United States Department of the Interior
National Park Service

National Register of Historic Places Multiple Property Documentation Form

This form is for use in documenting multiple property groups relating to one or several contexts. See instructions in *How to Complete the Multiple Property Documentation Form* (National Register Bulletin 16B). Complete each item by entering the requested information. For additional space, use continuation sheets (Form 10-900-a). Use a typewriter, word processor, or computer to complete all items.

☒ New Submission ☐ Amended Submission

A. Name of Multiple Property Listing

Railroads in Minnesota, 1862–1956

B. Associated Historic Contexts

Railroad Development in Minnesota, 1862-1956
Railroads and Agricultural Development, 1870-1940
Urban Centers, 1870-1940
Minnesota Tourism and Recreation in the Lake Regions, 1870-1945
Northern Minnesota Lumbering, 1870-1930s
Minnesota's Iron Ore Industry, 1880s-1945

C. Form Prepared By

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D. Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this documentation form meets the National Register documentation standards and sets forth requirements for the listing of related properties consistent with the National Register criteria. This submission meets the procedural and professional requirements set forth in 36 CFR Part 60 and the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation. (☐ See continuation sheet for additional comments.)

Signature and title of certifying official Barbara Mitchell Howard, Deputy State Historic Preservation Officer, MHS Date

State or Federal Agency or Tribal Government

I hereby certify that this multiple property documentation form has been approved by the National Register as a basis for evaluating related properties for listing in the National Register.

Signature of the Keeper of the National Register Date of Action

☒ see continuation sheet

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Provide the following information on continuation sheets. Cite the letter and the title before each section of the narrative. Assign page numbers according to the instructions for continuation sheets *in How to Complete the Multiple Property Documentation Form* (National Register Bulletin 16B). Fill in page numbers for each section in the space below.

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Section E. Statement of Historic Contexts

I. Railroad Development in Minnesota, 1862-1956

Setting the Stage: Early Railroads

Due to the country's vast geographic expanse, transportation has always been a significant issue in America, influencing production, trade, travel, and communication in ways unknown to more compact European nations. In particular, as Euro-American settlers streamed into the trans-Appalachian west during the early nineteenth century, the United States needed an overland transportation system to link different regions of the country. From early roads to canals and finally to railroads, Americans built a transportation system by the turn of the twentieth century that was larger and more complex than any other in the world.

The transformation of transportation in America began with the era of canal building. Although a system of roads extending westward from the major seaports had been established by 1820, water-borne transportation was more efficient for shipping heavy freight and generally faster than overland transport. Completion of the Erie Canal in 1825 demonstrated that canals could be built over long distances to connect major waterways and could be operated profitably. The immediate success of the Erie Canal led to a canal building boom that lasted through the 1830s. The network of canals and natural waterways provided antebellum America with important interregional links to exchange raw materials and manufactured goods, to transport passengers, and to deliver mail.

When the Baltimore and Ohio Railroad began construction on the first railroad in the United States in 1828, Baltimore city leaders had chosen to support that mode not because they had faith in the new technology, but because building a canal over mountainous terrain to the Ohio River was not feasible. Waterways remained the leading mode of transportation through the 1850s. In 1859, however, railroads surpassed canals in freight traffic and began a 60-year run as the single most dominant form of transportation. The advantages of railroads over other forms of transportation were numerous. Railroads were fast: for the first time in history, overland travel could move faster than the speed of a horse. Railroads were relatively reliable: due to their own operating and scheduling requirements, companies established timetables and a standard timekeeping system. Furthermore, because they required fewer transshipments than water-borne freight and were not slowed by the limitations of animal power, railroads were more efficient, especially for long hauls. Railroads were less expensive to maintain than canals, and routes were more direct because tracks were less dependant on topography and hydrology. In addition to their advantages in hauling freight, railroads dramatically reduced passenger travel times. For example, while a trip from New York to Chicago previously required two weeks of travel, railroad connections by the early 1850s trimmed travel time to two days.

By the early 1830s, numerous railroad charters were created with the intention to link cities on the eastern seaboard to each other and to the West. Often railroad construction was slower and more expensive than anticipated. The initial routes were often short lines connecting two cities, and connections to other lines were haphazard, due to differences in equipment and track gauges. Often no physical link existed between railroads. Nonetheless, the miles of track increased nationally to approximately 1,000 miles by 1835, then to 2,800 in 1840, and 8,900 by 1850. Most of that mileage was concentrated in the Northeast, which had a basic railroad network by 1850, predominately of tracks that already conformed to what would become the standard gauge of 4 feet, 8½ inches.

Railroad construction during the 1840s was only a prelude to the rapid expansion during the 1850s, when railroad mileage more than tripled from 8,900 to over 30,000 miles. The combination of a generally prosperous economy, expanding Euro-American settlement into new areas, and abundant optimism in the future of railroad transportation, along with generous subsidies, grants, and bonds from federal, state, and local governments, all acted to stimulate rapid growth. While state and local governments borrowed millions of dollars to help finance railroad construction, the largest subsidies came from the federal government, which granted railroad companies 25 million acres of land during the 1850s and a total of 175 million acres by 1871. Although 70 railroad companies received land grants, 70 percent of the acreage went to only four companies, which included the Northern Pacific in Minnesota. The land grants did not provide immediate capital for the railroads, but they did provide substantial collateral for loans and encouraged railroad construction into new territories in advance of settlement.

Although the 1850s was a period of rapid expansion for the railroads, by the eve of the Civil War the United States still did not have an integrated system. Differing track gauges between regions and companies required frequent transfers for freight and passengers traveling long distances, and a lack of rail service meant reverting to water-borne or animal-powered transportation. For example, due to a lack of rail connections as late as the early 1860s, a trip from Chicago to St. Paul (half the distance from New York to Chicago) still required two to three days, as travelers had to transfer from railroad cars to steamboats at La Crosse or Prairie du Chien, Wisconsin. Perhaps more dramatically, a trip from St. Paul to the Pembina settlement on the Red River (roughly the same distance as Chicago to St. Paul) required two weeks of travel via keel boat or ox cart.

The Golden Age: 1865 through World War I

Following the Civil War, railroad mileage in the United States more than quadrupled, primarily during three great waves of expansion: 1868 to 1873; 1879 to 1883; and 1886 to 1893. After the first period of expansion, a vast rail network extended from the Atlantic coast on the east to the Twin Cities in the northwest and to Kansas City in the southwest, with connections to the West Coast via the Union Pacific line. This area contained a mix of integrated agricultural and industrial areas that would become America's manufacturing and corn belts. During the late 1870s to early 1890s, railroad construction expanded the existing rail systems east of the Mississippi River and extended railroad service into less developed areas to the west. In addition, companies completed the **Northern Pacific** (see company history, page 126) and **Great Northern** (see company history, page 85) transcontinental routes, plus connections to the Canadian Pacific transcontinental line via the **Minneapolis St. Paul and Sault St. Marie (Soo Line)** (see company history, page 111), and the Union Pacific via the Chicago St. Paul Minneapolis and Omaha or Omaha Road (part of the **Chicago and North Western [C&NW]** system) (see company history on page 35) (Borchert 1987; Brownlee 1979:272).

As cities grew larger and an integrated national economy emerged during the mid to late nineteenth century, different regions of the United States became interdependent. In addition, cities, towns, and rural areas came to depend on each other for raw materials, processed foods, manufactured goods, labor, distribution, and markets for their respective products. The eastern part of the United States counted on the western population to provide markets for goods manufactured in eastern factories as well as a labor force for obtaining extractive resources (coal, minerals, lumber) that were needed to produce the manufactured goods. Similarly, the western part of the country relied on the eastern as a market for its commodities and to provide goods. Without a growing western population, no market would exist, nor the need for the shipment of resources and goods between the East and West. This pattern was reproduced on a smaller scale throughout the country for different resources and goods as large cities developed a mutual interdependence with their rural hinterlands. Rural areas, undergoing economic and population growth of their own, developed towns and smaller cities which maintained interdependent relationships with their own hinterlands. The railroads facilitated this symbiotic relationship between city and country. They hauled raw materials and agricultural produce into the city and carried manufactured or processed goods out into the country, while passengers and mail traveled in both directions.

Although Minnesota's first railroad was completed in 1862, the state's railroad history extends back to the territorial period. As the first national wave of railroad construction was under way during the 1850s, Minnesota leaders began planning for the future state's rail network. After receiving congressional approval to set aside public lands to aid in railroad construction, the territorial assembly allocated lands for four rail projects in 1857. Despite the failure of the originally chartered companies to build those rail lines in the proscribed time, the corridors identified, nonetheless, would later become important mainlines in the state's rail network: Minnesota and Pacific (Great Northern), Transit (Winona and St. Peter/C&NW), Root River and Southern Minnesota (Omaha Road and a portion of the Chicago Milwaukee and St. Paul's [CM&StP] Southern Minnesota line), and Minnesota and Cedar Valley (CM&StP Central Minnesota). A few railroad alignments were graded, but the Panic of 1857 dampened speculative investment, and venture capital to fund railroad construction remained limited through the end of the Civil War.

System Building

In the years from 1865 to 1893, railroad construction in Minnesota generally followed the boom and bust cycles of the national economy (Table 1). Between 1865 and 1873, there was a burst of construction, and the pioneer mainlines were partially or completely built across the state. From 1877 and through the 1880s, the mainline routes were completed and numerous branch lines were built to provide interconnecting networks. By 1893, the systems were essentially completed in the southern two-thirds of the state and in the Red River Valley. After the turn of the century, construction focused on upgrading existing lines and adding new service to the northern logging and Iron Range areas.

Just as the mature rail network would later focus on the Twin Cities, railroad construction during the 1860s focused on St. Paul, which was the head of steamboat navigation on the Mississippi River, and the cities of Minneapolis and St. Anthony, which had massive waterpower potential. The St. Paul and Pacific line, which had received the old Minnesota and Pacific charter, completed the line from St. Paul to both St. Anthony and Minneapolis in 1862. Projects to extend connections to the south, southeast, southwest, north, and northwest were all begun before the end of the decade. In addition, three lines began building westward from the Mississippi River in southern Minnesota, and another line extended westward from Duluth.

Early Minnesota routes generally were intended to connect the existing nodes of population and commerce, which were located on the navigable waterways. To connect those points, however, the railroads were built through many thinly settled areas. While the terminal points generated passenger and freight traffic, railroad companies could not rely on local traffic to supplement their income. East of the Mississippi River, railroads typically were built in settled areas with established markets and were expected to begin generating substantial revenues immediately. The only speculation involved how much the terminal cities and areas between them would grow in population and commerce to increase revenues for the railroads.

Table 1. Minnesota Railroad Mileage (from Stover 1970:154)

Year	1860	1870	1880	1900	1920	1930	1940	1955	1968
Miles of Track	0	1,092	3,151	6,943	9,114	9,362	8,421	8,303	7,990

West of the Mississippi River, where Euro-American settlement was generally sparse during the 1860s and 1870s, railroad lines often preceded established markets and carved out their own "territories." Construction was more speculative, and profits often were delayed until more settlers arrived. The advantage was that the railroads enjoyed initial monopolies within their territories. Because Minnesota contained some existing river-based markets but a low overall population, railroad construction during this period represented both the eastern (established markets, high revenues) and the western (pre-settlement, low revenue) patterns of development.

After connecting the cities of St. Paul and St. Anthony in 1862, the St. Paul and Pacific railroad built its branch line along the Mississippi River, reaching Anoka in 1864 and the Watab sawmills north of St. Cloud in 1867. The St. Paul and Pacific mainline was one of two lines begun during this period specifically as a transcontinental, and it was completed across the state to Breckenridge by 1871. The other transcontinental line was the Northern Pacific, which intended to connect the Great Lakes port at Duluth to Puget Sound. This line had extended across the state by the early 1870s.

Two routes connecting the Twin Cities with Chicago were completed during this period. The Central Minnesota connected with the McGregor Western at Owatonna by 1868, and the St. Paul and Chicago completed its river route along the Mississippi in 1872 (both companies were acquired by the Chicago Milwaukee and St. Paul [CM&StP], which ultimately became the **Chicago Milwaukee St. Paul and Pacific [CMStP&P]**) (see company history, page 62). Building in the opposite direction, the Lake Superior and Mississippi line completed track from St. Paul to Duluth in 1870. Three east-west routes through southern Minnesota were begun with the intent of connecting river cities in southeastern Minnesota with the expanding agricultural region to the west: the Hastings and Dakota (H&D), the Winona and St. Peter, and the Southern Minnesota, which built west from La Crescent. The Minnesota Valley line (St. Paul and Sioux City, later the Omaha Road and ultimately C&NW), which was built to connect the Mississippi and Missouri Rivers, had completed its southwesterly route by 1872 (Prosser 1966).

By 1873, the 1,902 miles of railroad track in Minnesota had laid out a fundamental network of mainline routes. The statewide population was nearly a half million people, about 20,000 of whom lived in St. Paul and another 18,000 in Minneapolis, which had annexed St. Anthony in 1872. Duluth was projected to be the next major Great Lakes port. The farms and towns of southeastern Minnesota were well established, and settlers were streaming onto the prairie lands of western Minnesota. But railroad construction and economic development in general came to a virtual standstill following the economic Panic of 1873. Brought on in large part by the speculative investment in railroads built ahead of demand, the Panic affected Minnesota much like the rest of the country. Business investment fell off precipitously, and communities stopped growing or even shrank. Duluth lost half of its inhabitants between 1873 and 1875 (Hofsommer 2005a).

Even as the railroads were building across Minnesota and were embraced by the communities through which they passed or helped to create, conflicts were becoming apparent by 1870. As elsewhere in the country, when railroads in Minnesota competed with each other, they lowered rates for passengers and freight. However, when a railroad company held a monopoly, it was unchecked and sought to maximize revenue. The costs of railroad construction and maintenance were unlike any previous enterprises. Although railroads chartered prior to 1870 generally received generous subsidies in the form of federal land grants and state and local bonds, all railroads issued stock and borrowed large sums to finance construction or acquisition of new lines and equipment, as well as upgrades to the existing infrastructure. Total railroad investments by 1860 already had surpassed $1.1 billion, as companies were poised to begin their great post-Civil War expansions. By way of comparison, construction and operation of the canal system up to 1860 had required a total investment of approximately $200 million (Cronon 1991:80).

Because the investment in railroads was so great, every action by the railroads was driven by the imperative to increase revenue, reduce costs, or both, in order to ensure dividends for shareholders and to service the debt load. In addition, railroads bore extremely high fixed costs, not only from servicing debts but from high operating expenses, such as maintaining grades, rails, and bridges and paying employee salaries. Fixed charges represented as much as two-thirds of a railroad company’s expenses and were unaffected by the volume of traffic it carried. As a result, the railroad companies believed that carrying freight, no matter how low the rate, was better than an idle line. Thus, customers with high volumes of freight and areas served by competing railroads often received relatively low rates, whereas areas served by a single line were often charged much higher rates (Cronon 1991:84-85).

Railroad rate structures appeared profoundly unfair to many Americans, particularly those in sparsely populated agricultural regions, and rates became a major factor in anti-railroad agitation beginning by the 1870s. Small farmers, who generally paid the highest rates, became advocates for railroad regulation through the National Grange organization, which was formed in 1867. Rate wars, such as those between the Lake Superior and Mississippi line and the Milwaukee and St. Paul railroad during 1870 to 1872, made the rate disparities apparent to all. In 1871, the Minnesota legislature created the Office of Railroad Commissioner to regulate railroad practices, including classifying types of freight and setting maximum rates. Various additional railroad regulations were enacted during the 1870s, with varying degrees of success and approval; some claimed the rates imposed were ruinous to the railroads, while others decried the lack of enforcement. Perhaps the most fundamental shift was in the declaration that railroads were "public highways" with obligations to the residents of their service areas (Prosser 1966:20-23).

During the period from 1877 to 1893, a great surge of railroad construction, slowed only by a recession in 1884-1885, further expanded Minnesota's transportation network. This expansion was directly related to Minnesota's growth and connection to the national economy. From 1870 to 1880, Minnesota's population grew from approximately 430,000 to 780,000, and over the same period, farmland acreage more than doubled. By 1890, the population stood at 1.3 million. Many of the new residents were European immigrants, encouraged by the railroad companies to establish farms near their rail lines.

Much of the new farm acreage was planted in wheat, and during the 1880s, the so-called bonanza farms of the Red River Valley began a period of large-scale wheat production. Some of the wheat was ground into flour at local mills and then shipped out via railroad, but increasingly farmers sold the wheat to elevator companies who distributed the whole grain to large milling operations in Minneapolis or out East via the Duluth port. During this period, Minneapolis became the leading flour milling center in the world. In addition, southern Minnesota farmers were beginning to diversify into livestock, dairying, and a variety of crop production, and the railroads hauled these commodities to a growing number of food processing centers.

The state's numerous saw mills produced prodigious amounts of lumber which was hauled on the railroads after it was milled. In northeastern Minnesota, large deposits of iron ore were discovered, although extraction operations were just being developed. In the midst of the population growth and economic development, a hierarchy of urban centers and small cities and towns had sprouted up on the railroad network in order to distribute raw commodities and manufactured goods (Borchert 1987:45-47; Hofsommer 2005a:69).

The 1880s to early 1890s was a period of national railroad system-building throughout the United States. In establishing their systems, railroad companies sought a continuous flow of passengers and freight by controlling the connections between major markets that were independent of competing lines. Thus, companies added branch lines to their existing mainlines to increase their control over a given territory, and they built new mainlines to secure access into terminal points. This construction pattern, however, led to redundancies of service and expansion into areas where traffic volumes did not support the cost of construction at that time. Those systems that were overbuilt would incur financial difficulties during the mid 1890s (Chandler 1977:147).

During the period 1877 through 1893, two chartered transcontinental routes reached the West Coast and helped Minneapolis and St. Paul became a metropolitan center that dominated the region across the

Dakotas and into Montana. The first was the reorganized Northern Pacific, which continued building west from Bismarck, North Dakota, in the late 1870s, and by 1883 completed the first northern transcontinental line. The Northern Pacific then built a direct connection from its mainline at Brainerd south along the Mississippi River to Minneapolis and St. Paul.

While the Northern Pacific had focused first on completing its line to Puget Sound, and then on building a network, the James J. Hill line established a strong home territory first, and then built to the West Coast. Acquiring the old St. Paul and Pacific line with a group of investors in 1878, Hill formed the St. Paul Minneapolis and Manitoba Railway (Manitoba) to connect the milling and wholesaling operations in the Twin Cities with the Red River Valley. Once a reliable source of income had been secured, the Hill interests formed the Great Northern and expanded to the West Coast by 1893. Before the end of the 1890s, Hill would gain control of the Northern Pacific as well.

As the northern railroads carved out a northwest empire, several Chicago-based railroads sought to secure their territories in the Midwest, connecting agricultural production areas with cities. Known as granger railroads, these lines, which included the CM&StP, C&NW, and Illinois Central, carried heavy volumes of agricultural products, especially grains such as wheat. In Minnesota, the CM&StP and C&NW both built new routes and acquired or gained control over numerous smaller railroad companies, such as the H&D, Southern Minnesota, and Omaha Road. By the 1880s, the CM&StP and C&NW thoroughly dominated the southern half of the state.

In the mid 1880s, other companies began to challenge the dominance of the regional and transcontinental railroads in Minnesota. **Chicago Great Western (CGW)** (see company history, page 53), organized as the Chicago St. Paul and Kansas City in 1886, established new freight and passenger connections from the Twin Cities to other regional centers such as Kansas City and Omaha. Several railroad lines merged to form the Soo Line in 1887, bringing competition from the Red River Valley to Minneapolis and providing an outlet to eastern markets that by-passed Chicago. The **Minneapolis and St. Louis (M&StL)** (see company history, page 44) completed its line from the Minneapolis milling district south to Albert Lea in the late 1870s, with connections to the **Chicago Burlington and Quincy (CB&Q)** (see company history, page 50) and **Chicago Rock Island and Pacific (CRI&P)** (see company history, page 74). The CB&Q and the CRI&P made incursions of their own into Minnesota, notably the CB&Q, which gained direct access to St. Paul in 1887 through the Chicago Burlington and Northern.

The northern Minnesota railroad network was taking form by the early 1890s. When the Mesabi iron ore deposits were discovered and the first mine established at Soudan in 1884, the Duluth and Iron Range railroad built a line to the port at Two Harbors to haul out the ore. By 1893, the Duluth Missabe and Northern railroad was hauling ore from Mountain Iron to Duluth. Also by that time, Great Northern subsidiary companies had begun building lines that would create a direct connection from the Great Northern division point at Crookston to Duluth. By 1900, that line would pass through the heart of the northern pine forests and would provide the Great Northern with access to the Mesabi Range (Prosser 1966:35-36).

Mature Railroad Systems

By 1893, Minnesota's transportation network had transformed from several pioneer lines to many overlapping grids that connected all of southern Minnesota, the Red River Valley, and Duluth to the larger national transportation network. Three sets of overlapping lines now spread across the state. The first set radiated out from Chicago, concentrating on southern Minnesota with connections to the Twin Cities. The second set spread out from Duluth to the iron ranges, northern forests, and Red River Valley. The third set expanded from the Twin Cities and included the northern transcontinental lines of Great Northern and Northern Pacific as well as regional carriers to reach westward to the Dakotas and Montana and southward into Iowa (Borchert 1989:56).

In 1893, the second great period of railroad expansion came to a close. As in 1873, the financial Panic of 1893 was followed by a severe economic depression that limited capital improvements for all types of businesses for much of the 1890s. Railroads in particular were hurt by the depression. Heavily in debt from the rapid expansion of the previous decade and having limited revenue on lines built ahead of demand, many railroad companies went into bankruptcy and receivership during the mid 1890s.

During the period from the late 1890s through World War I, railroad construction in the United States expanded again and, although not as dramatically as during earlier periods, nonetheless doubled the nation's track mileage. During this time, the United States railroad network reached maturity: the last of the transcontinental lines were built, extensive webs of mainlines and branch lines covered all the states east of the 100th meridian, which runs midway through the Dakotas, and rail mileage nationwide peaked in 1916 to an estimated 250,000 miles. Construction focused on building mainlines in the West, filling in branch lines in established regions, and adding passenger routes around the larger cities. Railroad companies also invested heavily in improvements to the earlier, hastily built lines and upgrades to their rolling stock.

Expansion of the Minnesota railroad network also followed this national pattern: new construction focused on the northern half of the state, branch lines were added in the southern half, and new or upgraded connections were completed in the Twin Cities. Although Minnesota railroad mileage peaked in 1929, the network was essentially completed during the 1910s, when even the remotest areas of the far northern region were no more than 50 miles from a rail line (Prosser 1966; Stover 1961).

The late 1890s through the 1910s was generally a period of prosperity, and Minnesota's population and economy expanded. The state population grew by a million from 1900 to 1910 and reached 2.4 million by 1920. Minnesota's three main commodities groups—products of agriculture, forests, and mines—provided a solid economic base, while manufacturing and food processing grew to prominence throughout the state's metropolitan and urban centers. Like the nation as a whole, Minnesota's population was shifting from rural to urban. Minneapolis and St. Paul led the way with 380,000 and 235,000 residents respectively in 1920, while 99,000 people lived in Duluth. Railroad companies both spurred and benefited from Minnesota's spectacular economic growth during this period: freight hauled by railroads increased from 18.5 million tons in 1895 to 85.8 million tons in 1910, and the number of passengers nearly tripled during 1900 to 1910 (Borchert 1989:57; Prosser 1966:42).

While the focus of the railroad companies during the 1880s and early 1890s had been on building regional systems to control as much traffic as possible within a territory, during the first decade of the twentieth century, interregional combined systems began to dominate. A relatively few major investment groups gained controlling interest in multiple railroad companies, and as a result, by 1906 nearly two-thirds of the railroad mileage in the United States was controlled by seven groups. One of the groups was led by James J. Hill and John Pierpont Morgan, who controlled the Great Northern, Northern Pacific, and CB&Q railroads, encompassing a total of about 21,000 miles of rail lines. Other combined systems with a presence in Minnesota included the Vanderbilt roads, which included the C&NW and the CRI&P. In addition, the Illinois Central, which was part of the system controlled by Edward H. Harriman (including the Union Pacific and Southern Pacific), had a minor presence in Minnesota. The combined systems not only controlled large territories, they influenced the smaller, regional carriers. For example, the CM&StP was not aligned with any of the interregional systems and, in an effort to remain competitive, built its own extension to the West Coast during 1906 through 1909 (Bryant 1988:77; Stover 1970:93-97).

During the early twentieth century much of the new railroad construction in Minnesota was in the far north. The logging industry traditionally had used waterways to float logs to sawmills, which often utilized waterpower, and then in turn, railroads hauled the milled lumber from sawmill sites. By the turn of the twentieth century, however, the pine forests near navigable streams had been cleared. In order to reach the more remote timber in the northern forests, logging companies began transporting the cut logs via railroads to the sawmill sites. Logging companies ran short, often temporary, feeder lines to the new branches and mains of the Soo Line, Great Northern, and Northern Pacific that crisscrossed the region between Duluth and the Red River Valley. Similarly, many new miles of railroad lines were built to serve the Mesabi, Vermillion, and Cuyuna iron ranges. The Great Northern, **Duluth Missabe and Iron Range (DM&IR)** (see company history, page 80), Soo Line, and Northern Pacific expanded their presence on the various ranges and funneled immense volumes of iron ore to the port complex at Duluth and Superior, Wisconsin, and to Two Harbors. By 1910, the products of the mines, primarily iron ore, accounted for about 56 percent of the freight tonnage hauled by Minnesota railroads (Prosser 1966:42).

Due to their high, concentrated populations, Minneapolis and St. Paul became the focus of passenger operations, as well as freight. Passenger traffic carried by railroads peaked during the 1910s, and although automobiles were beginning to siphon off short-haul passengers, railroads continued their monopoly of long-distance travel. From stations in downtown Minneapolis and St. Paul, passengers could connect by limited-stop, through-service trains to Chicago, Milwaukee, Kansas City, Omaha, St. Louis, and Seattle; and options included overnight service. By 1916, a record 174 intercity trains originated, terminated, or passed through Minneapolis passenger stations daily. Nearly all of these used the CM&StP or Great Northern depots (Hofsommer 2005a:224).

During the early decades of the twentieth century, at the height of their dominance of transportation in America, railroad companies were subject to increasing federal and state regulation. During the 1880s, Minnesota had added to its earlier railroad regulations by replacing the Office of Railroad Commissioner with the Minnesota Railroad Commission, which was empowered to investigate railroad practices, inspect depots, address rate and service complaints, and set rates.

The federal government established a regulatory framework for railroads through passage of the Interstate Commerce Act in 1887. During the depression of the 1890s, many people either blamed the railroads for the country's economic problems or focused their discontent on railroad management, particularly in the wake of the American Railroad Union and Pullman strikes of 1894. By the turn of the twentieth century, many Americans were searching for order in a society rapidly transforming from rural and agricultural to urban and industrial. Many believed the government was responsible for remedying perceived social problems. Over the next two decades, known as the Progressive Era, unprecedented government regulation was overlaid on American life, including the railroads.

Regulation of the railroads during the early twentieth century stemmed not only from new laws, but also more vigorous enforcement of existing laws. For example, when the Hill-Morgan interests combined with Harriman to form the Northern Securities holding company, the federal government prosecuted the company for violation of the Sherman Anti-Trust Act of 1890, and the state of Minnesota prosecuted them for violation of various state laws. While many states, including Minnesota, regulated intrastate rates, passage of the Elkins Act of 1903 and Hepburn Act of 1906 provided the federal government with the power to set price ceilings on rates. Those regulations and others were viewed by many as a necessary check on the power of railroads, particularly farmers and small town business owners, who were disadvantaged by rate differentials and rebates. The regulations, however, left the railroads without a reasonable means of adjusting their rates to reflect not only their high fixed costs, but rising costs related to labor, material, fuel, equipment, and debt service. In addition, such regulation made it difficult for railroads to raise the capital necessary for infrastructure improvements. Because passenger and freight traffic, and thus revenue, were high during the 1910s, the new regulatory environment did not present great problems for the railroads. However, during the 1920s, and particularly the 1930s, this system would limit the ability of railroad companies to respond to new challenges (Hofsommer 2005a:186-187, 205-206; Prosser 1966:41).

Government control over the railroads came to a head during World War I. Because the demands of the war effort required movement of vast amounts of materials, supplies, fuel, and troops and recruits, the federal government assumed control of the railroads in an effort to ensure the availability of transportation. The United States Railroad Administration (USRA) operated the railroads from late 1917 to 1920. Although the USRA assured priority for military traffic on the railroads, minimal maintenance and no upgrades were made to the infrastructure, despite the heavy demands. Furthermore, while revenues increased greatly during 1915 to 1920 as railroads hauled supplies to East Coast ports, operating costs grew even faster. By 1920, operating costs averaged 94 percent of operating revenues among Class One railroads (Hofsommer 2005a:260; Prosser 1966:50).

Despite the efforts to regulate the railroads, most Americans viewed them as a vital force in society. As one historian put it, "the discrimination, the abuses, and the charges of monopoly…were really minor when compared with the major contributions railroads made to the expanding American economy and society in the half century prior to World War I" (Stover 1970:93). The railroad influence on American life was perhaps at its peak during the early decades of the twentieth century. By 1920 for example, railroads directly employed two million people, carried the bulk of the mail, hauled 77 percent of the freight, and carried 98 percent of the traveling public. Railroad companies had developed Standard Time in 1883 in order to better coordinate operations, as well as for safety purposes. Although the federal government did not officially acknowledge Standard Time until 1918, most Americans had set their clocks to railroad time soon after its introduction. In addition, the railroad companies had developed administrative systems that, by the early twentieth century, were the model for other corporations (Chandler 1977; Stover 1970:93, 98).

During the late nineteenth and early twentieth centuries, railroads were the single most powerful force shaping the American built environment. The railroad lines and lands surrounding the rights of way have been called "metropolitan corridors" that represented entirely new environments developed both to serve the railroads and to benefit from them. The corridor provided order in a disorderly, even chaotic, urban environment; and it provided a focus for small town and rural environments. Through the efficient designs for their own facilities and by encouraging efficiency through grouped land uses, such as industrial zones, railroads created highly centralized corridors of technically controlled order (Stilgoe 1983).

The railroads had a clear influence on Minnesota's built environment during this period. As commodities and manufactured goods flowed back and forth between metropolitan centers, smaller urban centers, and small cities and towns, a constellation of urbanized places (population greater than 2,500) was spread out on the railroad network. At the top of the hierarchy stood the Twin Cities, where a massive industrial corridor extended from North Minneapolis southeast to South St. Paul, consisting of manufacturing, storage, and wholesale operations that centered on a network of railroad lines, yards, and spurs. In both downtowns, large ornate passenger depots welcomed visitors to the cities. Minneapolis even built Gateway Park in 1915 near the new Great Northern depot. In smaller cities and towns, the railroad corridor was equally important, as warehouses and manufacturing plants lined the tracks and the central business districts either paralleled or radiated out from the tracks. In most towns in western Minnesota, grain elevators were the dominant feature of the skyline, and in Duluth, the massive elevators and ore docks dominated the port. Although well-matched to railroad transportation, these built environments would require rebuilding and reconfiguring during the second half of the twentieth century to suit the needs of the new automobile era.

Competition Between Transportation Modes, 1920-1956

The years 1920 to 1956 could be characterized as a second transportation revolution, when both flexibility and speed of transportation increased dramatically over the previous railroad era. New modes of transportation presented great challenges to the railroads, such as the greater flexibility provided by automobiles or trucks, and the greater speed offered by airlines. The large railroad companies, organized to ensure stability and regularity of operations, had become slow-moving bureaucracies and did not respond quickly enough to those challenges. In addition, regulations enacted in the early twentieth century to check the monopolistic power of the railroad companies limited their ability to change rates, reduce service on unprofitable lines, or merge with other companies and, thus, limited their ability to compete with other forms of transportation. Overall, this was a period of decline for the railroads. They lost most of their passenger business, their share of freight tonnage nationwide slid to less than 50 percent, and many spent long periods in bankruptcy and receivership.

Railroads began this era at their peak. In 1920, track mileage nation-wide was at its maximum extent, and freight volumes, passengers, and revenues were at their highest numbers. For example, the CM&StP hauled 45 million tons of freight in 1920, a 36 percent increase over 1915 and 50 percent higher than 1908. The number of passengers carried in 1920 was only slightly lower than the peak during World War I. Despite such positive statistics, the railroad industry was confronted by the highest operating costs, wage aggregate, and taxes in its history, and the smallest net operating income in over 30 years. With operating costs nearly equal to operating income in 1920, railroad companies were vulnerable to any reduction in traffic and, therefore, in revenue (CM&StP Annual Reports 1908, 1915, 1920; Hofsommer 2005a:266).

As demand for goods and commodities fell after World War I, the United States sank into a short but sharp recession. Agricultural commodity prices, at an all time high in 1920, slumped the following year, remained depressed through the 1920s, then fell even further after 1929. The low prices hurt many Minnesota farmers' ability to repay debts and led to many foreclosures. The lumber industry, already in decline due to depletion of the white pine forests, virtually abandoned Minnesota during the 1920s, though paper mills continued operating. Other areas of the economy, however, such as manufacturing, securities, and housing, recovered after 1921 and expanded until later in the decade. The Twin Cities especially continued their growth, as the population of Minneapolis expanded to 464,000 in 1930 and St. Paul reached 272,000. After the stock market crashed in 1929, however, the general economy sank into the economic crisis known simply as the Great Depression and did not fully revive until World War II (Borchert 1989:57).

Most railroads operated at a profit from 1923 to 1929, but net incomes continued to decline. Despite record volumes of freight, profit rates were low due to high operating costs. Because their ability to raise rates was limited, many lines attempted to reduce operating costs by increasing efficiency. They upgraded motive power, rolling stock, and track and roadbeds during the 1920s. Even more troubling to the railroads than operating costs was the rapid decline of their commercial passenger traffic. Rail lines' share of this market dropped from 98 percent in 1916 to 75 percent by 1930. More dramatically, intercity private-automobile traffic not only surpassed that of the railroads during the 1920s, but by the end of the decade, it was six times greater. Cars and buses offered intense competition for the railroads' passengers due to their greater flexibility, mobility, and in the case of automobiles, privacy. The number of registered automobiles nationwide grew from about 3.5 million in 1916 to 23 million by 1929, and intercity buses captured about 18 percent of commercial passenger traffic in 1930 (Stover 1961:212-213, 238).

During the Depression, the railroad's previously precarious position became untenable for most, as passenger numbers continued to decline and freight levels dropped off. When production fell on farms, mines, and factories, there simply was not enough freight to go around. Railroad revenues fell sharply, and both freight tonnage and overall revenue in 1933 were half of their 1929 levels. In addition to losing their passenger base and facing a nationwide decline in shipping, railroads were under increasing competition for freight traffic by the 1930s. Improvements in truck design and upgrades to highways allowed trucking to capture a substantial share of intercity freight, growing from about 4 percent in 1930 to 10 percent in 1940. Likewise, pipelines' share of intercity freight, particularly petroleum, expanded from 5 percent to 10 percent over the same period. These specialized carriers could haul certain types of freight at lower cost than the railroads (Borchert 1987:87-88; Hofsommer 2005a:281-282; Stover 1961:238).

With no end in sight to the red ink, numerous railroad companies filed for bankruptcy during the 1930s, including the CMStP&P, the CRI&P, the M&StL, the CGW, the C&NW, and the Soo Line. In further cost-cutting measures, companies abandoned the least profitable lines, reduced service on others, stored equipment, and laid off workers. National railroad mainline mileage fell from its 1916 peak of 255,000 miles to 232,000 miles in 1941, and in Minnesota the mileage declined from a peak in 1929 of nearly 9,400 miles to about 8,400 in 1940. Similarly, by 1941 the number of railroad employees nationwide fell by about one-third, and there were one-quarter to one-third fewer rolling stock and locomotives in service (Stover 1961).

With full-scale war being waged in Europe by 1940 and the United States' entry into World War II in December 1941, production and manufacture of all order of commodities and goods increased, effectively lifting the economy out of the Depression. Railroads played an important role in the war effort and benefited from the massive movement of raw materials to factories and of supplies and troops to the East and West Coasts. Railways carried 97 percent of the domestic troop movements and 90 percent of the military supplies. Already by 1941, railroad freight tonnage exceeded the previous peak in 1918, and in 1944 it was nearly double. With gasoline rationing in effect, passenger traffic on the railroads also increased dramatically, and in each of the years from 1943 to 1945, passenger mileage was double that of 1918 (Bryant 1988:xxiii; Stover 1961:202-205).

Having learned from their mistakes during World War I, railroad companies took cooperative measures to coordinate their operations and thus reduce congestion at the ports. The federal government formed the Office of Defense Transportation to coordinate railroad operations but did not take direct control. Although operating at full capacity, railroad companies were unable to make major improvements in infrastructure due to limitations imposed by the federal War Production Board. Those limitations notwithstanding, some rail lines were built in direct support of the war effort. For example, when the Twin Cities Ordnance Plant was built in New Brighton in 1941, a long spur was extended from the Minnesota Transfer Beltline to provide the necessary rail access (*Minnegazette* 1997:24-25).

The spike in revenues during the war only temporarily masked the problem of inter-modal competition that had plagued the railroads prior to the war. From the late 1940s to the late 1950s, steady economic growth coupled with a rapid population increase resulting from the Baby Boom led to a period of prosperity in the United States. Although railroad companies previously had been profitable during periods of general prosperity, such was not the case following World War II.

In the post-World War II era, transportation continued to decentralize and specialize. During the earlier heyday of the railroads, traffic movement was hierarchical; it focused on distribution centers and ultimately flowed toward the major terminal hubs that collected and redistributed passengers and freight. With automobiles and trucks, people could travel and ship goods and materials much more directly between smaller cities and towns. In addition, improvements in aircraft led to the growth of commercial airlines offering very rapid transportation between major hubs. During this period, railroads transitioned from being the dominant freight transportation mode to being one of many options among specialized carriers.

Passage of the Federal Aid Highway Act of 1956 established the interstate highway system, and subsequent appropriations financed the transition of the American transportation network from a railroad base to a highway base. In addition, this Act signaled a symbolic shift in transportation priorities. Development of the highway system reflected a trend in transportation that was well-established by the mid 1950s. By then, railroads slipped to third place among passenger carriers, behind automotive and aircraft. The railroads' percentage of intercity commercial passenger traffic continued the long decline that began in the 1920s, falling to 28 percent, while airline travel surged to over 30 percent. In the area of freight, although gross tonnage hauled increased, railroads were not keeping pace with their rivals. Their share of intercity freight declined from 77 percent in 1916 to 44 percent by the end of the 1950s (Borchert 1987:84; Stover 1961:238).

Even in the area of national defense, where railroads had played a significant role in every conflict from the Civil War to World War II, the relative significance of railroads was in decline by the 1950s. Cold War era facilities generally used automobile- and truck-based transportation, which was better suited to the decentralized facilities. For example, the Nike missile air defense system which was established in 1954 and included several facilities around the Twin Cities, exclusively utilized trucks to transport missile components and other supplies (Hoisington 2004:27).

In response to the competition from other transportation modes, railroad companies reduced their costs to operate more efficiently. One cost-savings tactic was to cut underutilized services, such as eliminating local passenger trains to focus on limited, through routes or to abandon branch lines with low traffic volumes. Due to such abandonment, by 1959 railroad mileage in the United States had fallen to 217,000 miles. In addition, railroads cut crew size, partly as a result of the abandonment of lines and service reductions and partly due to increased automation. By the late 1950s, railroad employment dropped to 800,000 people, representing a decline of 60 percent since 1920. During the 1960s, railroads continued to abandon branch lines, and by the end of the decade, most had abandoned passenger service altogether. Railroads also altered their operations and, after World War II, began to specialize as carriers of long-haul, bulk items where speed and direct distribution were not a priority. By focusing on high-traffic corridors and long-haul freight, railroad ton-miles reached 575 billion in 1960, up from 367 billion in 1916. As noted above, however, railroads' share of freight slipped to less than half of the total in the United States (Stover 1961:224, 256).

The decentralization of transportation had the effect of also decentralizing the built environment. For example, the population of the Twin Cities metropolitan area grew continually and expanded from 842,000 in 1920 to 1.6 million in 1960 and to 2.2 million in 1980. During the same period, the populations of Minneapolis and St. Paul peaked in 1950 at 522,000 and 311,000 respectively, and declined in every subsequent decade through the 1980s. Industrial parks, shopping malls, and residential subdivisions, which all focused on the roadway network, spread over the seven-county metropolitan area creating a much lower population density than in the older urban core. Similar developments on a smaller scale occurred in urban centers throughout Minnesota (Borchert 1989:57).

Railroad Engineering and Architecture

Track-guided transport systems had existed in various forms in Europe since at least the 1500s, but the first practical application of an engine-powered passenger railroad with components technologically similar to modern railroads was England's Stockton and Darlington Railway (S&D), completed in 1825. Although the first run of the steam engine Locomotion on the thirty-seven mile railway was an important event, the S&D was essentially the cumulative result of centuries of individual technological advances in the fields of ironworking, bridge building, and mechanical and civil engineering.[1] Railroad technology continued to evolve over the course of the nineteenth century as the materials and designs improved for the track structures, which included rails, ties, and ballast, and for the roadway, which included the roadbed under the track structure, roadbed shoulders, and ditches.

The most basic issue for a railroad designer was the alignment of the roadway. According to Vance (1995:48), the fundamental geographic features of a railroad roadway alignment were the two established termini and the minimum irreducible grade of the line.[2] Once those were established, derivative features included establishment of a working grade for steam locomotives that avoided grade redundancies (repeated ascents and descents while approaching a summit), provision of reasonable curvature in the alignment (more curves meant additional miles traveled, sharper curves meant slower speeds), and connection to established markets between the termini. The preferred alignment would then be a route that provided the gentlest grades on the least circuitous route that connected the greatest number of existing markets. In England and the eastern United States, where railroads were heavily capitalized, direct routes could be obtained and grades could be leveled through cuts, fill, and extensive viaduct work where needed.

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[1] Technological advances associated with engine types and hauling power or the specific operation of passenger and freight cars will not be addressed by this study unless such developments were specifically associated with the history of Minnesota railroading or where such developments resulted in the historically significant modification of Minnesota railroad buildings or structures.
[2] To avoid a steep grade (the slope of the roadbed), which would require greater motive power, a railroad engineer may design around a geographic feature rather than surmount it, thus reducing the grade. The minimum irreducible grade is the gentlest grade that can be obtained and still connect the established termini.

In lightly populated western areas, such as Minnesota during the nineteenth century, the scarcity of capital required the lower-cost alternative of building over or around topographical features. Those lines would then be reconstructed as traffic increased. In doing so, railroad companies often up-graded all of the infrastructure elements of a line to incorporate the latest technology. So common was this practice, that Vance cited "reconstruction" as a "characteristic of American railroads" (1995:48-50).

Track Structure

From their inception, tramways and railways featured custom-designed guidance systems, initially in the form of simple ruts that kept wagons on a proscribed track and later fixed rails that provided guidance for flanged wheels. In the sixteenth and seventeenth centuries, various types of rail systems were fashioned from wood, and later from cast iron as blast furnace technology developed in the mid eighteenth century (Goodale 1920:64). In the early nineteenth century, English railways used cast or wrought iron rails fastened to longitudinal stone sleepers, a configuration that was still under development in the 1820s when the Baltimore & Ohio railroad began construction (Kirkman 1902:26).

An issue for early American railroad builders was the gauge or width of the track structure. The S&D in England used a track gauge of 4 feet, 8½ inches, ostensibly because it was the standard width of horse-drawn carriage wheels. There were variations of track gauge used in the development of the early United States railroad network. For example, a five-foot gauge was common in the South, whereas a narrower three-foot gauge was often used in rugged terrain. In the Northeast, a gauge of 4 feet, 8½ inches was common, and because it was adopted as the standard gauge in the Pacific Railroad Act of 1862, it became the standard gauge for American railroads (Weitzman 1980:32). As a result, standard gauge track was the standard in Minnesota. Narrow gauge tracks, however, were preferred in areas with steep topography, such as Colorado. Some railroads in the southeastern Minnesota bluff country, such as the Caledonia and Mississippi (later CM&StP), initially built railroad lines with three-foot narrow gauge tracks but later converted them to standard gauge (Prosser 1966:21).

Rails: While it took decades for a standard gauge to develop, a common design for rails evolved much more quickly. When the earliest railroads were constructed, the general lack of iron smelting and forging facilities in the United States forced builders to use wrought iron straps spiked to longitudinal wooden sleepers. That system worked well for light loads, but heavier loads worked the stringer nails loose, causing straps to curl and occasionally rip through the floorboards of passenger cars (Veenendaal 2003:16). In 1830, Robert L. Stevens developed the inverted T profile rail for the Camden and Amboy Railroad in New Jersey. The wide portion of the T was fastened to wood ties that were laid perpendicular to the rail, and flanged wheels ran on the slightly bulbous top of the T's vertical member (Kirkman 1902:32). The first T rails were rolled in England, but with the proliferation of United States ironworks in the 1840s, rail production began to grow. In 1861, the year before the first Minnesota railroad was completed, Congress passed the Morrill Tariff which stopped the import of foreign rails and provided a significant boost to United States mills and foundries (Veenendaal 2003:16). The forty-five-pound-per-yard iron rail used to construct Minnesota's first railroad, the St. Paul and Pacific during 1858 to 1862 from Saint Paul to Saint Anthony (later Minneapolis), may have been a mix of imported and domestic rail stock (Crooks 1905:448).

After the Civil War, the new Bessemer process for manufacturing steel was used to cast rails for heavy-traffic routes. Steel was much harder yet more elastic than iron, and it weighed less. Early steel rails weighed about thirty pounds per yard, but as annual freight tonnages increased in the last decades of the nineteenth century, rails increased to fifty to sixty pounds per yard. Despite its advantages, only 29 percent of the rail lines in the United States were laid with steel rail by 1889 (Swank 1892:410). Ten years later, however, the nation's mainlines were entirely steel—iron rails remained only on branch lines and spurs, where traffic speed, volume, and weight were low and therefore less punishing (Veenendaal 2003:17). In addition, by 1900 steel rails reached a robust ninety pounds per yard, stout enough to carry the heaviest annual traffic at mainline speeds. Rail weights steadily increased in tandem with the weight of locomotives and freight cars, with rail weights reaching an average of 131 pounds per yard by about 1930 and 152 pounds per yard by the 1940s (Weitzman 1980:31). An additional attempt to fortify routes for particularly heavy freight included welded rail, a feature of the DM&IR southbound track leading from the iron ore mines to Duluth and Two Harbors in the 1960s (Dorin 1969:20). Although this was the first example of welded rails in Minnesota, the technology had been in use elsewhere for many years.

Ties: Although stone sleepers were used initially to support the rails, railroad companies abandoned the sleeper system during the 1830s because the stone did not adequately cushion the relatively brittle iron rails. The switch to wood ties heralded another change in the basic character of the track structure. White oak, rock oak, and burr oak were the first choices for wood ties and had a usable life ranging from 5 to 12 years or as long as 25 years under certain conditions. Softer wood such as cedar, pine, and cypress, however, had a shorter usable life, ranging from 3 to 7 years, depending on the type of wood and the environmental conditions. Uniform and long-lasting ties were important not only because replacing them was expensive, but ties take time after being laid to settle and create a smooth surface for the rails. Maintaining a smooth roadbed affected the life of the rails, wear and tear on the rolling stock, speed of the trains, and comfort of the passengers. The life of ties varied a great deal depending not only on the type of wood but the weight, volume and speed of traffic, drainage of the ballast, climate, and other variables (Colliery Engineer Company 1899:1029; Webb 1901).

The increasing scarcity of durable hardwoods by the late nineteenth century led to the development of preservatives for softer woods and the adoption of stone ballast to facilitate better drainage of the rail bed. The most common wood-tie treatment was surface scorching. More effective chemical treatments soon followed including saturation with mercury chloride (Kyanizing), copper sulfate (Boucherie), or zinc chloride (Burnettizing) and high-pressure impregnation with creosote, a technique that preserved ties for up to 30 years (Kirkman 1902:182; Veenendaal 2003:17).

Ballast: The advantages of a solid bed of ballast were clear by the late nineteenth century. As one railroad engineer noted: "On many American railroads, the neglect of this safeguard [ballast] against the effects of our Northern winters, renders them very unsafe at high velocities" (Gillespie 1869:295). Ballast provided a more stable foundation, reduced dust, and assured that the tracks were clear of seasonal water and mud. Despite the benefits of ballast, as late as the 1890s a railroad engineer stated that "the steel is often thrown down on rough grades and run over without ballasting" (Kindelan 1894:25). When ballast was not used, often the ties were bedded (a layer of dirt or earth was placed under thin ties, or the bed was dug out under thick ties) to ensure a level surface to receive the rails. By the turn of the twentieth century, ballasting the roadbed became more common, as heavier and longer trains traveling at higher speeds required greater stability. Initially, ballast materials included stone, slag, gravel, sand, cinders, or burned clay—although stone was the preferred material (Kirkman 1902:164). During the early twentieth century, companies replaced such ballast with layers of crushed granite two to three feet thick on the heavily-used routes and on the high-speed, luxury passenger lines. Such high iron status was reserved for important main corridors.

Roadway

A railroad roadway that was level, stable, and well drained was critical to the stability of the track structure. According to one railroad engineer, "The stability of the track depends upon the strength and permanence of the roadbed and structures upon which it rests" (Webb 1901:69). A line's roadway was the earthwork within the right of way that was worked to prepare for reception of the tracks. A railroad roadbed was the finished surface on which the tracks rested. A roadbed may have consisted of simply a ground surface graded level, or it may have been a surface raised on fill with a layer of gravel, slag, or cinder sub-ballast. By the early twentieth century, the recommended minimum width of roadway between the toe of each slope on a standard gage, single track Class A (heaviest traffic) railway was 20 feet with 18-inch shoulders. On single-track fills, roadways ranged from 16 to 25 feet wide, while in cuts they were typically 16 to 20 feet (Howson 1926:96; Tratman 1926:17-21). Also by that time, it became common practice to create a thicker roadbed, by adding a layer of gravel or cinder sub-ballast, to help prevent the surface ballast material from being pushed into the roadbed.

Because water would quickly undermine the track structure, particularly the ties, good drainage was seen as critical. "The worst enemy is water… therefore the first and most important provision for good track is drainage" (Webb 1901:69). Engineers were generally in favor of rounding off shoulders and toes of embankments, sodding the slopes, and using drain tile in the ditches to promote drainage and reduce erosion. In the early years of the twentieth century, railroad managers often did not approve the additional up-front costs to include such measures—despite substantial savings in future maintenance. Such improvements would become more common during the 1920s, especially following World War II.

Bridges

The heavy live loads associated with freight trains required that trestles and bridges meet exacting engineering standards without excessive cost. Wooden trestles were often temporary structures used to bridge small topographic features on branch lines where the cost of filling and cutting exceeded the value of the line or where the value of the branch line's resource had not been determined, such as at a new mining site. Where cutting and filling was possible, stone culverts (and later, metal pipes) were built to facilitate drainage under the track.

By 1900, plate girder bridges were commonly used for short spans of less than 50 feet, although spans up to 100 feet could be achieved if necessary. Spans of 50 to 150 feet were bridged with multiple deck trusses or through trusses of the Whipple, Baltimore, Pratt, or Warren types that were supported on piers founded on wood piles or (after 1890) steel or concrete piles (Disney and Legget 1949:31). Robust modifications of the Warren truss, including cantilevered versions, could be extended to between 150 and 550 feet, but these designs were reserved for major crossings where the maintenance of river traffic was a consideration (Kirkman 1902:246). Where a fixed bridge was too low to allow boats to pass under, movable spans were installed including vertical lift bridges, rolling lift bridges, and swing spans.

The earliest metal bridges in Minnesota were riveted iron with pin-connected joints (Vose 1873:175). After 1890, steel became more common with connections between truss elements bolted and/or welded (Weitzman 1980:75). At the same time, pre-cast reinforced-concrete slab and rigid-frame bridges came into use for short spans, particularly for grade separations (Disney and Legget 1949:62). For more detailed discussion of bridge types, see Railroad Grade Separation Structures on page 217.

Safety Systems

Advancements in railroad technology during the late nineteenth and early twentieth centuries provided for safer as well as more efficient operation of railroads. Railroad-related accidents came in several forms including derailment of an individual train, collision between two trains, and collision between a train and another vehicle or pedestrian. Improvements to the roadway and track structure during the nineteenth century, as discussed above, allowed trains to run on smoother and more stable tracks, thus reducing derailments. Reducing the number of collisions, however, would depend on other safety measures.

The first traffic on United States railroads did not have the benefit of rapid communication via the telegraph. As a result, traffic was managed by signalmen who recorded individual train movements, visually signaled the information to other passing trains, and changed the switches as necessary to prevent collisions. The system worked for low-traffic rural lines, but quickly became unworkable in high-traffic urban environments. Charles Hutton Gregory developed an interlocking foot-powered mechanism in 1843 that prevented conflicting signals from being displayed, and thirteen years later John Saxby designed the first interlocking mechanism that operated switches and signals in tandem from a central bank of levers. This system prevented a signal operator from inadvertently opening a junction to more than one train or from displaying the all-clear signal on occupied track. The first United States built, interlocking machine was designed in 1875 by J. M. Toucey and W. Buchanan of the New York Central and Hudson River Railroad for Manhattan Island—but the Union Switch and Signal Company provided 95 percent of the nation's interlocking towers by 1885. The signal towers used for operating the interlocking switches and levers were generally two-story wood-framed buildings until the early twentieth century, when brick became standard.

After 1910, high-traffic routes in Minnesota began to use block signaling to facilitate train movement. Each train was assigned a block of space on a track and an automatic red/yellow/green light signaling system allowed engineers to maintain safe distances (Raymond 1917:122). By the advent of World War I, nearly 800 miles of Minnesota railroad were governed by block signals (Prosser 1966:49). At the same time, electrical and pneumatic control systems were revolutionizing interlocking facilities. Site-specific interlocking mechanisms evolved into division-wide computer-managed systems in the 1960s and remotely-managed nation-wide networks in the 1970s.

While the derailments and train-to-train collisions had declined by the turn of the twentieth century, the number of pedestrians and vehicles struck by trains increased dramatically. One source estimated that 200,000 persons were killed or injured by railroads between 1900 and 1920, including nearly 14,000 persons killed after being struck by trains in 1919 alone (Stilgoe 1983:167). While many trespassers were killed while walking along the tracks or crossing at unspecified points, numerous accidents occurred at grade crossings. As trains ran at increasingly faster speeds, such as the express limited trains that often exceeded 60 miles per hour, pedestrians and drivers had difficulty gauging speeds or mistook the fast trains for slow-moving freights.

Due to the growing carnage and the resulting public outcry, as well as local ordinances in some cities, railroad companies began installing more elaborate safety measures at grade crossings or building grade separations. While simple signs had long marked crossings, by the 1910s railroad companies began posting watchmen, crossing gates, and bells and flashing lights at the busier intersections to warn drivers and pedestrians of on-coming trains. Another solution was to separate the grade crossings through either elevation or depression of the railroad corridor or a combination of the two. Although grade separation was a safer alternative than otherwise uncontrolled grade crossings, it was a costly undertaking and elevated tracks could become an eyesore to the community.

Minnesota Designs

By the time the first railroad was constructed in Minnesota in 1862, many basic design issues associated with the development of railroad technology had been addressed by railroads in the eastern United States. A standard gauge was becoming the norm for track width, the iron T-rail had been established as the standard rail profile, and many problems related to live loads on wood trestles and metal truss bridges had been solved. Nevertheless, Minnesota benefited from significant advances in railroad engineering between the end of the Civil War and the first several decades of the twentieth century including the production of high-tensile steel rail, treated ties, superior roadway design, semi-automated interlocking and switching machinery, and the design of specialized yards, docks, and terminals for the state's grain, iron ore, and logging industries.

In general, Minnesota benefited from advances in railroad engineering throughout the nineteenth and twentieth centuries. The railroad industry generally relied on established engineering designs for their routine operation—showing a marked tendency to reject the unproven in favor of older but reliable mechanical systems. Innovative technologies were typically incorporated only when they could provide a measurable economic advantage over competitors.

As the Minnesota railroad network was completed in southern Minnesota by about 1900 and in the north by the early 1910s, railroad companies made infrastructural improvements in their existing networks to gain economic advantage over competitors. During the first decade of the twentieth century, as railroad companies competed in mature markets, they reconstructed lines that had been built 20 or 30 years earlier with minimal roadway preparation. Then, again in the 1920s, railroad traffic was increasing with heavier loads and longer trains, and the railroads faced intermodal competition from automobiles, buses, trucks, and pipelines. "Intensive improvement and partial reconstruction of railroads, in order to secure increased efficiency and economy in operation as well as to meet the requirements of increasing traffic, have been conspicuous features in recent years and will continue for a long while," noted a writer in the mid 1920s (Tratman 1926:380). Common railroad reconstruction work nationally and on Minnesota lines from the late 1890s through the 1920s included:

- Double tracking lines to increase overall capacity
- Grade reduction and curve revision
- Extension of passing sidings

- Enlargement of freight yards and passenger terminals
- Relocation and redesign of engine terminals, shops, and coal/water stations
- Enlarged warehouses, freight houses, and grain elevators
- Cutoff lines and beltlines for through freight to bypass congested city centers
- Grade separation at crossings with highways and city streets
- Replacing lighter bridges with heavier structures
- Replacing trestles and viaducts with filled embankments
- Widening cuts and fills
- Installing block signals

The CM&StP grade separation of its H&D line through Minneapolis is a significant example of efforts to separate grade crossings. After years of negotiation, in 1910 Minneapolis civic leaders and the CM&StP agreed to a plan for grade separation on the H&D line, which crossed through a primarily residential district. During 1912 through 1916, the CM&StP excavated approximately a 3-mile stretch of depressed track on the H&D line in Minneapolis and built 37 bridge crossings over it. Because most grade separation projects at that time consisted of elevation of the tracks, the Minneapolis project was one of only a few examples nationally of track depression (Vermeer and Stark 2004).

Although Minnesota was not central to railroad innovation, some technological developments in Minnesota industries affected railroad operations. The Lake Superior mining industry used some of the most powerful and innovative systems in the world to transport and unload iron ore, utilizing the biggest locomotives, the heaviest freight loading systems, and the shortest freight cars (24 feet long) (Dorin 1969:6). The timber-constructed ore docks at Duluth and Two Harbors were some of the largest in the world when first built in the 1880s. Dock Number 6 at Two Harbors, completed in 1909, was the first steel and concrete ore dock on the Great Lakes, and when Dock Number 1 was completed two years later, it was the fastest loading dock on the Great Lakes.

Because the docks at Two Harbors were subject to extreme winter temperatures, a steam-powered thawing system was developed in the 1890s to thaw as many as 270 cars simultaneously. The steam system was replaced in the mid 1960s with a faster infrared heating system, capable of heating only 36 cars simultaneously, but at a faster rate and with less intensive labor (Dorin 1969:26). Because of the extraordinarily large quantity of ore shipped through Duluth and Two Harbors, the DM&IR’s Proctor Yard pioneered an automatic car identification system in the 1960s, by which a light-sensitive scanner read color-coded panels and transmitted ore weight and car data to the yard, dock office, and the Iron Junction Operations Center (Dorin 1969:22).

Grain handling and storage was another railroad-related industry where Minnesota-based operations were leaders in innovative design. Massive, terminal grain elevators were located at both Minneapolis, which was the largest terminal grain market in the country during the late nineteenth and early twentieth centuries, and Duluth, which transferred millions of bushels of grain annually from railroad cars to Great Lakes ships during the same period. Those elevators included early examples of cylindrical steel bins and advances in tile and brick construction in both cities. The Peavey-Haglin Experimental Concrete Grain Elevator in St. Louis Park, built in 1899, was the first example in the world of a cylindrical reinforced-concrete grain elevator, and in the following year, the Peavey Elevator in Duluth used the design for a block of bins (Frame 1989). Although the innovations in elevator design did not relate directly to the transfer of grain from rail cars to elevators, railroads were nonetheless integral to the function of the elevators and directly contributed to the need for greater storage capacity.

The architectural properties associated with Minnesota's railroad system reflect the general progression of design and styles built from the 1860s to the present. The earliest structures from 1862 to circa 1870 were wood frame buildings, none of which are known to have survived. Depots were the public face of the railroads, and their designs after 1870 reflected the influence of popular architectural styles. Depots in larger cities generally were designed by architects in styles common for public buildings, such as Romanesque, Classical Revival, or Beaux Arts. Notable examples are the St. Paul Union Depot, Milwaukee Road Depot in Minneapolis, and the Duluth Union Depot. Those depots were built with high-quality materials like brick, stone, and terra cotta, as well as marble and hardwoods in the interiors. Depots in smaller cities that handled high volumes, such as division points or mainline junctions, were often architect designed, such as the Soo Line Depot in Thief River Falls. Conversely, the lower volume Second Class depots and many of the higher volume First Class depots were built according to standardized plans developed internally by the railroads' engineering departments. Typically wood-framed and sided, though occasionally brick, those depots were mostly functional and represented modest stylistic influence, such as Craftsman or Tudor Revival (Esser et al. 1995; Grant and Bohi 1978). Shop complexes were generally comprised of functional buildings, though stylistic elements were often incorporated—such as the Romanesque clock tower at the Northern Pacific's Brainerd shops complex.

II. Canadian Northern Railway Company

Introduction

The Canadian Northern Railway Company was formed in December of 1898 through a merger of a number of Canadian regional lines that were owned and constructed by William Mackenzie and Donald Mann. Mackenzie and Mann, former railway contractors turned railroad promoters, constructed these lines to compete with the Canadian Pacific Railway, which had maintained a monopoly over Canadian grain traffic (and most other Canadian railroad traffic) since the first of its tracks were laid in 1881.

Mann obtained an interest in a predecessor of the Canadian Northern in 1887, when he was left with unsecured provincial bonds in the Hudson Bay Railway after working as a contractor on that line. Subsequently, in 1895 he purchased the charter of a paper road, the Lake Manitoba Railway and Canal Company, at which point he approached Mackenzie to partner with him in the company. Mackenzie agreed, and beginning in 1896, the two embarked on a series of construction projects in a piecemeal fashion throughout Canada, acquiring other companies as they went. In this way, they met with fair success in the arena of Canadian rail traffic.

In 1898, however, the goal of Mackenzie and Mann changed from the construction of competing regional lines to the connection of these lines to form a transcontinental system. In December of that year, they reorganized the Hudson Bay Railway (which had become the Winnipeg Great Northern Railway) and the Lake Manitoba Railway and Canal Company, into the Canadian Northern Railway Company. Seven months after forming the new company, they obtained a federal charter that permitted the construction of extensive new mileage, and then absorbed other companies into the Canadian Northern system. As a result, by 1915 the Canadian Northern had connected many of its former regional lines into a continuous mainline from Montreal to Vancouver. In this way, it became Canada's second transcontinental railroad (Regehr 1976).

It was shortly after the Canadian Northern was created that Mackenzie and Mann made their foray into northern Minnesota, acquiring and building lines that would later be run by the company. The Canadian Northern's Minnesota lines carried large volumes of lumber out of the northern pine forests, hauled iron ore from the Mesabi mines, and provided Duluth with an additional connection to a transcontinental rail line (for a map of the Canadian Northern railroad network in Minnesota, see Maps section).

Predecessor Line: Port Arthur Duluth and Western Railway Company

The Port Arthur Duluth and Western Railway Company began as the Thunder Bay Colonization Railway Company, which was incorporated to take advantage of potential new business created when silver was discovered south of Port Arthur and to connect that city with Duluth. Construction on the Thunder Bay Colonization Railway never materialized, and in 1887 the company was renamed the Port Arthur Duluth and Western (Battistel 2006).

The Port Arthur Duluth and Western did not fare much better than its predecessor. Construction was completed from Port Arthur to the Gunflint Iron Mine six miles south of the international border by 1893, but the combination of rough natural topography and insufficient financing prevented the desired connection to Duluth. Further, insufficient shipments were made over the new rail line, and within five years, the company had gone bankrupt. It was at this time that Mackenzie and Mann purchased the road, mainly with the intent of using the first 19 miles south of Port Arthur for the Ontario and Rainy River Railway (another railroad venture that would come to be associated with the Canadian Northern), though they also hoped that the Mesabi iron range might extend farther north than previously discovered (Battistel 2006; Regeher 1976:80).

In 1902, the Canadian Northern abandoned the Minnesota segment of the road. Though it was subsequently leased to the Pigeon Bay Lumber Company for its logging operations, a 1909 fire destroyed the trestle over the international border at North Lake, after which point it ceased to be of use (Battistel 2006).

Acquisitions in Minnesota

Minnesota and Manitoba Railroad Company

The Minnesota and Manitoba Railroad Company was incorporated in April of 1899 by the Minnesota and Manitoba Lumber Company "to build and operate a railroad from a point on the northern Minnesota border, southeast to a point at or near Rainy River" (Prosser 1966:148). The lumber company, however, had no interest in building or operating the road—but rather hoped to attract a purchaser who did. In this way, they could ensure reliable transportation of their freight while providing the purchaser with the exclusive rights to it.

Later in 1899, Mackenzie and Mann became the hoped-for purchasers. With the lucrative lumber traffic contract, came the added benefit of a charter that allowed them to connect two of their roads under other charters: The Ontario and Rainy River Railway, whose route ran from Port Arthur to Rainy River, and the Manitoba and South Eastern Railway, whose route ran from Winnipeg to the international border north of

Warroad. The Minnesota and Manitoba route, constructed in 1900, connected the western end of the Ontario and Rainy River with the eastern end of the Manitoba and South Eastern via Baudette, Minnesota, and the international border north of Warroad. In December of 1901, not long after its completion, the Minnesota and Manitoba was leased to the Canadian Northern. It was purchased outright by the Canadian Northern in 1903 and eventually became part of its transcontinental line (Regehr 1976:79-80, 221).

In 1914, the Canadian Northern built a depot along this line at Warroad, which was listed on the National Register of Historic Places for its significance:

as a structure through which numerous emigrants from the United States passed on their way to Canada. It is located on the only section of the Canadian transcontinental railway system which passes through the United States. The station, whose construction was made possible by a treaty between the two countries, is believed to be the first depot in the United States constructed by a foreign corporation [Skrief 1980].

Minnesota and Ontario Bridge Company

In 1899, the Minnesota and Ontario Bridge Company was incorporated with the objective of building a steel railway bridge across the Rainy River between Baudette, Minnesota, and Rainy River, Ontario. Once this bridge was constructed, sometime during 1900 or 1901, it was leased to the Canadian Northern, who purchased the company in 1903 (Regehr 1976:80, 221).

Duluth Rainy Lake and Winnipeg Railway Company

The Duluth Rainy Lake and Winnipeg Railway Company was incorporated as the Duluth Virginia and Rainy Lake Railway Company in July of 1901 by a logging company to facilitate the transportation of its products (Evesmith n.d.). Sources vary as to the name of this company, which was either Cook and O'Brien (Regehr 1976) or Cook and Turrish (Evesmith n.d.). The objective of the railroad company, "to build and operate a railroad from Virginia northwest via Vermillion Lake, Ash Lake, and Gabitegumag [Kabetogama] Lake, to the village of Koochiching at the northern boundary of the state" (Prosser 1966:133) was partially achieved under its original name, with the construction of a line from Virginia to Cook in 1903.

Sources vary as to when the rest of the line in Minnesota was constructed. Prosser (1966:133) indicates that the Duluth Virginia and Rainy Lake was reorganized as the Duluth Rainy Lake and Winnipeg on December 18, 1905, and that construction from Cook to at least the state line (Prosser does not provide information on mileage outside of Minnesota) was carried out during 1907 and 1908. Regehr (1976:313) states that track had been laid through to Fort Frances, Ontario, by 1905, which fueled the interest of Mackenzie and Mann, who wanted to build a Canadian Northern through line from Winnipeg to Duluth. In either case, Mackenzie and Mann took a controlling interest in the road in 1905. They operated the road as the Duluth Rainy Lake and Winnipeg, first on its own and subsequently under the Duluth Winnipeg and Pacific Railway Company, until they purchased it outright through the latter in 1913 (Wikipedia 2005).

Duluth Winnipeg and Pacific Railway Company

The Duluth Winnipeg and Pacific Railway Company was incorporated by Mackenzie and Mann in March of 1909 to extend the Duluth Rainy Lake and Winnipeg line from Virginia to Duluth. Prior to that time, the logging company that had incorporated the Duluth Rainy Lake and Winnipeg still maintained a 49 percent interest in the railway company, but it chose to sell out to Mackenzie and Mann when they proposed extending the line. Mackenzie and Mann formed the Duluth Winnipeg and Pacific through a complicated financial arrangement, the end result of which was that the company was controlled by the Canadian Northern, but Mackenzie, Mann and Co. Ltd. held 49 percent interest in it (Prosser 1966:133; Regehr 1976:313).

Mackenzie and Mann hoped that a line with connections to Duluth would play a significant role in iron ore and lumber transportation, especially if Mesabi Iron Range deposits extended farther north than previously discovered. Additionally, they sought to compete with United States railways for the traffic obtained through connections with western Canadian railways. To these ends, they constructed the line from Virginia to Duluth, which was completed in 1912 (Regehr 1976:312-313). In July of that year, the Duluth Winnipeg and Pacific took over the operation of the Duluth Rainy Lake and Winnipeg line. In 1913, Mackenzie and Mann purchased the Duluth Rainy Lake and Winnipeg through the Duluth Winnipeg and Pacific, so that the Duluth Winnipeg and Pacific mainline extended from Duluth to Ranier near International Falls, and then across Rainy River into Ontario to connect with the Canadian Pacific mainline (Prosser 1966:133). In the same year, they had a depot constructed in Virginia for the Duluth Winnipeg and Pacific, which is listed on the National Register of Historic Places as a symbol of “the entrepot status of Virginia for the central and eastern Mesabi Range and [because it] signifies the dependence of the iron mining region upon the railroad to bring in all the needed goods and workers for the industry and to take out the iron ore” (Skrief 1979).

The Duluth Winnipeg and Pacific line met Mackenzie and Mann’s hopes for lumber traffic, eventually shipping 200 million board feet annually. It also profited from iron ore transportation, though not to the level anticipated. After World War I, potash and paper constituted additional significant freight traffic for the line (Regehr 1976:314; Wikipedia 2005).

The Duluth Winnipeg and Pacific name was retained under the Canadian Northern and subsequently Canadian National Railways until 1993, when Canadian National renamed its system of U.S. subsidiaries as CN North America. In 1995, the name CN North America was dropped, and the entire system returned to the name Canadian National Railway (Wikipedia 2005).

Canadian National Railway

The completion of the Canadian Northern transcontinental road came at a high price for Mackenzie and Mann, first literally and then figuratively, when they paid by losing their life's work. Mackenzie and Mann went into heavy debt to complete the line, and when it was finished, poor operating results, a lack of local traffic, legally imposed rate maximums, and the free use of the line by the government for military purposes during World War I, resulted in an inability to make good on those debts. The end result was the nationalization of the Canadian Northern in 1918, at which point Mackenzie and Mann were forced to resign from the company that they created. Subsequently, in 1923 the Canadian Northern was amalgamated with the Intercolonial Railway, National Transcontinental Railway, Grand Trunk Railway, Grand Trunk Pacific Railway, and several smaller lines to form the Canadian National Railways (Regehr 1976). In 1960, Canadian National Railways became Canadian National Railway.

Today, the former Minnesota and Manitoba route continues to constitute a portion of the Canadian National transcontinental route. The Canadian National uses the line of the former Duluth Winnipeg and Pacific as part of a route that leads beyond Duluth to Chicago and the major U.S. interchanges located there (Wikipedia 2005).

III. Chicago and North Western Railway Company

Introduction

The Chicago and North Western Railway Company (C&NW) established itself as a major presence in southern Minnesota primarily through acquisition and integration of established lines into its system. The C&NW was incorporated in 1859, by assembling a group of small railroads in Illinois, Iowa, and Wisconsin. Beginning with its acquisition of the Winona and St. Peter (W&StP) in 1867, the C&NW established itself as a major railroad in southern Minnesota. By the early 1880s, the C&NW controlled lines extending across Minnesota from the Mississippi River into Dakota Territory and through southwestern Minnesota, including a controlling interest in the Chicago St. Paul Minneapolis and Omaha (Omaha Road) by 1882. C&NW developed a triangular flow of freight on its lines between farms and towns in southwestern Minnesota, as well as parts of Iowa, Nebraska and Dakota Territory, the Twin Cities, and Chicago. Freight could thus flow in a continuous loop; for example, wheat hauled into Minneapolis was processed into flour and sent to Chicago, while manufactured goods were shipped out to the prairie towns.

One of the major granger railroads in the Upper Midwest, the C&NW was a main competitor of the Chicago Milwaukee and St. Paul (CM&StP) in southern Minnesota through the early twentieth century. The C&NW fared better than many of its fellow granger lines during the post-World War II era. In 1960, it acquired the Minneapolis and St. Louis (M&StL), and in 1968, the Chicago Great Western (CGW) (for a map of the C&NW railroad network in Minnesota, see Maps section).

Acquisitions

Winona and St. Peter Railroad Company

New Construction

The W&StP was incorporated in 1862 (originally chartered as the Transit Railroad Company in 1855) with the intent of building a line from Winona on the Mississippi River to St. Peter on the Minnesota River, and on to Big Sioux River in Dakota Territory. The goal was to connect those major waterways and to access the fertile but sparsely settled lands in that region. When the W&StP completed its line to Watertown, South Dakota, in 1873, it had received over $12 million worth of subsidies, including approximately 1.75 million acres in federal land grants, 50 miles of graded roadway, plus state and municipal bonds (Prosser 1966:169).

The first 11 miles from Winona to Stockton were completed by the end of 1862, making the W&StP the second operational railroad in Minnesota. Crossing the bluffs west of Winona, which have some of the steepest topography in Minnesota, the W&StP reached St. Charles in 1863 and Rochester in 1864. When the W&StP completed tracks to Owatonna in 1866, it connected with the Minnesota Central railroad (later CM&StP), which provided access to Minneapolis and St. Paul. Continuing west, the W&StP reached Waseca in 1867. During this period, construction had been financed largely through a group of eastern investors, known as the Barney group (land sales were not yet a significant source of funds). In 1867, the Barney group sold its controlling shares in the W&StP to the C&NW. The W&StP, however, continued to operate as a proprietary line under its own corporate name, organization, and operations until 1900 (Grant 1996:30-31; Prosser 1966:169).

During the period 1870 to 1873, despite the change in ownership, the W&StP continued building westward. The line reached the Minnesota River Valley in 1870 and gained access to Mankato through a subsidiary, the Winona Mankato and Northern Railroad, and then built north to St. Peter in 1871. Also in 1871, at the other end of the line, the W&StP built a bridge across the Mississippi River at Winona, thus allowing for direct connections to the east. After reaching St. Peter, the W&StP crossed the Minnesota River again in 1872 and built to New Ulm. Building west from New Ulm, the line turned sharply northwest at Tracy, continued into Dakota Territory, and reached Lake Kampeska and Watertown in 1873. The economic depression of the mid 1870s did not bankrupt the C&NW/W&StP like many of its competitors, but investment capital dried up. New construction was delayed until later in the decade.

The W&StP also constructed new mainline during this period. In 1879, the railroad built a line directly west from Tracy into Dakota Territory and on to the Black Hills. This line was then designated the mainline, and the route northwest from Tracy to Watertown was reduced to branch status.

Acquisitions by the Winona and St. Peter

The W&StP resumed construction in the late 1870s, and between 1878 and 1881 four feeder lines were built from the W&StP mainline, helping to fill in the rail network and to solidify the company's service area. Although each line was built by a separate company, the C&NW financed all of them. In 1881, the W&StP absorbed all four of the branch lines (Grant 1996:45-46; Luecke 1990:113-115 Prosser 1966:120, 156-157).

Chatfield Railroad Company

The Chatfield Railroad Company was incorporated in 1878. A line was built from Chatfield Junction on the mainline to Chatfield in Olmstead County to discourage the Southern Minnesota (later CM&StP) from extending a branch line north to Rochester.

Plainview Railroad Company

The Plainview Railroad Company was incorporated in 1877. The following year, a line was built north from Plainview Junction on the mainline to Plainview in Olmstead County to counter construction of the Minnesota Midland (later CM&StP), which connected Wabasha to Rochester.

Rochester and Northern Minnesota Railway Company

The Rochester and Northern Minnesota Railway Company was incorporated in 1877. The following year, a line was built north from Rochester to Zumbrota in Olmstead and Goodhue Counties to counter construction of the Minnesota Midland.

Minnesota Valley Railway Company

The Minnesota Valley Railway Company was incorporated in 1876. The company built a line in 1878 from Redwood Junction (west of Sleepy Eye) to Redwood Falls in Brown and Redwood Counties.

By the early 1880s, the W&StP rail network was essentially complete. The W&StP built one short branch line in 1890 from its mainline at Kasson into Mantorville to counter construction by the Chicago Great Western railroad toward Mantorville and to gain access to the stone quarries. The W&StP continued to operate as an independent railroad owned by the C&NW until it was formally merged into the larger company in 1900.

Chicago St. Paul Minneapolis and Omaha Railway Company

Predecessor Lines

Although the Omaha Road had only a two-year corporate existence when the C&NW acquired a controlling interest in 1882, its predecessor lines nonetheless created important early connections from the Twin Cities. The St. Paul Stillwater and Taylors Falls Railroad Company (StPS&TF) created a route that provided connections for a new through route to Chicago in the early 1870s before it was acquired by the St. Paul and Sioux City Railroad Company (StP&SC). The StP&SC built a line up the Minnesota River Valley during the late 1860s and across southwestern Minnesota by the early 1870s. Reorganized as the Omaha Road in 1880, the company was controlled by the C&NW by 1882 but remained a proprietary line through most of its history.

St. Paul Stillwater and Taylors Falls Railroad Company

The StPS&TF, which was incorporated in 1869, built a line east from St. Paul to Stillwater in 1871—receiving 44,500 acres in federal land grants through the State of Minnesota. In the same year, the StPS&TF built a line to Hudson, Wisconsin, with a drawbridge over the St. Croix River, and connected with the West Wisconsin Railroad, which then leased the StPS&TF for access to St. Paul. By 1872, the West Wisconsin connected with the C&NW at Elroy, Wisconsin, providing through service between St. Paul and Chicago (Grant 1996:72; Prosser 1966:163).

After the West Wisconsin defaulted on debt in 1878, it was reorganized as the Chicago St. Paul and Minneapolis Railway. Soon after its reorganization, the new company teamed with the CM&StP to form the Minneapolis Eastern Railway Company, a terminal railroad funded by both companies to gain access into the Minneapolis milling district. This new short line was completed in 1879 (Grant 1996:74; Prosser 1966:144). One year later in 1880, the StPS&TF railroad was acquired by the StP&SC.

St. Paul and Sioux City

The StP&SC was originally incorporated as the Minnesota Valley Railroad Company in 1864, acquiring a portion of the charter from the Root River Valley and Transit Railroad. The intent was to build up the Minnesota River Valley, then continue southwest to Sioux City, Iowa. In 1865, the Minnesota Valley railroad completed a line from Mendota to Shakopee. As it extended up the south side of the Minnesota River, the Minnesota Valley railroad connected with Le Sueur in 1867 and Mankato in 1868; then it built southwestward out of the river valley and into the sparsely settled prairie lands. In 1870, the railroad reached St. James in Watonwan County, which previously had been designated as the division point. Meanwhile, in 1869, the Minnesota Valley railroad was reorganized as the StP&SC. Also in 1869, in a joint venture with the Minnesota Central railroad (later CM&StP), the StP&SC completed an extension from Mendota through West St. Paul and into St. Paul via a bridge over the Mississippi River.

The Sioux City and St. Paul Railroad (which was affiliated with the StP&SC) completed construction of the line through southwestern Minnesota, extending to Worthington in 1871 and to LeMars, Iowa, in 1872. While building this line, the StP&SC received 855,200 acres in federal land grants through the State of Minnesota, as well as 37.5 miles of right of way with graded roadway, and state and municipal bonds. Likewise, the Sioux City and St. Paul received approximately 230,000 acres of land. The StP&SC thus provided the first direct connection between southwestern Minnesota and the Twin Cities (Grant 1996:69-70; Prosser 1966:152-153, 161, 164).

As with other railroads, investment capital available to the StP&SC dried up after the Panic of 1873, and new construction was put on hold for several years. Starting in the mid 1870s however, the StP&SC continued its expansion through southwestern Minnesota, and by the early 1880s, the company had built the lines listed below to fill in its rail network and to connect with existing towns initially bypassed by the mainline. In addition, the StP&SC sought to solidify its service area in southwestern Minnesota, as the Southern Minnesota railroad extended its mainline west of Winnebago City after 1877 (Grant 1996:70-71; Luecke 1990:106-110 Prosser 1966:147, 161).

- **Dakota Extension:** Between 1876 and 1880, the StP&SC built an extension from Sioux Falls Junction near Worthington to Sioux Falls and Salem in southern Dakota Territory, providing a connection with the growing rail hub. The railroad built an additional branch off of the Dakota Extension in 1879, running south from Luverne in Rock County to Doon, Iowa.
- **Minnesota and Black Hills Railroad Company:** Incorporated in 1878, and after a few months, acquired by the StP&SC. The StP&SC built the line west from Huron Lake in Jackson County, reaching Woodstock in Pipestone County in 1878 and later extending the route to Pipestone in 1884.
- **Lake Crystal to Elmore:** In 1880 and 1881, the StP&SC built from Lake Crystal in Blue Earth County south to Elmore on the Iowa border to connect with the Toledo and Northwestern Railway (a C&NW-controlled road) and to improve connections to the southeast.

Formation of the Chicago St. Paul Minneapolis and Omaha Railway Company

In 1880, the Chicago St. Paul Minneapolis and Omaha Railway was incorporated as a combination of the StP&SC's Taylors Falls line and two Wisconsin lines. One year later, the Omaha Road acquired the StP&SC as well as the Sioux City and St. Paul. The new company was headquartered in St. Paul.

In 1882, the C&NW acquired controlling interest in the Omaha Road by investing about $10.5 million in stock. The Omaha Road remained an independent railroad, but increased its connections with the C&NW and, as an affiliated line, would not be acquired by any of the competing granger railroads. This was in part a defensive move by the C&NW against the Chicago Rock Island and Pacific (CRI&P) railroad, which had designs on the Omaha Road. Perhaps more importantly, the new connections provided both the Omaha Road and the C&NW with a triangular flow of traffic between Omaha, the Twin Cities, and Chicago. Thus, by moving agricultural commodities, processed foods, and manufactured goods between those three and other Midwestern markets, the combined C&NW and Omaha Road established itself during the 1880s as a major granger railroad system. Although the Omaha Road remained independent, freight interchanged between lines with minimal disruption. For example, by the end of the 1880s livestock originating on C&NW lines in South Dakota could transfer to the Omaha Road at Mankato, then ship to the stock yards and packing plants at South St. Paul (Grant 1996:76-78).

The Omaha Road maintained a number of facilities in the Twin Cities, including its headquarters on Fourth and Rosabel Streets in downtown St. Paul until 1917, when the Omaha Road moved into consolidated offices with the C&NW at Fourth and Wall Streets in St. Paul. In 1881, the Omaha Road established two major yards in St. Paul and one in Minneapolis. The West Division Shops (or St. Paul Shops) was a locomotive repair facility built in St. Paul's West End and which, through expansions, became the Omaha

Road's main engine shops. On the East Side, the Omaha Road built the East St. Paul Yards, which would become a major switching facility for the railroad. Just west of downtown Minneapolis, the Omaha Road established a rail yard and depot that was expanded in 1887. Also in 1887, the Omaha Road built its southeast Minneapolis yard, which along with the Great Northern and CGW yards, served a large concentration of grain elevators. By the turn of the century, the Omaha Road was a major carrier in the Twin Cities—running 16 freight trains and 20 passenger trains daily into and out of its terminals (Follmar and Mikelson 2004:31-32).

Acquisitions

After the economic depression of the mid 1890s, the Omaha Road acquired three small lines to improve its connections and fill in its rail network (Prosser 1966:127, 166, 168):

Superior Short Line Railway Company of Minnesota

The Superior Short Line Railway Company was a transfer line built in 1886 from Rice's Point to a junction with the St. Paul and Duluth (Northern Pacific) tracks in Duluth. The Omaha Road acquired the short line in 1895 to access Duluth (as well as Superior) via its Chippewa Falls and Northern branch.

Watonwan Valley Railway Company

The Watonwan Valley Railway Company was incorporated in 1899 and built a line from Madelia (Watonwan County) to Fairmont (Martin County). This railroad was acquired by the Omaha Road later that year.

Des Moines Valley Railway Company of Minnesota

The Des Moines Valley Railway Company of Minnesota was incorporated in 1899 and built from Bingham Lake (Cottonwood County) to Currie (Murray County) in 1900. The Omaha Road acquired this line in 1900.

From the 1880s to the turn of the century, the Omaha Road made improvements within its existing rights of way. In 1882, in order to accommodate the growing traffic between the Twin Cities and Chicago, the Omaha Road improved its railroad corridor east of St. Paul, including double-tracking the line to the St. Croix River crossing at Hudson, straightening curves, and reducing grades. During 1895-1896, the Omaha Road and W&StP (C&NW) consolidated their lines in Mankato, utilizing the W&StP right of way. In 1898 and 1902, the Omaha rerouted 5.75 miles of its roadway alignment between Belle Plaine and Henderson to reduce curves and grades. Much of the original right of way was converted to a county road. Short stretches of double tracks were added in 1900 in St. Paul's West End and between Sioux Falls Junction and Worthington (Luecke 1990:138-139). In 1904, the C&NW acquired an outright majority of shares of the Omaha Road, increasing its control. The Omaha Road, however, officially remained a separate corporation.

Chicago and North Western, 1870s-1904

The period from the late 1870s through the turn of the century was one of expansion for the C&NW, and it established itself as an important granger railroad in the Midwest and Minnesota. From approximately 1,500 miles of track owned in 1874, the C&NW grew to 4,250 miles by 1890, then to 7,515 miles by 1910. As noted above, the C&NW hauled heavy volumes of agricultural commodities throughout southern Minnesota, particularly after it gained control of the Omaha Road. For example, in 1900 agricultural products accounted for approximately 20 percent of the company's ton-miles of freight (Poor 1890, 1900, 1910).

In addition to hauling the produce and livestock from Minnesota's farms, the C&NW owned subsidiary land companies to develop cities and agricultural land along its lines as well as the Omaha Road lines. For instance, the Western Town Lot Company, a subsidiary of C&NW that served as its land department, was active in selling land and promoting settlement in western Minnesota and the Dakotas during the 1870s and 1880s. During the 1880s and 1890s, the C&NW's Iowa-Minnesota Townsite Company promoted and sold properties along its Minnesota and Iowa lines. Similar to other railroad companies, the C&NW also established an agricultural extension program to promote diversified and scientific farming. Along the Omaha Road lines, the Northwestern Town Lot Company actively promoted cities such as Le Sueur, Kasota, Luverne, and Worthington (Grant 1996:94-95, 2000:201).

During the 1890s, the C&NW began adding express (limited-stop) passenger service, including the Overland Limited from Chicago to San Francisco (with the Union Pacific) and, in 1895, the Northwestern Limited between Chicago and Minneapolis. Stopping only in Chicago, Milwaukee, St. Paul, and Minneapolis, this express train completed the run in 13 hours—down from 17 hours a decade earlier (Grant 1996:104). In addition, the C&NW established a Department of Tours to promote tourism to such exotic locations as Yellowstone National Park and Rocky Mountain National Park.

Although the economic depression of the mid 1890s halted most new construction and bankrupted many railroad companies, by the end of the decade the C&NW emerged in a strong economic position. Using its healthy revenues and investor confidence, the C&NW began expanding its network again and consolidated its control over subsidiaries. In 1900, the C&NW fully merged the W&StP into its corporate structure, and the W&StP became the Minnesota Division of the C&NW. Four years later, the C&NW acquired additional stock in the Omaha Road, gaining an outright majority and consolidating its control over that company.

Acquisitions

During the period 1899 through 1902, numerous lines were built under subsidiary companies, which were then absorbed by the C&NW (Grant 1996:88; Prosser 1966:137-139, 148-149, 153-154).

Mankato and New Ulm Railway

The Mankato and New Ulm Railway was built in 1900 between Mankato and New Ulm to provide a direct connection into Mankato from the west, rather than looping north through St. Peter and then south. This line became a segment of the mainline, and the segment from St. Peter to New Ulm was reduced to branch status.

Minnesota and South Dakota Railway Company and Minnesota Western Railway Company

The Minnesota and South Dakota Railway Company built in 1900 from Tyler (Lincoln County) through Hendricks into South Dakota, and the Minnesota Western Railway Company built in 1902 from Evan (Brown County) to Marshall Jct. (Lyon County) in order to add service to grain-growing regions. These "gathering branches" ran at capacity during harvest season but were relatively quiet the rest of the year.

Minnesota and Iowa Railway Company

The Minnesota and Iowa Railway Company built a branch line in 1899 and 1900 from Vesta (Redwood County) to connect with the mainline at Sanborn. It also built a cutoff project from Sanborn, southeast through Ceylon (Martin County) and into Iowa to provide more direct connection between western Minnesota/eastern South Dakota and points to the southeast.

Iowa Minnesota and Northwestern Railway Company

The Iowa Minnesota and Northwestern Railway Company built in 1900 from Fox Lake (Martin County) southeast through Fairmont, Blue Earth, and Kiester (Faribault County) and on to Mason City, Iowa, to further improve connections to the southeast.

New construction and acquisitions not only broadened the C&NW rail network, but altered development patterns in southwestern Minnesota. Much like the building campaign of the late 1870s and early 1880s, new townsites (such as Comfrey in Brown County and Lucan in Redwood County) were platted along the newly constructed lines, often by the Western Town Lot Company (Gimmestad 1978, 1979). In addition, the new lines stimulated growth in established cities. For example, the Redwood Falls branch line began receiving traffic from the Minnesota Western branch line and joined the mainline just west of Sleepy Eye. The city grew accordingly, and the C&NW built a substantial new brick depot in 1902 (Roise and Hybben 1991).

Chicago and North Western in the Twentieth Century

Although the C&NW undertook little new construction in Minnesota during the early twentieth century, the company continually improved its existing lines by investing in heavier steel rails, hardwood crossties, crushed rock ballast, new bridges, longer passing sidings, and automatic block signals. In 1911, the C&NW completed its Adams Cutoff in Wisconsin, which by-passed Madison to reduce the distance and travel time from Chicago and Milwaukee to St. Paul. Although, as noted above, the Omaha Road remained an independently operating company, during World War I the United States Railroad Administration consolidated some of the operations and administration of the two companies in the interest of efficiency.

The C&NW and Omaha Road remained granger railroads through the first half of the century. The Omaha Road in particular relied on agricultural and animal products for revenue. Those commodities represented 41 percent of freight tonnage in the early 1920s and 31 percent in the early 1930s. Though less dependent, the C&NW carried large volumes of agricultural and livestock products, which by the 1940s, still comprised about 19 percent of its total freight tonnage (Chicago and North Western Railway Company 1942:38; Chicago St. Paul Minneapolis and Omaha Railways Company 1923:36-37, 1932:12-13).

Like many other companies, the C&NW's passenger service was an important source of revenue during the first two decades of the twentieth century. By the 1920s, however, the number of passengers began a long-term, steady decline due to competition from automobiles and later, buses and airlines. In an effort to stem the slump, the C&NW upgraded its passenger cars in 1923 on its North Western Limited run between the Twin Cities and Chicago. The passenger decline, nonetheless, continued into the 1930s, and in 1935, the C&NW introduced the 400s—streamlined, diesel-powered, high-speed passenger trains running between Chicago and the Twin Cities.

Despite the declining passenger revenue, the amount of freight hauled by the C&NW continued to increase during the 1920s, and the company operated at a profit. Conditions changed quickly, however, with the onset of the Great Depression in 1929. The number of passengers continued the long-term decline, and freight tonnage dropped precipitously. As a result, the company's net operating income fell from about $26 million in 1929 to $6 million in 1931. Four years later the C&NW filed for bankruptcy and entered receivership. The company remained in receivership until 1944, when wartime demand finally brought the company back to profitability (Grant 1996:151).

Following World War II, the C&NW remained profitable. By the mid 1950s, however, due to neglect of infrastructure and rolling stock, as well as duplication of operations with the Omaha Road, the company had financial difficulties and narrowly avoided bankruptcy. A new company administration brought about changes: most notably, consolidation of the offices and operations of the Omaha Road with the C&NW in

1957. In addition to increased efficiencies, the C&NW began a period of mergers that resulted by the end of the 1960s in the third largest railroad company in track mileage in the country. In 1960, the C&NW acquired the M&StL, which provided a complimentary route structure. Another notable acquisition by the C&NW was the CGW in 1968. The C&NW, therefore, successfully navigated the 1970s and 1980s, which were difficult for many railroads, through competent management, timely abandonments, a period of employee ownership, and finally, in 1995—acquisition by the Union Pacific.

Minneapolis and St. Louis Railway Company

Introduction

The M&StL was formed in 1870 as a locally owned railroad that would provide Minneapolis business interests with direct access to raw materials, especially grain and lumber, and an outlet for processed goods. Formation of the road was an effort to check the growing power of Chicago and Milwaukee interests. The first board of directors of the M&StL was comprised of some of the most prominent men in Minneapolis at the time including: William D. Washburn, John S. Pillsbury, Isaac Atwater, Rufus J. Baldwin, and William W. Eastman. The determination to remain locally controlled, however, meant that the M&StL was squeezed between larger, more powerful competitors, such as the CM&StP, the Omaha Road (controlled by C&NW by 1882), and the St. Paul Minneapolis and Manitoba railroad (later Great Northern). With direct connections from Minneapolis to the west and south, the M&StL benefited from a strong agricultural base in its service areas. As railroad companies combined into increasingly larger systems during the early twentieth century, the M&StL could no longer compete. By 1923, the bankrupt company went into receivership from which it did not emerge until 1942. Prudent management allowed a return to profitability in the years following World War II. In 1960, the M&StL was acquired by the C&NW.

Expansion Years, 1870-1900

New Construction

Early railroad development in Minnesota focused on connections with St. Paul. By the late 1860s, development of the milling district in Minneapolis was in jeopardy due to poor railroad connections, despite the advantage of plentiful waterpower provided by St. Anthony Falls. Railroads controlled by Milwaukee and Chicago interests set rates that favored shipping grain to those cities, and thus, Minneapolis mills found it difficult to obtain an adequate supply of wheat for their flour mills. Acquiring the 1853 charter for the defunct Minnesota Western Railroad, the M&StL was established in 1870 with the intention of building a locally owned and operated railroad outlet for Minneapolis milling interests.

Initial construction by the M&StL focused on two critical connections: to the expanding wheat fields of southwestern Minnesota and to the Great Lakes port at Duluth. In 1871, tracks were completed from Minneapolis to Merriam (southeast of Shakopee), providing connections to the StP&SC (later the Omaha Road) and, by the following year, to the Hastings and Dakota (later the CM&StP). Also in 1871, a group of shareholders of the M&StL formed the Minneapolis and Duluth railroad and built a line from St. Anthony to White Bear Lake to connect with the Lake Superior and Mississippi line. The M&StL later acquired this line in 1881. Although the Panic of 1873 and ensuing depression halted any additional construction by the M&StL for several years, the company provided Minneapolis with key rail connections, and it controlled a great deal of right-of-way within the milling district (Hofsommer 2005b:6-12; Prosser 1966:141).

As the economy improved by 1877, the M&StL built a line from Merriam to Albert Lea, allowing for a connection to Chicago via the Burlington Cedar Rapids and Northern railroad and the CRI&P. New M&StL facilities included a roundhouse at Albert Lea and a joint depot with C&NW in Waseca. The Albert Lea line passed through established communities such as Jordan, New Prague, Waterville, and Waseca, and it provided the impetus for new towns along the line including: Montgomery, Kilkenny, Palmer, Otisco, and New Richland. Numerous elevators were established along the Albert Lea line for shipping grain into Minneapolis, and with its dominant position in the milling district, the M&StL hauled out over half of the flour produced (Hofsommer 2005b:17). The new connections brought profitability to the M&StL by the late 1870s and spurred on additional new construction.

In 1879, the M&StL completed tracks from Albert Lea southwest to Emmons near the Iowa state line and on to Fort Dodge, Iowa to gain access to the nearby coalfields. Building in the opposite direction in 1880, the M&StL completed an extension from the St. Paul and Duluth (StP&D) tracks at Wyoming to Taylors Falls. This line was part of a planned extension to Duluth that was not completed due to a new operating agreement for use of the StP&D tracks.

Acquisitions

<u>Minneapolis and St. Louis–Pacific Extension</u>

The M&StL began a major westward extension in 1879 to tap into the wheat fields of western Minnesota and Dakota Territory. Building under the corporate entity known as the Minneapolis & St. Louis–Pacific Extension, tracks were completed westward from Hopkins Junction to Winthrop in Sibley County. New communities along the line included Deephaven, Minnetonka Beach, Green Isle, Victoria, Hamburg, Arlington, Gaylord, and Winthrop. In addition to accessing grain, this route included a stop at the St. Louis Hotel near Excelsior, and a mile-and-a-half spur that was extended to the Lake Park Hotel at Tonka Bay.

By the early 1880s, Lake Minnetonka had become a fashionable resort area, and passenger service boomed on the M&StL during the summer months.

The Pacific Extension was consolidated with the M&StL in 1881, and in the following year construction continued westward from Winthrop. During 1882 and 1883, tracks were completed to Morton on the Minnesota River.

Wisconsin Minnesota and Pacific

In 1884, the Wisconsin Minnesota and Pacific (WM&P) railroad built a line from Morton northwest to Marietta near the current South Dakota state line, and then into Dakota Territory to Watertown. The WM&P also built a line from Red Wing to Watertown, Minnesota. The two disconnected segments of the WM&P were controlled by the CRI&P, but M&StL leased the tracks from Morton to Watertown until it acquired them in 1899 (Donovan 1950:65; Prosser 1966:143, 172).

Minneapolis New Ulm and Southwestern Railroad Company

In 1896, the Minneapolis New Ulm and Southwestern Railroad Company (Southwestern) built a line from the M&StL tracks at Winthrop, south to New Ulm (Prosser 1966:144). Three years later in 1899, the M&StL acquired the Southwestern with the intent of continuing construction south to Storm Lake, Iowa. The following year, tracks were completed south from New Ulm through St. James and into Estherville, Iowa. A number of new towns were platted along the line by the Iowa & Minnesota Land & Townsite Company. This line provided a competitive outlet for St. James, which was previously served only by the Omaha Road.

Despite efforts at expansion, the M&StL was no match for its larger rivals. In 1882, the local investors (led by the Washburn brothers) agreed to sell controlling interest to a group led by CRI&P interests. Despite this alliance and the new connections it brought, competition from larger railroads in Minneapolis, western Minnesota, and South Dakota left the M&StL with insufficient revenue. In Minneapolis in particular, which was the key market of the M&StL, competition became intense in the mid 1880s as the Omaha Road, Soo Line, Chicago Burlington and Northern, and Wisconsin Central all added routes to the city. While the M&StL handled nearly 20 percent of all rail cars entering Minneapolis in 1886, two years later, it handled just under 9 percent of all cars. In 1888, unable to make payments due on company bonds sold to finance its construction campaign earlier in the decade, the M&StL filed for bankruptcy and entered receivership. Receivership lasted until 1894, when the company was reorganized as the Minneapolis and St. Louis Railroad Company (Hofsommer 2005b:41-43, 50).

Minneapolis and St. Louis in the Twentieth Century

At the turn of the twentieth century, the M&StL was an established granger line: during the 1890s, grain alone accounted for 25 percent of its freight tonnage, most of which was hauled into Minneapolis. Several line elevator companies operated on M&StL lines, including Pacific Elevator Company and Great Western Elevator Company. Although a large percentage of its freight was wheat, the M&StL was one of the smaller carriers, ranking sixth among wheat carriers into Minneapolis in 1902 and well behind the leading rail lines Great Northern and CM&StP. Not all of the grain shipped by the M&StL went to Minneapolis. For example, the Eagle Roller Mill Company in New Ulm was a regional milling company that owned line elevators in five South Dakota towns. Lumber represented another 23 percent of the M&StL freight, much of it shipped out to the prairies from Minneapolis. Freight tonnage on the M&StL doubled from 1890 to 1900, but flattened out after that. Passenger service, however, grew faster—doubling over the same period and continuing to grow into the first decade of the twentieth century. In 1902, the M&StL debuted its North Star Limited service between the Twin Cities and Chicago. Despite growth in its overall passenger fares, the M&StL discontinued service to Lake Minnetonka, where tourism had been in decline for years—streetcars competed more successfully in this shrinking passenger market (Hofsommer 2005b:79-80; 92).

In addition to limited growth in freight earnings, following its reorganization, the M&StL had lost its alliance with the CRI&P when the larger company established its own connection to Minneapolis. The M&StL also lost its outlet to Duluth in 1901 when the Northern Pacific acquired the StP&D railroad. Furthermore, after canceling its lease on the M&StL line between St. Anthony and White Bear Lake, the Northern Pacific acquired that branch line as well. Feeling threatened by expanding rail systems, the M&StL leadership expanded its own rail network. In 1905, the M&StL gained control of two Iowa lines: the Iowa Central and the Mason City and Fort Dodge. Two years later, the M&StL constructed an extension from Watertown, South Dakota, to LeBeau on the Missouri River, which temporarily increased its livestock haul.

With the expansion of its service area, coupled with a healthy economy, the M&StL freight haul in 1910 was double that of 10 years earlier. Both freight and passenger revenue continued to increase during the 1910s. To handle the increased volumes, the company invested in improvements to its lines. For example, a steep grade between Hopkins and Chaska was reduced, and additional ballast and heavier rails were laid on numerous lines, including 80-pound rails between Hopkins and Minneapolis. Trackside facilities were also improved, such as a larger roundhouse and yards at Albert Lea and new depots or transfer platforms at Hopkins, Dawson, and Winthrop.

Despite the increased revenue and facility improvements, the M&StL ran into financial difficulties in the mid 1910s. With competition from larger systems, a strengthened Interstate Commerce Commission (ICC) limiting rates, and heavy debt obligations from the earlier expansions, the M&StL voluntarily re-organized in 1916 to avoid bankruptcy. Although control by the United States Railroad Administration and heavy freight traffic during World War I masked underlying weaknesses, by the early 1920s, the M&StL was losing money. In 1923, unable to make payments on debts, the M&StL filed for bankruptcy and went into a long period of receivership. Unable to regain its footing during the 1920s, the M&StL suffered further losses during the Depression of the 1930s and did not emerge from receivership until 1942. In 1935, Lucian Sprague, who would lead the company back to profitability in the Postwar years, was appointed Trustee. Despite calls for the company to be dissolved during the period of receivership, the ICC did not allow the M&StL to be broken up, though the railroad abandoned some of its Iowa and South Dakota lines in the late 1930s. During this period, the M&StL only updated its infrastructure, motive power, and rolling stock where such investments improved efficiency.

As with the rest of the railroad industry and the American economy in general, the M&StL benefited from the demands of World War II. For example, freight tonnage doubled from 1938 to 1945. Passenger traffic likewise increased, growing more than three-fold from 1940 to 1945, though still well off the peak years of the 1910s. Profitable years for the M&StL continued through the late 1940s and early 1950s, led by efficient operations and strong demand at its Minneapolis terminals and connections to eastern railroads in Peoria, Illinois. With cash reserves growing during the 1950s, the M&StL considered expansion, unsuccessfully trying to acquire the Toledo Peoria and Western railroad, and then buying the Minnesota Western Railroad Company.

Minnesota Western Railroad Company (Electric Short Line Railway or Luce Line)

In 1956, the M&StL acquired the Minnesota Western Railroad Company. This line was originally incorporated in 1908 as the Electric Short Line Railway, also known as the Luce Line (for its founder William L. Luce). The intention was to build a line between Minneapolis and Brookings, South Dakota, and in the process, provide rail connections to established towns along the line that were lacking such rail service.

Construction began in 1913 between downtown Minneapolis and Luce Line Junction at the western city limits, though this segment was reorganized in 1915 as the Electric Short Line Terminal Company. Construction west of Luce Line Junction also began in 1913, extending the line through Stubbs Bay on Lake Minnetonka and Winsted in 1914, and reaching Hutchinson the following year. The line stopped at Hutchinson for the rest of the 1910s, continued westward to Cosmos in 1922, and reached Lake Lillian in 1923.

The company experienced financial difficulties and in 1924 was reorganized as the Minnesota Western railroad. In 1927, the line was extended to Gluek in Chippewa County, which became the terminal point, and it was subsequently leased to the Minneapolis Northfield and Southern (MN&S) railroad. Although Cargill acquired the line in 1942 when it established Port Cargill on the Minnesota River, the MN&S continued to manage operations. This arrangement would continue until the M&StL acquired the line in 1956 (Hofsommer 2005b:266; Prosser 1966:134).

By the late 1950s, the M&StL itself became an attractive target of acquisition: it was a profitable operation, it was stocked with modern equipment, and it had no bonded debt obligations. The C&NW acquired the M&StL in 1960 and named it the Minneapolis and St. Louis Division (later Central Division).

IV. Chicago Burlington and Quincy Railway Company

Introduction

Although the Chicago Burlington and Quincy Railway Company (CB&Q), was one of the Midwest's primary shippers, its railroad network within Minnesota was minimal. The CB&Q tapped into the state's rail system through two entry points. The first line crossed the Mississippi River at Prescott, Wisconsin/Point Douglas, Minnesota (east of Hastings, Minnesota) and ran to the South St. Paul stockyards. A second line crossed the Mississippi River at Marshland, Wisconsin/Winona, Minnesota and connected to the Chicago and North Western (C&NW) the Chicago Milwaukee and St. Paul Railroad (CM&StP), and the Chicago Great Western (CGW) (for a map of the CB&Q railroad network in Minnesota, see Minneapolis-St. Paul Area in Maps section).

The CB&Q was founded on February 12, 1849, as the Aurora Branch Railroad in Aurora, Illinois. The 12-mile Aurora Branch was composed of secondhand strap iron spiked to wooden ties. With rolling stock on loan from Galena and Chicago Union Railroad (G&CU), the Aurora Branch's first train ran on September 2, 1850, from Batavia, Illinois, to Chicago along six miles of the G&CU's track. The Aurora Branch was renamed the Chicago and Aurora Railroad (C&A) in 1852, although it had not yet built its own line to the Windy City. On July 6, 1856, following its extension to the Quad Cities, the C&A changed its name to the Chicago Burlington & Quincy Rail Road Company (Prosser 1966:122). The CB&Q territory consisted mainly of 400 miles of track in Illinois, Iowa, Missouri, and Nebraska.

Toward the end of the Civil War, the CB&Q built its own line from Aurora to Chicago. A few years later in 1868, the CB&Q secured connections to Iowa's Burlington and Missouri River Railroad (B&M) and Missouri's Hannibal & St. Joseph Railroad (H&StJ) through construction of bridges over the Mississippi River at Burlington, Iowa and Quincy, Illinois. In 1870, the CB&Q absorbed the B&M's statewide Iowa line as part of its campaign to extend its network to Denver, Colorado (Burlington Route Historical Society).

The CB&Q played an important role in the development of Chicago as the main railroad hub in the Midwest and in the agricultural development of the Midwest. In 1865, the CB&Q drove the first train into Chicago's new Union Stockyards. By 1870, the successful CB&Q was the largest industrial employer in the Chicago region, with more than 1,200 employees (Grant 2005). Like other Midwestern railroads, the CB&Q recovered a large part of its investment capital from the sale of its agricultural land grants. From its inception, it relied heavily on its receipts from Illinois and Iowa farm shipments, and it became one of the major granger railroads.

Acquisitions

Chicago Burlington and Northern Railway Company

The Chicago Burlington and Northern Railway Company (CB&N) was incorporated in 1883. With one-third of its stock owned by the CB&Q, the new company would provide the CB&Q with direct access to the Twin Cities. The CB&N built its line to Savanna, Illinois, and then pushed northward along the east bank of the Mississippi River toward St. Paul, reaching Prescott, Wisconsin, in 1886. The following year the railroad bridged the St. Croix River and laid track through St. Paul Park and into St. Paul (Prosser 1966:220).

Winona Bridge Railway Company

In 1891, the CB&Q entered into an agreement with the Green Bay Winona and St. Paul Railway Company to bridge the Mississippi River at Winona. The crossing, which featured a swing span truss (demolished in 1987) to allow river traffic, facilitated the CB&Q connection to the C&NW, the CM&StP, and the CGW mainlines (Prosser 1966:220; Specht 1966).

Chicago Burlington and Quincy in the Twentieth Century

By the turn of the twentieth century, James J. Hill was looking for an independent outlet to Chicago for the Great Northern. After a brief battle with Edward Harriman of the Union Pacific, in 1901 the Great Northern and the Northern Pacific (also soon to be controlled by Hill) acquired 98 percent of the CB&Q stock. On June 24, 1914, the CB&Q Rail Road was reorganized as the CB&Q Railway. Although its operation by the United States Railroad Administration (USRA) during World War I (and the resulting deferred maintenance) had deleterious effects on its track and rolling stock, the CB&Q managed to preserve its solvency and controlled almost 10,000 miles of railroad line by the early 1920s (Bryant 1988:72; Grant 2004; Prosser 1966:122).

The CB&Q earned a reputation for implementing innovative technology. It installed the first printing telegraph as early as 1910 and was the first line to use train radio in 1915. In 1927, the CB&Q was also a forerunner in the use of Centralized Traffic Control (CTC), equipping 1,500 miles of mainline with CTC by 1957. It was this forward-looking development that, in the worst years of the Depression, led the CB&Q Railway to introduce the streamlined, high-speed, diesel-electric *Zephyr* passenger train (Grant 2004). On May 26, 1934, the CB&Q's *Pioneer Zephyr* executed a 1,000-mile high-speed "Dawn-to-Dusk" run from Denver to the site of the Chicago World's Fair, reaching a peak speed of 112.5 miles per hour (BNSF 2006a). *Zephyr* service between Chicago and Minneapolis was inaugurated in July 1934 with the *Twin Cities Zephyr*. Two years later, the *Twin Zephyrs* provided morning and afternoon departures.

Despite the technological success of the *Zephyr* series, the CB&Q failed to permanently regain the passenger traffic it had lost as a result of competition with automobiles beginning in the 1920s and the general economic decline in the 1930s. By the end of World War II, the automobile had decisively replaced the passenger train as the choice of traveling Americans. The CB&Q continued, however, to enjoy its share of Minnesota's commercial shipping receipts, serving a number of prominent industries.

The CB&Q completed the dieselization of its fleet by 1959. Although the railroad had positive annual revenue of approximately $250 million and employed about 22,000 people nationwide in 1960, its financial situation gradually began to decline with the rest of the American railroad industry (Grant 2004). Eventually, the CB&Q merged with the Northern Pacific, Great Northern, and the Spokane Portland and Seattle Railroad to become the Burlington Northern Railroad on March 2, 1970. The following year, North American passenger train service was nationalized through the creation of Amtrak, ending the *Zephyr* era. The Burlington Northern sought additional rail mergers throughout the 1970s (mostly denied by the Interstate Commerce Commission) and diversified its holdings in the oil and energy-production industries. In the late 1980s, the diversification strategy was abandoned (Burlington Northern spun off its energy holdings into a subsidiary) in favor of a comprehensive program to increase shipping efficiency and improve labor relations Gale Group 2005).

On September 22, 1995, the Burlington Northern and the Atchison Topeka and Santa Fe Railroad merged to form the Burlington Northern Santa Fe Railway (BNSF). As of 2006, the BNSF system included 32,000 miles of track in 28 states and two Canadian provinces (BNSF 2006b).

V. Chicago Great Western Railway Company

Introduction

The Chicago Great Western Railway Company (CGW), unlike many railway companies created during the nineteenth century, was not formed with the intent of connecting specific metropolitan areas, shipping points, or regions of the United States: rather, it was the outcome of a corporate move to reorganize the failing Chicago St. Paul and Kansas City Railway Company (CStP&KC) (Grant 1984:33). The CStP&KC was incorporated in 1886 "to construct, lease, purchase, and operate railway and telegraph lines in Iowa, Minnesota, Wisconsin, Missouri, Kansas, and Nebraska" (Prosser 1966:125). As sold to the CGW in 1893, it was the product of the reorganization of another company, the Wisconsin Iowa and Nebraska, a subsequent merger with the Minnesota and Northwestern Railroad Company (M&NW), and the construction of lines from Des Moines to Kansas City and from Eden to Wasioja in Minnesota (for a map of the CGW railroad network in Minnesota, see Maps section).

Over the decade following its incorporation, the CGW acquired and constructed small branch lines, which took it into Dekalb, Illinois, and Mantorville, Minnesota. Those lines provided connections between previously existing lines from Red Wing to Mankato, Duluth to Zumbrota, and Winona to Rochester by creating a thoroughfare between Rochester and Zumbrota, Minnesota. Additionally during this time, it purchased the Mason City and Fort Dodge Railroad. From Fort Dodge, Iowa, it undertook its last major construction effort into Omaha. After 1903, and under new management beginning in 1909, the CGW found new routes primarily by establishing connections with existing interurbans in its territory. Only one small branch line was constructed after 1909 for the remainder of the CGW's existence (Grant 1984).

On the whole, the CGW and its predecessor lines did not open any new areas of the United States because, as one of the latest granger railroads, its lines and destinations frequently mirrored those previously established by earlier, more powerful companies. Though eventually nicknamed the Corn Belt Route for its paths through and service to the agricultural Midwest and Plains, the CGW lines serviced industrial, often extractive industrial, and passenger markets. Its main function, then, and the reason for its success in areas with earlier lines, was to provide competition for the established roads, which were then forced to lower their rates. Such competition especially benefited industrial and agricultural concerns in smaller markets where a manufacturing plant or grain elevator constituted a significant portion of the community's economic well-being. In the era before effective regulation, railroads set rates at whatever the market would bear. Without a second competing railroad, many communities during the nineteenth century were at the mercy of a single railroad regarding the rates paid. The CGW offered competing railroad service for communities in southeastern Minnesota previously served only by the Chicago Milwaukee and St. Paul (CM&StP) or Chicago and North Western (C&NW).

Predecessor Lines in Minnesota

Minnesota and Northwestern

The M&NW was the brainchild of schoolteacher-turned-lawyer-turned-railroad magnate A. B. (Alpheus Beede) Stickney, who came to Minnesota from Maine in 1861. It was Stickney's belief that Minnesota needed a connection to Chicago that was based on Minnesota interests and controlled by Minnesota citizens (Bee et al. 1984:13). To this end, Stickney obtained (nearly three decades after its creation) the original 1854 charter of the unconstructed M&NW, which was the last available pre-1858 charter and desirable because charters from that period exempted the company "from all local and other taxation in Minnesota except a two percent tax on its gross earnings" (Grant 1984:4). Two years later, in September of 1885, the mainline of the M&NW, which ran from St. Paul to the station of Mona, Iowa, 1.4 miles southeast of Lyle, Minnesota, officially opened for through traffic after the completion of the Robert Street Bridge across the Mississippi River (Grant 1984:15). With engine facilities already completed in St. Paul, a second facility was completed at Lyle by October of 1885. Continued construction, however, in Minnesota and on to Dubuque over the next year shifted the southern end of the mainline in Minnesota from its trajectory toward Lyle and moved it toward Taopi, Minnesota.

During 1885, Stickney and the M&NW set in motion perhaps the railroad's strongest effect on the development of a given location, and simultaneously created its leading revenue producer: the St. Paul Union Stockyards, better known as the South St. Paul Stockyards. In 1886, Stickney called together select St. Paul businessmen, western cattle producers, and M&NW railroad officials to promote its expansion (Bee et al. 1984:17; Grant 1984:20). Following the meeting, the investment group purchased 250 acres to establish the stockyards. Access to the stockyards was provided by a spur track from the M&NW mainline. The year 1886 also witnessed the construction of the M&NW car shops in South St. Paul, north of the stockyards along the mainline (Glewwe 1987:35). The following year, the M&NW merged with the CStP&KC, upon whose board of directors Stickney and his son, Samuel, already sat.

Chicago St. Paul and Kansas City Railway Company

In Minnesota, the 1887 merger of the CStP&KC and the M&NW primarily represented a change in name and nothing more—although construction outside of the state provided it with a new connection to Kansas City. A single construction episode occurred in the state under the CStP&KC, consisting of the building of a branch line in 1890 from the mainline at Eden to Wasioja, which was to accommodate the burgeoning stone quarrying industry in Wasioja (Grant 1984:27). After this year, the financial strain of rapidly extending the mainline to Kansas City, combined with the financial panic of 1893, caught up with the CStP&KC, and it was reorganized as the CGW.

Chicago Great Western Railway Company in Minnesota, 1893-1908

After the 1893 reorganization of the CStP&KC into the CGW, construction of rail lines by the CGW itself was limited to two instances in Minnesota. In 1902, the CGW built a line from Rochester to Zumbrota, Minnesota, to connect lines it had acquired through the 1901 purchase of the Wisconsin Minnesota and Pacific Railway Company (WM&P) (Bee et al. 1984:45-46). In 1911, a branch line was built "from a point designated Belle Chester Junction, 1.8 miles south of Goodhue on the Rochester line, southeasterly to Belle Chester [Minnesota]" (Grant 1984:82-83) to access clay deposits that could be shipped to Red Wing for pottery and sewer pipe manufacture.

A third construction event indirectly attributable to the CGW was the extension of the Eden to Wasioja line from Wasioja to Mantorville, Minnesota. This extension had been requested of A. B. Stickney by the Mantorville Stone Company during the mid 1890s to facilitate the transportation of its limestone. Because the CGW was still in financial straits, however, the village of Mantorville created the Mantorville Railway and Transfer Company (incorporated in 1895) through which they shouldered most of the labor and financial responsibility for the creation of the line. In addition to appropriated village funds, stock sold to Mantorville's citizens was used to pay for grading, building materials, and construction, the latter of which was carried out by local residents. Once the road was nearly complete in September of 1896, "residents agreed to surrender their assets to the Chicago Great Western, at the latter's insistence" (Grant 1984:49).

Beyond these three construction events, for the remainder of its existence the CGW opened up new lines only through the leasing and subsequent acquisition of the WM&P in 1899 and 1901, respectively, and through the leasing of the St. Paul Bridge and Terminal Railway Company in 1935.

Acquisitions

Wisconsin Minnesota and Pacific Railroad Company

The history of the WM&P in Minnesota (prior to its relationship with the CGW) is that of its three units: the Cannon Valley Division (CVD), the Duluth Red Wing and Southern Railroad Company (DRW&S), and the Winona and Western Railway Company (W&W).

Cannon Valley Division

The CVD of the WM&P began its existence as the Minnesota Central Railroad Company (Central). The Central was incorporated in 1857 with the objective of connecting the Mississippi and Minnesota rivers at

Red Wing and Mankato, respectively, an objective shared by the Cannon River Slack Water Navigation Company (Bee et al. 1984), or Cannon River Improvement Company (Grant 1984), though the Central sought to do so overland and the Cannon River Improvement Company aimed to use a massive canal system. No action was taken on either charter, however, until the mid 1870s, when "Red Wing became the largest primary wheat market in the world" (Bee et al. 1984:3). Quickly recognizing the prohibitive costs of building a canal system from Red Wing to Mankato, the Cannon River Improvement Company dropped its plans, and in 1878 was acquired by the Central. Still, however, the railroad did not get off the ground, leaving Red Wing vulnerable to competing wheat markets located along the mainline of the CM&StP, a railroad that refused to build the southwesterly branch line to Cannon Falls and Northfield as requested by Red Wing's civic leaders (Bee et al. 1984:3). This situation changed with the arrival of A. B. Stickney.

In 1881, Stickney (not yet engaged with the M&NW) became the president of the Central, promising Red Wing a connection to Waterville by 1882 and to Mankato (a community of 4,440 and a producer of stone and brick) by 1883. Backed by the Minneapolis and St. Louis (M&StL), upon whose board of directors Stickney sat and which in turn was controlled by the Chicago Rock Island and Pacific (CRI&P), the Central was finally strong enough to make a push for construction—and strength was necessary once the CM&StP became cognizant of Stickney's plans (Bee et al. 1984:5; Grant 1984:50).

When Stickney announced the construction plans in 1881 for the Central, the CM&StP announced that it would parallel that construction. The CM&StP was true to its word, and though the roads entered into mutually beneficial agreements from time to time, the construction battle was played out from Red Wing to Faribault through city councils, courts, surveying and construction operations, and outright sabotage. Finding more favor with communities along the route, the Central was able to secure locations that generally provided easier construction and more direct paths, and the Central completed construction into Red Wing in December of 1882, six months before the CM&StP (Bee et al. 1984:8).

The completion of the Central line into Red Wing turned out to be more important to the city than civic leaders had previously realized. In the early 1880s, it came to the attention of Red Wing officials that in an attempt to disable the Red Wing stoneware industry, the CM&StP was colluding with competing stoneware companies out of Akron, Ohio. The Ohio companies used the CM&StP exclusively, and in return the railroad offered them favorable shipping rates or rebates that facilitated the entry of their wares into the Twin Cities market at lower costs than the Red Wing products. It has been said that the presence of the Central saved Red Wing's stoneware industry by allowing it to receive competitive freight rates, and thus, to compete with the larger Akron companies (Bee et al. 1984:8; Burt 1991:22).

Though the small victories of the Central over the CM&StP assisted the economy of Red Wing, they came at great cost to the railroad company. Subsequently, the Central could not afford to construct facilities to support the line or purchase trains to move along it, even after the legislature approved in 1883 to change the Cannon River Improvement Company to a railroad business, which gave the Central its 300,000-acre land grant. Although the M&StL never acquired the Central, it began operating the Central almost immediately after construction to Red Wing was completed in January of 1883. Within seven months, the Central was reorganized under the control of the CRI&P as the WM&P (Prosser 1966:172).

The WM&P continued the construction drive to Mankato, building from Waterville to Watters in 1885 and from Watters to Mankato in 1887 (Prosser 1966:172). In the end, however, the competition from the CM&StP was too much for the WM&P, which lost money until the Panic of 1893 forced it into foreclosure, resulting in its outright purchase by the CRI&P. The experience of the CRI&P was not much better with the WM&P, and in 1899 the CVD was leased to the CGW, while the Pacific Division of the WM&P was purchased by the M&StL (Grant 1984:51). Stickney's control through the CGW had a positive effect on the success of the road, and in 1900 the WM&P constructed a two-mile line from Faribault Junction (a point on the west bank of the Straight River) into the downtown and industrial area of Faribault, making this the only new construction completed by any of the CGW's acquisitions after they were involved with the company. In April of 1901, the WM&P was absorbed into the reorganized CGW that took over WM&P stock while maintaining its own separate identity. Within the next few months, the WM&P was able to purchase the DRW&S and the W&W, bringing them into the CGW system (Bee et al. 1984:9; Prosser 1966:172).

Duluth Red Wing and Southern Railway Company

The DRW&S originated as the Red Wing and Iowa Railway Company, incorporated in 1881. No rail lines were built for this company, however, and in 1886 it was reorganized as the DRW&S (Prosser 1966:131). Red Wing officials hoped that this road would remedy the commercial failure of the Central by constructing a line from Duluth to St. Croix, New Richmond, and River Falls, Wisconsin, then over the Mississippi to Red Wing, and on to Zumbrota and Rochester, with connections to Owatonna, Geneva, and Albert Lea, Minnesota (Burt 1991:22; Grant 1984:52). According to an 1887 publication, the idea behind the route was "to connect the richest and most highly cultivated agricultural regions of Minnesota and Iowa, and the coalfields of the latter state, with the great lakes, affording a more direct and cheaper route to the eastern markets, and thus insuring a profitable business to the road. The line [was to] traverse heavy belts of pine and hard wood timber, passing some of the finest and most extensive water powers of the Northwest" (Duluth Red Wing and Southern 1887:1).

The grand designs of the railroad company were never realized. Grading on the road began in 1888, and in 1889 rails were laid from Red Wing south to Zumbrota, Minnesota (Burt 1991:22), marking the only construction on the DRW&S mainline. Despite its locational shortcomings, however, the DRW&S benefited the city of Red Wing by ensuring the transportation of clay to local stoneware companies. Prior to the construction of the road, the stoneware industry had been hampered by irregularity in the delivery of clay, which occurred because wet weather often made roads impassable for delivery wagons: in one instance, factories were closed for nine weeks due to a lack of clay. Once the DRW&S line was built, the demands for clay could be met. In addition, in 1892 the DRW&S constructed a one-and-a-half-mile branch line connecting Claybank to the clay pits east of the line. By that time, up to three clay cars a day were coming into Red Wing, and eventually the DRW&S would own 33 such cars (Bee et al. 1984:24; Burt 1991:24).

Even with the reliability of these shipments, however, the DRW&S, like many other small lines, was hit hard by the Panic of 1893. The road struggled over the next eight years with "wheat, raw clay, and finished clay products account[ing] for more than 90 percent of all business originating on the line" (Bee et al. 1984:25-26)—but without profit. When Stickney indicated an interest in the line, the DRW&S acquiesced, relieved that under Stickney's purview, the line would continue to serve Minnesota interests. In July of 1901, the DRW&S was subsumed into the WM&P under control of the CGW.

Winona and Western Railway Company

The forerunner of the W&W, the Winona and Southwestern Railway Company (W&SW), was incorporated in 1872 as a response to abuses by the Chicago and Northwestern—a company that had purchased Winona's first railroad, the Winona and St. Peter, in 1867 (Bee et al. 1984:29-30). Investors in the W&SW were local lumbermen who hoped to "obtain new markets and to provide cheaper transportation for their products" (Bee et al. 1984:36). Previously a paper railroad known as the Winona and La Crosse, the W&SW continued to suffer from a lack of construction for almost two more decades until a line was constructed from Winona to Bear Creek, Minnesota (southwest of Rollingstone), in late 1888. By 1890, the line had been constructed through Altura, Utica, and Simpson to the state line at Le Roy, Minnesota, then over the state line to Mcintire, Iowa, where it connected with the CStP&KC (Grant 1984:55, 56; Prosser 1966:170). This construction transformed Simpson into a grain-shipping point for the railroad. Legal, financial, and other slowdowns, however, plagued the W&SW, sending it into receivership after the 1893 Panic. The following year, it was sold to H. W. Lamberton and colleagues, who reorganized it as the Winona and Western Railway Company (Grant 1984:57-58).

Lamberton and the rest of the W&W management opted to postpone any new construction on the railroad until the state's economy was in recovery. The portion of the line from Bear Creek to Altura was reconstructed in 1897, and three years later the W&W built a branch line from Simpson to Rochester (Grant et al. 1984:35; Prosser 1966:170). Though the branch line had a positive effect on both cities, by the turn of the century, the Winona lumber industry (which was intended to support the W&W) was suffering from depletion of resources and competition from northern Minnesota and Wisconsin. The lumbermen who owned the W&W recognized the decline of their industry and what it meant for the railroad and began to look for a buyer. Stickney was interested, and in September of 1901, the CGW purchased the W&W through the WM&P. This purchase would constitute the last major action for the CGW on the part of A. B. Stickney in Minnesota. The financial health of the railroad went into decline after 1904. It should, however, be noted that despite this decline, in 1906, the CGW constructed a railroad depot in Red Wing to serve as its division headquarters for the lines acquired through the W&W. This depot is listed on the National Register of Historic Places for its significance as "one of two substantial Red Wing depots representing the important rail transportation system of the area" (Bloomberg 1980).

In 1908, the CGW went into receivership, and Stickney retired, severing his professional connection to the company. In August of the following year, the CGW was purchased by J. Pierpont Morgan, and in September, it was reorganized as the Chicago Great Western Railroad Company with the appointment of Samuel Felton as president.

Chicago Great Western in Minnesota, 1908-1941

In Minnesota, under Felton's presidency and prior to World War I, the CGW focused primarily on the upgrade of existing lines and of locomotives, though Felton "authorized the construction of a new bridge over the Mississippi River at St. Paul, the purchase of terminal facilities from the Wisconsin Central in the warehouse district of downtown St. Paul and on Boom Island in Minneapolis, as well as traffic rights for passenger and freight trains between St. Paul and Minneapolis from the Great Northern Railway" (Bee et al. 1984:48). During the first half of the 1910s**,** the CGW struggled through a significant decline in freight, especially on the branch lines, until World War I—an event that saw control of the railroads turned over to the United States Railroad Administration, but one that raised the revenues of the CGW 80 percent or more above pre-war years (Bee et al. 1984:49-50).

The economic boost provided by the war was not limited to the CGW, nor even to railroads, and despite a recession after the war's conclusion, the United States enjoyed general prosperity through the 1920s—a decade in which the CGW was highly successful. Felton designed a new and faster locomotive to travel between the Twin Cities and Rochester to accommodate travel to the by-then famous Mayo Clinic, and the increase in the country's financial well-being saw Minnesotans taking the CGW to vacation in more southerly locations, such as Omaha and Kansas City, during the winter. Overall, however, passenger traffic was declining, and the road's success mainly came from major increases in freight transportation. Felton's health, however, was also declining; and in 1925 he became Chairman of the Board of Directors, turning over the presidency to his protégé Nathaniel Howard. Both stepped down on October 7, 1929, after Felton "requested that he be relieved of all active work, due most likely to a combination of increasingly poor health and the appearance of hostile new financial interests" (Grant 1984:109).

The Great Depression had a significant financial impact on the CGW. Further, the railroad, now under the control of a syndicate of approximately 60 individuals from the railroad industry called the Bremo Corporation, suffered from the poor management of Victor Boatner (Grant 1984:111). In 1931, Boatner was replaced by Patrick Joyce, under whom the financial hardships inflicted by the Depression forced the company to declare bankruptcy in 1935. Between the years 1935 and 1941, the road's two trustees, Joyce and Luther Walter, a Chicago attorney, worked on a plan for reorganization. In the meantime, with decreases in all forms of traffic, the CGW alleviated some of its financial strain by abandoning and taking up select tracks. In Minnesota, these included the former W&W tracks from Altura to Rollingstone (1934), Utica to Planks Junction (1935), Gilmore to Rollingstone (1936), Gilmore to Sugar Loaf (1938), and the branch line from Claybank to the clay pits (1936), as well as the combined former CStP&KC and Mantorville Railway and Transfer branch line from Eden to Mantorville (despite the protests of the latter's citizens) (Grant 1984:118). One line, however, was newly leased during this period: that of the St. Paul Bridge and Terminal Railway Company.

Acquisitions

St. Paul Bridge and Terminal Railway Company

The St. Paul Bridge and Terminal Railway Company was incorporated in October of 1908 with the object of building and operating "a railroad from a point near the [St. Paul] Union Stockyards Company at South St. Paul north to cross the Mississippi River and to a point in St. Paul; thence southeasterly to a point at or near Newport, across the Mississippi River, and north to the point of origin" (Prosser 1966:161). By the following year, the company had completed the first objective and immediately leased the 2.45 miles of the Stockyards Terminal Railway, a company that was incorporated in 1907. The tracks to Newport and back to the stockyards were never built, but in 1935, the lines of the St. Paul Bridge and Terminal Railway Company, including those leased from the Stockyards Terminal Railway Company, were leased by the CGW which assumed switching operations at the stockyards (Bee et al. 1984:17).

Chicago Great Western in Minnesota, 1941-1968

In February of 1941, the Chicago Great Western Railroad Company was reorganized under its original name, the Chicago Great Western Railway Company: the name under which was subsumed, among others, the St. Paul Bridge and Terminal Railway Company in Minnesota. Soon thereafter, the United States went back to war, and though World War II provided another much-needed economic boost to the CGW, it also diverted much of its workforce into battle, leaving the road to bear the consequences of heavy understaffing. The CGW stepped up to the war challenge, as its connections to Kansas City, Omaha, and the Twin Cities took on added importance for shipments to the coasts when the Panama Canal closed (Bee et al. 1984:69). During the war years, Bee et al. (1984:69) noted: "Longer and heavier trains rolled south out of St. Paul carrying everything from meat to machine-gun bullets. Grain traffic increased dramatically in Northfield, Cannon Falls, and Winona." This period witnessed the removal of only minor trackage in Minnesota: from Sugar Loaf, to a point east of the CM&StP crossing in Winona, in 1943 (Prosser 1966:123).

After World War II, the CGW remained profitable for several years, and under the presidency of Joyce's replacement, Harold Burtness, it replaced its steam locomotives with diesel locomotives. The railroad caught the attention of Kansas City investors, who soon took over the CGW, replacing Burtness in October of 1948 with coal magnate Grant Stauffer (Grant 1984:135). Stauffer died five months later and was succeeded by William Deramus III, whose father, William Deramus Jr., was president of the Kansas City Southern and one of the new investors backing the CGW. Deramus III initiated a program that involved heavy rehabilitation of existing railroad structures, including lines, drastic cutbacks in passenger service, and the lengthening of freight movements (Grant 1984:138-141). In 1952, the branch line from Bellechester Junction to Bellechester, Minnesota, was taken up (Prosser 1966:123). Shortly thereafter, the CGW designed and constructed the Roseport industrial complex south of its South St. Paul terminal, leading to the construction of the Great Northern Oil Company refinery and the St. Paul Ammonia Products plant in that location—two facilities that profited the CGW (Bee et al. 1984:71). The railroad, overall, enjoyed healthy financial returns during the early to mid 1950s.

Despite such returns, however, the mid 1950s marked the beginning of the end of the CGW. The federal government turned its support toward up-and-coming transportation innovations, such as passenger jets and the Interstate system. After Deramus resigned in 1957, Edward Reidy served as the CGW's last president, and during his tenure, all remaining passenger service was discontinued by 1965. Miles of Minnesota track were abandoned and removed, including those from Utica to Altura (1962), Red Wing to Pine Island (1966), and the remaining line east of Simpson to Winona (1962-1968) (Bee et al. 1984:73; Grant 1984:156). In 1964, the CGW entered into talks with the C&NW, and the following year, a merger between the two was approved. Following the resolution of subsequent legal entanglements, on September 1, 1968, the CGW was subsumed under the C&NW.

VI. Chicago Milwaukee St. Paul and Pacific Railroad Company

Introduction

When the Milwaukee and St. Paul Railway Company changed its name to the Chicago Milwaukee and St. Paul Railway Company (CM&StP) in 1874, it emerged from a series of mergers as a dominant railroad in Minnesota and the Midwest. After building through Wisconsin and into Iowa, its acquisitions of the Minnesota Central Railway Company, the St. Paul and Chicago Railroad Company, the Hastings and Dakota Railway Company (H&D), and the Southern Minnesota Railroad Company provided the CM&StP with a number of strategic connections. In addition to its Midwest network, the CM&StP eventually completed an extension from the old H&D mainline to Puget Sound in 1909. The CM&StP was one of the major granger railroads, and it hauled large volumes of agricultural produce and livestock from southern and western Minnesota, South Dakota, and northern Iowa into the Twin Cities. It then hauled out processed food and manufactured goods. Along with the Chicago and North Western (C&NW), the CM&StP was a dominant railroad in the southern third of Minnesota from the late nineteenth through mid twentieth centuries (for a map of the CM&StP railroad network in Minnesota, see Maps section).

After bankruptcy and receivership in the mid 1920s, and to reflect its transcontinental status, the CM&StP was reorganized as the Chicago Milwaukee St. Paul and Pacific Railroad Company (CMStP&P). It would continue operating under that name, despite two additional periods of receivership in the 1930s and 1970s, until its 1985 acquisition by the Soo Line.

Predecessor Lines in Minnesota

The Milwaukee and St. Paul Railway Company

The CM&StP was initially chartered in Wisconsin in 1847 as the Milwaukee and Waukesha Railroad Company. After reorganization as the Milwaukee and Mississippi Railroad, the company completed a line from Lake Michigan to the Mississippi River in 1857. Meanwhile, the La Crosse and Milwaukee Railroad Company completed a line between those two cities by 1858. The La Crosse line changed its name in 1863 to the Milwaukee and St. Paul Railway Company, and in 1867, it acquired the Milwaukee and Mississippi, the McGregor Western, and the Minnesota Central (Central) railroads. These acquisitions provided the Milwaukee and St. Paul with a through route between Chicago and the growing Twin Cities market.

In 1869, the Milwaukee and St. Paul built a bridge across the Mississippi River between St. Paul and Mendota, giving the line direct connection into St. Paul as well as Minneapolis. In 1872, the Milwaukee and St. Paul acquired the St. Paul and Chicago railroad, which had recently completed its route along the Mississippi River. The Milwaukee and St. Paul reorganized as the CM&StP in 1874.

Acquisitions of Minnesota Central Railway Company and McGregor Western Railway Company

In 1864, the Central (originally incorporated as the Minnesota and Cedar Valley Railroad in 1856) laid tracks from Minneapolis across the Minnesota River to Mendota and then south toward Iowa. The goal was to link up with Iowa railroads that connected to Chicago and Milwaukee. In 1865, the Central reached Faribault, and during the following year, completed tracks to Owatonna.

At Owatonna, the Central made connection with the Winona and St. Peter (W&StP) railroad, which was building east-west across southern Minnesota. The Central received subsidies of approximately $1.8 million in land grants, right of way with graded roadway, and state and local bonds to assist with the construction. McGregor Western Railway, meanwhile, built north from Iowa into Minnesota through Lyle, Austin, and Owatonna in 1867, connecting with the Central. The McGregor then acquired the Central in July of that year and, in turn, was acquired two months later by the Milwaukee and St. Paul railroad. Because this line provided the first through route between the Twin Cities, Milwaukee, and Chicago, it was often referred to as the Pioneer Route (Luecke 1988:1-16; Prosser 1966:150-151).

St. Paul and Chicago Railroad Company

The St. Paul and Chicago Railroad Company was incorporated in 1867 and acquired the charter rights from the old Minnesota and Pacific Railroad Company (incorporated in 1857, later the St. Paul and Pacific) to build a route along the Mississippi River between St. Paul and Winona. With an extension to La Crescent and a bridge across the river to La Crosse, this line created a through route between the Twin Cities and Chicago, and it linked the established river cities of Hastings, Red Wing, Wabasha, and Winona with year-round transportation. In 1869, the St. Paul and Chicago reached a point across the Mississippi River from Hastings. Using ferries to transport passengers and freight across the river until a bridge was completed late in 1871, the St. Paul and Chicago continued building its route along the west side of the river. Laying tracks south from Hastings, the line reached Red Wing in 1870, while at the same time, another crew built north from Minnesota City (just north of Winona) north to Weaver. During the following year, the gap from Red Wing to Weaver was completed. The St. Paul and Chicago then completed the route from St. Paul to the Mississippi River and crossed at La Crescent in 1872, but the bridge across the river would not be completed for another four years. The company received subsidies of approximately $1.28 million in state land grants and municipal bonds. In 1872, the Milwaukee and St. Paul acquired the St. Paul and Chicago (Luecke 1988:18-28; Prosser 1966:158).

Chicago Milwaukee and St. Paul Railway Company

Introduction

The CM&StP weathered the 1870s economic depression better than many railroads, most likely because it focused on acquiring lines after they were built, rather than speculatively building new lines into thinly settled areas. During the late 1870s and early 1880s, the CM&StP expanded its network throughout southern Minnesota, primarily through acquisitions. In 1880, for example, by absorbing the Southern Minnesota railroad (which had gone bankrupt in 1873), the CM&StP added a second east-west mainline in Minnesota. By 1880, the CM&StP had 3,775 miles of completed road in the Midwest, compared to only 1,412 miles three years earlier, and owned 425 locomotives, 319 pieces of passenger equipment, and more than 13,000 freight cars (Derleth 1948).

By the 1880s, the CM&StP had a solid rail network throughout southern and western Minnesota, southern Dakota Territory, Illinois, Iowa, and Wisconsin. Like the C&NW, the Chicago and Rock Island, and others, the CM&StP was one of the granger railroads that served the Upper Midwest and carried heavy volumes of agricultural products. For example, in 1880 agricultural products comprised nearly 41 percent of the freight by weight hauled by the CM&StP, and wheat alone accounted for over 12 percent. Although the percentage would fall over the next 40 years, the volume of agricultural freight would continue rising. While agricultural products had dropped to about 30 percent of all freight by 1920, the total tonnage had increased more than three-fold (CM&StP Annual Reports 1880-1925).

The CM&StP influenced southern Minnesota, not only by hauling the produce and livestock from its farms, but also playing a more direct role in development. Much like other railroad companies, the CM&StP lines influenced townsite development, whether platted by the company or a private proprietor, or as an impetus to the growth of an existing community. For example, Montevideo, an existing community platted on the Chippewa River in 1870, became a local trade center when the H&D reached the town in 1878. In addition, Montevideo continued to grow after 1887, when the CM&StP established division offices and repair shops there, providing jobs for 200 local employees. Another example is Wheaton, which was platted by the Fargo and Southern in 1884. Yet another example is the town of Fulda, which was formed in the early 1880s as part of the Avoca Colony of the Catholic Colonization Bureau, and for which the official plat was filed in 1889 by Bishop John Ireland. A final example is the community of Clinton, which was platted by a private proprietor in 1885 along the Fargo and Southern line (Granger 1984a, 1984b, and 1984c; Harvey and Nelson 1979).

Through acquisitions and new construction, the CM&StP established its own direct connections between Minneapolis/St. Paul and the agricultural lands to the south and west, as well as a through route to Chicago to the southeast. After a damaging rate war in 1882, the CM&StP came to an agreement to split the market with the C&NW, which controlled the Chicago St. Paul Minneapolis and Omaha (Omaha Road) by that time, and the Chicago and Rock Island railroad, which had agreements with the Minneapolis and St. Louis (M&StL). In the agreement, the CM&StP would receive 37.5 percent and 43 percent of the business from Minneapolis and St. Paul, respectively, to Chicago. That agreement notwithstanding, the CM&StP was the dominant carrier in Minneapolis by 1889. It hauled 32,273 carloads of freight into the city, which was second only to the St. Paul Minneapolis and Manitoba's (Manitoba's) 40,101, and it hauled 38,438 carloads out of the city, the most of any carrier (the Omaha Road a distant second at 21,716 carloads) (Hofsommer 2005a:109-110, 134).

Through its dominant position in Minneapolis, the CM&StP played an important role in the development of the Minneapolis flour milling industry. It also directly contributed to the growth of other food processing related businesses. For example, Cargill operated 41 line elevators between La Crescent and Pipestone on CM&StP's Southern Minnesota Division (Hofsommer 2005a:192). Other examples include its lines through South St. Paul serving the stockyards, through Austin serving Hormel, and through Le Sueur County serving the vegetable canning plants.

Acquisitions

Hastings and Dakota Railway Company

The H&D was incorporated in 1867, acquiring the rights of the old Hastings Minnesota River and Red River of the North Railroad Company (incorporated in 1857). Backed by local interests, the intent of the original charter was to build a line southwest from Hastings to New Ulm and on to the Red River, thus tapping into the interior of Minnesota Territory and creating a rail-steamboat transfer point at Hastings. The Panic of 1857, however, and then the Civil War, prevented any construction by the original company.

After its incorporation, the H&D completed a line from Hastings to Farmington in 1868 and connected with the Minnesota Central. At some point, the intended route changed to extend northwest from Farmington and cross the Minnesota River at Shakopee, perhaps influenced by the arrival of the Winona and St. Peter railroad at the south bend of the river. Construction then continued west to present-day Lakeville on the Credit River in 1869.

In 1870, when the Milwaukee and St. Paul leased the H&D tracks and the St. Paul and Chicago reached Hastings from St. Paul along the Mississippi River, the H&D began to function within a larger rail system. Construction was delayed on the H&D while the St. Paul and Chicago, also under the influence of the Milwaukee and St. Paul, continued building its river route. In 1871, construction resumed and the H&D

extended its line to Carver, crossing the Minnesota River at Shakopee, and then extended to Glencoe the following year. The Milwaukee and St. Paul then acquired this segment of the H&D. Because the H&D was a land-grant railroad, having received over 375,000 acres of federal lands, it remained a corporate entity for the purposes of distributing lands and constructing the line westward from Glencoe (Luecke 1988:54; Prosser 1966:137).

The Panic of 1873 and ensuing economic depression delayed construction for several years, and Glencoe remained the terminal point until 1878 when economic conditions had improved and agricultural settlement was pushing into western Minnesota. The H&D extended its route from Glencoe to Ortonville during 1878 through 1879, with a division point and repair shops at Bird Island (later transferred to Montevideo) and then on to Aberdeen, South Dakota. On January 1, 1880, the CM&StP acquired the segment of the H&D west of Glencoe.

Southern Minnesota Railroad Company

The Southern Minnesota Railroad Company was incorporated in 1864 by a local group, which acquired the Root River Valley rights from the defunct Root River Valley and Southern Minnesota Railroad (incorporated in 1855). Previous grading had been completed between Grand Crossing on the Mississippi River and Houston from 1858 to 1859, but no tracks had been laid. Building through the rugged Root River Valley, the Southern Minnesota Railroad completed a line from Grand Crossing (La Cresent) to Houston by the end of 1865 with repair shops at Hokah, and by 1868, the line reached Lanesboro. The intent of the original charter was to build a railroad up the north branch of the Root River Valley and then on to Rochester. Because the W&StP railroad had reached Rochester in 1866, however, leaders of the Southern Minnesota decided to continue westward, rather than build into an area with established competition.

While building west from Lanesboro, the company also began building west from Ramsey (a point on the Minnesota Central just north of Austin) which was to be the western division point. After reaching Albert Lea in 1869, the Southern Minnesota continued westward and completed a line to Winnebago City in 1870. Also in 1870, the Southern Minnesota located its western division repair shops in Wells, ensuring growth for the newly platted town (Luecke 1988:30-36; Prosser 1966:164-165).

Although the Southern Minnesota had built rapidly, laying nearly 170 miles of mainline during the late 1860s, construction stopped at Winnebago City in 1870. The railroad had built ahead of settlement, and traffic and land sales were not generating sufficient revenue. In 1872, the Southern Minnesota filed bankruptcy and entered receivership. Due to the Panic of 1873 and ensuing economic depression, the company did not emerge from receivership until 1877, when it was reorganized as the Southern Minnesota Railway Company with the CM&StP as a major shareholder.

While the Southern Minnesota Railroad endured financial difficulties, the Central Railroad Company of Minnesota (originally Minnesota and Northwestern in 1857, re-organized in 1872) completed a line from Wells to Mankato in 1874 after numerous fits and starts. This line became an important feeder between the Southern Minnesota Railroad's mainline and the growing rail hub at Mankato, and in 1879, the Southern Minnesota acquired the route. Eventually, this line would be extended to Faribault for through service to the Twin Cities via the CM&StP Pioneer Route (Luecke 1988:51; Prosser 1966:119).

After emerging from receivership, the Southern Minnesota pushed its line to the prairie lands of southwestern Minnesota during the late 1870s, and in 1880, it completed the route to the state line at Airlie (west of Pipestone) and into South Dakota. Already a major shareholder, the CM&StP acquired the Southern Minnesota on May 1, 1880.

Chicago Clinton Dubuque and Minnesota Railroad Company

This line was originally incorporated as the Dubuque and Minnesota Railway Company in 1868 with the intent of building a route south to the state line from La Crescent, which was the terminal of the Southern Minnesota railroad. No tracks were completed, however, and the company was reorganized as the Chicago Dubuque and Minnesota Railroad Company in 1871. The line was completed from La Crescent into Iowa in 1872. Bankrupted by the Panic of 1873 and ensuing economic depression, the line was reorganized as the Chicago Clinton Dubuque and Minnesota Railroad Company (CCD&M) in 1878.

In June of 1880, the CCD&M absorbed the Caledonia Mississippi and Western. This locally backed railroad was incorporated by Caledonia interests as the Caledonia and Mississippi Railroad Company in 1873 to connect their town with the new Chicago Dubuque and Minnesota railroad. Although a portion of the route was graded, the company defaulted, and no tracks were laid.

The railroad was reorganized in 1879 as the Caledonia Mississippi and Western Railroad Company with backing from the CCD&M and local bonds. The CCD&M built a line from Reno through Caledonia and west to Preston. This line was built as a 3-foot narrow gauge and later converted to standard gauge in 1901. On October 19, 1880, close to four months after the CCD&M absorbed the Caledonia line, the parent line was acquired by the CM&StP (Luecke 1988:96-106; Prosser 1966:118-119).

Stillwater and Hastings Railway Company

The Stillwater and Hastings Railway Company was incorporated in 1880 to provide direct railroad connection between Stillwater and Hastings. The company only constructed about five miles of tracks between Lakeland and Lakeland Junction in 1880. In 1882, it was sold to CM&StP, which completed the route (Prosser 1966:165).

Chippewa Valley and Superior Railway Company

The Chippewa Valley and Superior Railway Company was incorporated in 1881 to build a line from Wabasha up the Chippewa River Valley to Eau Claire, Wisconsin. Financed by the CM&StP, the line was completed in 1882 and included a pontoon bridge for crossing the Mississippi River at Read's Landing. On November 9, 1882, shortly after the Chippewa line was completed, the Chippewa Valley and Superior was acquired by the CM&StP. This branch line provided CM&StP with access to the Chippewa Valley lumber trade (Luecke 1988:124-128; Prosser 1966:126).

Minnesota Midland Railway Company

The Minnesota Midland Railway Company incorporated in 1876 with the intent to build a line from Wabasha west through Zumbrota to Faribault, then continue westward to Big Stone Lake. Building up the Zumbro River Valley, the company completed its route to Zumbrota in 1878, utilizing a 3-foot narrow gauge line (converted to standard gauge in 1903). The Midland established a roundhouse and transfer yard at Wabasha, and the CM&StP built a dual-gauge transfer line to connect its mainline with the Midland. Although it was intended to become a major east-west line similar to the Southern Minnesota and the W&StP, the Midland did not build past Zumbrota. The CM&StP acquired the Midland in 1878, though it continued to operate independently until February 12, 1883, when it became the Wabasha Division (Luecke 1988:88-94; Prosser 1966:151).

Fargo and Southern Railway Company

The Fargo and Southern Railway Company was incorporated in 1881 in North Dakota. It was a locally backed effort to provide Fargo with rail connections, in addition to the existing Manitoba and Northern Pacific railroads, and thereby connect it with additional trade outlets. Financing for the road was insufficient, however, until the CM&StP bought out its main stockholder in 1883.

By the early 1880s, the CM&StP had built tracks throughout the southern portion of Dakota Territory and was seeking a foothold in the lucrative Red River Valley grain trade. The Red River Valley had been dominated by James J. Hill's Manitoba railroad and the Northern Pacific since the early 1870s, and Hill in particular jealously guarded his territory. To disguise its efforts, the CM&StP did not acquire the Fargo and Southern outright, but quietly planned to construct a line from Fargo to Ortonville, Minnesota, to connect with its H&D Division. To build the Minnesota portion, which ran from White Rock, South Dakota, to Ortonville, the CM&StP financed the Fargo and St. Louis Air Line Railroad Company in 1883, which was conveyed to the Fargo and Southern later that year. Despite Hill's efforts to stop its construction, the Fargo and Southern completed its line in 1884. The CM&StP then acquired the Fargo and Southern on June 16, 1885.

Although the CM&StP initially shifted the mainline designation from the Aberdeen line to the Fargo line, Hill forbade any Manitoba freight from transferring to the Fargo and Southern, and the line never carried the volume anticipated. The Fargo was soon downgraded from mainline to branch status, and it did not break the Manitoba and Northern Pacific railroads' control of shipping in the Red River Valley (Luecke 1988:192-137; Mitchell 1982:177-185; Prosser 1966:135).

Duluth St. Cloud Glencoe and Mankato Railway Company

The Duluth St. Cloud Glencoe and Mankato Railway Company incorporated in 1900 with the intent of providing a direct connection between southern Minnesota rail hubs and the Great Lakes port. The company only completed a line from Albert Lea (Freeborn County) as far as St. Clair (Blue Earth County) by 1907. The CM&StP acquired the line on December 21, 1910.

New Construction by the Chicago Milwaukee and St. Paul Railway Company, 1880-1887

During the 1880s, the CM&StP improved its connections within the Twin Cities, and it supplemented its mainline network with branch (feeder) lines. Three main projects in 1880 helped establish the CM&StP as a dominant carrier in Minneapolis. The CM&StP, in conjunction with the Omaha Road, formed the Minneapolis Eastern railroad to build tracks in the Minneapolis milling district and thereby improve its access. The CM&StP also built a Short Line between the downtowns of Minneapolis and St. Paul, including a new bridge across the Mississippi River. Finally, the CM&StP constructed the Benton Cutoff, which ran from Benton on the H&D line northwest directly into Minneapolis, and eliminated the need to transfer to the M&StL at Chaska or haul on the roundabout route through Farmington and up the old Minnesota Central.

During this period, the CM&StP established its South Minneapolis Yards, including a round house (1879) and shops (1881), which were regularly expanded and were a major repair and maintenance facility (Luecke 1988:84-85; 213). In addition to the shops facility, the CM&StP lines through south Minneapolis supported a growing industrial corridor.

In 1882, CM&StP built a line from St. Croix Junction (Hastings) to Stillwater. This included the acquisition of the Stillwater and Hastings Railway Company and the completion of the line from Hastings to Stillwater. Access to Stillwater was gained via trackage agreements with the Omaha Road and the Stillwater Transfer Company. This branch line, along with the former Chippewa Valley and Superior line, provided the CM&StP with a steady supply of lumber to haul out to the prairies of western Minnesota and Dakota Territory (Luecke 1988:118-122; Prosser 1966:124).

During 1882 and 1883, the CM&StP built the Cannon Valley branch line westward from Cannon Junction (located on its River Division mainline north of Red Wing) to Cannon Falls and then into Northfield. The CM&StP had considered building this route earlier, but delayed until the new Chicago Great Western (CGW) railroad began constructing a line along the Cannon River between Red Wing and Northfield. The CM&StP management viewed this construction as an incursion into their territory and built the parallel route to undermine the profitability of the CGW line (Luecke 1988:109-116; Prosser 1966:124).

During the 1880s, Lake Minnetonka was a fashionable resort area for Twin Cities residents, as well as tourists from the southern United States. The Manitoba railroad which ran a line along the north side of the lake, and the M&StL, which ran along the south side, carried heavy passenger volumes during the summer months to the grand hotels and country cottages around the lake. In 1887, the CM&StP built a branch line from Hopkins to Deephaven (with a stop at the Hotel St. Louis) to tap into the Lake Minnetonka passenger business.

As part of the CM&StP's ongoing competition with the Manitoba railroad along the margins of their territories, in 1887, the CM&StP built a branch line from Glencoe on the H&D Division north to Hutchinson. This route was originally chartered in 1865 as the St. Cloud Mankato and Austin Railroad Company, with the intent of connecting the three cities in its name. When the company was revived and began surveying a line in 1884, the CM&StP and Manitoba each saw it as a potentially beneficial branch for itself and as an invasion by the other. The CM&StP acquired the company in 1886 and began building between Glencoe and Hutchinson as the first segment of a route between Austin, Mankato, and St. Cloud. In response, however, the Manitoba immediately built an extension from Wayzata to Hutchinson. The two railroads then agreed to split the charter rights, and no more of the route was built by the CM&StP (Luecke 1988:134-137; Prosser 1966:124).

Expansion During the Early Twentieth Century, 1900-1920

During the late nineteenth century, the CM&StP was an "exceedingly prosperous" regional carrier. By 1900, its 6,500-mile network radiated out from Chicago and Milwaukee, servicing most of the Upper Midwest (Bryant 1988:76). Despite running some deficits during the depression years of the 1890s, the CM&StP avoided the bankruptcy that plagued many other railroads. The company was known for sound finances and able management, and its major stockholders included Philip D. Armour and William Rockefeller. During the first two decades of the twentieth century, the CM&StP completed its rail network in Minnesota and upgraded a number of its older lines.

During 1902 and 1903, the CM&StP built a line from Farmington through Montgomery to Benning (north of Mankato). This line provided CM&StP with a direct connection between Mankato and the Twin Cities, and it crossed through Le Center and the growing vegetable canning region of Le Sueur County. During the same period, the CM&StP extended the Minnesota Midland line from Zumbrota to Faribault, providing another connection between the River Division and the old Central line. This work was completed in conjunction with the upgrade of the Midland from narrow gauge to standard gauge.

Similarly, when the CM&StP rebuilt the narrow gauge line from Reno to Preston in 1903, it built a five-mile extension from Preston to Isinours Junction on the Southern Minnesota mainline, completing the loop in Houston and Fillmore Counties and providing more direct access between the mainline and the county seat in Preston (Luecke 1988:139-140).

In 1906, the CM&StP began building a second mainline on the River Division to accommodate the heavy traffic on its main through route between the Twin Cities and Chicago. In addition to heavy freight volume, this route carried a large number of passengers. The CM&StP had begun offering its Pioneer Limited express passenger service in 1898 between the Twin Cities and Chicago. This second line ran immediately parallel to the original along most of the route in Minnesota, except for a segment north of Red Wing. Here, the original mainline, which ran along the base of the bluffs, became the eastbound line, and a new westbound line was built to the east (closer to the river). In 1943, the alignment of the westbound line was double tracked, and the original alignment was removed (Luecke 1988:148).

By the first decade of the twentieth century, the CM&StP, which had not historically forged alliances, was becoming increasingly isolated by alliances among competing companies. When James J. Hill acquired a controlling interest in the Chicago Burlington and Quincy in 1901, it represented a strategic alliance among both northern transcontinental lines and one of the major Chicago railroads. That development, combined with the longtime alliance between the C&NW and the Union Pacific, led CM&StP officials to believe that in order to compete with the growing interregional systems, the company needed to build an extension to the West Coast. In addition, company management felt that the growing Pacific Northwest markets could support another transcontinental line. During 1906 to 1909, a CM&StP subsidiary company constructed an extension between Mobridge, South Dakota, and Puget Sound, Washington (Borak 1930; Bryant 1988:76-78).

During 1910 through 1916, in order to handle the increased traffic the Pacific extension was expected to generate, the CM&StP built a second mainline on the H&D Division between Minneapolis and Aberdeen, South Dakota, which included a re-alignment of the following segments in Minnesota:

- To the west of Montevideo (Chippewa County), a new eastbound line was constructed north of the original line to ease the steep grade between Montevideo and Watson. The original line served as the westbound track until it was abandoned in 1945.
- The entire Benton Cutoff was re-aligned, straightening bends and curves, and shifting the junction farther west to a point near Cologne.
- The grade depression project in south Minneapolis created 2.8 miles of grade separation from city streets. Tons of fill were hauled to the Bass Lake Yard to expand that rail yard.
- A section of the mainline was realigned through Ortonville (the original mainline had bypassed Ortonville).

After the Pacific Extension, 1920-1985

Although the CM&StP Pacific Extension was built quickly and was well engineered, it was also costly, exceeding the original estimate of $45 million by over 400 percent. While carrying this heavier debt load, the CM&StP did not gain the amount of revenue expected from the Pacific Extension. The line crossed a sparsely populated region between its terminal points and was forced to depend primarily on through traffic for revenue. When the Pacific Northwest economy slumped during the 1910s, and then the Panama Canal diverted traffic after 1914, the company incurred a loss in 1917: its first since the early 1890s.

The commandeering of the railroads by the federal government during World War I only delayed the inevitable, and during the early 1920s, the CM&StP operated at a deficit—estimated at a total of $20 million during 1921 to 1924. From a high of $200 per share in 1905, the value of the company stock dropped to about $4 per share in early 1925. With a heavy debt, passenger revenues falling, and insufficient freight revenues, the CM&StP declared bankruptcy and entered receivership in 1926. It emerged two years later, re-organized as the CMStP&P (Borak 1930; Bryant 1988:76-78).

Despite its financial difficulties, the CM&StP constructed two short extensions during the 1920s. In 1923, the CM&StP built a short branch from its Short Line to the new Ford Plant in St. Paul. A few years later in 1926, the CM&StP built a branch line from a point between Hayward and Oakland on its Southern Minnesota mainline to Hollandale (in Freeborn County). Hollandale was formed by a land promotion company, originally for persons of Dutch descent, and then opened to all. The community shipped several thousand carloads of vegetables annually during the 1930s (Works Progress Administration 1985[1938]:424).

After emerging from receivership in 1928, the CMStP&P enjoyed a brief return to profitability before the stock market crashed in October 1929 and the Great Depression began. After five years of declining passenger and freight revenues due to the Depression, the CMStP&P declared bankruptcy in 1935. In

1935, to stem the loss of passenger traffic, the CMStP&P introduced the *Hiawatha*, a high-speed streamliner for express passenger service between Chicago and the Twin Cities. The *Hiawatha* trains, which topped out at over 100 miles per hour in speed trials, typically averaged 60 miles per hour over the entire run from Chicago to the Twin Cities. This express service was later extended to Chicago-Omaha and Twin Cities-Puget Sound corridors.

Unlike the brief period of receivership during the 1920s, the CMStP&P did not emerge from receivership this time until 1945. Although traffic volume on the H&D Division remained heavy, improved signaling and traffic flow allowed the CMStP&P to abandon much of the second mainline, including 74 miles in Minnesota (though some of the mainline trackage was converted to sidings). This abandonment helped the railroad cut operating costs.

The heavy demands of the war effort during World War II restored the profitability of the CMStP&P, and the company remained profitable through the 1950s. Due to inter-modal competition, the CMStP&P had to increase its efficiency through such measures as increasing automation in operations, consolidating freight yards (such as the new St. Paul Daytons Bluff Yard), and phasing out steam locomotives. Despite those improvements, by the early 1960s it was clear that railroad companies would have to consolidate and abandon unprofitable routes. The CMStP&P was unable to come to a merger agreement with the C&NW during the late 1960s, and when the new Burlington Northern emerged in 1970, the CMStP&P could no longer compete. The railroad declared bankruptcy for the last time in 1977. In 1985, the CMStP&P was sold to the Soo Line.

VII. Chicago Rock Island and Pacific Railway Company

Introduction

The Chicago Rock Island and Pacific Railroad (CRI&P), also known as the Rock Island Line, had a relatively small presence in Minnesota's railroad history. The track routes built directly by the CRI&P in Minnesota comprised a single 8-mile branch line between Clark's Grove and Maple Island in 1926. The remainder of the mileage was laid by the Burlington Cedar Rapids and Northern Railway (BCR&N) under lease to the CRI&P as part of the CRI&P's attempt to access the Twin Cities market and connect to its northwest-bound competitors in the Dakotas (for a map of the CRI&P railroad network in Minnesota, see Maps section).

Railroads are often associated with the initial establishment of townsites that subsequently develop around a depot or resource-loading station. From this perspective, however, the BCR&N and CRI&P appear to have been involved in the establishment of only two communities: Kenneth and Hardwick, in Rock County, Minnesota. Kenneth was platted in 1900, a year after the BCR&N brought the railroad to the site. A BCR&N station was built in Hardwick in 1886 in honor of J. L. Hardwick, the master builder of the BCR&N, but the first townsite building was not constructed for another five years. In 1900, a second BCR&N line from Worthington connected at Hardwick. The remainder of the communities traversed by the CRI&P's lines predated the railroad's development and/or had existing competitor railroad stations (Upham 2001). There are no known National Register of Historic Places-listed or -eligible properties in Minnesota associated with the CRI&P or its predecessor lines.

Origins of the Chicago Rock Island and Pacific Railway Company

The CRI&P was initially conceived in 1845 as a railroad connector route from La Salle, Illinois, at the terminus of the Illinois and Michigan Canal to Rock Island, Illinois, on the Mississippi River. Incorporated as the Rock Island and La Salle Railroad Company on February 27, 1847, the organizers found investor interest for a railroad connecting two rivers to be lacking. In February 1851, they changed the eastern terminus to the fledgling city of Chicago and the company name to the Chicago and Rock Island Rail Road (C&RI).

Construction began in mid-September 1851; the first train ran on October 10, 1852, and the line was completed to Rock Island by February 1854. A C&RI subsidiary, the Mississippi and Missouri Railroad (M&M), was the first to build a railroad bridge over the Mississippi River between Rock Island and Davenport, Iowa (completed April 22, 1856). The M&M continued to extend the line west toward

Des Moines, but by the end of the Civil War, it was still 40 miles short of its goal. It was finally acquired by the C&RI in August 1866, creating the CRI&P.

The CRI&P continued its opportunistic expansion in a westerly direction, reaching Des Moines in 1867 and Council Bluffs in 1869. It simultaneously began construction to connect to the growing markets in Kansas City, Missouri, and developed its own regional system through the construction of branch line connectors and the acquisition of small railroads in Iowa and Illinois in the 1870s. In subsequent decades, it forged new main lines into Kansas, Nebraska, Colorado, and Oklahoma (Kirby 1983).

By 1885, the CRI&P was poised to enter Minnesota. It began by purchasing a majority stock interest in the Burlington Cedar Rapids and Northern Railway (BCR&N).

Predecessor: Burlington Cedar Rapids and Northern Railway

The BCR&N was originally incorporated in Iowa as the Burlington Cedar Rapids and Minnesota Railway (BCR&M) (Railroad and Warehouse Commission 1898:114). The BCR&M had been formed by the consolidation of the Cedar Rapids and Burlington Railway and the Cedar Rapids and St. Paul Railway on June 30, 1868, with the intention of building a connection through Mason City, Iowa, to Mankato, Minnesota. The combined railroad was reorganized as the BCR&N on June 22, 1876 (Railroad and Warehouse Commission 1898:114). During the late nineteenth century, the BCR&N built lines into south-central and southwestern Minnesota. By 1878, the BCR&N extended a line to Albert Lea from Northwood, Iowa, via Gordonsville and Glenville. In 1884, the BCR&N completed a line from Lake Park, Iowa to Worthington via Round Lake, and two years later the company completed its line to Watertown, South Dakota, which crossed through Rock and Nobles counties in Minnesota. The BCR&N built a short branch in 1891-1892 from its Watertown line at Trotsky to Jasper (Pipestone County). The BCR&N built a line between Worthington and its Watertown line in 1900, connecting at Hardwick. In 1901, the BCR&N constructed a second line into Albert Lea, this one from Homedale, Iowa to the southwest.

In 1901 and 1902, the BCR&N gained direct connection to St. Paul by laying rail from Albert Lea to Comus (Faribault County) via the cities of Owatonna and Faribault, from Rosemount to Newport via Inver Grove Heights, and Inver Grove Heights to West St. Paul via the South St. Paul stockyards. It closed the gap by acquiring trackage rights on the Chicago Milwaukee and St. Paul (CM&StP) between Comus and Rosemount and on the Burlington and Milwaukee between Newport and St. Paul.

The Chicago Rock Island and Pacific in the Twentieth Century

Beginning in the 1880s, the CRI&P began expanding its regional market through the purchase, lease, and construction of railroad lines that ran parallel to its competitors. The CRI&P's purchases of small lines culminated with the consolidation of its Kansas, Nebraska, and Colorado lines in 1891, which added 1,476 miles to their system. Already a majority owner, the CRI&P leased the BCR&N properties in 1902 for 999 years, adding another 1,289 rail miles to its network (Grant 2005:79; Prosser 1966:125).

By end of 1902, the CRI&P had built from the BCR&N's terminus in Albert Lea to Comus. The CRI&P purchased trackage rights between Comus and Rosemount (Dakota County) and between Newport (Washington County) and Minneapolis, via Saint Paul. Following the completion of the line, the CRI&P purchased outright the BCR&N in June 1903 and the Minneapolis and Saint Paul Terminal Railway Company in March 1904.

By 1909, the CRI&P's system had swollen to include 8,026 miles of track, but the line was overextended. The expense of laying new track to Colorado, Oklahoma, and Texas forced the company into bankruptcy and receivership on April 20, 1915. It emerged from receivership in June 1917, in time to be seized by the United States Railroad Administration on December 28th for use during World War I. Control was returned to the CRI&P on March 1, 1920, but poor management in the following decade resulted in a weakened CRI&P.

After 1930, the Great Depression affected the CRI&P much like the railroad industry in general. The failing economy and several poor harvests led the CRI&P to abandon its 9-mile route from Trosky to Jasper (Pipestone County) in 1932. The following year, the CRI&P into receivership again in June 1933.[3] Over the next several years of low traffic volume and flagging profits, the CRI&P's management decided to reorganize (in July 1936) and pursue a program to modernize the line's track and facilities. This meant modification of portions of the mainlines to reduce curves and level grades, systematic replacement of ties and ballast for both mainlines and branches, installation of heavier rail, replacement of old bridges, and modernization of shop and repair facilities. The railroad also purchased its first diesel switch engines in 1937.[4] Coupled with the line's new passenger cars, the CRI&P introduced its first streamliner service in 1937, known as the *Texas Rocket*.

After five years of aggressive modernization, the CRI&P was well-prepared for the heavy traffic it would receive during World War II. In the last year of the war, the line began to run diesel freight service. The thoughtful reorganization and efficient operation of the company led to its emergence from receivership in January 1948. As part of the reorganization, the company's subsidiaries were merged, including the Chicago, Rock Island and Gulf Railway Company; the Choctaw Oklahoma and Gulf Railroad Company; the Morris Terminal Railway Company; the Rock Island Arkansas and Louisiana Railroad Company; the

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[3] As a result of the poor economy,.
[4] By 1948, the CRI&P had retired half of the 1,160 steam locomotives it had used through the mid 1930s.

Rock Island Company of New Jersey; the Rock Island-Memphis Terminal Railway Company; the Rock Island-Omaha Terminal Railway Company; the Rock Island, Stuttgart and Southern Railway Company; and the St. Paul and Kansas City Short Line Railroad Company.

Rocket service proved to be very popular and was later extended to Des Moines, Kansas City, and Minneapolis-St. Paul in September 1937. The success of the *Rocket* Service led to the construction of new retarder yards at Armourdale in Kansas City, Kansas, in 1948 and at Silvis, Illinois, in 1949. Retarder yards (or hump yards) were designed to speed overall service by providing classification tracks for the rapid and efficient sorting of rolling stock.

The CRI&P's reorganization and effective management in the 1940s prepared it well to compete in the burgeoning post-WWII economy. At the time of the company's centennial in 1952, it had recently purchased control of the Pullman Railroad Company, the Burlington-Rock Island Railway Company, and the Peoria and Bureau Valley Railroad Company and was considered one of the best, fully diesel-powered railroads in the country. It was also building new line in Texas, while paring down its system by abandoning small segments of track in Oklahoma, Iowa, and Illinois. By the end of the 1950s, the company had begun attracting the attention of its competitors, and in 1959, the CRI&P entered merger talks with the Chicago Milwaukee St. Paul and Pacific. However, the talks broke off in late 1960.

The Southern Pacific Railroad and the Union Pacific Railroad became the next interested suitors to the CRI&P in the summer of 1962. A merger proposal with Union Pacific was announced in May 1963, but the terms were not approved by the stockholders of both companies until May 1965. Corporate goodwill, however, was not enough to convince the Interstate Commerce Commission (ICC) that the merger was not monopoly building and that it did not undermine the national transportation network. The railroads maintained that because the rail system was overbuilt, the overall traffic density was low and the maintenance costs were cutting into company profits. The ICC regulations limited railroad abandonments to preserve shipping access, which the railroads regarded as interfering with their attempts to streamline (Conant 2004). By the time the ICC decided to allow a significantly modified version of the merger in December 1974, the financial condition of the CRI&P had deteriorated profoundly, not only because of the long-term effects of the stalled merger, but also due to the siphoning of the CRI&P's passenger traffic by Amtrak beginning in 1971. The CRI&P entered receivership for a third and final time on March 17, 1975, and the Union Pacific withdrew its merger offer.

The CRI&P continued to struggle financially, abandoning additional portions of its Minnesota lines, until it the Brotherhood of Railway and Airline Clerks struck in August 1979 over a wage dispute. Although President Carter ordered a sixty-day cooling-off period, strikers ignored the order. In January 1980, a court ordered the liquidation of the CRI&P. The company was formally dissolved in June 1984, after many of its lines were sold to other railroads including the Missouri Pacific, St. Louis Southwestern, and the Missouri Kansas and Texas. The Union Pacific eventually acquired the former CRI&P track when they purchased the Missouri Pacific in December 1981 and the Missouri Kansas and Texas in August 1988 (Thompson Gale 2005).

VIII. Duluth and Northeastern Railroad

The Duluth and Northeastern Railroad (D&NE), with headquarters at Rush Lake, was incorporated by the Duluth Logging and Contracting Company on September 30, 1898. Its goal was to construct a logging railroad into the timber-rich Cloquet River Valley, reaching from Duluth north to Lower Island Lake in Township 53 North, Range 14 West, then northeast across the Duluth and Iron Range Railroad (D&IR) in Section 18, Township 56 North, Range 12 North, and continuing to the northern state boundary (Prosser 1966:128) (for a map of the D&NE railroad network in Minnesota, see Maps section).

In the winter of 1898, the D&NE hauled approximately 30 million board feet out of Minnesota's northern forests on branch lines constructed of 30-pound rail (King 1981:89). Logs were transported by rail to Island Lake, then floated down the Cloquet and St. Louis rivers to sawmills at Cloquet. In 1902, low water levels interfered with the summer log drive, and the railroad began surveying a new Cloquet to Rush Lake route. The company took up the tracks of its 1898 line to Island Lake by April 1905, and that summer began shipping timber along 42 miles of new track between Rush Lake and a new bridge over the St. Louis River at Cloquet (King 1981:93; Prosser 1966:129). The following year, after moving its headquarters to Cloquet, the company completed its line to Hornby and added passenger service.

Handling over 12,000 passengers and 200,000 tons of freight annually by 1909, the D&NE decided to build a new branch from Harris Lake to a junction with the D&IR, a move which resulted in peak traffic and revenues in 1912 of 20,831 passengers and 686,276 tons of freight (King 1981:94). An additional extension from Brevator Junction to Brevator was laid in 1910 (later taken up in 1926) (Prosser 1966:128).

While the 1918 Cloquet fire may not have sealed the D&NE's fate, it did not strengthen the forest products industries of the region. Despite plans in the 1920s to log large tracts of far northern Minnesota, the regional logging railroads were beginning to abandon their trackage. The D&NE was sold to the Northwest Paper Company in 1929. After 1938, when the last good timber had been removed from the General Logging Company's lands, the Minneapolis Red Lake and Manitoba abandoned its lines, leaving the D&NE as the last surviving common-carrier, logging railroad in the state (King 1981:27). Two years later, General Logging entirely ceased its logging operations north of Hornby, and without this source of revenue, the D&NE abandoned its line between Hornby and Rose Lake. The next year (1941) the D&NE shut down its line between Saginaw and Hornby (Prosser 1966:91). Northwest Paper Company sold the remaining D&NE lines to Potlatch Corporation in 1963, and three years later, Potlatch retained only 11 miles of line between Cloquet's paper mills and the Duluth Missabe and Iron Range junction at Saginaw (Prosser 1966:91). In 1981, the railroad continued to operate as a general freight shipper; the last remnant of the once-expansive Minnesota logging railroad network (King 1981:97).

IX. Duluth Missabe and Iron Range Railroad

Predecessor Lines

The Duluth Missabe and Iron Range Railroad (DM&IR), along with its predecessor companies, played a critical role in the development of the Missabe and Vermilion iron ranges because it hauled hundreds of millions of tons of iron ore from the mines to the ore docks at Lake Superior. The railroad was also instrumental in the formation of townsites on the iron ranges including the port cities of Duluth and Two Harbors (for a map of the DM&IR railroad network in Minnesota, see Maps section).

Duluth and Iron Range Railroad

The Duluth and Iron Range Railroad (D&IR) was established in 1874. Its charter specified the construction of railroad from Duluth to the northeast corner of Township 60 North, Range 12 West, on the Mesabi Iron Range. Although the Minnesota legislature granted the company 10 square miles of swampland per mile of track, no work was done on the line until interest in the D&IR was purchased by Charlemagne Tower in 1882. In July 1884, the Vermillion Range's Soudan Mine (Tower Junction) was linked to a new port at Agate Bay, a natural harbor north of Duluth (Lamppa 2004:48; Prosser 1966:127).

Agate Bay, which developed into the town of Two Harbors, was chosen as the initial terminus of the line due to its relative proximity to the mines. The D&IR initially built two wooden ore docks in Two Harbors to make the transshipment from railcar to ore boat. Eventually, the company would operate six docks in the harbor, including Dock Number 6, which was built during 1907 to 1909 and is nationally significant as the first steel and concrete ore dock on the Great Lakes (Holum 1984). In addition, the D&IR built a sorting yard and engine and car shops complex in Two Harbors in 1884, which it expanded over the years.

By 1886, the D&IR had constructed a connecting line to Duluth, approximately 60 miles to the southwest. The following year, control of the railroad was purchased by the Illinois Steel Company, though the railroad continued to operate independently. Once the D&IR had established traffic between the Mesabi Range and the Lake Superior ports, additional lines were built as new mines opened, beginning with an 1888 branch from Tower Junction northeast to Ely in the Vermillion Iron Range. In 1892, a branch was constructed off the mainline from Allen Junction to McKinley in the Biwabik deposits. The railroad continued westward through the Mesabi Range to Virginia, completing the route from McKinley the following year. An additional branch from McKinley to Eveleth was finished in 1895 and extended in 1910 to Webster. In 1899, the D&IR double tracked its mainline from Two Harbors to Adams Junction to handle the increasingly heavy loads—estimated by 1905 to be 35 trains per day carrying 2,000 to 2,500 tons each (Roise 2002:12).

In 1901, the D&IR and its competitor, the Duluth Missabe and Northern Railway Company (DM&N), both became part of the United States Steel Corporation conglomerate. This created a level of financial stability that facilitated nearly 20 years of increased building for the D&IR on the fringes of the Mesabi and the Vermillion ranges, with branches built from Robinson to Burntside Lake (1913), Mesaba via Dunka River to Scott Junction (1914) (Mesaba to Dunka River portion taken up in 1960), and Wales to Whyte (1917 to 1918).

By World War I, the D&IR's iron-ore-hauling system was complete (with the exception of a 1948 line from Whyte to Forest Center). By 1927, the D&IR served the mines at Aurora, Babbitt, Biwabik, Colby, Ely, Eveleth, Largo, McComber, McKinley, Mariska, Pettit, Sparta, Soudan, Virginia, and Winton. In 1930, the D&IR and the DM&N were merged by their parent company into the DM&IR.

Duluth Missabe and Northern Railway

The DM&N was incorporated in 1891 to build railroad from a point on Lake Superior and then north to the Canadian border. The DM&N was founded by several Duluth businessmen, including the five Merritt brothers, who were dominant figures in the opening of the Mesabi Iron Range and railroad construction during the 1880s and 1890s. The Merritts and their associates took over the charter of the defunct Lake Superior and Northwestern Railway to build a railroad in conjunction with the opening of Mesabi Iron Range mining and ore transport operations (King 1972:45-46).

The first DM&N construction project was a 48-mile line between Stoney Brook Junction (Brookston) and the Mountain Iron Mine, completed in 1892 (Prosser 1966:130; Walker 1979:101). Although this line did not run directly to Lake Superior, it operated under a lease agreement with the Duluth and Winnipeg Railroad Company. The Duluth and Winnipeg, which had a line from Lake Superior northwest to Deer River, Minnesota, would carry DM&N trains on its 26 miles of track from Stony Brook to the harbor and develop an ore-transfer facility on the Allouez Bay in Superior, Wisconsin. The first ore train made the trip from the Mesabi Iron Range to the Lake Superior dock in November 1892 (Dillan 1961:29; King 1972:46-49).

The Merritt brothers further advanced their interests in 1892, when they leased the Missabe Mountain Mine near Virginia to Henry W. Oliver, who was developing Mesabi Iron Range properties. His Oliver Iron Mining Company then entered into an agreement with the DM&N for ore transport. Once the DM&N completed spur lines to the Biwabik Mine and a Missabe Mountain spur from Wolf to Virginia in 1893, the line served all the early mines in the eastern Mesabi Iron Range (Walker 1979:108).

With the continued development of mines in the eastern Mesabi Iron Range during the early 1890s, the Merritts and their associates constructed their own line into Duluth in 1893 and an ore terminal in West Duluth. This decision to expand, however, exhausted the Merritt's financial resources and led to complicated fiscal arrangements. The need for capital from sources beyond Duluth, coupled with the financial Panic of 1893 and the hard years that followed, had long-lasting effects on the development of the Mesabi Iron Range. The Merritts lost control of their railroad, and the DM&N became part of the Lake Superior Consolidated Mines, a company controlled by John D. Rockefeller. The capital resources of Rockefeller, who was able to forego short-term profits, funded the extension of the DM&N with branches to additional mines (from Wolf to Hibbing in 1894 and from Eveleth to Spruce in 1895) and the construction of a second ore dock in Duluth (Walker 1979:204-205).

In 1894, the Oliver Iron Mining Company became a subsidiary of Carnegie Steel (Walker 1979:208-209). Two years later the company leased the iron ore properties of Rockefeller’s Lake Superior Consolidated. With this arrangement, the Oliver Iron Mining Company and the DM&N, controlled by Andrew Carnegie and John D. Rockefeller respectively, dominated the Mesabi Iron Range mining and shipping system. The DM&N Railway transported the ore to Duluth, and from there it traveled on Rockefeller’s Bessemer Steamship Company ore carriers to Lake Erie ports. In 1901, J. P. Morgan acquired the railway and the mining company, as well as Rockefeller's ore steamers, for his United States Steel Corporation. The operations in the Mesabi Iron Range continued to function under their original names though they shared support by (and allegiance to) U. S. Steel. For many years during the heyday of the Mesabi Iron Range mining industry, William J. Olcott was president of both the DM&N (known as the Missabe Road) and the Oliver Iron Mining Company (Bradley et al. 2003:7-18, 19).

The Oliver Iron Mining Company and the DM&N ore line were closely allied as they extracted, processed, and transported the riches of the Canisteo Mining District and shared overlapping management. The line was managed from Duluth and provided passenger and freight services through an area with few roads—consequently becoming an important component of local transportation. The rail line enabled opening of the mines (by bringing in heavy equipment), continued to be essential to mining operations (by hauling out their product), and provided necessary passenger service for the residents of the iron range towns (Bradley et al. 2003:7-22).

The DM&N accompanied the mining industry into the western Mesabi Iron Range. In 1906, it built the Alborn branch line, a 55-mile line that extended northwest from Alborn (Coleraine Junction) on its mainline to Pengilly, and then southwest along the iron range to terminate in the Canisteo Mining District near Coleraine. This line was the railroad's only major branch line. Additional ore dock facilities were erected in Superior at approximately the same time.

In order to capitalize on the Alborn branch line, the DM&N completed several additional construction projects. A Hull-Rust short line was built soon thereafter from the Alborn branch to the Hull Junction. The increased traffic from the Hibbing area led to the double tracking of the Alborn branch south of the Hull-Rust short line junction (King 1972:90). Much of the track of this branch line was re-laid in 1918 and 1919, perhaps in anticipation of the acquisition of 70-ton capacity steel ore cars that would replace the 50-ton cars used since circa 1900 (King 1972:218). A telegraph/telephone line was also added alongside the roadbed (Valuation Records, DM&N Railway Archives, MHS).

At the western end of the line in the Canisteo Mining District, the DM&N established a number of facilities. At Bovey, the DM&N Railway had a station building, a freight warehouse, and a section house. The DM&N stop was north of Bovey where the main road left the town on a north-south orientation and then turned east to Taconite, before TH 169 was constructed. The Bovey facility included an ice house, wood shed, hand car house, tool house, wash house, residence, and section house. At Coleraine, the DM&N had another passenger depot and freight warehouse, as well as a car repair facility. Four dwellings were erected in 1907-1908 for line employees; an additional house was built circa 1920. None of these DM&N buildings remain in Bovey or Coleraine. An additional spur line extended to Taconite and the Holman Mine north of the line and served its coal dock and pit yards. In addition, between Holman and Bovey, the DM&N Railway established the Taconite Junction section house and yard facility in 1909. At this location the line placed a section house, car repair and hand car sheds, and other outbuildings (Bradley et al. 2003:7-22).

Passenger service was an important component of the DM&N Railway's traffic through the 1920s. In 1922, the railroad ran three trains daily in each direction between Duluth and the Mesabi iron range towns, using the mainline to reach the Hibbing/Virginia area and the Alborn branch line to serve Coleraine and Bovey. Service on the Alborn line to Coleraine was discontinued in 1951 (King 1972:105-106, 153).

The DM&N's ore runs from various points on the Mesabi Iron Range had two components: the trip between the iron range and the Proctor Yard, and then the steep grade between the Proctor Yard and the docks in Duluth. Long, ore trains arrived at the Proctor Yard, where they were broken down into shorter trains to deliver ore to the docks. During the busy years of the 1910s, trains descended Proctor Hill as often as every 15 minutes. Between 1906 and 1915, the DM&N docks regularly loaded more than 10 million tons of ore annually. During World War I, the annual totals exceeded 20 million tons, although they declined to levels between 14 and 20 million during most of the 1920s.

The DM&N improved its motive power periodically in order to move such large quantities of ore as efficiently as possible. The acquisition of a group of powerful Mallet locomotives in 1910, and increasing the size of Proctor Yard, enabled the DM&N to haul the increasing tonnage during the 1910s. A group of

Santa Fe-type locomotives enabled the ore trains to grow to 135 carloads on the iron range-to- Proctor portion of the route—twice the former length. Another group of heavy-duty locomotives handled the traffic up and down Proctor Hill. During the 1920s, more Mallet engines were put into use to increase the number of ore cars per train (King 1972:97, 113, 198, 209). The replacement of several bridges and trestles on the line during the late 1910s (including the Holman [A49A] Bridge), appears to have been related to the use of this improved equipment and increased capacity (Bradley et al. 2003:7-22).

Duluth Missabe and Iron Range Railway

In 1930, the DM&N took over the operation of the D&IR. The rail operations were managed separately until they were consolidated into a single company in 1937: the DM&IR (King 1972:115, 119).

After struggling through the lean years of the early 1930s, ore transport increased significantly towards the end of the decade. In 1939, twice as much ore was shipped from the combined railroad's ore docks as in 1938, as the United States steel industry increased its pre-World War II production. By 1941, the unprecedented figure of over 37 million tons of ore traffic was reached. With the help of new, more powerful engines, the line's ore tonnage reached over 44 million tons in 1942; more than half of this ore was carried by the Missabe division. The technical innovation of a centralized-traffic-control system (installed in 1943) that implemented remote control of switches helped to manage traffic of over 40 million tons annually during the remainder of the busy war period. This effort made possible the production records set by many of the mines during the war years (King 1972:119-127). A final burst of ore production and transport occurred during the Korean War. 1953 was another record-setting year for the DM&IR Railway with over 49 million tons of ore carried (King 1972:199).

The tapering off of iron ore mining in the western Mesabi Iron Range after the peak production year of 1953 led to the eventual abandonment of portions of the DM&N. During the 1960s, the railroad ran from 12 to 18 “ore extras” per day over the Missabe Division, as well as several locals (including the Coleraine Local) (Dorin 1969:21). However, by the early 1970s, the Alborn branch line was no longer the “lifeline” it once was for the mining industry (King 1972:90). It was abandoned in 1977 (Dan Stein, DM&IR Railway, March 10, 2003). An arrangement with the Burlington Northern Railway (now the Burlington Northern Santa Fe Railway) permitted DM&IR Railway traffic originating in Coleraine to move over its line east across the iron range (King 1972:90). The DM&IR continues to serve the taconite industry in the iron range. This taconite route makes use of the two predecessors’ original mainlines to form a loop between Duluth, the eastern Mesabi Iron Range, and Two Harbors. The line delivers limestone to the taconite facilities in the Mountain Iron, Eveleth and Virginia areas and hauls taconite pellets to the harbors for shipping (Bradley et al. 2003:7-19 to 21).

X. Great Northern Railway Company

Introduction

In 1893, the Great Northern Railway Company became the fifth transcontinental railroad in the United States. Extending from St. Paul to Seattle, this northernmost of the transcontinental lines represented the vision and the business acumen of James Jerome Hill: a man with a legacy of undisputed importance in the development of the railroad industry and the state of Minnesota. Hill is widely known as the Empire Builder. Propelled by his active efforts in the areas of immigration, legislation, advertising, and agriculture, his empire grew along the routes of his railroad lines into the western United States. By the time of his death, the lines of the Great Northern covered over 8,100 miles and ran through parts of Michigan, Wisconsin, Minnesota, Iowa, North Dakota, South Dakota, Montana, Idaho, Washington, and Canada (Hidy et al. 1988:318-323) (for a map of the Great Northern railroad network in Minnesota, see Maps section).

Despite its widespread presence, the history of the Great Northern is rooted in Minnesota. It was in Minnesota where the road began, and where Hill, who lived in St. Paul for 60 years, began to build his empire through a complex web of predecessor companies and rail lines that reached all but the easternmost corners of the state. On paper, the direct predecessor of the Great Northern is the Minneapolis and St. Cloud Railway Company. Incorporated in 1856 with the intent to "build and operate a railroad between Minneapolis and the navigable waters of Lake Superior via St. Cloud" (Prosser 1966:142), this road was reorganized as the Great Northern Railway in 1889. Physically, however, the Great Northern in Minnesota is truly the descendant of the St. Paul and Pacific, later the St. Paul Minneapolis and Manitoba (Manitoba), under whose tenure the first operational rail line in Minnesota was constructed. This rail line was the first segment of what would become the Great Northern mainline to the Pacific Coast.

Predecessor Lines in Minnesota

St. Paul and Pacific Railway Company and the St. Paul Minneapolis and Manitoba Railway Company

In 1857, the Minnesota and Pacific Railway Company was formed with the goal of constructing a mainline from Stillwater to Breckenridge via St. Paul and St. Anthony and a branch line from St. Anthony to St. Vincent near the mouth of the Pembina River (Prosser 1966:149). Under the presidency of future United States congressman Edmund Rice, grading began quickly. As with many of the early roads, however, the construction project was soon faced with financial difficulties, so that by 1860, the Minnesota and Pacific could claim nearly 63 miles of graded roadway, but none of it with tracks. With eastern financing, 1,400 feet of tracks were built in September of the following year, but legal issues took their toll, and construction ceased for the Minnesota and Pacific.

In March of 1862, the Minnesota legislature transferred the rights and property of the failed road free of all encumbrances to the St. Paul and Pacific Railroad Company, a company that continued to recognize Rice as the president but was associated with new investors. This group was more successful, and on June 28, 1862, the first train made its run between St. Paul and St. Anthony along the first operational line in the state. Days later, the St. Paul and Pacific began offering regular passenger service between the two cities, and it was instantly used by approximately 90 people daily (Luecke 1997:4). A mail contract and freight traffic followed shortly thereafter. The latter increased with the extension of the branch line, which was constructed before the rest of the mainline due to the daunting task and expense of constructing the bridge that would be required for the mainline over the Mississippi River between St. Anthony and Minneapolis. As of February 6, 1864, mainline construction was assigned to a separate corporation organized under the St. Paul and Pacific charter, called the First Division of the St. Paul and Pacific Railroad, but it was not begun until 1867.

By 1867, the branch line had reached Sauk Rapids and was carrying shipments of potatoes, lumber, shingles, barrel staves, grain, flour, furs, hides, furniture, agricultural implements, anvils, and other diverse general merchandise. That August, the bridge over the river was complete, and construction on the mainline had progressed to allow service to the resorts in Wayzata along Lake Minnetonka. Even so, the St. Paul and Pacific continued to face financial constraints, and in November of 1870, the Northern Pacific was, with certain conditions, allowed to buy the majority of the stock in both the St. Paul and Pacific and the First Division of the St. Paul and Pacific. Following this arrangement, the goal of building to the city of Breckenridge was attained in 1871 (Hidy et al. 1988:6-13; Prosser 1966:160).

During the 1860s period of mainline expansion, the St. Paul and Pacific began efforts to attract settlers to buy the nearly 2.6 million acres of land provided by the railroad's federal land grant in Minnesota. Settlement was important to provide dependable freight traffic, as well as laborers who would build the lines over which that traffic would be transported. Promotional pamphlets, professional writers, immigration agents, public sales, and facilities for cooking, washing, and sleeping were strategically placed in undeveloped areas to encourage new settlement and businesses along the future rail lines (see *Railroads and Agricultural Development*, 1870-1940 on page 141).

Additional encouragement to use the St. Paul and Pacific was provided by James J. Hill who, as a general transportation agent, made an agreement with the railroad. Steamboat freight marked with Hill's name and transported by the railroad company would be transferred through the depot free of the usual transfer charge. Thus began the most significant relationship of the St. Paul and Pacific with any individual, as will be detailed later.

After the mainline was completed, the Northern Pacific began construction on the St. Paul and Pacific branch line to St. Vincent, but 1872 witnessed a sluggish market for securities. This decline was compounded by the Panic of 1873, and the Northern Pacific was forced to relinquish control of the St. Paul and Pacific. In August of 1873, Jesse P. Farley, an Iowa railroad man who had worked for several eastern roads, was granted receivership of the St. Paul and Pacific (Hidy et al. 1988:23-25; Luecke 1997:32).

At this time, Donald Alexander Smith, Norman Wolfred Kittson, and James J. Hill began plans to gain control of the railroad company. Needing financial resources, they approached Smith's cousin and a prominent Canadian banker, George Stephen, for assistance in fundraising. Stephen, initially doubtful of the plan, finally acceded in 1877 after much maneuvering by Hill, Kittson, and Smith made control of St. Paul and Pacific bonds a realistic opportunity. Kittson and Hill, along with other St. Paul businessmen, had formed the Western Railroad Company of Minnesota in 1874 and obtained rights to a route from Brainerd to Sauk Rapids. These rights gave them a bargaining chip in a complicated legal situation involving the Northern Pacific and contractors who worked on the branch line, allowing for the 1877 removal, thanks largely to Hill's efforts to sway the Minnesota legislature, of conditions for and restrictions on the St. Paul and Pacific related to construction of the line to St. Vincent.

In 1876, Hill, Kittson, and Smith discovered that bonds controlled by Dutch bondholders would become available that fall and began negotiations that eventually came to fruition in March of 1878. By June of that year, Hill and Kittson had taken over leadership positions in corporations unofficially affiliated with the St. Paul and Pacific, with Hill serving as president of the Red River and Manitoba Railroad Company. In September, Farley leased the St. Vincent Extension and the contract for completing the line to the Red River and Manitoba. December 2, 1878, saw the first train of the St. Paul and Pacific travel from St. Paul to Winnipeg via the St. Vincent Extension.

By this time, Hill, Kittson, Smith, and Stephen were aggressively negotiating with the two remaining significant stockholders: Charles B. Wright, president of the Northern Pacific, and Edwin C. Litchfield of Electus B. Litchfield & Company, a New York firm that held the majority of the First Division stock. Deals were made, and on February 6, 1879, Hill and Stephen were elected as directors of the First Division of the St. Paul and Pacific. The next day, Stephen was elected president. May 23rd of the same year witnessed the formation of the St. Paul Minneapolis and Manitoba Railway Company, also led by Stephen, which took control of both divisions of the St. Paul and Pacific before it purchased them outright on June 14 (Hidy et al. 1988:28-36; Prosser 1966:161). Beginning one week after taking control of the St. Paul and Pacific and over the next four and a half years, the Manitoba engaged in a flurry of acquisitions and construction that would provide it with key connections between the Twin Cities and the Red River Valley.

The Red River Valley had become a key economic center early on with the growth of the fur trade. Various goods were transported via oxcarts north to Canada along paths paralleling the river, and furs, hides, and related goods returned south the same way. While these paths once extended to St. Paul, they stopped well short of that destination after the St. Paul and Pacific built its line to Sauk Rapids. Hill, recognizing the profits that might be generated by innovative transportation between the Twin Cities and the Red River Valley, became part-owner of a steamboat company in 1871. When he and Kittson incorporated the Red River Valley Railroad Company in 1875, the fur trade was in decline, but wheat cultivation had shifted from the southeastern portion of the state to the Red River Valley (see *Railroads and Agricultural Development, 1870-1940* on page 141). Over the next 10 years, Hill became a dominant figure in transportation to, from, and within the Red River Valley, first through his steamboat company, next through his affiliation with the St. Paul and Pacific, and especially through his role in the Manitoba, which had made the Red River Valley its stronghold.

During this period, James J. Hill served first as general manager, then after election in 1882, as president of the Manitoba. It was at this time that Hill would solidify his hold over rail traffic in the Red River Valley of Minnesota, primarily through the acquisition of numerous small companies, most of which occurred between 1879 and 1883. Additional acquisitions would occur in Minnesota in 1886 and 1891. The majority of these acquisitions, which eventually became part of the Great Northern network, were of railroad companies in which Hill and his cohorts held leadership roles and/or that had been financially backed by the Manitoba with the goal of eventual assimilation into the Manitoba system. As noted by Martin (1976:88):

The Manitoba followed a general policy of relying on small and separate companies to construct its branch lines. It usually invested in the stocks and bonds of these little area lines and in turn leased and operated them directly. Such branches might, on occasion, link major cities in the heart of the railroad's empire, like the Minneapolis and St. Cloud. More often, they reached out to the less populous hinterland.

Though it lacked in numbers of people, the hinterland was a solid source of freight. In 1884, for example, 20 percent of the freight traffic of the Manitoba was wheat, coming chiefly from the farmers of the Red River Valley and destined largely for the flour mills of Minneapolis (Hidy et al. 1988:52). Not satisfied, however, with the Red River Valley to Twin Cities-based markets alone, and concerned about the seasonality of and increasing competition for wheat shipments, Hill saw the need for the Manitoba to tap into other markets. He began this process in 1881 by purchasing control of the St. Paul and Duluth jointly with the Chicago Milwaukee and St. Paul (CM&StP) and the Chicago St. Paul Minneapolis and Omaha;

then in 1882, he constructed the beginning of his own line toward the shipping ports of Lake Superior using the Minneapolis and St. Cloud charter to build from East St. Cloud to Hinckley, which was made more direct with the Manitoba's construction of the Elk River to Milaca line in 1886. Additionally, Hill and the Manitoba began to focus on timber in the north-central part of the state as early as 1883.

It was fortunate that Hill had the foresight to diversify his markets. The year 1885 witnessed a severe drop in wheat prices and an associated exodus of numerous farmers from the Red River Valley. Though the Manitoba's hold over this location was such that it retained the wheat traffic that remained, it was equally necessary for Hill to concentrate on new products; thus, while the Manitoba remained focused on the western part of the state, a partner company also owned by Hill, the Eastern Railway Company, would later continue the Manitoba's push to the northeast and join it within the Great Northern system.

Acquisitions by the St. Paul Minneapolis and Manitoba

Red River Valley Railroad Company

On June 12, 1875, the Red River Valley Railroad Company was incorporated by Hill and Kittson to "construct and operate a railroad from Breckenridge to Glyndon and other lines in the Red River Valley" (Prosser 1966:157). Truly, however, its purpose was to link the St. Vincent extension at Crookston to Fisher's Landing (near present-day Fisher), which was located on the Red Lake River about 10 miles west of the rail line and about 13 miles southeast of its confluence with the Red River. The point of this link was to provide a shorter connection to freight carried by Kittson and Hill's steamboating operation, the Red River Valley Transportation Company, much of which came to the Northern Pacific line at Moorhead from Winnipeg via the Red. By diverting their steamboats to the new line, Kittson and Hill could transport the freight traffic on their own rail lines, providing them with a source of revenue and, just as importantly, taking one away from the Northern Pacific. To avoid charges of monopoly, Hill and Kittson did not sit on the board of directors, but instead paid Jesse Farley to construct the line, which he did in 1875. By May of 1876, the Red River Valley Transportation Company, which was the only steamboating company operating along the Red River from Winnipeg south, established Fisher's Landing as the southern terminus for all of their steamboat traffic (Martin 1976:83, 121; Luecke 1997:32-33).

Three years later and without concern for perceptions of monopoly, as Hill and Kittson moved to take over the St. Paul and Pacific, they were elected to the board of directors of the Red River Valley Railroad Company (Hidy et al. 1988:31). Because the completion of the St. Vincent extension brought Winnipeg's freight traffic directly to the Manitoba, the connection to Fisher's Landing became obsolete. Under Hill and Kittson's direction, therefore, the company began construction of a line from Fisher's Landing to Grand Forks in April of 1879. The line reached East Grand Forks in October of that year, and shortly thereafter the Red River Valley Railroad Company was subsumed by the Manitoba (Prosser 1966:157; Luecke 1997:41-42).

Barnesville and Moorhead Railway Company

The Barnesville and Moorhead Railway Company was incorporated as a subsidiary of the Manitoba in August of 1880 with the expressed goal of building a branch line from the St. Vincent Extension to Moorhead. Tacitly, its purpose was to tap into the Moorhead and Fargo market, which up until that point had been dominated by the Manitoba's chief competitor, the Northern Pacific. The Manitoba, which provided financial backing for the road, purchased the Barnesville and Moorhead on October 29, 1880.

Due to attempts by the Northern Pacific to prevent the Manitoba from constructing in Moorhead, when service on the line began two days later, it had not fully reached its final destination, but came instead to a point slightly east of where it was to cross the Northern Pacific line in the city. A resolution was achieved and the crossing established on December 26 of the same year (Luecke 1997:44-47).

St. Cloud and Lake Traverse Railway Company

Like the Barnesville and Moorhead, the St. Cloud and Lake Traverse Railway Company was backed by the Manitoba and incorporated to compete with the Northern Pacific. This time the intent was to pre-empt the presence of the latter in the area that the line was intended to serve, between Morris and the head of the Red River at Big Stone Lake.

The St. Cloud and Lake Traverse was incorporated in May of 1880, but the construction contract had already been granted the month before. Grading could therefore begin within a couple of weeks. The construction of the line, however, faced delays, and was not completed as quickly as had been hoped. Even so, with the line awaiting completion, the company was purchased by the Manitoba on the same day, October 29, as the Barnesville and Moorhead. The line was finished on December 9, 1880 (Luecke 1997:47-49).

Northern Pacific Fergus and Black Hills Railroad Company

The Fergus Falls to Pelican Rapids branch line of the Northern Pacific Fergus and Black Hills Railroad Company (Fergus and Black Hills) was the only early acquisition by the Manitoba without a previous tie to the company. The Fergus and Black Hills was formed in 1878 through the efforts of George B. Wright, a former St. Paul and Pacific supporter, who aligned himself with the Northern Pacific to further his true interest: the livelihood of Fergus Falls.

As the Fergus and Black Hills began grading for branch lines from Wadena and Pelican Rapids to Fergus Falls in the spring of 1881, the Manitoba countered by grading a parallel route on the Pelican Rapids branch. Hill filed an injunction to halt construction by the Fergus and Black Hills, alleging that it was on Manitoba right of way. After months of battle, an agreement was reached between the Manitoba and the Northern Pacific, part of which included the transfer of the Pelican Rapids branch line to the Manitoba. The Manitoba officially took charge of the line and its operations on November 2, 1882.

Minneapolis and St. Cloud Company

The Minneapolis and St. Cloud Railway Company was incorporated in 1856. The owner of the road (also the founder of the city of St. Cloud), Joseph P. Wilson, was consistently frustrated in his attempts to finance the road, and it remained a paper road until 1882. In that year, the Manitoba constructed a line for the struggling company from East St. Cloud to Hinckley to prevent line construction and ownership by the Northern Pacific in that location (Hidy et al. 1988:41). The Minneapolis and St. Cloud retained its identity when the Manitoba purchased it the following year, but in 1889, James J. Hill reorganized this line as the Great Northern Railway Company (Prosser 1966:142).

Minneapolis and Northwestern Railroad Company

In February of 1878, as the St. Paul and Pacific was trying to iron out its relationship with the Northern Pacific, Hill incorporated the Minneapolis and Northwestern Railroad Company, which held the rights to construct a line on the west side of the Mississippi River from St. Cloud to Minneapolis. Prior to 1881, the line connecting these locations on the east side of the river had been fairly sufficient in handling the volume of passenger and other traffic. Subsequently, however, the Manitoba, as part of the same agreement by which the Manitoba received the Pelican Rapids branch line from the Northern Pacific, gave the Northern Pacific right of access over its line between Sauk Rapids and Minneapolis on the east side of the Mississippi. The subsequent strain on that line required that Hill put the Minneapolis and Northwestern into action. In October of 1882, one month after the completion of the west-side line, it was announced that the Northern Pacific had purchased the east-side line from the Manitoba. In November, the Manitoba commenced through traffic on the west-side line and forever shifted the southernmost portion of the original branch line of the St. Paul and Pacific. The following April, the Minneapolis and Northwestern was sold to the Manitoba (Luecke 1997:58-59).

Red River and Lake of the Woods Railway Company

Another Manitoba-backed railroad company, the Red River and Lake of the Woods Railway Company, was incorporated in April of 1882, ostensibly with the goal of connecting its named points (Prosser 1966:156). Instead, a line was constructed between Shirley and St. Hilaire, which opened “free government land and forest areas" (Hidy et al. 1988:44). The line was completed at the end of June 1883, and the company purchased by the Manitoba on July 11 of the same year (Luecke 1997:59-60).

Minnesota and Dakota Northern Railroad Company

The Minnesota and Dakota Northern Railroad Company was incorporated in March of 1879 to connect Moorhead to a northerly point on the Red River (Prosser 1966:147). The Minnesota and Dakota Northern line was constructed by Moorhead residents Solomon Comstock and Almond White, who received construction plans from the Manitoba.

Comstock and White developed nine townsites along the proposed line, constructed the line from Moorhead to Halstad, provided the Manitoba with free trackage, depot, and yard sites, and developed five more townsites along the line (Martin 1976:88-89). The line was of mutual benefit to the townsite developers and to the railroad, which sought to keep its hold on the wheat trade of the Red River Valley by preventing the Northern Pacific from gaining a foothold there. In November of 1883, one month after the line was finished, the Minnesota and Dakota Northern was officially acquired by the Manitoba (Luecke 1997:57-58).

Sauk Center and Northern Railroad Company

Backed by the Manitoba, the Sauk Center and Northern Railroad Company was formed in response to construction efforts by the Northern Pacific on its Little Falls and Dakota branch line, which was heading from Little Falls toward Sauk Center. This line was planned to extend to the Red River at Brown's Valley and to take advantage of an abundance of timber freightage in Todd County.

Incorporated in February of 1881, the company began grading in the fall, and tracks were laid the following spring between Sauk Center and Browerville. After a delay when crews were sent to work on the Minneapolis and Northwestern, the line was completed into Eagle Bend in the summer of 1883. The company was sold to the Manitoba in November of that year, and regular service began in December (Luecke 1997:52-53). This sale marked the end of the early period of acquisition by the Manitoba.

St. Cloud Mankato and Austin Railroad Company

The Manitoba's second, less intensive period of acquisition began with its purchase of the St. Cloud Mankato and Austin Railroad Company in May of 1886. The St. Cloud Mankato and Austin had been a paper railroad from its incorporation in February of 1865, until two decades later when the Manitoba's hold over wheat shipments from west of the Twin Cities was threatened by construction by the Minneapolis and Pacific. In 1885, backed by the Manitoba, the St. Cloud Mankato and Austin started building its own road from St. Cloud to Willmar. It was purchased by the Manitoba prior to completion, which occurred in late August of 1886 (Luecke 1997:116-117).

Moorhead and Southeastern Railway Company

In 1884, the CM&StP began a foray into the Red River Valley via an affiliation with the Fargo and Southern line. In response, the Manitoba incorporated the Moorhead and Southeastern in September of 1884 with plans to parallel the Fargo and Southern, thereby taking the Milwaukee out of the equation. The Manitoba, however, was combating the Fargo and Southern in other ways as well, including physically blocking construction with train cars and personnel at a grade crossing owned by the Manitoba and matching the Fargo and Southern's rates for transportation of wheat from Fargo to Minneapolis.

Eventually, however, the Fargo and Southern met its demise on its own. As the Milwaukee was taking control of the road in July of 1885, overproduction of wheat combined with drought in the area was taking its toll on wheat prices and causing farmers to move from the Red River Valley, thus ending the "Great Dakota Boom." The suffering road found itself going head to head with the Manitoba for limited wheat traffic in the Red River Valley. After the Moorhead and Southeastern was constructed from Moorhead to Brushvale (across the state line from Wahpeton, North Dakota) in 1887, the Manitoba won, leaving the Fargo and Southern to become a passenger line (Luecke 1997; Mitchell 1982). This connection made the Breckenridge to Barnesville line obsolete, and it was taken up in 1889. On January 28, 1891, the Moorhead and Southeastern was officially purchased by the Manitoba (Prosser 1966:154, 162).

Wadena and Park Rapids Railroad Company

According to Prosser (1966:168), the Wadena and Park Rapids Railroad Company was incorporated in June of 1883 with the objective of building and operating a road connecting its named locations. Luecke (1997:133), however, claims that the Manitoba incorporated the road in June of 1891. In either case, construction on the road, which was an extension of the Sauk Center and Northern from Eagle Bend, began in the spring of 1891 with the simultaneous goals of reaching the timberlands of Wadena and Hubbard counties and drawing off traffic from the Northern Pacific in that area. In July of 1891, the line from Eagle Bend to Park Rapids was complete, and on August 1 it was purchased by the Manitoba.

New Construction by St. Paul Minneapolis and Manitoba

In addition to its numerous acquisitions, the Manitoba fortified its presence in Minnesota by constructing several lines. The earliest of these was the Lake Junction (Wayzata) to Spring Park line, which was built along the north shore of Lake Minnetonka in 1881 in response to the growing industrial concerns in the area. Freight generated by these concerns was initially responsible for the profitability of the line, but profitability increased significantly along with passenger excursions during the late 1880s as the lake and its environs became a famous recreational ground for wealthy tourists (Jones 1957; Luecke 1997:56-57; Vogel 2003).

In 1882, a line was built from Carlisle to Elizabeth to connect the Fergus Falls to Pelican Rapids branch line to the St. Vincent Extension in yet another move to compete with the Northern Pacific (Hidy et al. 1988:40; Prosser 1966:162). This line would be removed in 1898.

A new round of construction corresponded with the second period of acquisition, between 1886 and 1905, and began with the construction of lines from Elk River to Milaca, St. Louis Park to Hutchinson, and Yarmouth to the state line in 1886, the latter to connect Aberdeen in Dakota Territory to Duluth via the Manitoba main line (Hidy et al. 1988:62). Construction then continued from Benson to the state line at Nassau and from Evansville to Tintah in 1887, from Crookston Junction to Fosston in 1888, and from Red Lake Falls to Thief River Falls in 1892. Subsequently, lines were built from Halstad to Crookston Junction in 1896 and from Spring Park to St. Bonifacius in 1900 (Prosser 1966:162).

The Elk River to Milaca line was constructed as the first step in providing a direct connection by the Manitoba between the Twin Cities and Superior, Wisconsin, allowing the Manitoba to compete with the St. Paul and Duluth, then the only direct line from the Twin Cities to Lake Superior. Further, by avoiding an already crowded Duluth, the Manitoba could carve out an exclusive port in which it could significantly expand.

When the Elk River to Milaca line was completed in November of 1886, it replaced the more circuitous route previously used by the Manitoba from Minneapolis/St. Paul to Hinckley via St. Cloud. The extension of the new route to Superior had to wait for the formation of Hill's Eastern Railway Company in 1887 (see below) (Luecke 1997:64-66).

The line from St. Louis Park to Hutchinson was built in direct response to overtures by the CM&StP into the neutral, unserviced ground between its Hastings and Dakota Division mainline and the Manitoba's mainline. When the CM&StP laid track from Glencoe to Hutchinson, the Manitoba elected not to build a small branch south to Hutchinson, but instead chose to build a 53-mile line extending from St. Louis Park to Hutchinson through the formerly neutral ground. Construction was completed in December of 1886.

In 1900, when the Great Northern was leasing the Manitoba, the Great Northern sought to decrease the mileage of the Hutchinson branch, resulting in the Spring Park to St. Bonifacius branch line being laid between the Hutchinson branch and the Wayzata to Spring Park branch, as well as the removal of the track from St. Louis Park to St. Bonifacius.

Competition also spurred the 1886 and 1887 construction of the branch lines from Benson to Nassau and into South Dakota and from Evansville to Tintah. In the area of both lines, the Manitoba was threatened by the upstart Minneapolis and Pacific (later the Minneapolis St. Paul and Sault Ste. Marie [Soo Line]), which sought connections between the flour milling industry in Minneapolis and the wheat producers of South Dakota.

The Benson to Nassau area was additionally in the sights of a paper road called the Duluth, Huron, and Denver, whose objective connections could have heavily impacted the traffic of the Manitoba. Though the possibility of this road was enough to motivate the Manitoba to begin construction, its motivation was solidified by the recognition that a line from Benson through Nassau to Huron, South Dakota, would provide the added benefit of new and untapped grain traffic from Huron (Luecke 1997:81-83).

The year 1888 saw another menace to the Manitoba, this time by the Duluth and Winnipeg, which could siphon traffic from the Manitoba's Winnipeg link to the Canadian Pacific line and add another road to the battle for Lake Superior traffic. By constructing a branch line from the Manitoba mainline at Crookston to Fosston, the Manitoba was able to challenge the potential presence of the Duluth and Winnipeg there, while establishing an operational base from which to mount that challenge. Construction of this line was completed by November of 1888 (Luecke 1997:90-91).

The final two branch lines constructed by the Manitoba under the Great Northern, from Thief River Falls to Red Lake Falls and from Halstad to Crookston, were meant to counter the Northern Pacific infiltration into the Red River Valley by expanding and improving the Manitoba's network of connections in that region. The Thief River Falls to Red Lake Falls connection was completed in December of 1892, while the Halstad to Crookston connection was completed in October of 1896 (Luecke 1997:138-139).

Though still engaging in acquisition and new construction, in February of 1890, the Manitoba leased its properties to the recently formed Great Northern Railway Company. The lease represented little more than a change in name, as Hill was still the man behind the moniker.

Among the new construction projects that were carried out after the lease was put into place were three Great Northern depots constructed along Manitoba lines, notable because they are now listed in the National Register of Historic Places (National Register). The first, located in Crookston, was constructed in 1890 and is now a contributing property to the National Register-listed Crookston Commercial historic district and significant within this district for its reflection of Crookston's railroad development during the period within which it was constructed. Crookston soon thereafter became a distribution hub for the Manitoba, and in 1905 became the administrative headquarters for the northern division of the Great Northern Railway Company.

In 1902, a new depot was constructed along the Manitoba's Elk River to Milaca line in Princeton. Princeton's previous depot had been constructed to service the goods and laborers of the lumber industry, but with a shift to agriculture and light industry, it had become obsolete. The replacement depot is now listed in the National Register for its significance as a focal point of commercial transportation in the Princeton area (Nelson and Zeik 1977).

Downtown Wayzata received a new depot along the Manitoba main line in 1906, laying to rest a feud between James Hill and the citizens of Wayzata, which had, in 1893, resulted in the construction of a depot one mile east of the city. The 1906 depot is now significant for its links to that confrontation and architecturally, "as an unusually well-articulated example of the small town combination depot" (Anderson and Gimmestad 1981).

On November 1, 1907, the Manitoba ceased to exist when it was officially acquired by the Great Northern.

Minneapolis Union Railway Company

The Minneapolis Union Railway Company was incorporated in December of 1881 in response to the growing freight and passenger traffic transportation requirements of the city of Minneapolis. At the end of the 1870s, with the flour milling industry, lumber milling industry, and population booming, the city wanted efficient and sufficient rail service to handle their increased needs. Around this time, the CM&StP announced their plan to build a short line connecting Minneapolis and St. Paul, giving Hill cause for concern. The Manitoba's line into Minneapolis took a rather roundabout route, and therefore would not likely stave off the competition from the short line. In response, Hill formed the Minneapolis Union Railway Company (Union), which though separate from the Manitoba, was a subsidiary of it. Solidifying the connections between the Manitoba and the flour milling industry of Minneapolis, the Union retained Hill as its president and C. A. Pillsbury on its board of directors.

Despite its short length, the Union line, which was to connect University Switch to 3rd Avenue North in Minneapolis, posed a significant problem: the crossing of the Mississippi River near the falls of St. Anthony. The Manitoba's Chief Engineer, Charles C. Smith, came up with a plan for the bridge, which was to be located just below the falls. Construction on the Stone Arch bridge would take nearly two years to complete, and another five months before the first revenue train crossed it in April of 1884. The line continued to operate as the Union until it was purchased by the Great Northern on July 1, 1907 (Hidy et al. 1988:46; Luecke 1997: 163-170; Prosser 1966:146).

Willmar and Sioux Falls Railway Company

In 1886, the Willmar and Sioux Falls Railway Company was formed by James J. Hill "to build and operate a railroad and telegraph line from Willmar through Granite Falls, Marshall, and Pipestone to Sioux Falls by a feasible route" (Prosser 1966:169). The formation of the company was prompted by the movements of the Minneapolis and Pacific, which sought to tap into the Manitoba's wheat market west of Minneapolis, "thereby securing ample raw materials and reasonable rates for the growing flour milling industry at Minneapolis" (Luecke 1997:116).

When it became clear that the Minneapolis and Pacific would become more than a paper road, a line was built in 1885 from St. Cloud to Willmar by the Manitoba-backed St. Cloud Mankato and Austin (see above). Subsequently, between 1887 and 1889, the recently formed Willmar and Sioux Falls built a line from Willmar to Sioux Falls, running in Minnesota from Willmar to Jasper and then extending southwest to Sherman, South Dakota, on its way to Sioux Falls. The line, completed in late 1888, provided a connection between Sioux Falls and Lake Superior via the Willmar to St. Cloud line of the former St. Cloud Mankato and Austin, the Manitoba line from St. Cloud to Hinckley, and the soon-to-be-completed Eastern line from Hinckley to Superior. The Willmar and Sioux Falls, along with the rest of these connections, was subsumed by the Great Northern in 1907 (Hidy et al. 1988:63; Luecke 1997:115-131).

Eastern Railway Company

James J. Hill incorporated the Eastern Railway Company (Eastern) on August 13, 1887, and subsequently transferred the rights of the Minneapolis and St. Cloud to a route to Lake Superior to his new company. The Eastern began construction from Hinckley toward the St. Louis River in the spring of 1888; therefore, though established as an entity separate from the Manitoba, it served to expand the Manitoba railroad empire in Minnesota, this time with connections to the northeast part of the state. Such connections were desirable because of two major industries: shipping at Lake Superior (see "Urban Centers, 1870-1940" on page 156) and mining on the Mesabi Iron Range (see Minnesota's Iron Ore Industry, 1880s-1945" on page 175).

Almost every product imaginable was shipped through the ports at Lake Superior, creating traffic for those forms of transportation that could haul goods to and from its harbor facilities. During the peak of wheat production, for example, over one quarter of the 56 million bushels of wheat cultivated in the Red River Valley came through Duluth/Superior Harbor. Between 1891 and 1924, 7.7 billion board feet of lumber were shipped from Duluth alone (Labadie et al. 1992). If these products were not enough impetus to build into northeastern Minnesota, however, iron ore from the Mesabi Range became a significant source of freight for the Great Northern, as it hauled ore from the mines to the Lake Superior ports at Duluth and Superior.

When Hill began his foray into northeastern Minnesota, his concerns lay primarily with eliminating competitor lines that planned to build into the Red River Valley and into Winnipeg. Because, however, the competition planned to work its way from Lake Superior west, Hill hastened to build connections toward the lake, before the competition could build up steam. By the time service between Hinckley and Superior began in November of 1888, the Eastern had outfitted Superior, Wisconsin, with harbor facilities, which included the Great Northern A and X flour mills, adjoining docks, the rail yard, a roundhouse, and repair shops (Luecke 1997:66-69). During and after the construction of the Eastern mainline, the company, like the Manitoba, would build its presence through the acquisition and construction of several branch lines. The portions of these not taken up would join the Great Northern once it leased the Eastern in 1902 and subsequently purchased the road on July 1, 1907 (Hidy et al. 1988:88; Prosser 1966:134). In the process of these acquisitions, Hill purchased ore lands on the Mesabi Iron Range by acquiring railroad companies who owned such lands; subsequently, he did so through direct purchase. Though Hill kept these properties separate from the Eastern and later the Great Northern, it was not a question whose rail lines would serve his substantial holdings (Bradley et al. 2003:7-25-7-26).

In the end, iron ore traffic "accounted for about one-third of the tonnage hauled by the entire Great Northern Railway system [including the Eastern], and the ore lines contributed significantly to the line's profits" (Bradley et al. 2003:7-27). After the Eastern had been purchased by the Great Northern in 1907, ore traffic witnessed a heavy increase, with "more than 10 million tons . . . shipped during five of the years between 1910 to 1920" (Bradley et al. 2003:7-27). Iron ore shipped along rail lines built by the Eastern continued to be a cornerstone of the Great Northern's freight traffic throughout the remainder of its existence.

Acquisitions by the Eastern Railway Company

Duluth Superior and Western Railway

The Duluth Superior and Western Railway (DS&W) had its beginnings in the Duluth and Winnipeg Railroad, a company that had been incorporated in 1878 to connect its named locations. It performed minor construction along the St. Louis River to the south of Duluth in 1881, then was resurrected in 1888, at which time it began to build west from Cloquet. James J. Hill, sensing the potential for heavy competition if the road ever succeeded in its objective, ordered the construction of the Crookston to Fosston branch of the Manitoba (see above), but the Duluth and Winnipeg pushed on.

After the discovery of iron ore on the Mesabi Range in 1890, the owners of the Duluth Missabe and Northern (DM&N) incorporated the railroad in 1891 but needed a connection from their line, which extended from Mountain Iron to Brookston and into Duluth or Superior. Within approximately one year, the Duluth and Winnipeg provided that connection and began to profit from the shipment of ore, and by January of 1893, the president of the Canadian Pacific, William C. Van Horne, had control of the Duluth and Winnipeg (Hidy et al. 1988:86; Luecke 1997:89-90; Martin 1976:468).

Van Horne's timing could not have been worse. The Panic of 1893 quickly followed his purchase, as did the termination of the Duluth and Winnipeg's ties with an unsatisfied DM&N. The latter subsequently built its own line to Duluth, removing much of the ore traffic from the Duluth and Winnipeg. As a result, the Duluth and Winnipeg went into receivership in October of 1894. Duluth and Winnipeg stockholders banded together to save the road, and their efforts resulted in the December 1896 incorporation of the DS&W. Though the new road was chartered with a route that extended west to the Red River Valley instead of north to Winnipeg, it was still in Canadian Pacific hands; its new route, therefore, did nothing to allay Hill's fears of competition.

Hill began to push Van Horne to sell the road. It took two years and added pressure from George Stephen (now Baron Mount Stephen) and Donald Smith before Van Horne acquiesced, and then only in return for "significant traffic agreements" (Hidy et al. 1988:87). On June 22, 1898, Hill purchased the DS&W through the Eastern. Shortly thereafter, the line from Cloquet to Duluth was taken up and replaced by a line from Cloquet to Superior via Carlton. In 1899, the Eastern extended the Duluth to Deer River line of the former DS&W to Cass Lake (Hidy et al. 1988:86-87; Luecke 1997:95-96; Martin 1976:468; Prosser 1966:133-134).

Duluth Mississippi River and Northern Railroad

Although the Duluth Mississippi River and Northern (DMR&N) would also eventually tie into Hill's foray into the iron range via the Eastern, it began as a small logging railroad and was the first in Itasca County. As built in 1892, the road extended from the Mississippi River to a junction with the then Duluth and Winnipeg at Swan River. Over the next three years, it was extended beyond Swan River to Hibbing, and in 1895 transported 75 million board feet of timber to the Mississippi River where the timber began its 150-mile journey to the sawmills of Minneapolis (Hidy et al. 1988:87; Luecke 1997:100).

The extension to Hibbing, however, quickly resulted in a second focus with regard to freight traffic. Not only was iron ore already a booming industry in the Hibbing area, DMR&N railroad crews discovered what would become the Mahoning Mine, one of the most significant iron ore deposits in the state.

The extensive resources offered by the Hibbing area made the DMR&N, which built an extension to Chisholm in 1897 and from there to Dewey Lake in 1898, an attractive railroad for potential buyers. Its owners, Michigan lumbermen Amni Wright and Charles Davis, were well aware of this fact and increased its appeal by offering 25,000 acres of mining lands along with the road. Hill moved swiftly and purchased the DMR&N through the Eastern on May 1, 1899, for over four million dollars. This purchase, after the previous year's purchase of the DS&W, solidified the foundation of Hill's railroad empire on the Mesabi Iron Range (Hidy et al. 1988:87; Luecke 1997:100-101).

<u>Swan River Logging Company: Barclay Junction to Virginia Line</u>

The Swan River Logging Company was not a railroad company but, rather, a logging and lumbering business, though its charter indicated that it would engage in the "transportation of ore and logs by water and by cars" (Prosser 1966:166). The company constructed a rail line from Barclay Junction to Virginia in 1899, with the Eastern purchasing capital stock of the company in the same year to obtain trackage rights over the line ("Histories and Related Papers, 1899-1929, 1942, Swan River Logging Co., Ltd.," manuscript on file at the MHS).

Also in 1899, the Swan River Logging Company leased the Chisholm to Dewey Lake road, which had been constructed by the DMR&N in 1898 (see above) and at the time of the lease was under the ownership of the Eastern. In 1902, the Eastern purchased the Barclay Junction to Virginia Line from the Swan River Logging Company. Later, in 1909, the Swan River Logging Company purchased the Chisholm to Dewey Lake line from the Great Northern.

New Construction by the Eastern Railway Company in Minnesota

In the decade subsequent to the construction of its mainline from Hinckley to Superior in 1888, the Eastern, like the Manitoba, expanded its area of operations primarily through acquisitions (as described above). Between 1898 and 1903, however, new construction occurred on a yearly basis. In 1898, the Elk River to Milaca route of the Manitoba was relegated to branch line status as the Eastern constructed an extension of its mainline as a cutoff from Coon Creek Junction (approximately 14 miles north of Minneapolis) north to Brook Park (approximately eight miles southwest of Hinckley). The cutoff was constructed to improve service and to allay imminent competition from the CM&StP, who had recently begun plans to construct their own cutoff from St. Paul to Duluth (Luecke 1997:76-77). As previously noted, this year also witnessed the construction of a cutoff from Cloquet to Superior to replace the connection between Cloquet and Duluth.

The year 1899 saw the above-mentioned extension from Deer River to Cass Lake of the former DS&W line, which began the connection of the Twin Ports with the Red River Valley as established in the DS&W charter. This connection was continued in 1900 from Cass Lake west to Fosston, where it met with the Manitoba line running west from Fosston to the Red River Valley (Luecke 1997:97).

The Eastern's final construction episodes in Minnesota were linked to its expansion into the Mesabi Iron Range. In 1901, the Brookston to Ellis line was built to accommodate the growing mining industry in Virginia, just east of Ellis. In 1902, a line was constructed from Kelly Lake to Nashwauk to connect newly discovered iron deposits. The following year, after it became apparent that the town of North Hibbing would need to be moved in order to extract iron from beneath it, the portion of the former DMR&N line from Kelly Lake to Chisholm via Hibbing was taken up and replaced with a line from Kelly Lake to Flanders via South Hibbing. Finally, increased ore tonnage led the Eastern to double track its mainline west from Superior to Brookston in 1905 (Hidy et al. 1988:88; Luecke 1997:104-105; Prosser 1966:134). After 1905, the Eastern continued to operate its existing lines under lease by the Great Northern, which purchased the railroad company in 1907.

Park Rapids and Leech Lake Railway Company

Like many of the Great Northern predecessor lines in Minnesota, the Park Rapids and Leech Lake Railway Company could ultimately be linked to a parent company, in this case the Great Northern, associated with James J. Hill. After the Brainerd and Northern Minnesota Railway built to Walker in 1894, resulting in their domination of the timber reserves in that region of the state, the Great Northern began to consider ways to share in the profits obtainable through that resource. Though the Manitoba had gained a jump on the timber lands of north-central Minnesota as it began to grade from Park Rapids toward Akeley in 1893, the Panic of that year put a temporary end to the operation, and it would be four years before the construction process resumed.

In 1897, the Great Northern was contemplating a through route between Deer River and Fosston and knew that a line from Akeley north to that line would connect their Sauk Centre to Park Rapids branch line to the Twin Ports and the Twin Cities. Simultaneously, the new line would allow the Great Northern to tap into the timber of north-central Minnesota and to service the large lumber mill being planned in the town of Akeley, which was platted specifically for that operation. Extending the 1893 grade of the Manitoba northeast from Park Rapids, the Park Rapids and Leech Lake Railway Company began the construction process on October 8, 1897, two days after its incorporation. It completed the road to Akeley in just over one month.

The company, however, had not limited its sights to Akeley. It planned to route its line first to Leech Lake, by which it could firmly establish timber traffic for several years, and then on to the connection with the planned line from Deer River to Fosston at Cass Lake, which would be constructed under the Eastern instead of the Great Northern in 1899 and 1900. The Park Rapids and Leech Lake line to Cass Lake reached that city in December of 1898. It was controlled by the Great Northern for the next eight and a half years, at which point it was sold to and subsumed by the parent company (Luecke 1997:135-138; Prosser 1966:156).

Minnesota and Great Northern Railway Company

The final predecessor of the Great Northern was incorporated on March 31, 1904, under a name that hardly disguised its parent association: the Minnesota and Great Northern Railway Company. The stated objectives of the company were to build and operate a road from a connection with the Great Northern via its leasing of the Manitoba at Thief River Falls to the Canadian border in Roseau County and a second road from Pelican Rapids to the Canadian border in Roseau County, but its true objective was to delay and complicate to the greatest extent possible the construction of the Soo Line from Glenwood to Winnipeg, a line that would parallel the Manitoba line to Winnipeg and thereby strike "the very heart of the formation of James J. Hill's empire" (Luecke 1997:140). While engaging in numerous subversive tactics to slow the Soo Line, the Minnesota and Great Northern extended the Manitoba line from Red Lake Falls to Thief River Falls north to Greenbush.

Approximately five months after the line was completed in November of 1904, the Great Northern struck a deal with the Northern Pacific, which allowed the Great Northern to run over the Northern Pacific line between Red Lake Falls and Tilden Junction, where the Northern Pacific line intersected the Manitoba's Crookston to Duluth line. This line rendered the Manitoba's Shirley to St. Hilaire line redundant, and the western portion of this line, from Shirley to Wylie, was therefore taken up during 1906 and 1907. The Thief River Falls to Greenbush line operated under the Minnesota and Great Northern until July of 1907, when it was purchased by the Great Northern along with several of the other predecessor lines already described.

Great Northern in Minnesota, 1907-1970

In 1907, the Great Northern consolidated its holdings by purchasing the Eastern Railway Company, the Minneapolis Union Railway Company, the Minnesota and Great Northern Railway Company, the Park Rapids and Leech Lake Railway Company, and the Willmar and Sioux Falls Railway Company on July 1 and the St. Paul Minneapolis and Manitoba Railway Company on November 1. In the same year, James J. Hill turned over the presidency of the company to his son, Louis, and assumed the position of Chairman of the Board.

Under the junior Hill's presidency, the last two new Great Northern roads were constructed in Minnesota. The first was the extension of the former Minnesota and Great Northern line north from Thief River Falls to Warroad. This extension began as a move against the Soo Line and the Duluth South Shore and Atlantic as they built and threatened to build, respectively, through the Thief River Falls area in 1905. The

Minnesota and Great Northern quickly graded from Thief River Falls to Warroad, but afterward, the Soo Line retreated, leaving the Minnesota and Great Northern with no impetus to lay tracks.

That impetus came in the form of the incorporation of the Northern Minnesota Railway and the Minnesota Air Line Railway in the spring and summer of 1908. These two companies had sought to take over the neglected grades of the Great Northern, including the former Minnesota and Great Northern road to Warroad. The Great Northern, not about to let either company take any part of its northern Minnesota traffic, put the grade back into usable shape and laid tracks all the way to Warroad by November of the same year, putting a stockyard, depot, and elevator in Roseau on its way there. In Warroad, a roundhouse, rail yards, and water tanks were put in place, and in 1912, a spur laid from the yards to Lake of the Woods, which would serve the Armstrong Fish Company for over two decades. (Luecke 1997:144-146; Prosser 1966:136).

The second and final new construction episode was a line from Nashwauk to Gunn, meant to serve the burgeoning iron ore mining industry. The line, built in 1909, connected to the road from Nashwauk to Kelly Lake (and east). The latter was used in combination with the Ellis to Brookston road, as part of a south- and east-bound system to transport ore to Allouez, Wisconsin, on Lake Superior, while the Deer River to Duluth road was used to transport empty ore cars back to the iron range, as well as to haul ore directly from Gunn southeast to Lake Superior (Luecke 1997:104; Prosser 1966:136).

Louis Hill remained president of the Great Northern until 1912, when Carl R. Gray, who had up until then been president of the Spokane Portland and Seattle, was elected to the position. Gray served for two years before Louis Hill retook the position, where he remained until 1919, with a brief interlude during the first half of 1918, when the United States Railroad Administration took charge of all roads. Because Hill refused to work for the government, William P. Kenney, the vice president of traffic for the Great Northern, took over as president until the railroads were returned to private ownership. During this time, Hill served as chairman of the board. Louis Hill's tenure as president witnessed the retirement of his father from all official positions within the Great Northern organization in 1912 and the senior Hill's death in May of 1916.

Minnesota lines abandoned or partially abandoned during this time included those from Chisholm to Dewey Lake (one year after its 1909 sale to the Swan River Logging Company), Mississippi to Mississippi Junction (1917 to 1922), and Barclay Junction to Flanders (1910, 1916, 1920). This period was also one in which the Great Northern began to turn its attention west. Though the Great Northern already had a transcontinental line, the company wanted to expand its presence in states such as Montana, Oregon, and Washington, and it wanted to move into California. Activity in Minnesota was limited to improvements and new facilities, such as the Great Northern station constructed on Hennepin Avenue in Minneapolis in

1914, the depot constructed in Bemidji in 1913, and a bridge constructed in Wilkinson Township, Cass County, in 1915 (Hidy et al. 1988:125, 134, 137, 151; Prosser 1966:136). The latter two properties are now listed in the National Register, the depot because of its significance as "the only active, early twentieth-century railroad building remaining in Bemidji, which owed its initial settlement and prosperity to railroads in general and the Great Northern Line in particular" (Hess 1987), and the bridge because of its significance "as a surviving representative of the interaction of the logging industry and the railroads in northern Minnesota during the logging era" (Frame 1980) .

In October of 1919, Louis Hill chose to resume the position of chairman of the board, and the presidency of the Great Northern was turned over to Ralph Budd. Budd, who began work as an engineer for the Great Northern in 1909, had worked his way up to vice president by 1918. Budd worked primarily on improvements to rolling stock, motive power, and fixed properties. Included among the latter was the early 1920s construction of two warehouses by the Great Northern Warehouse Co. in Minneapolis, both of which are now listed in the National Register as properties contributing to the Minneapolis Warehouse District, and of the St. Paul Union Depot, also listed on the National Register. Lines taken up during Budd's presidency, which lasted until 1931 when he left to serve as president of the Chicago Burlington and Quincy, included Kelly Lake to Hibbing (1920), a portion of Barclay Junction to Flanders (1920), and Fermoy to Ellis (1925). The last of the acquisitions by the Great Northern, all of which occurred in 1928, occurred during his tenure as well (Hidy et al. 1988:155, 172, 199; Prosser 1966:132, 136, 144, 148).

Acquisitions by the Great Northern Railway Company

Duluth Terminal Railway Company

The Duluth Terminal Railway Company was incorporated on August 17, 1887. Its articles of incorporation authorized the company "to build and operate a railway along the shores of Superior Bay and St. Louis Bay, Minnesota and across Superior Bay from Rice's Point to Minnesota Point, with branches" (Corporate Records, 1888-1930, Duluth Terminal Railway Company, manuscript on file at the MHS).

The aim of the company was to connect different parts of Duluth and to serve all railroads that connected with its rail line. The construction of the line, which occurred in 1888 and 1889, was financed by the Eastern, but the line operated as the Duluth Terminal until purchased by the Great Northern on November 5, 1928 (Corporate Records, 1888-1930, Duluth Terminal Railway Company, manuscript on file at the MHS).

Minneapolis Belt Line Company

Although the Minneapolis Belt Line Company was not officially purchased by the Great Northern until December 31, 1928, the 1917 construction of its Minneapolis to Fridley line could easily be considered new construction by the latter company. In 1915, the board of directors of the Great Northern authorized construction of a line from Hopkins Junction to a point on the Minneapolis to St. Cloud line at Fridley "to relieve the congestion of traffic passing through the Cedar Lake Yard at Minneapolis" ("Corporate History and Organization," Corporate Records, 1914-1945, Minneapolis Belt Line Company, manuscript on file at the MHS).

Subsequently, the board decided to organize the Minneapolis Belt Line Company to construct the line. The company was formed by Louis W. Hill, E. C. Lindley, and L. E. Katzenbach of St. Paul, and when the line was completed in December of 1917, it was immediately turned over to the Great Northern for operation. The line was officially purchased by its operating company on December 31, 1928 ("Corporate History and Organization," Corporate Records, 1914-1945, Minneapolis Belt Line Company, manuscript on file at the MHS; Prosser 1966:132).

Minneapolis Western Railway Company

The Minneapolis Western Railway Company began with the 1873 conveyance of lands in the Minneapolis west-side milling district from the Minneapolis Mill Company to William D. Washburn for the construction of the Palisade Mills in Minneapolis, "and also the right . . . to locate, build, and use a railway track from Smith Street in Minneapolis to and in front of [those lands] and 150 feet northwesterly there from over the lands of [the Minneapolis Mill Company] or over its canal if extended" (quoted in Histories and Corporate Records, Minneapolis Western Railway Company, manuscript on file at the MHS).

Shortly thereafter, Washburn and the Minneapolis Mill Company built a wooden trestle over the main waterpower canal on which the Minneapolis and St. Louis (M&StL) furnished and laid the tracks. Washburn was a member of the M&StL board of directors at the time. In approximately 1875, the M&StL built a branch from its main line to the trestle and operated its trains over it, though it did not hold title to any portion of it (Histories and Corporate Records, Minneapolis Western Railway Company, manuscript on file at the MHS).

When the trestle needed repair in 1884, the M&StL assigned the responsibility to the Minneapolis Mill Company, at which point several individuals who were in the milling business decided to form the Minneapolis Western to take over the trestle (Histories and Corporate Records, Minneapolis Western Railway Company, manuscript on file at the MHS). The Minneapolis Western constructed an iron replacement in 1885. In the same year, the company built a railroad bridge from University Switch to 6th Avenue South (Minneapolis Riverfront District 2005; Prosser 1966:146).

In 1889, James J. Hill became interested in the line, and he acquired controlling interest of the Minneapolis Western through a company that his son-in-law, Samuel Hill, presided over: the Minneapolis Trust Company. By 1892, the Minneapolis Trust Company had acquired all interests in the Minneapolis Western, and on April 8, 1895, transferred its capital stock from the Minneapolis Trust Company to the Great Northern, who took direct control of it at that time (Histories and Corporate Records, Minneapolis Western Railway Company, manuscript on file at the MHS). The Minneapolis Western was officially subsumed into the Great Northern when it was sold to the parent road on December 31, 1928.

These acquisitions completed the final strands in the web of Great Northern lines in Minnesota. By this time, the attention of the Great Northern had long since turned west of the state. Even so, the Great Northern remained a solid avenue of passenger traffic until the dominance of the automobile, and it continued to play an integral role in freight traffic in Minnesota for the remainder of its existence. With Budd's departure, William Kenney had a second opportunity to serve as company president, a position he held until his death on January 24, 1939. Under Kenney, the Mississippi Junction to Swan River (1936) line was taken up.

On September 26, 1939, Frank J. Gavin, who had been serving as the assistant to the president, was elected to the senior post. Between that date and his retirement in 1951, the Tintah to Elbow Lake (1942) and St. Hilaire to Wylie (1943) lines were abandoned. When he retired, the Great Northern elected its last president, John Budd, who was the son of Ralph Budd. John Budd, previously the president of the Chicago and Eastern Illinois, left this post to become the vice president of operations for the Great Northern in 1949. During his presidency, lines from Superior to Duluth (1944), St. Vincent Junction to St. Vincent (1952), Yarmouth (Aberdeen Junction) to Hankinson (1956), Elbow Lake to Evansville (1957), Swan River to Kelly Lake (1959), and Elliott Siding to Wacouta (1961, 1962), as well as a 0.37-mile section of line at Chisholm (1969) were removed. Budd strove throughout his presidency for a merger with the Northern Pacific. The merger became a reality on March 3, 1970, when the Great Northern joined with the Northern Pacific and the Chicago Burlington and Quincy to become the Burlington Northern (Hidy et al. 1988:199, 216, 248-249, 327; Prosser 1966:136).

XI. Minneapolis Northfield and Southern Railway Company

Introduction

The Minneapolis Northfield and Southern Railway Company (MN&S) was incorporated by Harry E. Pence on June 21, 1918, "to acquire, maintain and operate a railroad between Minneapolis and Northfield, and to make extensions to other points in Minnesota" (Prosser 1966:144). The railroad to be acquired was the Minneapolis St. Paul Rochester and Dubuque Electric Traction Company (MStPR&D), more popularly known as the Dan Patch Electric Line. It was under this company that nearly all of the future MN&S trackage was constructed (for a map of the MN&S railroad network in Minnesota, see Maps section).

Minneapolis St. Paul Rochester and Dubuque Electric Traction Company

The incorporation of the MStPR&D was the one unprofitable link in a chain of business ventures developed by Colonel Marion W. Savage, which were related to his race horse, Dan Patch, and ultimately his livestock-food-supplement and mail-order business, the International Stock Food Company.

The International Stock Food Company was started by Savage in 1890, at which time the operation was located in a warehouse on Washington and Second avenues in Minneapolis. Savage's prowess in advertising was unmatched, as were the dollars he was willing to spend to promote his company. The returns outweighed the expense, and the International Food Stock Company grew and profited exponentially (Brady 2006:78-79).

With the wealth accumulated through this business venture, in the summer of 1902, Savage purchased a 750-acre property in the town that would come to be named for him. There he built a house and farm with an enormous barn to accommodate the racehorses he owned and planned to own, including Dan Patch, who he purchased in December of 1902. Already internationally renowned for having tied the world pacing record, Dan Patch would soon grace the stock books and advertising prints of the International Stock Food Company. The more Dan's racing successes were advertised with the International Stock Food Company, the more people came out to see him race, and the more people witnessed Dan's successes, the more they believed in the products of the International Stock Food Company.

In addition, they were swayed to purchase the other Savage-owned products Dan was used to promote. These included, among others, a sugar feed developed by Savage's chemists, "manure spreaders, sewing machines, thermometers, gasoline engines, watches, knives, washing machines, and incubators for chicken eggs" (Brady 2006:164), patent medicines, lithographs, "cigars, smoking tobacco, toys, grooming supplies,… a piece of sheet music called the 'Dan Patch Two Step,'" and eventually cars (Middleton

1959). Dan's selling power was cemented as he repeatedly broke his world pacing record, setting his best time in 1905 with a 1:55.25 mile. Two years later, Savage launched yet another business venture, the MStPR&D, which he marketed as the Dan Patch line (Brady 2006).

The plan for this line was to serve only passenger traffic, and originally it was to connect Minneapolis, where the International Stock Food Company was now headquartered in the Exposition Building, to the city of Savage at a point that would allow excursionists to walk over to visit Dan Patch and Marion Savage's farm. Ambitious as he was, at the time of the incorporation of the MStPR&D in 1907, Savage decided that the line should extend beyond his namesake into northern Iowa, and that a second line should extend from Minneapolis to Dubuque and then east to Chicago. Pushing the idea of "the People's Railroad," Savage sold stock at 25 dollars a share and marketed to residents along the line. In this way, he secured enough capital to begin construction south from Minneapolis in 1908.

Once construction began, Savage quickly realized that, although Dan Patch provided a passenger destination in the city of Savage, no tourist attractions were present to extend passenger traffic beyond that point. To remedy this situation, Savage built Antlers Park: a 237-acre amusement center complete with Ferris wheel, merry-go-round, and pavilion to which were added an aerial swing, miniature railroad, baseball diamond with grandstand, rental cottages, a lake, boat landing, rowboats, canoes, sailboats, a beach, "bather's chute," clubhouse, and restaurant. The park, located near present-day Lakeville, opened in 1910 and was immensely popular. Profits from passenger traffic to and from the park fueled construction south from Savage, and the Dan Patch line reached Northfield on December 1, 1910 (Brady 2006). During 1910, the railroad also constructed a small depot at Orchard Gardens. Located in present-day Burnsville, Orchard Gardens was a subdivision of five- to ten-acre plots created by Savage from several thousand acres of land that he had purchased and established for the purpose of agriculture and as a source of commuter traffic (Olson 1976:506), and the depot has been listed on the National Register of Historic Places "as a rare example of the diminutive 'flag stop' railroad depot" (Reynolds 1979).

Although construction of the line to Northfield indicates Savage's initial success in financing his railroad, in the long run, the railroad was not profitable. Trouble began when Savage could not convince the city of Faribault, the next major stop planned for the MStPR&D, to grant right-of-way through the city. To finance the purchase of right-of-way through Faribault and additional construction, the railroad began carrying freight as well as passengers and in 1915, leased trackage rights to Faribault and Owatonna from the Chicago Great Western (CGW). The MStPR&D also began construction on a 15-mile track extension from the Auto Club (near Savage's home in Bloomington) through the lightly populated western suburbs of Minneapolis, Edina, and St. Louis Park to Luce Line Junction, where the Dan Patch gained connection to downtown Minneapolis. Savage then established a station in Minneapolis located at North Seventh Street and Third Avenue North (Brady 2006:208-209).

By early 1916, the MStPR&D was deep in debt: the lease agreement had proven unprofitable; the extension would require more capital before it would pay off; and stockholders, already frustrated by a lack of dividends, refused to purchase additional stock. Later that year, the railroad's owner and the horse that was once the railroad's main attraction, died within days of each other. One week later, the road went into receivership (Brady 2006). In 1917, Antlers Park and the 15-mile extension from Auto Club Junction were sold, the latter to C. T. Jaffray and Associates, which represented the bondholders' committee (Olson 1976:507).

Minneapolis Northfield and Southern, 1918-1982

In June of 1918, Harry E. Pence organized the MN&S, and two months later, this new company purchased the MStPR&D at foreclosure (Gjevre 1990:62). Subsequently, the MN&S purchased back its Auto Club Junction extension from Jaffray. In 1921, a new lease agreement was made with the CGW, allowing the MN&S the use of trackage from Northfield to Mankato and Randolph, which promoted renewed passenger traffic between Mankato and Minneapolis (Olson 1976:507). In addition, in 1927 the MN&S leased the Luce Line, which it already connected with to enter downtown Minneapolis, to gain access to markets in western Minnesota.

While diversifying its markets helped the MN&S, freight traffic was the key to its success. In 1927, the company constructed a branch to connect Soonor, near Luce Line Junction, to the Minneapolis St. Paul and Sault St. Marie (Soo Line) in Crystal, approximately six miles to the north. According to Olson (1976:507):

Trackage rights were then obtained over the Soo Line Ry. into their Shoreham yards and interchange was established with the Northern Pacific Ry. at Northtown. Thus a belt line circling Minneapolis on three sides had been created, intersecting all the trunk line railroads radiating west and south from the Twin Cities.

The MN&S' beltline promoted industrial development, which in turn provided a reliable source of freight. By using the MN&S to connect to the larger railroads, local industrial concerns were able to avoid delays caused by shipping freight through the terminal switching yards in Minneapolis and St. Paul. Thus, the road found a niche in Twin Cities industrial rail traffic (Middleton 1959:19-20; Olson 1976:507).

Finding this niche was important because by the late 1920s, the MN&S was forced to move further away from Marion Savage's vision of an all-passenger railroad. Pence stated that increased bus service in the 1920s resulted in a significant drop in railway passenger traffic; therefore, by 1931, the MN&S

discontinued passenger service between Northfield and Randolph, Faribault and Mankato, and Northfield and Faribault (Olson 1990:125). In 1942, passenger traffic ceased altogether, but was likely of little concern given the boost to the industrial sector provided by World War II. Furthermore, with development of Port Cargill in Savage during World War II, the MN&S became an inter-modal transfer railroad, serving the barge traffic from Cargill and other shippers. During the Postwar period, the MN&S continued to be “a vital transfer road with access to 130 or more industries,” (Gjevre 1990:62) until it was purchased by the Soo Line in 1982.

XII. Minneapolis St. Paul and Sault Ste. Marie Railway Company

Introduction

A group of Minneapolis businessmen, primarily in the milling industry, incorporated three separate predecessor lines of the Minneapolis St. Paul and Sault Ste. Marie Railway Company (Soo Line) in 1883 and 1884 to gain independent connections to the wheat fields to the west and the flour markets to the east. By the early 1880s, a series of events seemed to be conspiring against Minneapolis milling interests. Chicago-based railroads tended to favor that city in setting rates, which promoted the flow of unprocessed grain from southern Dakota and Minnesota directly to the east. In addition, in 1882, the Minneapolis and St. Cloud railroad, which was controlled by the St. Paul Minneapolis and Manitoba (Manitoba), began building a line from the Manitoba's St. Vincent line toward Duluth. This line would allow Red River Valley wheat to bypass Minneapolis via the Great Lakes. Finally, the Chicago Rock Island and Pacific (CRI&P) railroad, which was based in Chicago, had gained control of the formerly local Minneapolis and St. Louis (M&StL) railroad.

Largely the same group of Minneapolis investors that in 1870 had incorporated the M&StL, wanted a locally owned road that would give priority of wheat shipments to the Minneapolis mills over those of Duluth and Chicago and would haul flour to eastern markets at competitive rates. Many saw such a venture as critical to protecting the emerging flour milling industry. Although, when the Soo Line emerged in 1888, it was controlled by the Canadian Pacific Railway Company, it nonetheless provided competitive shipping to and from the Twin Cities market. A relative late-comer to Minnesota railroading, the Soo Line established its mainline from Sault Ste. Marie, Michigan, through the Twin Cities and to Portal, North Dakota, by 1893, connecting to the Canadian Pacific at both ends. This line created a third northern transcontinental connection to the Twin Cities.

When the Soo Line expanded its network in the first decade of the twentieth century, it opened new routes to Duluth, it established competition for the Great Northern and Northern Pacific railroads, and it provided the first rail service to the new Cuyuna Iron Range (for a map of the Soo Line railroad network in Minnesota, see Maps section).

Predecessor Lines in Minnesota

Minneapolis Sault Ste. Marie and Atlantic Railway Company

As early as 1873, Israel Washburn suggested a railroad for the 500 miles between the Twin Cities and Sault Ste. Marie, Michigan, as a means of bypassing Chicago. Ten years later in 1883, the Minneapolis Sault

Ste. Marie and Atlantic Railway Company (MSSM&A) was incorporated in Wisconsin. The incorporators were a who's who of the Minneapolis milling industry, including William D. Washburn (President), Charles A. Pillsbury, H. T. Welles, John Martin, Charles M. Loring, Clinton Morrison, William D. Hale, W. W. Eastman, and Thomas Lowry of the Minneapolis Street Railway Company. With no land grants or significant subsidies, the new company was completely financed by Minneapolis investors, and 75 percent of the total stock was owned by flour-milling interests.

In 1884, 46 miles of line were constructed in Wisconsin. Through a traffic agreement with the Chicago St. Paul Minneapolis and Omaha, that railroad was used to convey MSSM&A traffic between Minneapolis and Turtle Lake. Although the initial funding was entirely local, it was insufficient, and funds ran short by 1885. Outside investors were sought out, and the additional capital provided adequate funding to complete the line. The railroad reached Sault Ste. Marie in 1887, and by the end of the year, it completed a bridge to Canada in a joint venture with the Canadian Pacific and Duluth South Shore and Atlantic railroads. In January of 1888, the first train departed from Minneapolis loaded with flour destined for Boston, New York, Philadelphia, London, England, and Glasgow, Scotland. The company was merged into the new Soo Line in 1888 (Gjevre 1990:13-14).

Minneapolis and Pacific Railway Company

The Minneapolis and Pacific Railway Company was incorporated in 1884 to build westward from Minneapolis into North Dakota. This line was to be the other half of the new "Washburn Road." It was incorporated by the same group of Minneapolis investors as the Sault Ste. Marie route and was intended to bring wheat to the mills to be processed, then shipped east. In 1886, the line was built 218 miles northwest to Lidgerwood, North Dakota, and Glenwood, Minnesota, was established as the division point. The company was merged into the new Soo Line in 1888. Nonetheless, Lidgerwood would remain the western terminal until the early 1890s, when the Canadian Pacific consolidated its control over the company and extended the line to connect with its mainline at Portal, North Dakota (Gjevre 1990:15-16; Prosser 1966:141).

Minneapolis and St. Croix Railway Company

The Minneapolis and St. Croix Railway Company was incorporated in 1884 to build a line connecting the Minneapolis and Pacific railroad in Minneapolis with MSSM&A at Turtle Lake, Wisconsin. In 1887, a line was built from the Shoreham Yards in northeast Minneapolis to the St. Croix River and from Soo Line Junction in St. Paul to Cardigan Junction on the mainline. Construction stopped at the St. Croix River, however, due to a lack of funds. The company was merged into the new Soo Line in 1888 (Gjevre 1990:18; Prosser 1966:142).

The Consolidated Soo Line, 1888-1910s

Introduction

With cash running short on all three "Washburn Roads" by 1888, the shareholders began looking for additional investors. At the same time, the Canadian Pacific, which had recently completed a line to Sault Ste. Marie from the northeast, was eager to firm up its new connection with the Twin Cities and to block the Grand Trunk railroad from making such a connection. Two large shareholders of the Canadian Pacific, George Stephen and Donald Smith of Montreal, acquired a controlling interest in shares of the MSSM&A, Minneapolis and Pacific, and Minneapolis and St. Croix railroads, as well as the Aberdeen Bismarck and Northwestern Railway in Dakota Territory, and moved to consolidate the companies into the Soo Line. Two years later in 1890, the Canadian Pacific acquired a majority of the Soo Line's equity and thus, formalized its controlling interest in the company. Despite the change in ownership, Minneapolis men remained on the board of directors, and Thomas Lowry served as the president (Gjevre 1990:18; Hofsommer 2005a:156, 184; Lamb 1977:167).

After consolidation, the Soo Line quickly assumed an important role in Minnesota railroading. By 1889, for example, the Soo Line was the fifth leading carrier of freight into and out of Minneapolis, and with its balanced route structure, it handled nearly equal amounts of incoming and outgoing freight traffic. In addition to serving the milling industry, the Soo Line was a major employer in Minneapolis: it built a six-story office building downtown (and in 1915 a much larger building at Fifth and Marquette); its main engine repair facility at Shoreham Yards in Northeast Minneapolis employed hundreds; it also maintained yards in Near North and North Minneapolis. In St. Paul, the Soo Line's presence was smaller, yet it operated a large freight depot and served the Lower Landing warehouse district (Gjevre 1995:21-25; Hofsommer 2005a:134).

The Soo Line also helped shape western Minnesota in the 1880s. When the Minneapolis and Pacific railroad built northwest from Minneapolis in the mid 1880s, it crossed an area already settled, but it chose a route that passed through only a few existing towns, such as Buffalo, Paynesville, and Glenwood. The Soo Line platted most of the other towns along its line through affiliated land companies, such as the Pacific Land Company (on the Minneapolis and Pacific), the Minnesota Land Company, the Minnesota Loan and Trust Company, and the Kittson Land Company. In addition, in 1894 the Soo Line established a subsidiary company, the Tri-State Land Company, which served as its real estate department. While most railroad companies platted towns when building through lightly settled territories, the Soo Line did so at a higher rate than most because, lacking land grants, platting and selling town lots helped to offset construction costs. That trend would continue as the Soo Line built new lines in the Red River Valley and across northern Minnesota during the early twentieth century (Gjevre 1990:139; Harvey 1982:65-70).

New Construction

In response to the Great Northern campaign to reach the west coast, during 1891 to 1893 the Soo Line extended its mainline from Lidgerwood to Portal, North Dakota, where it connected with the Canadian Pacific. This was the third northern transcontinental route, along with the Great Northern and Northern Pacific, and it provided the Twin Cities with another connection to the Pacific Northwest. After a slowdown in construction during the economic depression of the mid 1890s, by the turn of the century, the Soo Line was poised to expand its network throughout northern Minnesota.

Winnipeg Line

This line was built in 1903 and 1904 from Glenwood to Noyes to gain additional service areas in the Red River Valley and to provide an additional connection to the Canadian Pacific. The new line ran through Alexandria and Thief River Falls, which was made the division point for the line. This line also ran through the White Earth Reservation, where several towns were platted along the line and given Ojibwe names, such as Mahnomen. The Clapp Amendments to the Federal Appropriations Acts of 1906 and 1907 authorized mixed-blood Indians on the White Earth Reservation to sell land that had been allotted to them. Except for a short loop of the Northern Pacific along the northern boundary, the Soo Line was the only railroad serving the reservation, and it benefited from the resulting land rush. The Winnipeg Line gave the Soo Line better access to prime wheat cultivation areas, and it provided the spine for a new northern Minnesota rail network created by the Wheat, Brooten, and Plummer lines (see below) (Gjevre 1990:39; Prosser 1966:145).

Wheat Line

This line was built in 1905 from Dakota Junction just north of Thief River Falls to the state line at Oslo and on to Kenmare, North Dakota. The object of constructing this line was to provide the Soo Line a greater access to the prime wheat-growing lands of eastern North Dakota, and as a result, it was known as the Wheat Line. This line crossed the Great Northern’s St. Vincent line at Warren (Gjevre 1990:39; Prosser 1966:145).

Brooten Line

This line was built as a cutoff between the mainline at Brooten in western Stearns County and the port at Superior, Wisconsin, with additional connections to Duluth. The line was constructed from Brooten to Moose Lake in 1907 and 1908, then completed to Superior in 1909. It allowed a much more direct connection between the Soo Line’s mainline and the Lake Superior ports. In addition, the new Plummer Line (see below) would connect with this line at Moose Lake for access to the ports (Gjevre 1995:49; Prosser 1966:145).

Plummer Line

This line was built to provide more direct access between Duluth/Superior and Winnipeg. It was constructed in 1909 and 1910 from Moose Lake on the new Brooten Line to Plummer on the Winnipeg line, south of Thief River Falls. This line accomplished three main objectives. It gave the Soo Line a direct connection to the Duluth/Superior ports for wheat shipments from North Dakota and Manitoba and a direct connection between the Wheat Line and the ports. It also provided the Soo Line with access to the pine lands in the Bemidji and Cass Lake areas, allowing the railroad to tap into the lumber market and diversify its freight. Finally, it connected with a subsidiary line—the Cuyuna Iron Range Railway—that served the new Cuyuna Iron Range and further diversified the Soo Line's freight (Gjevre 1995:31-32; Prosser 1966:145).

Twin Cities Facilities

In 1891, the Soo Line built a line between Northtown Junction and Camden Place, allowing for direct connection between the former railroads of the Minneapolis and Pacific and the Minneapolis and St. Croix (Prosser 1966:145). The Soo Line then established the Shoreham Shops. This large complex contained passenger car shops, a boiler shop, roundhouse, and classification yard. In 1909, the Soo Line established its own connection into the St. Paul warehouse district through construction of a 1,218-foot tunnel between Trout Brook Junction and East 7th Street near Westminster Junction.

Acquisitions

Wisconsin Central Railroad Company

The Wisconsin Central Railroad Company was incorporated in 1897 as a merger of a number of lines, primarily in Wisconsin, but including two short lines connecting to the Twin Cities. The Minnesota portion of the Wisconsin Central was built in two stages. The first portion was built in 1884 by the Minnesota St. Croix and Wisconsin Railroad Company between Gloster Junction in North St. Paul and Carnelian Junction north of Stillwater, then to the St. Croix River. In 1888, the St. Paul and St. Croix Falls Railroad Company built from Trout Brook Junction in St. Paul to Gloster Junction. Both lines were acquired by the Wisconsin Central Company in 1888. The Soo Line leased the Wisconsin Central in 1909, providing it direct access to Chicago and Milwaukee. In 1911, a line was built between the Soo Line mainline at Withrow in Washington County to Carnelian Junction, and the Wisconsin Central portion of line to the St. Croix River was rebuilt to reduce grades and eliminate curves (Prosser 1966:152, 160, 171).

Cuyuna Iron Range Railway Company

The Cuyuna Iron Range Railway Company was incorporated in 1908 with the intent of connecting the newly developing Cuyuna Range mining operations with the Soo Line's Plummer line. Cuyler Adams was the president of the company, which received backing from the Soo Line. Beginning at a junction with the Plummer Line (later named Lawler), the new Cuyuna railroad extended west through Aitkin to Iron Hub in 1909, then completed the line to Crosby the following year. Also in 1910, several loops were constructed, including one through Crosby, and a stub line was built to Riverton. When completed in 1910, the Cuyuna line was acquired by the Soo Line (Prosser 1966:126; Welton 1992, part 1:33-36).

In 1929, the Soo Line and Northern Pacific reached an agreement to pool the iron ore tonnage coming out of and the coal tonnage going into the Cuyuna Range, and to jointly use the facilities and equipment between Ironton and Superior. The Soo Line subsequently abandoned its Cuyuna line from East Lake to Ironton (Prosser 1966:145).

Establishing a Northern Minnesota Network

Completion of new lines and the acquisition of existing lines greatly increased the Soo Line presence in northern Minnesota. From a primarily through route to and from the Twin Cities during the late nineteenth century, the Soo Line expanded its network and diversified its freight during the early twentieth century. For example, from 1900 to 1910, the mileage of track owned by the Soo Line more than doubled, and much of the new trackage was in Minnesota (Poor 1900, 1910). The Soo Line was the first railroad to serve the new Cuyuna Iron Range, beginning in 1911. Although it was not the first to build through the timber-rich Bemidji/Cass Lake area, the Soo Line added additional service to the lumber mills and created competition for the Great Northern. While establishing its northern Minnesota rail network, the Soo Line altered existing communities and created new communities along its lines. A few examples are outlined below.

Thief River Falls was designated the division point for the Winnipeg Line in 1904, and it served as the connection point for the Wheat and Plummer Lines following their construction. The new roles of as a division and connecting point had an immediate effect on Thief River Falls. As a regional lumber milling point, the city had gained a Great Northern connection in 1892, but the line was a minor branch and was located on the edge of town. The population was 1,800 in 1899. By 1906, two years after the Soo Line built its mainline through town, the population of Thief River Falls had doubled to 3,700, and a corridor of wholesale warehouses, grain elevators, a creamery, and the passenger and freight depots lined the railroad. In addition, on the edge of town, the railroad established a roundhouse, mechanics shop, and associated structures (Esser et al. 1995; Sanborn Map Company 1899, 1906).

Moose Lake, already a stop on the Northern Pacific's St. Paul and Duluth line, by 1910 became the connecting point for the Plummer and Brooten lines and for the nearby Lawler Junction with the Cuyuna line. In 1909, the Soo Line built a Class One depot, two section houses, and a number of smaller buildings to house employees and serve as work shelters. The population of Moose Lake, which was 480 in 1904, grew to 750 in 1914. On the Plummer line, the Soo Line platted the City of Federal Dam in 1910 and named it the division point. The railroad then established a roundhouse, repair shop, and switching yards, as well as a depot and other support buildings, employing over 100 men (Holum 1984; McKeig 1996:43-44; Sanborn Map Company 1904, 1914).

The Soo Line was the first railroad to connect to the Cuyuna Range, and its first iron ore shipment was in 1911. During the early years of mining on the Cuyuna, the Soo Line had a near monopoly. For example, in 1913 the Soo Line hauled roughly 96 percent of the ore out of the Cuyuna Range, while the Northern Pacific handled the remaining 4 percent. The Northern Pacific increased its share as new mines came on line over the rest of the decade, but the Soo Line still hauled about 70 percent of the Cuyuna's ore in 1920. Numerous towns were established on the range, including Crosby, Ironton, and Deerwood (Welton 1992 part 2:15).

The Soo Line After 1920

By the 1920s, the Soo Line was a financially sound regional railroad. It carried diverse freight, including agricultural products, iron ore, coal, and lumber. It served as the U.S. leg of the Canadian Pacific transcontinental, and it connected with major terminal markets at Minneapolis/St. Paul, Duluth, and Chicago. Its rail network in Minnesota had been completed by the early 1910s, and following United States Railroad Administration control during World War I, the company focused on maintenance and improvements to its rail lines and rolling stock. Although freight volumes increased during the 1920s, passenger numbers were declining, and passenger revenue fell by more than $1 million during 1924 alone. Automobiles were competing successfully for local traffic, and the Soo Line began cutting back local passenger services. Nonetheless, the Soo Line was in sound financial condition and, by decade's end, maintained a $20 million surplus (Gjevre 1990:209).

The Great Depression affected the Soo Line like most railroads—revenues fell precipitously after 1929. The Soo Line staved off bankruptcy longer than many railroads, due to the cash reserves it accumulated prior to 1929, the backing of the Canadian Pacific railroad, deferred maintenance, and cutbacks in operations. After years of operating at a deficit, the Soo Line filed for bankruptcy at the end of 1937. The company remained in receivership for nearly five years until World War II created sufficient demand for railroads. The railroad emerged from receivership in 1942, and two years later, the company was renamed the Minneapolis St. Paul and Sault Ste. Marie Railroad Company. During the war, the Soo Line carried heavy volumes of passengers and raw materials, though relatively little military equipment (Gjevre 1990:197).

During the 1950s and 1960s, the Soo Line resumed its strategy from the 1920s and successfully operated as a regional carrier with strong transcontinental connections. With solid revenues, the company began converting its motive power to diesel, a process completed in 1955. On January 1, 1961, the Wisconsin Central and the Duluth South Shore and Atlantic railroads were merged into the Minneapolis St. Paul and Sault Ste. Marie Railroad, and the new company was officially renamed the Soo Line Railroad Company, which had long been its logo. Although the Soo Line was financially strong through the 1960s, passenger traffic continued its long decline, including long-haul service. Passenger routes were discontinued one by one, until by the end of the decade, the Soo Line no longer provided passenger service.

Although the Soo Line continued to operate as a profitable regional carrier through the 1970s, its management grew concerned about being boxed into its territory by the much larger interregional rivals, such as the Burlington Northern. In 1983, the Soo Line acquired the Minneapolis Northfield and Southern railroad, which provided additional industrial mileage. Then in 1985, it acquired the bankrupt Chicago Milwaukee St. Paul and Pacific, which doubled its revenue base and territory. During the early 1990s, the Canadian Pacific, in turn, acquired all of the outstanding Soo Line stock, and the Soo Line became a wholly owned subsidiary of the Canadian Pacific (Abbey 1988:407).

XIII. Minnesota Dakota and Western Railway Company

The Minnesota Dakota and Western Railway Company (MD&W) constructed two of the many small railroad lines built to serve the logging industry in northern Minnesota during the early twentieth century. Unlike many of the more ephemeral lines, however, one of the MD&W lines remained in operation for nearly a century and currently continues to operate (for a map of the MD&W railroad network in Minnesota, see Maps section).

The MD&W was created as a transfer railroad by Edward Wellington Backus to serve his lumbering and paper business interests, most importantly the Minnesota and Ontario Paper Company. Backus began his career as a lumberman in Minneapolis, but as the supply of timber relatively close to the Twin Cities declined in the late 1890s, he turned his attention to the international boundary between Minnesota and Ontario, where timber was plentiful, and he could create profitable lumber and paper mills. Along with four other lumber companies, E. W. Backus & Co. "formed a syndicate to acquire extensive timberlands in an area north of Brainerd to assure a supply for their mills" and planned and financed the railroad that would become the Minnesota and International Railway Company (KCHS 1983:11).

Through a combination of construction, acquisition, and leasing, the railroad extended from Brainerd to International Falls by 1907. This road was eventually controlled by the Northern Pacific, of which Backus was an officer and trustee. At approximately the same time, the Duluth Rainy Lake and Winnipeg railroad built a line from Cook to Fort Frances, Ontario, which was the second major railroad line serving the logging industry in the area (Prosser 1966:147-148, 226; Searle 1977:39).

Backus created the MD&W as a subsidiary of the Minnesota and Ontario Paper Company. The purpose of the railroad was to provide the paper company and his other enterprises access to both the Minnesota and International and the Duluth Rainy Lake and Winnipeg railroads. According to Prosser (1966:151), the MD&W was incorporated as the International Bridge and Terminal Company in 1902, but the Minnesota and Ontario Paper Company (1950:11) indicates that the International was a separate, Canadian corporation owned by the Ontario-Minnesota Pulp and Paper Company Limited, which operated the international bridge over the Rainy River in partnership with the MD&W. A company history states, "Reference to the name, 'Minnesota, Dakota and Western Railway' is found in newspaper files of 1910, though the line was not formally incorporated as a common carrier until January 1, 1912" (Minnesota and Ontario Paper Company 1950:12).

The predecessor of the MD&W carried out its first construction in the form of piers and concrete spans for the international bridge over the Rainy River in 1909. Although the bridge was not completed until 1912, the intervening years witnessed the construction of the railroad's mainline. This line was approximately a four-mile connection between the Minnesota and International Railway and the Duluth Rainy Lake and Winnipeg near International Falls. A branch line, built circa 1910, was constructed west from the Minnesota and International Railway line at Nakoda and extended 14 miles west to Loman:[5]

> where catch booms and sorting works were constructed in Rainy River and a hoist was built for the loading of the forest products from Rainy River onto flat cars for the rail haul back upstream to International Falls. This development "cornered" a very sizeable supply of pulpwood and sawlogs for the mills at International Falls [Pollard c. 1977:3].

The Minnesota and Ontario Paper Company enjoyed great financial success. It was the largest corporation in Minnesota during the 1930s, solidified the forest products industries in International Falls, and was the key to development of Koochiching County (Koochiching County Historical Society [KCHS] 1983:11; Mitchell 1999). As the KCHS (1983:11) notes, "The forest products industries that have been the mainstay of Koochiching's economy for 75 years—and are continuing as such—are deeply rooted in the accomplishments of E. W. Backus."

Backus, however, was forced to resign from the company when the Great Depression sent it into bankruptcy and receivership in 1931. The company trustees managed to bring the company out of debt after a decade and regain its properties, but these assets would not include the Nakoda to Loman branch line of the MD&W, which was taken up in 1940 (Prosser 1966:151).

By 1965, the Minnesota and Ontario Paper Company had reclaimed its economic power after a period of extensive growth, and in that year, the company, including the MD&W, merged with wood products and paper manufacturer Boise Cascade. The railroad carried on its operations as the MD&W, and it continues to do so today (Boise Cascade 2006).

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[5] The Minnesota and Ontario Paper Company (1950:12) states, "At the peak of operations, in 1928, the Mando logging railways totaled over 150 miles of mainline and about 70 miles of spur tracks," and it refers to the Nakoda to Loman line as a "branch." It is unclear how "mainline" and "branch" are defined in this context, or which of the 150 miles referred to as mainline were operated by the Minnesota Dakota and Western. The mainline and Nakoda to Loman line discussed here are addressed because they are the only two listed/depicted by Prosser (1966:151) in relation to the Minnesota Dakota and Western.

XIV. Minnesota Transfer Railway

Introduction

The purpose of the Minnesota Transfer Railway (MTR) was quite different from that of other railway operations in Minnesota. The MTR provided freight transfer functions for the various rail lines that served St. Paul and Minneapolis and direct freight shipping from businesses located in the Midway Industrial District. The need for the MTR demonstrated the extent to which the Twin Cities had become an important hub for interstate railroads. Though a project undertaken by James J. Hill, the MTR was jointly owned and operated by the rail lines it served. The MTR provided freight transfer services from 1883 through the 1960s, and direct shipping services after circa 1910.

Via its freight transfer services, the MTR handled nearly all of the "less-than-carload" freight that arrived in the Twin Cities, unloading cars and sorting their contents for reshipment, filling cars destined for each rail line, and sorting cars for inter-line transfer. These operations took place in the extensive MTR rail yard located in the western portion of St. Paul, which was known as the Midway and later as the Midway Industrial District. During the early twentieth century, the MTR also began providing direct shipping services, via spur lines leading from the transfer yard to manufacturing plants and warehouses in the Midway Industrial District. The operation was curtailed during the late 1960s as mergers of the larger roads reduced the need for inter-line freight transfer. The Minnesota Commercial Railway, an industrial switching operation, purchased the MTR facilities in 1986.

Railroads and a Regional Transportation Center

From the 1880s through the mid twentieth century, Minneapolis and St. Paul served as a joint regional commercial center, or a gateway city. The Twin Cities provided financial services, were the location of manufacturing operations, and functioned as distribution centers for products as diverse as lumber, furniture, flour, processed foodstuffs, hardware, and clothing. The transportation component that extended the economic influence of this commercial center comprised the numerous railroad lines that connected the Twin Cities with rural Minnesota and nearby states. The lines brought agricultural products to the Twin Cities for processing and trans-shipment, and distributed consumer goods and supplies into an extensive commercial hinterland.

The area dominated by the commerce of the Twin Cities extended throughout much of the Northwest, as the upper Midwest and northern western states were known during the late nineteenth and early twentieth centuries, and to some extent to the northern Pacific Coast. Wholesalers and jobbers (manufacturers' representatives) served as the links between producers and consumers and relied on the Twin Cities' extensive rail connections. This distribution of goods comprised a significant portion of the local economy; only the grain and flour business in Minneapolis was a larger sector (Bradley et al. 2004:36; Eaton 1989:7-8; Shuman 1929).

Railroad service and the commercial operations of the Twin Cities grew apace during the 1870s. By 1880, nine railroads entered the two cities, but few of them provided through freight. Even the four transcontinental lines had to break up and re-form their freight trains in Minnesota. Each line maintained its own freight terminals throughout the two cities, and by the 1880s, the time-consuming and expensive transfer of freight from one line to another was developing a bottleneck that would cause expensive delays for shippers and rail lines (Bradley et al. 2004:36-38).

Minnesota Transfer Railway: Development and Early Operation, 1883-1910

By the early 1880s, James J. Hill, at that time a St. Paul businessman and general manager of the St. Paul, Minneapolis and Manitoba Railway (Manitoba, later Great Northern), recognized the freight transfer problem as one that could be solved with some planning and capital. One of Hill's rail trips to St. Paul was stalled northwest of Minneapolis. Frustrated with the congestion, Hill continued on with a horse and buggy. He noted the vacant land in the Midway District of St. Paul and saw it as a place where extensive amounts of relatively inexpensive and flat land could be acquired for a sorting and transfer yard (Pyle 1917:392-93).

Hill purchased undeveloped property in the Midway District, then assembled an unincorporated association that, with the Manitoba railroad, funded the construction of track and a rail yard between 1880 and 1883. Once the track was built, Hill oversaw the incorporation of the Union Stockyards-Minnesota Transfer Railroad in 1883. This new entity was jointly and equally owned by the five rail lines it served: Hill's Manitoba railroad, the Chicago St. Paul Minneapolis and Omaha Railway, the Northern Pacific Railway Company, the Chicago Milwaukee and St. Paul Railway (CM&StP), and the Minneapolis and St. Louis Railway. In 1886, the predecessor companies of Wisconsin Central and Chicago Great Western lines, along with the Chicago Burlington and Northern, were admitted as equal partners. The Minneapolis St. Paul and Sault Ste. Marie Railway (Soo Line) became a part owner a dozen years later, followed by the Rock Island in 1902. For most of its years of operation, the MTR served nine owning carriers (Donovan 1954:4, 24).

Historian Henry A. Castle (1912:620) summarized the original main function of the MTR in the following statement:

Every freight train that rolls into either city, unless its consignment is for local consumption, no matter on what road, whence it came or whither it is bound, must go into this terminal, be examined, broken up if necessary and have the contents of its different cars reloaded, before it can proceed to its destination.

The heart of the MTR operation was its extensive rail yard north of University Avenue and west of Prior Avenue. This site was situated so that the Great Northern and Northern Pacific lines passed on the north side of the yard, and the CM&StP ran south of the yard and connected to it by a short spur. A bridge carried University Avenue over the 19 tracks that funneled into the main yard. The MTR's General Office building (no longer standing) was located on University Avenue, west of Prior Avenue. The MTR purchased a building (no longer extant) for use as a waiting room for passenger service. The line's roundhouse and diesel shop, located on Cleveland Avenue south of University Avenue, have been determined eligible for listing on the National Register of Historic Places (Bradley et al. 2004:152; Donovan 1954:4).

The MTR was managed by an executive of one of the owning carriers who served a two-year term. The officers who managed the MTR served the same functions for the St. Paul Union Depot Company. The employees of the MTR worked around the clock to have cars sorted between arrivals and departures of the owning rail lines. These carriers committed to having the MTR provide all of its transfer services and initially were assessed on the basis of the volume of freight handled. Each road paid a portion of the MTR's operating expenses and an extra charge for freight handled after the Shreeve Plan was adopted in 1930 (Donovan 1954:13-17; McClurg 1936:2, 7).

The yard was divided into sections identified by letters that were used by the rail lines to drop off and pick up cars, and to assemble cars heading east and west. The yard had a hump configuration and gravity was used to move cars. One small section of the yard was used for repairing cars. Small shipments, less than a car load in volume, were handled in the P yard. There the MTR unloaded the cars, sorted their contents, and repacked cars for shipping on one of the lines. The MTR rail yard was surrounded by stock pens, ice houses, and repair facilities of the owner rail lines. It could handle all types of freight, except grain. After 1905, many carloads of immigrants heading west paused in the MTR yards. The yard switchmen, many of whom were recent immigrants themselves, helped the travelers acquire supplies. The MTR's rolling stock consisted mainly of the locomotives used to shift cars in the yard (Donovan 1954:4; McClurg 1936:3).

The MTR acquired the Minnesota Belt Line Railway and Transfer Company in 1898. This line had been chartered in 1889 to connect the Great Northern and Northern Pacific lines extending along the east side of the Mississippi River in Fridley with the plant of the Minneapolis Stock Yards and Packing Company in New Brighton. The belt line's 14-mile line extended south from New Brighton to the MTR yards. The line carried primarily livestock, and transported 9,000 hogs a week when the MTR acquired it. Passengers, mainly cattlemen to and from the stockyards, made use of the belt line, though this service was not continued long into the twentieth century (Donovan 1954:25-27).

The MTR used the Belt Line track to make connections with several rail lines and industries. The line intersected with the Northern Pacific line at Park Junction, and there were sidings that served both that line and the Burlington line. Spurs served industries in the Park Junction industrial district south of Como Avenue. The spur line Minneapolis East Hennepin Lead served several firms and the Northwest Terminal, including Firestone Tire and Rubber, General Electric, Land O'Lakes Creameries, Minneapolis Heat Regulator (Honeywell), National Biscuit, Goodyear Tire and Rubber, and General Mills. Tank cars were moved by the MTR to and from the tank farms of Standard Oil and the Great Lakes Pipe Line companies in Ramsey County. The MTR exchanged cars with the Soo Line at the Bulwar Junction south of New Brighton. The line's siding at the New Brighton stockyards accommodated 156 cars, while a "Butcher's Spur" served rendering plants about a mile away. As the Belt Line curved to the west, the Twin Cities Arsenal Spur veered off to the east. After 1916, the line extended west a short distance past Central Avenue, and it provided rail service to the Minnesota and Ontario Paper Company's plant, where carloads of ties and poles were treated with creosote (Donovan 1954:9-12).

After 1900, the MTR provided switching service and track maintenance for the St. Anthony Loop, a horseshoe-shaped length of track constructed between Raymond and Hampden Avenues. This spur line was constructed in 1886 by the St. Anthony Park Improvement Company, a real estate firm. Later, the 1.7-mile loop was purchased by the St. Anthony Park Shippers' Association (Donovan 1954:25).

Serving the Midway Industrial Area, 1910-1986

A significant portion of the manufacturing, warehousing, and wholesaling functions, originally located in the urban centers of Minneapolis and St. Paul, were relocated after the turn of the twentieth century to the Midway Industrial District of St. Paul. This area, adjacent to the Minneapolis city line, accommodated the expansion of commercial and wholesaling activities. The Midway Industrial District acquired a distinct identity during the 1910s and 1920s. The area offered rail connections, freight transfer services, and large parcels for the development of manufacturing and warehouse operations. The MTR provided connections to all of the regional railroads, while the Twin Cities Rapid Transit Company on University Avenue provided transportation for employees and commercial travelers who needed to visit the establishments located in the area (Bradley et al. 2004:34-41).

As the Midway Industrial District developed, the MTR continued to provide freight transfer services. The volume of the MTR operation in 1910 was over 560,000 cars (an average of 1,500 cars each day), while roughly 200 of those cars were processed daily as less-than car-load freight. The MTR used 19 steam locomotives and employed 1,200 people in 1912. The volume of cars handled by MTR increased to 700,000 in 1916 and to 800,000 in 1923, but then dropped to 510,000 in 1930 as some railways had begun to handle their own re-shipments and the effects of the Depression began to be felt (Bradley et al. 2004:150; Castle 1912:620; Pyle 1917:393;).

The MTR added additional services after 1910, as the businesses that were established in the Midway Industrial District requested direct freight shipping service. A series of track leads was constructed on the streets in the Midway Industrial District so that rail cars could be filled by manufacturers and jobbers located in the area. The Charles Street Lead served several businesses and the MTR's freight warehouse near Carlton Street. The Myrtle Avenue Lead served businesses between Cleveland and Raymond Avenues. The Wabash Avenue Lead served the Waldorf Paper, Weyerhaeuser Timber, and Willys-Overland operations, and later the International Harvester plant. The Southeast Industries Line provided service to Barrett-Zimmerman Company (and later the Brooks Brothers Lumber Yard on that site) and the A. J. Krank Manufacturing Company. East of Fairview Avenue, this lead served the plants of Griggs, Cooper and Company, Northwest Co-op Mills, and Nash Coffee. The lead to the Northwest Terminal area in Minneapolis provided similar services. During the 1930s, the MTR provided direct freight shipping services to 300 firms; by the 1950s, it was serving another 100 facilities (Donovan 1954: 6-7; McClurg 1936:6).

The University Avenue bridge over the MTR yard, which had carried the double tracks of the Interurban streetcar line since 1890, deteriorated to the point that it had a restricted load capacity by 1930. This structure was replaced in the 1930s by a pair of bridges that each carried two rail lines over University Avenue. The MTR worked with the National Recovery Act program to complete this project (Bradley et al. 2004:152; McClurg 1936:5).

Though the volume of freight handled by the MTR peaked during the early 1920s, the line provided freight transfer and direct shipping services throughout the 1940s and 1950s. During this later era, the MTR handled as many as 3,000 cars daily. With fewer small freight shipments to manually process, the number of employees decreased to 700 during this time. During the early 1950s, the MTR modernized its roundhouse facility and adapted it for diesel locomotive servicing. The sale of 50 acres of the yard to the St. Paul Port Authority during the 1960s followed a drop in freight traffic. The Amtrak passenger depot and the Transfer Road industrial complex occupy this tract of land today. After a series of railroad mergers from the 1960s through the 1980s, the need for freight transfer was significantly reduced. The Minnesota Commercial Railway, an industrial switching operation, purchased the MTR facilities in 1986 (Donovan 1954:3; Stottlemyer 1982:7-9).

XV. Northern Pacific Railway Company

Introduction

The history of the Northern Pacific Railway begins with the national effort to build multiple transcontinental railways to the Pacific Ocean. The economic potential for the agricultural development of the northern Great Plains led the United States Congress to choose Minnesota as the eastern terminus of a northern transcontinental railroad that would reach 1,400 miles to the Pacific coast of Oregon. By the time the Northern Pacific merged with other regional giants to become the Burlington Northern in 1970, it operated approximately 1,500 miles of track within the state (for a map of the Northern Pacific railroad network in Minnesota, see Maps section).

Predecessor Lines in Minnesota

Northern Pacific President Henry Villard formed the Oregon and Transcontinental Company in 1881 as a holding company for the Northern Pacific and Villard's other corporate interests. One of its most important functions was to build branch lines along the Northern Pacific's transcontinental route. The Northern Pacific charter also allowed the acquisition of existing railroads, and it began purchasing regional predecessors in 1896 to diversify its shipping sources and bolster profits.

In the public eye, Minnesota's early railroads had started as entrepreneurial ventures by ambitious, local civic leaders and businessmen. Because of their success, they were later purchased by nationwide railroad concerns such as the Northern Pacific. In reality, however, some of the state's early railroads were conceived of during the 1860s in anticipation of their being absorbed into the greater regional or transcontinental networks that were taking shape. Occasionally, local railroad owners were mere figureheads used to bolster the local interest necessary to sell railroad bonds, their lines actually backed by the significant wealth and endorsement of Northern Pacific executives and members of the Board of Directors. Other predecessors were incorporated by close business associates of Northern Pacific board members and executives of established eastern railroad companies.

St. Paul and Duluth Railroad Company

The St. Paul and Duluth Railroad Company (StP&D) was incorporated on June 28, 1877, and its first act (on July 17th) was the acquisition of the Lake Superior and Mississippi Railroad Company (LS&M) and its St. Paul to Duluth route. Two years later, the company built a short spur from North Pacific Junction at Carlton (where the Northern Pacific had linked to the LS&M in 1870) to Knife Falls (now Cloquet). From a regional standpoint, the StP&D's goals were a continuation of the LS&M's: to connect the commercial waterways of the Mississippi and St. Croix rivers with Lake Superior. As part of this strategy, the StP&D

leased the newly-completed Taylors Falls and Lake Superior Railroad on October 12, 1880, bringing St. Croix River shipments to its Wyoming station. From a national perspective, the StP&D served the interests of the Northern Pacific, acting as a link between the Northern Pacific's terminus in Duluth, St. Paul, and the markets of Chicago and the east.

In 1891and 1892, the company completed track from Groningen to the sandstone quarries in present day Banning State Park, named for StP&D President William Banning. The Groningen-Banning line, along with the rest of the StP&D, was heavily damaged during the Hinckley Fire of September 1, 1894. The successful recovery of the railroad led to the founding of the village of Banning in 1896, but it was to be short lived. By 1900, steel had begun to replace stone as the dominant building material and prairie fires continued to threaten the town. The quarries were abandoned by 1905, and the town had ceased to exist by 1912. The tracks were taken up in 1918 (Railroad and Warehouse Commission 1898:163).

In 1898, the StP&D purchased the Taylors Falls and Lake Superior Railroad Company and its line from Wyoming to Taylors Falls. The following year, it acquired the Grantsburg Rush City and St. Cloud Company, the St. Cloud Grantsburg and Ashland Railroad (StCG&A), and the Stillwater and St. Paul Railroad Company, solidifying its control of Minnesota's central eastern border. With the heated competition between the Northern Pacific and the St. Paul Minneapolis and Manitoba (Manitoba) to establish shipping dominance to Lake Superior ports, the StP&D's 238 miles of track were ripe for acquisition. The line was formally transferred to the Northern Pacific on June 15, 1900 (Poor 1920:927).

Acquisitions

Lake Superior and Mississippi Railroad Company

The LS&M was incorporated on May 23, 1857, as the Nebraska and Lake Superior Railroad Company, but did no work until after changing its name to the LS&M on March 8, 1861 (Railroad and Warehouse Commission 1898:163). Originally charged with connecting Lake Superior to the commercial waterways of the Mississippi and St. Croix rivers, financial issues continually delayed construction, although the line's potential economic importance garnered legislative extensions for its completion in 1863 and 1867. After receiving 854,903.04 acres of land grants in 1865, the LS&M's mission was modified to include a branch line from either Lake Superior or the St. Louis River via Lake Vermillion to Minnesota's northern boundary (Prosser 1966:138). Construction progressed rapidly thereafter, with track laid between St. Paul and Wyoming (1868), Wyoming and Hinckley (1869), and Hinckley and Duluth (1870), together forming the Skally line. Seen as a logical connection between the Twin Cities and the Lake Superior ports, the LS&M was leased by the Northern Pacific in 1872.

When construction began in 1870, the first segment of Northern Pacific track was designed to intersect with the LS&M near present-day Carlton, Minnesota, where the line could connect with freight traffic from St. Paul and points east and with shipments from Duluth. The LS&M's routes were purchased by the StP&D in 1877, but not formally referred to as part of the Northern Pacific system until the Northern Pacific's purchase of the StP&D on June 15, 1900.

The Skally line was instrumental in providing direct service for shipping agricultural products and building materials between Minneapolis/St. Paul and the Lake Superior docks. It was quickly regarded as one of the biggest competitors with Hill's network. In an attempt to shorten its shipping distances, the Manitoba was forced to build multiple cutoffs from points on its Minneapolis to St. Cloud line to points on its St. Cloud to Hinckley line.

Taylors Falls and Lake Superior Railroad Company

The Taylors Falls and Superior Railroad Company was incorporated on February 19, 1868, and became the Taylors Falls and Lake Superior Railroad Company (TF&LS) on February 9, 1875. Constructed from 1878 to 1880, the 20.5-mile railroad transported goods from St. Croix River packet boats to a junction with the LS&M at Wyoming. It also served the agricultural communities of Center City, Lindstrom, and Chisago City and helped popularize Taylors Falls as a tourist and recreational community.

On October 12, 1880, the TF&LS was leased by the StP&D to feed traffic to the eastern part of their service area (Railroad and Warehouse Commission 1898:163). On November 12, 1898, the StP&D purchased the TF&LS. The line became part of the Northern Pacific after the StP&D's acquisition in 1900 and continued to operate until 1948, when its track was taken up because of the Northern Pacific's increased operating costs (Prosser 1966:155).

Stillwater and St. Paul Railroad Company

The Stillwater and St. Paul Railroad Company (S&StP) was incorporated on June 24, 1867, and in 1870, connected the St. Croix River town to White Bear Lake, just northeast of St. Paul. It received 65,123 acres of land grants and $25,000 in Stillwater municipal bonds. On January 1, 1871, the S&StP was leased by the StP&D (Railroad and Warehouse Commission 1898:163). The S&StP was then purchased by the StP&D on March 2, 1899 (Prosser 1966:159) and almost immediately transferred to the Northern Pacific when the Northern Pacific purchased the StP&D on June 15, 1900.

Over the following decades, the gradual reduction in St. Croix steamboat traffic and the closure of Stillwater's sawmills led to the S&StP being down-graded to branch status. After it was abandoned in the early 1980s, the Burlington Northern (successor to the Northern Pacific) donated the track between Duluth

Junction and Stillwater to the Minnesota Railroad Museum. It currently carries the Minnesota Zephyr dining train.

Minneapolis and Duluth Railway Company

The Minneapolis and Duluth Railway Company (M&D) was incorporated on May 16, 1871, and immediately built railroad line from St. Anthony (Minneapolis) to M&D Junction at White Bear Lake.

The M&D operated under lease by the LS&M from August 15, 1871, until it was transferred to the Minneapolis and St. Louis (M&StL) on December 1, 1873. The M&StL operated the railroad for nearly a decade before purchasing it on June 1, 1881 (Prosser 1966:141). Leased from the M&StL by the StP&D on August 1, 1882 (Railroad and Warehouse Commission 1898:163), the line was finally acquired by the Northern Pacific as part of its purchase of the StP&D on June 15, 1900.

Grantsburg Rush City and St. Cloud Railroad Company

The Grantsburg Rush City and St. Cloud Railroad Company (GRC&StC) was incorporated on November 28, 1878, for the purpose of building a railroad from a junction with the StCG&A near the Wisconsin/Minnesota border, through Chisago County to Rush City, Cambridge, and Princeton, then connecting with a branch line of the St. Paul and Pacific and continuing on to St. Cloud (Prosser 1966:135). No work was done, however, until 1884, when track was laid from Rush City to the St. Croix River and a connection made to Wisconsin's StCG&A. The line served not only to facilitate the agricultural development of Chisago County but to bring interstate traffic to the StP&D. The GRC&StC was acquired by the StP&D on March 2, 1899, and its lines conveyed as part of the Northern Pacific purchase of the StP&D on June 15, 1900. The Rush City to Grantsburg route was taken up in 1951 (Prosser 1966:155) as part of the Northern Pacific's post-WWII cost-saving measures (Renz 1980:257).

Kettle River Railway Company

The Kettle River Railway Company was formed through the sale of Hinckley municipal bonds on August 26, 1886, to construct a branch line to Kettle River from a connection with the StP&D in Pine County via a northeasterly extension to the river and a southerly spur track and extension from the StP&D main line (Prosser 1966:138). In 1886, it completed track from Friesland to Sandstone and was immediately purchased by the StP&D. After operating for only four years, it was sold to the Eastern Railway Company and dismantled in 1892 (Prosser 1966:138).

Duluth Short Line Railway Company

The Duluth Short Line Railway Company (DSL) was incorporated on July 1, 1886, to construct a railroad from the connection to the StP&D near Thomson to Duluth. Before it could build, the DSL was leased by the StP&D on September 1, 1886 (Railroad and Warehouse Commission 1898:163). Two years later, it had established service between Thomson and the Minnesota border at Grassy Point (Duluth), as part of the complex network of rail designed to connect the Lake Superior docks to the state's competing railroads. The DSL line was acquired by the Northern Pacific as part of its purchase of the StP&D on June 15, 1900.

St. Paul and Northern Pacific Railway Company

The St. Paul and Northern Pacific Railway Company (StP&NP) was incorporated January 29, 1874, as the Western Railroad of Minnesota (WRM), with the following goals (Prosser 1966:159):

- Build a mainline from Brainerd to Mankato through Minneapolis and St. Paul
- Build a mainline from Little Falls to the western border of Minnesota between Big Stone Lake and Lake Traverse
- Build several branch lines to the eastern border of Minnesota
- Build a branch line from a point between Brainerd and Sauk Rapids to a point on the NP line between Brainerd and Wadena
- Build extensions to the northern border of Minnesota
- Erect grain elevators and warehouses

By 1879, the WRM had laid track from Brainerd to Sauk Rapids, but financial problems forced delays in construction of the other segments. Renamed as the StP&NP on May 9, 1883, the company did not build the Sauk Rapids line to Minneapolis and the connection to St. Paul until 1884 and 1886, respectively. The StP&NP never completed its route from Little Falls to Minnesota's western border, building only as far as Staples by 1889. This may have been because leasing the Northern Pacific's westbound mainline (completed in 1871) was determined to be more cost-effective. The StP&NP was acquired by the Northern Pacific on November 2, 1896 (Prosser 1966:155).

Northern Pacific Fergus and Black Hills Railroad Company

The Minnesota Northern Railroad was originally established on February 5, 1878, to build track for the M&StL railroad. A combination of construction delays and the interest of new Northern Pacific President Henry Villard in branch line construction, however, led to the company's takeover. After purchasing its charter in 1881, the Northern Pacific reorganized the Minnesota Northern as the Northern Pacific Fergus and Black Hills Railroad. Surveys began immediately on a proposed branch route from Wadena to Fergus Falls to Breckenridge and beyond to the Black Hills, from Fergus Falls to Pelican Rapids, and from Wadena to the northern border of Minnesota. The railroad from Wadena Junction to Fergus to Pelican Rapids was completed the same year and from Fergus Falls to Breckenridge by November 1882 (Prosser 1966:154; Renz 1980:109).

The Northern Pacific Fergus and Black Hills Railroad's line to Pelican Rapids was to be built very close to a branch of the Manitoba (still under construction), a fact that immediately raised the ire of James J. Hill who considered the Fergus to Pelican Rapids branch an encroachment on the Manitoba's right of way. Hill filed an injunction against the Northern Pacific to halt construction, but it was not until after protracted and heated negotiations between the railroad giants that consensus was reached. As part of a complex agreement, the Northern Pacific transferred the branch to the Manitoba on November 2, 1882. The Northern Pacific Fergus and Black Hills Railroad was eventually acquired by the Northern Pacific, along with the Duluth and Manitoba Railroad Company, on April 21, 1898 (Prosser 1966:155).

Duluth and Manitoba Railroad Company

The Northern Pacific had sold its initial effort to reach the Canadian border (the Casselton Branch) to the Manitoba in 1882. The Manitoba subsequently extended their Montana Central Railroad subsidiary through one of the Northern Pacific's key market hubs in Helena, drawing traffic to their more northern line and on to the Canadian Pacific in Alberta. To counter this move, the Northern Pacific decided to build mainline through the Manitoba's valuable Red River Valley territory and link to Winnipeg.

Designed to challenge the Manitoba's exclusive access to the agricultural products of the Red River Valley, the Duluth and Manitoba Railway Company was organized by the Northern Pacific on June 3, 1884. It was to build line from a point on the Northern Pacific's line in Becker County north to the Canadian border via Red Lake Falls, with branches to the Red River and Brainerd. The following March, the company's name was changed to the Duluth and Manitoba Railroad (Prosser 1966:128). By 1887, service had been established between Winnipeg Junction and East Grand Forks (Pembina), from Red Lake Falls Junction to Red Lake Falls, and from Key West to Omera. Northern Pacific traffic to Winnipeg proper began rolling on July 1, 1888 (Renz 1980: 139). (The Manitoba responded by building branch lines from Thief River Falls to Red Lake Falls in 1892 and from Halsted to Crookston in 1896 [Luecke 1997:138-139], thereby increasing its number of local shipping points.)

In the summer of 1890, the Northern Pacific had the line extended from Crookston to Carthage (Renz 1980:159) and in 1895, the Duluth and Manitoba's line was extended from Omera to Sherack. The railroad was officially acquired by the Northern Pacific, along with the Northern Pacific Fergus and Black Hills Railroad, on April 21, 1898 (Prosser 1966:155). The lines between Winnipeg Junction and Manitoba Junction were taken up in 1907. The Fertile to Tilden Junction route was taken up in 1958 (Prosser 1966:155).

Duluth Crookston and Northern Railroad Company

The Duluth Crookston and Northern Railway Company (DC&N) was organized on March 4, 1889. The DC&N was to establish railroad service from a point near Duluth to the northern boundary of Minnesota via Crookston (Prosser 1966:129). It rapidly built from Crookston east to a connection with the Duluth and Winnipeg. Ostensibly organized as a discreet company, James J. Hill vehemently claimed that the DC&N was instead controlled by the Northern Pacific. Although denied by the Northern Pacific, the company immediately purchased the DC&N following its completion on December 4, 1889 (Renz 1980:159).

Little Falls and Dakota Railroad Company

The Little Falls and Dakota Railroad Company (LF&D) was incorporated on January 29, 1879, to build railroad from Little Falls to the western Minnesota border via Sauk Center, Glenwood, Lake Minnewaska, and Morris. It received a land grant amounting to 265,856 acres of swamp valued at $2.50 per acre, as well as $182,000 in bond guarantees from counties and municipalities benefited by the line. Seen as a threat to the Manitoba's dominance of the Red River Valley markets, James J. Hill responded by forming the Sauk Center and Northern Railroad Company in 1881.

By 1882, the LF&D had only succeeded in building from Little Falls to Starbuck, where it purchased a final connecting segment to Morris from the Manitoba. The LF&D was acquired by the Northern Pacific on June 5, 1900 (Prosser 1966:155).

Minnesota and International Railway Company

The Minnesota and International Railway was chartered in Minnesota on July 17, 1900. It proposed to build railroad and telegraph line from Bemidji to the Canadian border at or near Rainy Lake and to operate steamboats on Rainy and Lake of the Woods tributaries. As a first order of business, the Minnesota and International absorbed the Brainerd and Northern Minnesota Railway Co. on June 29, 1901 (Poor 1911:1265). It then proceeded to build from Bemidji to Northome in 1901 and 1902 and from Funkley to Kelliher in 1903 (Prosser 1966:147).

The Big Fork and Northern Railway's 31.6-mile route between Northome and Grand Falls was leased to the Minnesota and International on December 18, 1905, and the following day to the Northern Pacific. The Northern Pacific also leased traffic rights on 0.37 miles of Big Fork and International railroad between the north bank of the Grand River and Grand Falls, and 0.84 miles of track between Brainerd and West Brainerd. By 1920, the Minnesota and International operated 179.51 miles of mainline, owned 28 miles and leased 3.43 miles of sidings, and had spurs totaling 14.84 miles (Poor 1920:939). Although a majority of its stock had always been controlled by the Northern Pacific, the Minnesota and International was not formally sold to the Northern Pacific until October 22, 1941.

Acquisitions

Brainerd and Northern Minnesota Railway Company

The Brainerd and Northern Minnesota Railway Company was organized on May 9, 1892. Although its original charter specified that railroad be built from Brainerd to the northern border of Minnesota, it only succeeded in linking Brainerd to Walker by 1894 and Walker to Bemidji by 1897. After the Brainerd and Northern was purchased by the Minnesota and International on June 29, 1901, the push to complete a railroad to the border received construction funding from the Northern Pacific. The gap between Bemidji and Big Falls was closed by 1905 (Renz 1980:222).

The Brainerd and Northern's route was formally acquired by the Northern Pacific as part of its purchase of the Minnesota and International on October 22, 1941. In 1985, as part of the Burlington Northern Railway Company, the track from Brainerd to Bemidji to International Falls was abandoned. After unsuccessfully attempting to sell the route as a tourist line, the Burlington Northern removed tracks and ties from the rail bed, and demolished bridges over river crossings by 1987. The corridor from Baxter to Bemidji was eventually purchased by the Department of Natural Resources in 1991 to form the Paul Bunyan State Trail.

Big Fork and Northern Railway Company

The Big Fork and Northern Railway Company (BF&N) was incorporated on February 20, 1905, to build railroad from Northome to Koochiching (Itasca County), although construction of the line was terminated at Grand Rapids. The Minnesota and International acquired the BF&N on December 18, 1905 (Prosser 1966:117). The lines of the BF&N were acquired by the Northern Pacific as part of its purchase of the Minnesota and International on October 22, 1941.

Big Fork and International Falls Railway

The Big Fork and International Falls Railway was incorporated on December 29, 1906. Its mission was to construct railroad between the Big Fork River (Itasca County) and International Falls. In 1907, it selected Grand Falls as its origin and completed the line. The firm was sold to the Northern Pacific on June 18, 1914 (Prosser 1966:117) (see Poor 1914:1494).

A contract between the United States Director General of Railroads and the Northern Pacific and the Big Fork and International Falls Railway Co. was executed on December 10, 1918, to procure use of the railroads from 1918 to March 1, 1920 (Poor 1920:929).

Cuyuna Northern Railway Company

The Cuyuna Northern Railway Company was founded on September 25, 1911, by Cuyler Adams, considered the discoverer of Minnesota's Cuyuna Iron Range. Adams had been an early investor in the Northern Pacific, but in 1878, exchanged his devalued company stock for agricultural land in North Dakota (Lamppa 2004:190). After making a significant profit as a wheat farmer, he moved back to Crow Wing County in 1882. It was there, while surveying the boundaries of his property, that Adams noticed systematic deviations in his compass readings. He correctly deduced that the deviations were caused by large iron ore deposits, and established the Orelands Mining Company to exploit the resource. Unfortunately, Adam's unusual method of discovery and the fact that his property was located 50 miles from any known iron ore deposits failed to inspire local investors, and he spent twenty years unsuccessfully trying to market Orelands stock. It was not until the Oliver Iron Mining Company (a U.S. Steel Co. subsidiary) began exploratory drilling in the area that Adam's claims were taken seriously. The Oliver drilling crews withdrew in 1904 after a dozen fruitless attempts to locate ore, but in the meantime, Orelands had secured its financial backing (Lamppa 2004:191).

In 1909, Adams incorporated the Cuyuna Iron Range Railway Company (CIR) to serve the Orelands Mining Company, namely to transport the ore now coming out of Adams' Kennedy Mine. Sensing future profits to be made, Adams' control of the CIR was immediately purchased by the Minneapolis Saint Paul and Sault Ste. Marie Railroad (Soo Line). The first 42-car train carrying Kennedy ore, however, took weeks to travel less than ten miles to the CIR's connection with the Northern Pacific because of mechanical failure. Adams saw the Soo Line's failure as an opportunity to compete, and founded the Cuyuna Northern Railway Company a few months later. The Cuyuna Northern was to build main line from Deerwood north to the Mississippi River and construct two branch line connections: one to the Northern Pacific between Deerwood and Aitkin and another southwest to the Northern Pacific between Fort Ripley and Brainerd (Prosser 1966:127).

In 1912, track was laid from Deerwood to an ore shaft near Mille Lacs and from Deerwood to Orelands. On October 20th of that year, Adams' new railroad delivered its first load of ore from the Cuyuna-Mille Lacs Mine to the Northern Pacific junction (Walker 1979:254). Like the Soo Line, the Northern Pacific was interested in exploiting the potential of the Cuyuna Iron Range and acquired the Cuyuna Northern on June 18, 1914. Under Northern Pacific ownership, the Cuyuna Northern constructed track between Iron Mountain Switch and Iron Mountain in 1915 (Prosser 1966:127).

Minnesota and the Northern Transcontinental Route

The Northern Pacific Railway Company, 1870-1970

The Northern Pacific was incorporated in the State of Wisconsin by a special Act approved March 15, 1870, and amended January 20, 1871; March 6, 1871; and April 15, 1895 (Railroad and Warehouse Commission 1898:158). Construction began in 1870 at Northern Pacific Junction (present-day Carlton, Minnesota) (Renz 1980:34). Initial attempts to lay track were plagued by the environmental character of Minnesota itself. As reported by the St. Paul Weekly Press in February 1870, "the direct line, as surveyed, is in reality a pretty crooked one, for, through the first 150 miles . . . it winds among the sloughs, and lakes, and bogs, and wooded and sandy ridges of a curiously broken and barren country" (Quoted in Lubetkin 2006:58). In fact, a straighter route running to the north of Brainerd would have saved nearly 25 additional miles of construction, but it is hypothesized that the more southern route was selected to arrange the preferential sale of land owned by relatives of Northern Pacific President J. Gregory Smith. Such corporate conflict of interest was typical within the Northern Pacific, and the alignment of the Duluth to Moorhead route appears to have been influenced by land profiteering as well as efforts to find stable land surfaces upon which to build (Lubetkin 2006).

By July, it was clear that the phrase "curiously broken and barren country" was a significant understatement, as survey crews labored to bring the first one hundred unpredictable miles of sphagnum bog to grade:

The area consisted of porous glacial moraines with lakes, swamps, peat bogs, sloughs, pine barrens, sinkholes, quicksand, and sometimes floating "islands" of solid ground. Besides visible creeks and rivers, underground streams flowed just below what appeared to be firm land. The deceptive covering was a forest of pine, spruce, tamarack, birch, and some elm protected by seemingly impenetrable undergrowth [Lubetkin 2006:52-3].

Building the Northern Pacific's 12-foot-wide railroad bed through Minnesota wetlands required driving piling and dumping large quantities of fill, but construction contractors were paid by the mile and often shortcut the process by sinking piling in unstable ground and filling with wood and brush. As a result, rail bed would begin to disintegrate as soon as the first engine passed over it (Lubetkin 2006:61).

Despite instances of corruption and shoddy construction, the Northern Pacific's tracks reached the Red River on October 5, 1871 (Poor 1885:719). This accomplishment was undercut by a continual drain on the Northern Pacific coffers, both by internal mismanagement and by financial interests in New York, Chicago, and Omaha that worked to block freight traffic to Duluth. To compensate, Jay Cooke hosted commissioners from the Union Bank of Vienna in the hopes that the institution would provide the backing to complete the line to Oregon, but the group had little of Cooke's speculative zeal and backed out.

Beginning in January 1871, Cooke exercised his last option by selling Northern Pacific bonds to the public. The subsequent propaganda campaign included advertisements in 1,371 publications, 2.5 million circulars, and 30,000 maps. The Northern Pacific's effort was lauded by governors and members of the United States Congress, who delivered inspirational speeches praising the vision of a northern transcontinental line. Newspapermen were paid to run stories hailing the livability and economic potential of Duluth. The Northern Pacific's financial shortfalls could have been lessened by the federal certification of its Minnesota track, which would have bolstered the railroad's bonds and opened 2,925,000 acres of Northern Pacific land (and more, if the LS&M and St. Paul and Pacific land grants were included) to logging and/or settlement. Northern Pacific President Smith had prevented certification inspections in 1871, likely because he knew how poorly the rail bed had been built. He similarly blocked certification during most of 1872 (Lubetkin 2006:166).

President Smith's indiscretions finally resulted in his replacement in November by General George Cass, and by December the 228 miles of Northern Pacific track in Minnesota had cleared certification. There were "15 passenger and 9 freight stations, 20 water towers, three engine houses, and three repair shops (in Duluth, Brainerd, and Fargo). Every mile of track had 2,640 ties, and track iron was 56 pounds to the yard . . ." (Lubetkin 2006:166). Yet even after certification, portions of gradually sinking rail bed between Duluth and Brainerd caused shutdowns. In one swampy location, the bed was only stabilized following the placement of 65 feet of additional fill.

Certification opened the Northern Pacific's Minnesota land grants for sale and added at least $10 million in value to the company. Land varied in price from $2.50 per acre for the low-quality timber lands east of Brainerd to $8.00 per acre for the rich farmlands of the Red River Valley. Many railroads developed advertising programs to encourage immigrants to settle on their federal land grants, but the Northern Pacific's Bureau of Immigration was more extensive than that of other companies (Peterson 1927:37). In November 1871, the Northern Pacific's board of directors announced that while fares for immigrants to inspect potential homestead lands would be sold at full price, this cost could be rolled into any future land purchases (within 60 days). In addition, subsequently purchased fares for an immigrant's entire family and possessions would be provided gratis. For immigrants that arrived with little but the shirts on their backs, the Northern Pacific extended cash-payment terms and offered long-term credit. In 1872, the Northern Pacific erected reception houses (also known as "receiving houses" or "immigrant houses") at Duluth, Brainerd, and Glyndon. Such buildings, like the 100-person capacity facility in Duluth, provided new arrivals with free food, clothing, shelter, and information (Peterson 1927:63). The Northern Pacific also encouraged settlement by offering to purchase any wood cut from purchased timber lands.

The Northern Pacific was also approached proactively by immigration companies such as the New England Military and Naval Bureau of Migration. In 1871, the Bureau guaranteed the settlement of 1,000 people in a township near Detroit Lakes within one year, provided the Northern Pacific meet the following conditions: that it sell all the land in the township; that the Northern Pacific's land company not purchase land in the township; that timber in Township 139, Range 40, be reserved for building purposes; and that a section be donated for religious purposes (Peterson 1927:73). Northern Pacific approved the proposal, and an advance group of settlers arrived on April 9, 1872.

Although the majority of these new Minnesotans made no complaints, a letter in the April 16th *St. Paul Press* compared the climate to that of New England in November and further stated that the soil was one foot deep as opposed to three feet deep (as the Northern Pacific had advertised), that the timber was of very poor quality, and that the "well-watered" aspect of the landscape apparently referred to the fact that 20 percent of the township was swamp. By June, the Northern Pacific had agreed to build 500 houses for the struggling community (available for 10 percent cash and 10 annual payments), but as of August, only 30 to 40 houses had been built (Peterson 1927:73).

In 1873, Northern Pacific crews continued to push railhead eastward through the Dakota Territory (reaching the Missouri River in June) and westward from Kalama to Tacoma in the Washington Territory. By this time, however, Northern Pacific bond sales had been decisively overtaken by construction expenses, forcing the company into bankruptcy—and as a result, the Jay Cooke and Company closed its doors in September 1873. The cumulative public loss of confidence in the United States banking system created the Panic of 1873, leading to the Northern Pacific's bankruptcy on June 30, 1875, the suspension of construction, and the resignation of Northern Pacific President Cass, who was replaced by Charles Barstow Wright (Renz 1980:49).

Construction at the west end of the line in North Dakota resumed at a slow pace in 1877, but it was not until completion of the company's reorganization in 1879 that track was extended west of the Missouri River. Wright's conservative policies rankled the Northern Pacific's board of directors, and he was succeeded in May 1879 by Frederick Billings. Among Billing's goals was to allay investors' fears about the security of the route through Indian lands and to re-energize construction by gaining U.S. Army protection of construction crews in the Dakota Territory.

However, it was not until the energetic Henry Villard took control of the company in 1881 that construction begin to accelerate. Villard understood that the success of the Northern Pacific hinged not only on its rapid completion, but on public perception of the dependability of the line, bolstered by the 1882 completion of a permanent bridge across the Missouri River at Bismarck/Mandan and an eastern extension of line from Northern Pacific Junction to the growing shipping port of Superior, Wisconsin (Renz 1980:81). After a harrowing year of heavy snows, rockslides, aborted tunneling, and switchback construction, the last spike of the Northern Pacific railroad was driven on September 7, 1883, at Golden Creek, Montana. The Northern Pacific now had 1,675.5 miles of operable track between Lake Superior and Wallula Junction, Washington.

Much of the construction activity on the Northern Pacific in the late 1880s focused on competing with the other transcontinentals for access to timber and mineral resources on the western end of the systems. The intensive mainline construction of the preceding decades and the race to build western branch lines, however, had depleted the Northern Pacific treasury to the point that it teetered on the brink of receivership, and the continuing battle with James J. Hill's Manitoba did nothing to help the situation. In 1887, rumors began concerning the Northern Pacific's imminent consolidation with the Wisconsin Central Railroad. The Wisconsin Central had never made a profit carrying Northern Pacific traffic, and threatened a rate war. After years of conflict within the board of directors and rancorous debate with the Wisconsin Central, the Northern Pacific leased the company on April 1, 1890. This unprofitable situation tipped the financial scales for the Northern Pacific. Although 1891 was modestly profitable for the company, earnings were not rising fast enough to outpace the costs associated with system maintenance (Renz 1980:169). By May 1892, the Northern Pacific was operating at a deficit, and an investigation into the company's ballooning, floating debt was initiated.

The results of the investigation were not complimentary regarding Villard's management of the Northern Pacific, and he was forced to resign in June 1893. This weakening of confidence was followed by a significant decline in business in July and August. By August, one of the trustees of the Northern Pacific's mortgages filed a creditor's bill in the United States Circuit Court, alleging the company's insolvency. This pushed the Northern Pacific into bankruptcy and receivership in October 1893.

Following several years of reorganization and low-volume operation, the Northern Pacific emerged from bankruptcy in 1896 and began a vigorous recovery. During this period, it began the formal purchase of many of its branch lines, beginning with the StP&NP in November 1896. In 1898, it acquired the Duluth and Manitoba and the Northern Pacific Fergus and Black Hills, furthering its competition with Hill's system. The LF&D and the extensive StP&D system were both absorbed in 1900. The StP&D's system connected to Mississippi and St. Croix waterway traffic and effectively tapped the agricultural resources near the eastern border of Minnesota. The Minnesota and International, with its attendant access to the pulp timber of northern Minnesota, was purchased in 1901, as was the Minneapolis and Duluth (Prosser 1966:155).

Although the Northern Pacific continued to nettle the competitive Hill, relations between the two were no longer as adversarial as they had been during the 1880s. In an attempt to control unpredictable rates on the competing lines, the Manitoba (now the Great Northern), the Northern Pacific, and the Chicago Burlington and Quincy Railroad Company (CB&Q) formed the Northern Securities Company as a holding company for the lines. This proposal was seen by the State of Minnesota as a direct violation of its prohibition on the monopolistic ownership of parallel railroad lines, and the US Supreme Court eventually heard the case as the *State of Minnesota v. Northern Securities Co.* (US 199 [1902]). The Court deemed the partnership in violation of the Sherman Antitrust Act, and ordered it dissolved in 1904. This left Hill in charge of the Northern Pacific.

The years leading up to World War I were very prosperous for the Northern Pacific (as they were for most North American railroads), although the only significant additions to the system's mileage were the purchase of the Big Fork and International Falls and the Cuyuna Northern railroads on June 18, 1914 (securing access to the Cuyuna Iron Range), and the incorporation of the Twin City Belt Railway Company in January 1917 to build a line from Inver Grove Heights to Anoka and connect to various regional rail lines and the St. Paul stockyards [Poor 1920:928]).

This golden era of railroading was came a sudden end with the federal government's seizure of the national system in 1918, under whose control much critical line maintenance was deferred. When the Northern Pacific was returned in 1919, its challenges included litigation related to its National Forest land grants, ongoing consolidation with the Great Northern, and contentious valuation proceedings with the Interstate Commerce Commission (ICC) (Renz 1980:238). After reviewing the condition of its lines, it entered into a series of legal claims and counter-claims with the government. Despite these distractions, a general loosening of the legal reigns regarding industry competition in the 1920s resulted in steady profits for the country's railroads, and by 1927 a consolidation of the Great Northern and Northern Pacific finally seemed possible. A merger proposal was submitted to the ICC in October 1928 and approved in March 1930—under the condition that the new entity divest all Burlington system stock. Given the previous years stock market crash, this condition was sufficient to torpedo the proposed union.

The Depression of the 1930s had one beneficial effect on the nation's railroads: it forced a pervasive reduction in unnecessary expenditures and an increase in efficiency. There were to be no profits for the Northern Pacific, however, until 1939 when agricultural shipments from the drought-stricken plains had increased and the construction industry began to recover. With the entry of the United States into World War II, relaxations in agricultural restrictions and increases in commodity shipments resulted in the Northern Pacific's rapid financial recovery. It was during this period that the Northern Pacific made its final significant acquisition in Minnesota, foreclosing on the mortgage of the Minnesota and International between Brainerd and Grand Falls on October 22, 1941.

Like all North American railroads, the Northern Pacific faced pivotal financial and operational decisions in the post WWII era. Although the war had stimulated the national economy, the rising cost of labor and price of construction materials forced railroad companies to abandon unprofitable lines, cut staff, and raise rates throughout the late 1940s and 1950s—decisions that made effective competition with the growing trucking industry difficult. As an example, in 1947 the Northern Pacific's work force numbered approximately 26,000 people with total wages of $79,968,701. By 1966, the number of employees had been reduced to 15,293, but the payroll had seen a net increase to $112,148,000 (Renz 1980:257). A portion of the staff reduction can be explained by the Northern Pacific's increased use of continuous welded steel rail and the development of automated roadway maintenance machines in the 1950s. The $4 million spent on automation lessened the need for expensive track gangs and allowed the company's maintenance expenditures to increase by only 1.5 percent between 1950 and 1960. The Northern Pacific also completed a program to modernize its lines with the final transition from steam locomotives to diesel engines in 1958, a move that saved the company millions of dollars in maintenance.

In 1961, merger plans for the Northern Pacific and Great Northern were revived and an application submitted to the ICC, but after five years of review, the plan was rejected by a slim margin. After adjustments to the agreement were made, the ICC finally issued its approval on November 30, 1967. The Northern Pacific merged with the CB&Q; Great Northern; and the Spokane, Portland and Seattle Railroad to become the Burlington Northern on March 2, 1970. The Burlington Northern sought additional rail mergers throughout the 1970s (mostly denied) and diversified its holdings in the oil and energy-production industries. In the late 1980s, the diversification strategy was abandoned (with Burlington Northern spinning off its energy holdings into a subsidiary) in favor of a comprehensive program to increase shipping efficiency and improve labor relations (Gale Group 2005).

On September 22, 1995, the Burlington Northern Railroad and the Atchison Topeka and Santa Fe Railroad merged to form the Burlington Northern Santa Fe Railway Company (BNSF). As of 2006, BNSF's system included 33,000 miles of track in 28 states and two Canadian provinces (BNSF 2006b).

XVI. Railroads and Agricultural Development, 1870-1940

As railroads built across Minnesota during the 1870s, they generally extended westward from the Mississippi River and from Duluth, and they radiated out from Minneapolis and St. Paul. The pre-railroad settlement pattern focused on rivers and streams for transportation and waterpower. Railroads opened up all areas of the state with tillable land, turning it to agricultural production—first raising wheat and later engaging in diversified agriculture. In doing so, railroads both encouraged and openly promoted settlement by Euro-Americans and European immigrants, the establishment of townsites, and the formation of food processing industries.

Wheat Monoculture

As Euro-American settlers in Minnesota claimed farmlands, many immediately planted wheat as a cash crop. Beginning in the St. Croix Triangle in the 1840s, wheat production spread throughout southeastern Minnesota and along the Minnesota River during the 1850s and 1860s. Wheat production nearly doubled every year between 1860 and 1875. Because wheat was primarily a cash crop, farmers shipped the bulky commodity on rivers or had it hauled on wagon trains to railheads, such as Prairie du Chien or La Crosse, Wisconsin, for shipment to terminals at Milwaukee or Chicago. After 1875, wheat cultivation shifted from southeastern to western Minnesota and, in particular, to the Red River Valley. As noted in the Statewide Historic Farmstead Study, “[this shift] was influenced by several major events: the depletion of soils and the rise of land prices in southeastern Minnesota, the construction of railroads throughout Minnesota, the establishment of farms on Minnesota’s prairie, the phenomenon of bonanza farming, the rise of Minneapolis milling, and organized colonization and settlement activities” (Gemini Research 2006:4.16-17).

While the former prairie lands of southwestern Minnesota produced bountiful harvests of wheat and other grains beginning in the 1870s, they were no match for the prodigious volumes of grain flowing from the Red River Valley. The so-called bonanza farms, which were heavily mechanized operations covering thousands of acres, were early examples of industrialized farming. A large volume of wheat was hauled to Duluth and shipped via the Great Lakes, and increasingly during the 1870s, wheat was hauled to Minneapolis for milling in the massive flour mills (see Flour Milling, page 150). As wheat cultivation increased in western Minnesota and as flour processing capacity increased in Minneapolis, the railroads provided the vital transportation link that encouraged further increases in both production and milling.

Railroads revolutionized the process of hauling grain to markets. Prior to the arrival of railroads, grain was typically packed in sacks on the farm, hauled by horse and wagon to a local market, and sold to local merchants or to commission merchants. The merchants then arranged for the sacks of grain to be transferred to river boats for shipment to terminal markets such as Chicago, Milwaukee, or New Orleans, where the sacks were transferred to lake or ocean-going vessels for eastern markets. At each point of transshipment, the sacks were carried manually between wagons, boats, and ships—a process both time-consuming and limited in the volume it could handle.

Railroads transformed the old process of water-based grain shipping. Grains and cereals hauled by railroad came not by the sack-full but by the carload, each of which could consist of over 300 bushels during the 1850s and, later in the century, 2,000 to 3,000 bushels. The development of through routes reduced the number of transshipments, and with advances in grain elevator construction and mechanization, the handling of wheat at transshipment points became more efficient. For example, St. Louis, which depended heavily on river traffic and did not invest in grain elevators during the 1850s, shipped approximately 2 million bushels of wheat per year through its congested levee. Chicago, with large state-of-the-art elevators, shipped 21 million bushels of grain in the single year of 1856. A 10,000-bushel shipment of wheat might require a couple hundred workers several days to move through the St. Louis levee in the mid 1850s. When Chicago's 12 largest elevators operated simultaneously, they could receive and ship nearly a half million bushels every 10 hours (Cronon 1991:110-115; Frame 1989:E2).

As the railroad network developed in Minnesota during the mid 1860s to 1880, railroad builders first concentrated in the settled areas of southern and southeastern Minnesota, radiating out from St. Paul and Minneapolis and extending west from the Mississippi River. During the 1870s, the railroads extended past the agricultural frontier through western Minnesota and into the Dakotas. By 1880, the Chicago Milwaukee and St. Paul (CM&StP) had two east-west railroad corridors across southern Minnesota, and the Chicago and North Western (C&NW) owned one railroad corridor and controlled another, while two corridors of the St. Paul Minneapolis and Manitoba (Manitoba) radiated northwest from Minneapolis, and the Northern Pacific extended west from Duluth (Prosser 1966).

As had happened in Chicago during the 1850s, the railroads were hauling massive amounts of wheat into Minneapolis by the 1880s. The Union Elevator Company built the first terminal elevator in Minneapolis (and perhaps the first elevator in Minnesota) in 1867 along the CM&StP tracks. They sold the elevator to the railroad in 1877. In 1868, the Pacific Elevator was constructed along the St. Paul and Pacific (later Great Northern) tracks. By the end of the century, 28 elevators with a capacity of about 27.5 million bushels were located in Minneapolis. Receipts for wheat alone in Minneapolis led the nation at 32 million bushels by 1885, and receipts reached 100 million bushels by 1912. In 1921, Minneapolis surpassed Chicago with a grain elevator capacity of 55 million bushels (versus 49 million). The railroads and grain elevators fed the Minneapolis flour milling industry, which increased production six-fold from 1875 to 1885 and represented the single largest market for Minnesota and Dakota wheat (see Flour Milling, page 150). In addition, by the early twentieth century, Minneapolis had become an important market for corn and for coarse grains, including flax, barley, rye, and oats (Frame 1989:E11-12; Hartsough 1925:60; Hess and Cudzia 1991:8:9).

With connections to two transcontinental railroads (Northern Pacific and Great Northern), the Great Lakes terminal port at Duluth had become a large grain market by the late nineteenth century. In the late 1860s, Duluth businessmen constructed a grain elevator in anticipation of the Northern Pacific railroad building west and the Lake Superior and Mississippi railroad (later also Northern Pacific) connecting with St. Paul. Completion of those railroads, as well as the Great Northern spurred the growth of Duluth as a major grain port. In 1886, Duluth elevators transferred 22 million bushels of grain from railroads to ships on Lake Superior. The Northern Pacific alone hauled on average 9.2 million bushels annually into Duluth (Koop and Morris 1996:E4-6, 15).

A number of companies, including in Minnesota the CM&StP, C&NW, Chicago Burlington and Quincy (CB&Q), and Chicago Rock Island and Pacific (CRI&P), came to be known as granger railroads during the late nineteenth century because they hauled large volumes of grain from an area extending from Kansas, Missouri, and Illinois north to Canada. The granger railroads, along with the Chicago Great Western (CGW), were the dominant carriers in southern Minnesota. The Great Northern, Northern Pacific, and Minneapolis St. Paul and Sault Ste. Marie (Soo Line) dominated the area north and west of the Twin Cities, particularly the Red River Valley.

In the small towns along Minnesota's railroads, country elevators handled grain coming from the farms and transferred it to the railcars. During the 1870s, the formative period for Minnesota's grain markets, the railroads played a critical role in establishing the grain-handling infrastructure. During the 1860s and early 1870s, railroad companies often owned elevators. Following the depression of the mid 1870s, however, line elevators, which were groups of country elevators under central management, became the dominant type of country elevator and remained so until the early twentieth century. Country elevators received grain from farmers, stored it, and transferred it to railcars for shipment to terminal markets. By the 1880s, Cargill, Hodges and Hyde, and Van Dusen emerged as the three most important line elevator companies. Generally, southern Minnesota line companies shipped their grain directly to Chicago on carriers such as the CM&StP's Southern Minnesota Division and the C&NW. To the west and north of the Twin Cities, the line companies sent their grain to Minneapolis or Duluth. Large line elevator companies included the Northern Pacific Elevator Company, A.J. Sawyer, Delano Davison and Kyle, and Northwestern Elevator Company (Frame 1989:E8-E9).

Although the railroads did not often own line elevators by the 1880s, they directly influenced the size and location of elevators by favoring larger elevators and controlling placement within their rights of way. The railroads, line elevator companies, and trade groups, such as the Millers Association, the Grain Exchange, and the Duluth Board of Trade, controlled the grain trade in Minnesota.

Diversification and Industrialization of Agriculture

Even as wheat production peaked in Minnesota during the late nineteenth century, farmers began to expand their crop base and diversify into livestock production. By the mid 1870s, in southeastern Minnesota where farms were well established, soils in many areas were exhausted from intensive wheat production, which combined with grasshopper infestations, crop disease, and low wheat prices during the early 1870s convinced farmers to diversify their operations.

Farmers began raising dairy and beef cattle, poultry, and hogs. In addition, they began growing a variety of crops, including oats, corn, barley, potatoes, flax, sugar beets, and vegetables for market. This diversification began in the southeastern part of the state and spread west and north. An important development after about 1890 was the corn-livestock belt across southern Minnesota, where farmers grew large quantities of corn for hog feed and for silage for cattle. The hogs and cattle were shipped via railroads to stockyards and meat packing operations to meet the growing market demand.

During the early twentieth century, Minnesota farmers continued to diversify their products, and in addition, they greatly increased their productivity. Farms began to take on some of the industrial aspects of late twentieth century agribusinesses: smaller numbers of farmers on larger, mechanized farms producing goods almost exclusively for the marketplace. With commodity prices generally high and the railroad transportation network at its peak, from about 1900 to 1920 farmers increased acreage, utilized improved methods and livestock, and turned to mechanized equipment to increase their output. By 1929, 86 percent of farm products were sold on the market rather than used directly by the farm family (Gemini Research 2006:4.42). The development of agribusiness, much like the growth of large corporations in other economic sectors during the late nineteenth and early twentieth centuries, was both encouraged by and a benefit to the railroads. More reliable farm production moving primarily to market locations meant higher volumes of freight for the railroads.

As diversified agriculture spread across southern Minnesota during the 1880s, the granger railroads, which were concentrated in that part of the state, diversified their freights. For example, although the freight tonnage of wheat hauled by the CM&StP increased by 78 percent from 1885 to 1900, the total for all agricultural products increased by 128 percent, and all freight increased by 174 percent. During that period, the percentage that wheat represented of all freight dropped from over 12 percent to about 5 percent. More strikingly, between 1900 and 1920, the tonnage of wheat hauled by the CM&StP increased by 6 percent, while the freight tonnage of all agricultural products increased by 50 percent, and all freight increased by 154 percent (CM&StP Annual Reports).

Railroads both indirectly and directly encouraged the large diversified farming operations. Farmers could raise any variety of crops and livestock and still ship the produce and animals quickly and efficiently to market. In addition, farmers could ship their diversified products to food processing plants or their specialty crops directly to cities. By the early twentieth century, the food processing industry, which was beginning to operate with economies of scale, the growing urban markets, and the large diversified farm operations maintained a symbiotic relationship facilitated by railroad transportation.

In addition, some railroad leaders actively encouraged agricultural diversification out of self-interest. Reliance on a single crop, such as wheat, made both farmers and railroad companies vulnerable to natural disasters, such as droughts and grasshopper plagues, as well as commodity price fluctuations. Just as dependence on a single crop could spell disaster for farmers, it was an economic risk for railroads, which could see their freight volumes, and therefore their revenues, drop with a single poor harvest. Furthermore, the wheat monoculture led to soil exhaustion, which led to lower yields, and thus, lower revenues for the railroads. Conversely, with a diverse base of crops and livestock to haul, railroads maintained higher volumes of freight throughout the year. An even greater risk to the railroads was that farmers would simply move on after the soil lost its fertility, while railroads, with their heavy capital investment in infrastructure, would be left behind. This concern was particularly acute in the western and northwestern parts of the state, where railroads generally were built in advance of Euro-American settlement during the 1870s and 1880s on the speculation that homesteaders would come and create markets. Railroad leaders, particularly James J. Hill, along with land developers, agricultural processors, and other agribusinesses all encouraged diversification, scientific agriculture, and mechanization. For example, Hill established an Agricultural Extension Department within the Great Northern in 1911 to conduct experiments in cultivation techniques and to publicize new farming methods (Strom 2003).

Immigration and Settlement

The construction of railroads was essential to fast and cost-efficient transportation in the United States from the mid nineteenth century into the twentieth century, but such transportation, and the new mass production and distribution economy, were only necessary and profitable if people were available at the points being connected to be the laborers, producers, markets, and consumers. This fact was not lost on the United States railroad companies, many of whom accepted large land grants from the federal government beginning in 1850, with the understanding that much of the land could be sold to subsidize railroad construction. This arrangement required people to purchase the lands to help finance construction.

In addition, the railroads needed to sell the land to people who intended to settle and work those lands because, in doing so, those people would require the shipment of products and consumer goods. To encourage such settlement, most westward-bound railroad companies holding land grants established land departments and bureaus of emigration. These entities all worked with a common purpose: land departments were organized to sell railroad-owned lands to new settlers, and bureaus of emigration were organized to bring those settlers from overseas. Both entities employed a wide variety of media to achieve their goals. Most popular were pamphlets, sometimes quite lengthy, that promoted the natural and already-built advantages of a given location. Other media included “newspaper advertising, lectures, bureaus of information, and [traveling] exhibits” (Peterson 1932:31), as well as testimonial letters of questionable veracity, often having been written by railroad agents based on their communications with settlers or created for prize-winning contests (Scott 1985:26).

The timing of these promotional activities began when numerous Europeans were seeking change. The Industrial Revolution, intense population growth, and other conditions overseas helped to displace workers so they sought residence elsewhere (Holmquist 1981:4). Most notable of these conditions were the advances in agricultural mechanization over the course of the eighteenth century and changes to the European system of farming that left many farmers without land and without jobs. The overabundance of labor combined with additional population growth helped to fuel the nineteenth-century Industrial Revolution by creating a pool of willing factory workers.

Because the continuing development of new machines made additional job tasks more efficient, the increasing supply of labor again outweighed the work available and left many people in poverty. Other location-specific or group-specific catalysts occurred in the mid nineteenth century, including “famine in Ireland and Finland . . . political inequality . . . rebellion against state-church dictation, direct persecution (such as the Jews in eastern Europe), [and] compulsory military service” (Holmquist 1981:4).

During this time, railroad promotional materials and promoters began arriving in Europe from Minnesota. The state government had taken upon itself to attract new settlers to Minnesota, and the railroads independently began their own marketing schemes to do the same shortly after the first rails were constructed in Minnesota in 1862. In the later part of the decade, the state government and the railroads joined forces in this colonization effort with powerful results (Peterson 1932:26-27).

The mutual interest of the state and the railroad companies in attracting European emigrants to Minnesota was expressed through the sharing of personnel, capital, and influence. Early on, the state provided official recognition of and documentation for railroad emigration agents who traveled overseas “[in] order that the character of the mission might be made more impressive” (Peterson 1932:27). By the 1870s, however, the state had created paid positions for commissioners of immigration for specific countries, such as Germany, Norway, or Sweden, who were to protect and provide initial guidance for immigrants to Minnesota. In addition, immigration agents were stationed in major Minnesota cities and in places of entry such as Chicago, Milwaukee, and New York to guide and assist the immigrants.

Railroad companies designed and produced promotional materials for distribution by the commissioners and railroad agents who were stationed in European offices. They also provided financial incentives, such as discounted or free transportation and food to new immigrants, not just along the railroad lines but “from the steamboat landings to the depots” (Peterson 1932:30). Also offered were refundable fares for prior land-inspection travel, with refunds contingent on the purchase of at least 40 acres of land within 60 days of obtaining such a fare.

Cooperation between the state and the railroads also worked on a much larger scale, as indicated by “the draining of the Red River valley lands [to make them agriculturally usable] . . . . [I]n 1893 Minnesota made an appropriation for the work, and the Great Northern gave $25,000 to aid in the development of a comprehensive drainage system in the valley” (Scott 1985:8).

Minnesota touted health, timber, game, and even ice among the benefits of the state’s natural environment, while mills and factories were presented as places of potential employment and were highlighted in the built environment (Hedges 1926; Iseminger 1871), but the main advantage promoted by both the railroads and the state was the land. Minnesota could not claim extensive mineral deposits, but the promoters could easily demonstrate what appeared to be endless amounts of agricultural terrain (Strom 2003:8); for example, the Northern Pacific’s London newspaper, *Land and Emigration*, noted: “The Northern Pacific Railroad Company, by act of Congress, is entitled to 4,276,000 acres of land in the State of Minnesota. . . . There are many meadows and marshes covered with luxuriant grasses, where thousands of tons of hay may be had for the cutting” (quoted in Holmquist 1981:4).

To displaced European farmers, owning 80 or 160 acres was enticing; even more so if those acres were located among people from their home country who spoke their language. For this reason, emigrants often recruited for and formed a colony before leaving their homeland, working with the railroad agents to find a suitable Minnesota location. Such colonies bolstered the motivations of other emigrants from the original country to start a life in Minnesota, and though some immigrants used them as a comfortable stepping stone to somewhere else in the state or the country, many became ethnic communities such as Brown and Stearns counties for Germans; the St. Croix Valley for Swedes; Houston and Fillmore counties and the Red River Valley for Norwegians; Ramsey and Dakota counties for Irish; the iron ranges for Finns and Yugoslavs; and McLeod, Scott, and Le Sueur counties for Czechs. Once the state and the railroads had begun the process of promotion, their efforts were heavily supplemented by those who had settled in Minnesota sending their reports back to friends and families still in Europe (Holmquist 1981:4).

The state was not the only entity the railroads cooperated with to bring immigrants to Minnesota. Religious entities were also interested in organizing colonies, and the railroads worked with them to ensure that those colonies were located on railroad land; for example, the Soo Line was the parent company of the Soo Line Catholic Colonization Company. The agent for the latter, Francis H. Murray, was instrumental in the settling of Onamia by Catholic Belgian immigrants in 1911 by providing potential parishioners with a "special Soo Line train" to Onamia, where his work was to "show the lands to the Colonists and sell to those who wished to buy. . . . There was already provided there a house for the Priests and ten acres of land fronting on Lake Onamia, and later $500 towards Church construction" (Francis H. Murray, "The Arrival of the Crosier Fathers in America," Francis H. Murray papers, 1896-1958, manuscript on file at the Minnesota Historical Society (MHS). Three years later, Murray wrote to the Reverend W. Van Dinter in Onamia to ask if the railroad could build up the Onamia Parish by supplying transportation on the Soo Line, particularly in regard to Belgian immigrants ("Copy of Letter Mr. F. H. Murray Sent to Van Dinter, Dec. 17, 1914," Francis H. Murray papers, 1896-1958, manuscript on file at the MHS). Additionally, after the passage of the Soldiers' and Sailor's Additional Homestead Act of 1872 "allowed veterans of the Civil War to count their military service toward the five years required to gain titles to a free homestead and authorized those who had homesteaded on less than 160 acres to make an additional entry to bring their total acreage to 160 acres" (State Historical Society of North Dakota 1999), soldiers and their families from the eastern United States, encouraged by the railroads to take their 160 acres from railroad lands on or near the newly constructed lines, did form colonies such as Detroit Lakes in Minnesota (Hedges 1926).

Because so many conditions came together to promote movement into the midwestern United States during the mid to late nineteenth century, it is not possible to precisely quantify the strength of the effect of the presence of and promotion by railroads on immigration. It is known, however, that between 1860 and 1880, Minnesota experienced tremendous increases in population and population density, which corresponded to the increase in miles of railroad line constructed in the state. Annual population growth, for example, averaged 16,594 during the 1850s prior to any railroad construction, 26,768 during the 1860s when over 1,000 miles of track were constructed, and 34,106 during the early 1870s when over 2,000 miles were constructed (Peterson 1932:43-44). "Hence," as Peterson (1932:44) noted, "though it is difficult to appraise with any exactitude the numerical consequences of the propaganda and assistance that the railroads lavished in promoting the movement [into Minnesota], it is certain that 'the rapid extension of railroads was both a cause and a consequence of this increase of people; of their distribution, their productive power, and their demands for the comforts and luxuries of other skies' " [Folwell 1908:270].

Colonization work was continued by some railroads into the 1950s. Due, however, to immigration restrictions and a significant decrease in available land, such work had lost its basis for success and importance to the railroads three decades earlier. It was briefly revived during the "back-to-the-farm movement" of the Great Depression, but in the years after World War II it ended, having been supplanted by a focus on agricultural and industrial development (Scott 1985:11-12, 77).

Townsite Development

Development of the smaller cities and towns in Minnesota can be grouped both chronologically and by regional patterns. In portions of Minnesota, such as the southeast and along the Minnesota and Mississippi Rivers, where Euro-American settlement during the 1850s and early 1860s generally preceded railroad construction, towns were typically platted along rivers and streams to take advantage of navigation or water-power potential. When railroads were built in those areas beginning in the mid 1860s, they provided both through transportation and connections to the existing river-oriented commercial centers. In areas settled after the Civil War, particularly on the prairies in the western half of the state, the railroads often preceded settlement or were built into lightly settled areas. In those areas, town sites were generally platted by the railroad companies themselves or by speculators based on the projected location of the railroad corridor. This pattern continued through the end of the century, and even after 1900, towns were incorporated along new railroad branch lines. In the northeast, where railroads supported the lumber and mining industries, towns were subject to the vagaries of those industries.

At the most basic level, railroads influenced the geographies of towns and cities. Many, though not all, railroad towns were platted by railroad companies or affiliated firms. For example, about 40 percent of railroad towns that became county seats in Minnesota were platted by the railroad companies (Schmiedeler 2001:339). When the railroad companies platted towns, the placement along a railroad corridor depended on the projected trade area as well as the location of towns on competing railroads. Each railroad town was platted in direct relationship to a railroad corridor, and the tracks, right of way, and depot were the core of the town. The railroad companies tended to prefer town configurations where business districts were parallel to the tracks, but private proprietors preferred town patterns in which the commercial strip extended from one side of the tracks in an approximately T-shaped pattern. Unlike the earlier river towns, in which original plats generally were oriented to the river, railroad towns were typically platted on a grid pattern, and streets were oriented to the four cardinal directions.

Regardless of how a town initially developed, a railroad connection was critical to its success. Railroads not only hauled out agricultural commodities, they brought building materials and manufactured goods to small town merchants. Nearly all of Minnesota's 2,000 organized townships had at least a small crossroads center with a grocery store, saloon, and church. A railroad connection was necessary for a town to serve larger retail functions, such as dry goods stores, bakeries, and specialty shops and services. Towns that served solely as a rail stop, however, tended to remain small and serviced only a small geographic area. Railroads connected the smaller towns along the corridors to larger urban areas, and those cities served as collection and distribution points for their surrounding service areas. Cities located at intersections of railroad mainlines or that attracted specialized functions, such as railroad shops or division offices, agricultural processing or manufacturing facilities, or governmental or educational institutions, grew into modest-sized cities with multiple-county service areas. Fewer than 30 small cities in Minnesota grew into multiple-county, retail-trade centers with some manufacturing operations (Borchert 1989:56).

Most Americans living in small towns or rural areas during the early twentieth century interacted with the railroads primarily through the small local depot. "With its telegraph office, its mail and express service, and its full complement of daily passenger and freight trains, the local depot was the focal point of communication with the outside world" (Stover 1970:98). Although separate depots were often provided for passengers and freight in large cities, depots in small towns typically served both functions.

Food Processing

The capacity, speed, and efficiency with which railroads hauled agricultural commodities encouraged the concentration of food processing operations into shrinking numbers of increasingly large plants. Such industries as flour milling, meat packing, dairy processing (creameries and cheese factories), vegetable canning, and brewing all consisted of primarily local operations in the mid nineteenth century. Each of those industries began to consolidate during the late nineteenth century and became big businesses by the early twentieth century.

Along with technological advances, improvements in crop strains and animal breeding, and the growth of urban markets, the large volumes of raw commodities and equally large volumes of processed foods hauled by the railroads allowed large operations to achieve economies of scale and thereby reduce costs. These savings both increased profits, allowing companies to further invest in capital improvements, and allowed the large operations to lower their prices and undercut local processors. Minnesota's largest food companies—Pillsbury, General Mills, Hormel, Land O' Lakes, and Hamm's to name a few—all gained dominance during this period with vital assistance from the railroads.

Flour Milling

Due to the heavy reliance of Minnesota farmers on wheat production during the nineteenth century, flour milling was a major industry in the state. Virtually every stream with suitable waterpower sites spawned flour mills, and there were 507 of them in Minnesota by 1870. The Cannon River was an early center for flour milling, which led to the development of Faribault, Dundas, and Northfield. With 13 mills clustered around the falls at St. Anthony, by 1870 Minneapolis was already the largest milling center in the state. Despite the concentration of operations in Minneapolis, flour milling remained an important local industry into the twentieth century in many towns such as Faribault, Fergus Falls, Winona, and St. Cloud (Hartsough 1926:191-192; Lass 1983:132).

From 1880 to 1930, Minneapolis was the leading flour milling center in the world. St. Anthony Falls, over which the Mississippi River poured a year-round average of 25,000 tons of water per minute down a 70-foot drop within one mile, represented a gross capacity of approximately 120,000 horsepower. This massive power-generating potential was first used as early as the 1820s by the United States Army for flour and saw mills. By the 1870s, the falls supported a diverse industrial base, including sawmills, flour mills, and machinery, textiles, and paper manufacturers. With the development by Minneapolis millers of the so-called "New Process" milling specifically for spring wheat and with the increased cultivation of spring wheat in western Minnesota and Dakota Territory during the 1870s, the St. Anthony Falls industrial area was transformed into a flour-milling district, where 17 small firms operated 20 mills (Hartsough 1925:68; Hess and Cudzia 1991:8:4-7).

To meet the demand for wheat generated by the flour mills clustered around St. Anthony Falls, railroad lines converged on Minneapolis by the early 1880s, including CM&StP, Minneapolis and St. Louis (M&StL), C&NW/Chicago St. Paul Minneapolis and Omaha (Omaha Road), Soo Line, Great Northern, and Northern Pacific. As described above, railroads completely altered the transport of grain, and in the case of the Minneapolis milling district, they served as a virtual conveyor belt feeding the flour mills. By 1881, Minneapolis' output of 3.1 million barrels of flour led the nation for the first time, a position it would maintain for the next 40 years (Hess and Cudzia 1991:8:4-7).

The Minneapolis flour milling industry both expanded output and consolidated over the next 30 years. By the early 1900s, flour output reached 15 million barrels, and three companies managed 97 percent of the production: Washburn-Crosby Company (General Mills), Pillsbury Washburn Flour Mills Company (Pillsbury), and Northwestern Consolidated Milling Company (Standard Milling Company) (Hartsough 1925:68; Hess and Cudzia 1991:8:4-7). (For additional discussion regarding the development of Minneapolis, see *Urban Centers, 1870-1940*, beginning on page 156).

From 1900 through 1920, flour milling was the leading industry in Minnesota by value of product. The symbiotic growth of wheat production on the prairies and Minneapolis flour milling capacity during the late nineteenth and twentieth centuries was directly facilitated by the railroads. The railroads delivered the wheat to the mills and hauled out their flour at volumes that encouraged large farms and flour mills to take advantage of the operating economy of scale. The Washburn A Mill was the largest flour mill in the United States when it was completed in 1874. Although destroyed by an explosion and fire in 1878, the Washburn A Mill was rebuilt even larger the next year. Several years later, Pillsbury followed with construction of its A Mill, which had double the capacity of Washburn's. In addition to their hauling capacity, the railroads generally offered favorable freight rates to the large producers, allowing companies like Pillsbury and Washburn-Crosby to achieve additional economies of scale (Hess and Cudzia 1991:8:6-8; Jeffery 1989:224).

At times, railroad interests played an even more direct role in the development of the Minneapolis milling district. For example, in 1880 James J. Hill acquired the St. Anthony Falls Water Power Company and then developed a new waterpower canal primarily for the new Pillsbury A Mill. Alternately, the milling industry at times played a direct role in the development of railroads. Construction of both the M&StL and the Soo Line was financed primarily by Minneapolis milling interests seeking to assure steady supplies of wheat and dependable outlets for their flour.

Meat Packing

Even more than grain, dressed meat depends on quick delivery to market before it spoils. In the mid nineteenth century, prior to refrigeration systems and fast, reliable transportation, this meant that animals were shipped or herded live to their final market destination and butchered locally. The railroads, and particularly the refrigerated railroad car, changed that formula during the 1870s because they encouraged concentration and economies of scale among packers and because dressed meat was cheaper to ship than live animals. Chicago was the main railroad hub connecting the Midwestern and Eastern markets, and its stockyards became the early center of the new meat packing industry. The “Big Five” meat packing companies—Swift, Armour, Cudahy, Wilson, and Morris—were all based in Chicago and dominated the market by the early twentieth century.

By the turn of the twentieth century, the Big Five meat packers began establishing regional operations outside of Chicago. In 1886, Alpheus B. Stickney, president of the Minnesota and Northwestern Railroad (later CGW) led a group of investors in forming the St. Paul Union Stockyards in South St. Paul. Although St. Paul was peripheral to the supply of hogs and cattle during the nineteenth century, due to diversification by Minnesota farmers and the northward spread of the corn belt, southern Minnesota provided a ready supply of hogs by the turn of the century. In addition, St. Paul had good railroad connections to the cattle ranges of the Dakotas and Montana. Initially, South St. Paul was the headquarters for the Anglo-American Packing and Provision Company, but in 1897, the stockyards attracted Swift and Company, which built a packing plant there. Eventually, four of the Big Five would operate packing plants at the South St. Paul stockyards, including the massive Armour plant, which occupied 22 buildings on 49 acres and employed 2,000-3,000 men by the end of the 1910s. By 1920, the South St. Paul stockyards were the sixth largest in the country (Hudson 1994:155; Schmidt and Ketz 1996b:59-60).

Although there were no large terminal stockyards in Austin or Albert Lea, important packing plants developed in both cities. George A. Hormel and Company, established as a local butcher shop in Austin in 1891, took advantage of Austin's railroad connections with the CM&StP and CGW, and by 1920 was Minnesota's largest meat-packing operation. Albert Lea, served by the CM&StP, the M&StL, and the CRI&P, was also home to a large locally owned meat-packing plant that was acquired by Wilson and Company in 1912. Led by these plants, as well as those in South St. Paul, meat packing was the fastest growing industry in Minnesota from 1900 to 1920. Along with grain elevators, virtually every rail stop included at least a small stockyard (Jeffrey 1989:225).

Large concentrated stockyard operations with packing plants clustered around them were well suited to the railroad companies, which were always seeking economies of scale to increase their efficiencies. As early as the 1920s, however, motor trucks began siphoning off stock freight for short hauls to local packinghouses. After World War II, the trend was clear: many smaller packing plants relocated close to their production areas and were served by truck transportation. From 1925 to 1960, the percentage of cattle purchased in terminal markets dropped from 91 percent to 46 percent and hogs from 76 percent to 30 percent (Hudson 1994:176).

Dairy Processing

Because dairy products spoiled quickly and because milk was bulky, during the nineteenth century, dairy products were generally produced on the farm for local consumption. Cheese was an exception because it did not spoil as quickly as butter or raw milk. As early as the 1850s, cheese factories began mass-producing cheese in the northeastern United States. Although butter factories (creameries) began to appear in the 1860s, most butter was produced on individual farms through the nineteenth century.

A number of technological innovations during the late nineteenth century, notably the centrifugal cream separator, the Babcock Test for measuring cream content in whole milk, and improvements in transportation networks, allowed for more efficient processing of a more uniform product. When those inventions were coupled with the cooperative creamery movement, in which dairy producers jointly owned production facilities, the number of creameries in Minnesota skyrocketed beginning in the 1890s. Formed in 1889, the Clark's Grove cooperative creamery was the first in Minnesota, and by 1898, there were 664 creameries in the state, including 560 cooperatives (Tweton 1989:272). Early dairy processing facilities tended to specialize in a single product such as cheese, butter, ice cream, or after the turn of the twentieth century, fluid milk.

Although dairy products were produced at hundreds of small creameries throughout Minnesota, the butter, cheese, cottage cheese, and fluid milk that went to market converged in the Twin Cities and particularly in

St. Paul. By the 1920s, St. Paul was among the most important markets for dairy products in the United States, and when combined, the two cities were the sixth leading butter producing center in the country. Nonetheless, a large portion of Minnesota's dairy products were shipped to eastern markets directly from the points of production (Hartsough 1925:55, 65, 180). In 1921, 320 cooperative dairy producers formed the Minnesota Cooperative Creameries Association, a statewide organization that sought to improve marketing and distribution of its members' products. Two years later, its members pooled 1,826 carloads of butter to gain a more favorable shipping rate to the market. Later renamed Land O' Lakes, this organization became one of Minnesota's largest companies (Tweton 1989:272). In addition, companies like Old Home and Kemps also became large producers of dairy products.

Specialty Products

During the late nineteenth and early twentieth centuries, a number of specialty-product growing and processing centers developed throughout Minnesota. Such products included vegetable cultivation and canning in south-central Minnesota, potatoes just north of Minneapolis and in the Red River Valley, sugar beets in the Minnesota and Red River Valleys, flax grown in the west for linseed oil processed in Minneapolis, and malting barley grown throughout the state and used for brewing, particularly in the Twin Cities.

While vegetable gardens were always a farm feature, large-scale commercial vegetable-growing operations developed in Minnesota in the early twentieth century. With an increasing demand from the expanding urban populations and a mature railroad network to ship out the canned goods, the number of vegetable-canning companies in Minnesota grew from 16 plants in 1910 to 47 in 1947. In 1903, the Minnesota Valley Canning Company (Green Giant after 1950) was founded in Le Sueur by John S. Hughes. Focusing initially on sweet corn, the company soon began canning peas, and it eventually expanded into other vegetables and served national markets. Other early leaders included Gedney, founded in 1881 in Minneapolis, and Owatonna Canning Company (Festal brand), founded in 1911 (Tweton 1989:282-283).

Potatoes became a valuable cash crop as the growing urban population of the late nineteenth century created a large demand. With sandy soils well-suited to potato cultivation and proximity to the Twin Cities, northern Hennepin County and Anoka County developed into a potato growing district by the 1880s. Served by a branch line of the Manitoba, Osseo became the central potato market and shipping point for area producers, and by the early twentieth century, this city was the largest potato shipping point in the country. After 1900, Red River Valley potato production increased dramatically as wheat farmers began to diversify. In Clay, Norman, and Polk Counties, potato acreage increased ten-fold from 1900 to 1920, by which time the Red River Valley had become the state's leading potato producer (Schmidt and Abel 2000a:16; Tweton 1989:284).

Minnesota's first sugar beet processing plant was built in 1898 in St. Louis Park (founded on the Minneapolis and St. Louis tracks), and although it burned down in 1905, it demonstrated the potential of this commodity line. By 1910, the Carver County (later Minnesota) Sugar Company was operating a plant, and area farmers produced 24,000 tons of beets. In the 1920s, the Red River Sugar Company and the American Beet Sugar (American Crystal Sugar) Company both constructed plants in East Grand Forks. Demand for sugar boomed following World War II, and American Crystal built plants at Moorhead and Crookston.

By the late nineteenth century, linseed oil (derived from flaxseed) was a valuable industrial commodity utilized in paint, varnish, oilcloth, linoleum, lacquer, printing ink, shoe polish, and patent leather. As a supplement to wheat cultivation, farmers in southwestern Minnesota in particular turned to flax production. Railroads hauled the flaxseed to processing plants, much of it to Minneapolis where flax receipts increased from one million bushels in 1891 to 10 million in 1906. The first linseed oil mill in Minnesota was established in Minneapolis in 1862, and by the early twentieth century, Minneapolis' six mills, including the predecessor companies of Archer Daniels Midland (ADM), ranked the city among the largest linseed oil production centers in the country; however, industrial use of linseed oil and, as a result, flax production fell off during the 1950s and 1960s as synthetic replacement products were developed (Hartsough 1925:70; Tweton 1989:279).

Much like meat packing, the brewing industry depended on keeping its goods cold from production to consumption and was a localized industry in the nineteenth century. In 1880, there were 132 breweries in Minnesota spread throughout the settled parts of the state. Like other industries, access to fast and reliable transportation, especially the refrigerated railcar, coupled with advances such as pasteurization and larger production plants, forced the state brewing industry to consolidate down to 94 breweries by 1900 and then to 51 in 1919. At the same time, production increased to 700,000 barrels in 1900 and 1.6 million barrels in 1915, as smaller numbers of increasingly larger breweries increased their productivity. Theodore Hamms Brewing Company alone produced about one-third of that total. Hamm's, Jacob Schmidt Brewing Company, and Minneapolis Brewing Company (Grain Belt) all built large state-of-the-art plants well served by railroad lines in St. Paul and Minneapolis. Some smaller breweries, however, remained vital, particularly those in areas with heavy German populations, such as Schell in New Ulm and Cold Spring in Stearns County. Although national Prohibition halted legal beer production in 1920, following its repeal in 1933, breweries resumed production. The trend toward consolidation and increased production continued, but increasingly brewers shipped their beer via trucks rather than rail (Tweton 1989:285-287).

XVII. Urban Centers, 1870-1940

During the late nineteenth century, big cities throughout the Midwest developed into a network of regional markets and links to larger national markets for farmers, mining companies, lumber companies, and small town commercial, food processing, and manufacturing operations. Chicago stood at the top of the hierarchy, providing connections from western railroads to eastern railroads, wholesale markets, commodities markets, and access to national banking and capital. In the western Midwest, St. Louis, Kansas City, Omaha, and Minneapolis/St. Paul emerged as regional commercial centers with hinterlands of their own. The Twin Cities hinterland by the turn of the twentieth century included an area encompassing eastern Wisconsin, all of Minnesota, northern Iowa, most of South Dakota, all of North Dakota, and the eastern half of Montana. Within this area, Duluth was a semi-independent metropolitan area, providing a link between railroads and Great Lakes shipping, as well as a focal point for the northern Minnesota logging and iron ore industries (Borchert 1989; Hartsough 1925) (for maps of the railroad networks in the Minneapolis-St. Paul and Duluth-Superior areas, see Maps section).

Manufacturing and Distribution

Minnesota's railroad network by the late nineteenth century reflected the importance of railroads in the growth of metropolitan centers, as well as the importance of those markets to the railroads. Through their extensive railroad connections made during the 1870s and 1880s, Minneapolis and St. Paul, and to a lesser extent Duluth, established themselves as important wholesaling centers for a vast hinterland primarily to the northwest and west. Initially dependent on Chicago, the Twin Cities became a primary distributing point after 1880 for firms from the eastern United States to areas within its hinterland. In addition, with the growth of manufacturing operations, the metropolitan area developed as a manufacturing center in its own right. By the turn of the century, the Twin Cities metropolis was among the 10 leading rail centers in the United States. With direct connections to the four northern transcontinental lines by 1910, the Twin Cities was a significant transfer point between the Northwest and the main national rail corridor between the Midwest and the Atlantic coast (Borchert 1989:67).

Railroads encouraged concentration of manufacturing and distribution in the Twin Cities and in urban areas around the country. From 1860 to 1900, the share of industrial goods produced in the 10 largest American cities rose from approximately one-quarter to one-third, and operations in large urban areas tended to be the most productive. With superior rail connections, those firms had greater access to raw materials, wholesale markets, and credit, and they could tap into concentrated labor forces. In addition, the railroads, in search of their own efficiencies, favored the large volumes of freight provided by the big urban producers and rewarded them with preferential rates, at least until discriminatory rate-fixing was outlawed (Licht 1995:125-126).

Competition was fierce for the growing Twin Cities freight and passenger markets during the 1880s, particularly for service to Chicago. The Chicago Milwaukee and St. Paul (CM&StP) was the only major Chicago road with direct access to Minneapolis and St. Paul, while the Chicago and North Western (C&NW) allied with the Chicago St. Paul Minneapolis and Omaha (Omaha Road), and the Chicago Rock Island and Pacific (CRI&P) allied with Minneapolis and St. Louis (M&StL) for access. A price war in 1882 sent rates tumbling for freight and passenger service between the Twin Cities and Chicago, and at one point, one-way passenger fare from Minneapolis to Chicago fell from $14.50 to $0.50. Meanwhile, newcomer Minneapolis St. Paul and Sault Ste. Marie (Soo Line) provided direct connections to eastern markets starting in 1888, and the Northern Pacific and Great Northern provided outlets to Duluth. By the end of the decade, the total number of carloads of freight delivered to Minneapolis was 162,472 for the year 1889, while 149,060 carloads were shipped out of the city. St. Paul, meanwhile, received 158,892 carloads of freight in 1888 and shipped out 93,006 carloads (Hofsommer 2005a:109, 134, 154).

By the late 1880s, the Twin Cities area enjoyed rail connections to numerous markets. Six rail lines ran from the Twin Cities to Chicago and connected to eastern markets; four lines connected to St. Louis; two lines ran directly to the Pacific coast and four more connected with other transcontinental lines; four lines ran to Lake Superior; and 10 lines fanned out into the agricultural districts of Minnesota, Iowa, Nebraska, and the Dakotas (Hartsough 1925:95). With those connections, commodities and manufactured goods flowed into and out of the Twin Cities and Duluth in multiple directions. Raw commodities streamed into the Twin Cities from rural areas for storage, processing, and distribution; manufactured goods were shipped into the Twin Cities and redistributed to smaller cities and towns as well as manufactured goods that originated in the Twin Cities. Those movements of freight required networks of railroad lines connecting the Twin Cities to rural areas and to established (primarily eastern) markets. Each railroad company serving Minneapolis and St. Paul maintained an extensive network of rail yards, switches, and spur lines, as well as connections to joint facilities, such as union depots and transfer yards.

During the 1890s, Minneapolis reigned as the premier flour-milling district in the world, and produced large quantities of milled lumber, linseed oil, agricultural implements, and other manufactured goods. St. Paul was the state capital, a transportation center, and a wholesale/jobbing center. In addition, the Twin Cities together served as a regional gateway between the Northwest and the great Chicago rail yards and thus, to eastern cities. The Twin Cities' industrial-railway corridor extended roughly northwest to southeast from North Minneapolis, through the two downtowns, and into South St. Paul. Important corridors also entered Minneapolis from the southwest and ran through South Minneapolis and came into St. Paul on the East Side and the West End. At the heart of this system, the Minnesota Transfer Railway (MTR) linked the mainline tracks of the nine cooperating companies and was the focus of the industrial-commercial area known as the Midway District. When the United States Census Bureau began classifying urban areas as industrial districts for purposes of statistical measure in 1905, Minneapolis/St. Paul ranked eleventh in the country in value of manufactured products and thirteenth in population (Hartsough 1925:71).

Industrial districts were the groups of manufacturing operations on the edges of downtown areas and increasingly in suburban areas, such as St. Paul's East Side corridor, and Minneapolis' Hiawatha corridor. By the late nineteenth century, large-scale steam-driven manufacturing plants developed along railroad tracks, which fed them raw materials and coal and hauled out their products at unprecedented rates. The industrial zones contributed to the rise of cities by providing jobs for urban workers and low-cost manufactured goods. The districts themselves also were significant aspects of the urban built environment—spaces devoted to factories, rail spurs, and storage yards. Those zones were built not only with brick and steel but with previously exotic materials such as terra cotta, poured concrete, and wired glass. With their ability to haul in massive volumes of coal and haul out the nearly as voluminous ash, railroads facilitated the development of central electrical generating stations, which by the 1880s, were beginning to transmit electricity over long distances via alternating current.

In St. Paul, the main warehouse and industrial districts developed east of downtown. The St. Paul and Pacific, the first railroad in St. Paul and in Minnesota, connected the Lower Landing (Lowertown) steamboat warehouse district to the developing waterpower center at St. Anthony in 1862. By the mid 1870s, the CM&StP connected St. Paul and Chicago, and St. Paul had railroad connections in all four directions, converging in Lowertown from along the Mississippi River and its tributaries, Trout Brook and Phalen Creek. With its numerous warehouses and railroad connections, Lowertown was the principal wholesale district, and was the location of the Union Depot. To the east along the railroad tracks through the Phalen Creek Valley, the East Side industrial corridor became an early focus for manufacturing, including Hamm's Brewery and St. Paul Harvester Works. By the turn of the century, factories and lumber yards lined the Omaha and the Northern Pacific tracks, and about 30 manufacturing plants employing 7,000 people were located in the East Side district. In 1909, Minnesota Mining and Manufacturing (3M) located its headquarters in this area (Schmidt and Ketz 1996a).

The Midway industrial district located between Minneapolis and St. Paul (though within the St. Paul city limits) developed after the incorporation of the MTR in 1881. Organized by nine railroad companies serving the Twin Cities, MTR owned 200 acres with track, switches, and yard locomotives to handle switching and consolidation of freight originating in the Twin Cities, as well as through traffic. Numerous manufacturing and wholesale operations set up shop in the larger Midway district, and by the 1920s, the Midway Commercial Club had 1,150 members (Hartsough 1925:70-71).

Several industrial districts developed in Minneapolis. When the St. Paul and Pacific (later the St. Paul Minneapolis and Manitoba [Manitoba]) reached St. Anthony in 1862, then crossed the Mississippi River into Minneapolis in 1867, the industrial district forming around the falls had gained rail connections. Although the waterpower offered by the falls initially supported sawmills, flour mills, and a variety of manufacturing firms, by the late nineteenth century, flour mills dominated the riverfront. To serve the mills, as well as the growing wholesale establishments centered in the warehouse district northwest of downtown, the railroads built a vast array of main tracks, yards, and spurs running west along Second Street to about Third Avenue, then following the river. Although a true union depot was never built in Minneapolis, both the CM&StP and the Great Northern built large passenger and freight depots that were used by multiple companies.[6]

During the 1880s, two industrial corridors developed in south Minneapolis, both along the CM&StP tracks: one running north-south along Hiawatha Avenue and another east-west along 29th Street. A number of large manufacturers located in these corridors, including Minneapolis Harvester, Minneapolis Glass Works, and Minneapolis Heat Regulator Company (Honeywell) (Roise and Pearson 2000:14).

In 1916, the Minneapolis Industries Association took a step to concentrate manufacturing within Minneapolis by establishing the Northwest Terminal District in Northeast. A central freight warehouse provided facilities for the nine railroads that served the district, and the City improved streets and sewer connections. By the mid 1920s, about 50 commercial and industrial firms in the district employed about 2,000 workers (Peterson and Zellie 1998:24-25).

Railroads provided the transportation, but also provided an important industrial market. For example, railroad repair shops ranked fifth among the leading industries in St. Paul during the 1900s, and remained among the leading industries for the next several decades (Hartsough 1925:64). In both St. Paul and Minneapolis, the railroad yard and shop complexes established to service rolling stock occupied large land areas. For example, the Northern Pacific established the Como shops on 220 acres in 1885 to service passenger cars. Other large shop complexes included the Manitoba Jackson Street shops and the Omaha Road Randolph locomotive shops in St. Paul, as well as the CM&StP South Minneapolis shops, the M&StL Cedar Lake shops, and the Soo Line Shoreham shops in Minneapolis.

As discussed in Agriculture (see above), Duluth's rail and harbor facilities made the city a major grain storage and transshipment center. Those facilities also shipped massive volumes of iron ore from the iron ranges and lumber from the white pine forests of northern Minnesota. In addition, by the early twentieth century, Duluth was a wholesale and retail center serving much of northern Minnesota. The Duluth harbor was lined with wholesale warehouses that received goods via ship and distributed them via railroads.

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[6] A union depot united all of the railroads serving a city in a single facility, consolidating the various railroads' station facilities within a building or complex.

Population

During the late nineteenth and early twentieth centuries, the United States was transformed from a rural agrarian society into an urban industrial society, and by 1920, the urban percentage of the population surpassed 50 percent. In Minnesota, a rural Midwestern state, the Twin Cities share of the population grew from less than one-sixth in 1870 to one-third in 1900, and then to over 40 percent by 1920. The combined populations of Minneapolis and St. Paul, not counting the dependent cities and towns in the current seven-county metro area, surpassed 600,000 by 1920. Duluth, barely in existence prior to 1870, grew to a population of 30,000 in 1887, and by 1920, its 99,000 residents accounted for about 6 percent of Minnesota's total population (Borchert 1989:61). Railroads helped make this urbanization possible.

Just as railroad companies sought out urban areas as concentrated freight markets, big cities provided greater opportunities for passenger revenue. More residents naturally meant more potential travelers. In addition, through service was more lucrative than local service, and the railroad networks connecting major metropolitan areas carried most of the through service. By thus concentrating in large markets, the railroads both served urban populations and encouraged their growth.

The concentration of manufacturing, commercial, and service industries, as well as the railroads themselves provided myriad employment opportunities in urban areas. By the early twentieth century, railroad companies had become the largest group of employers in the United States—1.7 million workers in 1910 and over 2 million by 1920. Large industrial plants employed thousands of workers and even mid-sized plants employed hundreds. The need to administer the armies of industrial workers, coordinate the throughput (inflow of raw materials and outflow of goods), and account for all financial transactions led in turn to the creation of salaried managerial positions. Railroad companies were an early leader in the creation of the modern corporation with hierarchies of managers, supervisors, and workers. The employment opportunities, along with the cultural attractions of the cities, encouraged thousands of people to move to or remain in urban areas. In addition to job opportunities, the railroads delivered to urban areas basic necessities, such as food, clothing, and fuel, that were increasingly mass produced, processed, and distributed (Chandler 1977; Schlereth 1991:22).

Some of Minnesota's new residents were foreign-born immigrants and some were migrants from the eastern and southern United States. Immigrants arrived throughout the period between the mid nineteenth century and the mid twentieth century and represented a wide range of ethnic groups, such as Polish workers arriving as early as the 1860s and Filipino workers coming in the 1940s. Though many of these immigrant groups were not the subjects of large-scale promotional activities geared toward settlement, they were actively sought by the railroads as a source of cheap labor. Those that responded, like their agricultural counterparts, frequently formed ethnic enclaves, usually in proximity to the railroad where their jobs were located. In St. Paul, the Upper Levee was occupied primarily by Italians, the East Side was home to successions of Swedish, Irish, and Italian residents, and many Mexicans resided on the West Side (Holmquist 1981). Euro-Americans and African Americans followed the railroad lines west and north to Minnesota to obtain the same benefits as their emigrant counterparts, with the former creating agriculturally based colonies and both groups forming enclaves in proximity to the railroads to facilitate employment.

Blue collar workers often lived in tracts near the industrial zones centered on railroad lines; for example, block after block of nineteenth-century cottages and twentieth-century bungalows were built to house workers in neighborhoods such as Northeast Minneapolis and St. Paul's East Side. In Duluth, the main industrial area developed in the West End near the harbor/rail nexus, and much of the adjacent housing was built for workers (Gebhard and Martinson 1977).

Middle class urban residents often lived in suburban neighborhoods more distant from their places of employment in the downtown areas and industrial zones, and they commuted via streetcar lines or heavy rail commuter runs. For example, the CM&StP Short Line between St. Paul and Minneapolis served commuters in the Macalester Park and St. Anthony Park neighborhoods by the 1880s. By the early twentieth century, the Great Northern, M&StL, and CM&StP all had lines serving the communities around Lake Minnetonka, which were home to increasing numbers of year-round residents.

Railroads contributed to the standardization of building methods and styles during the late nineteenth century by increasing the availability of architectural catalogues, uniform building materials (such as bricks, prefabricated balloon framing, and cast-iron cornices), and even entire houses in kits. This standardization helped builders to increase their rate of production to meet the demand for all order of buildings in the growing cities.

In addition to travel within metropolitan areas, limited trains—express passenger service with limited stops between terminals—became common between the major cities. For example, the Twin Cities to Milwaukee-Chicago corridor was heavily traveled, and companies competed for passengers by providing numerous amenities: observation cars and parlor cars equipped with buffets, smoking rooms, and barber shops, as well as separate dining cars and sleepers. By the early twentieth century, the CM&StP (*Pioneer Limited*), C&NW (*North Western Limited*), M&StL (*North Star Limited*), as well as the Wisconsin Central, CGW, Chicago Burlington and Quincy, and CRI&P all competed for passengers. The Twin Cities to Duluth corridor was also competitive for passenger service, and the Great Northern, Northern Pacific, Omaha Road, and Soo Line all offered service (Hofsommer 2005a:195-196).

During the late nineteenth and early twentieth centuries, railroad companies built large elaborate union stations in big cities, including the Duluth Union Depot (Chateauesque), the St. Paul Union Depot (Neo-Classical), and the Great Northern (Neo-Classical) and CM&StP (Renaissance Revival) Depots in Minneapolis, which served as a pair of de facto union depots. Passenger terminals consisted of three primary spaces: the railroad yard and approach to the station; the train sheds for entering and disembarking the trains; and the terminal building, containing the waiting and baggage rooms and other services. The great passenger terminals were gateways to the cities. Minneapolis even created the Gateway Park in 1915 near the Great Northern Depot, which had been completed during the prior year.

Although the band of large industrial cities extending from the East Coast to the Mississippi and Missouri Rivers had created great wealth, architecture, and culture by the early twentieth century, in the eyes of many they had become crowded, dirty, and dangerous places. The concentration of manufacturing, commerce, and population that had been encouraged by the railroads and provided efficiencies and economies of scale were proving difficult to manage. Many people could escape to quiet residential neighborhoods at the end of the workday, and streetcars and commuter rail extended suburban developments farther and farther from the urban cores. After about the mid 1920s and particularly after World War II, just as cars and trucks decentralized passenger and freight transportation away from the railroads, they decentralized urban geographies in general. Cities built to accommodate (as well as to benefit from) railroads, had difficulty accommodating automobiles by the mid twentieth century.

Smaller Urban Centers

Although the railroads encouraged concentrations in big cities, railroads also provided for the transportation needs of smaller, wholesale and specialized industrial centers. Manufacturing and commercial operations in these smaller urban centers were important to the state economy and critical to the towns in which they were located. Although populations of large urban areas were growing rapidly during the late nineteenth century, roughly 50 percent of industrial workers in the Midwest still resided in smaller cities (Licht 1995:125).

Railroads connected the metropolitan urban centers of the Twin Cities and Duluth with a network of smaller urban centers, and those cities served as collection and distribution points for their surrounding service areas. Smaller cities that were located at intersections of railroad mainlines or that attracted specialized functions, such as railroad shops or division offices, agricultural processing or manufacturing facilities, or governmental or educational institutions, grew into modest-sized cities with multiple-county service areas. Of the roughly 30 small cities that grew into multiple-county, retail-trade centers, six of them developed into urban centers supporting manufacturing operations, wholesale as well as retail firms, and direct connections to major markets in addition to the Twin Cities and Duluth (Borchert 1989:56).

Even fewer cities developed into commercial and wholesale centers with sizable manufacturing operations. To support wholesale operations, cities needed direct access to multiple, large markets in addition to the Twin Cities or needed a broad hinterland within the larger Twin Cities hinterland. The southern Minnesota cities of Winona, Albert Lea, Rochester, and Mankato, as well as Aberdeen and Sioux Falls in South Dakota, each were served by multiple railroad lines with connections to Chicago. Those cities were storage and transfer points for the agricultural products of the surrounding areas and distributed primarily groceries and other commodities. To the northwest, Grand Forks/East Grand Forks and Fargo/Moorhead served as intermediary wholesale centers between the Twin Cities and Duluth terminal facilities and smaller markets in the Red River Valley and North Dakota (Hartsough 1925:185-187).

In the manufacturing sector, the location of a factory was dependent not only on railroads, but also to proximity to raw materials, an available power source (such as water), and local expertise. Development of concentrated production centers, however, was dependent on multiple railroad connections for favorable rates and access to a wider range of markets. The following cities, though not an exhaustive list, represent some of the concentrated manufacturing centers outside of the Twin Cities and Duluth: International Falls, (paper and wood products), Cloquet (paper and wood products), Winona, (various products, especially Watkins and some wholesaling;), Faribault (various products, especially woolen mills), St. Cloud (various products, especially granite, and the Great Northern shops), Brainerd, (various products, especially wood products, and the Northern Pacific shops), and Fergus Falls (woolen mills and flour mills).

XVIII. Minnesota Tourism and Recreation in the Lakes Region, 1870-1945

From its earliest days, Minnesota has been a tourist destination. During the 1850s, steamboats carried Southern and Eastern tourists on "fashionable tours" up the Mississippi River into the wilds of Minnesota, which offered a cool respite from the summer heat. Civic boosters and even doctors promoted the northern air as a cure for malaria and tuberculosis, among other ailments. Early tourism, however, was mostly limited to sites near the river, due to the difficulty of traveling into Minnesota's interior. The advent of travel by railroad to and in Minnesota soon made extensive steamboat travel seem old-fashioned.

Railroad construction throughout the state was accompanied by the development of more widespread tourism. Many of the railroads developed promotional materials to stimulate recreational travel along their routes. For instance, an 1877 pamphlet for the Minneapolis and St. Louis (M&StL) railroad to Taylors Falls, "The Summer Resorts of Minnesota: Information for Invalids, Tourists and Sportsmen," promoted travel by train as fast and safe, as well as being modern and luxurious. The pamphlet highlighted Minnesota's mild summer weather and cool breezes and its prairies and forests (McMahon and Karamanski 2002).

The earliest railroad-era tourist centers were Lake Minnetonka and, to a lesser extent, White Bear Lake, both located conveniently close to the Twin Cities population center and accessed via early railroads. The St. Paul and Pacific (later St. Paul Minneapolis and Manitoba [Manitoba], then Great Northern) railroad reached Lake Minnetonka in 1867 as it built westward from Minneapolis across Minnesota, and by 1871, there were two tourist hotels in the village of Wayzata. Lake Minnetonka was popular among wealthy residents of Minneapolis and St. Paul who took carriages or trains out to the lake for its clean air and outdoor recreations.

As publications promoting Lake Minnetonka's benefits spread, wealthy Minnesotans were joined by socialites from the South seeking to escape the 1878 yellow fever epidemic, as well as pleasure-seekers from the eastern United States and Europe. The M&StL Pacific Extension completed a railroad corridor along Lake Minnetonka's south shore in 1881, connecting to the Lake Park Hotel in Excelsior, which was partially owned by the railroad and had been built in 1879 in anticipation of the railroad. The Hotel St. Louis also had been built in anticipation of the M&StL and was located at the projected Deephaven stop. In 1882, James J. Hill built the Lafayette Hotel at Minnetonka Beach along with a connecting spur line. The Chicago Milwaukee and St. Paul (CM&StP) also built a spur line from its Hastings and Dakota line at Hopkins to the Hotel St. Louis in 1887 to tap into the tourist market. As access to the lake improved, more and more middle-class tourists visited the lake in addition to the wealthy. During the

1880s and 1890s, the Lake Minnetonka area was visited by approximately 20,000 tourists per year in search of sailing, rowing, yachting, bicycling, tennis, fine dining, and other forms of entertainment, as well as good health. Many tourists stayed in the large hotels or small summer cottages established on the lakeshore (Hofsommer 2005a:92-93; Jones 1957:246; Vogel 2003).

Train travel opened additional resort areas close to the Twin Cities during the late nineteenth century. Railroad and steamboat transportation were combined in the enjoyment of the St. Croix River Dalles for a time as trains from St. Paul, Milwaukee, and Chicago brought passengers to St. Croix River towns, where they took day excursions on river boats. The Lake Superior and Mississippi railroad (later St. Paul and Duluth, then Northern Pacific), brought visitors to the Chisago Lakes area via its branch line to Taylors Falls. Chisago County towns such as Center City and Lindstrom, as well as Forest Lake in Washington County became summer resort towns for residents of Minneapolis and St. Paul. Forest Lake offered the Marsh and Euclid Hotels, as well as tenting areas along the lakeshore. Further north on this line, travelers enjoyed the scenic passage along the Dalles of the St. Louis River (McMahon and Karamanski 2002).

In addition to resorts, a new form of tourist entertainment developed by the early twentieth century: amusement parks served by, and in many cases built by, railroad and electric street railway companies. The first permanent amusement park in the United States was built in 1895, and they soon became established recreational institutions. For railroads and streetcar companies, the idea was to “create a lure at the end of the line, a pleasure park for leisure enjoyment” (Adams 1991:57). The success of the parks in generating profits for the rail companies was such that all major urban centers in the United States had at least one amusement park served by rail transportation during the early twentieth century. In the Midwest, these parks were modeled after those at Coney Island, most had a carousel, a Ferris wheel, a roller coaster, a penny arcade, and fireworks displays, as well as band concerts and dance halls. Amusement parks were among the top tourist destinations of the day (Adams 1991:59-65).

Lake Marion in Dakota County is an example of the rail-oriented amusement parks. As early as the 1870s and 1880s, tourists stayed in a hotel and cabins at Weichselbaum’s Resort on Lake Marion. Many of the tourists arrived via the CM&StP railroad, which established a flag depot, known as Weichselbaum Station, during the 1890s in present-day Lakeville. Although the early 1900s were the heyday of the Weichselbaum resort, the creation of Antlers Park amusement park brought in numbers of tourists to the Lake Marion area not equaled by the earlier lakeside attraction.

Marion Savage built Antlers Park during 1908-1910 in order to draw passengers on his Minneapolis St. Paul Rochester and Dubuque railroad (MStPR&D, later Minneapolis Northfield and Southern), which built south from Minneapolis starting in 1908 and reached Northfield in 1910. Antlers Park included a refreshment store, dance pavilion, landscaped grounds, children’s playground, a baseball diamond, tennis courts, picnic kitchens, band concert promenade, bath house, and a boat house. Water-based recreation included swimming, rowing, canoeing, sailing, and a tall water slide, or bather's chute, set up in the lake (Schreier 2003:162-166). The MStPR&D brought thousands of people to the Lake Marion area each week, individually and as excursion groups on a 40-minute route between Minneapolis and Antlers Park. Passenger traffic steadily increased on the MStPR&D during the 1910s, tripling during the years 1911 to 1915, and much of this traffic went to Antlers Park. In 1912, for example, MStPR&D trains made 19 daily scheduled stops at the park (Mako 1978:35; Olson 1976:504).

The popularity of amusement parks was inextricably linked to that of rail travel. Such parks were desirable destinations that brought large numbers of passengers down rail lines during the first two decades of the twentieth century, but their desirability was due in large part to their accessibility. The mass shift toward automobiles beginning in the 1920s opened up entertainment alternatives that competed with amusement parks. As passenger travel declined on railroads, rail-oriented amusement parks also declined. A number of additional conditions compounded the drop in attendance during the early 1920s: the absence of automobile parking at parks that had been served by the railroad, Prohibition, a 1921 railroad strike, poor weather during the on-season during three years in the early 1920s, and the transference of many parks to private ownership. By the mid 1920s, the heyday of the amusement park as a recreational destination was past (Adams 1991:66).

The rail system that supported the development of these resort areas soon encouraged vacationers to travel farther from home. As railroads extended from the Twin Cities into western and northern Minnesota during the 1870s, tourism followed. By the 1880s, the Manitoba, Northern Pacific, Great Northern, and CM&StP were promoting the lakes along their lines. Early resorts included Geneva Beach and Hotel Blake near Alexandria and Brightwood Beach near Litchfield on the Great Northern, the Hotel Minnesota near Detroit Lakes on the Northern Pacific, and Lakes Sarah and Shetek in southwestern Minnesota. In addition to the lakes, railroads provided access to prime hunting areas. For example, western Minnesota and Dakota Territory were popular among duck and pheasant hunters. Other locations evolved into tourist destinations. Although the Chase Hotel in Walker initially served mostly employees of the Great Northern and Northern Pacific and traveling salesmen when Bert Chase established it in 1898, Chase built the Isabel Lodge in 1915 to accommodate the growing tourist market. In 1898, Joseph and Josephine Ruttger began renting rooms at their farm outside Brainerd to fishermen who had come in on the Northern Pacific (Koutsky and Koutsky 2006:124-125; Walsh 1994:65-66, 69-70).

In addition to small parties, excursion groups were popular during the late nineteenth century, and they often rented whole passenger cars. By the turn of the twentieth century, excursion trains were running on the Great Northern, Northern Pacific, and other lines from the Twin Cities and from Chicago through Duluth into the northern lakes area. The group outings were not only from large cities into rural recreation areas; during the 1890s and 1900s, small town excursion groups commonly took day or weekend trips to Minneapolis and St. Paul to shop at department stores or to take in theater, musical performances, and athletic contests (Hofsommer 2005a:166-167; Prosser 1966:44).

Beginning in the 1910s and increasingly during the 1920s, automobiles became the preferred mode of travel for Minnesota tourists traveling to or from the Twin Cities. Railroads continued to carry many of the long-distance travelers, and the Great Northern line through Glacier National Park and Northern Pacific line through Yellowstone National Park were famous for their luxurious accommodations. For those traveling to the northern lakes or to Lake Superior's north shore, however, automobiles provided greater flexibility and access to resorts, lodges, or remote cabins. During the 1930s, despite the effects of the Depression, tourism was a growing industry in northern Minnesota, particularly along the North Shore of Lake Superior. As highways improved, aided by Depression-era federal relief funding and construction, automobiles carried an increasingly larger share of tourists. For example, when the old North Shore Road along Lake Superior was rebuilt as a state highway in the early 1930s, the border lakes region was opened up to tourists who traveled primarily by automobile (Schmidt and Abel 2000b:28-29).

XIX. Northern Minnesota Lumbering, 1870-1930s

The expansion of Minnesota's railroad system, greater demand for lumber, and other factors supported the expansion of lumbering after 1870 in Minnesota's North Woods, a combined coniferous and deciduous forest located north and east of the Mississippi River. The stands of white pine in this vast forested area were the most highly prized and aggressively logged off. As railroads opened portions of the North Woods not readily accessible by the many streams that drained into the St. Louis, St. Croix, and Mississippi Rivers, investments in lumber operations increased—and the state's lumbering industry increased steadily in volume through the 1880s and 1890s. By the time the northern pine was being logged, Minnesota's railroad system linked its commercial centers, Minneapolis, St. Paul, and Duluth, with the already settled areas in southern Minnesota and the Great Plains to the south and west. The agricultural areas to the south and west lacked trees and consumed a significant amount of Minnesota's lumber. After a peak in lumbering at the turn of the twentieth century, the industry declined during the following decades. The closure of the last major sawmills circa 1930 marked the end of a significant industrial era in Minnesota.

Railroads claimed several essential roles in the expansion of lumbering in northern Minnesota during this period, in both the extractive and distributive phases of the industry. The land grants that some of the lines received included extensive stands of timber. For instance, the grants to the Lake Superior and Mississippi Railroad (LS&M, later the St. Paul and Duluth Railroad [StP&D]) and the Northern Pacific were rich in timber. These lines were engaged in the lumber industry directly by carrying logs and milled lumber, as well as through the sale of stumpage, investment in sawmills near their lines, and in the purchase of railroad ties and cordwood from settlers on the land grants. Even more directly, the logging railroads, which were specialized and often temporary lines, extended into the forests to convey cut trees to nearby rivers, sawmills, or common carriers. Rail lines became common components of logging operations in Minnesota after the mid 1880s. Minnesota's common carrier railroads, which hauled mixed freight and passengers, also had essential roles in the lumbering industry. Common carriers that passed through the northern lumbering areas conveyed cut logs to sawmills in Minneapolis, Little Falls, Duluth, and other cities. Virtually all of the common carriers operating in Minnesota participated in the distribution of milled lumber in all directions from Minneapolis, which was the center of the state's lumber distribution market.

The logging landscapes in Minnesota passed relatively quickly from operations that relied on rivers, log drives, and boom operations to operations that combined water and rail transport. Logging near the Mississippi, Minnesota, and St. Croix Rivers was supported by a system of log camps in stands of trees near streams that fed into the rivers, boom operations, and river towns that served the logging camps and where sawmills might be located. With its increased production, this type of procurement operation was particularly successful when associated with the new steam-powered circular and gang-saws that could be operated around the clock. Economy of scale was reached when log drives delivered the raw materials to the mills, which were situated for the distribution of cut timber by rail to growing cities and the timber-starved Great Plains. Once a common carrier line was complete through a timber producing area, logging operations were centered at locations where the rail line intersected a log-carrying stream or logging railroad. Logging railroads, ice roads, and boom operations delivered logs to sawmills and the cut lumber was then distributed by the railroad line (Williams 1990:152-157). These type of developments occurred throughout northeastern and north-central Minnesota; for example, during the 1870s, it took place where the LS&M rail line crossed the tributaries of the St. Croix River.

Common-carrier railroads sustained the lumbering industry in northern Minnesota in both the extractive and distributive functions during the 1870s. The LS&M line between St. Paul and Duluth, completed in 1870, passed through the eastern portion of the North Woods. The extractive aspect of the industry was altered as sawmills were developed along this rail line, and the LS&M began to transport milled lumber from these northern mills to Minneapolis and Duluth. Other rail lines moved sawed lumber from Minneapolis, Stillwater, and Winona to the developing agricultural areas south of Minnesota. The lumber that they carried made the treeless prairies to the west and southwest inhabitable. The lumber industry of Winona, which initially relied on river transport, was expanded as the Winona and St. Peter Railway (W&StP) was completed westward. By 1871, the W&StP carried nearly 13,000,000 board feet of lumber west, much of it to the many Youmans and Hodgins lumber yards located along the line in Minnesota. The St. Paul and Sioux City Railroad (later acquired by the Chicago St. Paul Minneapolis and Omaha [Omaha Road]) carried considerable lumber into Dakota Territory and to Omaha and Kansas City (Larson 1949:107-109).

Minneapolis became the center of Minnesota lumber distribution during the 1870s due to its central location on the Mississippi River and extensive railroad service. The sawmills that developed at St. Anthony Falls during the 1850s processed at least half of the logs cut in northern Minnesota during the 1860s. Minneapolis was well on its way to becoming the center of sawmilling and wood products manufacturing in the state, a fact that enhanced its position in the distribution system. By the mid 1870s, seventeen firms dressed rough lumber and made doors, window sash, and blinds in addition to those attached to sawmills. Other lumber-based manufacturers made furniture, wagons and carriages, barrels for the flour and meat packing industries, and other items.

By 1876, over 137 million board feet of lumber were sent by railroad from Minneapolis to markets in Minnesota, Iowa, Missouri, Kansas, Nebraska, and Dakota Territory. The amount of lumber, lath, and shingles increased every year. During the 1870s, the relationship between the lumber and agricultural industries and rail shipments became clear. The treeless areas where wheat flourished needed the white pine cut in northern Minnesota for the construction of houses, elevators, and farm buildings. The freight runs that carried wheat east to Minneapolis and Duluth transported cut lumber in the opposite direction (Hartsough 1925:40; Larson 1949:110-112, 150-151). The early sawmills in Minneapolis were replaced during the late 1870s and 1880s by more modern operations operated by steam and located north of St. Anthony Falls on the Mississippi River.

The intensity and pace of the lumber industry in Minnesota increased during the 1880s. Minneapolis was ranked third among lumber-producing cities in 1880, following Bay City and Muskegon in Michigan. Minneapolis advanced its position as the center of the milling and distribution system as the white pine stands in Michigan were depleted. The extensive railroad network extending from Minneapolis made the city the logical location for the headquarters of many line-yard companies. Large line companies located numerous lumber yards along the rail lines. During the heyday of the state's lumber operations, many rail lines profited by transporting lumber from Minneapolis. The Minneapolis and St. Louis Railway, with superior access to Minneapolis and with lines running south through settled portions of Minnesota, Iowa, and Illinois, carried more lumber than any other line during the mid 1880s. The St. Paul Minneapolis and Manitoba Railway, which held second place as a lumber carrier in 1885, increased its tonnage every year through the 1880s.

Logging railroads, typically owned and operated by logging companies, altered lumbering operations in several important ways. These railroad lines were built quickly and relatively cheaply through the forests. They altered the seasonal schedule of lumbering because lumbermen no longer needed to rely on only streams and rivers to move felled trees and bucked logs from cutting areas to the mills. Because logs could be moved out of the forest throughout the year, sawmills could also operate year round and the capital invested in them was maximized. The expenses involved with construction and relocation of logging railroads, however, encouraged the operational policy of "cut out and get out" as the lumber companies sought to maximize profits and avoid long commitments of capital in the production operation (Birk 1998:E-1; King 1981:7, 18, 21). The approximately 10-mile-long logging railroad that the J. M. Paine and Company operation built in Carlton County in 1886 is thought to be the first instance of the use of narrow-gauge rail in Minnesota logging, though the technology had been utilized previously in Michigan lumbering operations. Forty companies built more than 5,000 miles of logging railroad lines in northern Minnesota during the following decades.

The separation of logging railroads and common carriers, however, was not always clear by reviewing function or by ownership and operation of the rail line. Some branch and local lines that became components of larger rail systems were standard gauge logging railroads that also carried local passengers and freight, and essentially functioned as common carriers. For example, the Duluth and Iron Range and Duluth Missabe and Northern railroads both operated many miles of spur tracks used exclusively for logging. By 1910, as logging operations were contracting in many areas, six common carrier lines owned by lumber companies operated 400 miles of mainline in addition to some 200 miles of constantly changing branches and spurs (King 1981:7, 16-17, 24-25).

During the heyday of the lumber industry in northern Minnesota, the railroads were critical elements in commercial logging operations. The extractive operations utilized all the components developed for Great Lake states' logging, such as steam skidders, ice roads, and narrow-gauge logging rail lines. Decentralized milling operations were connected with the central distribution center, Minneapolis, by numerous common carrier rail lines. Sawmill towns grew where the rail lines served milling operations. Local economies and railroad revenues depended on the success of the winter logging season, which in turn was affected by the weather and snowfall. Both the land uses and general setting for the railroad corridors were part of the dynamic commercial logging landscape as sawmill operations started up and flourished. Loggers then moved into nearby towns and community and commercial services were expanded. The settings for many railroad lines changed from long stretches of dense forests to broad expanses of clear-cut woods. As the timber was extracted, sawmills and the activity in sawmill towns migrated to unexploited areas.

Logging towns suffered economic challenges when sawmilling operations were moved or closed down as the forests in the vicinity were cleared. In some cases, the forest products industries, the resort industry, and other efforts sustained the former sawmill towns. Many northern Minnesota towns, and the railroad lines that served them, were part of the logging landscapes of production. For instance, Pine River and Brainerd on the Northern Pacific line had origins as sawmill towns. Although Bemidji had been founded before the Great Northern route between Fosston and Duluth was completed during the late 1890s, the arrival of the railroad turned the village into a lumber town, particularly after a sawmill was located there in 1903. Aitkin had a different position in the lumber production landscape, but one that also depended on the railroad. The town was established where the Northern Pacific line first crossed the Mississippi River west of Duluth, expressly to provision lumber camps located upstream. Steamboats on the river linked Aitkin and the railroad to the lumber camps.

As the demand for lumber in Minneapolis exceeded what the local mills could produce, cut lumber was brought into the city for distribution. The Omaha Road brought logs into the city from the Superior and Bayfield areas of Wisconsin, and then hauled the milled lumber south and west. During the mid 1880s, seven rail lines each transported over 125,000 tons of lumber and forest products annually from Minneapolis; another five distributed from 26,000 to 60,000 tons of lumber. A new lumber distribution pattern was established when the Minneapolis St. Paul and Sault Ste. Marie (Soo Line) carried Minnesota lumber, as well as wheat and flour, to the east coast while bypassing Chicago (Shutter 1923:343; Larson 1949:115-118).

During the 1890s, lumbering in northern Minnesota was affected by the demise of similar operations in Michigan. The influx of former Michigan lumbermen and their capital altered the industry, as did the consolidation of timberland holdings and processing facilities into fewer and larger operations. The market for Minnesota lumber was expanded to the east after Michigan's white pine stands were exhausted. The lumber industry in Duluth, in particular, was infused with new energy and capital as lumbermen relocated west from Michigan. By 1880, the lumber industry in that city was shipping building materials west to the Red River Valley and northern Dakota Territory on the Northern Pacific. The sawmills of Duluth and nearby Superior, Wisconsin, also shipped considerable amounts of lumber east via Great Lakes lumber carriers. By 1890, the Duluth and Winnipeg Railroad had been extended 100 miles into what had been an inaccessible forest. The former Michigan lumbermen also established some of the modern sawmills located north of St. Anthony Falls in Minneapolis. These businesses, coupled with the significant decrease in Michigan pine shipped to Chicago, helped Minneapolis supplant Chicago as the commodities distribution center for the white pine industry.

During the 1890s, Frederick Weyerhaeuser and other lumbermen developed new alliances with lumbering and processing firms that concentrated capital and influence. Weyerhaeuser and associates purchased the remaining portion of the Northern Pacific land grant in 1890 and that transaction shifted extensive tracts of lumber into private hands. Weyerhaeuser's group established sawmilling operations closer to the cutting, at Little Falls, Cloquet, and Virginia, but still kept sawmills in Minneapolis busy. The economic Panic of 1893 was a set-back for the lumber industry; it recovered, however, and 1899 was the peak year for sawmill cutting in Minneapolis and throughout the state. Railroads continued to carry lumber and wheat profitably through the early twentieth century. By the early 1900s, however, most lines carried more grain than lumber (Koop and Morris 2006:E-7; Larson 1949:229-244, 252).

Although the turn of the century is considered to be the peak of logging in Minnesota, logging operations continued in some of the less accessible northern regions of the state well into the twentieth century. The construction of railroad lines for lumbering operations continued during this time. The development of lumbering and paper making operations in Koochiching County, near International Falls, constituted one of the later and transitional chapters of the industry in the state.

Lumberman Edward W. Backus was determined to realize the lumbering potential of the far north-central area of Minnesota. Although International Falls was not yet connected to the state's rail system in 1900, Backus and partner Joseph Baker sent timber cruisers and surveyors into the northern woods to scout timber and rail line routes. In 1907, the Minnesota and International Railway (controlled by the Northern Pacific) constructed north from Brainerd, and the Duluth Virginia and Rainy Lake Railway (taken over in 1912 by the Duluth Winnipeg and Pacific Railway) was completed. Backus' vision for the International Falls area also included the construction of a waterpower dam and development of a paper-making plant.

The Mando paper making operation, as planned by Backus, was underway soon after a dam and hydroelectric plant were completed circa 1908, and it became a prominent paper making operation by 1930. Backus introduced Insulate, an insulation board made from wood by-products in International Falls, in 1916. Much of Backus' vision was implemented, and International Falls was an important lumber manufacturing and paper manufacturing center during the mid 1920s (Drache 1992:3, 6, 136-141; Hartsough 1925:190; Jeffrey 1989:228).

Sawmill operators had modernized their operations to stay competitive during the 1890s, and by 1900, three of the four mills in the United States that produced more than 100 million board feet per year were located in Minnesota. While investments in the lumbering industry decreased after 1900, forest products industries expanded, and Cloquet became a multi-faceted forest products center well-served by two trunk railroad lines. The Northwest Paper Company began manufacturing paper in Cloquet in 1898; the Weyerhaeuser interests transformed Northwest Paper into a producer of newsprint; and the Cloquet Box Company began operations in 1904. The Berst Company began manufacturing clothespins, toothpicks, and tongue depressors in 1905 and later added matches to its product lines. The Diamond Match Company operated a factory in Cloquet from 1905 to 1908. The large forest fire that burned Cloquet in October 1918 destroyed the facilities of the last active lumber milling operation, though the city rebounded as the center of forest products industries. The Weyerhaeuser firm maintained an interest in wood products and during the early 1920s established the Wood Conversion Company in Cloquet. During the mid 1920s, quantities of lumber, lath, shingles, and other products were shipped by railroad from Cloquet (Carroll 1987:150-152; Hartsough 1925:190-191; Jeffrey 1989:227).

By 1890, much of northern Minnesota and the rail corridors that passed through that portion of the state had become a landscape of logging depletion with large expanses of cutover forests. The cutover in Minnesota was part of over 50 million such acres in the northern Midwest. In a short period of time, the cutover dotted with stumps and slash piles had replaced the forests and would take decades to replenish. The extent of this land, and the need to replace its economic usefulness, resulted in the collaboration among timber companies, railway companies, and local governments to promote settlement and farming in cutover areas (Williams 1990:158-59). Promotional material of the era pointed to possibilities and downplayed or ignored the marginal quality of the land, short growing season, and the need to clear and prepare land for cultivation. Settlers came to the cutover areas, acquired land, and attempted to farm, and some of the former lumber towns experienced a short period of prosperity as long as nearby residents persisted with subsistence farming. Eventually abandoned farmhouses and outbuildings became part of the cutover landscape. As during the period of active lumbering, the cutover landscape was ever changing, as plant succession took place, forests were planted as part of the conservation movement, and small farms were carved out of it. Indeed, the rail lines through these areas were the most stable element of the landscape.

The demise of the northern Minnesota lumbering operations led to a similar demise in the railroads that exclusively served them during the 1910s and 1920s. In 1910, Minneapolis ranked third in the United States as a lumber producing city—a short nine years later, the city's last operating sawmill closed its doors. Minneapolis maintained its importance, however, as the center of the lumber wholesale trade due to its extensive railroad connections. Duluth's last active sawmill closed in 1926. In 1922, the Duluth and Northern Minnesota operation abandoned its 99-mile railroad line. In 1929, the Virginia and Rainy Lake Company, the largest white pine sawmill operated in Virginia, Minnesota, cut its last log (Hartsough 1925:41; Koop and Morris 2006:E-8).

XX. Minnesota's Iron Ore Industry, 1880s-1945

Introduction

The iron ranges of northern Minnesota were one of the state's major natural resources and contributed raw materials that supported the nation's steel industry. This resource contributed significantly to the early twentieth century economic and physical development of the United States. By the turn of the century, steel had surpassed iron as a primary building material and was used extensively in bridges, rails, framing multi-story buildings, and all order of consumer products. In addition, iron ore from Minnesota was a vital national resource during the First and Second World Wars, as well as the Korean War. The three ore ranges of Minnesota, the Mesabi, Vermillion, and Cuyuna, have related but individual histories of development. The railroad lines that crisscrossed the iron ranges by the 1920s played a critical role in the transportation of iron ore by connecting the mines with Lake Superior ports at Duluth and Two Harbors, and at Superior, Wisconsin.

Although railroads provided significant transportation links, they played largely supporting roles in community development and local commerce on the iron ranges. The citing of townsites, locations (residential enclaves owned by mining companies), and the occasional company town were determined by the mining companies or by speculative developers based on proximity to mine sites. Railroad lines supported communities by hauling manufactured goods and passengers, but rail alignments were heavily dependent on the position of the mines or, in the case of rail spurs, entirely dependent.

The Mesabi Iron Range

Due to the location and configuration of the Mesabi Iron Range, mining operations depended entirely on railroads to transport the iron ore to Lake Superior ports at Duluth/Superior and Two Harbors (for a map of the railroad network in the Mesabi Iron Range, see Maps section). The Mesabi Iron Range is a long, narrow deposit only two to ten miles wide, but extending about 100 miles long from the northeast to the southwest through western St. Louis and eastern Itasca Counties. Much of the ore was close to the surface and could be extracted by strip mining, though some shaft mining occurred as well. Within a decade after the first mine opened on the Mesabi Iron Range, the ore body was the most important source of iron in the United States, and Minnesota led the nation in iron ore production (Lass 1977:163).

The iron ore deposits at the eastern end of the Mesabi Iron Range were generally high-grade ores suitable for use in a steel mill. The western end of the range, however, generally contained a softer ore mixed with sand, which could not be used by steel plants without intermediate processing. Mining interests developed a successful ore washing and concentrating process, known as beneficiation, which made mining in the western Mesabi Iron Range feasible.

Development of the mining industry in the Mesabi Iron Range in the 1890s, located in an unsettled portion of northeastern Minnesota, required a railroad transportation system to deliver its ore to the Lake Superior ports. The rail lines connected the mines with Great Lakes shipping fleets, which in turn carried the ore to ports on Lake Erie that served steel mills in Ohio and Pennsylvania.

In addition to hauling the iron ore, railroad transportation was essential for developing the mines. The railroads brought workers, supplies, and equipment into the Mesabi Iron Range where there were few roads. For example, the completion of a branch line or mine spur allowed for delivery of steam shovels that removed both the overburden and ore from the stripping operations at the mines. The rail lines also provided passenger service across the range and between the mining communities and Duluth.

The Eastern Mesabi Iron Range Mines

The Merritt family was initially responsible for the development of iron ore mining and transportation on the eastern Mesabi Iron Range. The Merritts relocated to Minnesota from New York State in 1855 and were among the early settlers of the Duluth area. By the 1880s, several of the second generation of Merritts were among the leaders of Duluth, active in government and business affairs (Walker 1979:76-80). During the 1880s and 1890s, they attempted, with fellow Minnesotans, to use Midwest capital to fund mining and railroad construction, and keep the region’s resources under local control.

The Duluth Missabe and Northern Railway Company (DM&N) was established in 1891 by several Duluth businessmen, including five members of the Merritt family. The DM&N Railway’s first service route extended from the Mountain Iron Mine to an ore transfer facility on Allouez Bay in Superior, Wisconsin. In 1892 the DM&N constructed 26 miles of line from the mine to Stoney Brook Junction and leased from local short line Duluth and Winnipeg Railroad Company tracks east of Stoney Brook and its ore transfer dock on Allouez Bay. This combination was the first Mesabi Iron Range ore run.

In 1892, the Merritt brothers and their colleagues leased the Missabe Mountain Mine near Virginia to Henry W. Oliver, who owned the Oliver Iron Mining Company and was developing a number of properties on the range. Oliver then agreed to ship the iron ore on the Merritt’s DM&N railroad. Once the DM&N completed spur lines to the Biwabik Mine and a Missabe Mountain spur from Wolf to Virginia, the line served all the mines then active in the eastern Mesabi Iron Range (Walker 1979:108).

Rapid development of the mines in the eastern Mesabi Iron Range during the early 1890s encouraged the Merritts and their associates to construct the DM&N Railway's own line into Duluth in 1893 and to establish an ore terminal in West Duluth. The expansion required additional capital, however, and coincided with the financial Panic of 1893. These factors had long-lasting effects on the development of the Mesabi Iron Range. Overextended financially, the Merritts lost control of the DM&N Railway, and it became a subsidiary of the Lake Superior Consolidated Mines, a company controlled by John D. Rockefeller's U.S. Steel Corporation. Though Duluth businessmen lost control of the railroad, the line flourished. Because Rockefeller could forego immediate profits, he financed expansion of DM&N branch lines to additional mines in 1894 and 1895 and construction of a second ore dock in Duluth (Walker 1979:204-205).

As Rockefeller expanded the DM&N, Oliver interested Henry Clay Frick and Andrew Carnegie in acquiring the source of the iron ore used in their steel-making enterprises. In 1894 the Oliver Iron Mining Company became part of Carnegie Steel (Walker 1979:208-209). Two years later, the Oliver Iron Mining Company leased the iron ore properties of Rockefeller's Lake Superior Consolidated. This arrangement led to the dominance of the Mesabi Iron Range by Eastern mining and transportation concerns. The Oliver Iron Mining Company (Carnegie Steel) had by far the largest mining operation. The DM&N railroad (Lake Superior Consolidated) transported all of the ore produced on the range to Duluth. From there it traveled on Rockefeller's Bessemer Steamship Company ore carriers to Lake Erie ports. In this way, the rail line that was initiated with Midwest capital became a component of a large, vertically integrated industrial corporation.

While eastern Mesabi Iron Range ore production increased during the late 1890s, another prominent businessman became interested in the area. During the early 1890s, James J. Hill unsuccessfully attempted to purchase the Duluth and Winnipeg Railway, a line that extended northwest from Duluth just south of the Mesabi Iron Range. He then began construction of a competing line and soon purchased the rival short-haul line. The acquisition included an ore dock and other facilities in Superior, Wisconsin, and Mesabi Iron Range ore land held by subsidiary mining companies (Walker 1979:218). Hill's Eastern Railway Company subsidiary of the Great Northern Railway completed a line parallel to that of the former Duluth and Winnipeg Railway and purchased a short haul logging railroad that extended into the eastern Mesabi Iron Range. The two lines intersected approximately 20 miles southeast of Grand Rapids at Swan River and began hauling iron ore in 1895. That same year the Mahoning Mine opened near Hibbing and later became part of the largest open pit mine on the Mesabi Iron Range. Independent of the Rockefeller and Carnegie-Oliver interests, it used the Great Northern Railway for ore transport.

Hill thus established an ore transport route through the Mesabi Iron Range. He improved the Great Northern's position as an ore carrier during the early twentieth century with the construction of a more direct connection between Duluth and Ellis, located between Hibbing and Virginia, and additional branch lines. Although Hill's iron ore lines also served mines operated by U.S. Steel, he provided the Mesabi Iron Range with a transportation outlet independent of the Rockefeller and Carnegie interests.

A third railroad, the Duluth and Iron Range (D&IR), also served the eastern Mesabi Range. In 1892, the D&IR constructed a branch off its main line from Allen Junction to McKinley, in the Biwabik deposits and to other Mesabi deposits in 1893 (H. V. Winchell 1895:6). The D&IR continued westward through the Mesabi Range to Virginia, completing the route from McKinley the following year. A branch from McKinley to Eveleth was finished in 1895 and extended in 1910 to Webster (Prosser 1966:127-128). Additional branches were built from Mesaba via Dunka River to Scott Junction (1914) (the Mesaba to Dunka River portion was taken up in 1960), and from Wales to Whyte (1917-18). This construction completed the D&IR's iron ore-hauling system, with the exception of a 1948 line from Whyte to Forest Center. By 1927, the mines at Aurora, Babbitt, Biwabik, Colby, Ely, Eveleth, Largo, McComber, McKinley, Mariska, Pettit, Sparta, Soudan, Virginia, and Winton were served by the D&IR (Prosser 1966: 128; Zellie 2005:2-5).

The Western Mesabi Iron Range Mines

Development of the western end of the Mesabi Iron Range was delayed because of the difference in the ore found there. The sandy, silica-laden ore was undesirable to steel producers unless it could be processed into a higher-grade ore. The Oliver Iron Mining Company began to develop mines in the Canisteo Mining District after 1905, as it explored methods for concentrating the ore. John Greenway, the Oliver Iron Mining Company's General Superintendent of its Canisteo Mining District, tackled the problem and developed a prototype ore washing process. The Oliver Iron Mining Company's Trout Lake Washing Plant utilized Greenway's approach, which in turn led to the development of large mines in the western Mesabi Iron Range. The Trout Lake washer, placed in operation during the summer of 1910, processed ore from the Canisteo and Holman Mines.

The Oliver Iron Mining Company also oversaw the development of a model company town, Coleraine, near its Canisteo Mine and the smaller company town of Taconite near the Holman Mine. The nearby town of Bovey was platted by other interests and had some independence from the Oliver Iron Mining Company influence over the region.

Two railroads served the western Mesabi Iron Range: the DM&N (now the Duluth Missabe and Iron Range Railway) and the Great Northern (now the Burlington Northern Santa Fe Railway). The two railroads serving the iron mining industry followed it into the western Mesabi Iron Range. In 1906, the DM&N Railway constructed the Alborn branch line, a 55-mile line that extended northwest from Alborn on its mainline to Pengilly, and then extending southwest along the iron range to terminate near Bovey and Coleraine in the Canisteo Mining District. In 1903, the Great Northern Railway built a line from Kelly Lake, a junction southwest of Hibbing to Nashwauk at the eastern edge of the Canisteo Mining District. In 1909, the line was extended from Nashwauk to Gunn, a station southwest of Grand Rapids on the Great Northern Railway's line between Duluth and northwest Minnesota.

By 1909, the Canisteo Mining District at the western Mesabi Iron Range was well served by the two ore carrying railroads. A third rail service in the area was the track of the Oliver Iron Mining Company that moved ore between mines and the Trout Lake Washing Plant where it was concentrated. The company had rail shops at Coleraine that supported this function (Bradley et al. 2003).

Vermilion Range

The Vermilion Iron Range comprises an area between 5 and 15 miles wide in St. Louis, Lake, and Cook counties. Iron ore was first discovered by Charlemagne Tower on the Vermilion Range in 1865, commercial mining was not feasible until a railroad was built to haul ore from the mines. Although the Vermilion Range was less productive than the Mesabi and Cuyuna Ranges, it produced Minnesota's first shipment of iron ore in 1884 via the D&IR. The D&IR had exclusive railroad access to its mines from the beginning. As such, the history of the range is nearly synonymous with the history of the D&IR.

The D&IR was established in December 1874. Its charter specified the construction of a railroad from Duluth to the northeast corner of Township 60 North, Range 12 West on the Mesabi Iron Range. Although the Minnesota Legislature granted the company 10 square miles of swampland per mile of track, no work was done on the line until Tower purchased the line in 1882. The Minnesota Iron Company was organized the same year to operate the Soudan Mine at Tower Junction. High-grade ore was also discovered at Ely the same year (Zellie 2005:2-5).

In July 1884, the Soudan Mine was linked to a new port at Agate Bay, northeast of Duluth (Lamppa 2004:48; Prosser 1966:127). Agate Bay, which developed into the town of Two Harbors, was chosen as the initial terminus of the line because the extremely rough terrain northeast of Duluth slowed a rail connection from that direction. By 1886, the D&IR had constructed a connecting line to Duluth, approximately 60 miles to the southwest. In 1887, control of the railroad was purchased by the Illinois Steel Company.

Once the D&IR had established traffic between the Vermilion Range and the Lake Superior ports, construction progressed as fast as new mines could be opened. In 1888, the D&IR built a branch line from Tower Junction northeast to Ely at the east end of the Vermillion Range. With this rail access, the

Chandler Mine began production (Walker 1979:67-70). In 1901, the D&IR and its competitor, the DM&N, both were acquired by the United States Steel Corporation (U.S. Steel). This created a level of financial stability for the D&IR. The railroad completed its Vermillion Range rail network with a branch line from Robinson to Burntside Lake in 1913 (Prosser 1966: 128).

Cuyuna Range

The Cuyuna Iron Range is approximately 80 miles long and nearly 30 miles wide, located roughly in the geographical center of the state. The ore deposits extend in a northeast-southwest direction from Morrison County to Aitkin County, with the greatest concentrations in Crow Wing County.

Cuyler Adams is considered the discoverer of the Cuyuna Range. Adams had been an early investor in the Northern Pacific Railroad, but in 1878, exchanged his devalued company stock for agricultural land in North Dakota (Lamppa 2004:190). After making a significant profit as a wheat farmer, he moved back to Crow Wing County in 1882. It was there, while surveying the boundaries of his property, that Adams noticed systematic deviations in his compass readings. He correctly deduced that the deviations were caused by large iron ore deposits, and established the Orelands Mining Company to exploit the resource. Unfortunately, Adam's unusual method of discovery and the fact that his property was located 50 miles from any known iron ore deposits failed to inspire local investors, and he spent twenty years unsuccessfully trying to market Orelands stock. It was not until the Oliver Iron Mining Company (a U.S. Steel subsidiary) began exploratory drilling in the area that Adam's claims were taken seriously. The Oliver drilling crews withdrew in 1904 after a dozen fruitless attempts to locate ore, but in the meantime, Orelands had secured its financial backing (Lamppa 2004:191).

In 1909, Adams incorporated the Cuyuna Iron Range Railway Company (CIR) to serve the Orelands Mining Company, namely to transport the ore now coming out of Adams' Kennedy Mine. Sensing future profits to be made, Adams' control of the CIR was immediately purchased by the Soo Line. The Soo Line hauled its first load of Kennedy ore in 1911. Later in 1911, Adams founded the Cuyuna Northern Railway Company to build a mainline from Deerwood north to the Mississippi River, and construct two branch line connections: one to the Northern Pacific between Deerwood and Aitkin, and another southwest to the Northern Pacific between Fort Ripley and Brainerd (Prosser 1966:127). In 1912, Adam's new railroad delivered its first load of ore from the Cuyuna-Mille Lacs Mine to the Northern Pacific junction (Walker 1979:254). Like the Minneapolis St. Paul and Sault Ste. Marie (Soo Line), the Northern Pacific was interested in exploiting the potential of Minnesota's iron ranges, and it acquired the Cuyuna Northern in 1914.

After the Cuyuna Northern had been removed from the equation, the Northern Pacific and Soo Line began to establish joint shipping facilities throughout the range, notably at Ironton (Welton 1992 part 2:29). By the mid 1910s, the Cuyuna Range hosted an amalgamated Northern Pacific/Soo Line system; the Soo Line served the northern Cuyuna mines and the Northern Pacific acted as the primary shipper for the older, southern range mines, but the rail network was a complex web of shared operating rights and joint trackage. In October 1915, the Northern Pacific acquired the Mississippi Hill City and Western Railroad, ostensibly to extend it into the Soo Line's territory in the northern range, but there was insufficient interest shown by the mining companies for such a line (Welton 1992 part 2:29).

Between 1913 and 1925, the Soo Line dominated shipping on the Cuyuna Range. In 1913, 96.3 percent of the Cuyuna Range's 750,000 tons of ore was transported by the Soo Line—the remaining 3.7 percent was carried by the Northern Pacific. In 1914 and 1915, the Soo Line carried 84 percent versus the Northern Pacific's 16 percent. The Northern Pacific's share of ore shipment increased to 24 percent following the opening of the Mahnomen mine in 1916. Demand for iron ore with high manganese concentrations during World War I resulted in the opening of many new mines on the Cuyuna, with 37 mines in operation by 1920 (Zellie 2005). Most were served by the Soo Line, but the Northern Pacific's share of ore traffic continued to gradually increase through the mid 1920s, when it carried 37.5 percent of the tonnage. By the time mining on the Cuyuna Range was abandoned in the mid 1980s, a total of 55 mines had been opened (Alanen 1989:157; Zellie 2005:2-6).

Taconite

The Depression slowed demand for iron ore significantly during the 1930s, and many mines on all three ranges were temporarily closed. Wartime demands resulting from World War II during the early 1940s and the Korean War during the early 1950s led to extraction of massive quantities of high-grade iron ore, known as hematite. The increased production, however, led to a faster depletion of the plentiful but finite iron ore deposits.

To counter the expected exhaustion of hematite, a team from the University of Minnesota as well as mining and steel-manufacturing interests developed during the 1940s a process for converting hard taconite rock (25 to 35 percent iron) into concentrated pellets of iron ore. In 1953, the Reserve Mining Company was incorporated, and two years later in 1955, it began operation of a mine and crusher at Babbitt, a concentrator and pelletizing plant at Silver Bay on Lake Superior, and a rail line to connect the two facilities. In 1957, Erie Mining Company opened a taconite plant at Hoyt Lakes and a rail line connection to Taconite Harbor on Lake Superior. Those two operations not only helped maintain the economic viability of towns on the Mesabi and Vermilion ranges, such as Aurora, Gilbert, McKinley, and Tower, they created new communities at Babbitt, Hoyt Lakes, and Silver Bay. During the late 1960s and early

1970s, additional taconite plants were built at Eveleth, Nashwauk, Keewatin, Hibbing, and Mountain Iron. Those plants, located in the heart of the Mesabi Range, generally tapped into the already extensive rail network.

Section F. Associated Property Types

I. Name of Property Type: Railroad Corridor Historic Districts

II. Description

The property type "railroad corridor historic district" encompasses the right of way within which a railroad operated and all of the buildings, structures, and objects that worked together for the dedicated purpose of running trains to transport freight and passengers. The elements of railroad corridor historic districts are organized within linear rights of way that range from approximately 30 feet to several hundred feet in width but may extend for hundreds of miles in length. The linear nature of the railroad corridor historic district is an important associative characteristic that conveys the sense of a train traveling to a destination (Figure 1; Note: all figures are located at the end of Section F).

The MPDF *Railroads in Minnesota, 1862-1956* does not distinguish between railroad mainlines and branch lines. Although, historically, railroad companies identified their railroad corridors as mainlines or branch lines, the definition of mainline varied from company to company, depending on volume of freight, priority on operations time tables, and other factors. In addition, a railroad corridor's status may have changed over time, depending on operating conditions. For the purposes of evaluating historic significance, a railroad corridor's status as mainline or branch line is not a determinant; a railroad corridor can be eligible for the National Register regardless of its status as a mainline or branch line.

Corridor Elements. At minimum, a railroad corridor historic district includes a railroad roadway, which is the portion of the right of way modified to support the railroad tracks (see Railroad Roadway discussion below). The configuration of a railroad roadway in Minnesota is commonly a single track on a railroad bed with cuts and fills, and ditches. Other layouts may be present or may have been used historically (see Railroad Roadway below).

In addition to the railroad roadway, a railroad corridor historic district can include associated railroad-related support buildings and structures. The railroad support buildings and structures will vary between railroad corridor historic districts and can include: railroad stations, railroad yards, railroad depots, railroad grade separation structures, and railroad section houses (see discussion below). The locations of these elements historically varied according to local geography, existence of other railroad corridors and vehicular roads, markets served, and population. For example, railroad stations historically were located every 5 to 10 miles along a railroad corridor, but railroad yards were required only in special locations, such as at terminals, division points, and large railroad stations and junctions.

Geographic Influences. The geography of Minnesota influenced the location and design of railroad corridors in the state. The Twin Cities, Duluth, and Mississippi River cities, which were early terminals connected to waterways, served as starting points for railroad corridors that subsequently radiated out to resource procurement areas: the agricultural lands of southern Minnesota and the Red River Valley, the pine forests of central and northern Minnesota, and the ore fields of the iron ranges. Access to commodities, terminal facilities, and transfer points defined the destinations for railroad corridors. Once the destination points were established, the ideal railroad corridor alignment provided the gentlest grades on the straightest route, which could require extensive cutting, filling, and bridging, depending on the topographic and other natural features to be crossed. In lightly populated western areas, however, such as Minnesota during the nineteenth century, investment capital was scarce, and corridors were often built over or around natural features. Such alignments meant steeper grades or more circuitous routes but minimized initial construction costs. Years later as traffic increased, those early corridors were often re-aligned and reconstructed to straighten curves and reduce grades through more extensive cuts and fills. The built environment influenced the alignment of railroad corridors as well; for example, railroad corridors detoured from the most direct alignments between destination points in order to connect with existing towns along the way.

Boundaries. The boundaries of a railroad corridor historic district will be the historic right of way of the railroad company that built and operated the corridor. If the current railroad right of way is different than the historic railroad right of way, the historic right of way will be the boundaries of the railroad corridor historic district. If, however, portions of the historic right of way that are not important to convey the associative linear characteristic of the district are no longer within the railroad right of way and have lost historic integrity, the boundaries of a railroad corridor historic district may be limited to the current right of way. For example, if a former railroad yard is no longer within a railroad right of way and has lost its ability to convey its association with the railroad corridor historic district, the district’s boundaries may be limited to the current railroad right of way.

Variations. A railroad corridor historic district will consist of elements that span the period of significance and that illustrate changes in industry standards for the elements of the district. The physical characteristics of railroad corridor historic districts will vary based on technological changes, the need to replace roadway elements due to wear and tear, and the desire by railroad companies to gain operating efficiencies. Ballast design and, therefore, railroad bed width was dependent on the materials used, the climate, the weight of rails, and the volume, weight, and speed of train traffic. As more powerful engines hauled heavier loads at faster speeds, or as freight volumes increased generally, railroad companies installed heavier-weight rail, more substantial ballast, and wider railroad beds, which at times necessitated more extensive cuts and fills. During the twentieth century, railroad companies regularly upgraded the railroad roadway and tracks on their railroad corridors. In addition to the elements of railroad roadway, each railroad corridor historically required different numbers and types of supporting buildings and structures. The contributing elements of a railroad corridor historic district will consist of combinations of the following elements.

Common Elements of Railroad Corridor Historic Districts

Railroad Roadway

A railroad roadway is an element in a railroad corridor historic district. The design and material composition of a railroad roadway will vary within a railroad corridor historic district depending on environmental conditions. Typically in Minnesota, a railroad roadway will include a single set of tracks (Figure 2). Historically, in single track corridors, passing sidings were located approximately every 5 miles to allow opposing trains to pass each other and to allow fast-freight or express trains to pass slower trains. Busier railroads historically may have been double-tracked, and in railroad stations and yards, multiple tracks provided access to the facilities (Figures 3 and 4).

A railroad roadway will consist of a combination of the following structural components: ground modification (cuts, fills, and grades), a railroad bed, ballast, tracks, and ditches (Figure 5). Historically, the minimal ground modification needed for a railroad roadway, typical in flat dry lands, was a smooth-graded ground surface with small amounts of fill and shallow cuts, as needed. In rougher terrain and in wetlands or seasonally inundated lands, extensive fills and cuts were necessary to maintain a gentle gradient. The slopes on the sides of cuts and fills (side slopes) were typically at a horizontal to vertical ratio of 1½:1, though flatter slopes of 2:1 or 3:1 were necessary in areas with sandy or clayey soils.

A railroad bed is always present within the railroad roadway, regardless of the amount of cut or fill necessary (Figure 6). A railroad bed consists of a layer of soils applied to the ground surface to provide a smooth regular plane for the tracks and to uniformly distribute loads from trains, tracks, and ballast. Single-track railroad beds ranged from 16 to 24 feet wide, and a 20-foot width was most common.

Active railroad corridor historic districts will always include ballast and railroad tracks, while abandoned railroad corridor historic districts may not. Ballast is the layer of material between the railroad bed and the tracks. Although current ballast materials uniformly consist of crushed stone, historically, ballast materials varied among railroad corridor historic districts and consisted of crushed stone, slag, gravel, sand, cinders, or burned clay. The purpose of ballast is to distribute the loads imposed on the railroad bed by the railroad tracks and trains. To further distribute loads and to help prevent the ballast material from being pushed into the railroad bed, a sub-ballast layer of gravel, slag, or cinder may be placed between the railroad bed and the ballast.

The railroad tracks of a railroad corridor historic district are positioned on the ballast. Railroad tracks in railroad corridor historic districts in Minnesota always conform to standard gauge (4 feet, 8 ½ inches). Although some 3-foot narrow-gauge railroad tracks were built during the nineteenth century in southeastern Minnesota river valleys, those railroad tracks are no longer extant. Narrow-gauge railroad tracks used to access timber lands and iron mines were built outside of railroad rights of way by timber or mining companies or by railroad companies on easements and, therefore, are separate from railroad corridor historic districts. Railroad tracks consist of steel rails on wood ties (Figures 7 and 8). Typical ties are pieces of timber that measure 6-by-8 inches to 7-by-9 inches in cross section and 8 to 9 feet in length; they are laid perpendicular to the rails and are bedded in the upper portion of the ballast. Rails conform to the inverted T profile (Figure 9). Rails are spiked to the ties, though they usually rest directly on square, steel tie plates to prevent them from cutting into the ties (Figure 10). Although the material composition of rails has evolved since the nineteenth century (from iron to steel and progressively heavier weight, from 35 to 45 pounds per yard to more than 130 pounds per yard), their basic appearance has changed little. Drainage ditches typically flank the railroad bed or the side slopes where fill is present (Figure 11). To further promote drainage, tile pipes often line the ditch bottoms, and culverts carry water through the railroad roadway (Figures 12 and 13). To reduce erosion, the slopes may be planted with grasses, and the shoulders rounded off. The outer shoulders of the ditch slopes are the edges of the railroad roadway.

Historically, the area between the railroad roadway and the edge of the right of way was overgrown with vegetation. This vegetation contrasted with the surrounding fields of row crops, pastures, or forests. Telegraph poles and lines, as well as fences, which were originally wood or stone and later barbed wire with wood posts, further delineated the edge of the right of way.

Railroad Grade Separation Structures

Railroad grade separation structures carry railroad tracks of one railroad corridor over those of another railroad corridor, a vehicular roadway, a water course, or a topographic feature. These structures are elements in railroad corridor historic districts; or where a railroad corridor historic district is not present, railroad bridges, trestles, viaducts, and culverts will be a separate property type (see Property Type: Railroad Grade Separation Structures).

Railroad bridges during the nineteenth century mostly consisted of iron or steel truss spans. Fixed metal bridges were installed at most permanent river crossings, and utilized a variety of truss types, the most common of which are the Howe, Pratt, and Warren trusses. Movable bridges were built in locations where another form of transportation, such as a river, required an intermittent gap in a railroad corridor and include the vertical lift bridge, the swing bridge, and the cantilevered bascule bridge. Masonry arch railroad bridges used classic hyperbolic, segmental, and semi-circular arches of cut granite or sandstone ashlar masonry seated on massive stone piers. Concrete slab railroad bridges consist of three types: reinforced concrete, concrete I-beam, and concrete rail top.

Railroad trestles and viaducts are braced-framework structures designed to cross deep river valleys that lack navigable channels or to cross minor streams and gullies. Trestles have short (12 to 14 feet) spans (bents) fashioned from driven wood piles or cut framed timber (Figure 14). Viaducts use a skeletal frame of steel girders (Figure 15).

Culverts are small bridges designed to provide drainage for water or form a passageway through a fill material (usually earth). The simplest forms of culvert are boxes constructed of wooden beams or stone or concrete slabs, and prefabricated concrete or metal pipes (Figure 16). Formal masonry arched culverts may resemble arch bridges with stone or concrete drainage floors.

Railroad Stations

Railroad stations are encompassed within railroad corridor historic districts (Figure 17). A railroad station may contribute to a railroad corridor historic district if it retains historic integrity; or where a railroad corridor historic district is not present, railroad stations will be a separate property type (see Property Type: Railroad Station Historic Districts). A railroad station is the portion of railroad right of way operated for the purpose of a railroad stop and designated by name in railroad timetables. Railroad stations consist of buildings, structures, and objects used for loading and unloading passengers and freight and for operational needs. The most common buildings and structures within a railroad station include: railroad roadway; platforms; depots (passenger, freight, or combination); commercial buildings and structures within the right of way (elevators, warehouses, stockyards, lumberyards); and operations structures (water towers, coal chutes, light signals, interlocking towers).[7] Railroad stations were the commercial nodes of a railroad corridor historic district; whereas railroad yards provided the major maintenance, repair, sorting, and classification of railroad motive power and rolling stock. Although railroad stations and yards, at times, were located in geographic proximity, they operated as separate facilities.

Factoring out special circumstances, railroad stations typically were located every 5 to 10 miles along a railroad corridor historic district (and not more than 20 miles because steam locomotives required refills of

[7] The terms “depot” and “station” were often used interchangeably by railroad companies. In this document, depot refers to the main building used for loading passengers and perhaps freight (where separate freight houses are not present) within a railroad station. A station is made up of the entire area within the right of way that operated as a railroad stop, including the depot and other buildings and structures used for loading freight or minor maintenance of engines and rolling stock.

water). Railroad corridor historic districts widen considerably at railroad stations in order to accommodate the additional tracks and support buildings and structures. As a railroad corridor historic district approaches a station, the number of approach tracks may increase, and within the railroad station, the sidings and spurs that provide access to railroad depots, loading and storage buildings and structures, and operations facilities further increases the number of tracks. The through tracks, which continue on a railroad corridor historic district beyond a railroad station, can run down the middle of a railroad station with loading and storage facilities located on both sides, or can run along the side of the railroad station with loading and storage facilities on one side. Sidings are side tracks that connect to through tracks at both ends, whereas spurs are side tracks that connect to through tracks at one end.

A railroad depot is usually oriented on a long axis parallel to the railroad tracks. In this way, it sharply defines two separate functional areas: a passenger or freight arrival area, usually recognizable as a parking lot or freight drop-off platform; and a passenger boarding or freight loading platform immediately adjacent to the tracks. There are four main groupings of railroad depots, based on size, layout, services offered, and architectural detail: flag depots, combination depots, passenger depots, and union/terminal depots. Historically, depots provided a means for receiving, sorting, and loading any combination of passengers and freight. The majority of Minnesota's railroad depots were combination depots—small and capable of receiving both passengers and freight, with separate loading facilities for bulk freight, such as grain elevators. Large cities had union or terminal depots, which were designed exclusively for passenger traffic and were often one of the most architecturally sophisticated buildings in the community.

Any one of the following building or structure types could contribute to a railroad corridor historic district if it dates to the period of significance and retains historic integrity. They have been grouped within the railroad station element for ease of identification. Note the difference from railroad station historic district, which is a separate property type from railroad corridor historic district and in which certain buildings and structures must be present.

Platforms facilitated movement between railroad cars and railroad depots and warehouses. Low platforms are at grade, which would require a passenger to board a train by climbing the passenger car steps. High platforms are built up approximately 4 feet to facilitate loading of freight and boarding of passengers. Low platforms are concrete or brick, and high platforms are built up with wood framing or concrete (Figure 18).

Flag depots are open-air or enclosed, gable- or shed-roofed buildings with simple platforms located in areas where traffic was restricted to the occasional passenger, and where the train was flagged to stop rather than making scheduled stops. If passenger traffic at a flag depot increased, it could be upgraded to include a building with a railroad agent's office and a passenger waiting room (Figure 19).

Passenger depots varied in appearance. The smallest passenger depots are single-story frame or brick buildings with a waiting room, ticket office, and baggage room, which accommodated the occasional freight shipment. Small depots express nationally popular architectural styles through standardized plans developed by railroad architects and engineers. Large first-class passenger depots were designed individually and could be two-story buildings with waiting rooms, restrooms, smoking rooms, dining rooms, baggage rooms, offices for mail, telegraph, and wire services, news stands, supply rooms, lounges for conductors and trainmen, and administrative offices (Figure 20).

Combination depots have a single, central office space where an agent processed passenger tickets and freight bills, a passenger waiting area at one end of the building, and a freight room at the other end. Architecturally, combination depots were similar to passenger depots and may include a second story, a watch-tower, and wings for baggage and freight (Figure 21).

Union or terminal depots were designed by architects in styles common for public buildings, such as Richardsonian Romanesque, Classical Revival, and Beaux Arts. They feature high-quality materials like brick, stone, and terra cotta, as well as marble floors and hardwood finishes in the interiors. These buildings include a wide variety of railroad agency offices and passenger service areas, including the station master's office, train master's office, a ticket office, express office, telegraph office, baggage rooms, men's and women's waiting rooms, restrooms, news stands, a restaurant or lunch counter, and hotel facilities, among many others (Figure 22).

Commercial buildings and structures located within railroad station districts include general freight warehouses, specialty warehouses such as for agricultural produce or beer, grain elevators and storage bins, stockyards, and lumberyards (Figure 23).

Section Houses provided living quarters for railroad employees working as section foremen or track hands. Located in low population areas approximately every 3 to 10 miles along railroad corridors, section houses are architecturally modest, wood-frame buildings with gabled or salt-box roofs (Figure 24).

Water tanks (also known as water stations) used to refill locomotive steam boilers are located within railroad station districts. A water tank included connections to the water source through uptake pipes, a wood or metal water tank or tower, a delivery-spout or discharge pipe, and a small, usually wood frame, pump house (Figure 25).

Coaling facilities (coal stations) to receive, store, and deliver coal to steam locomotives are located within railroad station districts. Elevated coaling trestles included an inclined trestle approach to a platform, where the coal was dumped through chutes into a locomotive's coal tender below. Mechanical coaling stations (coaling elevators), constructed of reinforced concrete or steel, used a conveyor system to lift coal into loading chutes or into square bins with angular hopper delivery systems, or cylindrical bins with conical bottoms (Figure 26).

Ice houses provided ice for refrigerated cars and for use in passenger cars. Ice houses are of wood frame or occasionally brick construction, were insulated, commonly with sawdust, wood shavings, or ashes, or occasionally with layers of tongue-in-groove sheathing and insulating paper (Figure 27).

Interlocking towers operated to protect trains from collisions with other trains and intersecting vehicles and were historically located as part of a block signaling system, at the head of switch and yard systems. Towers are raised, hip- or gable-roofed, wood frame buildings with large windows or banks of window to provide the operator with views of the railroad roadway and surroundings (Figure 28).

Railroad Yards

Railroad yards are encompassed within railroad corridor historic districts (Figures 29 and 30, also see Figure 17). A railroad yard may contribute to a railroad corridor historic district if it retains historic integrity; or where a railroad corridor historic district is not present, railroad yards will be a separate property type (see Property Type: Railroad Yard Districts). A railroad yard is a system of tracks and support buildings and structures, associated with the switching and assembly of trains and the construction, maintenance, service, and repair of railroad rolling stock. Historically, the most common buildings and structures within railroad yards included: engine houses, shop buildings, turntables and transfer tables, yard offices, worker shelters, power houses, coaling stations, ash pits, water stations, ice houses, storage buildings, and safety structures (signals and interlocking towers).

Railroad yards were required only in special locations along a railroad corridor historic district, such as terminals, division points, and large railroad stations and junctions. Railroad corridor historic districts widen considerably within railroad yards. The yard tracks are located on one or both sides of the through tracks or between a set of double tracks. The body tracks of the yard are laid out in groups of parallel tracks that provide for the switching and storage of railroad cars. The parallel tracks are connected via diagonal ladder tracks. Railroad tracks within a railroad yard district temporarily store trains for switching and assembly, and provide access to railroad buildings and structures within a railroad yard.

Any one of the following building or structure types could contribute to a railroad corridor historic district if it dates to the period of significance and retains historic integrity. They have been grouped within the railroad yard element for ease of identification. Note the difference from railroad yard historic district, which is a separate property type from railroad corridor historic district and in which certain buildings and structures must be present.

Engine houses were designed to provide the regular mechanical service required to keep a railroad's motive power running. Square engine houses are located in smaller railroad yards and are wood frame buildings that provided side-by-side berths for locomotives undergoing service and repair. Roundhouses were constructed with multiple engine berths in a radial pattern and could have a segmental plan with the berths occupying a segment of a circle or a closed or full-circle plan, in which a through-passage provided access to a central turntable (Berg 1900:168) (Figure 31).

Transfer tables and turntables were used to maneuver locomotives into engine houses. Railroad transfer tables, used at square houses, consist of rectangular platforms with sets of tracks that moved locomotives perpendicular to the incoming spur tracks. Railroad turntables consist of circular platforms supported by steel truss or plate frameworks that could turn engines and freight cars or orient them properly for entry into roundhouses or repair shops (Figure 32).

Maintenance shops for locomotives and rolling stock were established at junctions and division points within a railroad corridor and could be combined with engine houses. Shops complexes include machine shops, oil houses, blacksmith shops, carpentry shops, wheel foundries, and mill rooms. Passenger and freight car shops are located where paint, cabinet, upholstery, planing, electrical, pattern, and special-purpose work would be done. Shop buildings are most often constructed of brick or brick veneer on wood frames, and have large bay doors and multi-light windows. Blacksmith shops included multiple chimneys to vent the forges (Figure 33).

Railroad power houses provided steam-generated electricity to the shops and engine houses, and distributed steam for heat. Power houses could consist of a small wood frame building located near the engine house or could be more substantial buildings with a single large room for the boilers (Figure 34).

Water tanks used to refill locomotive steam boilers are located within railroad yard districts. A water tank included connections to the water source through uptake pipes, a wood or metal water tank or tower, a delivery-spout or discharge pipe, and a small, usually wood frame, pump house (see Figure 25).

Coaling facilities to receive, store, and deliver coal to steam locomotives are located within railroad yard districts. Elevated coaling trestles included an inclined trestle approach to a platform, where the coal was dumped through chutes to stationary tenders below. Mechanical coaling stations (coaling elevators), constructed of reinforced concrete or steel, used a conveyor system to lift coal into loading chutes or into square bins with angular hopper delivery systems, or cylindrical bins with conical bottoms (see Figure 26).

Ash pits allowed locomotives to dump their ash and cinders. Ash pits ranged from 1 to 4 feet deep with side walls of stone, brick, or metal and sometimes had water pits for quenching hot coals (Figure 35).

Railroad yard offices housed employees responsible for orchestrating incoming and outgoing traffic; classifying passenger and freight cars and assembling the trains; and scheduling the servicing, repair, and pre-run preparation of locomotives. Railroad yard offices are typically architecturally plain office buildings of frame construction but could be substantial brick buildings (Figure 36).

Worker shelters in railroad yards included watchman shanties, flagman shanties, and signal maintainer houses. Worker shelters were simple, standard-plan, wood frame buildings with hipped or gable roofs, board and batten or clapboard siding, and large windows.

Interlocking towers operated to protect trains from collisions with other trains and intersecting vehicles and were historically located as part of a block signaling system, at the head of switch and yard systems. Towers are raised, hip- or gable-roofed, wood frame buildings with large windows or banks of window to provide the operator with views of the railroad roadway and surroundings (see Figure 28).

III. Significance

Due to the important contributions of railroads to the economic development of Minnesota during the late nineteenth and early twentieth centuries, railroad corridor historic districts are associated with the National Register areas of significance, *transportation* and *engineering*. The significance of railroad corridors within those areas of significance are linked to a number of historic contexts in Minnesota: *Railroad Development in Minnesota, 1862-1956*; *Railroads and Agricultural Development, 1870-1940*; *Urban Centers, 1870-1940*; *Minnesota Tourism and Recreation in the Lakes Region, 1870-1945*; *Northern Minnesota Lumbering, 1870-1930s*; and *Minnesota's Iron Ore Industry, 1880s-1945*.

During the nineteenth and early twentieth centuries, as Minnesota moved from a sparsely settled territory to a state integrated in the national economy, railroads provided important transportation connections that contributed to settlement, agriculture, commerce, industry, community development, and tourism. Between 1862 and the 1890s, Minnesota established a network of railroad corridors. The network connected resource procurement areas, smaller cities, urban centers, and the state's primary commercial and industrial centers—Minneapolis, St. Paul, and Duluth—as well as other regional markets, such as Chicago and Omaha. By the turn of the twentieth century, the railroad network extended throughout southern and central Minnesota, and the Red River Valley, and within another 20 years, much of northern Minnesota. In Minnesota, railroads were the dominant form of transportation and for many people were the only practical means of long distance transportation. The economic influence of railroads peaked in

Minnesota and nationally during the early decades of the twentieth century. By 1920, railroads directly employed two million people nationwide, carried the bulk of the mail, hauled 77 percent of all freight, and carried 98 percent of the traveling public (Stover 1970:93).

The economy of Minnesota during the nineteenth and early twentieth centuries was based on the extraction of raw materials from the land. Towns were platted along railroad corridors as gathering points for commodities and as distribution centers for manufactured goods, and some of those towns grew into urban centers that became hubs for industry and commerce. Railroad corridors were at the heart of the commercial and industrial development of the state, transporting the commodities, manufactured goods, and people between the rural areas, small towns, and cities. Transportation via railroad corridors opened up whole regions of the state to agricultural production, logging, and iron ore mining. Railroad corridors brought in new residents and shipped out their produce and livestock. Furthermore, railroad corridors actively encouraged migration from the eastern United States and from abroad.

Within the context of agricultural development, railroad corridors hauled crops and animal products from farm to market with a speed and level of service that was unmatched during the nineteenth century. The massive volumes of wheat hauled on railroad corridors to mills in Minneapolis and elsewhere facilitated industrial crop production, large-scale milling, and mass marketing of flour and food products. Indeed, the "milling in transit" rates (reduced rates offered by railroads to large mills) were based on the idea that wheat/flour was only temporarily stored at the mill, and rates could be based on the lower, long-haul rates between western wheat fields and eastern markets for flour. Similarly, through efficient transportation, railroad corridors facilitated the transition to diversified agriculture in Minnesota after 1880 by connecting producers of a variety of agricultural commodities with processors.

Within the industries of logging and mining, railroad corridors connected the resource procurement areas with transfer or terminal points. Railroad corridors were integral to the iron ore mining industry because extracting the bulky commodity in areas far from water transport would not have been economically feasible but for connections provided by railroad corridors. Even hauling mining equipment into the remote mine locations would have been difficult if not for railroad corridors. Regarding commercial logging, railroad corridors opened up forest lands for logging that were far from navigable streams, which was particularly important in the far northern forests.

Railroad corridors spurred the development of urban centers at major railroad junctions and transfer points, and Minneapolis-St. Paul developed as both a railroad hub and a metropolitan center with economic influence over portions of six states. Railroad corridors modeled engineering efficiency through the designs for their own facilities and encouraged efficiency through grouped land uses, such as industrial zones and warehouse districts. In the Twin Cities for example, an extensive industrial corridor extended from North Minneapolis southeast to South St. Paul, consisting of manufacturing, storage, and wholesale operations that centered on the confluence of multiple railroad corridors. In other urban centers and smaller cities and towns, warehouses and manufacturing plants lined the railroad corridor, and central business districts either paralleled or radiated out from them. In most towns in western Minnesota, the grain elevators within the railroad corridors were the dominant feature of the skyline, and in Duluth, the massive elevators and ore docks, built to serve the converging railroad corridors, dominated the port.

In the context of tourism, many railroad corridors, as part of their passenger business, carried travelers from cities into the lakes regions or to areas renowned for hunting, and conversely, they carried tour groups from small towns into cities for cultural events or shopping. In some cases, railroad corridors were instrumental in the establishment of significant tourist destinations.

IV. Registration Requirements

A railroad corridor historic district is a substantive concentration of railroad-related buildings and structures that were built and operated within a railroad right of way in Minnesota between the years 1862 and 1956. Some railroad tracks used to access timber lands and iron mines that were built outside of railroad rights of way by timber or mining companies or by railroad companies on easements are not considered or included within the MPDF *Railroads in Minnesota, 1862-1956*.[8] To be eligible for listing in the National Register within the MPDF *Railroads in Minnesota, 1862-1956*, a railroad corridor historic district must meet one of the following significance criteria, and it must retain historic integrity.

Criterion A

To meet National Register Criterion A, a railroad corridor historic district will have significant and demonstrable association with the *transportation* area of significance. The significant association may be within any of the contexts described in Section E. Significant railroad corridors can be characterized by the important connections they made or by the types and volumes of traffic they carried. For a railroad corridor to be eligible for association with *transportation*, it must meet at least one of the following significance requirements.

1. A railroad corridor historic district opened to settlement a region of the state with no, or virtually no, regional roads or navigable rivers by providing the only long-distance transportation option, and construction of the railroad was followed by a significant increase in the rate of settlement. By definition, this first requirement (though not requirements two through four) would exclude southeastern Minnesota

[8] Birk (1998) developed registration requirements for logging railroads outside of railroad company rights of way.

(the area southeast of the lower Minnesota River), as well as areas along navigable portions of the Mississippi, Minnesota, and St. Croix rivers. Approximate geographic regions consist of the following:

- Southwestern Minnesota—south of the Minnesota River and approximately west of Mankato;
- South-Central Minnesota—between the Minnesota and Mississippi Rivers;
- Red River Valley;
- Central Minnesota—approximately from St. Cloud to Walker;
- Northeastern Minnesota;
- North Central Minnesota.

For example, a railroad corridor that built through southwestern Minnesota during the early 1870s, provided the first railroad service in the region, and was followed by rapid settlement would be a significant corridor. Such a corridor also would have been the only long-distance transportation in the area until additional railroad corridors were built during the late 1870s. If more than one railroad built into a region during the same time period, they both may be significant corridors, particularly if they built in different directions within the region. For example, two railroads building through southwestern Minnesota during the early 1870s, one in a southwesterly direction from Mankato and the other in a northwesterly direction from Mankato, would both meet the conditions of this requirement.

2. A railroad corridor historic district provided transportation between a significant class of resource or a significant manufacturing or commerce node and an important transfer point or terminal market for commodities, products, or services. Furthermore, the railroad corridor historic district either established a railroad connection that did not previously exist or served as the dominant transportation corridor, and establishment of the connection was followed by a significant expansion of an industrial, commercial, or agricultural practice. Examples of this type of association are railroad corridors that provided the first railroad connection to one of the iron ranges or that connected important logging centers, such as Bemidji or International Falls, with the pine forests.

3. A railroad corridor historic district was an influential component of the state's railroad network, or it made important early connections within the network or with other modes of transportation. An example of this association may include a transcontinental railroad corridor in Minnesota. Although transcontinental corridors (or those with transcontinental connections) are not automatically eligible under this requirement, all should be given consideration under this requirement due to their inter-regional nature. Another example of a significant railroad corridor historic district would be an early railroad corridor connection between the Twin Cities and Duluth or Chicago. The definition of an "early corridor" within the railroad network will vary by region within the state.

4. A railroad corridor historic district provided a critical link or junction between two or more important railroad corridors, and the connection led to significant expansion of operations in the transportation network or in commerce or industry. The corridor directly contributed to the development of the commercial or industrial operations, or it influenced transportation patterns in an area of particularly heavy railroad traffic. For example, a railroad corridor that, as a transfer facility in the Twin Cities, eased congestion in the crowded downtown terminals and led the development of an important industrial corridor would be a significant transportation link. Another example of a significant transportation link would be a junction that served several major railroad corridors into downtown St. Paul and ranked among the busiest junctions in the Twin Cities.

Criterion B

Railroad corridors will not be eligible for the National Register under Criterion B. Railroad corridors were built and operated by large corporations that represent the work of many people, rather than individuals. Although prominent individuals dominated some of the companies, such as James J. Hill of the Great Northern or Alpheus B. Stickney of the Chicago Great Western, they managed the construction while working out of the company's headquarters. Administrative offices would represent their corporate lives better than railroad corridor historic districts.

Criterion C

Railroad corridors will not be eligible for the National Register under Criterion C. To be eligible for the National Register, a railroad corridor historic district would need to be a significant and distinguishable entity that embodies the distinctive characteristics of a type, period, or method of construction, or that represents the work of a master. Due to the nature of railroads in Minnesota, this will not be the case.

By the time railroad construction began in Minnesota during the 1860s, the basic technology of railroad tracks had been established, and railroad engineers had a great deal of experience in designing railroad roadways. As railroad technology and engineering advanced during the late nineteenth century, new components were introduced elsewhere on older, more established railroad corridors. Furthermore, there are few areas in Minnesota where the steep topography presented engineering challenges, such as the bluffs along the Mississippi River in the southeastern part of the state. Even in those areas, topographical features to be surmounted were minor compared with mountainous regions elsewhere. Furthermore, except for short branch lines, railroad corridors were not designed or built in singular episodes; rather they were built over periods of years or even decades. In all railroad corridors, the buildings and structures generally followed standard designs that were modified to meet local site conditions, except where those conditions required an original design for specific individual structures, such as a bridge at a major river crossing.

Finally, segments of railroad corridors were modified and individual components were upgraded and replaced periodically due to wear and tear or to meet evolving operational needs.

Criterion D

It is unlikely that a railroad corridor historic district would meet Criterion D. To do so, further analysis of the corridor must be likely to yield important information about significant aspects of the evolution or development of railroad corridor design, operations, or the inter-relationships between railroads and the industrial and commercial operations they served. The extant built environment of the railroad corridor historic district must be the principal source of the important information—archaeological resources are not considered or included in the *Railroads in Minnesota, 1862-1956* MPDF. It would be an extremely unusual set of circumstances by which railroad buildings and structures are extant in sufficient number and diversity within a railroad corridor to yield important new information. Even the railroad roadway itself, the single essential element of a railroad corridor historic district, is unlikely to provide important new information based on its extant physical features, due to the alteration or dismantling of railroad roadways in the course of railroad operations or abandonment.

Because so many railroad buildings have been demolished over the years, too few historic-period buildings and structures within railroad corridors are extant to make an analysis of the spatial, organizational, or construction patterns of only the extant built environment a likely source of new information regarding railroad properties. This is particularly so because railroad corridors generally were well documented by the railroad companies. Future studies, however, in which archaeological analysis is combined with analysis of the extant built environment, could provide important new information significant under Criterion D.

Criteria Considerations

The National Register Criteria Considerations will not apply to railroad corridor historic districts.

Periods of Significance

The period of significance of a railroad corridor historic district will begin with its date of construction or establishment of significant operations and will be no earlier than 1862. Railroad corridors may have relatively long periods of significance, depending on the area of significance and contexts with which they are associated, but the period will end no later than 1956. When a railroad corridor is associated with broad historic patterns, its period of significance will be the time when the corridor provided the significant transportation connection to a region or to specific commercial, industrial, or tourist operations. If a railroad corridor is significant for its association with the opening of a region of the state to settlement, its period of significance will end when another railroad line provided additional service into the area. If the corridor is significant for its association with the opening of a resource procurement area or for connecting significant commercial or industrial operations: the end date of the period of significance will coincide with the end of the significance of the resource or commercial/industrial operation; or it will end when another railroad corridor provided similar service.

An important consideration for the period of significance of a railroad corridor is to distinguish between the time when the corridor played a significant transportation role and the time when it simply provided a useful service. Continued use of a railroad corridor historic district does not necessarily justify continuing the period of significance. For example, a corridor that was significant for transporting logs from the northern Minnesota pineries to saw mills may have continued to operate as a common carrier long after the forests were cleared by the late 1920s. Its period of significance, however, would end with the end of logging operations, unless other significant associations are identified that post-date the logging era.

A railroad corridor historic district will have a single period of significance even if there are multiple construction episodes; the period of significance should encompass all significant construction episodes. This approach reflects that railroad corridors often were built and rebuilt over a time span that will be within the railroad corridor's historically significant period of time. If, for example, a smaller segment of a railroad corridor was constructed at an early date, achieved significance, and then was connected to a larger corridor later, the period of significance for the entire corridor begins at the earliest date of construction and continues to the end of the significant associations. If an early segment of a railroad corridor was not significant by itself but gained significance as part of the larger corridor, the period of significance would begin with establishment of the larger corridor.

Integrity Requirements

To be eligible for the National Register, a railroad corridor historic district must not only meet the National Register significance criteria, but it must also retain historic integrity. The seven aspects of integrity must be applied to the railroad corridor historic district to assess its historic integrity (see discussion of each aspect below). At minimum, a railroad corridor historic district must retain integrity of *location, design* and *materials*. Railroad corridor historic districts may include many contributing elements but must include, at minimum, a railroad roadway that retains historic integrity. The number and arrangement of contributing elements will vary between railroad corridor historic districts. The integrity of *location*, *design*, and *materials* of railroad buildings and structures within a railroad corridor historic district will determine whether they contribute to the district. *Setting* that still reflects the historic appearance of a railroad corridor historic district can mitigate for the loss of railroad tracks and railroad support buildings and structures within the right of way, provided the railroad bed and other elements of the roadway are intact. The loss of *setting*, however, in combination with the loss of railroad tracks and railroad support buildings and structures within the right of way, further diminishes a railroad corridor historic district's overall historic integrity and may lead to a loss of integrity. If a railroad corridor historic district retains the other aspects of integrity, it will also retain integrity of *feeling* and *association*. Integrity of *workmanship* in contributing elements, such as bridges and depots, will contribute to a railroad corridor historic district's overall historic integrity.

Historically, it has been typical for railroad corridors to evolve over time—they were extended into new geographic areas, they were rebuilt, and specific elements were replaced or upgraded—and such modifications reflect the historic operating patterns of railroads. Therefore, the historic integrity of a railroad corridor historic district should be judged based on its conditions at the end of the period of significance.

The seven aspects of historic integrity are discussed below in order of importance to the overall integrity of a railroad corridor historic district. In assessing the integrity of a railroad corridor historic district, the cumulative effect of changes to the corridor since the period of significance must be compared with the cumulative presence of the elements of the corridor that retain integrity.

Location. *Location* is the place where the elements of a railroad corridor historic district were constructed and operated, and it is the most important aspect of integrity for a railroad corridor historic district. The horizontal alignment (both the general route and the degree of curves) and the vertical alignment (particularly the degree of gradient within specific segments) affected the markets served, distance traveled, motive power required, and speeds attainable. To retain integrity of *location*, a railroad corridor historic district must conform to the horizontal and vertical alignment present at the end of the period of significance. Changes in alignment and grade or other modifications during the period of significance will not compromise the integrity of the railroad roadway. Such alterations themselves reflect historic trends or changes in operation, such as the introduction of high-speed limited passenger service or the need to accommodate longer and heavier trains running at higher speeds.

Design. *Design* is the combination of planned, developed, and constructed elements within a railroad corridor historic district that created its form, plan, and structure. Historically, much of the effort related to the design of railroad corridors was focused on the alignment of the railroad roadway. Beyond the alignment, entire railroad corridors were rarely designed and built in a single episode, and segments of corridors were reconstructed as financial conditions allowed and as needed based on wear and tear and operating requirements. In Minnesota, segments of railroad corridors and elements within them followed standardized designs and well-established technologies (see engineering context in Section E), though elements of railroad corridors often required location-specific design modifications. Although the design of a railroad corridor historic district evolved over time, this aspect of integrity is important to convey a railroad corridor historic district's function as a railroad. To retain integrity of *design*, a railroad corridor historic district must retain integrity of *location*. In addition, the elements of the railroad roadway—railroad bed, fills or cuts, and ditches—should retain sufficient visual presence to convey their historic functions. Physical changes to the railroad roadway undertaken after the close of the period of significance will affect its integrity of design.

Buildings and structures within a railroad corridor historic district other than the railroad roadway help to convey the overall design and operation of a railroad corridor historic district. When those buildings and structures retain integrity of *location* and *materials*, they increase a railroad corridor historic district's overall integrity of *design*. Railroad support buildings and structures need not be present in a railroad corridor historic district if the railroad roadway retains a high degree of integrity of *design*, *materials*, and *setting*. Railroad stations or railroad yards, however, must retain some buildings and structures other than the roadway in order to be contributing elements to a railroad corridor historic district. In addition to the railroad roadway, a railroad station must retain at least a depot and a commercial loading structure or warehouse, unless the station operated as a flag stop and there were no separate freight facilities. A railroad yard must retain at minimum, in addition to the railroad roadway, an engine house and maintenance or repair shop.

Materials. A railroad corridor historic district must retain some of the physical *materials* from its period of significance. Due to the large number of elements combined to create a railroad corridor historic district, not all of them need to be present for the railroad corridor historic district to retain at least partial integrity of materials. The modified ground of the railroad roadway, represented by cuts, fills, and grades, must retain its historic materials and they must be visible. Replacement of the ballast, ties, and rails within a railroad corridor historic district represents a loss of historic materials. However, the almost identical appearance of modern tracks to their historic counterparts—steel T-rails, supported by wood cross ties, resting on a bed of stone ballast—means that the replacement of tracks within a historic railroad roadway will not result in a complete loss of the railroad roadway's integrity of *materials* or the other aspects of integrity for the district as a whole. When the tracks have been removed altogether as part of abandonment, a railroad corridor historic district loses part (though not all) of its historic characteristics, and its ability to convey its historic significance is diminished. In a railroad corridor historic district, the loss of tracks from a railroad roadway increases the relative importance of other elements of the roadway and of other support buildings and structures in the district. For example, the district may retain overall integrity of materials if it includes an intact railroad bed clearly defined by substantial cuts and fills, as well as associated buildings and structures, such as bridges and grain elevators. The loss of the railroad tracks, in itself, would not entirely compromise the integrity of a railroad roadway as a contributing element of the district.

Setting. The *setting* of a railroad corridor historic district includes properties adjacent to the right of way and may include the broad landscapes through which railroads passed, such as agricultural fields and urban areas. Adjacent properties help to convey the transportation function of a railroad corridor historic district. In addition, due to their locations lining railroad corridor historic districts, adjacent properties help to convey the linear aspect of a corridor and to provide the corridor with a visual frame. The *setting* of a railroad corridor is an important aspect of its historic integrity, both because it helps to define the corridor and because individual elements within the corridor are often lost due to replacement, abandonment, or demolition. To retain integrity of *setting*, the general land uses adjacent to a corridor must be similar to the historic land uses. Surrounding buildings and structures will retain sufficient historic appearance to convey their functions during the period of significance. Similarly, landscape features will be able to convey the historic functions of surrounding lands, such as agricultural fields. Many railroad corridors around urban centers have lost their integrity of *setting* due to suburban development, though they may retain the other aspects of integrity. Properties comprising the *setting* of a railroad corridor historic district need not be present if the railroad corridor historic district retains a high degree of integrity of *location*, *design*, and *materials*, and the corridor's right of way is sufficiently wide to maintain the *feeling* and *association* of the railroad corridor historic district despite alterations to adjacent properties.

Feeling. *Feeling* is conveyed by a railroad corridor historic district's ability to illustrate its historic function and feel from its period of significance. It is the cumulative presence of a railroad corridor historic district's character defining features, such as a linear railroad roadway, railroad yards, depots, and compatible setting, that conveys the feeling of traveling on a railroad corridor during the late nineteenth or early twentieth centuries. The extent to which a railroad corridor historic district retains its integrity of *feeling* is derived from the extent to which it retains its other aspects of integrity.

Association. *Association* is the direct link between a railroad corridor historic district and the significant transportation it provided. A railroad corridor historic district retains its integrity of *association* if it retains integrity of *location*, *materials*, and *design*.

Workmanship. For many elements of a railroad corridor historic district, *workmanship* will not be a factor in evaluating integrity, due to the utilitarian nature of the resource and standardized design of its components. Some specific elements within a corridor, however, may exhibit high degrees of workmanship, such as the stonework on a bridge abutment or the finishes on a depot. In such cases, evidence of the craftsmanship used to work the materials should be evident.

Contributing vs. Non-Contributing Segments

The length of a railroad corridor historic district can be subdivided into segments, or linear portions, of the whole; the district will consist of contributing segments, and it may include non-contributing segments. A non-contributing segment of a railroad corridor historic district is a portion of the railroad corridor historic district that lacks historic integrity. For example, if the railroad roadway has been altered and the setting is poor, the segment is a non-contributing segment of the larger railroad corridor historic district. Provided that the non-contributing segment of a railroad corridor historic district retains some visible expression on the landscape of the former railroad roadway, the segment is within the district boundaries, and the district as a whole may retain integrity (see District Boundaries discussion below).

A railroad corridor historic district retains historic integrity when enough of its contributing segments are sufficiently intact to convey that the linear corridor is, in fact, a railroad corridor that connected regions of the state or opened them up to settlement. Although contributing segments should constitute a majority of the linear mileage of a district, it is not practical to define a minimum required percentage of contributing segments necessary for a railroad corridor historic district to retain integrity because this integrity threshold will vary to some extent between districts. For example, a particular group of corridor segments that retain their integrity may be critical to conveying the historic character of a railroad corridor, even though the segments together do not comprise a majority of the corridor’s historic linear mileage. Similarly, a railroad corridor historic district significant for the connections it once made does not retain historic integrity if the segment providing connection to its significant terminal, transfer, or resource procurement area lacks historic integrity and if the portion lacking historic integrity is of sufficient length that the corridor no longer approaches the area of significant connection. This area will vary between railroad corridor historic districts. If the significant connection was a resource procurement area, contributing segments of the railroad corridor historic district must extend at least into the region where the resources were gathered. If the significant connection was a terminal or transfer, contributing segments of the railroad corridor historic district must extend at least to the metropolitan area or urban center where the connection was made, though not to the specific connection point.

District Boundaries

The starting point for delineating boundaries for a railroad corridor historic district is the historic right of way and terminal destinations. Railroad corridor historic district boundaries, however, may also be delineated based on historic integrity. Because the critical associative characteristic of a railroad corridor historic district is the linear quality, at least some visual continuity along the entire corridor is necessary to provide cohesiveness to the contributing elements of the district and maintain the overall linear quality of the district. A railroad corridor historic district cannot include a segment where the associative quality is not present. For a segment of a railroad corridor to be considered within the boundaries of a railroad corridor historic district, there must be some remaining visible expression on the landscape of the railroad. For example, when a portion of a larger corridor has been abandoned, all elements of the corridor have been removed, and the railroad bed has been plowed over, the historic district boundaries end where that removed segment begins. These physical conditions are to be distinguished from corridor segments that have lost historic integrity but retain some visual presence; such segments are non-contributing segments within a railroad corridor historic district, as discussed above.

If a railroad corridor segment has completely lost its integrity, such that there is no visible expression on the landscape, corridor segments on either side of that segment have also lost their ability to convey the operation of the whole corridor as a single transportation corridor. A railroad corridor historic district cannot jump over this type of missing gap to connect segments retaining integrity any more than a train traveling along a corridor could jump such a gap. When a segment of a larger railroad corridor retains integrity, that segment will be a railroad corridor historic district eligible for the National Register if, by itself and exclusive of other segments, it meets the significance criteria. For example, when a railroad corridor historic district retains historic integrity between a resource procurement area and an intermediary transfer or commercial market, but has been completely removed between the intermediary and terminal markets, it will be eligible if the intact connection to the intermediary market is historically significant. Also, when a railroad corridor historic district retains historic integrity up to its destination city, but not the exact terminal point, such as the railroad station or junction, the district retains integrity as a whole because it still conveys the important association of connecting two cities or a resource procurement area with a city.

I. Name of Property Type: Railroad Station Historic Districts

II. Description

The property type "railroad station historic district" is a grouping of railroad-related buildings and structures that provided the services and facilities required for the efficient railroad transport of passengers and freight (see Figure 17). A railroad station historic district functioned as a gateway for passenger traffic and as a transfer and storage point for common carrier freight. It also possessed limited repair and maintenance facilities common to railroad yards. Railroad station historic districts consist of buildings, structures, and objects used for loading and unloading passengers and freight and for operational needs. Those buildings and structures include railroad roadway and platforms; depots (combination or union/terminal); commercial buildings and structures within the right of way (elevators, warehouses, stockyards, and lumberyards); and operational support structures (watering and coaling facilities, signals, and interlocking towers).

A railroad station historic district will include, at minimum, a *railroad depot*, and it will include at least some of the following buildings and structures (for brief descriptions, see Railroad Corridor Historic District above; also see Figures 18-28).

- *Freight and Passenger Platforms (may be integrated with the depot)*
- *Associated Railroad Roadway*
- *Engine House*
- *Maintenance* or *Repair Shops*
- *Turntable or Transfer Table*
- *Coaling Station*
- *Ash Pit*
- *Watering Station*
- *Ice House*
- *Switching and Signaling Structures*
- *Freight Houses*
- *Storage Warehouses*
- *Commercial Loading Facilities* (such as grain elevators, stockyards, and lumberyards)
- *Sheds*
- *General Repair* and/or *Maintenance Buildings*
- *Power House* (although many urban stations used municipal electric services)

A railroad station historic district will *not* include the following property types that are only found in railroad yard historic districts:

- *Classification Track Systems*
- *Yard Offices*
- *Worker Shelters*
- *Car Construction Shops*

Railroad rights-of-way widen considerably within railroad station historic districts in order to accommodate additional tracks and support buildings and structures. As a railroad line approaches a station, the number of railroad tracks (termed approach tracks) increases, and within the railroad station historic district boundaries, there are additional sidings and spurs providing access to the depot and to loading and storage facilities. The through tracks, which continue on a railroad station historic district beyond a combination railroad station, run down the middle of a railroad station district with loading and storage facilities located on both sides, or along the side of the railroad station historic district with loading and storage facilities on one side. Platform structures facilitated movement between railroad cars and railroad depots and warehouses. Low platforms were built at grade, and they required a passenger to board by climbing the passenger car steps. High platforms were built up approximately 4 feet with wood framing or concrete to facilitate loading of freight and boarding of passengers, particularly when luggage was brought aboard.

A railroad depot was usually oriented on a long axis parallel to the railroad tracks. In this way, it sharply defined two separate functional areas: a passenger or freight arrival area, usually recognizable as a parking lot or freight drop-off platform; and a passenger boarding or freight loading platform immediately adjacent to the tracks. Depots provided a means for receiving, sorting, and loading any combination of passengers and freight. The majority of Minnesota's railroad depots were combination depots—small and capable of receiving both passengers and freight, with separate loading facilities for bulk commercial freight, such as grain elevators. Large cities had union or terminal depots, which were designed primarily for passenger traffic but also functioned as centers for shipping non-industrial freight.

Geographic Influences. The existing settled landscape in the southeast portion of the state strongly influenced the location of railroad corridors following the introduction of railroad transportation to Minnesota in the 1860s. Railroad companies typically built their lines to serve established rural and urban communities in this region. Similarly, many railroads located their stations near pre-existing shipping or transportation nodes in these communities, such as steamboat landings and stagecoach transfer points.

Steamboat landings on the region's major river systems were typically located close to established commercial and industrial districts on the broad, level floodplains of the Mississippi, Minnesota, and St. Croix rivers. Because the same geographical conditions that fostered the successful growth of pre-railroad communities often provided an ideal environment for the construction of the state's growing railroad network, railroad stations were often constructed near established shipping nodes.

In the largely unpopulated western portions of the state, however, railroads were designed to facilitate settlement, and their shipping services pre-dated the development of rural shipping routes. As a result, the locations of railroad stations were often determined by railroad surveyors and engineers, without regard to any existing transportation networks. These isolated shipping nodes typically provided the seed from which commercial and agricultural concerns in rural communities grew and prospered. Variables such as the projected market service area of a railroad and operations needs, such as watering and coaling facilities, were factors in the locations of railroad stations.

Boundaries. The boundaries of a railroad station historic district will be the historic right of way and station property boundaries of the railroad company that built and operated the station. If the current right of way and station property boundary is different than that of the period of significance, the historic right of way will comprise the boundary of the railroad station historic district. If, however, portions of the historic right of way and station property boundary that are not important to convey the essential characteristics of the district are no longer within the railroad right of way and no longer possess integrity, the boundaries of a railroad station historic district may be limited to the current right of way and station property boundaries.

Variations. A railroad station historic district will consist of elements that span the period of significance and that illustrate the historic significance of the railroad shipping node. The physical characteristics of a railroad station historic district will vary based on the local geographical environment, the historic volumes of shipping or passenger traffic associated with the station, the technological engineering design associated with the period of significance, and the architectural principles employed in the depot's design and construction. In addition, railroad station historic districts may include different numbers and types of supporting buildings and structures, depending on the types of services and shipping volumes associated with the station.

III. Significance

Railroad station historic districts are significant in the area of *transportation* as major nodes of passenger transportation and freight shipping on Minnesota's railroad network. A railroad station historic district's historical significance generally begins when a significant number of repair and maintenance buildings and structures for rolling stock (described above) are added to the site of an existing combination depot or a union/terminal depot. The gradual addition of such buildings and structures elevated simple passenger-freight depots into diversified transportation and service centers that were important engines for local economic growth, strategic storage and distribution centers for regional shipping, and way-stations for the critical servicing and repair of a railroad company's engines and freight cars.

The end of a railroad station historic district's period of significance will generally coincide with the termination of either passenger or freight shipping services, or with the closing of rolling stock service facilities.

IV. Registration Requirements

A railroad station historic district is a substantive concentration of railroad-related buildings and structures within a current or former railroad right of way that were built and operated in Minnesota between the years 1862 and 1956. To be eligible for listing in the National Register within the MPDF *Railroads in Minnesota, 1862-1956*, a railroad station historic district must meet one of the following significance criteria and must retain historic integrity.

Criterion A

To meet National Register Criterion A, a railroad station historic district must meet at least one of the following requirements.

1. The railroad station historic district was a significant contributor to the economic growth of surrounding commercial or industrial operations.
2. The railroad station historic district served as a significant regional distribution center for commercial or industrial products (defined within the context of overall regional commercial traffic).
3. The railroad station historic district served as a significant regional transportation center for passengers (defined within the context of overall regional passenger traffic).

Criterion B

Railroad Stations will not be eligible for the National Register under Criterion B. Railroad stations were built and operated by large corporations that represent the work of many people, rather than individuals. Although prominent individuals dominated some of the companies, such as James J. Hill of the Great Northern or Alpheus B. Stickney of the Chicago Great Western, they managed the construction while working out of the company's headquarters. Administrative offices would represent their corporate lives better than railroad station historic districts.

Criterion C

Railroad station historic districts comprise a complex of railroad-related service and maintenance buildings and structures that are associated with either a large combination depot or a union/terminal depot. These complexes were the result of the piecemeal addition of buildings and structures associated with the gradual increase of local passenger and freight traffic at a railroad depot, and not the result of a single design/construction event. As a result, railroad station historic districts will not meet Criterion C.

Criterion D

It is unlikely that a railroad station historic district would meet Criterion D. To do so, further analysis of the station area must be likely to yield important information about significant aspects of the evolution or development of railroad design, operations, or the inter-relationships between railroads and the industrial and commercial operations they served. The extant built environment of the railroad station historic district must be the principal source of the important information—archaeological resources are not considered or included in the *Railroads in Minnesota, 1862-1956* MPDF. It would be an extremely unusual set of circumstances by which historic-period railroad buildings and structures are extant in sufficient number and diversity within a railroad station to yield important new information. Even the buildings that remain within a railroad station, such as a depot or warehouse, are unlikely to provide important new information because railroad buildings in Minnesota typically followed standardized designs to meet standardized functions.

Because so many railroad buildings have been demolished over the years, too few historic-period buildings and structures within railroad stations are extant to make an analysis of spatial, organizational, or construction patterns, a likely source of new information regarding railroad properties. Future studies, however, in which archaeological analysis is combined with analysis of the extant built environment, could provide important new information significant under Criterion D.

Criteria Considerations

The National Register Criteria Considerations will not apply to railroad station historic districts.

Integrity Requirements

To be eligible for listing in the National Register within the MPDF *Railroads in Minnesota, 1862-1956*, a railroad station historic district must meet one of the National Register significance criteria and must retain historic integrity. Because railroad station historic districts evolved organically, they will consist of contributing elements (see Description above) and may include non-contributing elements. In addition to retaining integrity of *location*, a sufficient number of a district's contributing elements must retain integrity of *design* and *materials* to convey the district's historic character. At minimum, a railroad station historic district will include a depot and additional operations or commercial buildings and structures. The railroad roadway need not be present, but some visible expression of the railroad corridor must remain to convey a connection with a linear transportation corridor. Non-contributing elements within the district must not visually overwhelm the contributing properties to the degree that the district cannot convey its historic character. For example, non-contributing elements must not be a majority of buildings and structures within the historic district, and their height, massing, and materials must be compatible with the contributing elements of the district.

Location. Although a railroad station historic district may not be relocated, enough of its contributing elements must retain integrity of *location* sufficient to convey the historical appearance and functional character of the district. Changes in alignment and grade or other modifications during the period of significance will not compromise the integrity of the railroad roadway. Such alterations themselves reflect historic trends or changes in operation, such as the introduction of high-speed limited passenger service or the need to accommodate longer and heavier trains running at higher speeds.

Design. Because railroad station historic districts consist of a group of buildings and structures that were not designed as a single entity, the overall integrity of *design* for the layout of a railroad station historic district is not critical. However, a sufficient number of contributing buildings and structures within the district must retain enough integrity of *design* to effectively convey the district's historical appearance.

Materials. The group of contributing buildings and structures within a railroad station historic district must retain sufficient overall integrity of *materials* to convey the character and appearance of the district during its period of significance.

Setting. A railroad station historic district need not retain integrity of setting if it has a high degree of integrity of *location*, *design*, and *materials*, and alterations to adjacent properties do not significantly interfere with the district's ability to convey its period of significance.

Feeling. *Feeling* is a railroad station historic district's ability to illustrate the sense of the historic period. It is the cumulative sum of a railroad station historic district's character defining features.

Association. *Association* is the direct link between a railroad station historic district and the significant services it provided or the significant engineering embodied in its design. A railroad station historic district retains its integrity of *association* if it retains integrity of *location*, *materials*, and *design*.

Workmanship. Integrity of *workmanship* will not be a factor in evaluating integrity, due to the utilitarian nature of the resource and standardized design of its components. Some specific elements within a railroad station historic district, however, may exhibit high degrees of workmanship, such as the finishes on a depot. In such cases, evidence of the craftsmanship used to work the materials should be evident.

I. Name of Property Type: Railroad Yard Historic Districts

II. Description

A "railroad yard historic district" includes a system of tracks associated with the sorting, classification, switching, disassembly, and assembly of trains and specialized support buildings, structures, and specific facilities associated with the construction, maintenance, service, repair, refueling, and storage of railroad rolling stock (see Figures 29 and 30). This property type includes railroad yard facilities primarily designed for rolling stock maintenance, as opposed to those designed primarily for freight car classification. Although rolling stock maintenance facilities were commonly referred to as "shop complexes," they also included track systems for the sorting, switching, disassembly, and assembly of trains. Buildings and structures within this type of district include engine houses, shop buildings, turntables and transfer tables, yard offices, worker shelters, power houses, coaling stations, ash pits, water stations, ice houses, storage buildings, and signaling structures.

A standard single or double-tracked railroad corridor's right of way widens considerably as it enters a railroad yard historic district, providing space for various support buildings and structures and the multiple branches of interconnected track used for the sorting of rolling stock. The total size of a railroad yard reflects its capacity for the organization of rolling stock and the disassembly and assembly of trains. Trains arriving at a railroad yard on the through tracks were typically switched onto the arrival/departure tracks and then routed to the long yard lead track. Once positioned on the lead track, a train could be disassembled and its component cars distributed by switch engines onto parallel groups of tracks known as yard body tracks. Here, the switch engines routed cars to the proper locations on the yard body tracks and facilitated the gradual building of new trains by either physically pushing cars together or setting cars in motion down a switchable series of inclined tracks (known as a *hump yard*). Depending on the destination of a given freight car, yard personnel operated the series of switches required to shunt a car through the complex series of parallel yard body tracks and diagonal ladder tracks. Once an engine had properly distributed its freight cars, it navigated the network of track spurs that provided access to the yard's ash pit and refueling stations, and to the yard's repair and maintenance shops.

The largest railroad yard historic districts, located in major urban centers and railroad division points, also included the shops necessary for the construction of new locomotive engines and new passenger and freight cars or major repairs to locomotives and cars.

A railroad yard historic district must be associated with a historically significant railroad corridor. If the significant railroad corridor retains historic integrity, the railroad yard may contribute to the railroad corridor historic district. If the railroad corridor lacks integrity, the railroad yard itself may be eligible. A railroad yard historic district must include 1) a system of tracks and support buildings associated with the classification, switching, disassembly, and assembly of trains and specialized support buildings, structures; or 2) specific facilities associated with the construction, maintenance, service, repair, refueling, and storage of railroad rolling stock. Railroad yard historic districts will include the following contributing elements (for brief descriptions, see Railroad Corridor Historic Districts above; also see Figures 25-28 and 31-34).

- *Engine Houses* (square or round, with or without transfer or turntable structures)
- *Yard Offices, Worker Shelters, or Maintenance* or *Repair Shop Buildings*

A railroad yard historic district may also include the following elements.

- *Car Construction Shop Buildings*
- *Freight Houses*
- *Express Buildings*
- *Storage Warehouses*
- *Specialized Maintenance* and/or *Repair Shops*
- *Power Houses* (although many urban railroad yards used municipal electric services)
- *Coaling Stations*
- *Ash Pits*
- *Watering Stations*
- *Ice Houses*
- *Switching and Signaling Structures*

A railroad yard historic district will *not* include the following property type: *Passenger Depots* (any variety, excluding small buildings for the boarding of railroad employees).

Geographic Influences. Because railroad yards were used for the labor-intensive sorting and classification of freight cars, they required large acreage and level topography to function correctly. Railroad yards were often located on the fringes of rural or urban communities because of their industrial character, although many yards built in the late nineteenth and early twentieth century are now surrounded by mixed commercial and residential development. Topographical considerations aside, the locations of railroad yards were usually determined by railroad company’s shipping traffic and sorting/classification needs within the railroad network, and the yard sites laid out by surveyors and engineers. As a result, railroad yards may be present in established rural or urban communities or located in more remote rural settings.

Boundaries. The boundaries of a railroad yard historic district will be the historic right of way of the railroad company that built and operated the yard. If the current right of way and yard property boundary is different than that of the period of significance, the historic right of way will comprise the boundary of the railroad yard historic district. If, however, portions of the historic right of way and yard property boundary that are not important to convey the essential characteristics of the district are no longer within the railroad right of way and no longer possess integrity, the boundaries of a railroad yard historic district may be limited to the current right of way and yard property boundaries.

Variations. Railroad yards were among the most variable of railroad facilities, including nearly any combination of railroad car classification systems, repair, and maintenance shops. The most common variation in yard function often reflected the yard's focus on the repair and maintenance of rolling stock versus railroad car classification and train building. Although repair and maintenance yards were often referred to as railroad shops, they typically possessed enough sorting and classification tracks to be considered a railroad yard variant.

III. Significance

Railroad yard historic districts are significant in the area of *transportation* for their important functions related to the historical operation of Minnesota's railroad network, including 1) the classification, disassembly and assembly of trains, and 2) the construction, repair, maintenance, and refueling of rolling stock. Although stylish depot façades are most closely identified with Minnesota's historic railroads, the utilitarian service facilities and complex web of tracks associated with railroad yards were critical to the efficient operation of the state's rail network.

If all the required elements necessary to comprise a railroad yard historic district were initially present at a site, the district's historical significance may begin on the yard's initial operation date. If a railroad yard was initially established exclusively as a classification yard but was later upgraded to include rolling stock construction and maintenance facilities, its significance as a railroad yard historic district would begin on the date when the required additional elements listed above became active.

The end of a railroad yard historic district's period of significance will generally coincide with the termination of freight car classification services, or with the closing of the rolling stock service facilities specified above.

IV. Registration Requirements

To be eligible for listing in the National Register within the MPDF *Minnesota Railroads, 1862-1956*, a railroad yard historic district must meet one of the following significance criteria and must retain historic integrity.

Criterion A

To meet National Register Criterion A, a railroad yard historic district must meet at least one of the following requirements.

1. The railroad yard historic district provided freight car classification services on a historically significant railroad corridor.

2. The railroad yard historic district provided facilities for the construction, maintenance, service, repair, refueling, and storage of railroad motive power or rolling stock on a historically significant railroad corridor.

Criterion B

Railroad yards will not be eligible for the National Register under Criterion B. Railroad yards were built and operated by large corporations that represent the work of many people, rather than individuals. Although prominent individuals dominated some of the companies, such as James J. Hill of the Great Northern or Alpheus B. Stickney of the Chicago Great Western, they managed the construction while working out of the company's headquarters. Administrative offices would represent their corporate lives better than railroad corridor historic districts.

Criterion C

A railroad yard historic district meets Criterion C if its classification tracks or rolling stock support facilities were designed and built in a single construction episode and represent a type of railroad yard important to the historical development of railroad car classification systems or rolling stock maintenance and repair facilities. If a railroad yard historic district is an important example of a cohesively designed railroad yard system, it will meet Criterion C regardless of whether it is associated with a historically significant railroad line. Because of the historically wide variation of railroad yard design and configuration, an argument for eligibility under Criterion C must provide adequate documentation of a yard's significant contributions to the development of classification systems or repair and maintenance facilities.

Criterion D

It is unlikely that a railroad yard historic district would meet Criterion D. To do so, further analysis of the yard area must be likely to yield important information about significant aspects of the evolution or development of railroad design, operations, or the inter-relationships between railroads and the industrial and commercial operations they served. The extant built environment of the railroad yard historic district must be the principal source of the important information—archaeological resources are not considered or included in the *Railroads in Minnesota, 1862-1956* MPDF. It would be an extremely unusual set of circumstances by which historic-period railroad buildings and structures are extant in sufficient number and diversity within a railroad yard to yield important new information. Even the buildings that remain within a railroad yard, such as a shop building or yard office, are unlikely to provide important new information because railroad buildings in Minnesota typically followed standardized designs to meet standardized functions.

Because so many railroad buildings have been demolished over the years, too few historic-period buildings and structures within railroad stations are extant to make an analysis of spatial, organizational, or construction patterns, a likely source of new information regarding railroad properties. Future studies, however, in which archaeological analysis is combined with analysis of the extant built environment, could provide important new information significant under Criterion D.

Criteria Considerations

The National Register Criteria Considerations will not apply to railroad yard historic districts.

Integrity Requirements

To be eligible for listing in the National Register within the MPDF *Railroads in Minnesota, 1862-1956*, a railroad yard historic district must not only meet one of the significance criteria, it must also retain historic integrity. Railroad yard historic districts will include contributing elements (see Description above) and may include non-contributing elements. In addition to the railroad yard historic district retaining its integrity of *location*, a sufficient number of a district's contributing buildings and structures must retain integrity of *design* and *materials* sufficient to convey the district's historic character. At minimum, a railroad yard historic district will include an engine house and support building. The classification tracks need not be present, but there must be some visible expression of the yard track areas (alterations or new construction should be limited to surface level, such as a parking lot) and of the through roadway. Non-contributing elements within the district must not visually overwhelm the contributing properties to the degree that the district cannot convey its historic character. For example, non-contributing elements must not be a majority of buildings and structures within the historic district, and their height, massing, and materials must be compatible with the contributing elements of the district.

Location. To retain its integrity of *location*, a railroad yard historic district must occupy its historic site. In addition, enough of its contributing elements must retain integrity of *location* sufficient to convey the historic appearance and functional character of the district.

Design. The integrity of *design* for the overall layout of a railroad yard from its period of significance is critical to its eligibility as a railroad yard historic district. In addition, a sufficient number of contributing buildings and structures within the district must retain adequate integrity of *design* to effectively convey the district's historic appearance.

Materials. The contributing buildings and structures within a railroad yard historic district must retain sufficient overall integrity of *materials* to convey the character and appearance of the district during its period of significance. The routine replacement of the railroad roadway structure (including railroad bed, ballast, ties, and rail) does not affect the district's overall integrity of *materials*.

Setting. A railroad yard historic district need not retain integrity of *setting* if it has a high degree of integrity of *location*, *design*, and *materials*, and the scale, height, and massing of new construction or alterations to adjacent properties do not significantly interfere with the district's ability to convey its historical character.

Feeling. *Feeling* is a railroad yard historic district's ability to illustrate the historic sense of the period of significance. Because it is the cumulative sum of character defining features, if a railroad yard historic district retains integrity of *location*, *design*, and *materials*, it will retain integrity of *feeling*.

Association. *Association* is the direct link between a railroad yard historic district and the significant classification, maintenance, or repair it provided or the significant engineering embodied in its design. A railroad yard historic district retains its integrity of *association* if it retains integrity of *location, materials*, and *design*.

Workmanship. Integrity of *workmanship* will not be a factor in evaluating integrity, due to the utilitarian nature of the resource and standardized design of its components. Some specific elements within a railroad yard historic district, however, may exhibit high degrees of workmanship, such as the finishes on a depot. In such cases, evidence of the craftsmanship used to work the materials should be evident.

I. Name of Property Type: Railroad Grade Separation Structures

II. Description

The property type "railroad grade separation structures" is the grade-separated crossing between a railroad corridor and another railroad corridor, a vehicular roadway, a water course, or a topographic feature. Structures within this property type include railroad bridges, railroad trestles and viaducts, culverts, and tunnels. The boundaries of railroad grade separation structures include the right-of-way occupied by the railroad bridge, trestle, viaduct, or culvert without any surroundings. The following property descriptions are based on historical contexts previously developed for bridges carrying automobile traffic in Minnesota. These include *Minnesota Masonry-Arch Highway Bridges, 1870-1945* (Hess 1988); *Reinforced-Concrete Highway Bridges in Minnesota, 1900-1945* (Frame 1988); and *Historic Iron and Steel Bridges in Minnesota, 1873-1945* (Quivik and Martin 1988).

Railroad Bridges

The ability of the arch to bear heavy loads has been known to builders for thousands of years, and the earliest railroad bridges were masonry arch structures, designed to carry fully loaded freight trains by gradually distributing their enormous weight throughout the arch structure. In Minnesota, masonry arch bridges were constructed from the earliest developmental period of the railroad network through ca. 1900. Arch forms included classic hyperbolic, segmental, or semi-circular arches of brick or of cut granite or sandstone ashlar masonry. Common geometric variants included simple arches and skewed arches. The masonry blocks at the base of the arch barrel were seated on massive stone piers (often in waterways) and the fill supporting the railroad roadway was retained by thick masonry spandrel walls.

Due to their strength and durability, masonry arch bridges were the best alternative to wood trestles or iron truss bridges prior to the introduction of steel and concrete. Although masonry arch bridges could be extraordinarily expensive, they were favored by railroad engineers for their stability and longevity. Arch bridges also had a monumental aesthetic that made them popular as public landmarks, such as James J. Hill's 1882-1883 Stone Arch Bridge in Minneapolis. While these were undoubtedly the sturdiest of the arch forms, long-span masonry arch bridges became prohibitively expensive following the economic decline of the railroads in the 1890s and were superseded by reinforced concrete bridges. Masonry arch railroad bridges in Minnesota are significant attempts to address site-specific engineering challenges and represent a rare construction type. Additional information regarding the development of masonry arch bridges is found in the historical context *Masonry-Arch Highway Bridges, 1870-1945* (Hess 1988).

Despite the popularity of the masonry arch, most of Minnesota's nineteenth and twentieth century bridges used geometric frameworks (or *trusses*) of iron or steel members in various states of tension or compression. The engineering principles underlying the development of metal truss systems for railroad traffic were based on the same principles that led to the development of earlier wooden truss systems. Although metal railroad trusses were more stoutly designed to resist the heavy live loads associated with railroad traffic, the truss types developed by pre-railroad engineers and the configuration of their posts, chords, and bracing elements remained essentially unchanged. Fixed metal bridges were installed at most permanent river crossings, and utilized a variety of truss types, the most common of which were the Howe, Pratt, and Warren varieties. Trusses of all varieties could be constructed as *through trusses* (in which traffic passes between the bridge's main girder panels and under a series of cross-bracing elements tying the panels together); *pony trusses* (in which traffic loads are transferred to a web of cross-bracing elements, but without resting directly on the main girders, but the main girders are not situated high enough to warrant the use of an upper portal brace); and *deck trusses* (in which traffic loads rest directly on the top surfaces of the main girders).

After 1840, Howe truss bridges became an early standard truss for use on railroads. Howe trusses have inclined portal posts, with vertical members in tension and a set of mirrored diagonal members in compression. Additional diagonal members may be present to cross-brace each truss panel, acting in counter-stress when loaded. The Pratt truss, patented in 1844, has vertical members in compression and diagonal members in tension. Early examples of the type have inclined portal posts, intermediate posts, hip verticals, and bottom chord joints with pin and eyebar connections; later examples have riveted or welded joints. The steel plate, channel, angle bars, and gussets that typically comprise the elements of the upper chord and inclined end posts are often riveted with straight-neck button rivets. Variants of the Pratt truss include the Parker (with a single slanted upper chord in the panel medial to each portal strut), the camelback (technically a Parker, but with an upper chord of exactly five slopes), the Baltimore truss (with additional vertical and diagonal bracing in the bridge panels), and the Pennsylvania, or Petit truss, combining elements of the Parker and Baltimore variants. A typical Warren truss (patented in 1848) has inclined portal-posts and diagonals which carry both compressive and tensile forces. The Subdivided Warren variant adds vertical beams to help brace the triangular web system. Warren trusses may also have arched, polygonal upper chords.

Developed in the mid-1800s, plate girder bridges carry loads on composite steel I-beams that rest on abutments or piers and are one of the simplest forms of metal railroad span. Each I-beam girder is composed of a solid sheet of plate steel with flange plates attached to the edges by riveted or welded steel angle bars. The floor system of plate girder bridges is composed of beams and stringers, also composed of riveted or welded plate and angle. In the 1920s, rolled I-beams could be used to bridge spans of up to 30 feet. Plate girders, however, because of their composite construction, could be used for spans up to 125 feet, and their ease of erection made them economically attractive alternatives to metal truss railroad bridges. Deck plate girder bridges carry loads on the surfaces of the girder top plates, which are stabilized by cross bracing. Pony plate girder bridges, in which rail traffic is carried between the plate girders, distribute loads throughout the floor system to the main girders, with knee bracing stabilizing the juncture between the plate girders and the deck (Hool and Kinne 1924:287; Howson 1926:461).

Movable bridges are used in locations where a temporary gap in a railroad corridor is needed to allow passage of other traffic, usually water-borne shipping. Common movable bridge types included the bascule bridge, the swing bridge, and the vertical lift bridge.

In their simplest form, bascule bridges were typified by medieval castle drawbridges (the single-leaf variety). Double-leaf bascules used two symmetrical movable spans to open wider navigation channels. Hardesty et al. (1975:515) note that the first recorded railroad bascule bridge was built in Selby, England, in 1839, but engineer J. A. L. Waddell opined that the first structurally important bascule was the 1897 Michigan Avenue Bridge in Buffalo, New York, a counterweighted bridge which used a trunnion (or *axle*) system as a pivot (Waddell 1916:12). This single trunnion bascule type became known as the Chicago type. Bascules with multiple trunnions were also developed, and were known as Strauss bridges. Rolling lift bascule bridges, which rolled back from the navigational channel on semi-circular girder tracks, were first developed in the 1820s and evolved into two distinct classes: the Scherzer and the Rall (or Strobel). The Scherzer rolling lift bridge used a large counterweight that descended into a pit when the leaf was raised. The type was patented by William Scherzer, who built the first example in Chicago in 1893 (Hool and Kinne 1923:1). The Strobel bascule variant was patented by Charles Strobel in 1899, and combined the rolling aspect of the Scherzer design with the trunnion rotation of a classic bascule bridge. This allowed the use of a much smaller roller diameter, and simplified the service and replacement of critical portions of the lift mechanism (Hool and Kinne 1923:26).

Swing bridges were used as early as 1625 in Cherbourg, France, but did not become common in the United States until after the 1850s (Hovey 1926:12). Swing bridges typically utilized a metal through truss that rotated on a center pivot anchored to a pier. The earliest swing bridge mechanisms had rim-bearing pivot mechanisms, in which a series of bearings or conical rollers ran along a circular track on the top of the center pier (Hool and Kinne 1923:196). In the 1870s, simpler and more reliable center-bearing pivot mechanisms became increasingly popular and by ca. 1940 had supplanted rim-bearing pivot technology (Hool and Kinne 1943:3; Hovey 1926:36). While swing bridges were often considered the simplest and most cost-effective solution to managing competing traffic, they were slow to operate and could create significant delays for watercraft when located in proximity to each other (Hool and Kinne 1923:2).

Vertical lift bridges employed a system of counterweights, sheaves, and steel cables to lift the central section of a bridge out of a navigable right-of-way. Squire Whipple began designing, patenting, and building small vertical lift bridges for New York state canal crossings between 1872 and 1880. While Whipple's early bridges were operated by an imaginative double-counterweight system, their size was limited by the brittle cast iron elements and construction techniques of the time (Hovey 1926:149). In 1892, John Alexander Low Waddell proposed a 250-foot span with a vertical lift of 140 feet to bridge the Duluth ship canal, but objections by the War Department prevented the bridge from being built. An almost identical version of Waddell's Duluth lift span was completed in 1894 on South Halstead Street in Chicago, Illinois. The span was 130 feet long and carried a 34-foot roadway and two 7-foot sidewalks and allowed an overhead clearance of 155 feet when fully open. In 1910, J. B. Strauss patented a design for a movable bridge where the required vertical lift was small. Strauss' design used no sheaves or cables, but made use of pin joints to move two large counterbalancing devices at each end of a movable span. Duplicate hoist machinery at each end of the span caused the main counterweights to rise and fall in a vertical plane, while the counterweight link pivoted, bringing the main pivot on the span up in a similar vertical plane. The Strobel vertical lift bridge was similar in design to the Strauss system, avoiding use of the somewhat problematic sheave/cable construction. The Strobel system used a rolling trunnion on the upper surface of the lift tower in an attempt to compensate for horizontal movement of the counterweight-span structure (Hovey 1926:168). By the mid-1920s, Waddell and Harrington of Kansas City, Missouri, had simplified and improved the basic design of large vertical lift bridges, but the efficient coordination of the sheaves and up-haul/down-haul cable systems still vexed engineers. The reliable operation of vertical lift spans over 400 feet (such as the Missouri Kansas and Texas Railroad's Boonville Bridge in Missouri) was only achieved with the invention of the synchronous motor systems in the late 1920s. Additional information regarding the development of iron and steel bridges is found in the historical context *Historic Iron and Steel Bridges in Minnesota, 1873-1945* (Quivik and Martin 1988).

As a raw material, the plasticity of concrete made it "peculiarly adaptable as a material for arch construction" (Howson 1926:457). Although the first concrete arch bridge was built in France in 1840, it was constructed without internal reinforcement, and relied instead on its massive structure to absorb stress (Condit 1960:246). Reinforced concrete was originally developed by Josef Monier in 1867, who succeeded in building a small concrete girder bridge in Saint-Benoît-du-Sault, France, as early as 1875. However, Monier's techniques were not practically adapted to serve structural arch systems until 1889, when Ernest L. Ransome developed a method for strengthening concrete with a twisted mesh of iron bars and built the first reinforced concrete arch bridge in San Francisco. In 1894, Josef Melan developed a reinforcing system that used a parallel series of curved steel I-beams to form the arch, which was then jacketed with concrete (Newlon 1979:100). While Melan's bridges were very popular in the first fifteen years of the twentieth century, they were primarily steel arch bridges with a coating of concrete, and their high material costs kept them small. Concurrently, Viennese engineer Fritz Elder von Emperger developed variants of the Melan system that supplemented the continuous arch barrel members with curved, lateral steel rib members. In 1898, F. W. Patterson of the Allegheny County, Pennsylvania Department of Roads created a new rib arch design by omitting Melan's and von Emperger's barrel arch members and relying entirely on two parallel, curved I-beams to support a roadway bridge deck.

By ca. 1915, the size limitations of the Melan arch had become apparent, but engineers had begun to apply aspects of Ransome's wire mesh reinforcing system to Patterson's open-spandrel arch designs. This approach to reinforced concrete construction allowed a much greater strength-to-weight ratio for arch superstructures and quickly became the economically competitive design choice for monumental concrete arch bridges. Reinforced concrete largely replaced ashlar masonry as a building material for arch bridges after ca. 1920. The most dramatic use of reinforced concrete engineering was in monumental arch bridges built from the 1920s through the 1940s, which stretched the engineering limits of the form (Howson 1926:459). These open-spandrel arch bridges often use intermediate vertical posts that rested on the upper surface of the arches and supported the roadway deck above. Single arches required massive, stable abutments to support lateral forces. Multiple concrete arches in a viaduct configuration offered some support to one another, but still required monolithic piers for overall stability. Details regarding the importance of historical reinforcing systems to the evolution of concrete arch bridge construction are presented in *Reinforced-Concrete Highway Bridges in Minnesota, 1900-1945* (Frame 1988). Reinforced concrete structures that utilized patented systems or arch designs, including the Melan reinforcing system, the James B. Marsh rainbow-arch design, and others described in Frame (1988), are significant bridge forms.

The concrete rigid frame bridge was developed in the early 1920s. Within 15 years of its introduction, the form had replaced arches, slabs, and girders at many crossings, and by 1938, approximately 400 had been built in the United States (Hayden 1950:184). The concrete rigid-frame was the economical choice for spans from 35 to 80 feet and the steel rigid frame form for spans from 80 to 120 feet. Popular for freeway grade separations, the rigid frame design gradually gave way to less expensive concrete slab and concrete girder designs as concrete jacketing technology improved in the 1940s and 1950s. There were several varieties of the concrete rigid frame bridge, including the barrel, ribbed, and cellular types. Nevertheless, the form remains among the simplest of engineering designs. Frame (1988) provides the following description:

If a solid, horizontal slab is rigidly connected with vertical walls, a simple rigid-frame bridge has been created. The critical point is that the three sides are rigidly connected at the two "knees" or corners, and all work together in carrying a load. In sectional elevation, the rigid frame appears somewhat different from an abutment-supported slab. In the conventional slab arrangement, its abutments are heaviest at the bottom and lighter at the top where the bridge seat is located. In the rigid frame, the reverse tends to be true: the transverse vertical walls, which replace traditional abutments, are wedge-shaped, tapering downward to the footing.

Reinforced-concrete and steel girder rigid frame bridges are often not recognized as such until their construction plans are reviewed.

Reinforced-concrete slab railroad bridges were built as early as reinforced-concrete arch bridges, but were utilized for very short crossings, supporting loads through sheer strength. Still used in railroad corridor construction, they are generally of three types: reinforced-concrete slab, reinforced-concrete I-beam, and reinforced-concrete rail top. Reinforced concrete slab bridges are used for short spans (no longer than about 20 feet) where the simple cohesive strength of the concrete and metallic reinforcement bear the direct flexing moment applied by a train in motion. Concrete I-beam bridges carry these same loads by using multiple, heavy, concrete-jacketed I-beams as stringers, spaced 16 to 18 inches apart. The concrete rail top form uses closely-spaced lengths of steel rails as stringers to support a concrete slab. The concrete rail top bridge is suitable for very short spans of 6 to 10 feet. Additional information regarding the development of reinforced-concrete bridges is found in the historical context *Reinforced-Concrete Highway Bridges in Minnesota, 1900-1945* (Frame 1988).

Bridge substructures, such as piers and abutments, also may be significant for their employment of important historical construction methods (including the use of stone masonry for abutments or underwater caissons in pier construction).

Railroad Trestles and Viaducts

Railroad trestles and viaducts are braced frameworks designed to cross deep river valleys that lack navigable channels or to cross minor streams and gullies. Trestles have short (12 to 14 feet) spans (bents) fashioned from driven wood piles or cut framed timber. Viaducts use a skeletal frame of steel girders. Trestles and viaducts had particular advantages and disadvantages—wood trestles were cheap to build, but had short lifespans; steel viaducts were expensive, but lasted longer and responded better to heavier live loads.

Small wood trestles over minor gullies, wetlands, and drainages are constructed with 15 to 18-inch diameter, creosoted wood piles vertically driven into stable sediments and with 3 by 6-inch scantlings bolted diagonally across the piles to serve as cross-bracing (usually when the piles were over about 9 feet tall [Cook 1999:144]). A series of timber stringers are attached to this wood substructure to support a standard set of ties and rail. Trestles built after the early twentieth century may use steel piles for such shallow crossings. Higher and longer wood trestles cross deeply dissected drainages or valleys where the maintenance of a navigable river channel below is not required. To allow for passage of river traffic, a metal truss, usually a deck truss, may be used to bridge the gap in the wood trestle system.

Because of their great expense, metal framework viaducts were usually only constructed in railroad corridors with high traffic volumes or trains with particularly heavy loads, or in areas that regularly experienced high cross-winds.

Railroad Culverts

Culverts provide drainage for water or form a passageway through a fill material (usually earth) and are usually provided where a railroad roadway passes over a minor or intermittent stream. Culverts are actually miniature bridges, and their historical significance should be evaluated with reference to a comparable bridge design type (e.g., masonry arch, concrete slab, etc.). Although there is little analytical information regarding their historical development, one of the earliest (pre-railroad) forms of culvert consisted of a simple box constructed of wooden beams, or wooden beams that were laid on masonry ledges to bridge small drainages. The first railroad culverts were box-like cut masonry structures, with stone slabs or sections of rail carrying the roadway load and resting on masonry sidewalls. Formal masonry arches were designed for more permanent crossings, resembling arch bridges with stone or concrete drainage floors. Occasionally, more elaborate culverts were constructed using brick or interlocking metal plate in semicircular barrel arches. Cast iron pipe culverts were developed ca. 1850, and were the most commonly used culvert type during the latter half of the nineteenth century (Howson 1926:447). After ca. 1900, prefabricated reinforced concrete pipe and/or corrugated metal pipe was increasingly used for railroad culverts (Howson 1926:446).

III. Significance

Because railroad grade separation structures played an important role in the operation of railroad corridors in Minnesota, they are associated with historical significance in *transportation*. In addition, because railroad bridges, trestles and viaducts, and culverts are associated with the application of scientific principals to the design and construction of structures, they are also associated with *engineering*. The significance of railroad corridors within those areas of significance are linked to a number of historic contexts in Minnesota: *Railroad Development in Minnesota, 1862-1956, Railroads and Agricultural Development 1870-1940, Northern Minnesota Lumbering, 1870-1945, Minnesota's Iron Ore Industry, 1880s-1945,* and *Urban Centers, 1870-1940*. In addition, Multiple Property Documentation Forms previously developed for bridges carrying automobile traffic may be used as a basis to evaluate the significance of railroad bridges. These include *Minnesota Masonry-Arch Highway Bridges, 1870-1945* (Hess 1988); *Reinforced-Concrete Highway Bridges in Minnesota, 1900-1945* (Frame 1988); and *Historic Iron and Steel Bridges in Minnesota, 1873-1945* (Quivik and Martin 1988).

Masonry arch bridges, viaducts, and culverts are rare property types in Minnesota's railroad network and are significant for their association with early construction of the state's railroad network and for their design and construction.

Metal truss bridges and viaducts built of iron or wrought iron typically predate the mid-1890s. After that date, most metal trusses were constructed of steel. Steel trusses built during the period between circa 1894 and 1900 were early examples of the use of the material and represent an important transitional type of design and construction. Although pin-connected Pratt and riveted Warren truss bridges were the most common trusses constructed on late nineteenth and early twentieth century Minnesota railroad lines, they are significant for their association with the state's early railroad corridors and may be significant for innovative engineering design and construction related to their crossing site.

Movable spans such as bascule bridges, swing bridges, and vertical lift bridges are examples of complex engineering designs applied to unusual site circumstances. All metal truss bridges that exceed standard span lengths also are considered significant as major engineering solutions to address unusual or complex site conditions.

Early examples of reinforced-concrete arch bridges, slab bridges, girder bridges, and rigid frame bridges and viaducts are significant as transitional types of design and construction and also may be associated with historically significant grade crossing programs of the mid-twentieth century. All reinforced-concrete bridges that exceed standard span lengths also are considered significant as major engineering solutions to address unusual or complex site conditions.

Wood trestles were constructed with relatively short-lived materials and represent simple engineering solutions to grade separations. As individual structures, the vast majority are not historically significant. Nevertheless, trestles may contribute to the overall historic character of a railroad historic district. As most trestles are relatively small, it may be demonstrable that a particularly large or long trestle is historically significant.

Railroad tunnels are examples of an extremely rare railroad-related property type in Minnesota and are significant as major engineering solutions to unusual or complex site conditions.

IV. Registration Requirements

To be eligible for listing in the National Register within the MPDF *Railroads in Minnesota, 1862-1956*, a railroad grade separation structure must have been built within a railroad corridor between the years 1862 and 1956; must meet one of the National Register Criteria for Evaluation; and must retain overall historic integrity.

Criterion A

A railroad grade separation structure will meet National Register Criterion A only if it is a contributing element of a railroad corridor historic district, a railroad station historic district, or a railroad yard historic district. The period of significance for the grade separation structure and the district must be the same.

Criterion B

Railroad grade separation structures will not be eligible for the National Register under Criterion B. These structures were built and operated by large corporations that represent the work of many people, rather than individuals. Although prominent individuals dominated some of the companies, such as James J. Hill of the Great Northern or Alpheus B. Stickney of the Chicago Great Western, they managed the construction while working out of the company's headquarters. Administrative offices would represent their corporate lives better than railroad corridor historic districts.

Criterion C

Registration requirements for masonry arch, metal truss, and reinforced concrete bridges in Minnesota have been developed by Hess (1988), Quivik and Martin (1988), and Frame (1988), respectively. These documents have been used as the basis for evaluating railroad structures with masonry, metal truss, and reinforced concrete spans under Criterion C.

Railroad grade separation structures will meet Criterion C if they

- represent the early work of an historically important railroad engineer, architect, contractor, or fabricator (see Frame 1988; Hess 1988; and Quivik and Martin 1988) for partial lists of bridge engineers and bridge-building companies significant to the history of Minnesota bridge-building);
- utilize designs or building systems that represent historically important types or construction methods, such as masonry arches, innovative metal truss designs or reinforced concrete systems that extended span lengths;
- employed experimental or innovative elaborations of contemporary engineering practice to meet unusual or extreme site conditions (e.g., high vertical clearance, wide channel clearance, extreme skew, etc.); or
- employed important contemporary construction methods (such as the use of stone masonry for abutments or underwater caissons in pier construction).

A railroad grade separation structure will meet Criterion C if it meets one of the following conditions (adapted from Frame 1988; Hess 1988; and Quivik and Martin 1988):

1. Masonry arch spans built prior to 1938.
2. Masonry arch bridges or viaducts with two or more spans.
3. Masonry arch bridges or viaducts with highly skewed configurations.
4. Masonry arch bridges with arch types other than semi-circular or segmental.
5. Masonry arch bridges whose rise:span ratio exceeds 1:5.
6. Metal truss bridges built prior to 1890.
7. Steel truss bridges built during the 1890s.
8. Iron or steel arch bridges, or through trusses other than those of Pratt or Warren design.
9. Reinforced concrete structures built prior to 1910.
10. Reinforced concrete bridges constructed with patented reinforcing systems.
11. Reinforced concrete bridges with spans exceeding 100 feet.
12. Rigid frame bridges built prior to 1938.
13. Rigid frame bridges with a false arch, ribbed frame or through frame.
14. Bridges fabricated by an important national bridge company or an important Minnesota bridge fabricator.
15. Structures designed with patented or otherwise specially designed elements.
16. Structures designed by an important engineer.
17. Structures which exhibit innovative design solutions to address unusual engineering conditions, including trestles, movable spans and tunnels.
18. Bridges that represent innovative attempts to exceed the engineering limits for span length:
    a. Masonry arch spans: 30 feet and longer
    b. Metal through truss spans: 100 feet and longer
    c. Concrete slab spans: 30 feet and longer
    d. Concrete deck girder spans: 50 feet and longer
    e. Concrete through girder spans: 50 feet and longer
    f. Concrete arch spans: 100 feet and longer
    g. Concrete rigid frame spans: 50 feet and longer.
19. Structures (including culverts and tunnels) with exceptional aesthetic details or ornamentation.
20. A trestle of exceptional size or length.

While most grade separation structures could be considered representatives of a type, evaluation of significance under Criterion C should address additional important aspects of the property within a larger population of similar structures. Evaluations should consider:

1. The age of the structure.
2. The relative rarity of the structure as a design type.
3. The prominence of the engineer or construction contractor.
4. Extraordinary engineering characteristics, including innovative use of materials and the presence of notable aesthetic or decorative elements.

Criterion D

Although unlikely, railroad grade separation structures or their structural remains may meet Criterion D if further analysis can yield important information about a significant type of technology or construction employed as part of the evolution of its class of railroad-related properties.

The information that a railroad grade separation structure yields, or will yield, must be evaluated within an appropriate historic context. This requires consulting the body of information already collected from similar properties or other pertinent sources, including modern and historic written records. The researcher must be able to anticipate if and how the potential information will affect the definition of the context. The information likely to be obtained from a particular railroad bridge, trestle, viaduct, or culvert structure must confirm, refute, or supplement existing information in an important way. The importance of the information to be potentially obtained must be justified through the formulation of research questions that address historically significant questions. Research questions are usually developed as part of a research design, which specifies the questions to be asked, the types of data needed to supply the answers, and the techniques needed to recover the data.

The railroad grade separation structure should then be investigated with techniques sufficient to establish the presence of data relevant to the research questions being asked. The method of investigation will depend upon specific circumstances including the structure's location, condition, and the research questions being addressed. Justification of the research potential of a railroad bridge, trestle, viaduct, or culvert may be based on analogy to another better known property if sufficient similarities exist to establish the appropriateness of the analogy. The assessment of integrity for a railroad bridge, trestle, viaduct, or culvert considered under Criterion D depends on the research design's data requirements. A structure possessing information potential does not need to recall *visually* a manufacturing process or construction technique. However, the significant data required to yield the expected important information must be sufficiently intact.

Finally, in order for a railroad grade separation structure to be eligible under Criterion D, the structure itself must be, or must have been, the principal source of the important information.

Criteria Considerations

In order to meet Criteria Consideration B, a moved railroad grade separation structure individually eligible under Criterion C must retain enough of its historic features to convey its engineering or architectural values and retain sufficient integrity of *design*, *materials*, *workmanship*, *feeling*, and *association* to effectively convey its historical function as a railroad grade separation structure.

Integrity Requirements

In addition to the requirement that a railroad grade separation structure must meet one of the National Register Criteria to be considered eligible, it must also retain integrity. Integrity requirements for masonry arch, metal truss, and reinforced concrete bridges in Minnesota have been developed by Hess (1988), Quivik and Martin (1988), and Frame (1988), respectively and may be used as a basis for evaluating the integrity of railroad bridges.

Location. A railroad grade separation structure must retain its integrity of *location* if it contributes to a railroad district under Criterion A. Grade separation structures that have been relocated may still be eligible under Criterion C for their historically significant design and construction characteristics. Per Criteria Consideration B, a grade separation structure that achieves significance after relocation within a railroad network may be considered to have integrity of *location*.

Design. A grade separation structure must retain enough original physical features to effectively convey the significance of its engineering design. The most important part of railroad bridges, trestles, viaducts, and culverts is their superstructure, which expresses the engineering principles integral to their design. Therefore, for such structures to retain integrity of *design*, their superstructures must be substantially intact, including their connection types and the composition and configuration of their structural members. Movable bridges must retain their original machinery, control systems, and structural elements (e.g., the lifting towers characteristic of a vertical lift bridge) to effectively convey their operational design.

Setting. To be eligible under Criterion A, a grade separation structure must be located in a setting similar to that during its period of significance. For example, a bridge should still cross a river or stream channel or other body of water, another railroad corridor, or be situated over a similar barrier to travel. Grade separation structures eligible under Criterion C do not need to retain integrity of *setting*.

Materials. A railroad grade separation structure retains integrity of *material*s if the superstructure either: 1) retains original construction materials; 2) has replacement *materials* that were installed during the structure's period of significance; or 3) has modern repairs or replacements that have the same material character as those used during the period of significance. The presence of a bridge's original piers, abutments, decking, and guard rails adds to the overall *material* and *design* integrity of a bridge. However, because the periodic replacement of these elements was historically required to maintain the safety and operability of a bridge, their presence is not required for eligibility. Nevertheless, any replacements in these categories should be of appropriate scale and should not substantially obscure the functional identity of the superstructure, particularly the truss type.

Workmanship. Most components of railroad grade separation structures were mass-produced and do not exhibit qualities of *workmanship*. If, however, a decorative or aesthetic feature of a grade separation structure is an important feature of a structure, that feature must retain its original visual appearance.

Feeling. A grade separation structure's integrity of *feeling* will only be lost if modern alterations to its historical design or the addition of modern materials to its structure are of sufficient scale or visual contrast so as to dominate its overall visual appearance. A structure that retains integrity of *design* and *materials* will also retain integrity of *feeling*.

Association. *Association* is the direct link between a grade separation structure and the significant engineering embodied in its design. A grade separation structure retains its integrity of *association* if it retains integrity of *location*, *materials*, and *design*.

Criterion A. Because a railroad grade separation structure's site is integral to its association with the historical development of a railroad corridor or the opening of a region or locality, it must retain its integrity of *location*, *materials*, *design*, and *setting* to be considered eligible under Criterion A as part of an historic district.

Criterion C. A grade separation structure may retain overall integrity even if there have been alterations to its form and materials, as long as the historically significant engineering characteristics of the design or construction method are intact. Integrity of *design* and *materials* is critical if the structure is to convey its historical significance under Criterion C. Because the expression of historically important engineering design or construction is embodied in the structure itself and not in its specific physical environment, integrity of *location* is not necessary for eligibility under Criterion C.

Criterion D. The integrity requirements for a railroad grade separation structure considered under Criterion D depends on the data requirements of the research design. For example, if a research design specified that the remains of a grade separation structure had the potential to meaningfully contribute to the body of knowledge regarding the evolution of engineering theory and manufacture for that property type, the grade separation structure would have to retain integrity of *materials* and *design*.

I. Name of Property Type: Railroad Depots

II. Description

The depot buildings associated with Minnesota's railroad system reflect the general progression of design and styles built from the 1860s to the present. The earliest depots from 1862 to circa 1870 were wood frame buildings, none of which are known to have survived. Depots served as the public face of the railroads, and their designs after 1870 reflected the influence of popular architectural styles.

Using Berg's (1900) classification system, depots can be classified into four subtypes: flag depots, passenger depots, combination depots, and union/terminal depots. From a functional standpoint, these buildings and any associated support structures serve the same purpose: to provide a means for receiving, sorting, and loading any combination of passengers and freight. The predominantly rural character of Minnesota meant that the majority of depots would be combination depots—small and capable of receiving both passengers and freight. Medium-sized towns might have larger versions of the combination depot, with separate freight loading facilities for agricultural or industrial freight, if appropriate. Large urban areas such as Minneapolis-St. Paul, Duluth, and St. Cloud, had union or terminal depots, which were designed exclusively for passenger traffic and were often one of the most architecturally sophisticated and flamboyant buildings in the community.

The main depot at a railroad station was usually oriented on a long axis parallel to the railroad tracks. In this way, it defined two separate functional areas: a passenger or freight arrival area, recognizable as a parking lot or freight drop-off platform; and a passenger boarding or freight loading platform immediately adjacent to the tracks. Smaller railroad stations were often referred to as depots, although they also included the buildings, platforms, structures, and track within the immediate right-of-way, including passenger platforms, freight loading platforms, warehouses, and service buildings. For the purposes of this property type description, however, such groups are defined as railroad "stations" and are described in the property type "railroad station historic district."

A railroad depot may be a contributing element to a railroad station district or a railroad corridor historic district. Where neither of those two district property types is present, a railroad depot will be eligible for the National Register individually if it meets the registration requirements described below.

Flag Depots

A flag depot often was the first type of station built in a small town following the construction of a railroad, or a new community may have grown and developed around it (see Figure 19). Flag depots were small buildings or simple platforms located in areas where traffic was restricted to the occasional passenger, who waved a flag to signal a train to stop. Platform stops could be either low or high. Low platforms were common at the lowest traffic points on a line, and were simple, open-air frame shelters with shed or gable roofs. Built at grade, they required a passenger to board by climbing the passenger car steps. A high platform included an approximately 4-foot-high wood-frame or concrete platform covered by an open-sided roof structure. High platforms facilitated easier passenger access to cars, particularly when luggage was being brought aboard. In cold climates such as in Minnesota, flag depot platforms were typically enclosed to provide additional shelter in the winter, but were limited to a single room.

If passenger traffic at a flag depot increased, it could be upgraded by the railroad company to include a small building with a railroad agent's office and a passenger waiting room. From an operational standpoint, the replacement of a simple platform with a formal passenger building meant a significant change in the class of the station, which might then be referred to as a second-, third-, or fourth-class passenger depot.

Passenger Depots

Passenger depots were constructed where there was significant passenger traffic (see Figure 20). Their size and configuration usually varied directly with the volume of traffic. The smallest passenger depots were simple buildings with a waiting room, ticket office, and baggage room, which accommodated the occasional freight shipments. Large first-class passenger depots could be "two-story structures with capacious waiting-rooms, toilet-rooms, smoking-room, dining-room and appurtenances, baggage-room, express-room, mail-room, telegraph-office, parcel-room, news-stand, supply-rooms, rooms for conductors and trainmen, and offices" (Berg 1900:278). Functionally, the largest passenger depots resembled small terminal depots, although the railroad line continued past the passenger depot rather than terminating at it.

Passenger depots varied in appearance, with their scale and architectural character directly related to the volume of passenger and freight traffic. Low, single-story frame and brick buildings with various restrained expressions of eclectic Victorian architectural styles were common in smaller towns. Expressing the practicality of a railroad engineer, Berg (1900:284) noted that while "picturesqueness" in design can be important to a depot, "the style of the building should correspond to the use it is put to, [and] it can hardly be considered good practice to design a large depot on the same outlines as a church or an old-fashioned country tavern, especially when very serious defects of the ground-plan layout are created by giving too much attention to the architectural effect of the building." Nevertheless, he recommended that the standard passenger depot plans employed by most railroad companies be slightly modified at each site to avoid architectural monotony. In practice, the likelihood of a passenger depot to vary from a standard design was a function of the size of the community it served and its volume of business.

Combination Depots

Combination depots were usually located in small rural communities where there was both passenger and freight traffic, but not enough of either to justify the construction of separate buildings (see Figure 21). Usually no larger than a small passenger depot, they had a single, central office space that processed passenger tickets and freight bills, a passenger waiting area at one end of the building, and a freight room at the other end. When space allowed, the passenger area might be split in two by the ticket office, forming separate waiting rooms for men and women. Passenger and freight loading usually occurred at either end of a common loading platform. Berg (1900:247) noted several options for safely configuring track at combination depots with a high volume of passenger service, including separate side-tracks for loading freight cars left at the depot.

High-volume “second class” combination depots and many of the lower-volume “first class” combination depots were built from standardized plans developed internally by the railroads’ engineering departments. Constructed of brick or frame construction with wood siding, these depots exhibited modest stylistic influence from the Victorian Eclectic, Arts and Crafts, and Tudor Revival traditions (Esser et al. 1995; Grant and Bohi 1978). There were many variations on the design and layout of the combination depot, but the most common was the addition of living quarters for a station-master and a bunk room for railroad workers. This was customary in the American South and West, where nearby living quarters might be scarce, and it may have also been common during the early railroad years in the west and northwest regions of Minnesota.

Architecturally, combination depots were similar to passenger depots. However, if a depot engaged in a significant amount of commercial or industrial shipping and required a full-time caretaker, it might acquire any number of additions prone to architectural elaboration, including a second story, a watch-tower, and separate wings for baggage and freight.

Union or Terminal Passenger Depots

Union depots or terminal depots are large passenger depots, usually located in dense urban areas and designed by architects in contemporary styles common for public buildings, such as Richardsonian Romanesque, Classical Revival, or Beaux Arts (see Figure 22). Notable Minnesota examples are the St. Paul Union Depot, the Milwaukee Road Depot in Minneapolis, and the Duluth Union Depot. These complex buildings were built with high-quality materials like brick, stone, and terra cotta, with marble floors and hardwood finishes in the interiors. Architects were also responsible for depot design in smaller cities that were division points or junctions and had high volumes of passenger traffic. The level of stylistic expression in a union/terminal depot’s support buildings and associated shop complexes generally depended on the financial success of the depot and its visibility within the community.

Variants of union/terminal depots are similar to those of passenger depots, though on a larger scale. Such depots are massive buildings that once included a wide variety of railroad agency offices and passenger service areas, including the station master's office, train master's office, a ticket office, express office, telegraph office, baggage rooms, men's and women's waiting rooms, lavatories, news stands, a restaurant or lunch counter, and hotel facilities, among many others.

Union/terminal depots also were commonly associated with freight houses, express buildings, maintenance shops, freight platforms, sheds, and shelters. For the purposes of this MPDF, this group of property types will be considered a Railroad Station District.

III. Significance

Railroad depots are associated with patterns of transportation development in Minnesota within the statewide contexts *Railroad Development in Minnesota, 1862-1956*; *Railroads and Agricultural Development, 1870-1940*; *Urban Centers, 1870-1940*; *Minnesota Tourism and Recreation in the Lakes Region, 1870-1945*; *Northern Minnesota Lumbering, 1870-1930s*; and *Minnesota's Iron Ore Industry, 1880s-1945*. The period of significance for the railroad depots property type is 1862-1956; periods of significance for individual depots will depend on construction dates and years of operation.

Depots served important functions in the development of Minnesota's railroad network, are physical reminders of the railroad's importance to the early settlement of the state, and functioned as the critical interaction point between railroad companies and their clients. Depots are also one of the most visually recognizable elements of the state's railroad infrastructure. When associated with a historically significant railroad corridor, they are significant in the area of *transportation*. When considered individually, depots may be significant in the area of *architecture*.

Some depots were among the first built features at newly-platted townsites. They initially served as delivery points for the raw materials needed to construct houses and commercial buildings, and later as gateways for passenger traffic and common carrier freight. In addition to facilitating the shipping of outgoing commercial and industrial products, depots received all order of manufactured goods that made life on the Minnesota frontier seem somewhat more "civilized." The potential economic benefits of railroad access for a pre-railroad community or growing industry in nineteenth-century Minnesota could hardly be underestimated, and railroad companies often sat by as neighboring town councils, regional business concerns, and other interest groups battled each other to provide the most attractive financial incentives. This process underscores the symbiotic relationship between pre-railroad communities and the state's expanding rail network in the last 40 years of the nineteenth century: while many municipal histories suggest that the railroad's arrival was the primary catalyst for local economic growth, it is unlikely that a railroad would have agreed to bear the expense of operating a passenger/freight depot in an economically unsound community.

Railroad companies often used standardized blueprints for the construction of smaller flag, passenger, and combination depots. These highly functional building plans were designed to reduce the costs associated with building new line and may be significant in the area of *architecture* for their ability to convey the railroad's corporate identity. Also structurally simple, most standard depots incorporated decorative details influenced by the Italianate, Tudor Revival, Stick, or Arts & Crafts architectural movements and could be a source of local pride and an inspiration for area builders.

By contrast, railroad companies showed only a modicum of architectural restraint in the high-style design of urban terminal (or union) depots. To some degree, the colossal square footage of many terminal depot interiors was the practical result of providing administrative offices, passenger platforms, business amenities, and railroad service shops within a relatively small building footprint. However, the elaborate decorative exteriors of many Beaux-Arts terminals and the massive façades of Richardsonian Romanesque depots are less indicative of the development of a truly distinct American railroad architecture than of the extraordinary level of commercial competition between railroads in the nineteenth century. Nevertheless, many terminal depots were the best examples of a particular architectural style in a community and were often built by prominent regional or national architects.

IV. Registration Requirements

Criterion A

To meet National Register Criterion A, a railroad depot must meet at least one of the following requirements.

1. The railroad depot was a significant contributor to the economic growth of surrounding commercial or industrial operations.

2. The railroad depot served as a significant regional distribution center for commercial or industrial products (defined within the context of overall regional commercial traffic).

3. The railroad depot served as a significant regional transportation center for passengers (defined within the context of overall regional passenger traffic).

Criterion B

Railroad depots will not be eligible for the National Register under Criterion B. Railroad depots were built and operated by large corporations that represent the work of many people, rather than individuals. Although prominent individuals dominated some of the companies, such as James J. Hill of the Great Northern or Alpheus B. Stickney of the Chicago Great Western, they managed the construction while working out of the company's headquarters. Administrative offices would represent their corporate lives better than railroad corridor historic districts.

Criterion C

A depot will meet Criterion C if it embodies distinctive architectural design or construction methods associated with significant railroad lines, including the use of standard railroad building plans; if it is the work of a significant architect, engineer or builder; or if it possesses high artistic values or stylistic qualities important to the development of railroad depot architecture.

Criterion D

Depots will meet Criterion D if further structural analysis can yield important information about a significant type of construction or the spatial arrangement of depot-related support facilities at important locations along significant corridors. The mere existence, or former existence, of a depot at a particular location does not constitute sufficient important information to warrant eligibility. Rather, the information to be garnered should be supplemental to or in contrast with information available through other sources, such as historical documents or similar buildings.

Integrity Requirements

In addition to the requirement that a railroad depot must meet one of the National Register Criteria to be considered eligible, it must also retain integrity. A depot's integrity of *location* and its *association* with a railroad corridor is of critical importance when evaluating its eligibility under Criterion A. Many small flag and passenger depots have been relocated, either to transportation museums or as part of their commercial renovation and reuse. Depots that are not located on the site associated with their historic significance have usually lost integrity of *location*, *setting*, *association*, and *feeling*. They may, however, still be considered eligible under Criterion A if they meet the requirements under Criteria Consideration B for moved properties.

Location. In order to meet Criterion A, a railroad depot must retain its integrity of *location* by being physically located on its historic building site within its former railroad corridor. Additionally, in order for a railroad depot to be individually eligible, there must be at least some visible expression of the corridor to convey the depot's historic location within a larger transportation corridor. A depot may also retain its integrity of *location* if it has been relocated to a site with a setting comparable to its historic site, but only if the relocation site is within or adjacent to a railroad corridor that conveys the depot's association. Relocated railroad depots may still be eligible under Criterion C for historically significant design and construction characteristics. Per Criteria Consideration B, a railroad depot that achieves significance following its relocation within a railroad network, but within its period of significance, will be considered to have integrity of *location*.

Design. A railroad depot must retain enough original architectural, structural, and stylistic features to convey effectively the significance of its architectural or engineering designs or its function as a railroad depot.

Materials. A railroad depot retains integrity of *material*s if the building either: 1) retains its original materials; 2) has replacement materials that were installed during the depot's period of significance; or 3) has modern repairs, alterations, or additions that have the same design and material character as those used during the period of significance. Smaller depots were often modified to accommodate increased traffic or additional services on a railroad. Structural or decorative alterations made during a depot's period of significance may be considered part of its historic fabric, provided that they do not substantially diminish the qualities that make it architecturally or technologically significant.

Setting. To retain integrity of *setting*, a railroad depot must be located in a setting similar to that during its period of significance and must remain physically and visually associated with a railroad corridor or a corridor that maintains at least some visible expression of a former railroad corridor.

Workmanship. The structural components of railroad depots were usually mass-produced and thus do not exhibit qualities of *workmanship*. If, however, a decorative or aesthetic architectural feature of a railroad depot is considered a stylistically defining feature of the depot, that feature must retain its original visual appearance.

Feeling. A railroad depot's integrity of *feeling* will only be lost if modern alterations to its historical architectural design or the addition of modern materials or additions to the building are of sufficient scale or visual contrast so as to dominate its overall visual appearance. Usually, a depot that has lost integrity of *feeling* will have lost both integrity of *design* and *materials*.

Association. *Association* is the direct link between a railroad depot and the significant services it provided or the significant architecture embodied in its design. A railroad depot retains its integrity of *association* if it retains integrity of *location*, *materials*, and *design*.

Criterion A. Because a railroad depot's site is integral to its association with a railroad corridor, it must retain its integrity of *location*, *materials*, *design*, and *setting* to be considered individually eligible under Criterion A.

Criterion C. Integrity of *design* and *materials* are critical if the structure is to convey its historical significance under Criterion C. Integrity of *location* is not necessary for eligibility under Criterion C, and a relocated depot may retain overall integrity if it is located in a setting similar to its historic setting.

Criterion D. The integrity requirements for railroad depots considered under Criterion D depend on the data requirements of the research design. For example, if a research design specified that the remains of a railroad depot had the potential to contribute meaningfully to the body of knowledge regarding the evolution of the architectural design of depots, the depot remains would have to retain sufficient integrity of *materials* and *design* to address the research design questions.

I. Name of Property Type: Railroad Engine Houses, Transfer Tables, and Turntables

II. Description

There were two categories of engine houses: square houses and roundhouses. Both were commonly found at railroad stations and railroad yards where steam locomotives were maintained or repaired and prepared for line service (see Figures 17 and 29). Engine houses were critical components of railroad networks, providing the regular mechanical service required to keep a railroad's motive power running.

In smaller railroad yards, square houses were wood frame buildings that provided several side-by-side berths for locomotives undergoing service and repair (see Figure 31). Square houses were accessed by a single track that branched to individual berths as it approached the building. Each berth was able to accommodate two, and occasionally three engines.

Roundhouses were common at larger railroad yards in the nineteenth century, but could also be found near remote railroad junctions or on high-traffic corridors where engine service and maintenance facilities were routinely required. Constructed to allow the berthing of multiple engines in a radial pattern, roundhouses usually required the use of a turntable. Depending on the traffic volume of the railroad yard and the frequency of engine maintenance, roundhouses could be small, with an open or "segmental" plan (with only a few berths occupying a small segment of a circle) or very large, with a closed, or full-circle plan, in which a through-passage provided access to a central turntable (Berg 1900:168).

Because of the expense involved in their construction, roundhouses were very carefully located, with consideration given to the current and projected engine traffic; the topography of the building site; the availability of building materials; and the possible effect of such a large structure on the rest of the railroad yard infrastructure. Berg (1900:166) counseled railroads not to under-build their roundhouse capacity or fail to plan for possible expansions. At the same time, he warned against the construction of expensive engine houses on new railroad lines, where subsequent and potentially significant changes in traffic flow or shifting rail junctions could result in their marginalization or abandonment.

The limited space at most railroad yards required the use of transfer tables or turntables to maneuver rolling stock into engine houses (see Figure 32). Transfer tables consisted of a rectangular platform that carried an engine or several freight cars on a set of rails perpendicular to the incoming spur tracks—a system used most often at square houses. Railroad turntables consisted of circular platforms supported by steel truss or plate frameworks that could turn engines and freight cars in areas of heavy rail traffic, or orient them properly for entry into roundhouses or repair shops. There were three common types of turntables: cantilevered (or center-balanced); articulated (or center-hinged); and continuous girder, which incorporated a center pivot and wheels that rolled on a track along the circumference of the turntable. Power sources included electricity, compressed air from the local steam plant, a gasoline engine, or a hand-crank. The choice of turntable depended on the size of the railroad's rolling stock and the turning speed required. Some patented versions, such as the Mundt turntable, were designed to economize on materials while maximizing the stability of the platform. By the mid-1920s, turntable diameters ranged between 80 feet and 115 feet (Howson 1926:514).

III. Significance

Railroad engine houses and their associated transfer tables or turn tables are associated with the historical patterns of transportation development in Minnesota detailed in the statewide contexts *Development of Minnesota Railroads, 1862-1956, Railroads and Agricultural Development 1870-1940, Urban Centers, 1870-1940, Northern Minnesota Lumbering, 1870-1945,* and *Minnesota's Iron Ore Industry, 1880s-1945*. The engine houses were the most prominent buildings and structures found in nineteenth and twentieth century railroad yards and convey the extensive financial investment in maintenance and service facilities required to operate and maintain Minnesota's railroads. The utilitarian design and hard-used condition of engine houses often belies their critical importance to the ongoing functioning of locomotive engines. Many buildings were subject to heavy industrial use, and continually repaired or modified with little regard for design subtleties related to architectural ornament or material finishes. In addition, the eroding financial condition of railroad companies in the late 1910s and 1930s often resulted in the deferred maintenance of engine houses, and subsequent economic recoveries prompted the demolition of outmoded properties. As a result, few late nineteenth century and early twentieth century engine houses have survived. Those remaining early examples of railroad engine houses that possess integrity are thus considered significant for their association with the historical growth and development of Minnesota railroads and the operation of historic railroad station and yard facilities.

IV. Registration Requirements

Criterion A

Railroad engine houses and transfer tables or turntables will meet Criterion A if they are associated with railroad corridors that were historically important in the development of Minnesota's railroad transportation network, or if they are associated with important stations, terminals, railroad yards, or junctions.

Criterion B

Railroad engine houses and transfer or turn tables will not be eligible for the National Register under Criterion B. These structures were built and operated by large corporations that represent the work of many people, rather than individuals. Although prominent individuals dominated some of the companies, such as James J. Hill of the Great Northern or Alpheus B. Stickney of the Chicago Great Western, they managed the construction while working out of the company's headquarters. Administrative offices would represent their corporate lives better than railroad corridor historic districts.

Criterion C

Railroad engine houses and transfer tables or turntables will meet Criterion C if they meet one or more of the following requirements.

1. The railroad engine house, transfer table, or turntable exhibits design or construction characteristics that were important in the historical development or evolution of railroad maintenance or service facilities in Minnesota such as an early or innovative example of engine house, transfer table, or turntable design.

2. The railroad engine house, transfer table, or turntable is an important example of a standardized railroad support building design. Important examples would include, among others, any wood-framed or rectangular engine houses due to their relative rarity, and large roundhouses that encompass more than 180 degrees of a circle.

Criterion D

An engine house and transfer table or turntable will be eligible under Criterion D if further structural analysis can yield important information about a significant type of construction; the infrastructure or spatial characteristics of a significant station, terminal, railroad yard, or junction; or the physical extent or function of the facility at important locations on significant corridors. The mere existence, or former existence, of an engine house and transfer table or turntable at a particular location does not constitute sufficient important information to warrant eligibility. Furthermore, the information to be garnered should be supplemental to or in contrast with information available through other sources, such as historical documents or similar extant structures.

Integrity Requirements

A railroad engine house and transfer table or turntable must retain, at minimum, its integrity of *location*, *materials*, and *design* to be considered eligible. The property may still retain historic integrity if there have been minor alterations to its form and materials, as long as the historically significant aspects of its design or construction method are intact. Any evaluation of eligibility should consider the integrity of the surrounding railroad station or yard as it would have appeared during the period of significance, as well as the relative rarity of the property type, and any extraordinary engineering characteristics, such as the innovative use of materials or the presence of innovative technologies.

Location. In order to meet Criterion A individually, an engine house and transfer table or turntable must retain its integrity of *location* by being physically located on its historic building site within its former railroad corridor, yard, or station. Additionally, in order for an engine house and transfer table or turntable to be individually eligible, there must be at least some visible expression of the corridor, yard, or station to convey historic location within a larger transportation corridor. A relocated engine house and transfer table or turntable may still be eligible under Criterion C for historically significant design and construction characteristics. Per Criteria Consideration B, an engine house and transfer table or turntable may retain integrity of *location* if they have been relocated to a site with a setting comparable to their historic site, but only if the relocation site is within or adjacent to a railroad corridor that conveys the engine house and transfer table or turntable's association.

Design. To retain integrity of *design*, an engine house and transfer table or turntable must retain the original architectural, structural, and stylistic features that convey the significance of its historic functions or its architectural or engineering designs.

Materials. An engine house and transfer table or turntable retain integrity of *material*s if they either: 1) retain original materials; 2) have replacement materials that were installed during the period of significance; or 3) have modern repairs, alterations, or additions that have the same design and material character as those used during the period of significance. Structural and design alterations made during the period of significance may be considered part of the historic fabric.

Setting. To retain integrity of *setting*, an engine house and transfer table or turntable must be located in a setting similar to that during its period of significance and must remain physically and visually associated with a railroad corridor or a corridor that maintains at least some visible expression of a former railroad corridor.

Workmanship. If the decorative or aesthetic architectural features of an engine house are considered stylistically defining features of the building, to retain integrity of *workmanship*, those features must retain enough of their original visual appearance to effectively convey the building's historical significance.

Feeling. An engine house and transfer table or turntable have lost their integrity of *feeling* if modern alterations to its historic architectural design or the addition of modern materials or additions are of sufficient scale or visual contrast so as to dominate its overall visual appearance. Usually, an engine house and transfer table or turntable that have lost integrity of *feeling* will have lost both integrity of *design* and *materials*.

Association. *Association* is the direct link between an engine house and transfer table or turntable and the significant services it provided or the significant architecture or engineering embodied in its design. An engine house and transfer table or turntable retains its integrity of *association* if it retains integrity of *location*, *materials,* and *design*.

Criterion A. Because the site of an engine house and transfer table or turntable is integral to its association with a railroad corridor, they must retain their integrity of *location*, *materials*, and *design* to be considered individually eligible under Criterion A.

Criterion C. An engine house and transfer table or turntable will retain overall integrity even if there have been alterations to their *design* and *materials*, as long as the historically significant architectural characteristics of the design or construction method are intact. Integrity of *design* and *materials* is critical if the structure is to convey its historical significance under Criterion C. Integrity of *location* is not necessary for eligibility under Criterion C, and a relocated engine house and transfer table or turntable may retain overall integrity if it is located in a setting similar to its historic setting.

Criterion D. The integrity requirements for an engine house and transfer table or turntable considered under Criterion D depend on the data requirements of the research design. For example, if a research design specified that the structural remains of an engine house and transfer table or turntable had the potential to meaningfully contribute to the body of knowledge regarding the evolution of the design of railroad yards, the engine house and transfer table or turntable remains would have to retain sufficient integrity of *materials* and *design* to address the research design questions.

I. Name of Property Type: Railroad Section Houses

II. Description

When railroad lines passed through sparsely populated areas, railroad companies commonly divided the line into short segments called sections, each of which had a railroad employee (or a group of employees) assigned to it to provide maintenance and emergency services. The houses provided to these employees by the railroad companies were small and cheaply built dwellings called "section houses," which were typically built alongside railroad roadways within the right of way (see Figure 24). Berg (1900:15) states that a section house should be "cheap and built to suit the local climatic conditions," noting that section houses built by the Northern Pacific Railroad Company were predominantly designed "to keep the cold out" and that there were two varieties of section house: "one for accommodation of one or more families and the other for a number of men (Berg 1900:14).

Section houses could be of single or duplex configuration, but were nearly always one- or two-story wood frame structures with clapboard or board-and-batten sheathing and roofs of tin sheet, cedar shakes, or asphalt shingles. The modest architectural style expressed by section houses varied from region to region, but were generally influenced by the contemporary styles of local farmhouses.

The smallest section houses had only a living room and bedroom, with the fireplace used for cooking food, but most that were designed to accommodate a family had a living room, bedroom, and kitchen. When section houses were required to house groups of men, additional bedrooms were added to the floorplan. Berg (1900:19) describes a standard two-story section house designed by the Northern Pacific Railroad Company to accommodate a relatively large number workers:

The main portion of the house is 26 ft. x 20 ft., with a kitchen annex, 26 ft. x 10 ft. There are five rooms on the ground-floor, namely, a dining-room, three bedrooms, and a kitchen. The second floor forms one large common bedroom with a number of double bunks, 6 ft. 6 in. x 4 ft. 6 in. Where desired, this second floor can be divided into rooms by appropriate partitions.

III. Significance

Section houses are associated with historical patterns of transportation development in Minnesota within the statewide contexts *Development of Minnesota Railroads, 1862-1956, Railroads and Agricultural Development 1870-1940, Urban Centers, 1870-1940, Northern Minnesota Lumbering, 1870-1945,* and *Minnesota's Iron Ore Industry, 1880s-1945*. Section houses and the men and families who occupied them were important components of a railroad company's track maintenance system. Because section houses were usually built from standard company plans, a comparison of extant examples may provide information regarding the evolution of worker housing during the development of Minnesota's railroad network. Generally, they are considered significant for their association with historic railroad lines and for their representation of evolving trends in railroad worker housing.

IV. Registration Requirements

A railroad section house can be individually eligible under Criteria C and D. Periods of significance for individual railroad section houses will depend on the date of construction and years of operation.

Criteria A and B

A railroad section house will not meet Criteria A or B as an individual property. Section houses served as the residence for the section crew foreman, and as such, functioned as other residences would. The difference for a section house was that it was located on railroad property within or adjacent to a railroad corridor. Therefore, if the railroad corridor does not retain integrity as a historic district, a section house will not convey its function as a specialized railroad building, rather it will have the appearance of any other house. In addition, section houses were built and operated by large corporations that represent the work of many people, rather than individuals. Although prominent individuals dominated some of the companies, such as James J. Hill of the Great Northern or Alpheus B. Stickney of the Chicago Great Western, they managed the construction while working out of the company's headquarters. Administrative offices would represent their corporate lives better than railroad section houses.

Criterion C

A railroad section house will meet Criterion C if it meets one of the following conditions: it embodies the distinctive architectural design or construction methods associated with significant railroads, including the use of standard company designs; it embodies the work of a significant architect, engineer or builder; or it represents historically important trends in the evolution of standardized railroad company architecture.

Criterion D

A railroad section house or its structural remains will meet Criterion D if further analysis can yield important information about a significant aspect of the standardized architecture developed as part of the evolution of its class of railroad-related properties. The information that a railroad section house yields, or will yield, must be evaluated within an appropriate historic context. This requires consulting the body of information already collected from similar properties or other pertinent sources, including modern and historic written records. The researcher must be able to anticipate if and how the potential information will affect the definition of the context. The information likely to be obtained from a particular railroad section house must confirm, refute, or supplement existing information in an important way. The importance of the information to be potentially obtained must be justified through the formulation of research questions that address historically significant issues.

The railroad section house or its remains should then be investigated with techniques sufficient to establish the presence of data relevant to the research questions being asked. The method of investigation will depend upon specific circumstances including the house's location, condition, and the research questions being addressed. Justification of the research potential of a section house may be based on analogy to another better known property if sufficient similarities exist to establish the appropriateness of the analogy. The assessment of integrity for railroad section houses considered under Criterion D depends on the research design's data requirements. The significant data required to yield the expected important information about the railroad section house and its relationship to the historical development of Minnesota's railroads must be sufficiently intact.

Finally, in order for a railroad section house or its remains to be eligible under Criterion D, the structure or its ruin itself must be, or must have been, the principal source of the important information.

Integrity Requirements

In addition to the requirement that a railroad section house must meet one of the National Register Criteria to be considered eligible, it must also retain integrity.

Materials. A railroad section house retains integrity of *material*s if it: 1) retains original materials; 2) has replacement materials that were installed during the period of significance; or 3) has modern repairs, alterations, or additions that have the same design and material character as those used during the period of significance. Structural and design alterations made during the period of significance may be considered part of the historic fabric.

Design. To retain integrity of *design*, a railroad section house must retain the original architectural, structural, and stylistic features that convey the significance of its architectural design.

Workmanship. If an architectural design feature of a railroad section house is considered a stylistically defining feature of the property, that feature must retain enough of its original visual appearance to effectively convey the historical significance of its *workmanship*.

Feeling. If a railroad section house retains integrity of *design*, *materials*, and *workmanship*, it will retain integrity of feeling.

Association. A railroad section house will retain integrity of *association* if it retains its associated significant architectural features.

Location. Railroad section houses eligible under Criterion C that meet Criteria Consideration B for relocated properties are not required to retain their integrity of *location*.

Setting. Railroad section houses that are eligible under Criterion C are not required to retain integrity of *setting*.

Figures

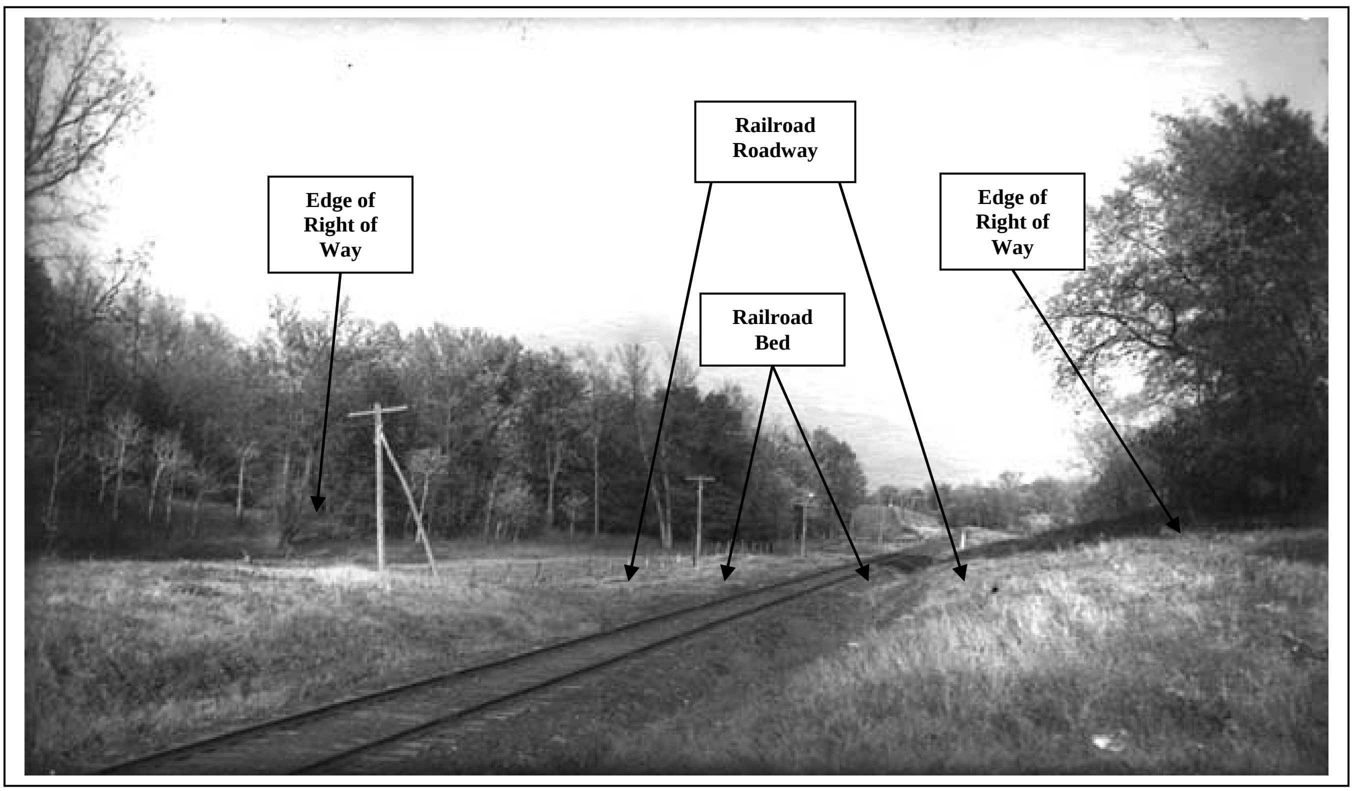

Figure 1. Railroad Corridor, Young America vicinity, ca. 1915

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Figure 2. Single-tracked roadway near dalles of the St. Croix River, ca. 1890

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Figure 3. Double-tracked roadway and depot, Wilder, ca. 1909

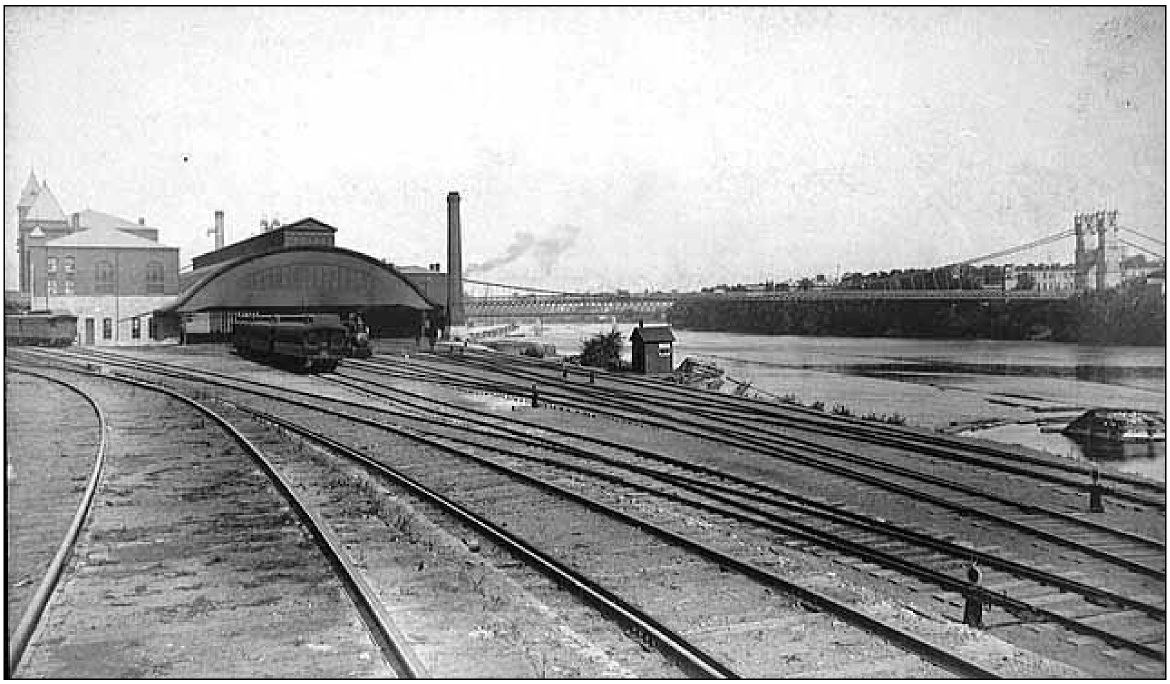

Figure 4. Multiple tracks at the Union Station, Minneapolis, ca. 1880s

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Railroads in Minnesota, 1862-1956
Name of Property

Minnesota, Statewide
County and State

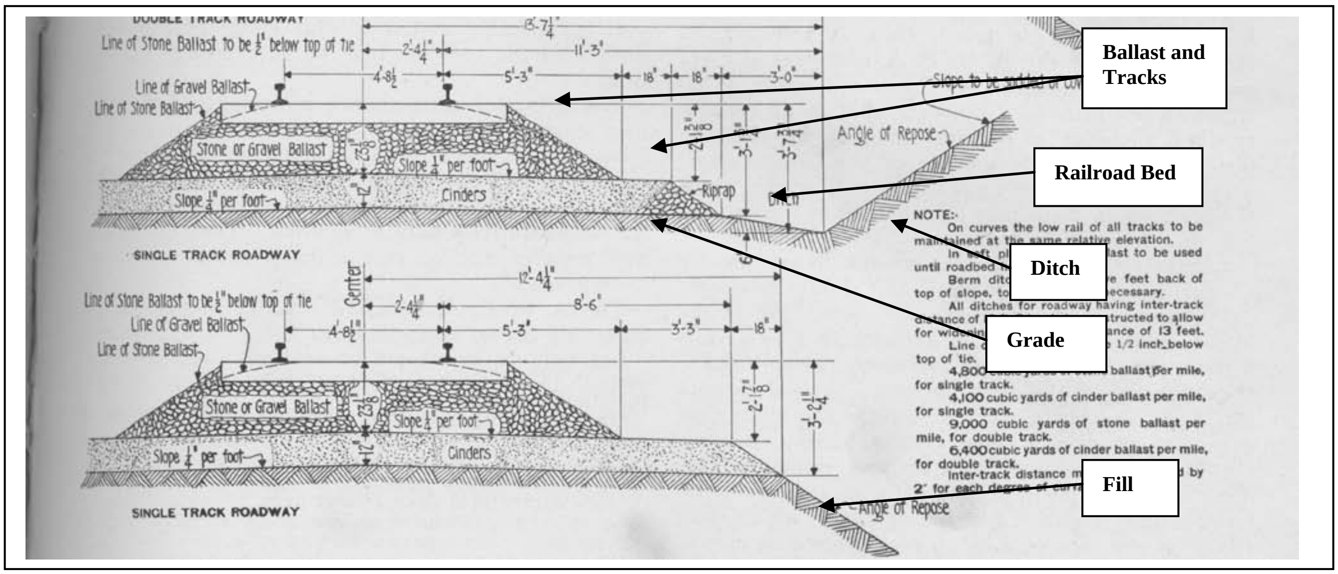

Figure 5. Typical railroad roadway cross section (Howson 1926:95)

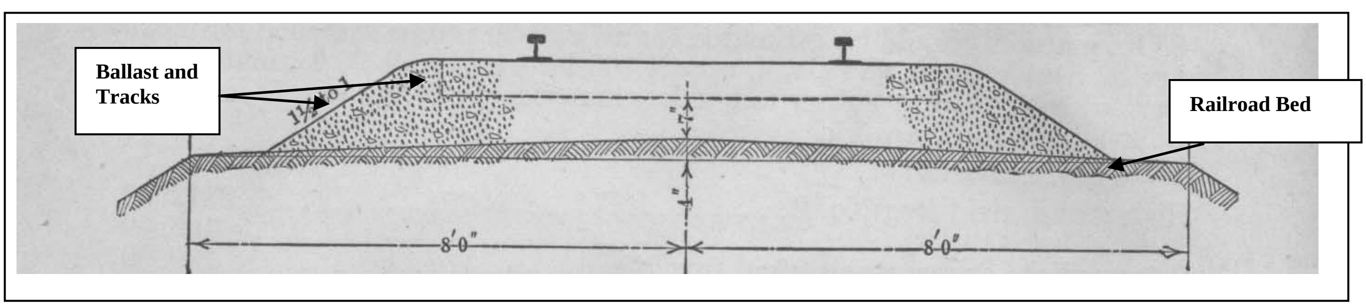

Figure 6. Typical railroad bed, ballast, and tracks (Orrock 1918:14)

Figure 7. Tracks over typical stone ballast (Howson 1926:146)

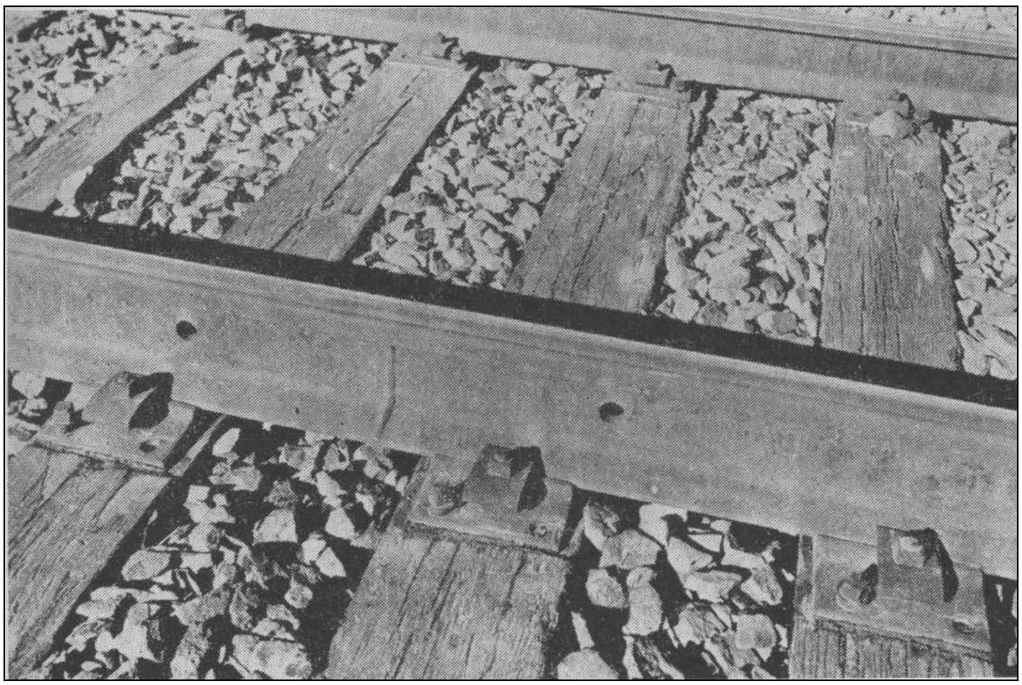

Figure 8. Steel rails on wood ties (Hay 1953:381)

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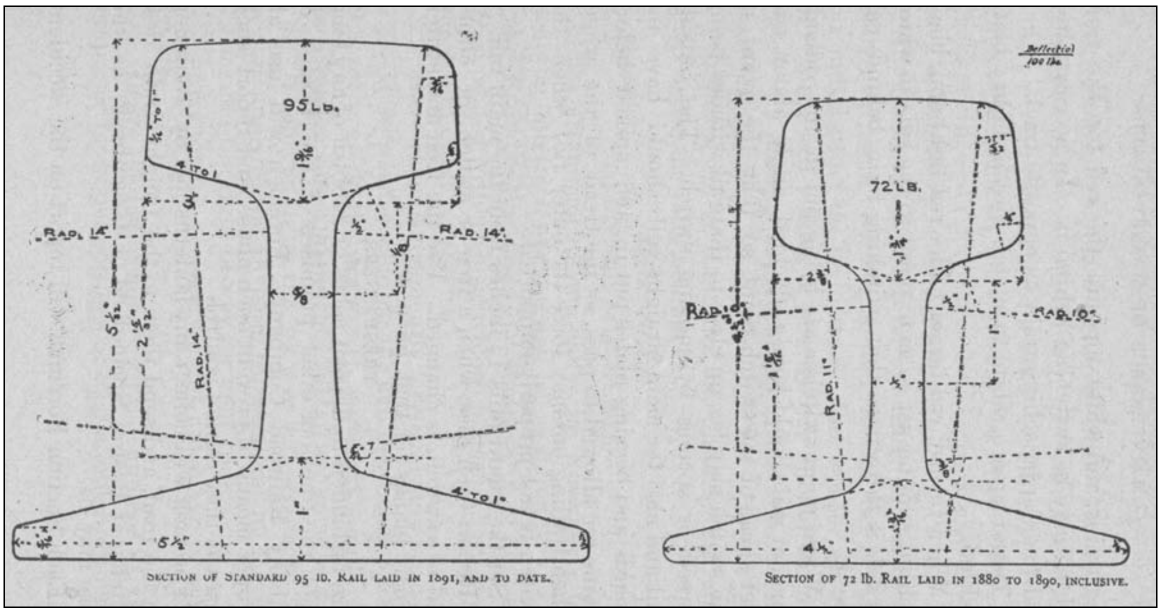

Figure 9. Cross section of "inverted T" profile (Smith 1906:19)

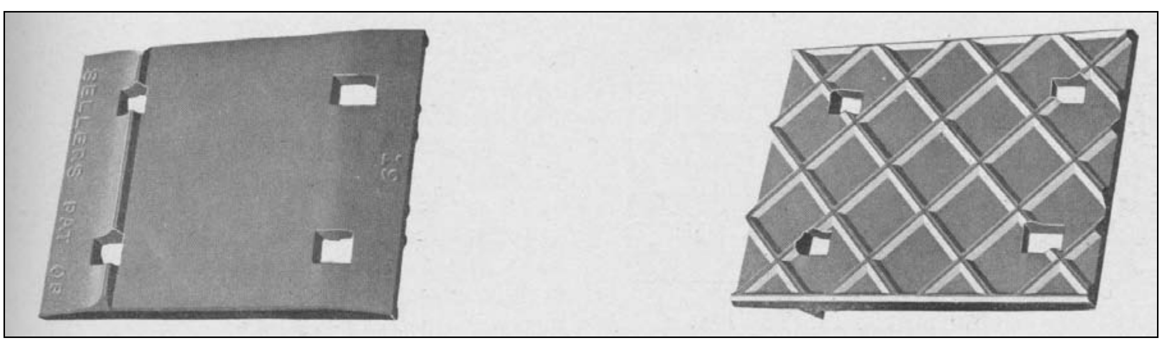

Figure 10. Top and bottom views of tie plate (Howson 1926:235)

Figure 11. Construction of drainage ditches (Rench 1946:21)

Figure 12. Tile pipe for drainage (Howson 1926:123)

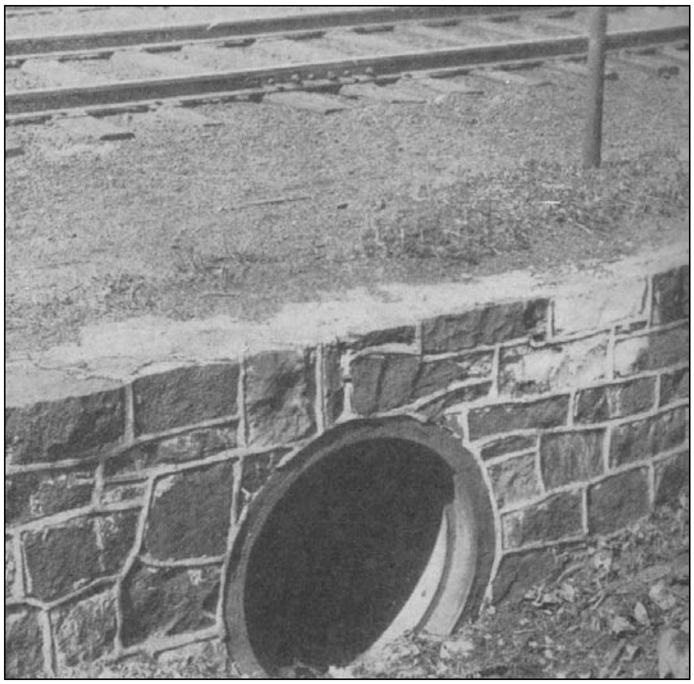

Figure 13. Cast-iron and masonry pipe culvert (Howson 1926:448)

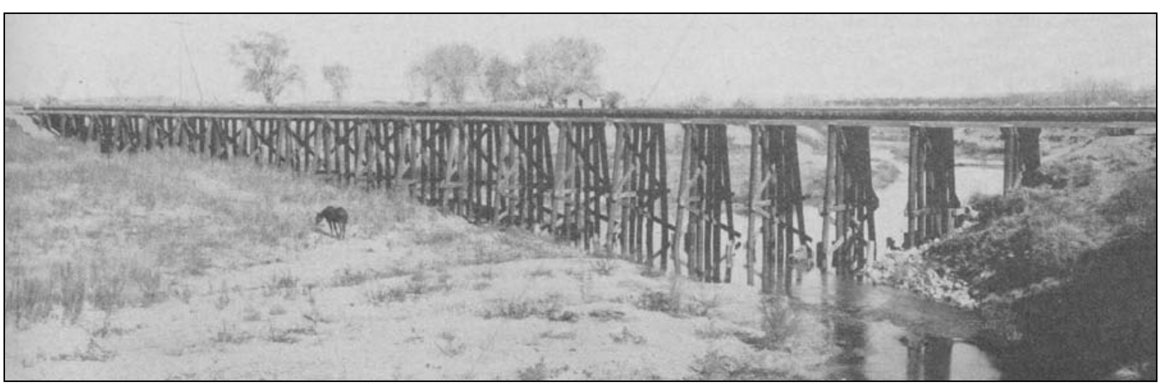

Figure 14. Typical pile trestle bridge (Howson 1926:527)

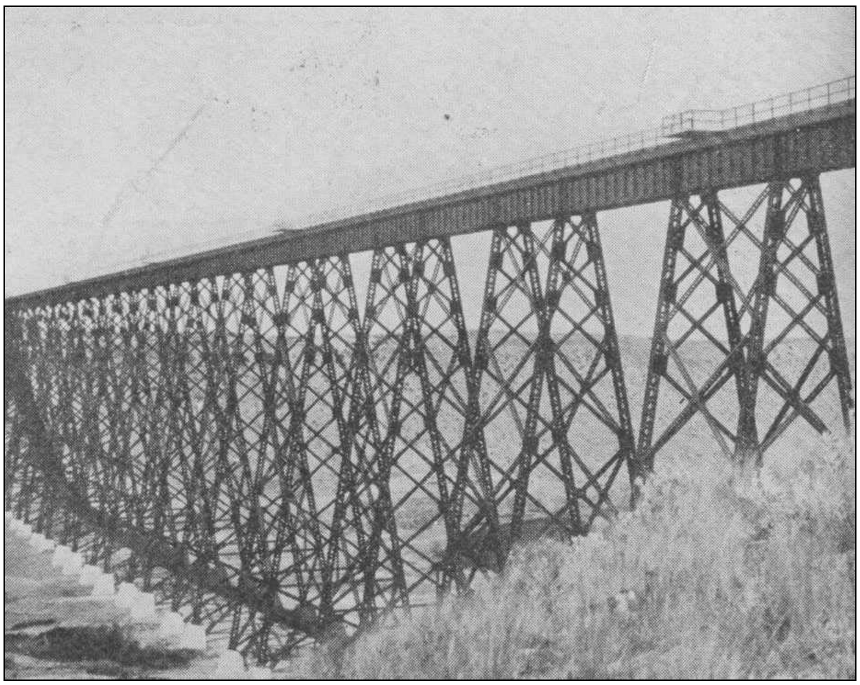

Figure 15. High steel viaduct (Howson 1926:468)

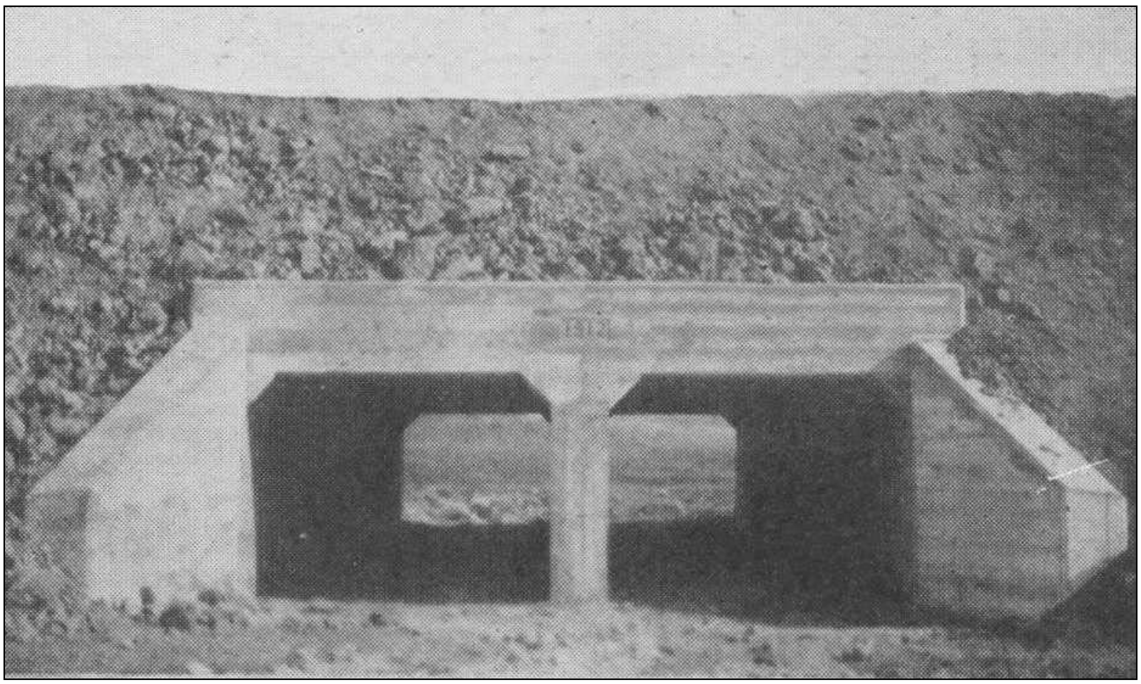

Figure 16. Double concrete box culvert (Howson 1926:445)

Figure 17. Railroad maintenance yard, station, and classification yard, Tracy, 1939

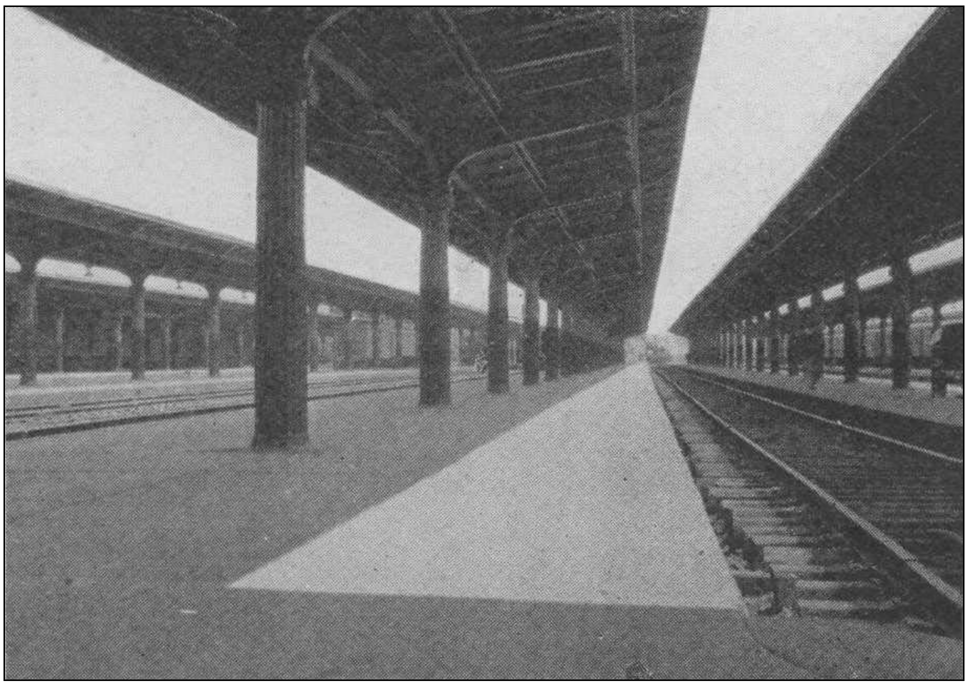

Figure 18. Low concrete passenger platform (Howson 1926:551)

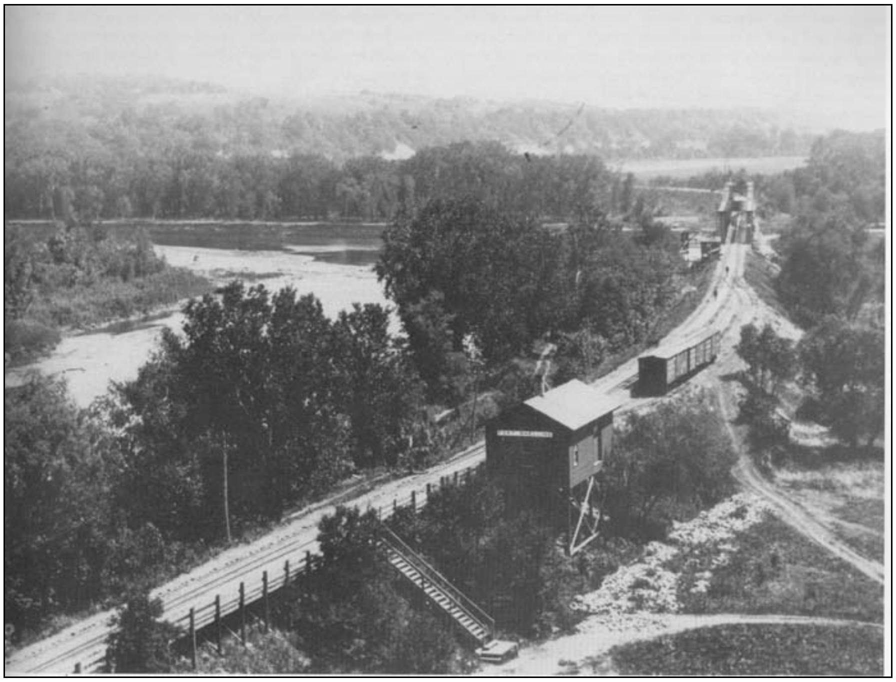

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Figure 19. Flag depot below Fort Snelling, ca. 1880

Figure 20. Passenger depot (Howson 1926:543)

Figure 21. Combination depot at Echo, ca. 1910s (Hofsommer 2005:235)

MHS. Location No. MH5.9 MP8 r167

Figure 22. Union Depot, Minneapolis, 1890

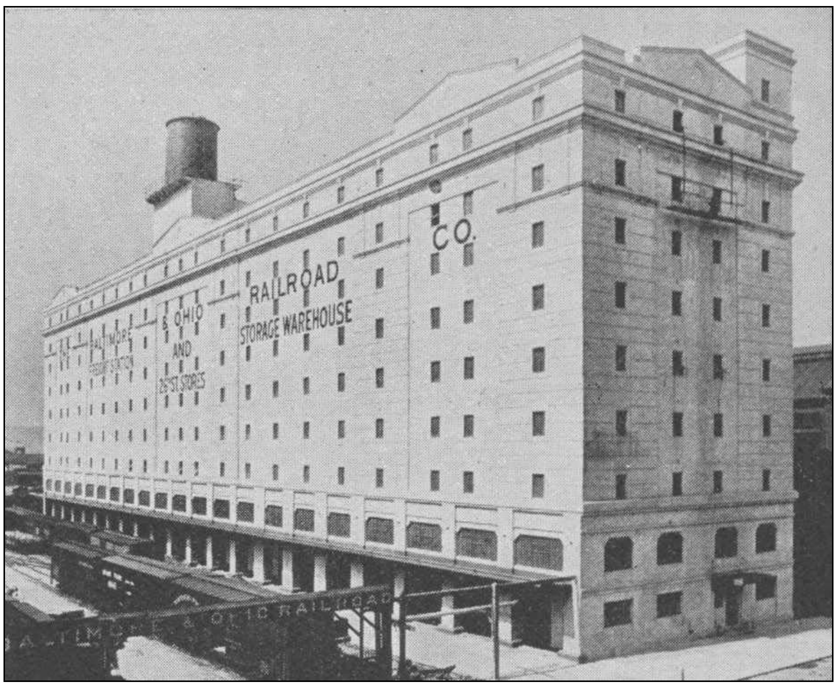


Figure 23. Railroad storage warehouse (Howson 1926:556)

MHS. Location No. MI8.9 BC p1

Figure 24. Section house at Ball Club, ca. 1900

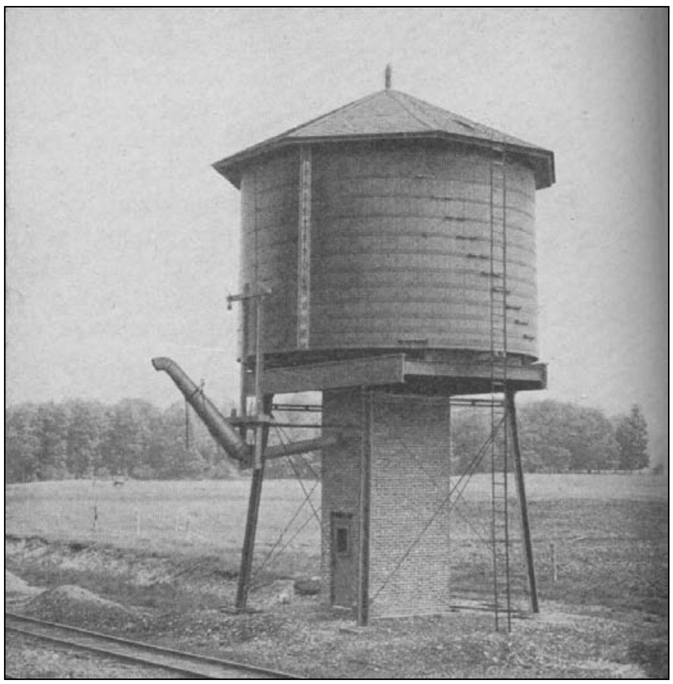


Figure 25. Water tank (Howson 1926:734)

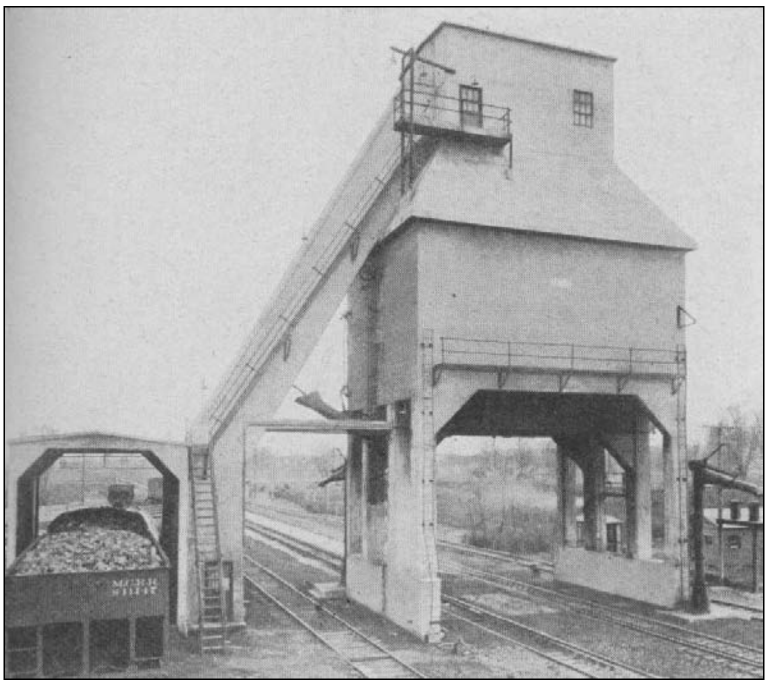


Figure 26. Coaling station (Howson 1926:567)

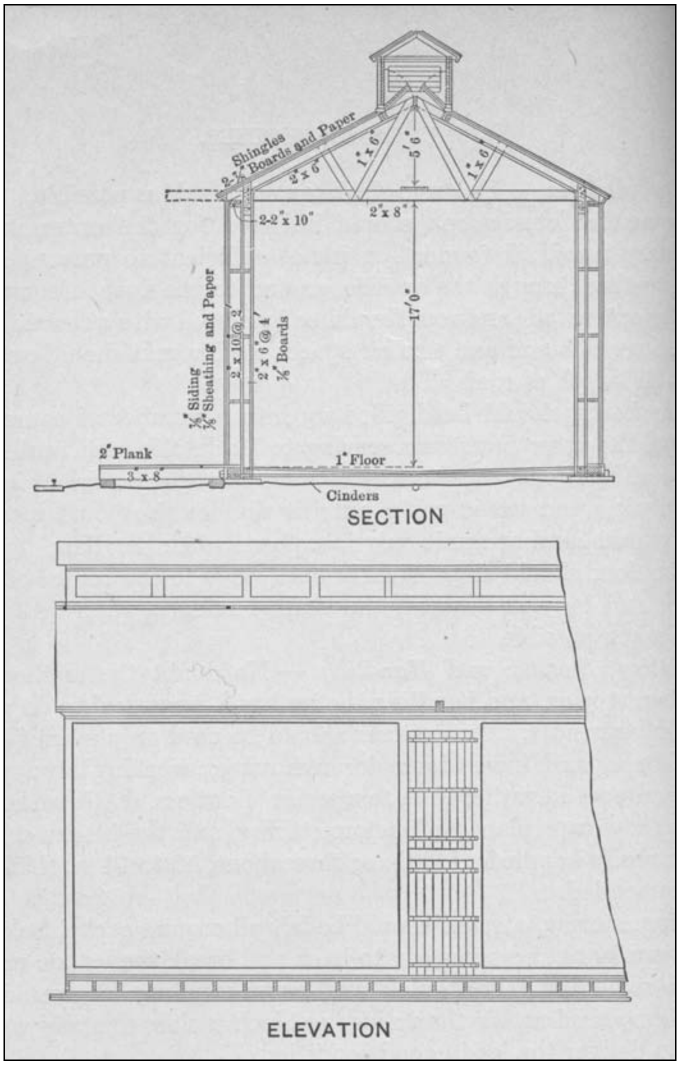


Figure 27. Typical ice house drawings (Orrock 1918:398)

Figure 28. Interlocking tower (Howson 1926:792)

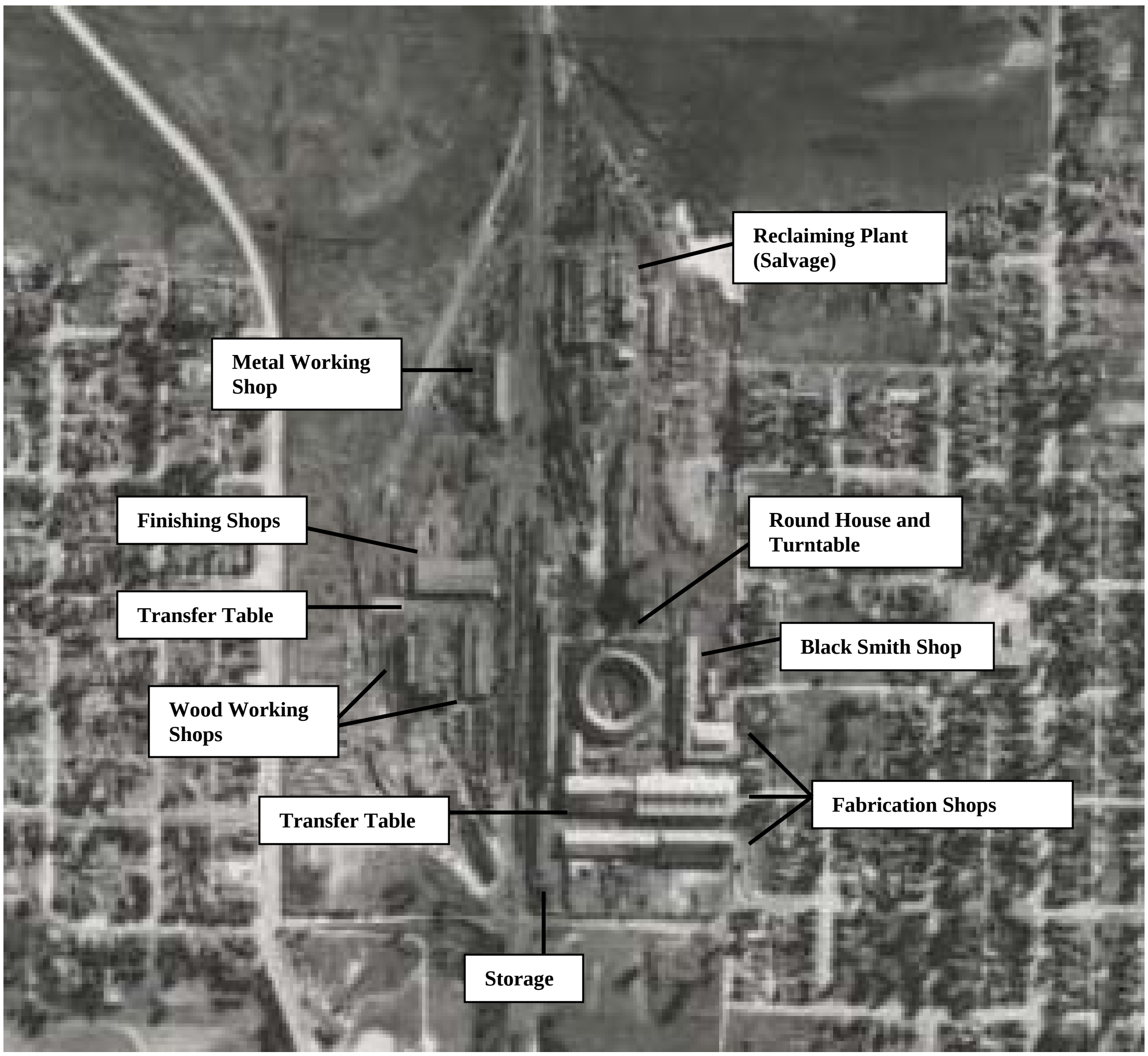


Figure 29. Railroad yards with shop complex, Brainerd, 1939

Figure 30. Northern Pacific railroad yard, St. Paul, 1899

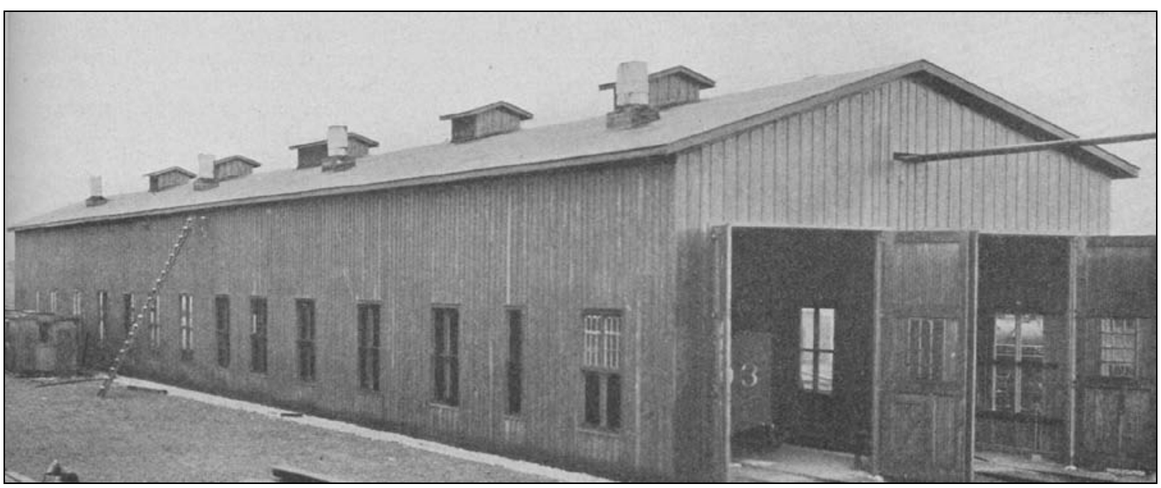
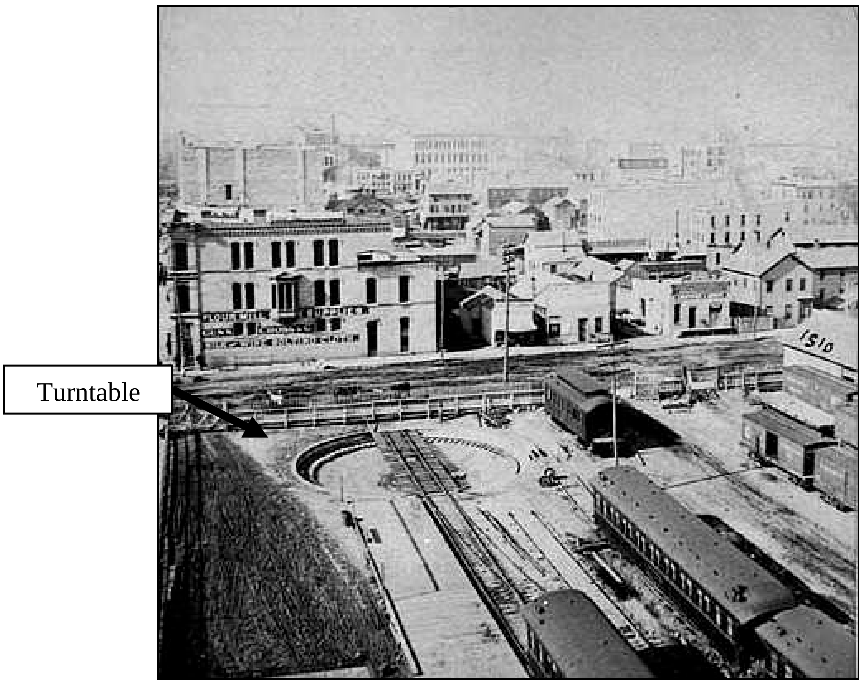
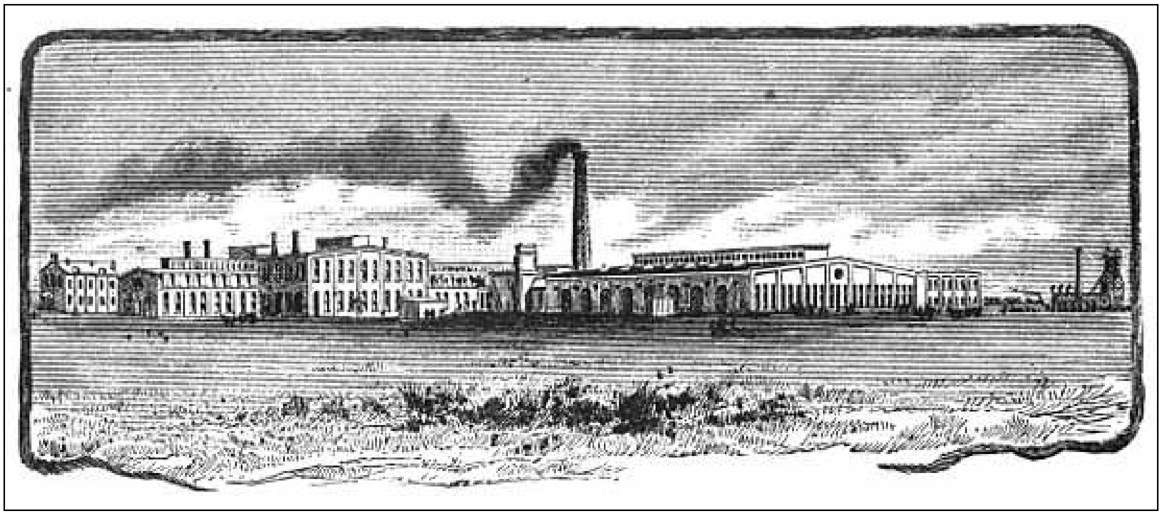


Figure 31. Engine house (Howson 1926:561)



MHS Location No. HE6.7M r3

Figure 32. Railroad yard with turntable, Minneapolis, ca. 1880



MHS Location No. MR2.9 SP3.1N p121

Figure 33. Rendering of Northern Pacific Como Shops, St. Paul, 1886

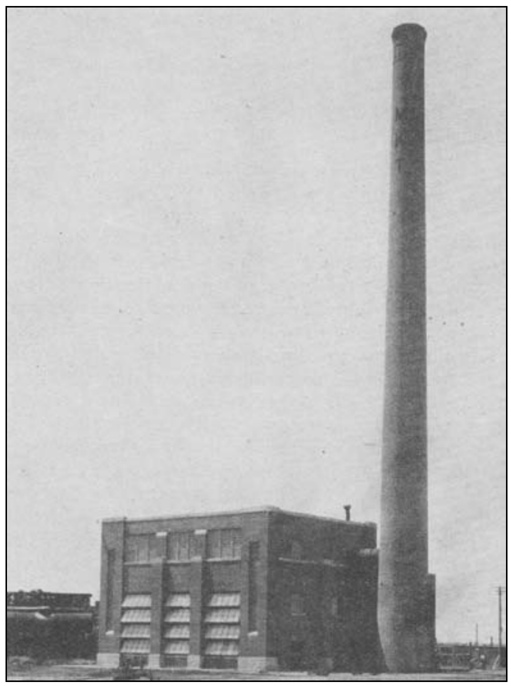


Figure 34. Power house (Howson 1926:585)

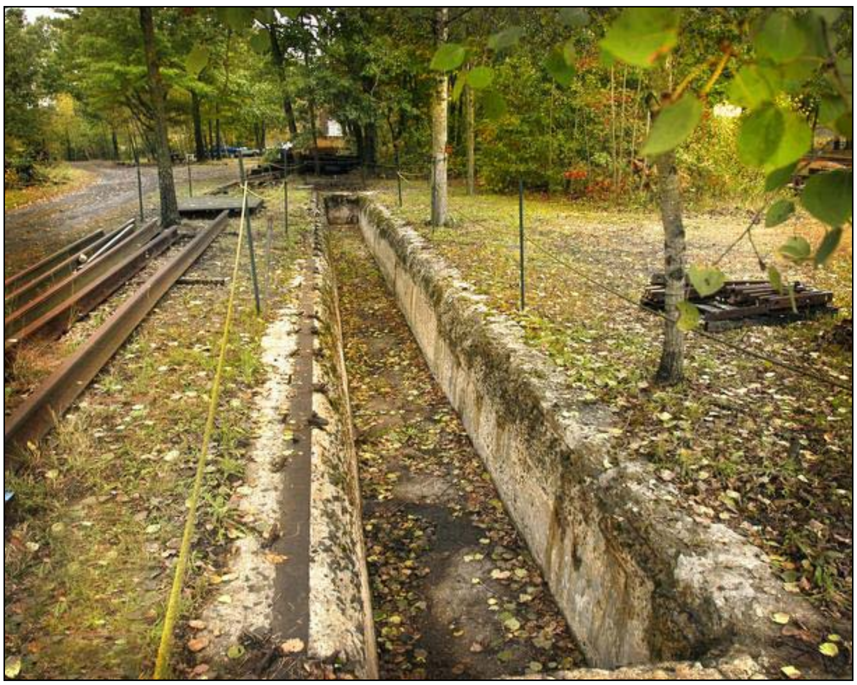


Figure 35. Ash pit at Connecticut Eastern Railroad Museum, Willimantic, CT

Figure 36. Northern Pacific office and shops, Brainerd, ca. 1875

Section G. Geographical Data

The State of Minnesota

Section H. Summary of Identification and Evaluation Methods

The MPDF *Railroads in Minnesota, 1862-1956* was developed in order to analyze railroad resources within the context of entire railroad corridors and to analyze railroad corridors within statewide contexts. Previous cultural resources management studies of railroad resources often were focused on the immediate project area, and the resources were evaluated for National Register eligibility within relatively short segments of larger corridors or as individual properties. Other published railroad histories tend to focus on the corporate history or economic influence of railroads.

Railroads in Minnesota, 1862-1956 was intended to be a study, not a survey, of railroad resources. The focus of this study was on synthesis of secondary source materials. State and local databases were searched for railroad-related information in Minneapolis and St. Paul. In particular, research was completed at the following repositories: Minnesota Department of Transportation project files; Minnesota State Historic Preservation Office; Minnesota Historical Society library and archives; Wilson, Walter, and Architecture libraries at the University of Minnesota; and Minneapolis and St. Paul public libraries. This research revealed an extensive existing literature regarding railroads. The main sources consulted include: previous railroad studies (books, articles, CRM reports); railroad engineering and architectural manuals from the late nineteenth and early twentieth centuries; other completed National Register nomination forms; railroad company annual reports; and historic period maps, particularly the *Railroad Commissioner's Map of Minnesota* (1930).

The historic contexts are derived from the historical research. The contexts are divided into six statewide thematic contexts and 14 railroad company-related contexts. The 14 companies selected represent the railroad corporations operating railroads in Minnesota as of 1960, which is near the end of the period of significance of the MPDF, as listed in Richard Prosser's *Rails to the North Star* (1966). An exception is the Illinois Central railroad, which operated a small amount of right of way in Minnesota but had a much larger presence in other states. These 14 companies represent combinations of railroad companies that may have been originally independent, and subheadings for predecessor companies are provided within the contexts. Railroad corridor associated with railroad companies other than these 14 can be evaluated and nominated within this MPDF, but additional contextual information will be required. Because transportation was the function of railroads, the thematic contexts are focused on the interplay of railroad transportation during the nineteenth and early twentieth centuries with other aspects of Minnesota's economy, such as industry, commerce, urban development, and procurement of commodities.

The significant property types identified in this MPDF are based on function. Because all railroad buildings and structures functioned in combination with other railroad buildings and structures, individual resources were grouped into a limited number of district property types: railroad corridor historic district, railroad station district, and railroad yard district. It became apparent, however, that some railroad resources may be eligible individually: railroad depots, railroad bridges, and engine houses. Those resources were also assigned property types.

The significance of railroads lies in the important transportation connections they made between resource procurement areas, railroad transfers, and railroad terminals. The registration requirements for significance under Criterion A reflect that significance and are primarily concerned with establishing the connections made by railroad corridors.

Limited field survey was completed during the course of this study of the buildings and structures within four selected railroad corridors. No archaeological surveys were completed during this study. For more information regarding field surveys and case study evaluations of National Register eligibility completed during this study, see Schmidt, et al. 2007.

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Glossary of Railroad Terms

Alignment: The position of track in a horizontal or vertical plane.

Ash pit: Shallow pit used for the dumping of ash and cinders from locomotives.

Automatic block signals (ABS): A system of trackside signals controlling a block and activated by the movement of trains over or past a mechanical or electronic detecting device.

Back shop: A railroad shop building in large shop complexes where heavy repairs and rebuilding of locomotives takes place.

Ballast: Material placed on a railroad roadbed to hold the ties in place, and to aid in uniform drainage. May include crushed stone on lines with heavy or higher speed traffic, gravel, cinders during the steam era, and occasionally slag on some lines serving steel mills. Many early railroads, lightly used branch lines and temporary lines, such as logging railroads, often had little or no ballast.

Ballon loop: A reverse loop of track, occasionally constructed in a yard or at the end of a branch line to allow a locomotive to be turned around.

Block: A defined section of track for controlling trains. On railroad lines equipped with signals, a “block” is the segment of track between two signal placements. Also a term used to describe a group of cars coupled together for movement to the same destination.

Branch line: A secondary line that branches off of a main line to serve an area, terminal, or an industrial site.

Bridge: A structure that replaces the roadbed for some distance to provide passage over a body of water, chasm, road, or other feature that cannot support or interrupts the roadbed. It usually consists of two parts—substructure (abutments and piers) and superstructure.

Cantenary: Any or all of a system of overhead wires that carry electric current to power electric locomotives, interurban cars and streetcars/trolleys. In this system, the contact wire is hung from another wire that hangs in a catenary curve supported by a mast or tower one or both sides of the tracks.

Car shop: A railroad repair building in large shop complexes where rolling stock is repaired and rebuilt.

Centralized traffic control (CTC): A traffic control system whereby train movements are directed through remote control of switches and signals from a central control panel, such as at a dispatching center, enabling trains to pass each other at sidings or interlockings without the need for their crews to stop and throw switches. The trains operate on the authority of signal indications instead of the authority of a timetable or train orders.

Class 1 Railroad: For industry reporting purposes, railroads in the United States are categorized according to size based on annual operating revenue. Class I railroads are the largest. Until 1955, this class included railroads with annual gross operating revenue of $1 million or more. In 1955 the threshold increased to $3 million and has continued to increase over time. By 1992, it had risen to $250 million and as of 2012 is at $256.4 million. As of 2012, there are seven Class I railroads operating in the United States: Burlington Northern Santa Fe, Canadian National, Canadian Pacific, CSX Transportation, Kansas City Southern, Norfolk Southern, and Union Pacific,

Class 2 Railroad: Mainline railroads that are smaller than Class I railroads, typically regional railroads. As of 2012, this class includes railroads with average gross revenue between $20.5 and $256.4 million.

Class 3 Railroad: This is the smallest class of railroad. Typically smaller shortlines or lightly used lines. As of 2012, this class of railroads includes those with average annual gross revenue under $20.5 million.

Classification yard: General term for a freight yard where trains are broken up and assembled by shifting cars with a switcher locomotive or by using a hump.

Coach yard: A yard where passenger trains are made up or broken up, and where passenger cars are stored and serviced.

Coaling facilities: Coal storage and handling structures and equipment positioned near the track to deliver coal to steam locomotives. Typically include a delivery track where coal was unloaded into the structure, a storage bin, and a chute for dumping coal into the locomotive tender. Types of coaling facilities include:

- Coaling tower: An elevated structure, either heavy timber or concrete construction, with a large bin or bins where the coal is stored. Coal is delivered by gondolas or hopper cars and dumped into a pit and then elevated into the tower by mechanical buckets.
- Coaling trestle: A long elevated with a series of bins where the coal is stored. Coal is delivered by gondolas and hoppers from a track over the bins that is accessed by a long incline at one end of the

trestle. As the name implies, coal trestles were of heavy timber construction and looked like a trestle, with either wood or steel bins.

- Coaling pocket: Smaller than a coaling trestle, it is a series of bins located along the service track with a slightly track behind the bins where coal is delivered and then manually shoveled into the bins.

Common carrier: A railroad involved with interstate commerce and subject to federal oversight.

Consist: The make-up of a train; a list containing specific information for each car of a train; also a group of locomotives.

Continuous welded rail: See "welded rail."

Crossbuck: An X-shaped sign located at a grade crossing just before the road crosses railroad tracks. A passive crossbuck is simply the sign itself and is comprised of a white X with black lettering mounted on a post. An active crossbuck includes active warning devices such as flashing lights and gates that lower when a train approaches.

Crossover: Two track switches laid back-to-back to allow trains to move from one track to another parallel track. Typically located on double track mainlines.

Culvert: A structure, usually a single-unit (a stone box or pipe), which creates a small opening in the roadbed (with some amount of roadbed above it) for the drainage of water.

Cutoff: A rail line constructed off of another to provide a shorter route to a given destination.

Cut: That part of the right-of-way which is excavated to provide a more gentle gradient for ascent or descent of a hill or mountain.

Diamond: A special piece of track that permits two tracks to cross one another (at an angle), but does not allow trains to move from one track to the other. It is called a "diamond" because of the shape formed by the rails of the crossing tracks. Also sometimes called a "crossing."

Depot: A building to receive, sort, and load any combination of passengers and freight. Also commonly called "stations" since they were at stations on a railroad (see "station"_. Most are located parallel to the tracks, but some major depots, terminals were located at the end of stub end tracks or over the tracks.

- **Combination depot:** A depot designed to receive both passengers and freight in locations where the amount of freight or the volume of passenger business does not warrant the construction of a separate freight-house or passenger depot. Mostly found in town and small cities, combination had a waiting room, ticket office, and a room for holding baggage, mail, Railway Express Agency freight, and less-than-carload freight.

- **Flag depot:** A small, passenger shelter at which a limited number of trains, usually only local trains stop, usually on the signal of a flag. Historically, a flag depot may have been a simple as an open platform, but many had a small, simple open-air or enclosed, gable- or shed-roofed building with a simple platform.

- **Passenger depot:** A depot designed solely for the accommodation of passenger business. Typically found in larger, communities, passenger depots provided space for many additional functions, including restrooms, smoking rooms, dining rooms, offices for mail, telegraph, and wire services, news stands, supply rooms, lounges for conductors and trainmen, and administrative offices.

- **Union depot (station or terminal):** A union depot united all of the railroads serving a city in a single facility, consolidating the various railroads' station facilities within a building or complex. Typically included facilities for passengers and their baggage, Railway Express Agency freight, and mail.

Degrees of curvature: How railroads measure the sharpness of a curve on a railroad line.

Division: An operating sub-unit of a railroad, managed by a "superintendent."

Division point: The location in a railroad corridor where one administrative and operational unit of a railroad ends and another begins. Division points often include railroad yards and maintenance shops. These were also crew change points for trains.

Double track: Mainline constructed of two tracks, in which one track supports traffic flow in one direction, and the other track supports traffic flow in the opposite direction.

Engine house: A railroad shop building, typically with a rectangular footprint for storing and providing regular mechanical maintenance for a railroad's locomotives. Most commonly found at small servicing facilities, such as branchlines or on shortlines.

Fill: Earth or rock, used to make a level roadbed across a valley or depression.

Freight house: The facility of a railroad line for receiving, storing, and delivering freight. Also known as a freight depot. Often located near a passenger deport.

Frog: The part of a track switch that permits the wheel flanges of cars taking one route to "pass through" the railhead of the other. Switches are numbered according to the angle of their frogs. A No. 20 switch (good for about 40 mph) separates the rails 1 foot for every 20 feet of travel. The lower the frog number, the sharper the curve, and the less speed at which the diverging route can be taken.

Gauge: The distance between the rails, measured between the inside edges of the railhead.

Grade: The ratio of elevation gained or lost per distance traveled measured in feet, expressed as a percent. The base is 100 feet, so a 1 percent grade represents a 1-foot elevation change in 100 feet of travel.

Grade crossing: Intersection of street or highway with a set of railroad tracks at the same level. Often slangy called a "crossing."

Grade Separation: A railroad crossing where the grade of the railroad bed or bridge is separated from another railroad line, a vehicular roadway, a water course, or a topographic feature.

Granger railroad: A term used for railroads that, during the late nineteenth and early twentieth centuries, hauled large volumes of grain from the primary grain-growing area of the Midwest, extending from Kansas, Missouri, and Illinois north to Canada.

Guard rail: An extra rail or set of rails placed between the running rails to prevent the wheels of a derailed car from going completely off the roadbed. If a wheel does derail where a guard rail is present, it is forced to remain between the guard rail and the running rail as it rolls along the ties. Guard rails are installed at locations where a derailment would be especially disastrous, such as on bridges, adjacent to structures, or along cliffs.

Hinterland: The region situated beyond metropolitan centers but linked to those centers through lines of economic exchange and interaction.

House track: A siding adjacent to a depot where passengers and freight are loaded or unloaded.

Hump yard: A classification yard with an elevated track or hump over which strings of cars are pushed by a switch engine and when they reach the crest of the hump, they are uncoupled according to which track they are destined for and they travel down the hump by gravity to classification tracks in the "bowl" to put together trains. As the cars roll down the hill, remotely-controlled switches, operated by employee in a control tower, direct them to the correct track. The speed of the cars are controlled by remotely-controlled retarders.

Ice House: Insulated building used to store ice for use in refrigerated and passenger cars.

Industrial railroad: A railroad owned and operated by an industry to move cars within a factory, plant, or mill and to and from a common carrier interchange. Industrial railroads are usually not common carriers.

Interchange: (n.) A "junction" between two railroads where cars are transferred from one road to another. (v.) The act of exchanging cars between two railroads.

Interchange track: A track used to exchange trains or cars between to railroads.

Insular: A railroad that is not connected to another railroad. Typically this includes railroads operating within an industrial site, some logging railroads, and some tourist railways. For example a railroad within a mill that strictly serves the operation of the facility and is not connected to tracks of a railroad that may serve the mill to deliver and supplies and ship products.

Interlocking: An arrangement of signals and switches connected, or "interlocked", in a way that their operations must succeed each other in a predetermined order, so that conflicting routes are impossible to set up. Specific interlockings are sometimes identified as "controlled points."

Interlocking tower: A structure positioned at the point where two tracks intersect in order to house the automated switches that control the crossing of the two tracks.

Intermodal: The use of more than one type of transportation system or vehicle to move freight and passengers.

Interurban: An electric railroad running between cities, often of lighter construction than "steam" or later "diesel," railroads. While they were similar to street railways in that they often operated in the streets of cities and towns instead of on a private right-of-way, they were different in that they often ran on dedicated right-of-ways between towns. Equipment used by interbuban lines was also larger, heavier, and more robust than equipment operated by street railways. Also, while most interurbans were primarily carrying passengers, many were common carriers, carrying freight and interchanging with traditional railroads. Interurbans had their rise and fall during the first four decades of the twentieth century.

Joint line: A railroad line jointly operated by separate two railroads; either by joint ownership or through trackage rights of one railroad on a line owned by the other railroad.

Joint operation: The operation of two railroads as one unit under two separate boards of directors.

Jointed rail: Rail in standard sections, usually about 39 feet in length, which are bolted together as opposed to continuously welded rail.

Junction: A place where two or more railroad lines converge.

Ladder track: A track connecting a number of parallel sidings or stubs in a yard or terminal.

Lead track: Railroad track used to connect the through tracks with yard tracks.

Limited service: Express passenger or freight service with no stops between major terminals.

Locomotive: A powered vehicle used to pull trains. May be steam, diesel, or electric powered.

Mainline: Rail line used for through trains or as the principal artery of a system, to which branches, yards, and spurs are connected. Mainline tracks are typically constructed for the operation of trains at higher speeds, and these trains are typically given preference in time tables over branch lines. Mainlines are also maintained to a higher standard than yards and branch lines.

Maintenance-of-way (M.O.W.): Term used to describe railroad departments, rolling stock, and buildings associated with building and maintaining railroad lines, including roadbeds, track, bridges and other infrastructure, but not locomotives and rolling stock.

Maintenance shops: A group of several use-specific shop buildings located at junctions and division points for the provision of maintenance on railroad rolling stock. The types of buildings that comprise a maintenance shop complex include machine shops, oil houses, blacksmith shops, carpentry shops, wheel foundries, and mill rooms, and shops for painting, carpentry, electrical, and special work could be completed.

Manual block: A type of train control system where the use of each “block” of track is governed by signals that are either controlled manually or by block-limit signals, or both, upon receipt of information by phone or other means of communication.

Milepost: A marker located along the right-of-way of a railroad line that marks the route mile of the line. May be concrete, or wood or metal with a small metal sign with the number on it. May also be marked on telephone poles if present in the right-of-way.

Mining railroad: A type of “industrial railroad” owned and operated by an industry to carry ore from a mine to a mill for processing, or to common carrier interchange or dock for transferring to a ship.

Motive power: The locomotives owned and operated by a railroad.

Narrow gauge: Term for railroad track having a gauge of less than the North American standard of 4 feet, 8-1/2 inches—often used for mining, industrial, and scenic railways. Gauges either 3 feet or 2 feet are most common.

Platform: A structure that facilitates movement between railroad cars and depots or warehouses. They may be a low platform, at grade, or a structure raised to the height of the floor of rolling stock, approximately 4 feet above grade. Elevated platforms are also commonly referred to as “loading docks.”

Point: The rails in a switch that move to direct a train onto the correct track. Points are attached to a “throwbar” that is used to move them.

Profile: A graphic representation of a railroad line showing the location and severity of grades; however, the vertical and horizontal scales are generally not the same, so as to emphasize the grades.

Rail yard: A system of tracks branching from a common track used for switching, making up trains and storing cars.

Roadbed: A layer of soils applied to the ground surface to provide a smooth regular plane for the tracks and to uniformly distribute loads from trains, tracks, and ballast.

Railroad corridor: The linear area that encompasses the right-of-way within which a railroad operated and includes all of the buildings, structures, and objects that worked together for the dedicated purposed of running trains to transport freight and passengers. Also see “right-of-way.”

Roadbed: The portion of the railroad right-of-way modified to support the railroad tracks. Typically an elevated bed with angled sides to raise the railroad tracks, provide for minimal grades, and to improve drainage.

Railroad shops: Structures and buildings in which the building and repairing of railroad equipment is performed, such as back shops, car shops, diesel shops, and roundhouses.

Railroad track: A structure consisting of a pair of parallel rails resting on ties, on which a train runs. Also see "standard gauge" and "narrow gauge."

Railroad yard office: Building occupied by employees working in a transfer or freight yard.

Receiving yard: The destination for arriving trains carrying cars to be sorted or classified.

Regional railroad: A railroad that is bigger than a short line but smaller than a major "Class I" railroad, usually a "Class 2" railroad.

Repair-in-place (R.I.P.) track: A railroad track (siding or spur) where rolling stock is repaired in place.

Ribbon rail: Welded rail that typically comes in quarter-mile lengths where the rail is welded together rather than in 39-foot pieces bolted together. It does not buckle, because the track structure resists thermal expansion and contraction, and the elasticity of the steel forces dimensional changes to occur in the cross section of the rail rather than in its length. Mostly found on mainlines and some heavy use branch lines. Also commonly referred to as "welded rail" or continuous welded rail."

Right-of–way (R.O.W.): The area owned by a railroad for the purpose of operating a railroad along a corridor. Includes the track, roadbed, depots, and other features.

Rolling stock: General term for the various types of freight, passenger, and MOW cars owned and operated by a railroad.

Roundhouse: A building with a circular form, usually arc-shaped, but sometimes a full circle at major facilities, designed to house locomotives during servicing. The roundhouse had multiple stalls and customarily faced a turntable that was used to direct a locomotive to and from the track for the appropriate roundhouse stall. The stall tracks radiate out from the turntable to the roundhouse.

Route mile: A mile of railroad without regard to the number of tracks on that line. For example, a 50-mile-long double track mainline has 50 route-miles but 100 "track miles" not counting sidings, spurs, and yards. On many railroad lines route miles are marked by a "milepost." Track miles are typically measured from one point, such as the starting point of the line or a division point. Also see "track mile."

Sand house: A building where sand is stored and dried before being loaded onto a locomotive to be used for traction.

Section house: Dwelling erected along the rail line used to house the section maintenance crew.

Section house: A railroad-owned residence provided house track maintenance workers. Usually a standard plan building.

Semaphore: A type of signal that uses a moving arm (or "blade") to convey train movement information to the engineer of a train. A semaphore arm consists of two parts: a metal or wood "blade" that pivots at different angles, and a spectacle holding colored lenses that moves in front of a lamp in order to provide indications at night. There are two types of semaphores: "upper quadrant" which have blades that move in an upward direction and "lower quadrants" that have blades that move in a downward direction.

Service track: A track where locomotives are serviced and fueled.

Shanty: Small structure in which watchmen, flagmen, and signal maintainers could take shelter. Shanties were identified by their use, e.g. "crossing shanty" or "watchman's shanty."

Shoo-fly: A temporary track used to avoid an obstacle that blocks movement on the normal track section.

Short line: A rail line that operates over a limited distance. However, in more modern slang it is used to describe all "Class 3" and some smaller "Class 2" railroads.

Siding: A side track that connects to the through track at both ends.

Signal: A manual or automated device that indicates to the engineer of a train information about the line ahead.

Slip switch: The combination of a diamond of two tracks that also includes a connecting track that allows for the movement between the two through tracks.

Sorting yard: See classification yard.

Spike: A long piece of steel, usually 6 to 9 inches long with a square profile, a wedge shaped pointed end, and an offset oval-shaped head that is driven into a tie to hold a rail in place.

Spring switch: A spring-mounted track switch that automatically returns to the normal position when the final car passes over it. This type of switch saves time by not needing to be operated manually.

Spur: A dead-end track that connects to through tracks at one end. Typically short in length, and used for loading and unloading rolling stock, or for storing equipment.

Standard gauge: The track gauge used throughout North America and most of Europe of 4 feet 8-1/2 inches, as measured from the inside vertical surface of the railhead.

Station: Location on a railroad line with a specific name designation in a timetable. A station can be any point on a railroad and may or may not have a depot. A station can be as basic as a siding or a junction with another railroad. Many depots are also commonly called “stations” since they are located at a “station” on the railroad.

Street railway: Generic term for horse powered and later electric powered railways that primarily operated in the streets of larger cities whose purpose was to carry commuters. Also commonly known as “streetcar lines” and “trolley lines.”

Stub line: A railroad corridor that terminates at a point with no through service.

Stub switch: A track switch in which the rails of the single-track end of track move sideways to meet the two (sometimes three) pairs of rails from the other end. Stub switches generally became obsolete in the first half of the twentieth century, and were replaced by the conventional switch with movable tapered rails called points.

Switchback: A track setup whereby a reserve move is made to negotiate very steep grades that is usually performed by using back-to-back switches. As a train climbs a hill it passes the first switch and continues onto a tail track. After it clears the switch, the switch is realigned and the train backs up the next track until it clears the next switch. The second switch is realigned and the train continues up the next track in a forward direction.

Switching railroad: A railroad whose primary purpose is to switch cars within a terminal or a large industrial site, or to interchange cars between railroads. Often jointly owned by multiple railroads. Sometimes referred to as a "union railroad" or a "connecting railroad."

Tangent: Straight track.

Team track: A rail siding for general usage by multiple freight shippers, named for the teams of horses that once pulled the wagons to fetch the freight. Freight platforms/loading docks were commonly found adjacent to team tracks.

Tell-tale: A device placed along the track to warn crew members operating a top freight cars of a moving train that a low structure or clearance was eminent down the line. They had a bar over the track with wires hanging down over the track to the height of the low clearance. Once crew members such as brakemen no longer worked on top of moving freight trains these were abolished.

Terminal: The principal point of origination or termination of trains for one or more railroads; generally located in or near major cities. The terminal could include a station building, switches, towers, associated buildings, and other equipment. Many major "depots", such as those in large cities that served multiple railroads were also called "terminals." Also see "depot."

Throat: The entrance tracks to a yard or terminal.

Through route: Railroad corridor that provided through service.

Through service: When railroads offer transportation between major destination points without needing to transfer passengers or freight.

Through tracks: The tracks that continue through a railroad station or yard area where there are several sidings and/or spurs.

Throwbar: A bar located underneath the rails of a switch, parallel to the ties, to which the points of the switch are attached and which moves the points.

Tie or Cross-tie: Ties are a component of the track structure that supports the rails. They are laid perpendicular to the rails and are bedded in the upper portion of the ballast. They can be wood, concrete, or occasionally a composite material. They can measure from 6-by-8 inches to 9-by-11 inches in cross section, and 8 to 9 feet in length; however, longer ties are located under switches.

Tie clip: A special steel clip used to attach rails to concrete ties.

Tie plate: A metal plate providing a bearing surface for the rail on the tie.

Toe: The base of an embankment where the slope levels off to the naturally occurring ground surface.

Trackage rights: The legal right of one railroad company to use the tracks of another, as agreed to by the companies concerned or their predecessors.

Track gauge: The distance between the pair of rails that comprise a set of railroad tracks. It is measured from the inside vertical surface of the top, or head, of each rail. The gauge used throughout North America and most of Europe is 4 feet 8-1/2 inches, called "standard gauge".

Track mile: A mile of track along a railroad line. Track mileage along segments of double-track railroad lines would be double the amount of “route miles”, to account for both main tracks. For example a double-track line that is 50 “route miles” in length has 100 track miles. Also see “route mile.”

Track warrant control (TWC): A method of controlling train traffic on a line, in which trains are authorized for movement only between specified locations, such as stations or mileposts. The form giving a train crew the authority to operate between the two locations is called a track warrant.

Transfer line: A railroad corridor whose primary function is to transfer trains between through routes, to connect to large classification yards, or to provide a bypass around heavy traffic areas.

Transfer table: A structure that moves sideways, or perpendicular, to the railroad tracks and is used to maneuver locomotives and rolling stock into backshops and carshops at major repair facilities. It is a bridgelike structure that with a deck that holds one track on it and wheels under it that move along a track laid perpendicular to the railroad tracks.

Trestle: A structure used to cross a deep river valley or to cross minor streams and gullies; usually a braced framework with 12- to 14-foot spans of wood piles or framed lumber.

Truss: A geometric framework of iron or steel members in various states of tension or compression, used for railroad bridges.

Truss bridge: A bridge type where the span is supported by paired trusses (one on each side of the tracks) of various designs. Most truss bridges are of steel construction. The trusses may be either above track level ("through truss") or below track level ("deck truss").

Turntable: A rotating structure that can turn 360 degrees to turn locomotives in the opposite direction or divert them onto a different track, such as accessing stalls in a roundhouse.

Union depot / Union station: See "depot"

Viaduct: A structure used to cross a deep river valley or to cross minor streams and gullies; usually a structure of iron or steel members.

Washout: A gap or break in the railroad tracks, ballast, and roadbed caused by floodwaters. Also, a signal to the engineer to make an emergency brake application.

Welded rail: See "ribbon rail."

Water tower: A wood or metal tank used to fill locomotive steam boilers. Typically found at regular intervals along railroads during the steam era. Usually located with locomotive servicing facilities in larger yards, near depots in smaller towns, or near source supplies along the line. May be accompanied by a pump house.

Wye: A triangular arrangement of tracks resembling the letter "Y" used for turning locomotives and cars.

Yard: A system or grouping of tracks connected to, but not part of, a main line; used for switching and storing cars, or for making up trains.

Yard ladder: An angled track connecting successively the body tracks in a yard. Also see "ladder track."

Yard limit: The limits of a railroad yard.

Yard limit board: A trackside sign denoting the boundary of yard territory and its accompanying rules.

Yard office: A building occupied by employees working in a transfer or freight yard.

Maps