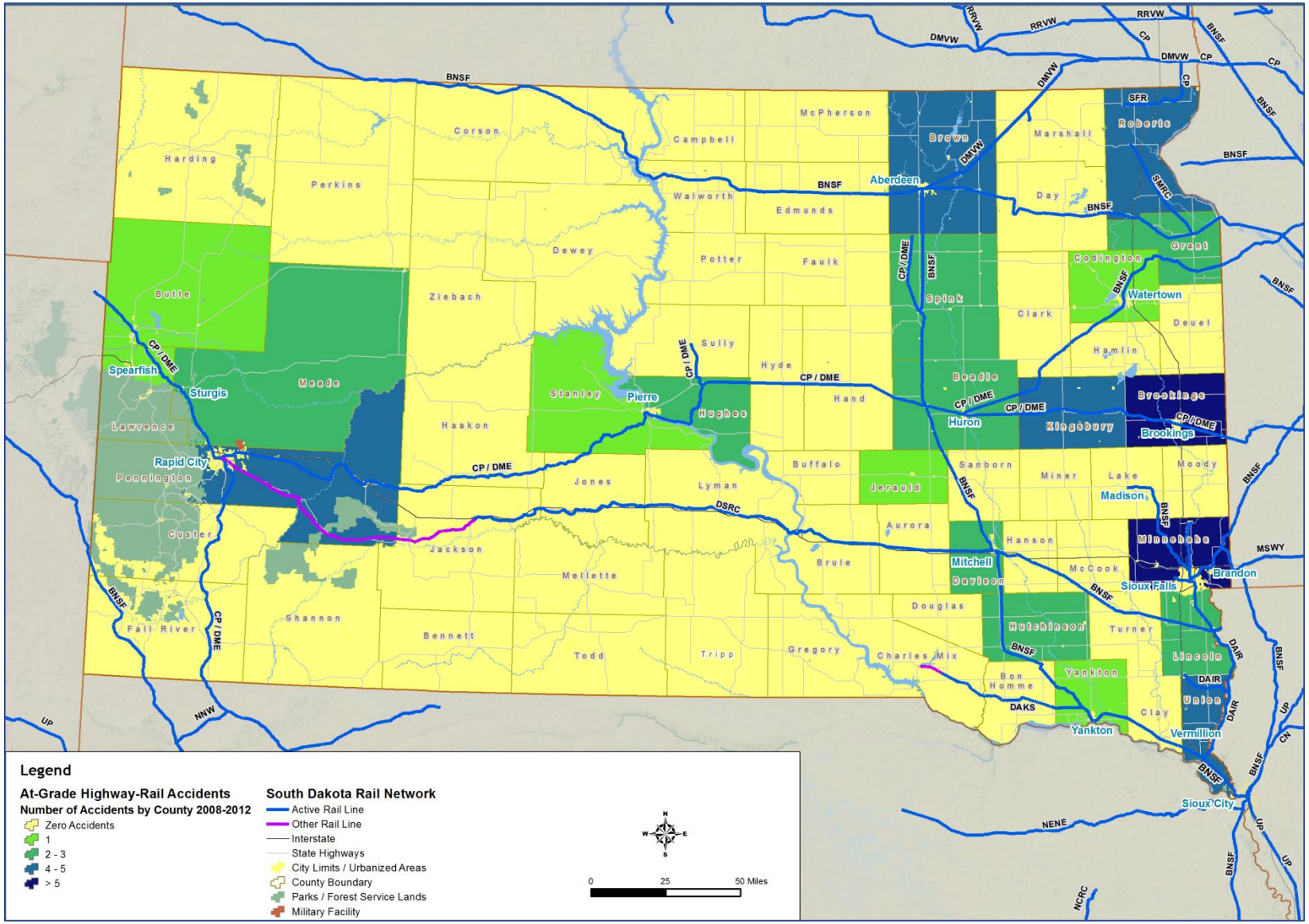
[100] Silva, Daniella. "Mile-long train carrying crude oil derails, explodes in North Dakota." *U.S. News on NBC News.com*, December 30, 2013. http://usnews.nbcnews.com/_news/2013/12/30/22113442-mile-long-train-carrying-crude-oil-derails-explodes-in-north-dakota?lite.

[101] Karlamangla, Soumya. "Train carrying crude oil explodes, spills oil into Alabama wetlands." *Los Angeles Times,* November 8, 2013. http://articles.latimes.com/2013/nov/08/nation/la-na-nn-alabama-train-explosion-20131108.

[102] Dawson, Chester. "Deadly Train Derailment Fuels Crude-by-Rail Concerns," *The Wall Street Journal,* July 8, 2013. http://online.wsj.com/news/articles/SB10001424127887324867904578591932401897430.

[103] http://article.wn.com/view/2014/02/26/DOT_Issues_Emergency_Order_Requiring_Stricter_Standards_to_T/.

Figure 70. South Dakota Highway-Rail At-Grade Crossing Incidents by County, 2008-2012



Source: FRA Office of Railroad Safety Database; South Dakota GIS Database.

Extreme Weather and Climate

Severe weather events and shifting climates can have significant impacts on transportation infrastructure and operations. Increasing severe weather events nationally have led to the U.S. DOT promoting adaptation strategies as part of agency planning in order to ensure that resources are invested wisely and that services and operations remain effective.[104] In addition to normal deterioration, transportation infrastructure is subject to a range of environmental risks over long time spans. The National Resources Defense Council has noted states' exposure to various extreme weather events, displayed for South Dakota in Figure 71. South Dakota has a history of severe weather events, including drought and wildfire, and the opposite extreme of flooding and severe storms. The transportation infrastructure in South Dakota, along with other states, remains vulnerable to shifts in weather patterns and extreme events. Examples of effects that extreme weather can have on transportation infrastructure include:

- More frequent/severe flooding of low-lying infrastructure and reduced access to docks or waterway infrastructure;
- Higher maintenance/construction costs for roads and bridges, and increased thermal expansion of bridge joints and paved surfaces, potentially causing degradation, due to higher temperatures;
- Asphalt degradation and shorter replacement cycles, leading to limited access, congestion, or higher costs;
- Increased risk of vehicle crashes due to decreased driver/operator performance or improperly maintained vehicles, due to severe weather;
- System downtime, derailments, and slower travel time due to rail buckling; and
- Air traffic disruptions due to severe weather and precipitation.

As example, in summer 2014, heavy rains caused severe flooding of the D&I Railroad. At the peak of the flood, railroad officials said about 12 miles of track and four bridges were underwater, and two other bridges are damaged, along the Big Sioux River, where floodwaters reached 2 to 3 feet above previous record levels.[105] As a result of this, the rail line has been shut down and is expected to be out of service for months, leaving shippers on the line to use truck transportation in lieu of rail.

Due to its large agriculture economy, South Dakota also is highly sensitive to variation in temperature and precipitation from year to year, and several governmental programs have been developed to prepare for and mitigate the effects of extreme weather on the State. The South Dakota Drought Task Force[106] was created in 2012 to create a formal group to closely monitor weather, precipitation and fire danger. Previously, the South Dakota Division of Wildland Fire Suppression (WFS) was created within the Department of Agriculture in 2001 to protect State and

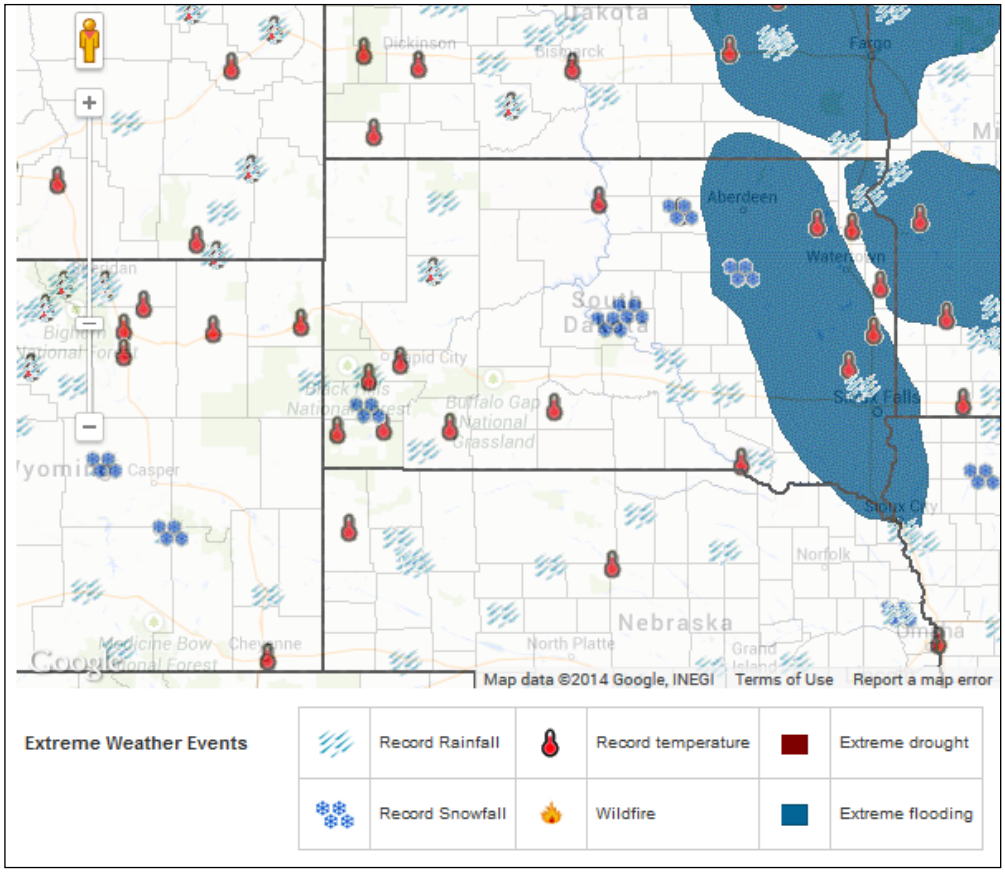
[104] U.S. DOT, 2013. *FY 2012-2013 DOT Climate Adaptation Plan.* http://www.dot.gov/mission/sustainability/2012-dot-climate-adaptation-plan.

[105] http://www.mitchellrepublic.com/content/flood-knocks-di-railroad-out-service.

[106] http://drought.sd.gov/.

private lands within the Black Hills Forest Fire Protection District and other forested areas throughout the State.[107]

Figure 71. South Dakota Exposure to Extreme Weather Events



Source: Natural Resources Defense Council, 2014.

SOUTH DAKOTA RAIL PLAN SUPPORTING STAKEHOLDER OUTREACH

As part of the South Dakota Rail Plan, stakeholder outreach was undertaken to better understand the needs and issues of the South Dakota rail system. Over 30 potential stakeholders were identified by the project team. Eleven interviews have been conducted. The majority of these interviews were conducted on the phone in spring 2014.

PARTICIPATING STAKEHOLDERS

In order to receive an array of information from all users of South Dakota's rail system, stakeholder categories were created and stakeholders targeted for interviews were selected in order to represent a diversified group who can report on all aspects of the rail system, including the

[107] http://sdda.sd.gov/divisions/#wildfireSuppression

owners, operators, users, and business advocates. The stakeholder categories and interviewees are summarized in Table 39 and Table 40.

Table 39. Key Stakeholder Interview Categories

Type of Business/Agency	Industry Sector	Modal Diversity
Class I Railroads	Transportation	Rail
Shortline Railroads	Transportation	Rail
Shippers	Shipping	Rail/Truck
Economic Development	Economic Development	

Table 40. Summary of Stakeholders Interviewed

	Stakeholder Affiliation	Type of Business/Agency	Primary Markets
1	BNSF	Class I Railroad	Pacific Northwest
2	Planning and Development District III	Economic Development	District III
3	Dakota and Iowa Railroad	Shortline Railroad	Ethanol going out to East and West Coast
4	Dakota Southern	Shortline Railroad	Mainly agriculture
5	Sisseton Milbank Railroad	Shortline Railroad	Local and regional grain, inbound plastics
6	South Dakota Corn Growers Association	Economic Development	Statewide
7	Dakota Plains	Shipper	Pacific Northwest
8	GCC	Shipper	Mostly local trucking with some rail service to Minnesota
9	Genesee & Wyoming	Shortline Railroad	Western and Central South Dakota
10	South Dakota Soybean Processors	Shipper	Canada and Pacific Northwest
11	Belle Fourche Development Corporation	Economic Development	Belle Fourche

INPUT FROM STAKEHOLDERS

Stakeholder interview guides were developed separately for each of the different stakeholder business and industry types. Interview questions categories included:

- **Economic Development:** How does the State's rail system impact economic development opportunities?

- **Infrastructure and Operations:** What key markets are served and how well can they be served by the railroads?
- **Institutional:** How adequate are rail connections for users and what expectations are there of involved parties, particularly for regulatory and funding concerns?

Stakeholder perspectives gleaned during the interviews are summarized below.

South Dakota Advantages

South Dakota is seen as a welcoming environment for doing business. With lighter regulations than surrounding states, a better tax structure, and adequate land for development, South Dakota has much room for growth. While rail access may not be as vast as other states, South Dakota has undertaken a large effort to maintain its system for its users. Having the State involved in the rail system helps to ensure that appropriate attention is given to this mode to maintain safe operating conditions and aid in funding needs. By owning rail assets, the State more fully understands and appreciates the economics, needs, and challenges of operating railroads.

Labor Supply

Across the board, the availability of skilled labor has arisen as a pressing issue. Shippers have had problems getting adequate truck service due to driver availability. This highlights the need for an efficient rail service throughout the State. Being able to serve companies better via rail would help to alleviate the driver shortage. However, the railroads also face labor issues. While the railroads tend to have low turnover, getting the right employee, with the right skills, and at the right time is difficult. As each of the railroads work to expand, they are competing for the same candidates and many of the shortline railroads cannot compete with Class I wages.

Growth

South Dakota's primary industry, particularly in relation to the railroads, is agriculture. Specifically, corn production has grown significantly due to the development of the ethanol industry. That growth will likely slow in the near future, but export of corn to international markets will continue to see corn soar. This commodity, along with others, is expected to grow in the future but without competitive rail services, the cost of transporting such goods significantly increases. Without an efficient method of moving this product, South Dakota growers cannot compete in the broader market. Growth in this commodity and other economic development initiatives, such as the planned industrial park in Belle Fourche, must be addressed by the railroads in order to ensure that adequate service is provided both within the State and to other regions to help position South Dakota for further growth. Adequate service will require investment in the infrastructure and extra rail cars in order to move all of the product in a competitive manner.

Funding/Line Upgrades

Due to the infrastructure requirements, owning and maintaining railroads is an expensive endeavor. For the most part, the railroad system of South Dakota is well maintained. As with any system, there are still some areas of improvement, such as rail and ties, but no major pressing issues have been identified. In order to improve existing problems, there are adequate funds to tap into, however, one must demonstrate adequate business in order to obtain loans. Opportunities such as the TIGER grant program are great but they are difficult for railroads in rural areas to obtain. Currently such grants lean towards municipal areas and larger cities. One example of a more ideal program is the shortline tax credit which helps the shortline railroads expand their business.

6

6 – Identify Potential Investment Opportunities

Preface

As part of State Rail Plan development, potential physical investment needs on the rail system in South Dakota were identified. These needs were generated by a variety of means, including by stakeholders during regional stakeholder roundtables and one-on-one interviews, by experts familiar with the rail system at South Dakota DOT and on the Project Team, and through data analysis undertaken as part of the Plan. In total, 27 physical infrastructure project needs were identified, and are described in this chapter.

It is not surprising the State system has a significant number of needs, as South Dakota's historic role has been to acquire at-risk rail assets as a means of preserving rail service and/or corridors for future use. Over one third of the projects identified in this chapter are on the State-owned rail system in South Dakota. As the majority of the State's system is in active service, the identified projects could provide immediate benefits to rail operators and their customers in most cases. In two additional locations, projects have been identified that could signal a return to service for inactive rail segments, spur economic development opportunities, and attract business back to the line.

Photo this page: BNSF train heading south at Wolsey, South Dakota

POTENTIAL INVESTMENT OPPORTUNITIES

As part of State Rail Plan development, potential physical investment needs on the rail system in South Dakota were identified through a variety of means. Ideas were generated by stakeholders during regional stakeholder roundtables and one-on-one interviews, by experts familiar with the rail system at South Dakota DOT and on the Project Team, and through data analysis undertaken as part of the Plan. Ideas generated through these processes were reviewed and refined by the Rail Plan Advisory Committee to develop this list of potential rail investment projects. Cost estimates (in 2014 dollars) for these projects were developed by Civil Design Inc., based on best rail unit cost-estimating practices.

PROJECTS OVERVIEW

In total, 27 physical infrastructure project needs were identified during State Rail Plan development. These projects have been placed in five categories:

- **Efficiency/Chokepoint.** These projects identify areas where system efficiencies are lacking due to a physical system bottleneck or other capacity constraint. Types of projects in this category are new sidings and interchanges.
- **Bridge Capacity.** These projects are focused on bridge replacement and rehabilitation. There are numerous aged bridges in the State and many are not 286,000 pound compliant.
- **Track Condition.** These projects are focused on rail line condition and include projects that upgrade lightweight rail to heavy rail (110 pounds, or greater), replace mismatched jointed rail segments, and refresh ballast and ties. Track condition projects also include upgrade of sod railroads that exist from years out of service and general neglect.
- **Safety.** These projects are focused on at-grade crossing safety. While only one project is identified specifically as a safety project in the projects list, there are safety components noted in several of the other projects.
- **Industrial Park Development.** These projects highlight areas where rail transfer facilities should be considered to bolster local economic development activities.

The full list of potential infrastructure projects is summarized in Table 41 and shown in Table 42. Additional detail on each is provided in Project Details. These projects are not listed in priority order.

Of the infrastructure projects identified, 36 percent of the projects (by 2014 project cost) are on the South Dakota-owned rail system, as shown, by rail line, in Table 42. It is not surprising the State system has a significant number of needs, as South Dakota's historic role has been to acquire at-risk rail assets as a means of preserving rail service and/or corridors for future use.

Today the majority of the State's system is in active service, and the identified projects could provide immediate benefits to rail operators and their customers. However, in two locations projects have been identified that could signal a return to service for inactive rail segments, spur economic development opportunities, and attract business back to the line. These opportunities to reintroduce service are briefly described below and will be further developed in subsequent tasks.

Inactive – MRC Line West of Chamberlain

This currently inactive line, leased for operation to Dakota Southern, lies just west of the MRC-Mitchell to Chamberlain rail segment that was recently rehabilitated and reintroduced into service. The line is in an area of the State that is described as "transportation disadvantaged" due to lack of rail service. The inactive portion of the line is in poor condition and due to this investors have been reluctant to build new elevators or improve grain handling facilities, although investments could lead to economic growth in the region by providing reduced-cost transportation. While there is significant agricultural land adjacent to the line, it is not in full production due to the high costs associated with transporting agricultural commodities long distances by truck.

Inactive – Napa-Platte Line

This line is leased for operation to Dakota Southern from Napa Junction to Ravinia, but is substantially inactive aside for the first 8 miles, or so. Originally a 60-mile line linking BNSF's Aberdeen Subdivision to a string of farming communities northeast of the Missouri River, a series of official and unofficial abandonments have left behind a smaller rail line which most recently has been used for rail car storage. The portion of the line from Ravinia to Platte is railbanked.

Table 41. Potential Investment Opportunities List

Map ID	Project Name	Estimated Cost	Rail Operator	State-Owned
Efficiency/Chokepoint Projects				
1	Wolsey Interchange	$1,750,000	Rapid City, Pierre, and Eastern (former CP/ DM&E)	●
2	Napa-Platte Interchange	$1,750,000	Dakota Southern Railway	●
3	MRC Passing Siding	$1,750,000	Dakota Southern Railway	●
4	MRC – Reconstruct Wye in Chamberlain	$650,000	Dakota Southern Railway	●
5	Sioux Valley Subdivision Meet and Pass Siding	$1,750,000	Dakota and Iowa Railway	●
6	Sioux City Interchange	$3,500,000	Multiple Railroads	
7	MRC Northbound BNSF Connection	$8,200,000	Dakota Southern Railway	●
8	RCP&E Yard near Huron	$16,000,000	Rapid City, Pierre, and Eastern	
9	RCP&E Siding near Huron	$3,500,000	Rapid City, Pierre, and Eastern	
10	RCP&E Siding near Aurora	$3,500,000	Rapid City, Pierre, and Eastern	
11	Mankato, MN Wye	$2,000,000	Rapid City, Pierre, and Eastern	
Bridge Capacity Projects				
12	Napa to Platte Mainline Bridge Repair/Replacement	$2,500,000	Dakota Southern Railway	●
13	Huron to Yale Line Bridge Upgrade	$2,000,000	Rapid City, Pierre, and Eastern	●
14	Sioux Valley Subdivision Bridge Upgrade	$40,000,000	Dakota and Iowa Railroad	●
Track Condition Projects				
15	Britton Line Rail Upgrade	$32,000,000	Dakota, Missouri Valley and Western Railroad	●
16	MRC West of Chamberlain – Phase 2	$30,000,000	Dakota Southern Railway	●
17	Sioux Valley Subdivision Slide Repair	$3,500,000	Dakota and Iowa Railroad	●
18	Sisseton to Milbank Railroad Reconstruction	$23,000,000	Sisseton Milbank Railroad	

Map ID	Project Name	Estimated Cost	Rail Operator	State-Owned
19	Napa to Platte Mainline Reconstruction	$25,000,000	Dakota Southern Railway	●
20	Redfield to Mansfield Line Upgrade	$14,500,000	Rapid City, Pierre, and Eastern	
21	Huron to Yale Line Upgrade	$6,000,000	Rapid City, Pierre, and Eastern	●
22	Sioux Valley Subdivision Rail Upgrade	$6,000,000	Dakota and Iowa Railroad	●
23	Pierre to Rapid City Track Upgrade	$105,000,000	Rapid City, Pierre, and Eastern	
24	Rapid City to Dakota Junction Track Upgrade	$40,000,000	Rapid City, Pierre, and Eastern	
Safety Projects				
25	Brookings 22nd Avenue Grade Crossing	$500,000	Rapid City, Pierre, and Eastern	
Industrial Park Development Projects				
26	Intermodal Yard at Sherman	$75,000,000	BNSF	
27	Belle Fourche Transloading Facility	$6,000,000	Rapid City, Pierre, and Eastern	
	Total South Dakota Rail System Needs	**$455,350,000**		

Figure 72. Location of Potential Rail Infrastructure Investment Opportunities

Table 42. State-Owned Rail System Needs

Railroad Operator	Rail Line	Project Name	Project Type	Map ID	Estimated Cost
Rapid City, Pierre, and Eastern (former CP/DM&E)	Huron to Yale Line	Huron to Yale Line Bridge Upgrade	Bridge Capacity	13	$2,000,000
		Huron to Yale Line Upgrade	Track Condition	21	$6,000,000
			Rail Line Subtotal		*$8,000,000*
Rapid City, Pierre, and Eastern	Wolsey Interchange	Wolsey Interchange	Efficiency/Chokepoint	1	$1,750,000
			Rail Line Subtotal		*$1,750,000*
Dakota, Missouri Valley, and Western Railroad	Britton Line	Britton Line Rail Upgrade	Track Condition	15	$32,000,000
			Rail Line Subtotal		*$32,000,000*
Dakota and Iowa Railroad	Sioux Valley Subdivision	Sioux Valley Subdivision Meet and Pass Siding	Efficiency/Chokepoint	5	$1,750,000
		Sioux Valley Subdivision Bridge Upgrade	Bridge Capacity	14	$40,000,000
		Sioux Valley Subdivision Slide Repair	Track Condition	17	$3,500,000
		Sioux Valley Subdivision Rail Upgrade	Track Condition	22	$6,000,000
			Rail Line Subtotal		*$51,250,000*
Dakota and Iowa Railroad	Sioux Valley Subdivision – Hawarden Branch	N/A			
Dakota Southern Railway	Mitchell to Rapid City Line (in partial service)	MRC Passing Siding	Efficiency/Chokepoint	3	$1,750,000
		MRC – Reconstruct Wye in Chamberlain	Efficiency/Chokepoint	4	$650,000
		MRC Northbound BNSF Connection	Efficiency/Chokepoint	7	$8,200,000
		MRC West of Chamberlain – Phase 2	Track Condition	16	$30,000,000
			Rail Line Subtotal		*$40,600,000*
Dakota Southern Railway	Napa to Platte Line (not in active service)	Napa-Platte Interchange	Efficiency/Chokepoint	2	$1,750,000
		Napa to Platte Mainline Bridge Repair/ Replacement	Bridge Capacity	12	$2,500,000
		Napa to Platte Mainline Reconstruction	Track Condition	19	$25,000,000
			Rail Line Subtotal		*$29,250,000*
		Total State-Owned Rail System Needs			**$162,850,000**

PROJECT DETAILS

The projects noted in Table 41 and Figure 72 are described in more detail in the following narrative. Projects are grouped by category and are listed in numerical order for reference purposes; this order does not indicate project priority.

EFFICIENCY/CHOKEPOINT PROJECTS

1. Wolsey Interchange

Provide one additional 8,000-foot siding to the existing interchange tracks. The current siding was constructed for the interchange of trains and rail cars and is located at the intersection of the BNSF and Rapid City, Pierre, and Eastern (RCP&E, former CP/DM&E) Railroads just west of Wolsey, South Dakota. The current interchange consists of two 8,000-foot tracks with access to both railroads in all four directions. The interchange is dispatched by the RCP&E and is owned by the State of South Dakota. This interchange track is used for interchange of cars between the two railroads and also provides for the interchange of unit trains between the BNSF and the RCP&E. Many times, there is not adequate trackage for the manifest car interchange and unit train interchange. One additional track will allow easier access for interchange between the two railroads.

The estimated cost of this siding is $1.75 million.

2. Napa-Platte Interchange

Provide one 8,000-foot siding for interchange of BNSF traffic with the Napa to Platte Railroad.

The estimated cost of this work is $1.75 million.

3. MRC Passing Siding

Construct one 8,000-foot meet and pass siding on the MRC Railroad. The exact location for this siding has not been determined, but could be either east or west of the Missouri River. With increasing traffic on the MRC due to improvements and development along the line, there will be a need for at least one location where a full train moving in each direction, will be able to meet or pass. Trains are becoming increasingly long and 8,000 feet is considered the minimum length needed for a siding. The exact location will be determined based on location of crossings, bridges, available right-of-way, and rail grade.

The estimated cost of this work is $1.75 million.

4. MRC – Reconstruct Wye in Chamberlain

Reconstruct the wye track just east of Chamberlain. The wye track is very useful in turning locomotives and maintenance of way equipment on a line that is a dead end on both ends. The current wye track is very light rail and has very poor tie conditions. The track bed is sod which makes it impossible to maintain line and grade. Reconstruction would require three new turnouts and about 1,500 track feet of new track construction, including ballast.

The estimated cost for this work is $650,000.

5. Sioux Valley Subdivision Meet and Pass Siding

Install one 8,000-foot meet and pass siding near Beloit, Iowa. The D&I Railroad operates the Sioux Valley Subdivision which is owned by the State of South Dakota. With increasing traffic on this subdivision, the need to be able to meet and pass trains is necessary for efficiency of the line and train operations.

The estimated cost of this work is $1.75 million.

6. Sioux City Interchange

Reconfigure the Sioux City Interchange to reduce movements required for rail car exchange. There is an interchange point in Sioux City, Iowa where four railroads meet and interchange rail cars. Within this area, there are five diamonds and three bridges making it difficult to exchange rail cars between railroads. There is one business that is located in the northwest corner of this interchange that could be removed, leading to a feasible way for the BNSF and the D&I to interchange traffic with the CN and UP. If this land were procured, a connection could be provided from the west that would lead into the yard at the north end. Construction of additional track and switches would be required along with demolition of the business in the northwest corner. This improvement would provide for a much more efficient exchange of rail cars between railroads.

The estimated cost of this work is $3.5 million.

7. MRC Northbound BNSF Connection

Construct a northbound connection from the MRC to the BNSF west of Mitchell, South Dakota. The MRC connection to the BNSF currently is through the yard in Mitchell. Long 110-plus-car trains, such as those traveling to and from the large grain elevator in Kimball, are required back the train beyond the northbound switch in the yard, blocking road crossings in order to proceed northbound to Aberdeen. A northbound connection from the MRC, originating just east of 407th Avenue and connecting just south of Wets 23rd Avenue would provide a direct route for northbound commodities and empty trains southbound. This connection would require construction of approximately 1.75 miles of new track and two switches, along with the acquisition of about 20 acres right-of-way and two new road crossings.

The estimated cost of this work is $8.2 million.

8. RCP&E Yard near Huron

Construct a 300 to 400 car yard at a greenfield site immediately west of Huron. This yard would eliminate the issues related to road crossings in town. Estimate cost of this work is $16 million.

The estimated cost of this work is $16 million.

9. RCP&E Siding Near Huron

Construct an 8000-foot siding at a greenfield site west of Huron for meet and pass and construction of longer trains from the proposed yard. This siding will alleviate issues associated with blocked crossings in Huron.

The estimated cost of this work is $3.5 million.

10. RCP&E Siding Near Aurora

Construct an 8000-foot siding near Aurora. This siding is required to pass trains in and around an area of heavy traffic due to Valero Renewables. There are also plans for another industry to be located near Valero that will increase the need for a meet and pass track. Estimated cost of this work is $3.5 million.

The estimated cost of this work is $3.5 million.

11. Mankato, MN Wye

Construct additional trackage at the wye interchange between the Canadian Pacific and the Union Pacific to facilitate the transfer of cars from the RCP&E to the Union Pacific. The current capacity of this interchange is inadequate for efficient train interchange.

The estimated cost of this work is $2 million.

Bridge Capacity Projects

12. Napa to Platte Mainline Bridge Repair/Replacement

Repair or replace bridges on the Napa to Platte Railroad to provide at least 286,000 pound capacity. From Napa Junction to Wagner, there are about 27 timber bridges. These bridges would need to have additional stringers to increase capacity along with replacement of some deficient components of headwalls, bracing, and some piles.

The estimated cost for this work is $2.5 million.

13. Huron to Yale Line Bridge Upgrade

Upgrade and rehabilitate five bridges on the mainline track. There are four bridges in or near Huron that are long timber bridges with the exception of the James River Bridge which is a steel girder structure. The timber bridges need to have some updating and upgrading to increase capacity. The steel structure over the James River requires work at the abutments to stabilize the embankments. Updating this structure also will be required.

The estimated cost of this work is $2 million.

14. Sioux Valley Subdivision Bridge Upgrade

Replace or repair bridges on the Sioux Valley Subdivision. The Sioux Valley Subdivision consists of 68 total miles of track that is owned by the State of South Dakota and operated by the D&I Railroad. Bridges on this subdivision are between 60 years old up to and exceeding 100 years old. There are 19 steel truss bridges, through steel girder bridges and open steel girder bridges. Included in these 19 bridges are 9 major river crossings of between 123 feet and 152 feet in length with a total span length of 2,386 feet. The steel bridges are 80 to 100 years old and many do not have 286,000-pound capacity. Along with the steel bridges, there are 50 timber structures varying from a single span to 44 spans and having total length of 3,078 feet. At least 22 of the timber bridges have insufficient capacity. All of the timber bridges are at least 60 years old. Replacement of the steel bridges is estimated at $31 million. The cost to replace the timber structures is estimated at $9 million.

The total cost estimate for this item is $40 million.

TRACK CONDITION PROJECTS

15. Britton Line Rail Upgrade

Replace existing light rail with heavy rail to support modern rail traffic and unit trains from Aberdeen, South Dakota to Geneseo Junction, North Dakota. This line is 77 miles long with good ties and ballast. The bridges are all rated at 286,000 pounds, or better. The rail on this line consists of a mixture from 75-pound to 100-pound and is deficient for modern traffic. Upgrades to the rail needed to support modern rail traffic consist of a minimum of 115-pound rail with matching plates and anchors. Along with the rail upgrades, all crossings would have to be adjusted and matching transitions from the current roadway surface would be required due to the increase in rail height.

The estimated cost for this work is $32 million.

16. MRC West of Chamberlain – Phase 2

Reconstruct 42 miles of track from Chamberlain to Presho. The current railroad is a sod railroad with primarily timber bridges designed for 263,000 pounds This project would include replacement of the rail along with the timber ties and walkways on the Chamberlain-Missouri River Bridge. The bridge at Kennebec also would need substantial rehabilitation to make it train worthy. All bridges on the segment in question would be upgraded to 286,000-pound capacity. Deficient or separated culverts would be relined to avoid future railroad grade washouts. Approximately 50 percent of the ties would be replaced along with the rail and other track material (OTM). Rail and OTM would be replaced to meet 115-pound rail standards. Ties would be good relay or new.

The estimated cost for this work is $30 million.

17. Sioux Valley Subdivision Slide Repair

Construct approximately 4,000 linear feet of railroad to repair an area of unstable grade near Hawarden, Iowa. There is a location just south of Hawarden, Iowa where shale subgrade has caused the land to slide out from under the track. There has been a study to determine the most feasible method of repair which concluded that in-place repair is not feasible and relocation of this section is necessary. Relocation would require acquisition of additional right-of-way, wetland mitigation, clearing, installation of new culverts and other drainage structures and phased construction due to poor soils. This project is complicated by the fact that it is located within 500 feet of the Big Sioux River and in the flood plain. The State of South Dakota has received a $2 million Federal grant to assist with implementation of the construction and has completed many of the required initial phases of this project.

The estimated cost of this work is $3.5 million.

18. Sisseton to Milbank Railroad Reconstruction

Reconstruct 37 miles of railroad owned by the Twin Cities and Western Railroad (TC&W) between Milbank and Sisseton. This railroad currently is very light rail with low-rated bridges that do not comply with modern rail standards. The line is owned by the TC&W and provides access to the Class I carriers of BNSF, CP, UP and CN. The closest Class I connection is at Milbank. TC&W has trackage rights from Milbank to Appleton, Minnesota on the BNSF and can access Class I carriers other than BNSF in St. Paul, Minnesota. Upgrade of this line would provide an economic boost to the City of Sisseton, Roberts County and the Sisseton Wahpeton Oyate Indian Tribe. This project would include rehabilitation of bridges and culverts; replacement of rail, ties and OTM with minimum 115-pound rail and materials.

The estimated cost of this work is $23 million.

19. Napa to Platte Mainline Reconstruction

Reconstruct approximately 46 miles of track between Napa Junction and Wagner. This shortline track currently is sod railroad with very light rail and underrated bridges. Many of the road crossings have been damaged and need to be reconstructed. Reconstruction would consist of replacement of ties, rail, OTM, and crossings. Bridges would be repaired and rebuilt where necessary. Ballast would be installed to create a ballasted railroad.

The estimated cost for this work is $25 million.

20. Redfield to Mansfield Line Upgrade

Upgrade 29 miles of railroad from Redfield to Mansfield. This line starts in Redfield and serves the towns of Athol, Northville and Mansfield where it terminates. The line consists of several different sections of 90-pound and 100-pound rail dating back to 1907. Replacement of the rail to 115-pound, OTM and approximately 30 percent of the ties would upgrade this line to modern standards and provide reliable service to the communities served.

The estimated cost for this work is $14.5 million.

21. Huron to Yale Line Upgrade

Upgrade 14.8 miles of railroad from Huron to 2.5 miles east of Yale. The rail in this section of track is old and light. The track needs upgrading to 115-pound rail to comply with modern rail standards. The ties and surface are in generally good condition although some additional ballast will be required to adjust line and grade on the finished track.

The estimated cost for this work is $6 million.

22. Sioux Valley Subdivision Rail Upgrade

Upgrade 15 miles of rail to heavy rail. The Sioux Valley Subdivision consists of 68 total miles of track that is owned by the State of South Dakota and operated by the D&I Railroad. Past projects have replaced 35 miles of rail to 115-pound rail and 18 miles to Beresford are in good shape with 100-pound rail or better. The 15 miles of rail requiring upgrades to 115-pound rail are located from approximately two miles south of Hawarden, Iowa to two miles North of Hudson, South Dakota (D&I Mile Post 22-37).

The estimated cost for this work is $6 million.

23. Pierre to Rapid City Track Upgrade

Improve the track conditions on approximately 165 miles of track from Pierre to Rapid City to make for more expedient and efficient train movements. Pierre Shale subgrade along the majority of the line between Pierre and Rapid City make for constantly changing track conditions in this section of mainline track. The shale in the subgrade creates low subgrade bearing pressures, and moisture conditions in the area constantly change the line and grade of the track. Since this subgrade was constructed in the early 1900s there has been technological advances in geotextiles and other methods for stabilizing this subgrade. Although the majority of the rail is 100-pound or heavier, there are approximately 20 miles of 90-pound rail that needs to be replaced to reduce subgrade pressures. Implementation of these techniques would improve the train speeds and track capacities making haulage much more economical.

The estimated cost of this work is $105 million.

24. Rapid City to Dakota Junction Track Upgrade

Upgrade 73.5 miles of rail and ties from 5 miles south of Hermosa to Dakota Junction. The Black Hills Subdivision is a rail line from Rapid City to Dakota Junction, Nebraska. The track on this section of railroad is 72-pound rail that was installed in 1910. Rail from Hermosa to Rapid City is all heavy welded rail. By replacement of the light rail to 115-pound rail to Nebraska, there would be good access to the BNSF directly from Rapid City. Ballast and surfacing would be required as part of this project along with some bridge improvements.

The estimated cost of this work is $40 million.

Safety Projects

25. Brookings 22nd Avenue Grade Crossing

Replace the out-of-date signal system on 22nd Avenue in Brookings. 22nd Avenue in Brookings handles almost 8,000 cars per day and is projected to have an ADT of 16,700 in 2035. The outdated current crossing consists only of flashing lights and the approach roadway is in rough condition. The new crossing will consist of gates, flashing lights, new sidewalks, and a center roadway median to prevent cars from driving around the crossing gates. This crossing will be much safer while regrading of the approach roadway will provide a smoother ride for vehicles.

The estimated cost of this work is $500,000.

Industrial Park Development Projects

26. Intermodal Yard at Sherman

Construct an intermodal yard near the town of Sherman, South Dakota on the BNSF Marshall Subdivision. There currently are many shippers that ship containers destined for the region through either Minneapolis, Minnesota or Omaha, Nebraska. If instead these containers could be rerouted to a facility in South Dakota, it would provide economic advantages to eastern and central South Dakota, western Minnesota, and northwestern Iowa. Properly determining an advantageous location for this facility is critical; the facility would require good highway access and rail access and must be on a main track with capacity for heavy loads and double-stack rail cars. This project would require land purchase and development of land and track.

The estimated cost for this work is $75 million.

27. Belle Fourche Transloading Facility

Construct a transloading facility in or near Belle Fourche, South Dakota. The ability to move goods and materials by multimodal means is an advantage to all business near the transloading facility. At a transloading facility, goods and materials (i.e., agricultural products, raw materials) can be transferred from truck to rail cars and from rail cars to trucks. Equipment and supplies could be transloaded using ramp facilities, and bulk materials could be transloaded using conveyors and hoppers. The facility also would require storage yards, warehousing, and possibly other industrial facilities. This location has a strategic position to the North Dakota oil fields and due to the railroad congestion in North Dakota, would possibly offer a time and price advantage to supplying the needs of the oil industry.

The estimated cost of this work is $6 million.

7

7 – Rail Investment Framework and Project Evaluations

Preface

Effective and cost-efficient connections between industry and markets are the primary drivers of rail-related economic activity within the state. Access to markets (or the need for such) is necessary to spur investment in capacity and growth. Through proactive actions to enhance, support, and influence rail development, the State can provide a framework for investment that leads to further economic development in the state. As part of this, a framework has been developed to evaluate projects using a multi-criteria approach. Along with supporting strategies, such as legislation or cooperation with neighboring States, this framework will position the State to meet the challenges of rail-related obstacles, whether capacity issues caused by increases in competition for service from Bakkan oil, weather-related challenges, or competition from other modes.

Photo this page: Ethanol train near Sioux Falls, South Dakota

RAIL INVESTMENT FRAMEWORK

Often, rail projects have multiple beneficiaries, although the benefits may not be equally distributed. A rail investment framework is important to ensure that State resources are invested in projects that will benefit the State's residents, industries, and system users. Through an investment framework that determines the beneficiaries of a project, project partners can also be identified. A current example of a South Dakota partnership on a rail project is the Dakota, Missouri Valley and Western – Britton line rail upgrade. The State is providing 50 percent of cost and the railroad is providing the other 50 percent.

PREVIOUS INVESTMENT FRAMEWORK

The 1997 South Dakota State Rail Plan included a framework for making investment decisions. The plan included the following actions developed to implement the State's goals and objectives:

- Identify the essential rail system needed to serve South Dakota's current and future agricultural, natural resource, industrial, and energy related activities.
- Retain a viable core rail system of essential rail lines which serve the primary traffic-producing areas in South Dakota and which provide accessibility to state and national markets.
- Eliminate non-profitable rail lines which are non-essential and whose services could be more efficiently provided by an alternative rail line or transportation mode.
- Invest Railroad Trust Fund dollars and assist in securing federal funds for the permanent improvement and rehabilitation of essential rail lines.
- Assist in establishing regional railroad authorities and providing loans to develop or improve rail facilities, including unit train loading facilities.

As the Local Rail Freight Assistance Program, a major source of funding for South Dakota rail projects had recently expired, the 1997 plan developed a selection process and criteria for rail projects to apply for limited federal and state funding. The South Dakota DOT solicited applications for projects, which were reviewed using a cost-benefit analysis methodology established for the LRFA program. The priority list of projects was then included in the Statewide Transportation Improvement Program (STIP). The screening criteria developed for rail projects selected for financial assistance were:

- Lines that are part of South Dakota's Core Rail System concept.
- Lines whose abandonment could have significant impacts on the affected shippers and communities.
- Light density lines threatened by physical deterioration or requiring rehabilitation to permit cost efficient operations.
- Light density lines providing access to the regional and national railroad network.
- Project locations where significant shipper interest in improving or maintaining local rail operations is demonstrated.
- Lines with benefit to cost rations which are greater than one.

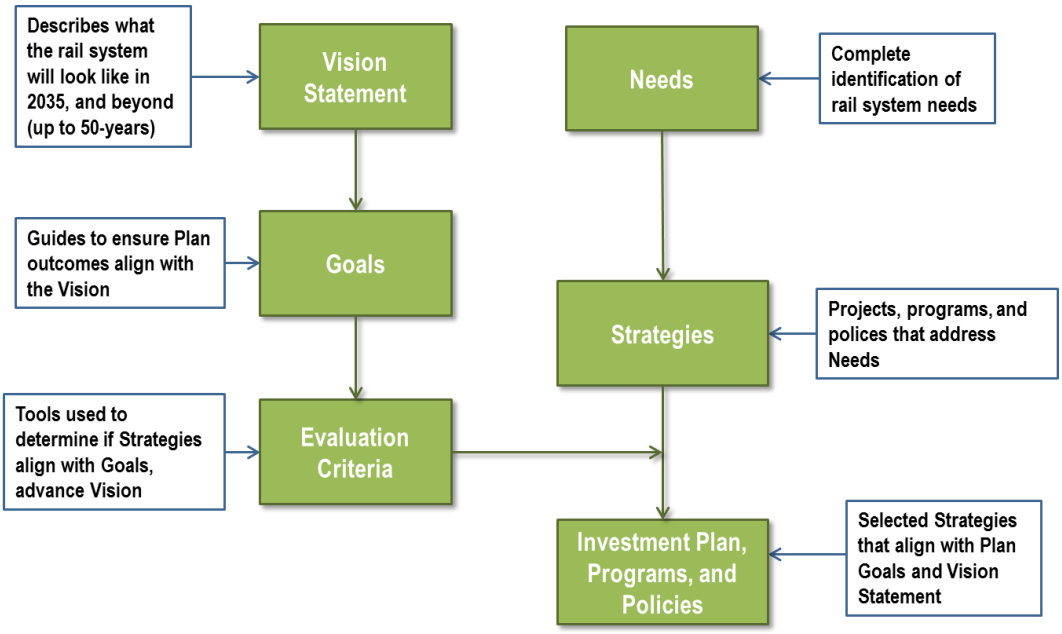
PROPOSED FRAMEWORK AND CRITERIA

As part of the State Rail Plan, a new rail investment framework and set of criteria have been proposed to further the prioritization of projects and allow the State to strategically invest infrastructure dollars. Funds continue to be scare and today it is often essential to forge partnerships to realize rail system potential. This framework is designed to:

- Provide guidance on when projects have a compelling public interest.
- Provide guidance on what level of participation from the state and other stakeholders is appropriate.
- Provide guidance on the nature of state participation (financial or other support).
- Assist the state in prioritizing investments based on an evaluation of benefits.

The proposed rail investment framework is detailed in Figure 73.

Figure 73. Proposed Rail Investment Framework



The benefits of this rail investment framework include the following:

- Recognize that South Dakota will make investments in partnership with other parties.
- Provide South Dakota guidance on when projects have a compelling public interest.
- Provide South Dakota guidance on what level of participation from the state and other stakeholders is appropriate (and the nature of that participation).
- Enable South Dakota to prioritize investments based on an evaluation of benefits.
- Provide flexibility for South Dakota to customize evaluation factors based on the project, funding program and involved stakeholders.

Qualitative criteria for evaluating projects based on the goals of the South Dakota State Rail Plan are shown in Table 43. The State may wish to include additional criteria, including quantitative criteria, and that which reflects private sector perspectives, in future evaluations.

Table 43. Project Evaluation Criteria

Goal	Evaluation Criteria		Criteria Description
Support Economic Growth and Development	Increases connectivity to the rail system for shippers within the state	High Benefit:	Project increases rail access by redeveloping rail lines or adding connections in South Dakota
		Potential Benefit:	Project may increase rail access through partial redevelopment of rail lines in South Dakota
		No Change:	Project does not increase connectivity to Class I railroads
Ensure Connectivity for Critical Industries	Increases connectivity to markets outside of South Dakota	High Benefit:	Project increases connectivity on a currently utilized line to Class I railroads
		Potential Benefit:	Project increases connectivity to Class I railroads on a line with potential future use
		No Change:	Project does not increase connectivity to Class I railroads
Maintain State Railroad Assets in a State of Good Repair	Meets or exceeds heavy rail standard and/or 286K weight limit	High Benefit:	Project upgrades rail or rail bridges to heavy rail and/or 286K standards
		Potential Benefit:	Project upgrades rail to standard less than heavy rail and/or 286K
		No Change:	Project does not upgrade rail standard.
Reduces Highway Impacts	Decreases truck VMT	High Benefit:	Project reduces truck VMT through direct substitution of rail for truck
		Potential Benefit:	Project has the potential to reduce truck VMT by increasing rail competitiveness
		No Change:	Project does not increase competitiveness of rail versus truck travel
Improves Railroad Safety, Security, and Resiliency	Decreases vulnerability to extreme flooding	High Benefit:	Project increases infrastructure resiliency in areas with high risk of flooding
		Potential Benefit:	Project increases infrastructure resiliency in areas with some risk of flooding
		No Change:	Project does not increase infrastructure resiliency

Source: Cambridge Systematics

SOUTH DAKOTA-OWNED RAIL SYSTEM PROJECT EVALUATION

As previously described, twenty-seven projects on the South Dakota owned rail system were identified. Out of the $455 million in total statewide projects, the total for projects on the state system was $163 million, or 36 percent of the total. State-owned system projects fall into the following categories:

- **Efficiency/Chokepoint.** Projects where system efficiencies are lacking due to a physical system bottleneck or other capacity constraint. Types of projects in this category are **new sidings and interchanges**. (11)
- **Track Condition.** Projects focused on rail line condition and include projects that **upgrade lightweight rail to heavy rail**[108], replace mismatched jointed rail segments, and refresh ballast and ties. (10)
- **Bridge Capacity.** Projects are focused on bridge replacement and rehabilitation, and making them **286,000 pound-compliant**. (3)
- **Safety.** Projects are focused on **at-grade crossing safety**. (1)
- **Industrial Park Development.** Projects highlight areas where **rail transfer facilities** should be considered to bolster local economic development activities. (2)

Projects on the state-owned rail system are shown in Figure 73 and detailed in Table 43.

SUMMARY EVALUATION AND METHODOLOGY

Projects on South Dakota's State-owned rail system were qualitatively evaluated based on their ability to further each of the State Rail Plan goals. For each goal, an evaluation criteria was designated, and projects were evaluated to the extent to which they provided "high benefits," "potential benefits," or "no change" in each of the criteria. Table 43 defined the evaluation criteria linked to each goal. Although only a single criteria is linked to each goal, this approach can also be used to evaluate a wide range of criteria in the future, depending on the changing needs of the State.

This qualitative method helps provide an "apples to apples" comparison on the relative benefits of each project. The Plan Advisory Committee encouraged the development of a straight-forward, easy to understand process for its transparency and ability of the State to replicate it again in the future.

[108] Heavy rail generally indicates 115 lb. rail standard; however in some cases a 110 lb. or similar standard of rail will provide the required capacity for the traffic using the line. In these cases, this would also be considered as a heavy rail standard.

Figure 74. South Dakota State-owned System Projects Vicinity

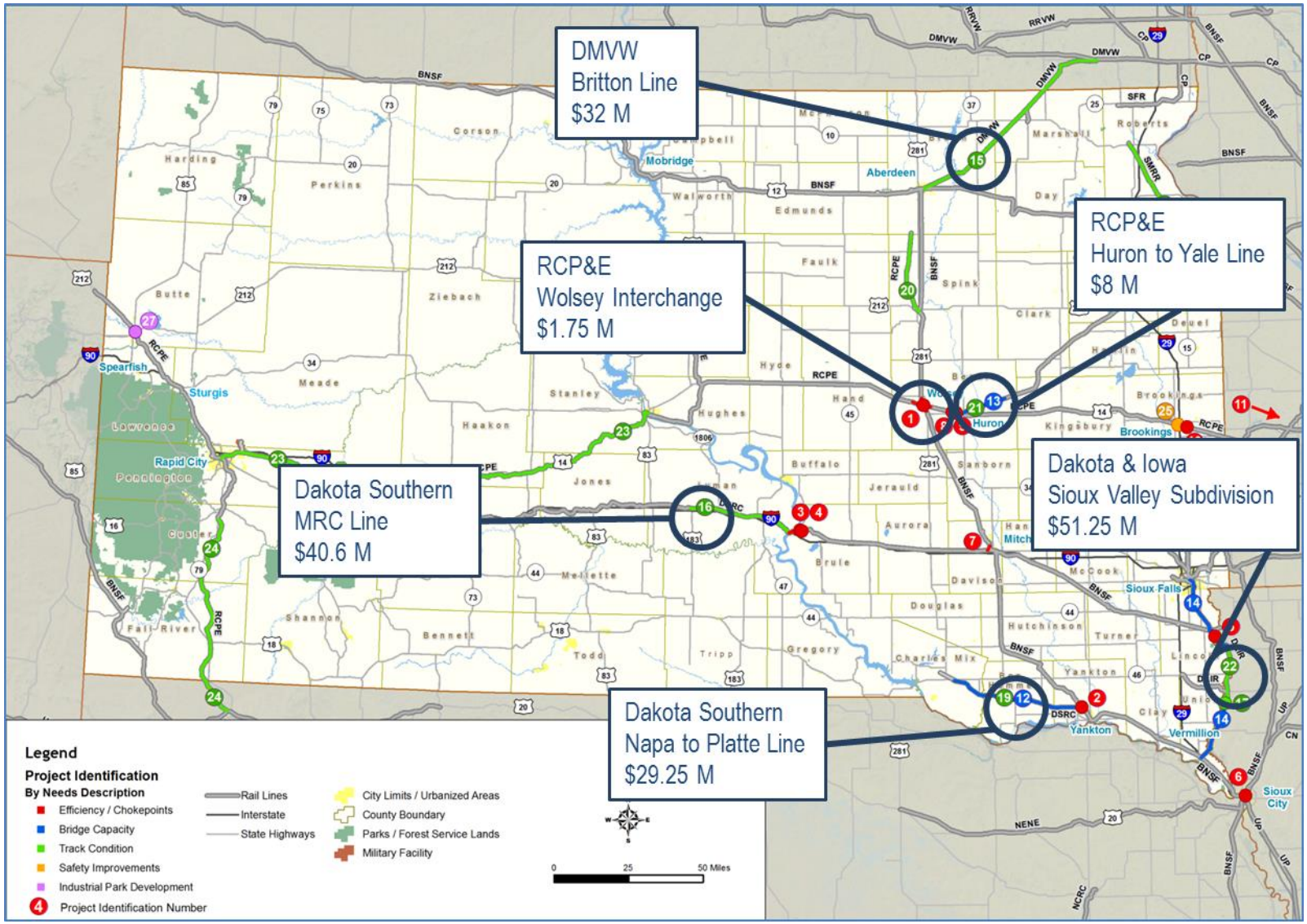


Table 44. State-Owned Rail System Needs

Railroad Operator	Rail Line	Project Name	Project Type	Map ID	Estimated Cost
Rapid City, Pierre, and Eastern (former CP/DM&E)	Huron to Yale Line	Huron to Yale Line Bridge Upgrade	Bridge Capacity	13	$2,000,000
		Huron to Yale Line Upgrade	Track Condition	21	$6,000,000
			Rail Line Subtotal		*$8,000,000*
Rapid City, Pierre, and Eastern	Wolsey Interchange	Wolsey Interchange	Efficiency/Chokepoint	1	$1,750,000
			Rail Line Subtotal		*$1,750,000*
Dakota, Missouri Valley, and Western Railroad	Britton Line	Britton Line Rail Upgrade	Track Condition	15	$32,000,000
			Rail Line Subtotal		*$32,000,000*
Dakota and Iowa Railroad	Sioux Valley Subdivision	Sioux Valley Subdivision Meet and Pass Siding	Efficiency/Chokepoint	5	$1,750,000
		Sioux Valley Subdivision Bridge Upgrade	Bridge Capacity	14	$40,000,000
		Sioux Valley Subdivision Slide Repair	Track Condition	17	$3,500,000
		Sioux Valley Subdivision Rail Upgrade	Track Condition	22	$6,000,000
			Rail Line Subtotal		*$51,250,000*
Dakota and Iowa Railroad	Sioux Valley Subdivision – Hawarden Branch	N/A			
Dakota Southern Railroad	Mitchell to Rapid City Line (in partial service)	MRC Passing Siding	Efficiency/Chokepoint	3	$1,750,000
		MRC – Reconstruct Wye in Chamberlain	Efficiency/Chokepoint	4	$650,000
		MRC Northbound BNSF Connection	Efficiency/Chokepoint	7	$8,200,000
		MRC West of Chamberlain – Phase 2	Track Condition	16	$30,000,000
			Rail Line Subtotal		*$40,600,000*
Dakota Southern Railroad	Napa to Platte Line (not in active service)	Napa-Platte Interchange	Efficiency/Chokepoint	2	$1,750,000
		Napa to Platte Mainline Bridge Repair/ Replacement	Bridge Capacity	12	$2,500,000
		Napa to Platte Mainline Reconstruction	Track Condition	19	$25,000,000
			Rail Line Subtotal		*$29,250,000*
		Total State-Owned Rail System Needs			**$162,850,000**

Individual South Dakota-owned rail projects were evaluated, and results were synthesized to determine the collective benefits for all of the projects on an individual rail line, and results were summarized by rail line.

Table 45 shows a summary of this qualitative evaluation, by rail line, across each of the State goals. Most of the projects provide benefits across a number of the goal areas. Projects on lines or interchanges not currently in service are generally categorized as providing "potential" benefits, as additional steps and/or coordination with the private sector will have to be taken in order for benefits to be realized. In the following sections, a brief discussion and summary table of each rail line's collective projects are shown. It is important to note that the collective benefits for each rail line assume that all of the projects in the package are completed. It is also important to note that projects should regularly be re-evaluated, as conditions may change.

Table 45. Summary Evaluation of State-owned Rail System Projects Based on Rail Plan Goals

Rail Line	Project	Rail Plan Goals				
		Economic Growth	Industry Connectivity	State of Good Repair	Reduce Highway Impacts	Safety, Security & Resiliency
RCP&E - Huron to Yale Line	Bridge & Line Upgrades	●	●	●	●	●
RCP&E - Wolsey Interchange	Wolsey Interchange	●	●	●	◐	●
DMWR - Britton Line	Rail Upgrade	◐	◐	●	◐	●
Dakota & Iowa – Sioux Valley Sub	Rail, Bridge & Siding Repairs	●	●	●	●	●
Dakota Southern – MRC Line	BNSF Conn, Rail, Bridge & Siding Upgrades	●	●	●	◐	●
Dakota Southern – Napa to Platte Line	Interchange, Rail & Bridges Upgrades	●	●	◐	◐	●

● = High Benefits ● = Potential Benefits ● = No Change

Rapid City, Pierre & Eastern (former CP/DM&E) – Huron to Yale Line

Projects on the Rapid City, Pierre & Eastern – Huron to Yale line include both bridge and line upgrades to meet heavy rail and 286K standards and improve the condition on the line. These projects will lead to increasing the state of good repair and decreasing the vulnerability of the line to extreme weather events.

Table 46. RCP&E Huron to Yale Line Project Evaluation

Rail Line	Project	Rail Plan Goals				
		Economic Growth	Industry Connectivity	State of Good Repair	Reduce Highway Impacts	Safety, Security & Resiliency
RCP&E - Huron to Yale Line	Bridge & Line Upgrades	●	●	●	●	●
Bridge Upgrade		●	●	●	●	●
Line Upgrade		●	●	●	●	●
Overall Benefits		◔				

● = High Benefits ● = Potential Benefits ● = No Change

Rapid City, Pierre & Eastern – Wolsey Interchange

The Rapid City, Pierre & Eastern - Wolsey Interchange is a single project to add an 8,000 foot siding to the interchange tracks between the BNSF and Rapid City, Pierre & Eastern Railroads just west of Wolsey, South Dakota. As shortlines such as the RCP&E realize growth potential through the center of the state, additional connections will be needed to properly connect the State and national (Class I) rail systems. This will allow for increased opportunities for economic growth through utilization of the RCP&E line within the state, in addition to increased industry connectivity to the BNSF Class I rail line. This interchange also has the potential to reduce highway impacts by increasing the rail competitiveness by allowing increased switching of trains and ease of passage.

Table 47. RCP&E Wolsey Interchange Project Evaluation

Rail Line	Project	Rail Plan Goals				
		Economic Growth	Industry Connectivity	State of Good Repair	Reduce Highway Impacts	Safety, Security & Resiliency
RCP&E - Wolsey Interchange	Wolsey Interchange	●	●	●	◔	●
Overall Benefits		◔				

● = High Benefits ● = Potential Benefits ● = No Change

Dakota, Missouri Valley and Western Railroad – Britton Line

The Dakota, Missouri Valley and Western Railroad – Britton Line project is to replace existing light rail with heavy rail to support modern rail traffic and unit trains from Aberdeen, South Dakota to Geneseo Junction, North Dakota. A new grain elevator near Britton is also under consideration. Partial improvements on this line have been approved by the railroad board, at a 50/50 cost share between the State and the railroad. In conjunction with these projects, the rail upgrades may allow for opportunities for economic growth through increased utilization of the Britton line, in addition to increased industry connectivity to Class I rail lines. This would also potentially reduce highway impacts by increasing the rail competitiveness. The project will also lead to increasing the state of good repair and decreasing the vulnerability of the line to extreme weather events.

Table 48. Dakota, Missouri Valley, and Western Railroad Project Evaluation

Rail Line	Project	Rail Plan Goals				
		Economic Growth	Industry Connectivity	State of Good Repair	Reduce Highway Impacts	Safety, Security & Resiliency
DMWR – Britton Line	Rail Upgrade					

Overall Benefits	

= High Benefits = Potential Benefits = No Change

Dakota and Iowa Railroad – Sioux Valley Subdivision

Projects on the Dakota and Iowa - Sioux Valley Subdivision include a meet and pass siding, slide repair, and both bridge and line upgrades. The Dakota and Iowa railroad recently experienced substantial damage from heavy flooding in mid-June, 2014. The water was about four feet above the floor beams on some of the steel trusses spanning the Big Sioux River, the highest ever recorded water elevation in this area, but luckily there was no damage to the steel trusses on the line. Track and ballast were also washed out along the line. These projects will lead to increasing the state of good repair and decreasing the vulnerability of the line to extreme weather events. Some individual projects lead to localized benefits for industry and the highway system, but systemwide there is no change in these areas.

Table 49. Dakota and Iowa – Sioux Valley Subdivision Project Evaluation

Rail Line	Project	Rail Plan Goals				
		Economic Growth	Industry Connectivity	State of Good Repair	Reduce Highway Impacts	Safety, Security & Resiliency
Dakota & Iowa – Sioux Valley Sub	Rail, Bridge & Siding Repairs	●	●	●	●	●
Meet and Pass Siding		●	●	●	●	●
Bridge Upgrade		●	●	●	●	●
Slide Repair		●	●	●	●	●
Rail Upgrade		●	●	●	●	●
Overall Benefits		◐				

● = High Benefits ● = Potential Benefits ● = No Change

Dakota Southern Railway – Mitchell to Rapid City Line (in partial service)

Projects on this line include addition of a passing siding, reconstruction of the Chamberlin Wye, a Northbound BNSF connection, and the Phase II reconstruction project west of Chamberlin. Some projects on this line were submitted for TIGER VI grant funding, which at this time has yet to be awarded.[109] The projects on this line are intended to extend west the active service of the line, and hence will have high benefits for the economy, industry connectivity, and the state of good repair. There is also the potential for reduced highway impacts through increased use of rail versus truck to transport goods along this line.

Table 50. Dakota Southern MRC Line Project Evaluation

Rail Line	Project	Rail Plan Goals				
		Economic Growth	Industry Connectivity	State of Good Repair	Reduce Highway Impacts	Safety, Security & Resiliency
Dakota Southern – MRC Line	BNSF Conn, Rail, Bridge & Siding Upgrades	●	●	●	◐	●
Passing Siding		●	●	●	◐	●
Chamberlain Wye Reconstruction		●	●	●	●	●
Northbound BNSF Connection		●	●	●	●	●
West of Chamberlain – Phase 2		●	●	●	◐	●
Overall Benefits		●				

● = High Benefits ● = Potential Benefits ● = No Change

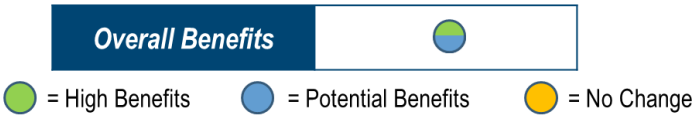
[109] An announcement was made on September 9, 2014 that South Dakota received the $12.68 million requested in the TIGER VI grant application. Construction of the Chamberlain to Presho segment is expected to begin in early 2015. http://news.sd.gov/newsitem.aspx?id=16693

Dakota Southern Railway – Napa to Platte Line (not in active service)

The Dakota Southern – Napa to Platte Line is not currently considered to be in active service. Projects on this line include addition of an interchange, mainline ridge repair or replacement, and mainline reconstruction. The projects on this line are intended to return the line to active service. These projects have a high benefit to the State's economy by increasing access to rail service for additional users within the state. Recently there has been discussion of locating rail/intermodal agricultural centers in the Napa Junction region, which would allow South Dakota agricultural producers to utilize the rail connections on this line, if it were returned to active service. If these centers are constructed, the proposed projects on this line could also provide increased industry connectivity benefits, and reduce highway impacts through increased rail utilization. The projects also have the potential to increase the state of good repair of the system.

Table 51. Dakota Southern Napa to Platte Line Project Evaluation

Rail Line	Project	Rail Plan Goals				
		Economic Growth	Industry Connectivity	State of Good Repair	Reduce Highway Impacts	Safety, Security & Resiliency
Dakota Southern – Napa to Platte Line	Interchange, Rail & Bridges Upgrades					
Napa – Platte Interchange						
Napa to Platte Mainline Bridge Repair / Replacement						
Napa to Platte Mainline Reconstruction						



8

8 – RECOMMENDATIONS

PREFACE

Each of the projects identified on the South Dakota state-owned rail system meet the needs identified in this Plan, as well as received the agreement on need by the Rail Plan Advisory Committee. However, determining which of these projects should be prioritized over others can often be a matter of subjection, as well as is critically dependent on available resources and partnerships. This Chapter summarizes the qualitative benefits of each of the state-owned rail line projects and arrays them against cost as an aid in determining which projects may provide immediate returns to the State. This Chapter also recognizes that physical infrastructure projects, alone, will not be sufficient to address the numerous needs that exist internal and external to South Dakota. An array of supporting strategies have been recommended to serve as an action plan for the coming years for both the South Dakota DOT, as well as its public and private sector rail partners.

Photo this page: Overgrown Napa-Platte line

Recommended South Dakota-Owned Rail System Investments

In the last several years the primary source of funding for state-owned rail line projects has been the South Dakota Railroad Trust Fund, however the South Dakota State Railroad Board is continuously faced with numerous worthy applications for Trust Fund dollars. The State has been active in seeking alternative funding sources, in 2010, the South Dakota DOT received a $16 million grant through the TIGER program to reconstruct the MRC Railroad. Through partnerships with the public and private sectors, South Dakota DOT is working for additional funds this year to continue to upgrade the line to the west (Presho).

One common way to determine project priorities is through comparing the costs and benefits. The benefits of each project were assessed using qualitative criteria in the previous subsection, and aggregated to determine an overall summarized benefit. In this subsection, estimated costs for the projects on each line are compared to these qualitative benefits. Figure 52 shows the summarized qualitative benefits and the overall estimated project cost for investments on each rail line.

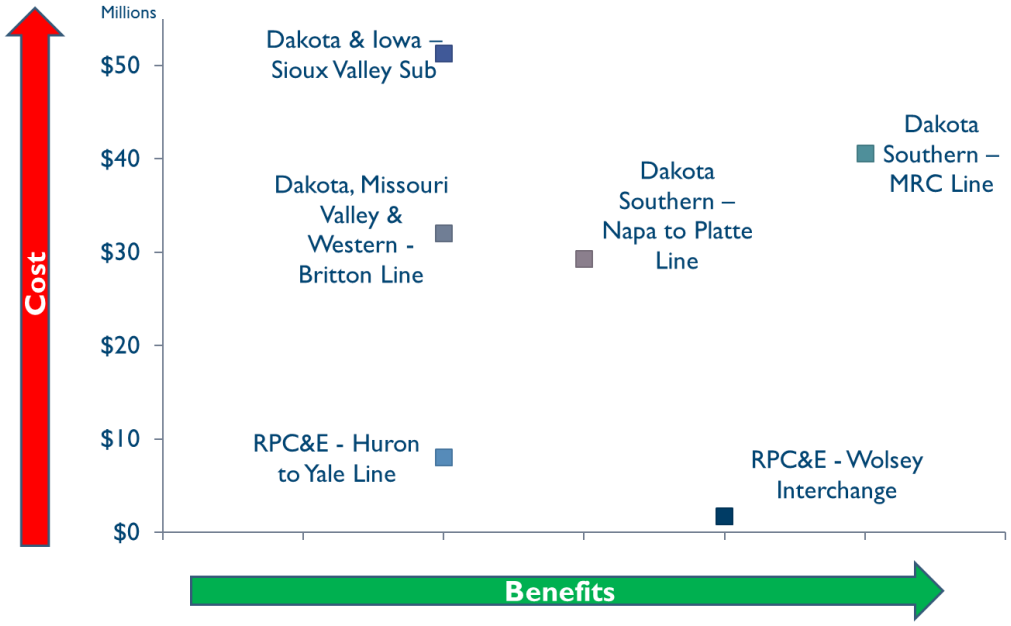
Table 52. Qualitative comparison of State-owned Rail System Investments

Rail Line	Project	Summarized Benefits	Overall Cost
RCP&E- Huron to Yale Line	Bridge & Line Upgrades		$8 Mil
RCP&E - Wolsey Interchange	Wolsey Interchange		$1.75 Mil
DMWR - Britton Line	Rail Upgrade		$32 Mil
Dakota & Iowa – Sioux Valley Sub	Rail, Bridge & Siding Repairs		$51.25 Mil
Dakota Southern – MRC Line	BNSF Conn, Rail, Bridge & Siding Upgrades		$40.6 Mil
Dakota Southern – Napa to Platte Line	Interchange, Rail & Bridges Upgrades		$29.25 Mil

= High Benefits = Potential Benefits = No Change

Costs and benefits can also be compared when using either qualitative, quantitative, or a mix of data by plotting the costs and benefits on an X-Y axis. Figure 75 illustrates the estimated costs and relative benefits of each rail system investment package. The highest (qualitative) benefits are to improvements to the Dakota Southern - MRC line, and the RPC&E - Wosley Interchange. The lowest (estimated) costs are for the RCP&E - Wolsey Interchange and RCP&E - Huron to Yale Line projects.

Figure 75. Cost-benefit comparison of State-owned Rail System Investments



RANKING PROJECTS BASED ON STATE RAIL PLAN GOALS

Projects can also be ranked by their alignment with the goals of the State Rail Plan. A tiered system was developed and used to rank projects based on whether they furthered the achievement of each of these goals.

- Tier 1 projects are those which provide "high benefits" in the given goal category
- Tier 2 projects are those which provide "potential benefits" in the given goal category, i.e. additional activity in the private sector is needed in order for the benefits to be realized.
- Tier 3 projects are those that do not contribute substantially to the achievement of a goal.

The following sections show the rankings of each of the projects, collectively by rail line, for each goal area.

Support Economic Growth and Development

Three projects provide high benefits to the State's goal of economic growth. These are the Dakota Southern - MRC line, Dakota Southern - Napa to Platte Line, and RPC&E - Wolsey Interchange. Each of these projects provides increased access to competitive rail service to South Dakota's industries. Table 53 shows the ranking of State-owned rail system projects that support economic growth and development.

Table 53. Ranking of State-owned Rail System Projects to Support Economic Growth and Development

	Rail Line	Project	Rail Plan Goals				
			Economic Growth	Industry Connectivity	State of Good Repair	Reduce Highway Impacts	Safety, Security & Resiliency
Tier 1	Dakota Southern – MRC Line	BNSF Conn, Rail, Bridge & Siding Upgrades	●	●	●	◐	○
Tier 1	Dakota Southern – Napa to Platte Line	Interchange, Rail & Bridges Upgrades	●	◐	◐	◐	○
Tier 1	RCP&E – Wolsey Interchange	Wolsey Interchange	●	●	○	◐	○
Tier 2	DMWR – Britton Line	Rail Upgrades	◐	◐	●	◐	●
Tier3	RCP&E – Huron to Yale Line	Bridge and Line Upgrades	○	○	●	○	●
Tier3	Dakota & Iowa – Sioux Valley Sub	Rail, Bridge & Siding Repairs	○	○	●	○	●

● = High Benefits ◐ = Potential Benefits ○ = No Change

Ensure Connectivity for Critical Industries

Two projects provide high benefits to the State's goal of connectivity for critical industries through increased connections to Class I railroads, and thus to the broader rail system and global markets. These are the Dakota Southern - MRC line, and the RCP&E - Wolsey Interchange. If the Dakota Southern – Napa to Platte line is put into service, these projects may also bring benefits to the state. Table 54 shows the ranking of State-owned rail system projects that support connectivity to critical industries.

Table 54. Ranking of State-owned Rail System Projects that Ensure Connectivity to Critical Industries

	Rail Line	Project	Rail Plan Goals				
			Economic Growth	Industry Connectivity	State of Good Repair	Reduce Highway Impacts	Safety, Security & Resiliency
Tier 1	Dakota Southern – MRC Line	BNSF Conn, Rail, Bridge & Siding Upgrades	●	●	●	◐	○
Tier 1	RCP&E – Wolsey Interchange	Wolsey Interchange	●	●	○	◐	○
Tier 2	Dakota Southern – Napa to Platte Line	Interchange, Rail & Bridges Upgrades	●	◐	◐	◐	○
Tier 2	DMWR – Britton Line	Rail Upgrades	◐	◐	●	◐	●
Tier3	RCP&E – Huron to Yale Line	Bridge and Line Upgrades	○	○	●	○	●
Tier3	Dakota & Iowa – Sioux Valley Sub	Rail, Bridge & Siding Repairs	○	○	●	○	●

● = High Benefits ◐ = Potential Benefits ○ = No Change

Maintain State Railroad Assets in a State of Good Repair

Four projects provide high benefits to the State's goal of maintaining a state of good repair for its railroad assets. These are the RPC&E - Huron to Yale Line, Dakota, Missouri Valley & Western - Britton Line, Dakota & Iowa - -Sioux Valley Subdivision, and the Dakota Southern - MRC line. Each of these projects involves upgrading rail lines to meet heavy rail and/or 286K standards. The Dakota Southern - Napa to Platte line projects also involve rail upgrades to meet these standards, and as this line is put into service the State may also accrue benefits. Table 55 shows the ranking of State-owned rail system projects that support maintaining assets in a state of good repair.

Table 55. Ranking of State-owned Rail System Projects that Maintain Assets in a State of Good Repair

	Rail Line	Project	Rail Plan Goals				
			Economic Growth	Industry Connectivity	State of Good Repair	Reduce Highway Impacts	Safety, Security & Resiliency
Tier 1	RCP&E – Huron to Yale Line	Bridge & Line Upgrades	●	●	●	●	●
Tier 1	DMWR – Britton Line	Rail Upgrade	◐	◐	●	◐	●
Tier 1	Dakota & Iowa – Sioux Valley Sub	Rail, Bridge & Siding Repairs	●	●	●	●	●
Tier 1	Dakota Southern – MRC Line	BNSF Conn, Rail, Bridge & Siding Upgrades	●	●	●	◐	●
Tier 2	Dakota Southern – Napa to Platte Line	Interchange, Rail & Bridges Upgrades	●	◐	◐	◐	●
Tier3	RCP&E – Wolsey Interchange	Wolsey Interchange	●	●	●	◐	●

● = High Benefits ◐ = Potential Benefits ● = No Change

Reduce Highway Impacts

Two projects provide high benefits to the State's goal of reducing highway impacts through increasing the competitiveness of rail service versus truck, thus leading to reduced truck VMT within the state. These are the Dakota Southern - MRC line, and the RCP&E - Wolsey Interchange. If the Dakota Southern - Napa to Platte line is put into service, this line also has the potential to replace truck trips with rail service, bringing additional benefits to the State. Table 56 shows the ranking of State-owned rail system projects that support reducing highway impacts within the state.

Table 56. Ranking of State-owned Rail System Projects that Reduce Highway Impacts

	Rail Line	Project	Rail Plan Goals				
			Economic Growth	Industry Connectivity	State of Good Repair	Reduce Highway Impacts	Safety, Security & Resiliency
Tier 1	Dakota Southern – MRC Line	BNSF Conn, Rail, Bridge & Siding Upgrades					
Tier 1	RCP&E – Wolsey Interchange	Wolsey Interchange					
Tier 2	Dakota Southern – Napa to Platte Line	Interchange, Rail & Bridges Upgrades					
Tier 2	DMWR – Britton Line	Rail Upgrades					
Tier3	RCP&E – Huron to Yale Line	Bridge and Line Upgrades					
Tier3	Dakota & Iowa – Sioux Valley Sub	Rail, Bridge & Siding Repairs					

= High Benefits = Potential Benefits = No Change

Improve Railroad Safety, Security, and Resiliency

Three projects provide high benefits to the State's goal of improving railroad safety, security, and resiliency by reducing the vulnerability to flooding in high-risk flood areas. These are the RCP&E– - Huron to Yale Line, Dakota, Missouri Valley & Western - Britton Line, and the Dakota & Iowa Sioux Valley Subdivision. On each of these lines, tracks will be upgraded in areas of the state most likely to experience damage due to flooding. Table 57 shows the ranking of State-owned rail system projects that increase safety, security, and resiliency through reducing the vulnerability of state assets to extreme weather events.

Table 57. Ranking of State-owned Rail System Projects that Improve Safety, Security, and Reliability

	Rail Line	Project	Rail Plan Goals				
			Economic Growth	Industry Connectivity	State of Good Repair	Reduce Highway Impacts	Safety, Security & Resiliency
Tier 1	RCP&E – Huron to Yale Line	Bridge & Line Upgrades					
Tier 1	DMWR – Britton Line	Rail Upgrade					
Tier 1	Dakota & Iowa – Sioux Valley Sub	Rail, Bridge & Siding Repairs					
Tier3	Dakota Southern – MRC Line	BNSF Conn, Rail, Bridge & Siding Upgrades					
Tier3	Dakota Southern – Napa to Platte Line	Interchange, Rail & Bridges Upgrades					
Tier3	RCP&E – Wolsey Interchange	Wolsey Interchange					

= High Benefits = Potential Benefits = No Change

RECOMMENDED SUPPORTING STRATEGIES

The previous sections of this summary have focused on the physical needs of South Dakota's rail system. There are other supporting actions and initiatives that South Dakota and its rail stakeholders can take to realize the State's vision for rail. The supporting actions are outlined below under the relevant State Rail Plan goal. It is expected that this list of strategies will be used as an action list by the South Dakota DOT and public and private rail stakeholders in the coming years.

SUPPORT ECONOMIC GROWTH AND DEVELOPMENT

South Dakota business, industry, and government leaders continue to emphasize the importance of statewide economic growth and development activities. The State can support local and regional economic development efforts by the following actions:

- Be an advocate for State, regional and local efforts that:
  - Increase freight handling capacity and capabilities (including grain shuttle facilities, transload facilities and industrial parks),
  - Develop and promote existing and new local freight connections, and/or
  - Increase rail siding availability and length.
- Be an advocate for short line railroads to upgrade track and maintain their systems in a state of good repair.
- Proactively work with local economic development and planning/zoning agencies to obtain local buy-in and advance projects that increase economic development opportunities.
- Consider financial support of projects that advance State Rail Plan goals, in a manner commensurate with benefits received.

ENSURE CONNECTIVITY FOR CRITICAL INDUSTRIES

Providing competitive, efficient, and reliable rail connections to existing and emerging industries helps lower the cost of doing business in the State, broadens the market reach for South Dakota products, and is a critical component of business attraction and retention strategies. South Dakota can ensure that key State industries have competitive and efficient links to the broader rail networks through the following actions:

- Proactively work to maintain, and increase, access for South Dakota shippers to Class I rail operators.
- Coordinate identifying rail investment needs (bottlenecks), and quantifying their impacts to South Dakota, with neighboring states, including Iowa, Minnesota, North Dakota and Nebraska.
- Be an advocate for National rail system investments that ensure efficient and reliable service and connections for South Dakota's key industries across Class I transcon corridors and at deep water export ports.

- Consider financial support of projects that advance State Rail Plan goals, in a manner commensurate with benefits received.

MAINTAIN STATE RAILROAD ASSETS IN A STATE OF GOOD REPAIR

Over the years, the State of South Dakota has acquired numerous small rail lines that primarily provide local service and serve as last-mile connections for local industries to the transcontinental freight rail network. Today, many of these lines have significant capital and ongoing maintenance needs. In addition to physical system investments, the State can ensure that these assets are preserved and will be available to provide value to the State and its residents now and in the future by the following actions:

- Develop and maintain a short-/long-range rail investment needs inventory in partnership with railroad owners and operators that is consistent with needs identified in this State Rail Plan.
- Work towards achieving minimum standards for all active, State-owned rail lines, including "heavy" rail and 286K-compliance.
- Require rail operators to develop annual maintenance plans for State-owned rail lines.
- Proactively work to secure funding for maintaining and improving the State-owned rail system, including:
  - Maximize and leverage State investments through available State and Federal grant and loan programs (e.g., TIGER and RRIF),
  - Pursue Public-Private Partnerships (PPPs) and secure private and public funds to support projects, and
  - Proactively work with the State Legislature to provide education on the benefits of rail.
- Consider financial support of projects that advance State Rail Plan goals, in a manner commensurate with benefits received.
- Proactively preserve rail system service, infrastructure and assets in South Dakota, to capitalize on future opportunities.
- Request the State Legislature explore and enact a policy regarding rail line preservation.
- In rail preservation, consider criteria such as[110]:
  - Existing industry base using the line;
  - Potential industrial customers not presently using the line but can be accessed by it;
  - How the line is connected to the national railroad system;
  - Geography of the line and its potential service territory;
  - Unique circumstances affecting operating costs and revenue potential; and
  - Regional vision for the future (what is expected to happen in the area served over the next 50 years?).

[110] As taken from the Oregon State Rail Plan, 2014.

REDUCE HIGHWAY IMPACTS

The current lack of rail service in some areas of South Dakota leads to higher transportation costs for producers who must rely on trucks to get product to market, which subsequently places a higher burden on the highway system, both in terms of weighted load and truck vehicle miles traveled. The State can reduce the burden on the highway system by taking the following actions:

- Coordinate among DOT divisions, system owners, operators, jurisdictions and other partners to ensure the rail system is integrated as a component of the broader multimodal transportation network in South Dakota.
- Be an advocate for increasing rail use by South Dakota businesses through projects, programs, and policies that:
  - Emphasize intermodal, multimodal, and first- and last-mile connectivity to key facilities,
  - Encourage and provide incentives for industrial land uses and development that are near and have access to rail lines, and
  - Increase freight handling capacity and capabilities in areas considered "transportation disadvantaged."
- Consider financial support of projects that advance State Rail Plan goals, in a manner commensurate with benefits received.

IMPROVE RAILROAD SAFETY, SECURITY, AND RESILIENCY

Safety, security, and resiliency on the South Dakota railroad network goes hand in hand with economic growth and development. The State can further the safety, security, and resiliency of the system by the following actions:

- Coordinate and support safety and security awareness programs, operational improvements, new technology and equipment that promote overall system safety and security.
- Support efforts that further the safety and security of employees working on the rail system, communities near the rail lines and the commodities being transported by rail through the State.
- Work in partnership with railroad operators, state and federal agencies, local communities, and emergency response providers to provide for the safe and secure transport of commodities throughout the State, nationally, and internationally.
- Design transportation projects to avoid, reduce or address potential safety concerns with at-grade or grade separated crossings.
- Work toward rail system connectivity, resiliency and redundancy within the overall transportation system to help South Dakota mitigate and recover quickly from natural disasters or human caused disruptions.
- Consider financial support of projects that advance State Rail Plan goals, in a manner commensurate with benefits received.

APPENDICES

A. SUMMARY OF SOUTH DAKOTA STATE RAIL PLANS

This appendix provides an overview of the past nine South Dakota State Rail Plans conducted between 1978 and 1997, including recent accomplishments pressing issues at the time of plan development.

Photo this page: South Dakota Wheat Growers elevator in Huron, South Dakota

Table A.1 Summary of South Dakota State Rail Plans – Previous Accomplishments and Current Issues

Year	Previous Accomplishments	Current Issues (During Plan Year)
1978	• Creation of a Task Force to study the rail system • Creation of a Railroad Advisory Commission • Railroad Revitalization and Regulatory Reform Act of 1976 (4-R Act) • Designation of "Intensive Study Lines" • Pertinent rail-related data collected on every rail segment • Priority classification of rail lines • Bill similar to "Iowa Plan" allowing State to share one-third of cost to rehabilitate • Second Bill making it legal for local government to form bonding districts • Statewide Rail Users Association formed • Meetings with shippers, receivers, and State departments/agencies	• No State program to give rail financial support • 51 percent of all rail lines potentially subject to abandonment • Historically railroads won abandonment repeals without regard to the State • No major classification yards, shops, terminals, etc. • Denied a major transcontinental line until 1905 • State lacks major north-south lines of interstate importance • Lack major industries and industrial centers which rely on rail service • Consists of largely branch lines and lower volume secondary lines • Drought (1976) had significant impact on agriculture and therefore rail • Irrigation of land to provide better yield and also require more fertilizer • No rail passenger service and would not be economically feasible • Inadequate designation of National defense rail lines • Rail traffic not up to maximum • Some lines are not self-supporting • Three carriers are not financially sound • Difficult to retain rail service once an abandonment case has been filed • Only rail segment eligible for rail assistance – Wren, Iowa to Iroquois, South Dakota • Abandonment of lines move traffic to highway and deteriorates roadways • Elevator operators hesitant to modernize/expand due to uncertainty of service
1980	• Federal monies approved for use on Miles City Extension (681 miles) • Bill modeled after "Iowa Plan" • Second bill for local government to form regional railroad authorities • 1979 State Legislature increased manpower and budget for Division of Railroads • Some railroad regulatory functions transferred to DOT • 1980 State Legislature created South Dakota Railroad Authority • Appropriation of $25 million to implement purchase plan • Purchase of 429 miles of core system and 825 miles of local option lines • 1980 Legislation created South Dakota State Railroad Board • Project recommendation made September 1980 with construction starting in 1981 • Clearance restrictions no longer part of rail plan	• Illinois Central Gulf (ICG) abandoning line • Milwaukee Road bankruptcy – loss of 1,400 miles • Poor condition of lines makes rehab/maintenance of all unrealistic • Negotiating with Milwaukee Road to buy 760 miles of abandoned lines • Considering lease of 55 miles of Milwaukee Road lines • Considering purchase of 19 miles of C&NW line • Abandoned Milwaukee Road lines not under consideration for funds • State wants to be in a position to focus on lines in purchased system • Only about 1,700 miles left in State with 26 percent potentially subject to abandonment • Cost of moving grain elevators from abandoned lines

Year	Previous Accomplishments	Current Issues (During Plan Year)
	• LRSA extends rail planning and project assistance • FRA approval of $3.5 million rehab on C&NW Blunt to Gettysburg line • Meetings with shippers, receivers, and State departments/agencies • Opening of Big Stone Power Plant led to increased coal carloads • Cost/Benefits of Railroad project alternatives	• Loss of traffic to motor carriers severely reduced revenue potential • Loss of 48.9 percent of operating rail mileage in five years • Drought caused inadequate traffic for many lines • Lack of centralized manufacturing centers and energy sources • Lightweight rail incapable of handling heavy loads • Rail lines must still use box cars which are no longer standard • Coordination of 30 days of service on abandoned Milwaukee Road line to release grain storage • State Supreme Court ruled gas tax cannot fund rail operations from highway fuels • Lowered cost of grain has hurt South Dakota farmers
1981	• History of Task Force and 4-R Act • Milwaukee Road main line project completed in 1980 • 7 projects recommended for funding • 4 projects prioritized for available funding • Staggers Rail Act of 1980 • Identification of lines essential to State needs • Illinois Central Gulf abandonment being appealed • Core system established to identify essential operations • CONRAIL and Amtrak examples • 1980 Legislature approved purchase of up to 1,254 miles • Purchase of 433.5 miles of core system and 303 local option lines • 1981 Legislature approved core system and permitted operation • 30 days of Directed Service Funding to restore permanent service • BN as core system operator – funds for track improvements not operations • Overview of each railroad segment • Commodity price, volumes, and expected growth • Congress proposed funding of "Section 803" for 3 years • Evolution of car tracking systems • Tracked flows for South Dakota shippers to create contract with car tracking company • Update to cost/benefit studies of 1980 Addendum • Public participation is integral to process • BN started operation once Class I standards met • Working to upgrade system to unit train standards • Intensive study of Pierre to Huron and Milbank to Sisseton	• $3.5 million rehab project approved by FRA, shippers could not afford to match • Rail network is light-density branch lines • Use of modern jumbo hopper cars prevented • Loss of traffic has led to reduced revenue potential • Fluctuating demand has been one of root causes of decline • Significant abandonment, especially due to Milwaukee Road bankruptcy • Lines approved for rehabilitation to Miles City filed for abandonment • South Dakota Rail Line Inventory Study didn't account for interrelationships • Only passenger service is seasonal tourist excursion • Many essential lines abandoned because of Milwaukee Road • Private solution could not be found to restore this service • Loss of main line between Gascoyne and Big Stone City threatened power plants • Grain needs an efficient bulk carrier • Volumes of fertilizer and irrigation • Large needs makes choosing application of funding difficult • No core system met Class II standards • Supply and demand for car supply

Year	Previous Accomplishments	Current Issues (During Plan Year)
1983	• Division of Railroads within DOT abolished • Railroad Advisory Commission abolished • Commission's duties transferred to Railroad Board • Public awareness important in rail planning • Service restored to all State-owned core system lines • Some noncore lines had minimum service restored • 6 projects in process in 1983 season • Purchase of Milwaukee Road track from Ortonville to Terry • BN and St. Louis and San Francisco Railroad merger • 483 miles approved for abandonment (1981-1982) • 336 miles put back into service in 1982 • 2 new rail companies formed to restore service • Projects using state and/or Federal funds on 390 miles of railway • New rail bridge over Missouri River at Sioux City • Milwaukee Road no longer owns any track in State • Tonnage carried on rail in State up over 3 percent • Stability assessment of lines (3 categories) • Only 3 operating lines in State not eligible for funding • Core system operating well but traffic needs to develop • Possible purchase of State-owned system in coming years • Economic analyses of five line segments • Study of Watertown area freight transportation system	• Remainder of noncore lines not shown to be feasible • Many miles remain of low density and poor condition • Operating trackage down to 1,989 miles from 4,420 • Illinois Central Gulf eliminated from list of railroads • Abandonment certificate delayed, line unused for 1 year • 86.7 miles of BN track operations cannot have 100-ton hopper cars • Fully loaded hoppers can only be used on one of C&NW's segments • Carloadings down 10 percent from 1977 • Only 3 rail lines in State carry over 3 million gross tons per mile • No passenger rail service, Amtrak unlikely to be extended • 21 percent of statewide mileage in Category I, II, or III • 7 lines (356.9 miles) threatened • 10 lines (354.5 miles) weak • Budget cuts at Federal left current program without funds
1984	• Aberdeen Rail/Highway Grade-Crossing Study • South Dakota receiving $2.1 million in 1985 for grade crossing	• Impacts of increasing train frequency • Highway users don't know if a rail line has been abandoned
1986	• Public interaction/shipper surveys • All lines with urgent needs have been analyzed • Napa to Platte line returned to service • Formation of Dakota Southern Railway Company • Improvement projects on 87 miles of railway • State sold Sioux Falls to Trent line • Expansion of unit grain train movements	• 98.8 miles approved for abandonment since last plan • One BN line has weight restriction hindering use of hopper cars • C&NW can only use hopper cars on one segment • Rail network must rely solely on freight • 16 percent of mileage in Category I, II, or III • 5 rail lines "threatened" (301.7 miles) • 10 rail lines currently "weak" (408.4 miles)

Year	Previous Accomplishments	Current Issues (During Plan Year)
	• Expansion of export grain market in Pacific NW • Twin 42-foot grain trailer program • Lower transportation costs for grain movements • $500,000 for intersection modifications for twin 42s • Only five operating lines not eligible for funding • Negotiating new lease with BN for continued operation • Potential C&NW sale and upgrade	• Competition from other modes (truck/barge)
1989	• Better shipper/railroad relations • More shortlines/fewer Class I • Rail traffic continues to exceed 1980 forecast • Pace of changes has slowed, fewer updates • Creation of DM&E • New short line – Sisseton Southern Railroad • Dakota Southern Railway Company formed • Formation of D&I Railroad • July 1986 – New core system agreement • 1987 completion of Ortonville-Terry rehab • 3 rail rehab projects initiated since 1986 plan • Steady number of cars, greater tonnage • Capacity limit on 315.4 miles has increased to 263,000 pounds • Unit trains have made the major difference	• Fewer miles of track than in 1986 • LRSA Federal funds have greatly diminished • LRSA expired Sept 1988 • Future Federal funding uncertain • All but 2 lines of DM&E can accommodate hopper cars • Terminating traffic continued trend of steady decline • 3 lines approved for abandonment since 1986 Rail Plan
1992	• 1991 Legislation Transferred Division of Railroads to DOT • Pace of changes slowed, fewer updates • All lines with urgent need and would benefit have been analyzed • 1990 – BN repaid loan for Ortonville-Terry line • Railroad Trust Fund helps fund rehabilitation • 1986 – Creation of DM&E • 1991 – Completion of Hawarden-Beresford line • Amendment of agreement with BN to extend to 2020 • August 1991 ownership of South Dakota Mainline transferred to BN • 1992 – C&NW and UP make joint filing for 25 percent control of C&NW stock • Growth of unit trains and loading facilities	• 2 local option lines purchased by State not operating • Availability of Federal assistance increasingly problematic • Local Rail Service Assistance program expired in 1988 • Support for Local Rail Freight Assistance program is erratic • Federal role in rail rehab has greatly diminished • Abandonment of Platte-Wagner line • Future of Kadoka to Rapid City line uncertain • All but 2 lines operated by DM&E capable of carrying hopper cars • 4 “threatened” lines • 4 other lines in need of assistance

Year	Previous Accomplishments	Current Issues (During Plan Year)
	• Surviving lines can be supported by traffic they carry	
1997	• Huron to Yale rail line rehabilitation project • Sisseton to Milbank rail line rehabilitation project • 1993 Flood Repair Projects – FRA Grant • Colony Line rehabilitation project • Sale of the Colony Island (UP to DM&E) • Light-weight rail replacement project on the D&I Railroad Line • Core line rehabilitation and rail replacement program • Unit Train Loading Facility Improvement at Midland • Northern Hills Regional Railroad Authority – development of passenger rail service • No rail lines potentially subject for abandonment	• Abandonment of the rail line from Watertown to Sioux Valley Junction (44 miles) • Abandonment of the rail line from Aberdeen to Hecla • Two State-owned rail segments in nonoperating status • LRFA authorization expired and State does not have resources to replace the loss of such funds • BNSF line from Aberdeen to Rutland, North Dakota-only line which may be threatened by abandonment • Rapid City to Pierre still experiencing major problems regardless of ongoing efforts • Mitchell to Kadoka speeds still restricted to 5-10 miles per hour, large investment required for upgrade • Hecla to Oaks, North Dakota has contacted regarding availability of funds to rehabilitate this line • Uncertain if revenue generated from agreement with BNSF will be adequate

B. Listing of South Dakota Regional Rail Authorities

Table B.1 South Dakota State Railroad Authorities

	Railroad Authority	Area Covered
1	Aberdeen-Brown County Regional Railroad Authority	Counties: Brown, Spink, Beadle, Edmunds Cities: Aberdeen
2	Beadle County Regional	Counties: Beadle Cities: Huron
3	Brookings County Regional Railroad Authority	Counties: Brookings Cities: Volga
4	Butte County Regional Railroad Authority	Counties: Butte Cities: Belle Fourche
5	Dakota Regional Railroad Authority	Counties: Cities:
6	Day County Regional Railroad Authority	Counties: Day Cities: Bristol, (Town of Andover)
7	East Central Regional Railroad Authority	Counties: Beadle Cities: (Cavour Township)
8	Grant County Regional Railroad Authority	Counties: Grant Cities: Milbank
9	Haakon County Regional Railroad Authority	Counties: Haakon Cities: (Town of Midland)
10	Hand County Regional Railroad Authority	Counties: Hand Cities: Miller
11	Hughes County Regional Railroad Authority	Counties: Hughes Cities: (Town of Harrold)
12	Hyde County Regional Railroad Authority	Counties: Hyde Cities: Highmore
13	Kingsbury County Regional Railroad Authority	Counties: Kingsbury Cities: Lake Preston
14	Lake Area Regional Railroad Authority	Counties: Lake Cities: Madison
15	Lake-Minnehaha County Regional Railroad Authority	Counties: Minnehaha, Lake Cities: None
16	Marshall Regional Railroad Authority	Counties: Marshall Cities: Britton
17	McLaughlin-Corson County Regional Railroad Authority	Counties: Corson Cities: McLaughlin
18	MRC Regional Railroad Authority	Counties: Davison, Aurora, Brule, Lyman, Jones, Jackson Cities: None
19	NAPA-Platte Regional Railroad Authority	Counties: Charles Mix, Bon Homme Cities:
20	Northeast Roberts Regional Railroad Authority	Counties: None Cities: Rosholt, (White Rock Township)

	Railroad Authority	Area Covered
21	Northern Hills Regional Railroad Authority	Counties: None Cities: Lead, Deadwood, Belle Fourche, Spearfish, Sturgis, Whitewood
22	Roberts Regional Railroad Authority	Counties: Union, Turner Cities: Alcester
23	Sioux Valley Regional Railroad Authority	Counties: Roberts Cities: Sisseton
24	Southern Union County Regional Railroad Authority	Counties: Union City Cities: Jefferson, Elk Point
25	Sully County Regional Railroad Authority	Counties: Sully Cities: Onida
26	Turner County Regional Railroad Authority	Counties: Turner Cities: Marion
27	Watertown-Codington County Regional Railroad Authority	Counties: Codington Cities: Watertown

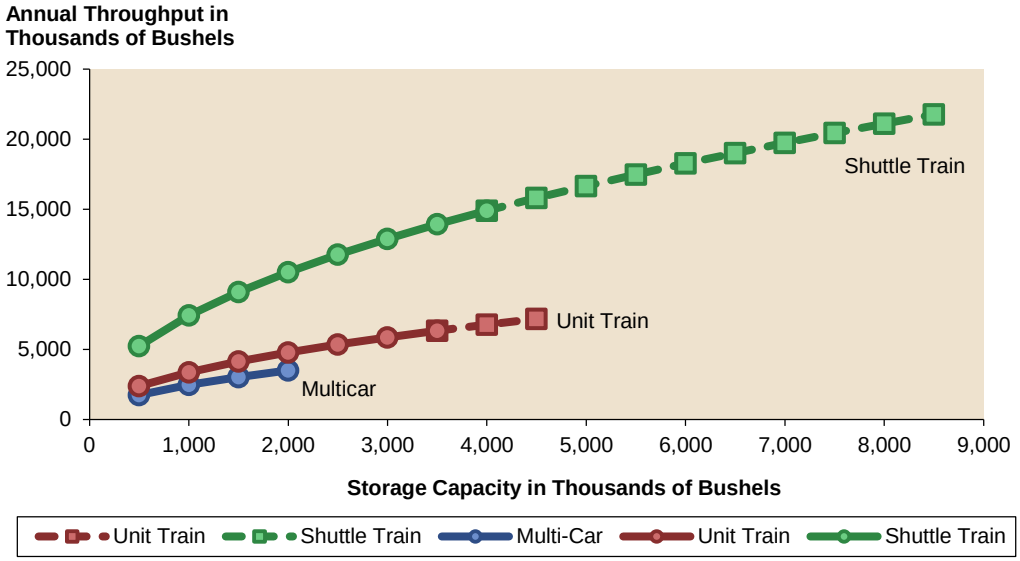
C. Demand and Throughput of Grain Elevators in South Dakota Estimation Methodologies

Using USDA's 2012-13 agricultural crop production data for South Dakota, 2022-23 national crop use projections, and rail utilization assumptions for domestic grain and seed of 60 percent and export grain of 90 percent, the existing and anticipated demand for outbound grain and seed by rail are estimated to be 265.6 million bushels and 398.5 million bushels annually, or 7.1 million tons and 10.5 million tons annually, respectively. In South Dakota, corn, soybeans, and wheat lead crop production and their peak harvest months range from October-November, September-October, and July-August, respectively. Some harvesting also takes place in the fringe months. There also are other crops such as oats, barley, sorghum, and dry beans that are produced in South Dakota and have their own harvest season. Fifteen percent of this annual volume is assumed to be delivered during a peak month. Therefore, the peak month demand for outbound grain by rail is estimated as 39.8 million bushels for 2012-13 and 59.8 million bushels for 2022-23. The crop wise grain rail demand is assumed to be distributed among the agricultural districts in South Dakota based on the crop production among the counties. The aggregate grain by rail demand for agricultural districts is the sum of the crop-wise demand values for the agricultural district.

In order to estimate the throughput of grain elevators in South Dakota, the methodology described in a North Dakota study[111] was used. This study established a relationship between the annual throughput of a grain elevator (with over one million bushels of annual volume) to the track capacity and the storage capacity. Grain elevators were classified into the following track capacity types: a) multicar (<50 rail cars); b) unit train (50-100 rail cars); or c) shuttle train (>100 rail cars). Multicar type grain elevators are typically not designed to handle large volumes, and on the other end, shuttle-train type grain elevators are designed to have high throughput with turnaround of 110-car train loads in fewer than 15 hours. Unit train type grain elevators handle moderate volumes, but the train turnaround times may not be as low as the shuttle train type grain elevators. The storage capacity is typically built to handle a mix of commodities and sometimes perform services such as blending of grains. Grain elevator storage capacity also is built to handle early arrivals of trains, delays in replenishment of grains, and weather events. Figure C.1 shows the relationship between annual throughput and storage capacity for grain elevators by track capacity type.

[111] Upper Great Plains Transportation Institute, North Dakota State University, Fargo, North Dakota. *Trip Generation Rates for Large Elevators: A North Dakota Case Study,* Final Report, December 2006.

Figure C.1 Annual Throughput versus Storage Capacity for Grain Elevators by Track Capacity Type



Source: *Upper Great Plains Transportation Institute, North Dakota State University, Fargo, North Dakota Trip Generation Rates for Large Elevators: A North Dakota Case Study, Final Report, December 2006.*

Note: *The dashed portions of the graphs are extrapolated estimates made for the purposes of this Rail Plan. The ranges of data used in the model estimation in the North Dakota Study were as follows:*

- [a] *Shuttle train type elevator storage capacities ranged from 0.5 million bushels to 3.7 million bushels, while throughput ranged from 3.7 million bushels to 16.3 million bushels.*
- [b] *Unit train type elevator storage capacities ranged from 0.3 million bushels to 3.4 million bushels, while throughput ranged from 1.1 million bushels to 10.2 million bushels.*
- [c] *Multicar type elevator storage capacities ranged from 0.2 million bushels to 2.0 million bushels, while throughput ranged from 1.0 million bushels to 7.2 million bushels.*

Although data on track capacity type is available for all grain elevators in South Dakota, data on storage capacity is available only for BNSF grain elevators in South Dakota.[112] In order to assess statewide throughput, therefore, the storage capacity of the other grain elevators was assumed as the average storage capacity by track capacity type estimated for the BNSF grain elevators in South Dakota as shown in Table C.1.

[112] http://www.bnsf.com/customers/grain-facilities/elevators/menu/sdlist.html (last accessed on April 9, 2014).

Table C.1 Average Storage Capacities of Grain Elevators in South Dakota by Track Capacity Type, in bushels

Grain Elevator Type	Average Storage Capacity in Bushels
Multicar	560,000
Unit Train	2,200,000
Shuttle Train	3,640,000

Source: *BNSF Grain Terminals List for South Dakota, available at: http://www.bnsf.com/customers/grain-facilities/elevators/menu/sdlist.html (last accessed on April 9, 2004); Kimball Facility data.*

Note: *The average is not taken for all terminals in South Dakota, only those listed in BNSF Grain Terminals List. The averages were determined for Multicar, Unit Train, and Shuttle Train types using data for twenty-eight (28), twelve (12) and nineteen (19) number of grain elevators, respectively.*

Using the actual and estimated storage capacity and the relationship shown in Figure C.1, the total annual throughput for all grain elevators in South Dakota was estimated as 686.2 million bushels annually. The total monthly throughput for the grain elevators was estimated by dividing the annual value by 12, and is 57.2 million bushels. The throughput for each county in South Dakota is based on the grain elevators located in the county.