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National Register of Historic Places Multiple Property Documentation Form

This form is for use in documenting multiple property groups relating to one or several historic 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.

x New Submission ___ Amended Submission

A. Name of Multiple Property Listing

Railroads in Colorado 1858 - 1948

B. Associated Historic Contexts

The Historical and Technological Evolution of Colorado's Railroads 1858 - 1948

x See continuation sheet

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 for Archeology and Historic Preservation. (☐ See continuation sheet for additional comments.)

James Hartmann March 3, 1998
Signature of certifying official Date

State Historic Preservation office, Colorado Historical Society
State or Federal agency and bureau

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

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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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Primary location of additional data

- ■ State Historic Preservation Office
- ☐ Other State agency
- ☐ Federal agency
- ☐ Local government
- ☐ University
- ☐ Other
  Name of repository:

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1 Introduction: The Geographic Irony

Before the discovery of gold near the site of present-day Denver in 1858, no pressing need existed in what is now Colorado for railroads. In the eastern United States numerous lines were by then well established, and the concept of railroads was already imbued in the American psyche. Once gold had been discovered, however, residents of Denver felt an immediate need for rail service. Before the spring 1859 gold rush, citizens and entrepreneurs held their first meeting for the purpose of somehow securing a rail line into Denver. Railroad followed mine, it seemed, as naturally as winter followed fall.

That is, in concept railroad followed mine. The realization of the concept was another thing entirely. Colorado terrain is integral to the story of the state's railroads. The Rocky Mountains run through the state from north to south in a wide band, presenting what Robert Ormes has called a "geographical irony." Precious metals and mineral wealth resided in the mountains, drawing prospectors, populating the territory, tempting railroads. At the same time the forbidding terrain, steep canyons, deep river gorges and rough, rocky landscape blocked many efforts to build through the mountains to the Pacific.[1]

The heart of the Colorado railroad story centers on building rails to the mines of the Rocky Mountains. Supply and shipping centers, agriculture and the tourist industry all followed the railroads to the mines. The following overview provides a history of railroad construction in Colorado. The story is complex, covering many different lines and regions, two distinctly different track gauges, transfers of ownerships, bankruptcies, engineering challenges, and of course mountain passes, river valleys and awe-inspiring scenery. Colorado is fortunate in having a rich body of literature covering its railroads. Many books in the Colorado railroad lexicon focus on individual lines, their histories, their financial maneuverings, their construction and the people who built them. Others focus on regions such as northern Colorado or the areas around Cripple Creek and Leadville. Still others focus on the narrow-gauge lines in particular, on lines built by a particular railroad personality, and on the complex financial transactions required by railroad building that gave rise to modern forms of big business and finance capitalism.

What has been lacking in the literature of Colorado railroads is a narrative overview that presents a comprehensive picture of Colorado railroads and ties this history to the cultural fabric of the state's rail lines, both functioning and abandoned. This narrative is an attempt to fill that gap, and to provide a context for the documentation and preservation of historic Colorado railroad resources. It presents contextual information so that rail building does not seem to occur in a vacuum, but to cover the widespread story within a reasonable length, only limited in-depth information is provided on any single subject. The bibliography is representative and includes a sizeable number of sources on Colorado railroad history.

The following overview history of Colorado railroads is presented in four sections. The first covers the period from 1858 to 1879, when Colorado tried to lure the transcontinental railroad into building through the state, the first track was laid, independent entrepreneurs extended the flatland railroad net, and railroads made their initial forays into the mountains. The second tells the story of Colorado's bonanza years–the period between 1880 and 1892, when silver boomed and more miles of rail were constructed than during any other period. The third section covers 1892-1913, when the silver slump changed the economic climate, railroad lines begin to consolidate, and when the operated rail mileage of the state reached its peak. The final section discusses the post-1913 period, when Colorado finally achieved a mainline transcontinental connection, and when rail abandonments began to outpace construction.[2]

2 The Placer Years: 1858 - 1879

Before there were mines and before there were railroads, there was the land itself. The Colorado mountains make up the highest section of the Rockies between Canada and Mexico. More than 600 peaks in the state measure higher than 13,000 feet above sea level, and 53 peaks reach over 14,000 feet. Colorado has the highest mean altitude of any state in the union, yet it would be a mistake to think of Colorado topography in terms of mountains alone. East of the mountains, a broad, dry plain advances to the Kansas/Nebraska border, where it merges with the Great Plains of the Midwest. West of the mountains, high plateaus stretch to the Utah border, carved by the Colorado River and its tributaries, the Yampa, Green, White, Dolores, Las Animas and Gunnison rivers.

Even the mountains themselves are more than simply a massive series of peaks. Scattered throughout the center of the Rockies are four parks–broad, flat, grassy valleys sheltered by the mountains. They take their name from "parc," the French word for game preserve, and provide a home for Rocky Mountain game animals. North Park straddles the border with Wyoming; Middle Park is the region included by much of Rocky Mountain National Park; South Park, the highest, is located west and north of Pikes Peak; and the San Luis Valley that stretches into New Mexico is the most southerly of Colorado's parks.

Four major rivers originate in Colorado's Rocky Mountains: the South Platte, the Arkansas, the Rio Grande and the Colorado. The South Platte and Arkansas flow east across the plains; the Rio Grande flows south down the San Luis Valley; and the Colorado drains the entire western slope, carrying more water than the other three rivers combined. None of these rivers are now or ever have been suitable for sustainable navigation, but all of them proved useful to guide explorers, migrants and railroad surveyors looking for ways through the Colorado terrain. All eventually nurtured settlement along their banks.[3]

Early Travel and Transportation

The eastern half of Colorado first entered the Union as part of the Louisiana Purchase. At the time of the land transfer, neither Napoleon Bonaparte, who sold it, nor Thomas Jefferson, who bought it, knew exactly where the western border of the purchase lay. The issue was rendered moot when western Colorado came into the Union after the conclusion of the war with Mexico in 1848. Native Americans, Spanish explorers, fur trappers and scouts traveled Colorado territory on foot and on horseback, blazing trails through the mountains and plains, long before railroad engineers began surveying. Many of the routes forged by these early explorers were used as later railroad routes. This is hardly surprising given that the early routes sought the easiest way to pass through the country and frequently followed rivers and natural byways, seeking the path of least resistance.

Fur trappers and traders forged several early overland routes through the state. The Trappers (or Taos) Trail ran between Laramie, Wyoming, and Taos, New Mexico, following the front range of the Rocky Mountains, over Sangre de Cristo Pass, through the San Luis Valley, and then along the Rio Grande to Taos. Similarly, the Overland Trail formed another trapper-blazed trail through the region. Used by the Overland Stage in the early 1860s, it extended west along the Platte and then followed the Cache la Poudre tributary into Wyoming. Cherokee gold seekers enroute to California in 1849 created the Cherokee Trail. They followed the Arkansas River to El Pueblo, later Pueblo, and then took the Trappers Trail north to the Overland Trail. Linking St. Louis and Santa Fe, the famous Santa Fe Trail paralleled the Cherokee Trail along the Arkansas to Bent's Fort and then split, with a northern route running to El Pueblo and then south over Raton Pass to Santa Fe, and a southern route that ran more directly to Raton Pass.[4]

Prior to the 1859 Colorado gold rush, Anglo explorers produced most of the written descriptions of Colorado. In 1806 Zebulon Pike led an expedition to the southern part of the Louisiana Purchase, exploring into Colorado along the Arkansas River and part of the way up his namesake peak. In 1820 Lt. Stephen Long of the U.S. Topographical Corps led an expedition that followed the South Platte to the site of present-day Denver and then, failing to find a pass through the mountains, south toward New Mexico. Long's expedition is most famous for its leader's damning characterization of the eastern plains of Colorado and the entire region of the Central Plains as the "Great American Desert"–a place "almost wholly unfit for cultivation."

During the 1840s explorer John Fremont passed through Colorado five times exploring routes in search of a transcontinental railroad route between St. Louis and the Pacific Ocean. In 1853 John Gunnison led a party through Colorado along the Arkansas River, into the San Luis Valley and west to the Gunnison River. He left both his name and his scalp in the West. Gunnison's interest was, like Fremont's, linked specifically to finding a central transcontinental railroad route. All of these explorations provided maps of the Colorado region as well as information on

topics as diverse as the location of mountain passes, natural history, animals and plants, and Native American peoples resident in the region. Anglo-Americans were curious about the information gained from these expeditions, but the reports did not become urgent until the discovery of gold.[5]

Historians credit Cherokee argonauts en route to the California gold fields for first finding gold along the Platte River in Colorado. The Cherokee had mined gold on their ancestral lands in northern Georgia before the government drove them out. Some prospected as they made their way west to California, and William Green Russell heard about Colorado gold from Cherokee prospectors while he was in Sacramento. Disappointed by the yields in California, Russell in 1858 organized a small party to venture to Colorado. There, just north of the confluence of Cherry Creek and the South Platte River, Russell and his group discovered placer gold. Additional gold discoveries followed on the heels of the first, as others found gold up Boulder canyon near present-day Gold Hill, up Clear Creek Canyon near Idaho Springs, and near Blackhawk.[6]

News of the gold strikes spread rapidly, spawning the legendary gold rush of 1859. One hundred thousand gold seekers are said to have set out for Colorado from Missouri River towns such as Atchison, Kansas City and Leavenworth. About two-thirds of these same people are said to have returned, disappointed by what they found–or failed to find–in Colorado. Traveling in both directions, many followed the older trails: the Overland Trail along the Platte and then south on the old Cherokee or Trappers Trails, or the Santa Fe Trail up the Arkansas and then north on the old Cherokee Trail to the gold fields. Some took new overland routes that had been discovered during the explorations of the last several decades. Travelers from Kansas City often followed the Kansas and Smoky Hill Rivers across Kansas and then struck out across the eastern Colorado plains to Denver. This was the shortest route, but also the most dangerous, most difficult and the one with the scarcest water supply. A few argonauts forged a new trail west from Leavenworth along the Platte River Route, bearing west along the Republican River and then across the plains to Denver. This was the least popular route. Once in Colorado, prospectors clustered in the new towns at the mouths of placer-rich canyons, and then blazed trails up the mountain canyons to the mines by foot, ox cart and horseback. Many of these new pathways would later become railroad rights-of-way.[7]

Colorado's first cities grew up along the foothills where avenues into the diggings crossed the main north-south trail, the Cherokee or Trappers Trail. Denver, Golden, Boulder, Colorado City and Pueblo all provided gathering places for gold rushers. Denver was particularly well situated, located where the Cherokee Trail crossed the South Platte. It was the easternmost supply center and therefore often the first city encountered by travelers from the east. Access to the diggings continued straightforwardly, if not easily, from Denver, either up Cherry Creek to the mountains toward Pikes Peak, or up the South Platte into the mountains in the direction of South Park. Golden was also well situated at the mouth of Clear Creek, the gateway to both Idaho Springs and the Blackhawk/Golden strikes. Boulder provided access up Boulder Canyon to Gold

Run (near present-day Gold Hill) as well as a second avenue to Blackhawk. Pueblo, the only one of the "new" towns that was relatively less new (it had been founded in the early 1840s), stood where the Santa Fe trail intersected the Cherokee and Trappers Trails.[8]

Each city contained citizens who tied their hopes for fortune on town-based businesses and real estate ventures, rather than on the mines. In truth, the mining industry presented rich opportunities for enterprising individuals hoping to supply it. By its very nature, mining required support from a wide range of services, including the supply of food and basic necessities, trade, transportation, lumbering, construction and manufacturing. A rivalry for control of access to the mining districts existed between the new cities of the front range, with Denver, Golden and Boulder each fancying itself as the major metropolis of the Rocky Mountain region. These ambitions played a large role in the future railroad development in Colorado.[9]

Wooing the Transcontinental Railroad, 1859-1866

A railroad to connect the Colorado gold fields with the rest of "the states" was called for almost as soon as gold was discovered. In February 1859, before the gold rush really got underway, a group of Denver citizens met to discuss possibilities for a transcontinental railroad route through the city. Denver boosters knew that a rail link would make the city "a point which cannot be dodged." Subsequently, four railroad companies, or phantom companies, emerged with plans to build to Denver. By 1860 none had panned out.[10]

Nationally, the concept of a transcontinental railroad had been under spirited discussion for nearly as long as there had been railroads in the United States. England had introduced the world's first railroad in 1825, and Americans were quick to adopt the new technology. Two years later the Baltimore & Ohio Railroad operated the longest stretch of track in the world, 133 miles from Charleston to Hamburg, South Carolina, the first important U.S. railroad.[11] By 1840 some 3,328 miles of railroad extended through the larger Atlantic states, eventually surpassing canals and rivers as the predominant means of transportation. Transcontinental railroad talk heated up during the 1840s and, after the War with Mexico and the acquisition of the western United States, accelerated again. By the late 1850s, as steam revolutionized transportation technology of all kinds, the railroad "came of age as the major instrument of transportation."[12]

Sectional and regional rivalries made the actual location of a transcontinental railroad impossible to agree upon, and at least five bands across America competed for recognition. By the time of the Pikes Peak Gold Rush, several extensive railroad surveys had been undertaken throughout the West. In 1855 alone Congress received ten volumes of western survey results from the army. Senator Thomas Hart Benton of Missouri kept Colorado under consideration as a through-state for the transcontinental road since it lay due west of his home state. The numerous

expeditions conducted by Benton's son-in-law, John C. Fremont, as well as the Gunnison expedition, bore the weight of Benton's influence.

Unfortunately for Denver boosters, the results of even Benton-backed surveys of the Colorado mountains showed that railroads could be built across them only via difficult, circuitous routes and by blasting at least one significant tunnel through the mountains. These survey findings were particularly damaging to Colorado's chances when compared with the results of other transcontinental railroad routes. The most favorable northern route roughly paralleled the Overland Trail, along the North Platte River and across southern Wyoming. The gentler grades of this route made it much more enticing to engineers.

Southerners objected strongly to any northern route, and during the 1850s decision-making about a transcontinental railroad reached a stalemate. The outbreak of the Civil War and Southern secession allowed the North to choose the route. In 1862 and 1864 two related transcontinental railroad acts gave the Union Pacific [UP] Railroad Company the contract to build a railroad west from Omaha. In addition, Congress allowed the Union Pacific a generous land grant subsidy as well as the ability to issue bonds to finance construction. The route across southern Wyoming was clearly the favored route.[13]

Colorado, particularly boosters in Denver and Golden, spent the next several years trying to woo the transcontinental railroad through the state. They first tried to secure the route by drawing its northern boundary at the 43rd parallel, which included the southern Wyoming route. When this failed, Colorado in 1861 received territorial status with the boundaries it has today. Efforts to amend the 1862 railroad bill to include government land grant subsidies for a branch line to Denver also failed. In 1863 the Union Pacific Railroad Company started laying track west from Omaha. Denver Mayor Amos Steck, not one to miss a promotional opportunity, sent a telegram pledging Colorado's "mountains of gold in aid of the great enterprise." A Union Pacific official responded with a promise to investigate the country near Denver for a possible rail connection.[14]

The Civil War slowed construction on the Union Pacific: from 1863 until the end of 1865 the UP completed only 40 miles of track. Colorado used the slow start to sponsor additional expeditions in the hopes of finding a pass that would convince the UP to build through its mountains. Berthoud Pass was among the most promising of the new mountain gaps discovered during this period, and results of the survey were sent to Washington for consideration. An 11,000-foot elevation, steep grades and the necessity of blasting a 3½-mile tunnel discouraged building through even this newly found pass, however. Colorado entreated the Union Pacific to survey its own routes, and the UP sent surveyors, but they also failed to find a suitable route through the mountains. By early 1867 Union Pacific directors reported to the Secretary of the Interior that "the topography of this mountain region forbids the passage of this national thoroughfare directly through the mining regions of Colorado."[15]

The Mining Situation

Railroading and mining were about as well suited for each other as two large-scale industries could be. Mining involved the shipment of large, cumbersome loads–heavy equipment in, heavy ores out–over precipitous terrain. Although horses and wagons or mules could carry the loads, and many of Colorado's mines relied on horse-drawn transportation for some extent throughout their producing years, the wagons' capacity was dwarfed by that of trains. Furthermore, horse-drawn transportation was slower and more susceptible to weather-caused interruptions than railroads. Because of their continuous need for the type of massive hauling power that trains were best suited to deliver, mines and smelters proved ideal customers for railroads. Districts served by railroads tended to prosper more and last longer than those dependent solely on horse-drawn transportation, and railroads that served prosperous mining districts could generally remain solvent. For this reason, mining districts and railroads sought out each other with almost equal fervor. Historian Rodman Paul, in his study of the mining frontier, stated that no factor signalled the end of the frontier phase of mining in the West more than the arrival of rail transportation.[16]

Colorado's desperate desire for railroad service into its mines was understandable. By 1867, however, the state of Colorado's economy failed to provide any additional incentive for railroads to build toward the state, with the "mountains of gold" pledged to the cause of a railroad dwindling to a mere trace. The period from 1864 to 1868 has been characterized as "the lowest point in the history of Colorado mining." For the first several years of the 1860s Colorado gold production amounted to almost $3.5 million per year, as prospectors traveled up mountain watercourses to the continental divide, collecting placer gold in the streams and tapping the easily assessable veins.[17] By 1864, however, placer gold had played out and even the quartz veins, processed by crude stamp mills hauled by bull teams from the railroad terminus at Atchison, failed to produce enough gold to keep mining thriving. A visitor to Blackhawk in 1866 saw "deserted mills, the idle wheels, and the empty shafts... [that] indicated a period of doubt and transition."[18]

Once the placers and early veins had been tapped, miners grappled with a complex, "rebellious" ore that refused to be drawn from hard rock using techniques that had worked in California and Nevada mines. Some new kind of smelting technology seemed to be called for, but the cost and uncertainty of waiting for it, and the difficulty of developing it, convinced many miners that the time had come to give up. Small mine owners began to sell their played-out holdings to eastern speculators, beginning a trend toward the consolidation of mine ownership into the hands of mining syndicates and a change in status for miners themselves from independent entrepreneurs to wage earners. Taken together, these changes indicated that, before the gold rush was ten years old, the initial entrepreneurial stage had passed, and a time of more capital- and technology-intensive corporate mining had begun.[19]

The high cost of overland hauls between mines and the distant railroad termini also contributed to Colorado's economic doldrums. In the mid-1860s, before railroads were available and when severe weather and increased Indian attacks on the plains made overland travel even more difficult and expensive than it had been, the lack of reasonably priced freight hauling options added another burden on the territory's economy. Even at this early stage, the financial feasibility of transporting and processing ore played as great a role as the richness of the lodes themselves.[20]

Colorado's First Trackage

In June 1867 Union Pacific workmen provided Colorado its first nine miles of track [*see Figure 1*]. The line ran through the far northeastern corner of the territory, part of its transcontinental line that followed Lone Tree Creek where it veered from the South Platte River. Tiny, remote Julesburg became the first town in Colorado with a railroad. For the next two years it possessed what the ambitious and competitive frontier towns of Denver and Golden did not.[21]

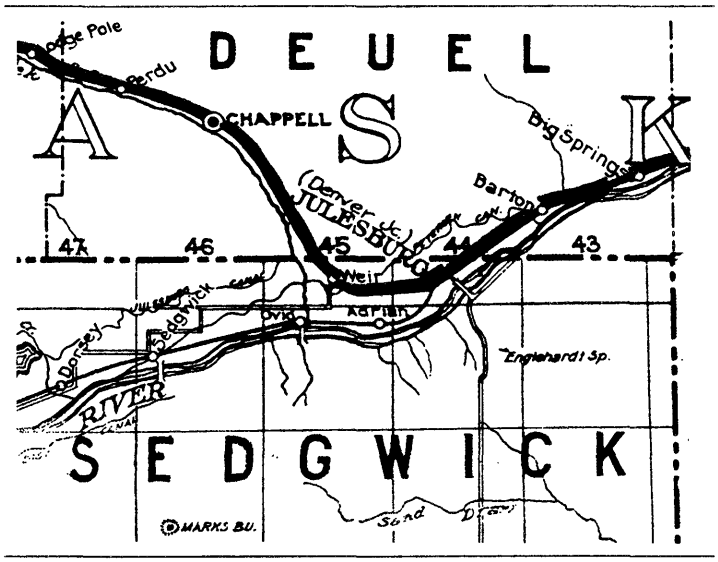

Figure 1. Union Pacific Railroad, from 1913 Colorado state map

The decision by the Union Pacific not to build its transcontinental line through Colorado marked a turning point for the state. Colorado boosters would continue to entice national lines to pass through the territory, but it also became clear that if Colorado wanted railroads built to its mines, people in the state would have to do it themselves. This challenge would be made more difficult by the fact that no one in Colorado had the kind of financial resources necessary to back a railroad enterprise. People typically came west looking to build their fortunes; if they had become financially successful in the East, they would probably not have come out West. This caused westerners to look to the government for help.[22]

Private sources had been able to finance railroad construction in the East during the 1840s and 1850s, but for the transcontinental railroad even they had turned to the government for financial support. The government supported the Union Pacific-Central Pacific construction by giving generous bond subsidies and land grants to the railroads. Throughout the 1860s the government granted land subsidies to other rail companies to help them raise money by land sales. This

climate of government support and the general unavailability of large pools of capital would affect the organization and construction of railroads in Colorado.[23]

The UP's decision not to build through Colorado spawned an immediate flurry of activity. In Denver "genuine alarm" fueled two efforts to connect the city by rail with the rest of the country. The first effort involved the Kansas Pacific [KP] Railway Company, which had incorporated more than ten years earlier to build a line from Kansas City to the Union Pacific line at the 100th Meridian but had subsequently developed transcontinental ambitions.[24] Playing on the ambitions of the Kansas Pacific, people in Denver urged the company to build from Kansas City to Denver. In the spring of 1866 the Kansas Pacific announced plans to reach Denver via the Smoky Hill route within three years. This may have been a hollow promise, though, because as the Kansas Pacific pledged itself to Denver, it also sent its representative, General William Palmer, to survey two routes to the Pacific coast, both of which ran south of Colorado.[25] Meanwhile, Colorado's congressional representatives joined those of Kansas to lobby for government subsidies for the Kansas Pacific. The line received an initial grant of land, but not a bond issue.[26]

A group from Golden led a competing effort to bring rails to the front range. In 1865 W.A.H. Loveland, E.L. Berthoud and Henry Teller organized Colorado's first railroad company–the Colorado Central [CC]. Two years later the Colorado Central's stated intention was to extend tracks north to the Union Pacific, west over Berthoud Pass to Utah, and southeast to the future Denver Pacific terminus and points east.[27] The idea was to put Golden, and not Denver, at the heart of Colorado's traffic between the mines and the rest of the states. Loveland's strategy was to form an alliance with the Union Pacific to finance construction of the proposed road. The governing board of the Colorado Central initially included eight Coloradans and fourteen easterners, including John Dix of the Union Pacific. In 1867 Loveland struck a deal with the Union Pacific that complied with Congressional strictures against UP's construction of branch lines. The CC would grade a road from Golden to the UP line north of Colorado, and the UP would lay the tracks and provide rolling stock. Unfortunately, Loveland and associates could not convince the surrounding towns to pledge the bond moneys needed for grading the road, and the deal dissolved. The Colorado Central soon slipped into a frustrating period of inactivity.[28]

The last railroad to enter the Colorado scene during the 1860s would be the first to lay additional track in the state. In November 1867 Denver promoters organized the Denver Pacific [DP] Railway & Telegraph Company to link the city with the Union Pacific line in Wyoming; in December they began making the first surveys north. The Denver group included ex-Governor John Evans and businessmen Bela Hughes and David Moffat. They had organized the road because the Kansas Pacific's timetable for building to Denver was so slow, and they may have doubted the Kansas Pacific's intentions of building to Denver at all. In any case, Denver promoters wanted a rail connection with the UP's transcontinental line because they believed that the city's future growth depended on it.[29]

Evans and Moffat would both play key roles, not only in the Denver Pacific, but in the subsequent development of Colorado railroads. Johns Evans, the elder of the two, was a 19th century renaissance man. Born in Waynesville, Ohio, in 1814, he became a doctor over the opposition of his family. He set up medical practice in Attica, Indiana, where he persuaded the state legislature, after a difficult political battle, to build Indiana's first hospital for the mentally ill. Evans served as its first chief administrator. After joining the faculty of Chicago's Rush Medical College, he first became convinced of the necessity of railroads while commuting via stagecoach between his practice and his professorship. After 1848 Evans participated actively in building community institutions in Chicago, including founding Northwestern University; the locality of Evanston takes its name from John Evans. Evans advocated numerous railway projects during his Chicago years. By the time that President Lincoln appointed him Territorial Governor of Colorado in 1862, Evans had developed "the ingrained conviction that the development of any community or region depended upon adequate, efficient, and cheap railway transportation."[30]

David Halliday Moffat, Jr., moved west to make a fortune. Born in Washingtonville, New York, he quit school at age twelve to become a messenger for the New York National Exchange Bank. At thirteen Moffat moved to Iowa where he worked in another bank, and at sixteen, as plans for the first transcontinental railroad commenced, Moffat moved to Omaha where he believed there was a fortune to be made in land speculation. This venture proved a disappointment. The tales of gold in Cherry Creek drew him further west to Denver where he opened a stationery story with D.G. Woolworth. Moffat and Woolworth's store prospered largely because their wagons brought eastern newspapers to Denver faster than the U.S. mail and sold at a premium. By 1866 Moffat became a cashier at the First National Bank in Denver, appointed by bank president Jerome Chaffee himself. Moffat would remain in the bank's employ for the rest of his life, becoming its president in 1880. When the transcontinental railroad passed Denver by, Moffat was already well established in Denver and ready to promote the new railroad venture. Evans took a liking to him, and together they boomed the Denver Pacific Railroad.[31]

Denver Pacific people approached the Union Pacific for help building a road to Cheyenne, just as the Colorado Central had before, and for the same reason. Like the Colorado Central, the Denver Pacific had more ambition than money. The UP continued to express little interest in building to the front range without significant help from the supplicant railroads. In 1868 Denver reached an agreement with the UP: the UP would build a road from Cheyenne to Denver in exchange for majority control of the Denver Pacific, if the DP could get a land grant from Congress. In this offer, the UP was consistent, if not exactly loyal; it had offered a similar agreement to the Golden promoters of the Colorado Central. In essence, if Colorado people could pay for a significant portion of construction, the Union Pacific would build to the front range.[32]

The Denver Pacific embarked upon an intensive period of congressional lobbying. In March 1869 the DP emerged with two things the Colorado Central did not have, a congressional land

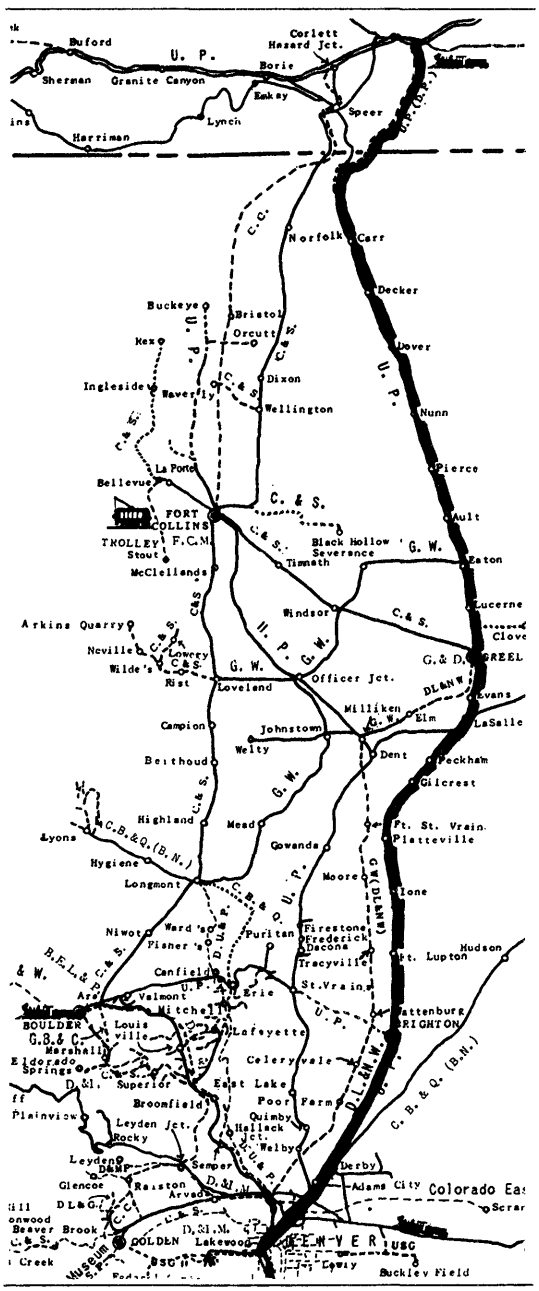

Figure 2. Denver Pacific Railroad, from 1986 map by Colorado Railroad Historical Foundation

grant and the backing of the Union Pacific. By May the Denver Pacific had graded a line from Denver to Cheyenne without laying any ties or track. It was unusual to grade the line before laying rail, but the practice was driven by the UP's congressional charter and by its financial inability to do anything more.[33]

Once the grading was completed, however, the UP reneged on its promise to build the road. In frustration, Evans turned to the Kansas Pacific, and the two roads formed a partnership. The Kansas Pacific essentially absorbed the Denver Pacific and assigned it a portion of its own land grant, giving it the means to build from Cheyenne to Denver as well as from Denver east to meet the westward building road from Kansas City. Construction on the two lines began in 1869, one south from Cheyenne, and one west from Kansas City.[34] In the meantime, in May 1869 the Union Pacific crew met that of the Central Pacific at Promontory, Utah, for the famous Golden Spike ceremony commemorating the completion of the transcontinental railway.

During the summer of 1870 Denver gained rail connections with both Cheyenne and Kansas City [*see Figures 2 and 3*]. The August meeting of the DP/KP rail crews at present-day Strasburg made railroad history. Although the fanfare was nowhere near that of Promontory, driving of the last spike at Strasburg–a silver one provided by the people of Georgetown–marked the completion of the first continuous track linking the Atlantic and Pacific Oceans. (The Union Pacific/Central Pacific line ran between the Missouri and Sacramento Rivers.) Later in 1870 the Denver Pacific built a line from Brighton (then called Hughes) toward the coal fields at Erie. The new line had its own corporate entity as the Denver & Boulder Valley Railroad.[35]

Denver's success meant rival Golden's failure. Moreover, the Kansas Pacific's successful link to Denver posed a challenge to the Union Pacific. The KP link

meant that it paralleled the UP for about two-thirds of its entire line, offering a more direct route from St. Louis and the South. The challenge presented to both Golden and the Union Pacific may have thrown the two together. In September 1870 the Union Pacific helped the Golden-backed Colorado Central build a line from Golden to Denver. Golden, too, now had a rail connection, albeit through Denver, to points north and east [*see Figure 4*].[36]

By 1870 the front range was in rail contact with the Union Pacific's transcontinental line to the north and with the Kansas Pacific and commercial points east. However, the mines, the *raison d'etre* for commercial interest in Colorado, still remained accessible only by team, horseback or on foot. Getting rails to the mines was the next hurdle for Colorado. To do this, three new railroads would enter the scene during the 1870s, and two of the "old" railroads would continue to build under the shadow and eventually under the influence of the Union Pacific.

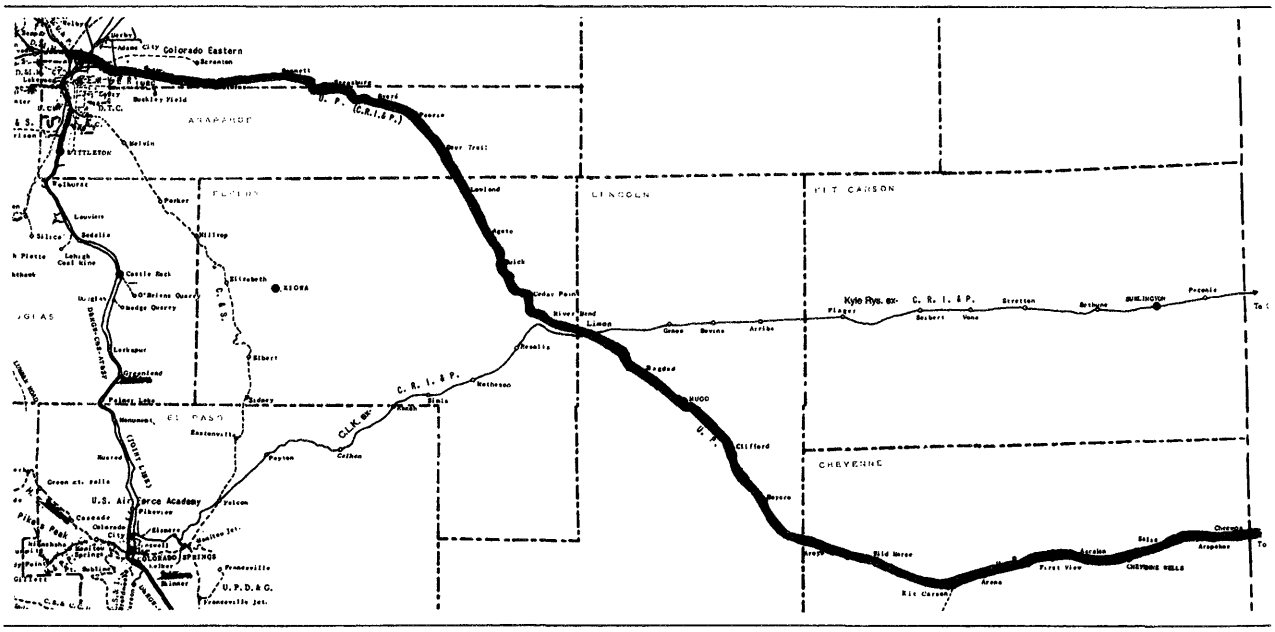

Figure 3. Kansas Pacific Railroad, Denver-Chemung, from 1986 map by Colorado Railroad Historical Foundation

Mining: Smelting and Silver

By 1870 two factors combined that would begin to elevate Colorado from its economic doldrums. The first was the invention of a smelting system that succeeded in separating gold from hard rock. The Boston and Colorado Smelting Company opened in Blackhawk in 1868, the

physical manifestation of eastern capital invested in eastern knowhow. Boston investors had supported the research of a Brown University professor, Nathaniel Hill, who developed the new process. The new Boston and Colorado smelter was a success almost from the beginning, encouraging renewed gold production from the mines.[37] The second factor to boost Colorado's economy was the beginning of a silver boom, inaugurated in 1869 by the discovery of large deposits high up Boulder Canyon at Caribou. Silver had been mined near Georgetown since 1864 but had not been developed in quantities sufficient to fuel sustained excitement. In addition, silver smelting experienced many of the same inefficiencies as gold, but, by the time of the Caribou strike, silver smelting had also become more efficient. Other strikes followed, with successive discoveries occurring along a southwest diagonal from Boulder to the San Juan Mountains. Gold production still outyielded silver for the early part of the 1870s, but by 1874 silver output had climbed to over $3 million per year, surpassing gold production for the first time.[38]

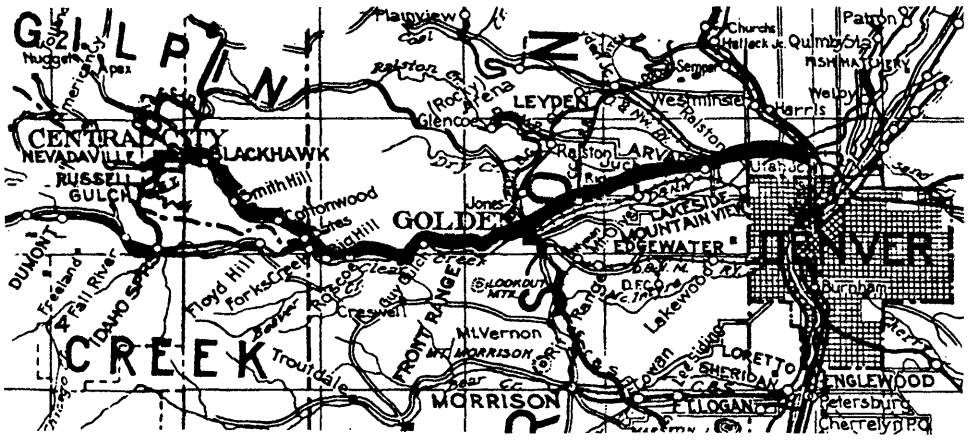

Figure 4. Colorado Central Railroad, Denver-Golden-Central City, from 1913 Colorado state map

Colorado's economy in the 1870s climbed slowly from the depressed state reached after mining foundered in the mid-1860s. The Panic of 1873 brought rail construction to a virtual standstill, before picking up again. Railroad work during the 1870s resembled the economy: gradual progress and sharp reversals, followed again by slow progress.[39]

The Mountain Lines: Blackhawk and Morrison

The Colorado Central–line of the Golden boosters–was first to build to the gold mines. In 1872 the CC laid narrow-gauge tracks from Golden to Blackhawk, up the "tortuous and steep-walled canyon" carved by Clear Creek [*see Figure 4*]. The railroad's affect on Blackhawk was nearly as dramatic as that of the new smelter. After rails reached Blackhawk, the expense of machinery fell, and the price of food, clothing and fuel dropped, allowing wages also to drop. All of this resulted from the lower freight rates that the Colorado Central could offer. While freight rates

fell, the precious metals exported from Blackhawk maintained their value, further increasing the railroad's value. The Colorado Central also planned to reach Central City, Idaho Springs and Georgetown and laid additional track up Clear Creek Canyon toward the latter two mining areas before the Panic of 1873 halted construction. It would take the railroad until 1878 to reach Central City, barely three miles from Blackhawk.[40]

In 1873 the Colorado Central extended track down to the coal fields of Boulder Valley. The link between Boulder Valley and Blackhawk was important for both regions because it provided a direct connection between the new smelter at Blackhawk and Boulder Valley's coal, necessary for fueling the smelter. In addition farmers and miners both gained an easier means of transporting the food and supplies that tied them together economically. The Colorado Central's valley connection spearheaded a new strategy to allow Golden to compete with Denver for a transcontinental rail link. Built west from Golden to Longmont via Boulder, the valley extension was part of a Union Pacific/Colorado Central aligned strategy to challenge the Denver Pacific by building a competing line from Golden to the transcontinental railroad at Julesburg. By 1873 the extension reached the Weld County line four miles east of Longmont.[41]

A completely new railroad made the second foray toward the mines. The Denver, South Park & Pacific [DSP&P] Railroad incorporated in 1872 with plans to build deep into the mountains, over the continental divide and into the San Juan mining district in the southwestern corner of the state. The narrow-gauge mountain line was destined to become a sentimental favorite, and would inspire some to poetry about its "little locomotives [that] could curve on the brim of a sombrero."[42] With the support of David Moffat, John Evans controlled the South Park, the pair's first Colorado venture since the Denver Pacific. Construction began in the depression year of 1873 and stopped in 1874 after workmen laid track to Morrison. In the mid 1870s the DSP&P was a railroad "from nowhere to nowhere" in terms of tapping a hauling market and would remain so, without additional construction, for about four years.

Placer Railroading

The difficulty of raising financing plagued virtually every railroad that had laid track to date in Colorado, with the possible exception of the UP. As a result, the funds raised were stretched as far as possible. Wherever roads could shave costs in material or construction, they did. As a result, railroads in Colorado were not built to last. A railroad entrepreneur told potential Paris investors that initial building costs per mile were significantly lower in Colorado than those in Europe, partly because construction was expected to last only ten years. Operating profits were expected to pay for subsequent upgrades and replacement costs.[43]

The strategy of building cheaply and deferring permanent construction has been called "placer railroading." It may have been the only way to finance railroad construction in the West, but it came at a price. While placer railroads themselves risked bankruptcy and takeover, their passengers and freight faced more immediate physical danger. Placer railroads were often overcapitalized and frequently failed to pay dividends. Railroad directors knew this and often secured their profits during construction. This left railroads strapped for both construction and operating funds and vulnerable to takeover. On the engineering side, steep grades, sharp turns and generally cut-rate construction resulted in a distressing number of derailments and train wrecks.[44]

Why build a railroad likely to be plagued with derailments and wrecks? Why invest in a railroad that might fail to pay dividends? Transportation historian George Taylor has argued that great improvements in transportation bring valuable indirect benefits to people and places along their routes. In general, farmers get more for their crops, manufactures and mine owners can command higher prices, consumers get more for their money, real estate values rise, middlemen and bankers get more business, and government tax revenues rise. In Colorado it is likely that most investors hoped to gain through the railroad's effect on these indirect factors, more than through a direct profit from the railroad itself.[45]

South From Denver: The Denver & Rio Grande Railroad

In 1870 former Kansas Pacific employees formed another Colorado railroad company. That summer, as Denver and Golden celebrated their newly forged rail connections, former Territorial Governor A. Cameron Hunt quietly secured railroad rights-of-way near present-day Colorado Springs. In October a new railroad incorporated in Colorado: the Denver & Rio Grande [D&RG] Railway Company. The D&RG would become one of the most important players in the development of the region's mines, literally changing the shape of railroading in Colorado.[46]

General William Jackson Palmer, formerly of the Kansas Pacific Railroad, founded the D&RG. Born in Delaware, he was raised a Quaker. Palmer worked on eastern railroads from the time he was seventeen, and he received an education in railroad administration while serving as confidential secretary to the Pennsylvania Railroad's "great constructive railroad president," J. Edgar Thomsen.[47] During the Civil War, Palmer served the Union side and afterward became involved in the Kansas Pacific. The surveys he conducted of the 32nd and 35th parallel routes to the Pacific had led him to recommend that the line avoid building to Denver, instead extending over Raton Pass into New Mexico and then on to the Pacific Ocean via Mexico. The Kansas Pacific, however, chose to build to Denver despite Palmer's recommendation.[48]

The idea of tapping the Mexican market on the way to the Pacific Ocean had captured Palmer's imagination. In 1869, when the entire country seemed to be thinking in terms of east-west

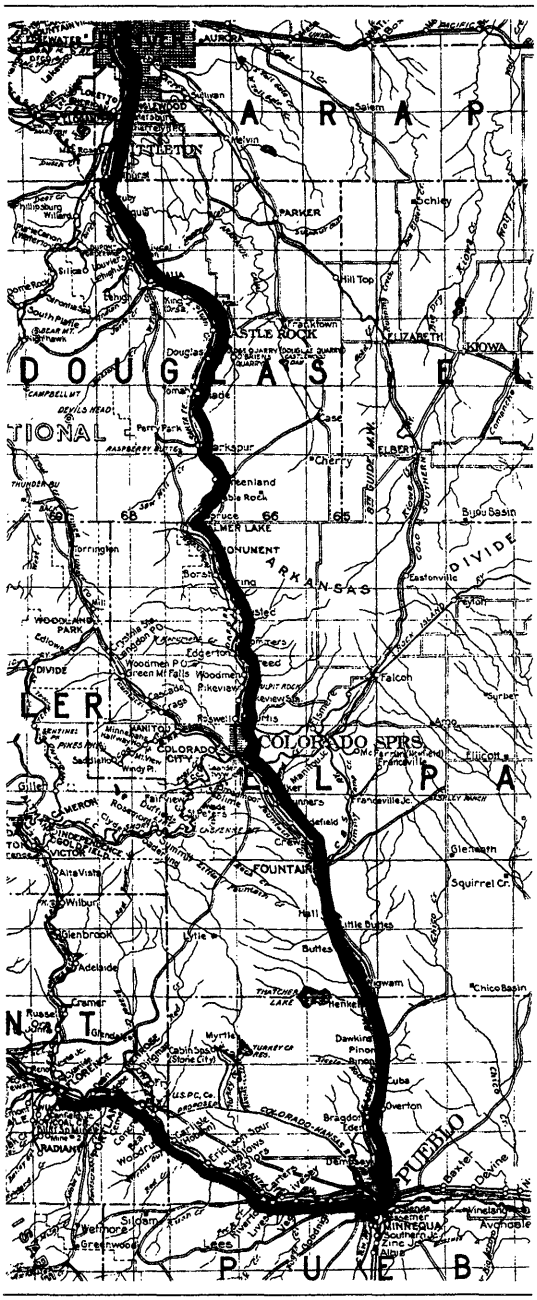

Figure 5. Denver & Rio Grande RR, from 1913 map

connections, Palmer hung on to his north-south ambitions and the lure of both Mexico and a southern outlet to the Pacific Ocean. He surveyed a Denver-to-Pueblo route and became convinced of the feasibility of a north-south railroad along the foot of the mountains.

Before Palmer concluded his work with the Kansas Pacific in 1870, he already had plans to embark on his own railroad company. As he participated in the last phases of Kansas Pacific construction, his partner Hunt began purchasing rights-of-way south of Denver. As soon as his work with the Kansas Pacific ended, Palmer married and took his wife on a honeymoon to Europe. There he intended to solicit financial backing for his railroad. One suspects that Palmer's trip to Europe was at least as much business trip as honeymoon.[49]

Palmer went to raise money for his new road at a time when railroads had fallen from favor with the government and as the country was tipping toward a depression. By 1870 an "era of suspicion and opposition to railroads" was emerging in America. People were beginning to suspect railroad companies of advancing their own interests over those of investors or customers, and there was even a whiff of scandal in the air. As a result, the government practice of granting land to support railroad production fell from favor. The Denver Pacific would be the only Colorado-based road to receive land grant support. After 1870 Colorado railroad promoters would have to solicit eastern and European support to finance their lines.[50]

Palmer needed both a good rationale to entice investors and a cost-effective plan for construction. His concept focused on building a railroad on an entirely new scale. In 1870 the size of railroad gauge, or the distance between the rails, was still a matter open to debate. At least twelve different gauges were then used in the United States, ranging from 4 feet-3 inches to 6 feet. President Lincoln specified that rails on the

transcontinental railroad be laid 4 feet-8½ inches apart, a width referred to as "standard gauge." When the transcontinental railroad was built, there were 20 times more miles of standard-gauge track than that of any other size in the country. It was this preponderance of standard gauge, not its actual technical superiority, that caused railroad interests to press for standard gauge for the transcontinental road. All track laid in Colorado to 1870 had also been standard gauge.[51]

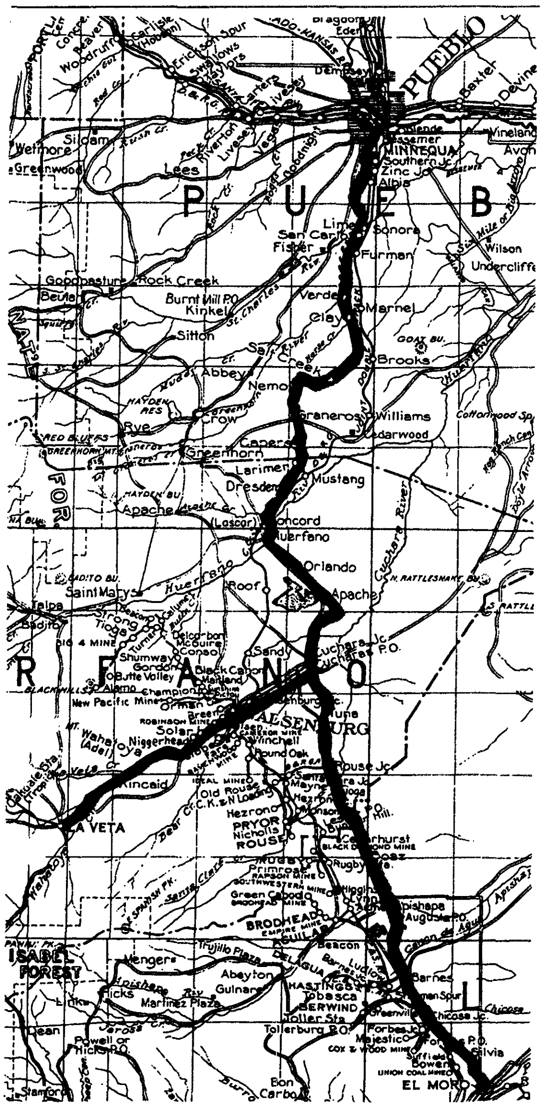

Figure 6. Denver & Rio Grande RR, from 1913 map

Standard gauge may have predominated in the United States, but it was not sacred, particularly for independent-minded railroad entrepreneurs of the Rocky Mountains. In Wales a new 2-foot-gauge railroad had been built at the Festiniog mines, and Howard Schuyler, engineer on the Kansas Pacific and soon to be engineer of the Rio Grande, went to study it. In 1871 the Denver & Rio Grande made U.S. rail history by becoming the first road in the country to use the narrow gauge, that is track laid 3 feet apart. Narrow-gauge track provided two advantages. First, it lessened the cost of construction by about a third, mostly due to lighter equipment requirements. Narrow-gauge rails weighed only 30-40 pounds per yard as opposed to the 80- to 90-pound rails of standard gauge. The locomotives and other rolling stock were also smaller and lighter, saving cost in material. The second advantage offered by narrow gauge was the promise of greater traction for climbing steep mountain grades. This advantage, however, the D&RG failed to put into practice immediately, intent as it was on reaching Santa Fe and El Paso along the base of the mountains.[52]

Palmer proved convincing in Europe, returning with enough funds to begin his railroad.[53] In 1871 the Rio Grande laid narrow-gauge track south from Denver to Colorado Springs, a town it had created and colonized to support the railroad. Many of the town's earliest residents came from Britain, drawn here by publicity distributed by Palmer on his busy honeymoon.[54] The following year the D&RG's narrow tracks reached Pueblo [see *Figure 5*]. Passengers could ride from Denver to Pueblo, a distance of 118 miles, in eight hours. Although the railroad did not have to create

Central Colorado Improvement Company, a new settlement called South Pueblo "rose like magic" south of the Arkansas River.[55]

In 1872 the Rio Grande made another U.S. railroad first by buying six sets of Westinghouse straight-air brakes and installing them on their freight locomotives, the first time air brakes had been used on freight trains. It was perhaps in anticipation of the mountainous terrain through which the railroad ran that the innovation was made. The D&RG next built a line from Pueblo to a coal deposit at Florence west of the city [*see Figure 5*], funded in part by a municipal bond issue.[56] The detour off the main line was to pay for itself by carrying the freight of the coal company. Once to the coal fields, however, the D&RG found it could not pay the cost of construction; as a result the construction company, another D&RG subsidiary, took possession of the road. For two years the construction company operated the line between Pueblo and Florence.[57]

The Panic of 1873 effectively ended construction on the D&RG for about three years. An 8½-mile extension from Florence to Canon City in 1874 comprised the entire extent of building for the railroad until later in the 1870s. Even this construction proved beyond the financial means of the company. Construction was possible only through municipal bonds issued resentfully by the people of Canon City, whose desperate need for a railroad proved stronger than their patience. During the same year, D&RG surveyors discovered excellent coking coal near Trinidad. In 1876, after stockholders provided financing, the D&RG built south from Pueblo to Cuchara, where the road wyed southwest to La Veta and southeast to another town they built themselves–El Moro [*see Figure 6*]. From there they could see Trinidad.[58]

East and South: The Atchison, Topeka & Santa Fe Railroad

At this point the Denver & Rio Grande had been the first Colorado railroad building toward the south. In 1873 a second new railroad company with southerly intentions extended a toe into Colorado Territory. The Atchison, Topeka & Santa Fe [AT&SF] Railroad had been organized during the 1850s, and during the relatively open-handed 1860s the company had received a government land grant based upon an approved schedule. Having built barely more than 100 miles by 1872, the AT&SF was in danger of losing its land grant. A flurry of construction activity brought rails to the border of Kansas and Colorado by the 1873 deadline to retain the land grants. The AT&SF then extended over the border, laying about ten miles of track into Colorado before suspending construction.

With its tracks paralleling the Kansas Pacific through rich cattle company, the AT&SF immediately posed competition for the older road. The KP had earlier organized a subsidiary to build south from Kit Carson and challenge the upstart AT&SF, but the newer road proved the more prodigious builder. By 1876 the Santa Fe stretched up the Arkansas River Valley to Pueblo

Kansas Pacific, instead of contesting the new road, settled for a rail link that ran between its line at Kit Carson and the AT&SF at Las Animas. By leasing the Kit Carson-Las Animas link, the Kansas Pacific became the biggest railroad enterprise in Colorado. This would draw it some unwanted attention.[59]

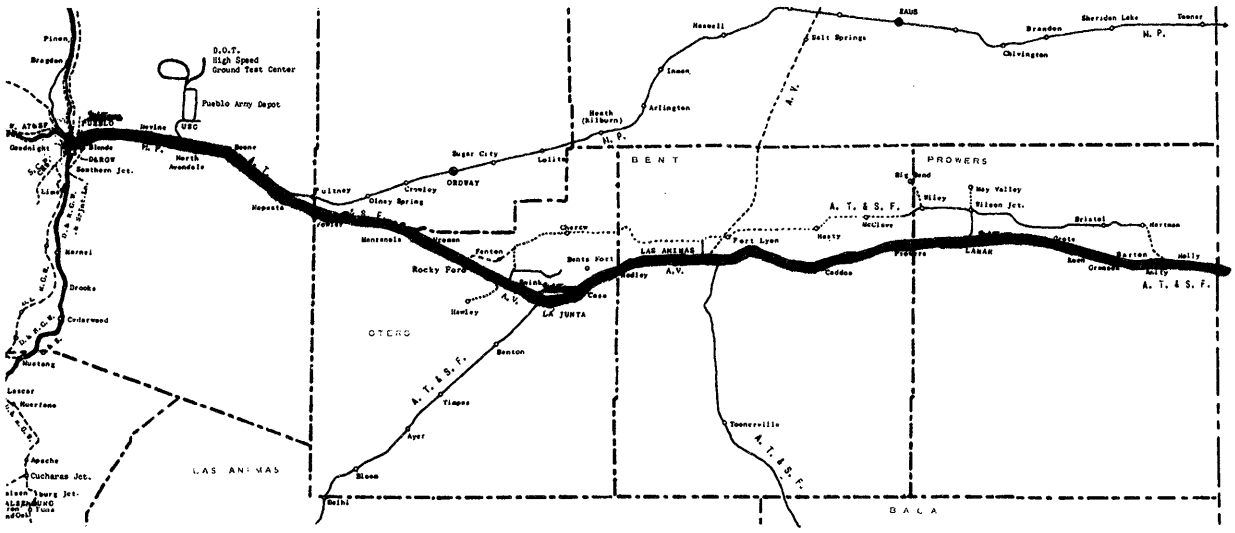

Figure 7. Pueblo & Arkansas Valley Railroad, Holly-Pueblo, from 1986 map by Colorado Railroad Historical Foundation

The Panic of 1873

The Panic of 1873 brought on a nationwide depression that hit railroads particularly hard. Triggered by the bankruptcy of financier Jay Cooke, principal investor for the Northern Pacific Railroad, it resulted in a series of bankruptcies that crippled the nation's rail network. In all, 77 American railroads went into insolvency. The ensuing financial depression brought the usual constriction in the money supply and the general rush to unload stock and bond holdings. For the railroads, the loss of confidence among investors was exacerbated by a nationally reported scandal involving Credit Mobilier, the construction company that had contracted to work on the Union Pacific. Suspicious purchases with UP stock and federal subsidies, missing funds and preferential stock sales by corporate insiders to members of Congress all combined to bring railroads into even greater disfavor.[60]

The 1873 depression effectively stopped rail expansion in Colorado. Annual rail construction in the state dropped from 123 miles in 1873 to just 28 miles in 1874. Colorado's traffic was mostly local, which sheltered it somewhat from fluctuations that affected national roads. The D&RG stayed afloat because of help from its subsidiary land and construction companies. But the need for capital investment in both mines and railroads made the state's economy vulnerable to economic instability in the East. The state was on its way to becoming what has been described as a "colonial economy" or what the historian Leon W. Fuller termed "little more than a pocket borough of the corporate oligarchy."[61]

Late in the 1870s Jay Gould provided the corporate oligarchical pocket into which the Kansas Pacific, the Denver Pacific and the Colorado Central disappeared. Jay Gould made his particular contribution to U.S. history by engineering new ways to manipulate stock, sniffing out vulnerable properties, buying them and then ruthlessly using his new properties to further other financial manipulations. He had begun his career as a stock market speculator, and in the mid-1860s gained notoriety–as well as respect–by a masterful manipulation of Erie Railroad stock. In 1869 he solidified his reputation as a formidable financial adversary by nearly cornering the gold market.

Gould is often viewed as the quintessential 19th century robber baron, looting businesses and returning nothing. He was not a builder, saying himself, "I don't build railroads, I buy them," which may partly account for the general antipathy with which he is viewed. Gould specialized in railroads, and railroad aficionados revile him for letting his properties deteriorate after he acquired them. Revisionists see Gould as a master at acquiring weak properties and making them turn a profit, often by instituting skillful management and innovative competitive tactics. He was at the very least a fierce competitor and without question the 19th century financier with the greatest influence on the development of Colorado's railroads.[62]

The Kansas Pacific attracted Gould's attention in the mid-1870s for both its size and its financial instability. It had negotiated a friendly lease of the Denver Pacific, as well as that road's coal mine subsidiary, the Denver and Boulder Valley, and the Arkansas Valley railroad that had built the Kit Carson-Las Animas link to the AT&SF line. With control of the longest trackage in Colorado, the Kansas Pacific was well situated geographically but poorly built, greatly undercapitalized and unable to secure a fair division of traffic. In the mid-1870s the line went into receivership, and Gould emerged in control the KP as well as its leased subsidiaries. To this he added the Golden, Boulder & Caribou line, which he bought outright.[63]

In a separate set of arrangements, Gould began buying Union Pacific stock, eventually gaining controlling interest in it. Since the line was so closely allied with the Colorado Central, Gould in effect gained control of the Colorado Central as well. By 1879 Gould merged his two Colorado railroad empires. He sold the former Kansas Pacific/Denver Pacific holdings as well as the Gol-

den, Boulder & Caribou line to the Union Pacific, and he arranged for a fifty-year lease of the Colorado Central. During the fight for control of these roads, Gould supported the Colorado Central's completion of a line to the transcontinental railroad, but had it connect near Cheyenne, rather than at Julesburg. Several years later under Gould's direction, the Colorado Central built a Julesburg branch, but since it went from the old Denver Pacific station of LaSalle east, it connected Denver more directly to the new line, and not Golden as the CC had originally intended.

By 1880 Jay Gould had merged the Kansas Pacific, the Denver Pacific, Denver and Boulder Valley, Golden, Boulder & Caribou, and the Colorado Central with the Union Pacific. He also presided over significant rail abandonments. Colorado's first occurred in 1874, when the four miles of Colorado Central track that had extended from Longmont east to the Weld County line were torn up to change the line's course straight north to the transcontinental line. Gould also orchestrated the largest abandonment during the first fifty years of Colorado rail history: the 1877 removal of track between the Kansas Pacific and the AT&SF at Kit Carson/Las Animas. Since Gould had no loyalties to either Denver or Golden, once he entered the scene, the competition between the two was over. Without Golden's energetic advocates, Denver, better situated for access from the east, had won.[64]

Colorado in 1876

As Jay Gould was in the midst of his railroad manipulations in 1876, Colorado achieved statehood. Without its railroad connections and mineral wealth, it is unlikely that the state would have been admitted to the Union this early. Colorado's entrance into the Union, however, cannot be attributed directly to either railroads or mines. The Republican Party's desire to secure as many electoral votes as possible during a tough election year and Colorado's likelihood of producing three Republican electors probably most influenced this timing.[65]

Colorado's constitution demonstrated the influence and economic control of absentee bankers and investors. It established little in the way of economic regulation, and it deviated from the majority of states' constitutions by setting no legal restrictions on usury. The constitution established a one-man railroad commission, but the state legislature appropriated no money for it. This left the regulatory agency easily controlled by railroad interests, most of whom lived outside the state.[66]

Still, by 1876 the indirect benefits from the railroad could already be seen in Colorado. A few years after Denver made its first rail connection in 1870, "its proudest year," both the population and mercantile business tripled. After rails reached Blackhawk, the expense of machinery fell, the cost of living fell, and wages adjusted accordingly, while mineral exports maintained their

value. During the 1870s the appraised valuation for counties through which the Rio Grande traveled tripled, while that of counties with no railroads had increased only 70 percent. Statewide, increases had doubled, leaving the railroad counties still significantly ahead in terms of appraised value.[67]

Colorado's population grew five-fold during the 1870s, with many of the newcomers living in or around towns that owed their existence to the railroads. The D&RG's creation of Colorado Springs and El Moro and its expansion of Pueblo have already been mentioned; the D&RG also created Castle Rock and Palmer Lake. Not far from Colorado Springs another D&RG creation–Manitou Springs–was emerging as a popular resort destination and its natural hot springs would inspire its self-promotion as "the Saratoga of the West." The Denver Pacific created Brighton, Evans, Pierce and Carr. The Kansas Pacific created Strasburg, Limon and Byers and founded an agricultural research station at Cheyenne Wells to support dry-land farming and stock raising. Eastern immigrants committed to an abstemious, hard-working, community-oriented agricultural life founded the colony of Greeley on land purchased from the Union Pacific. By 1880, under Jay Gould's influence, railroads would spearhead a project to make Kansas Pacific land grants around Denver more valuable by irrigation. The project would eventually help build the High Line Canal and significantly increase irrigated farm acreage in the Denver area.[68]

Economic and material conditions peculiar to the West affected railroad construction, and Colorado railroads had acquired a look of their own. In comparison with Europe, American iron was expensive and wood relatively cheap. This led to a preference for building wooden bridges and trestles that were frequently lined with water barrels to combat fire. Depots also were most often constructed of wood, particularly in the mountain regions where the cost of hauling stone or brick was high. Labor cost more in the U.S. than in Europe, so when the terrain offered a choice, engineers built structures that required the fewest man hours to build. This led to a preference for trestles over earth fill, steeper and therefore shorter grades, and sharper turns.[69]

South and West from Pueblo: The Bloody Angle

In 1876 the standard-gauge AT&SF met the narrow-gauge D&RG at Pueblo, in a junction that has been called the Bloody Angle. Here the two roads found their interests in conflict. The Rio Grande still had southern ambitions and planned to build over Raton Pass into New Mexico; the Santa Fe still had transcontinental ambitions and saw its best chance to further them by also building over Raton Pass. Both roads also coveted the same narrow right-of-way west toward the mines. The Bloody Angle represented the site of the two railroads' aggressive jockeying for the best and the first rail passages, occupying both factions through the end of the decade.

Round one in the war of the Bloody Angle went to the Santa Fe in a stirring piece of espionage, luck and derring do. By 1877 the D&RG had built nothing in the vicinity of Raton Pass. Its line ended at El Moro, where it owned the land and where it had been profiting from the new community's development. This had earned the railroad the ill will of Trinidad, located within sight of El Moro, which suffered as businesses relocated to El Moro. Instead of building to Trinidad and Raton Pass, the D&RG had spent 1876-77 building a breathtakingly high and circuitous road from La Veta south to Alamosa and Fort Garland [*see Figure 8*]. This line included Muleshoe Bend where the track climbed 400 feet in two miles, an excellent example of the principle of steeper grades built to lower costs of construction. At its highest point, the new stretch rose 9,300 feet above sea level, making it the highest trackage in the U.S. at that time.[68]

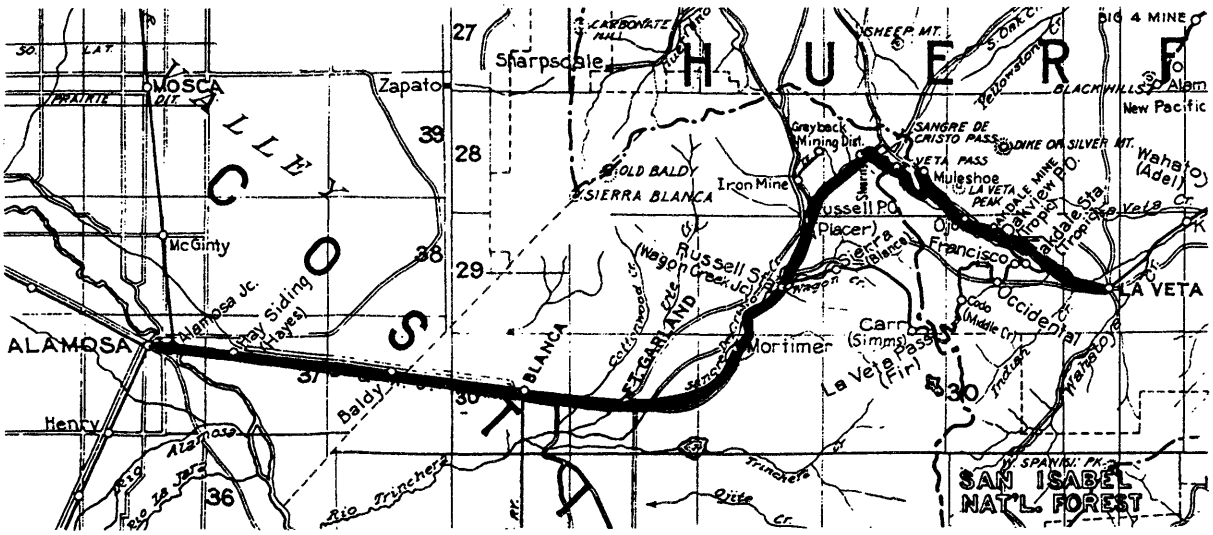

Figure 8. Denver & Rio Grande Railroad, La Veta-Alamosa, from 1913 Colorado state map

While the D&RG concentrated on its Alamosa route, the AT&SF dispatched two engineers to occupy and hold Raton Pass. In February 1878 the D&RG learned about the other road's plans, probably by intercepting a telegram. To forestall losing Raton Pass, the Rio Grande sent two of its best engineers, J.R. De Remer (who had engineered Muleshoe) and J.A. McMurtrie, to begin grading on the pass. On a cold night in February 1878 the two men boarded a train from Pueblo. By chance, two Santa Fe engineers who were traveling with the same objective rode on the same train. The Santa Fe engineers saw De Remer and McMurtrie and, when the train reached the terminus at La Veta at 11 p.m., they watched as the two Rio Grande men checked into their hotel. The Santa Fe men, A.A. Robinson and Ray Morley, then rented a team of horses and

drove through the darkness to Raton Pass. When they arrived in Raton, they roused local Trinidad men who agreed to go to work immediately, motivated at least partly by their resentment of the D&RG. The Santa Fe engineers immediately took their ad hoc crew out to the pass and in the wee hours started grading by lantern light. The following morning when the Rio Grande engineers arrived, the Santa Fe was already in possession. Raton Pass belonged to the Santa Fe by right of prior construction.[71]

General Palmer of the D&RG was an aggressive competitor who did not take kindly to the loss of Raton Pass. In 1877, however, a new objective emerged on the scene that was nearly as enticing as Mexico, and situated in a completely different direction. West of Pueblo, high up the Arkansas River Valley, the earlier disappointment of a short-lived gold strike was about to be redeemed by the excitement of one of the richest silver strikes in American history.[72] California Gulch, tucked deep in the Rocky Mountains at about 11,000 feet above sea level, had yielded one of the richer placer strikes during the early days of Colorado's gold rush, but by 1862 its gold had played out. A lode strike later in the 1860s renewed the hopes of a few optimists, but by the 1870s the area's production was barely enough to "keep a cat alive."[73]

Disgruntled miners complained about heavy sand and rocks they found mixed in with their gold. In 1874-75 two astute miners recognized the offending rock as silver. If the metal had been gold, a rush probably would have followed immediately, but the rush toward Leadville, as the town came to be called, waited until European-educated metallurgists built smelters suitable to reduce the argeniferous lead carbonates peculiar to Leadville. By 1877 a smelter had opened that successfully produced silver from Leadville's ore. In 1878 two smelters, one operated by the St. Louis Smelting and Refining Company and one by James Grant, boasted Freiburg-trained metallurgists. These smelters allowed Leadville to boom.[74]

Leadville presented a rich prize for the railroad that could reach it, producing over $2 million of silver in 1878, $9.5 million in 1879, and over $11 million in 1880. By 1879 lead production complemented silver, contributing an additional $2 million of yield per year. All of this occurred before railroads could reach the burgeoning district. Palmer immediately set his sights on Leadville. Unfortunately for him, so too did the redoubtable directors of the AT&SF. Again both roads found themselves at Pueblo where the only feasible way to build west lay up the Arkansas River canyon, a route not only treacherous, but so narrow at the Royal Gorge that only one railroad could build there. Interestingly, both the D&RG and the AT&SF lines employed engineers who had surveyed the Royal Gorge; back in 1871-72 when the D&RG had first reached Canon City, engineers De Remer and Morley had surveyed through the gorge. Later, Morley joined the AT&SF and had been one of the engineers who beat De Remer to Raton Pass. The men were friends, but competitors. The railroads they worked for were pure competitors.[75]

In April 1878, with Raton Pass lost and a genuine boom underway at Leadville, Palmer ordered De Remer, McMurtry and their men to withdraw from the pass and head to Canon City to begin building toward Leadville. The AT&SF caught wind of the move, probably again by intercepting and decoding the telegram from Palmer. In a reapplication of the tactics that had worked in the Raton Pass, AT&SF engineer Ray Morley raced to Canon City, hired an ad hoc crew, and rushed them into the Arkansas River canyon to occupy the mouth of the Royal Gorge. The D&RG struck back. Under cover of darkness, De Remer and nine men stole up the river on its opposite bank, snuck past the AT&SF installations, and then swam across the river to set up rock barricades inside the Royal Gorge itself. The D&RG men claimed to be the first to occupy the interior of the Royal Gorge. The AT&SF hired Bat Masterson and "100 prairie bad men... all remarkably well gunned" to bolster its position. It organized its own pony express service to circumvent the leaky telegraph lines and control communications between Manager William Strong and the action along the Arkansas. In the meantime, D&RG men set up more rock emplacements and armed its own men.

The battle soon spilled over into the courts, where the first several rounds went to the Santa Fe, including right of way to build through the gorge. Odd and disjointed tracklaying paralleled the court process. The Santa Fe laid track up from Canon City toward the gorge. North of the gorge, the Rio Grande laid narrow-gauge track that connected to nothing whatsoever on either end. Outside the gorge where the terrain was wider, both lines graded parallel routes while Masterson's army patrolled the AT&SF grade and armed D&RG stalwarts guarded their own.

The Santa Fe laid the first track in the Royal Gorge itself. At one point a bridge was necessary, but the gorge was so narrow there was no place to build a superstructure. Robinson solved the problem by erecting a kingpost truss across the gorge from one wall to the other and hanging the track sideways from it. The 175-foot Hanging Bridge crossed no water; its purpose was to carry trains along the sheer cliffs of the gorge. The Hanging Bridge became a favorite photo spot. In May 1879 the Santa Fe ran an inaugural excursion train from Pueblo over the Hanging Bridge in the gorge to the end of its track. The train then ran backwards on its return to Pueblo. The *Denver Tribune* called it a "stupendous achievement of railway engineering over nature's efforts to obstruct the pathway of commerce."[76]

Meanwhile, events in the courts and in the D&RG treasurer's headquarters moved on in a bloodless, discouraging way for the Rio Grande. The line had gone into receivership late in 1878 and had been leased to its rival the AT&SF. When the Santa Fe began using its control of freight traffic on the D&RG to weaken the struggling line, Palmer filed for violation of lease, and a federal court ordered the Santa Fe to cease operating the Rio Grande. In the early summer of 1879 Palmer determined to take his railroad back by force. A Rio Grande train "bristling with guns" lumbered south from Denver. Another armed D&RG train, captained by former governor Hunt, ran north from Pueblo, capturing Santa Fe stations by force at each stop along the way. Most Santa Fe agents surrendered. Some shot it out; two died.[77]

Neither guns, nor armored trains, nor court order ended the war between the Rio Grande and the Santa Fe. The end of the war at the Bloody Angle came instead by a business arrangement known as the "Treaty of Boston." Jay Gould, who had already gained control of the Kansas Pacific and Union Pacific, assumed half ownership of the Rio Grande. The D&RG bought out the AT&SF's track in the Arkansas canyon. The Santa Fe agreed not to build either to Leadville or to Denver, and the Rio Grande agreed not to build south. With this truce, the war between the AT&SF and the D&RG, two aggressive, empire building railroads, was reconciled.[78]

The settlement proved significant for the Rio Grande, marking a turning point in its history. First, Palmer gave up his dreams of Mexico and a railroad to the south: the Rio Grande would now commit itself to expanding within Colorado and would become a leading mountain road. Palmer had not abandoned his dream of building to the Pacific Ocean, only redirected it to the west. Second, the agreement ended Palmer's period of individual leadership of the D&RG. With Gould, Palmer had engaged a willful and powerful partner who had strong ideas of his own. In the end, however, Palmer may have entered into dangerous partnership, but he finally had the right-of-way and the money to build to Leadville.

3 The Bonanza Years: 1880 - 1892

The 1880s marked Colorado's most prolific decade of railroad construction. In three years–from 1880 to 1883–more track would be added than had been built during the preceding thirteen years. Construction would then slow during the middle of the decade, only to rebound with its biggest single year ever in 1887. By the end of the decade, Colorado would have three times the railroad mileage it started with in 1880. The state would grow along with the railroad network, as assessed property valuation would triple and there would be four times as many farms and six times as much capital invested in manufacturing.[79]

Much of the new rail construction would come from railroad companies that had already laid track in the state. The Denver & Rio Grande would be one of the most prodigious builders, often working in completely different areas of the state at the same time. Its presence would inspire other lines to compete, and, conversely, the construction of other railroad lines would goad the Rio Grande into changing its plans to beat them to desirable locations. By 1881 the Union Pacific and the Atchison, Topeka & Santa Fe controlled virtually every railroad in the state–and all lines into it–except for the routes owned by the Denver & Rio Grande. This situation would tempt other entrepreneurs to try to break the monopoly. Three additional main lines would build from the east, with new local roads springing up as well. By the end of the decade, track would

traverse the state, cross the continental divide numerous times, tunnel through the divide, and reach beyond state borders not only to the east and north, but also west into Utah and south toward the Gulf of Mexico.[80]

The mines and their explosion of silver, gold, lead and other minerals provided the magnet that drew the railroads into the mountains. For twenty years, from about 1880 to the end of the century, Colorado's mineral production never fell below $21 million a year. Railroads in Colorado would be criticized in the press. They were frequently financially unstable and would sometimes go bankrupt. They would war with each other, and derail. They would also be highly sought after. Every mine, every agricultural settlement, every smelter, everyone in Colorado, it seems, wanted rail connections. As people in the mining towns conducted a lively commerce down the mountains, the supply towns of the front range would flourish as well. Tourists would find their way to Colorado in increasing numbers, drawn partly by the marketing efforts of the railroads.[81]

Transcontinental Fever

The Denver & Rio Grand Railway under the contentious leadership of William Palmer and Jay Gould devised a new vision for itself as the mountain railroad with Pacific ambitions. As the line turned from its original southern goal westward into the mountains, a second front of rail construction began in Salt Lake City with a narrow-gauge line that extended toward Colorado's western border. In 1881 the Utah project incorporated as a separate entity, the Denver & Rio Grande Western Railway, with Palmer as president. He bought several small Utah lines before constructing any of his own and patched them together as the incubus of "the Western." All of the acquisitions were narrow-gauge lines and all connected to mining areas in the vicinity of Salt Lake City.[82]

Palmer and Gould were typical in their transcontinental ambitions. During the early 1880s, transcontinental fever raged nationwide among railroad entrepreneurs. The 1869 Union Pacific/ Central Pacific link had not quenched the nation's desire for a transcontinental railroad, but, if anything, served to increase the desire for additional lines. Perhaps the challenge of completing such a massive economic, organizational and technical feat appealed to the kinds of big personalities attracted to railroading. Perhaps the motivation was more basic: money and power. In any case, many other railroads built with transcontinental goals, including the Atchison, Topeka & Santa Fe. Some succeeded. By 1883 three additional routes would be completed across America: the Southern Pacific line to New Orleans, the Northern Pacific from Portland, Oregon, to St. Paul, Minnesota, and the AT&SF's southern link between Kansas City and the Pacific. Each line would pose competition to each other, as well as to the Union Pacific.[83]

Palmer's Utah company, the Western, spent its first year acquiring lines, beginning construction in earnest in 1882. Palmer insisted that the link with Colorado be made as quickly as possible, and crews built with such haste that when tie shipments failed to keep up with their progress, they hand-hewed their own oversize ties. Although the track was narrow gauge on the Utah line, Palmer planned ahead to a time when his line would be converted to standard gauge and ordered tie crews to lay standard sized ties. At Ogden, Palmer's tracks met with the Central Pacific's standard-gauge Pacific extension, presenting a possible connection to fulfill Palmer's Pacific ambitions. A future standard-gauge line would facilitate an easier connection; building a less expensive narrow-gauge line first applied the "placer railroad" principle in typical Palmer style. His other line, the D&RG, arranged a lease of the entire Western line, cementing the alliance between the two companies.[84]

By 1880 the vogue for narrow-gauge track had waned in the United States. During the Civil War the value of integrating the country's rail system had become clear due to the strategic advantage rail connection offered during the war itself, and the need for western grain to be shipped to the east coast, both for domestic and troop consumption and for export to Europe. After completion of the first transcontinental railroad in standard gauge, the 1870s had seen a proliferation of standard-gauge tracklaying in America. Additionally, standard-gauge operation had been shown to be more efficient than narrow-gauge. Standard-gauge tracks allowed for more cars to be pulled safely on a single train, a practice that generally lowered operating costs. Railroad bridge building over major waterways, particularly the Mississippi River, further contributed to the preponderance of standard gauge as bridges laid standard-gauge tracks along these important links.

Colorado railroads in general–and the D&RG in particular–remained the most persistent variation from the nationwide preference for standard gauge. Narrow gauge still offered special appeal to mountain railroads because of the tighter turns it allowed and its reputation for superior traction. Above all, narrow-gauge railroads still cost less to build. Palmer's standard-size ties laid across Utah during the early 1880s indicated that standard gauge was about to win him over as well, however. He did not have to choose immediately between narrow gauge and standard gauge but could choose to lay a third rail later to accommodate trains of another gauge. The practice, known as "third railing," was employed by many lines that wanted to be accessible to both standard- and narrow-gauge rolling stock.[85]

The principals of the Central Pacific and Union Pacific, the two megaliths of the transcontinental railroad, maintained a complex relationship. In the words of one D&RG official, "one day the Union Pacific and the Central Pacific people are like two chums in a bed, the next day they are like two cats hanging over a clothesline." Over the Western's connection at Ogden, the CP and UP took up cat-like positions. The CP saw an opportunity to challenge its difficult partner. The UP viewed the Western's connection as a threat and actually tore up the first line the Western had laid into Ogden. In the meantime, Jay Gould, still a principal with the UP although at the

time planning to get out, made a major play to drive down the price of D&RG stock so that he could buy a controlling interest in it. His tactics included spreading rumors that the Leadville mines were played out and that the Rio Grande was undercapitalized and corrupt, and instigating rate wars wherever his lines challenged Palmer's. In 1881 Palmer surprised stockholders at the annual meeting by having maintained control of the line. In Utah the Western eventually solved the problem of terminal access over the UP's objection by laying a third rail along the track of its new ally, the Central Pacific, and entering the station via the CP's right-of-way.[84]

By March 1883 the Western had built east past Green River, Utah, and was ready for its connection with the Rio Grande. This "western front" held significance for all the D&RG's building from the Colorado front range into the mountains. The D&RG strategy was to penetrate deeper westward into the mountains via profitable mining towns, with the eventual goal of reaching a transcontinental connection with the Western on the other side. With the western goal established, every internal Colorado line the D&RG built became a possible jumping-off point for the transmountain route. Each D&RG line to a profit center became part of an overall strategy to use proceeds from Colorado to subsidize interstate traffic.[85]

The San Juan Mountains

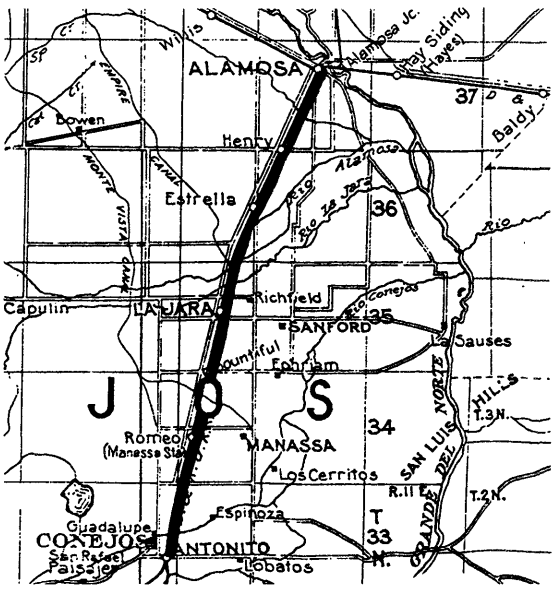

Figure 9. Denver & Rio Grande RR, from 1913 map

The Rio Grande already had momentum going in a southerly direction when the Treaty of Boston enjoined it from building any further south than Espanola, New Mexico, for ten years. For several years the D&RG had been planning to build toward Santa Fe and had been trying to pry financial support from the reluctant people of that city. Just before the treaty was issued, the Rio Grande had completed a line south from Alamosa to Antonito [*see Figure 9*]. At Antonito the line hovered on the New Mexico border. The treaty allowed the railroad to lay tracks over the already-graded road south to Espanola. Although the original intention of reaching Santa Fe no longer applied, enough had already been invested in the line to convince the D&RG to complete it. In 1881 the D&RG tracked south to Espanola as cheaply as possible, laying ties and rail directly on the earth along the natural contours of the land whenever possible. This created a rougher and steeper ride for later engineers and passengers.[86]

From Antonito the D&RG could also build west toward the mineral-rich San Juan range. The San Juan mountains rose in the southeastern corner of the state, "canopied with perpetual clouds... castellated crags, art-like monuments and stupendous precipices," in the words of one 19th century journalist. The area had long been known to miners; placer miners had come and gone in the early 1860s, and the 1870s brought a new series of strikes. The San Juans offered miners the usual difficulties of inaccessibility and severe winter weather, compounding them with the threat of Indian attack. The Ute tribe owned the land miners coveted in the San Juan range. In a trend mirrored across the United States wherever native peoples inhabited land desired by Anglo-Americans, Ute land gradually passed into the hands of the government in a series of agreements, begun in 1863 by negotiators Kit Carson and Alexander Hunt. In 1873 the Ute tribe ceded its lands and was removed to a reservation in Utah.[87]

Prospectors wasted no time contemplating the plight of the Utes. With the Indian threat abated in the San Juans, prospecting began in earnest, and miners found gold and silver throughout the region. Howardsville produced a gold strike in 1874. As a miner from an area nearby reported, "We ain't got much gold, but we've got silver by the ton," and gave the name to Silverton, platted in 1874. At the headwaters of the Animas River, Animas Forks, Gladstone, Mineral Point and Eureka all had been founded by 1878. A rich silver vein was discovered at Ouray in 1875, and by 1880 the camp had become the largest town in the San Juans with nearly 900 residents. In 1880 prospectors discovered gold at Telluride.[88]

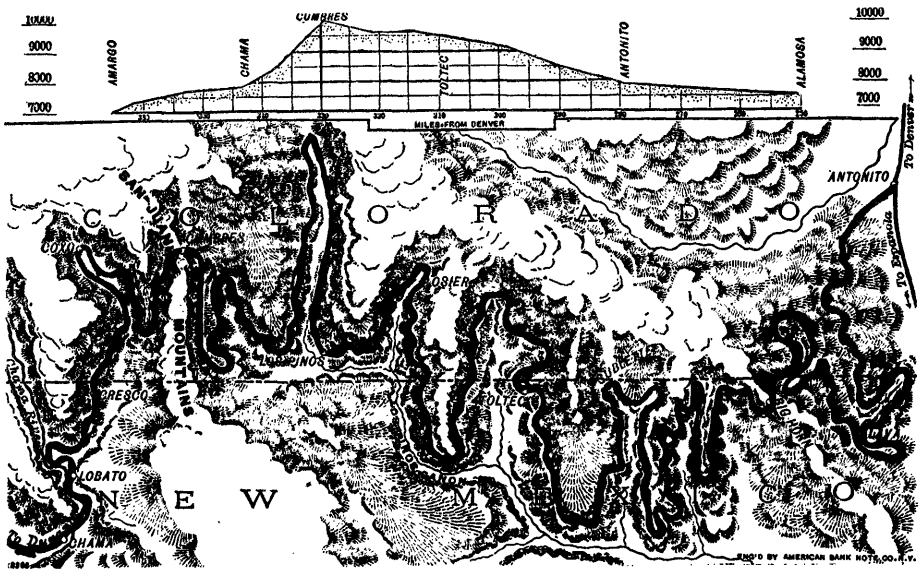

Figure 10. Denver & Rio Grande RR, Antonito-Chama, from 1894 D&RG map

By 1880 the San Juan mountains provided an understandable draw for the Rio Grande Railroad, but construction to them would prove punishingly difficult. Palmer put Alexander Hunt in charge of constructing the "San Juan Extension" and of solving "the most complicated problems that ever confronted American engineers." Hunt was a longtime Palmer associate, former territorial governor, old San Juan mountain hand and the associate of Kit Car-

son who had embarked upon negotiations with the Ute tribe almost twenty years earlier. As railroad trailblazer to the San Juans, Hunt built west from Antonito to Cumbres Pass into the mountains. The tortuous route required blasting a quarter-mile tunnel through solid granite at Toltec Gorge, and "heavy rock work" in order to lay track [*see Figure 10*].

From Cumbres Pass to Chama, New Mexico, construction crews dealt with a 4 percent grade, sharp curves and numerous grading challenges. To reach one-half mile of ascent, it was necessary to build 2½ miles of track, trestle and embankment; one mile of this stretch cost $140,000 to build. On another area of track known as the Whiplash, the road ascended over hairpin turns that created three parallel tracks over a short distance. The joke at the section house in the lower loop ran that, if the train traveled slowly enough, the passengers could become well acquainted with the section crew before passing through the area. In all, 64 miles of track were laid to complete the 35-mile distance.[91]

By February 1881 Hunt's crew reached Chama and, after taking a short winter break, continued construction. From Chama crews built toward a destination in the San Juans that had not existed months before. In a familiar pattern, the D&RG avoided the established city of Animas City and built instead toward a town it created 2½ miles south. When tracks reached the newly platted town of Durango in August 1881 [*see Figure 11*], Animas City quickly withered. A Durango newspaper reported that "Animas City is coming to Durango as fast as accommodations can be secured." Durango soon became the smelting center for the San Juan region.[92]

The D&RG made Silverton, not Durango, its ultimate goal. In October 1881 crews worked their way up the Las Animas River, the "River of the Lost Souls." Construction continued throughout the winter, although heavy snows and delayed supply shipments frequently interrupted the crews' progress. The last 45 miles of rails came from the Colorado Coal and Iron Company, the first rail laid in the state that had been produced in Colorado. The Pueblo-based company was a Rio Grande subsidiary, replacing England and Belgium as the D&RG's preferred rail suppliers. By the summer of 1882 the D&RG had reached Silverton [*see Figure 12*]. Lowered freight costs, the feasibility of shipping lower grade ore, easier access to smelting and shipping, and easier importation of goods helped the town prosper. By 1885 settlements in the San Juan region had expanded substantially: Ouray's population grew to 1,800 and remained the biggest town. Silverton's population was not far behind with 1,500. Howardsville, Eureka, Animas Forks and Gladstone each had year-round populations of at least 100 people.[93]

The need for efficiency prompted the railroad to adopt construction standards along the San Juan extension. The trestles all included 14-foot spans between bents, which allowed for the major timber pieces to be precut and available on short notice. Log bunkhouses at Sublette, Chama, Big Horn and Cumbres were all constructed from a similar design using similar materials. The frame section houses also shared a basic floor plan, design details and general look.

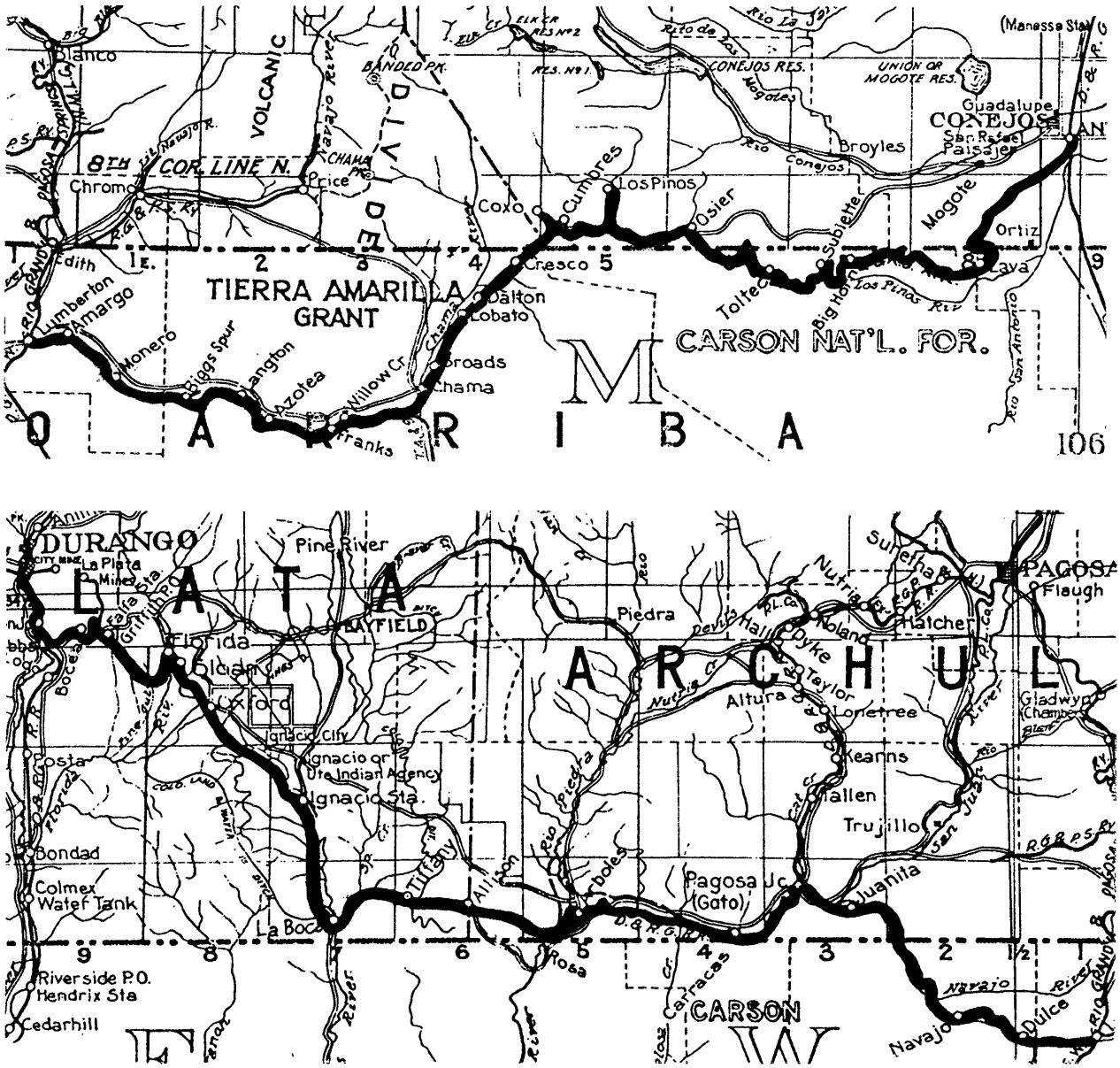

Figure 11. Denver & Rio Grande Railroad, Antonito-Durango, from 1913 Colorado state map

Figure 12. Denver & Rio Grande RR, from 1913 map

The buildings may even have been prefabricated in sections and shipped in by rail. The wooden water tanks also reflected a standardization that probably facilitated easier repairs because replacement parts and timber pieces could be standardized.[92]

The Rio Grande built no further into the San Juans than Silverton, leaving room for other entrepreneurs. When mines opened in the Red Mountain region, the D&RG surveyed a line to them but opted not to build. Beginning in 1882, Otto Mears and Fred Walsen began building toll cart roads from the mines to the railhead at Silverton. They completed twelve miles of road between Red Mountain and Ouray that year and extended their road twelve more miles to Silverton the following year. At $1,000 per foot, the costs for portions of Mears and Walsen's road rivaled those of the railroad. These roads, blasted through hard rock, would later provide the grades for some of the most adventurous railroads ever built in the state, as Otto Mears turned from toll roading to railroading.[93]

Leadville

After the war over the Royal Gorge was settled, the Rio Grande began laying track up the winding canyons of the Arkansas River to Leadville. On its way to Leadville, the railroad continued its pattern of creating new towns in full view of already established ones. Hunt acquired land from homesteaders and in 1880 laid out a town just north of the confluence of the Arkansas River and its tributary, the South Arkansas River. The new town lay in a valley guarded by the raw Arkansas Hills to the east and the Sawatch and Sangre de Cristo ranges to the west. Salida, the Spanish word for gate, grew just a mile north of the town of Cleora, created just two years earlier by the AT&SF. Essentially everything and everyone but the cemetery and its inhabitants moved from Cleora to Salida. When the narrow-gauge railroad reached Salida in May 1880, a temporary depot opened in a boxcar while crews built a depot and roundhouse from stone quarried near present-day Nathrop. Building on both new structures reached completion by the end of the year.[94]

As seemed often to happen, by the time the Rio Grande began earnest construction, the people of Leadville already resented the company for having delayed the connection with the AT&SF. Still, when the D&RG tracks reached Leadville in 1880, the people welcomed them [*see Figure 13*]. Former President Ulysses Grant rode the inaugural train as a guest of General Palmer and was met by twelve brass bands and the mining millionaire Lieutenant Governor Horace Tabor. Leadville's drinkers and gamblers reportedly stopped what they were doing long enough to lean out the bar windows and give three cheers. In fact, Leadville desperately needed the railroad. By 1880 the region's hillsides were denuded of trees, cut down to fuel the smelters. The railroad arrived as the area stood on the brink of a critical fuel shortage. The train saved Leadville's hillsides from further depredation; it hauled up coke made from Colorado coals to Leadville's smelters and limestone for fluxes; and it hauled out ore and minerals.[97]

Leadville became the first rich strike in Colorado to receive a rail connection soon after it had commenced, and the railroad played a key role in Leadville's prosperity. Mining historian Rodman Paul attributed Leadville's unusually quick and sustained success to three causes: *1)* the high quality of the silver ore itself; *2)* the cutting-edge smelting technology provided by highly skilled metallurgists; and *3)* the railroad. Besides the critical exchange of fuel and ore, the D&RG brought a wide range of consumer goods and passengers to Leadville. By the early 1880s, Leadville had 15,000 inhabitants, making it the second largest city in Colorado after Denver.

The railroad afforded Leadville's residents many of the amenities enjoyed in other, less remote American cities of the same size. Men wore coats and ties, streets were paved and lined with gas lamps, and local hosts and hostesses organized social events and outings that paralleled those offered in more established cities. Leadville offered more prurient amenities as well: drinking, gambling and prostitution. The boomtown atmosphere, the civic amenities–both refined and elemental–and the comfort of the railroad attracted tourists as well as inhabitants. President Rutherford B. Hayes, writer Oscar Wilde, western legend Doc Holliday and Indian activist Helen Hunt Jackson all visited Leadville in its early days. It was the railroad that allowed the connections; Oscar Wilde never would have risked dirtying his fancy breeches on a mule train.[98]

A second railroad–the Denver, South Park & Pacific–also built a connection to Leadville. This was former governor John Evans' line, the one that, before the Panic of 1873, had laid track only as far as "nowhere," from Denver to Morrison. As the Leadville boom got underway, the South Park found itself in good position to build west to Leadville over the high agricultural region of the South Park. By 1878 it had reached Bailey, from which overland mule trains transported freight to Leadville. The following year, while the D&RG and AT&SF were still engaged in war, the South Park built to Trout Creek pass, not far from present-day Buena Vista and the "last long leg" to Leadville. As the South Park built toward Leadville, the seemingly ubiquitous Jay Gould tried, in 1878, to take over the line. For once he failed, but he ended up holding a sizeable

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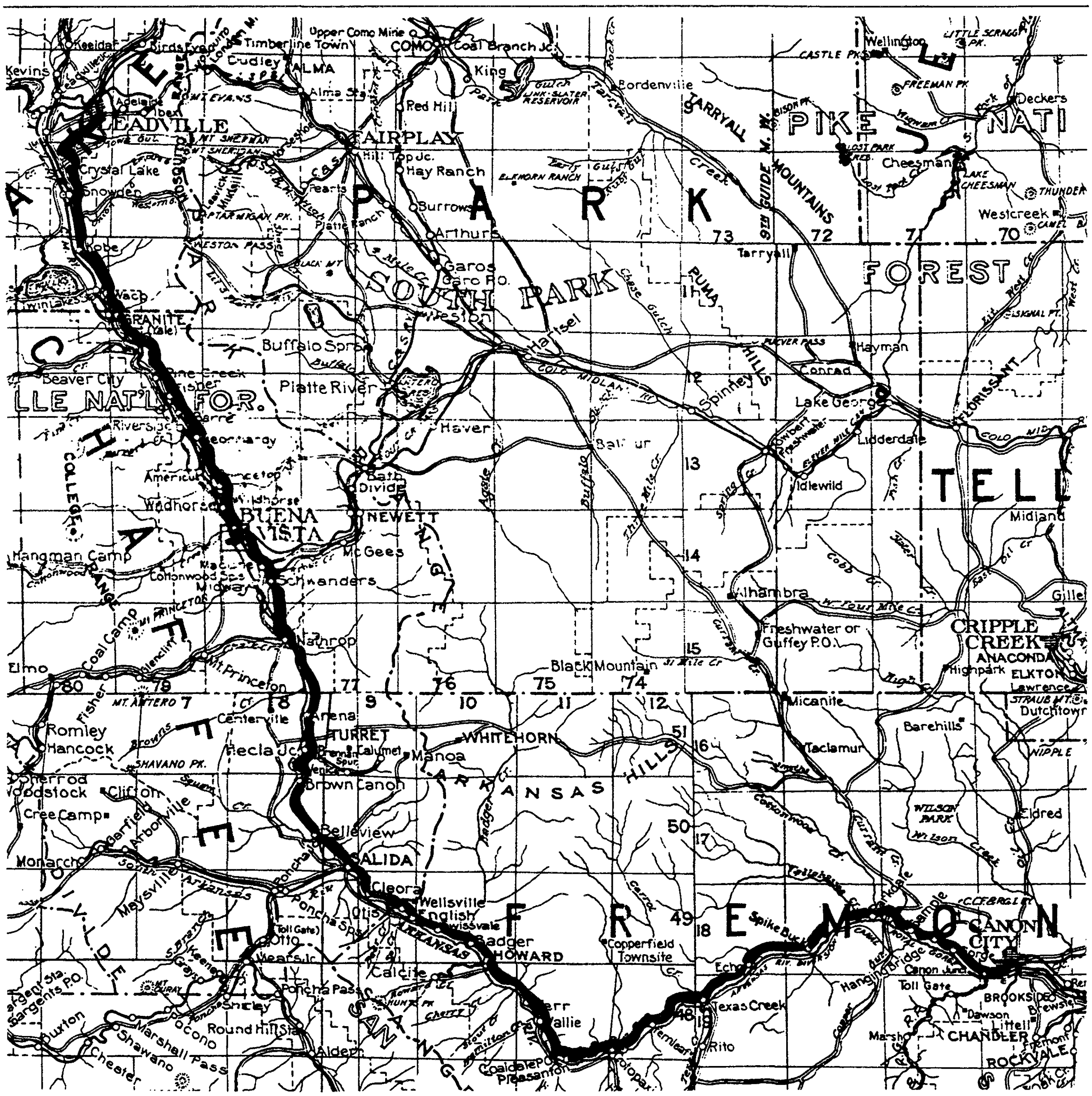


Figure 13. Denver & Rio Grande Railroad, Canon City-Leadville, from 1913 Colorado state map

portion of South Park stock and succeeded in convincing Evans to slow down construction in order to allow the D&RG to be the first to reach Leadville.[99]

In 1880 the South Park completed track to Buena Vista, where it joined the Rio Grande track to Leadville. That year Jay Gould succeeded in gaining controlling interest in the DSP&P stock. During the following years, the South Park built off its Denver to Buena Vista line and penetrated the mountain terrain that would later host a cluster of downhill ski areas. In the early 1880s the South Park built from Como to the mining camps of Breckenridge, Frisco, Dillon and Keystone. In 1884, over the objections of the Rio Grande, Jay Gould's South Park built up the valley from Frisco to Leadville, providing competition for rival Palmer's line [*see Figure 14*].[100]

The South Park's line to Leadville was popular, with narrow-gauge engines pulling elegant, small-scale Pullman Palace cars through the fantastic mountain scenery from Denver to Leadville. The "Carbonate Kings" rode the line, people who made their fortunes in Leadville such as Horace and Augusta Tabor, J.J. Brown and his "unsinkable" wife Molly, the Guggenheims, Charles Boettcher and Tom Walsh, owner of the Grand Hotel in Leadville and later mining partner with King Leopold of Belgium. They rode the night cars, "playing poker in their diminutive drawing rooms for fantastic stakes and downing the best bourbon with champagne chasers as the little trains pushed resolutely into midnight blizzards on the roof of the world..." Although the Rio Grande also pulled Pullman Palace cars fitted to narrow-gauge specifications, the South Park's route from Denver directly into the mountains made it popular.[101]

The South Park's route to Leadville inspired folktales. One often-repeated story involved a circus train. Among the amenities enjoyed by Leadville, one year, was a circus. Loaded up with tents, acrobats, clowns, animals and ringmaster, the train lost steam and came to a stop as it neared Leadville. Very much as in a children's story, the trainmen wondered how they could bring the circus to the people of Leadville. Then someone remembered the elephants. The handler unloaded the elephants and took them to the rear of the train where they laid their massive heads against the train and pushed, slowly pushing the train over the grade. This story, recorded in several different sources, may or may not be true, but it serves as an excellent example of the kind of stories that grew up with the mountain railroads, and with the South Park in particular.[102]

In 1886 a third railroad, a Colorado newcomer, reached Leadville. The Colorado Midland [CM] broke Colorado railroad tradition in two ways. First, it was financed in large part by a Colorado resident, James J. Hagerman, who earned his $50,000 per month the new fashioned way: he mined it. Hagerman's Mollie Gibson silver mine near Aspen provided some of the financial backing for the upstart railroad. The second groundbreaking feature of the Colorado Midland was that it was a mountain railroad of standard gauge. The new line also had more familiar aspects. In competition with the D&RG, its mission was to build to the mines, in this case Aspen. A fuller story about the Colorado Midland's race with the D&RG to reach Aspen will be

National Register of Historic Places Continuation Sheet

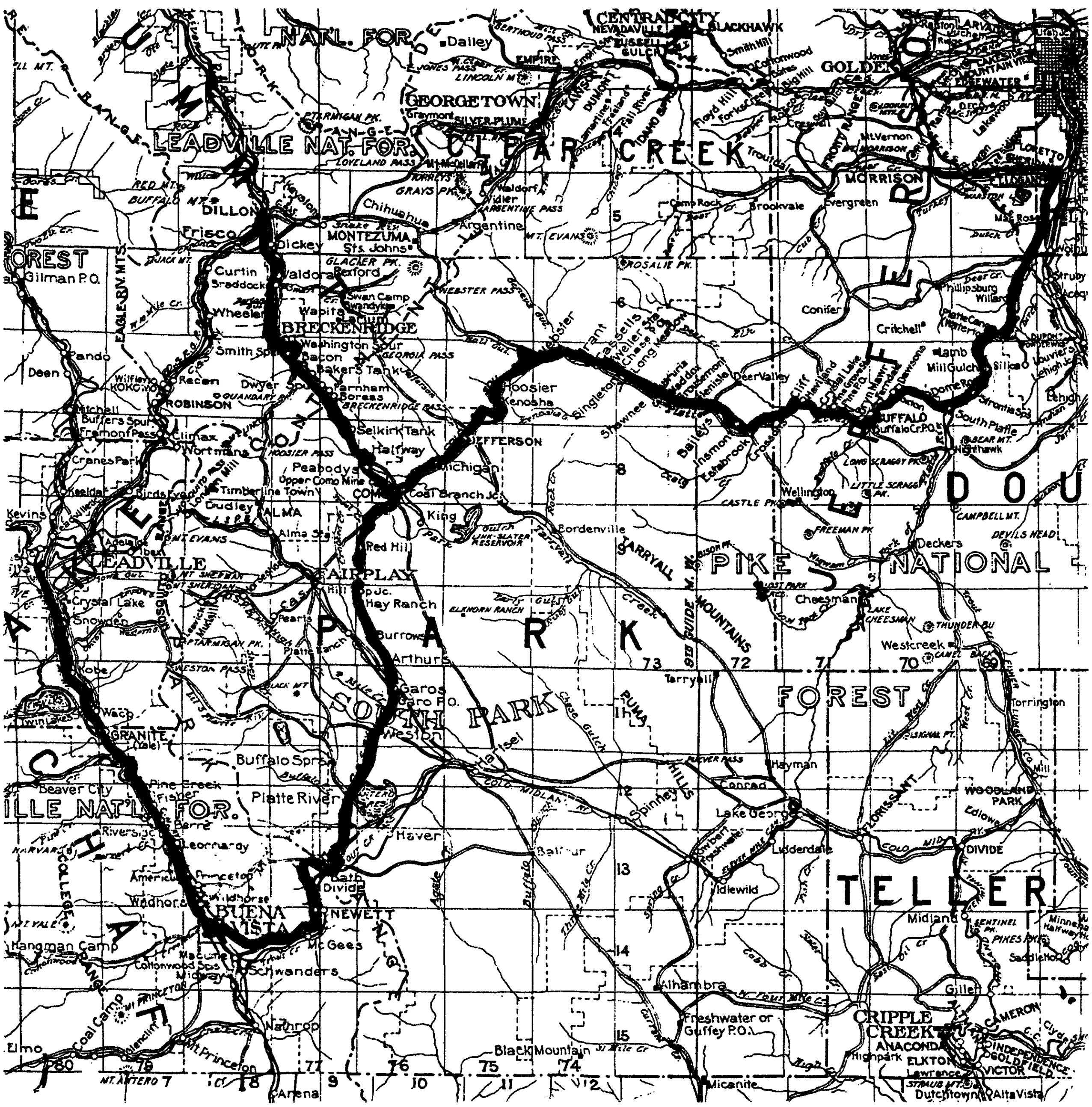


Figure 14. Denver, South Park & Pacific Railroad, from 1913 Colorado state map

told in a succeeding section. However, on its way to Aspen, the Colorado Midland also reached Leadville in 1886. Its route took it from Colorado Springs over Ute Pass through South Park to Buena Vista, and then, like the D&RG, up the Arkansas River to Leadville.[103]

Leadville inadvertently contributed to the discovery of additional silver strikes. The California Gulch boom and the city's subsequent growth is a matter of historic record, but Leadville experienced serious economic difficulties and setbacks as well. In 1880, the same year that the D&RG reached town, Leadville suffered failures of both the Chrysolite and Little Pittsburgh mines. These major failures shook confidence in the district's reliability, sending worried prospectors into the mountains to search for fresh sources of wealth. They found it in abundance. Near Leadville silver camps opened at Robinson, Kokomo, the Ten Mile district, Aspen and Ashcroft. South and west of Leadville, another silver area developed around Gunnison, which became the smelting center for St. Elmo, Tin Cup, Irwin and Gothic. Even further south and east silver ore was discovered at Silver Cliff and, later, at Creede.[104] Although Leadville's temporary crash served to motivate additional silver mining enterprises, the city eventually recovered from its economic setbacks, as its economy readjusted to "more sober growth." The new silver regions became the new destinations for Colorado's mountain railroads.[105]

Gunnison

Two companies–the South Park and the Denver & Rio Grande–raced to lay track to Gunnison. With both building from their Leadville termini, Gunnison became a sort of next step west after Leadville. For the Rio Grande, Gunnison would provide the jumping-off point for its transcontinental line, although it would entail the improbable construction of a road through the reportedly impassible Black Canyon of the Gunnison River. As had happened at Leadville, the South Park took the early lead, the Rio Grande reached the destination first, and the South Park left a legend. This time the legend would concern not elephants, but a haunted tunnel.[106]

Gunnison had been created in 1874 by a pioneer stock-share town company. During its formative years, the town struggled on the frontier, located uncomfortably close to the Ute Indian reservation and far from anything else. When prospectors discovered silver at nearby Crested Butte in 1879, Gunnison became the smelting center for the silver mines nearby. The South Park, then idling toward Leadville because of its promise to Jay Gould, found itself well-situated to build toward the new silver strike. During the summer of 1880, it built toward Gunnison from Nathrop and reached Alpine Pass, 11,524 feet above sea level, where crews began blasting a tunnel through the continental divide.[107]

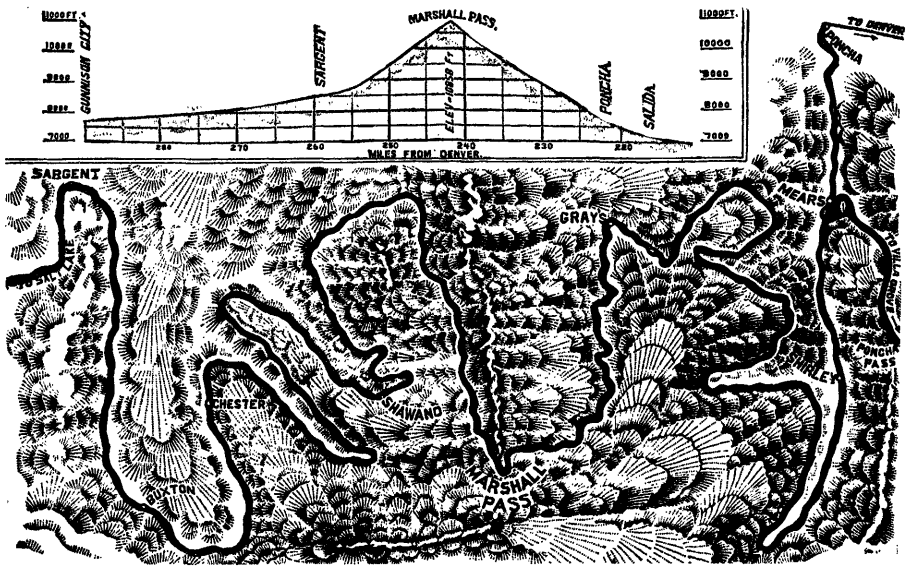


Figure 15. Denver & Rio Grande Railroad, from 1894 D&RG map

Aware of the silver strike at Crested Butte as well as the DSP&P's progress, the Rio Grande directors ordered construction crews to build westward toward Gunnison as well. In the fall of 1880 the railroad laid track from its new town of Salida on the Leadville line, west to Poncha Junction. As the DSP&P drilled the Alpine Tunnel in 1881, the D&RG laid track over 10,845-foot Marshall Pass [*see Figure 15*] to be the first to reach Gunnison.

Regularly scheduled service to Gunnison began in August 1881, and building out from the region continued. Before the year was out, the D&RG reached the silver city of Crested Butte [*see Figure 16*]. In addition, the D&RG had its toehold, at the improbable location of Gunnison, on its route to the Pacific.[106]

Meanwhile, at Alpine Pass the South Park crew faced unsettling difficulties. The tunnel lay in Ute Indian hunting lands, and the Ute Indians had reportedly laid a curse on it because the presence of men and machinery ruined the place as a hunting ground. The work was difficult and dangerous. In their remote location, the building crew experienced difficulties among themselves that they resolved by hanging one crew member. When the tunnel was finally completed, the first train through it derailed.[107] In 1882 the first DSP&P train steamed successfully into Gunnison [*see Figure 17*] through the Alpine Tunnel, then the highest tunnel on the continent and not yet considered haunted. With Gunnison reached, the line continued building vigorously from its main line for the next several years. It built out from Como over Boreas Pass and into Dillon, Keystone and Kokomo on its way to Leadville. In addition it extended a short branch into the heart of the South Park landform for which it was named, from Garos to Fairplay and then to Alma.[108]

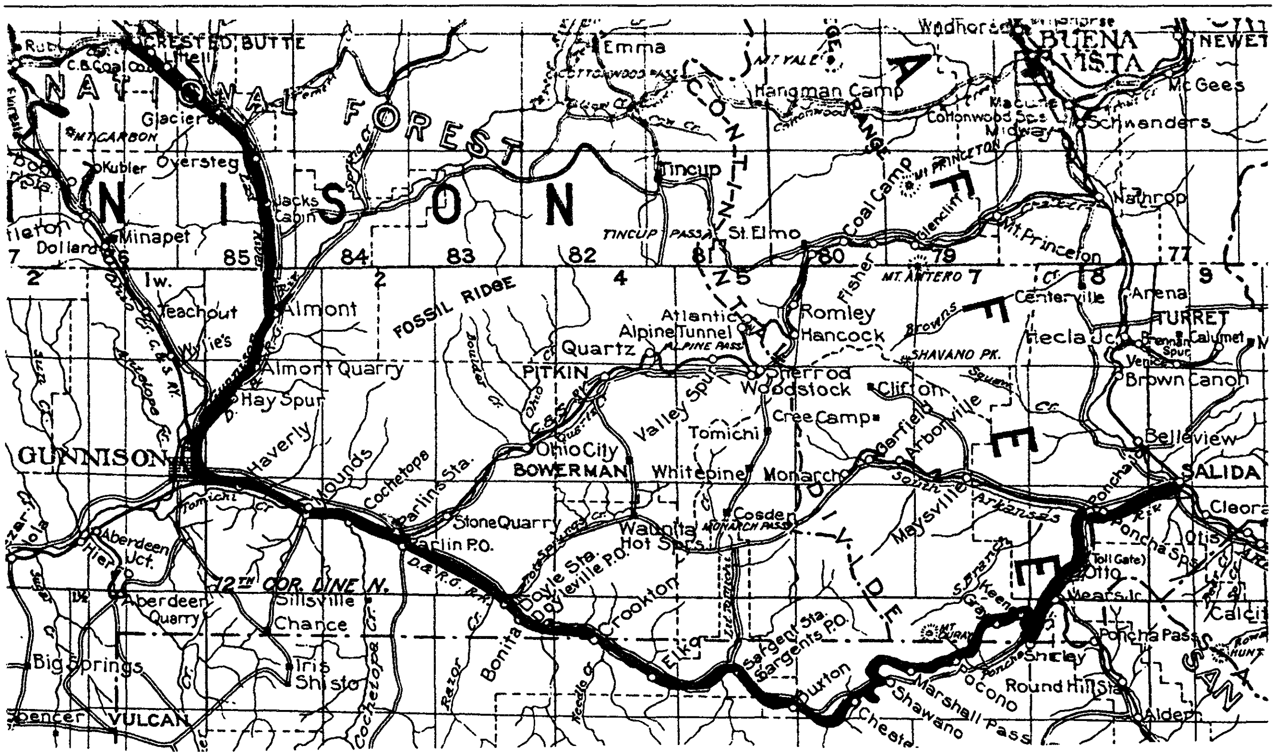


Figure 16. Denver & Rio Grande Railroad, Salida-Gunnison-Crested Butte, from 1913 Colorado state map

As the DSP&P reached the peak of its tracklaying in the early 1880s, it fell under the financial influence of Jay Gould and the Union Pacific. Gould, thwarted during an earlier takeover attempt, this time successfully manipulated securities and orchestrated competition to gain control of the line. In 1883 he then sold his South Park holdings to the Union Pacific. In 1887 the South Park declared bankruptcy, reemerging six years later as a Union Pacific possession named the Denver, Leadville & Gunnison Railway. Its tracklaying days essentially ended with its capture by the Union Pacific. Late in the century it added a tiny "hilltop" extension from Fairplay to Leavick, but otherwise kept to its 300-odd miles of track. Its little cars that "balanced on the edge of sombrero" continued to traverse the "rooftop of the world," and to capture the imaginations of its passengers. If affection can be measured in ink, the 500,000-word monograph published in 1950s attests to the esteem in which the South Park was held.[109]

Just when the South Park was slipping into bankruptcy in 1888, heavy snows closed Alpine Tunnel. Continued heavy snowfall kept the tunnel almost continuously closed over the next seven years, and in 1894 thirteen people died in a snowslide here. When a work crew finally

reopened the tunnel the following year, four members of the first train crew through died mysteriously, including the engineer found with his hands still gripping the controls. Investigators determined that the victims had been overcome by toxic fumes in the enclosed space, but people began to remember the tunnel's troubled construction and the rumored Ute curse. The Alpine Tunnel thereafter was said to be haunted by the ghost of the engineer who died with his hand on the controls. It finally closed for good in 1910 when a portion of it collapsed.[110]

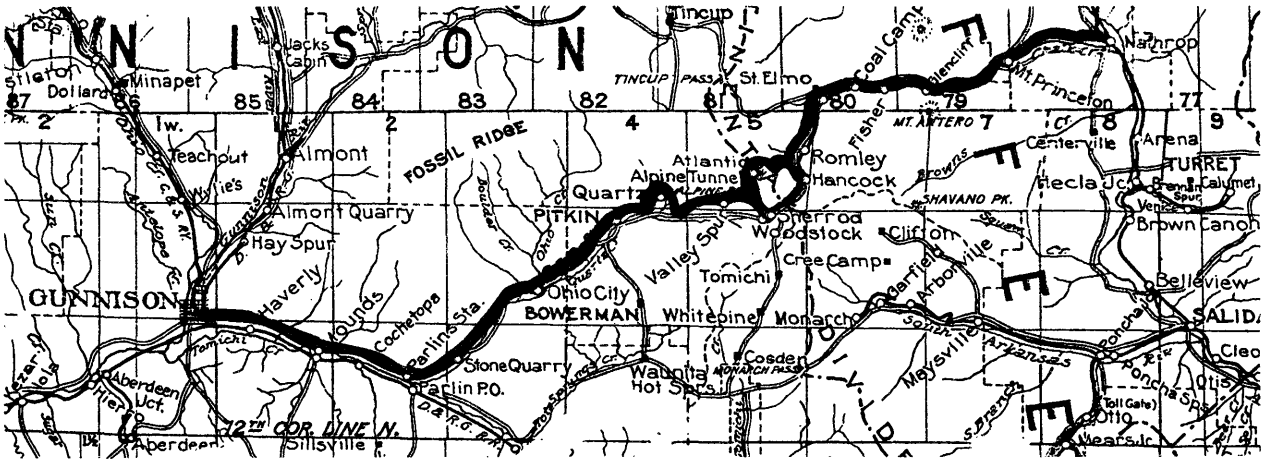


Figure 17. Denver, South Park & Pacific, Nathrop-Gunnison, from 1913 Colorado state map

Aspen

The year 1887 saw the rush to the new silver strikes in the area of Aspen. In response, two railroads–the Colorado Midland and the Denver & Rio Grande–set Aspen as their goal. A newcomer to the Colorado rail scene, the Colorado Midland had incorporated in 1883 but had built nothing for several years, suffering initially from lack of financial support. Later Jack Hagerman, a wealthy easterner who made a fortune in silver at Aspen, joined the railroad. In 1887 the Colorado Midland built from its railhead west of Colorado Springs to Leadville [*see Figure 18*], and then became the first line to extend westward from Leadville. The route required that the CM blast a 2,100-foot-long tunnel through the continental divide. The Hagerman Tunnel's western portal stood more than 11,500 feet above sea level and the road dropped steeply from there, rarely at less than a 3 percent grade, down to the town of Basalt. From there the road branched into Glenwood Springs and to the west side of Maroon Creek in the Aspen valley [*see Figure 19*].

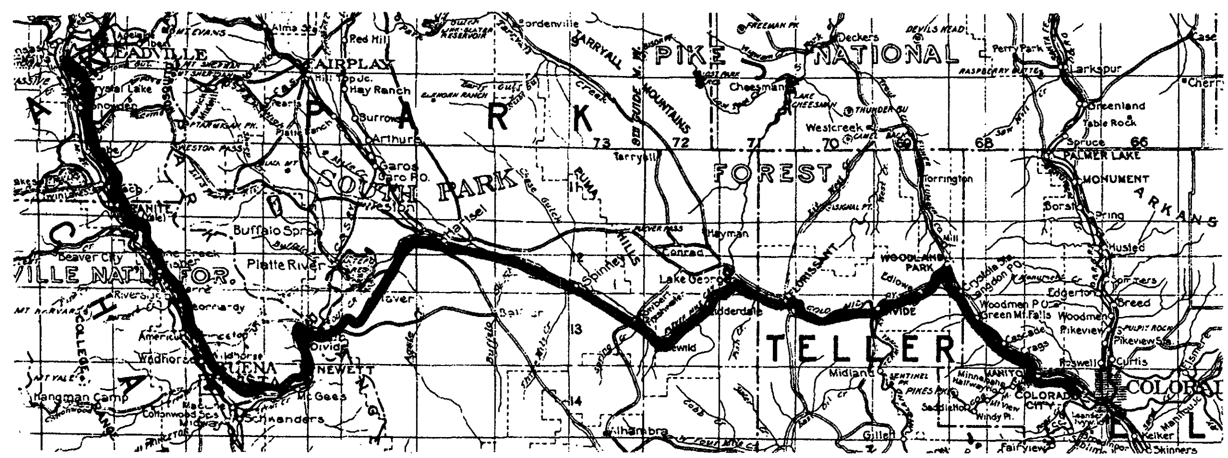


Figure 18. Colorado Midland Railroad, Colorado City-Leadville, from 1913 Colorado state map

Late in 1887 the tracks reached the Maroon Creek crossing just west of Aspen, where a 650-foot steel trestle had been designed by redoubtable civil engineer George S. Morison. Here construction stopped short. After building nearly 250 miles of standard-gauge track into the mountains in a single year, the railroad was forced to wait frustratingly close to its goal as the trestle's superstructural steel was delayed from the fabricator in the East. By the time that the Midland could complete the Maroon Creek Bridge, the Rio Grande had already entered Aspen.[111]

In a now familiar pattern, the D&RG had developed an interest in building to Aspen after it saw the intentions and progress of the Colorado Midland. By 1887 the D&RG was a very different organization from what it had been earlier in the decade. Expanding faster than its resources warranted, the railroad had gone into receivership. Palmer left the organization, and in 1886 the road was sold to its bond holders and reorganized. At this time Rio Grande president William S. Jackson learned of the Colorado Midland's intentions to build to Aspen. Although his company was financially crippled, the challenge provoked an almost Pavlovian Rio Grande-style reaction in Jackson. In an apparent desire to charge into the mountains, lay track faster and reach Aspen first, he asked his investors for permission to build to Aspen.

The timing was poor, though, as the investors, too close to having experienced financial failure, refused. The next year new D&RG president David Moffat was also anxious to reach Aspen ahead of the Colorado Midland. Moffat proved more successful in moving the investors, and in 1887 the D&RG began building from its railhead at Rock Creek to Glenwood Springs and then up the valley to Aspen. As the crew of the Colorado Midland waited on the wrong side of Maroon Creek, the Rio Grande took the first train to Aspen in October 1887. Three months later the

Colorado Midland also reached Aspen. Although the Midland failed to reach town first, it succeeded in becoming the first standard-gauge railroad constructed into the mountains. This was a significant difference because standard gauge had become, during the 1880s, the gauge of the future.[112]

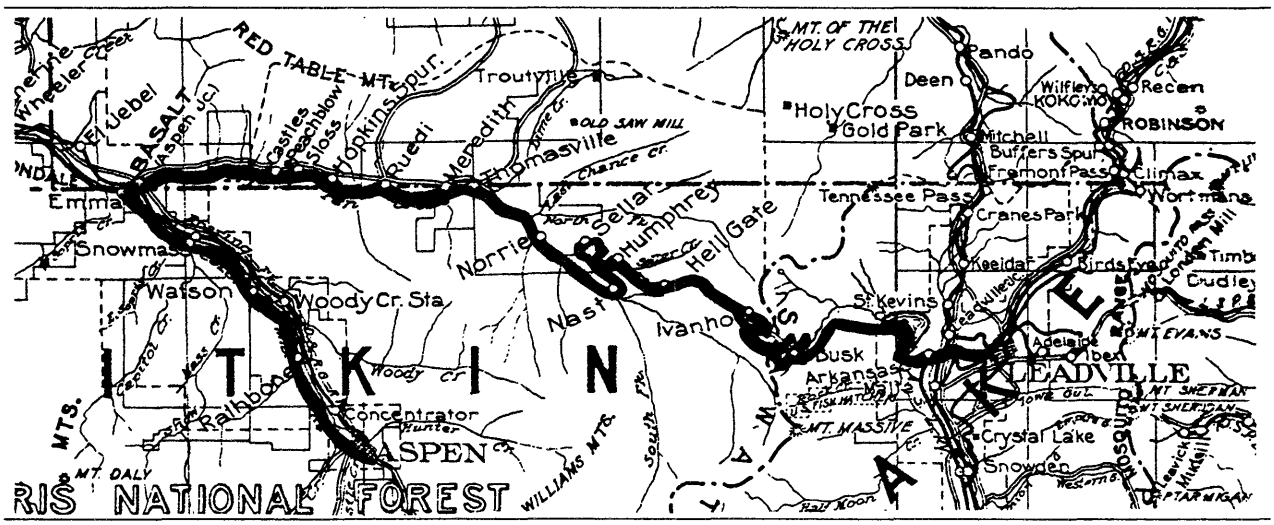


Figure 19. Colorado Midland Railroad, Leadville-Basalt-Aspen, from 1913 Colorado state map

The San Juans Revisited

During the last half of the 1880s toll road entrepreneur Otto Mears turned to railroading, building two lines from Silverton to the mines. A Russian immigrant who by the mid-1880s had served in the Union army, Mears had worked at a variety of frontier jobs from farmer to flour and sawmill owner, served as Indian agent, represented one of Colorado's electoral votes, and had built a profitable network of toll roads from the railhead at Silverton into the San Juan Mountains. By 1887 the state of his own profits and the demand for volume on his roads convinced him to build a railroad from Silverton up Mineral Creek to the mines at Red Mountain and Ironton. He financed his railroad with his own assets and by selling stock to the mines along his proposed route.

In 1887 Mears incorporated the Silverton Railroad along with his old friend Fred Walsen and some other "poker playing friends," building five miles of track from Silverton to Burro Bridge. The following year Mears hired Charles Wingate Gibbs, formerly of the Colorado Midland, as chief engineer. Gibbs employed seat-of-the-pants engineering methods that ignored established practice. Gibbs' personal stamp on the Silverton Railroad included vertical curves that rose

from level grade to a 5 percent gradient in 60 feet. These sharp climbs caused the pilots on the front of the engines to scrape the track and left the undersides eroded, a scar from doing battle on the Silverton. In 1888 Gibbs directed a challenging stretch of construction from Burro Bridge nearly to the end of the line at Ironton, eleven miles distant. At Chattanooga, two miles up from Burro Bridge, Gibbs erected the first major bridge on the line and built an engineering innovation–the "Chattanooga Loop"–that entailed nearly two miles of track in order to ascend a steep quarter-mile section of terrain. The Chattanooga Loop detoured up Mill Creek at a steep 5 percent gradient and then made an sharp 30-degree curve back to Mineral Creek to continue upward.[115]

At Red Mountain Gibbs encountered another topographical challenge: the town was bounded on two sides by Red Mountain Creek and the Mineral River, and on a third by a sheer rock wall. On the town's fourth side rose a large outcropping known as the Knob, a geological formation flanked by additional rocks to the east. The National Belle Mine lay in the center of these features, and the town of Red Mountain ranged along a little glen to the southeast. The physical configuration left no room for a traditional railroad loop and too little excavatable surface area to build a turntable pit. In response, Gibb engineered a wye. The topography allowed for only 150-foot-long legs on the wye, just enough for a locomotive and two cars, which would occasion creative switching on the part of railroad crews later on. Gibbs placed the depot on the only suitable location in Red Mountain, at the center of the wye. This unusual configuration distinguished both the station stop and the little railroad distinct among the mountain roads.[116]

Gibbs added a final distinctive feature to the line: a turntable at the tail of a switchback between Red Mountain and Albany. The Silverton served various mines along the route using spurs. The steepness of the line required the engine to be in front of the cars it pulled for safety, but the topography allowed no place for loops. Instead, Gibbs installed the "Corkscrew Turntable" which allowed for the engine to be uncoupled, turned and then reengaged to its cars at their opposite ends for continuing down grade. Gibbs was proud of the innovation, which he wrote up for publication by the American Society of Civil Engineers in 1890.[117]

Completed by 1889, the Silverton Railroad had received the tag line, "The Rainbow Route." It stretched 17½ miles, by loop, wye and turntable, from Silverton up Mineral Creek to Albany. From there Otto Mears' mule teams connected with Ouray. For a time Mears considered building track from Albany to Ouray, but the terrain proved too formidable. In 1889 Gibbs pronounced the line "the steepest (5 per cent grade), the crookedest (30 degree curves) and the best paying road in Colorado." Both tourists and freight rode the Silverton rails. Friends of Otto Mears traveled with distinctive railroad passes. During its first year of operation, Mears ordered white buckskin passes printed in Chicago. The following year, Mears' gave his guests passes stamped from solid silver produced by the Red Mountain mines and cast and engraved by a jeweler in Denver. In 1890 Mears issued watchfob medallions stamped from solid silver with a

crescent of blue enamel lettering that read "Rainbow Route." Mears' distinctive passes have become collectors' items, artifacts of his personal flair and his Rainbow Route.[116]

Creede offered Colorado its last major silver strike. Lodged on the eastern slope of the San Juans in "a gully between two great mountains," Creed boomed in 1890. The Denver & Rio Grande reached it by rail in 1891 merely by extending the line it had already built out from Alamosa to Wagon Wheel Gap earlier in the decade [*see Figure 20*].[117] The rush to Creede lacked many of the hardships of distance and inaccessibility that had characterized other mining strikes, because Wagon Wheel Gap at the end of the D&RG line lay only ten miles from Creede. The D&RG's first station in Creede was as raw and new as the town itself. In the words of one D&RG passenger, "The train stopped at the opening of this gully, and its passengers jumped out into two feet of mud and snow. The ticket and telegraph office on one side of the track were situated in a freight car with the windows and doors cut out of it and with the familiar blue and white sign of the Western Union nailed to one end; that station was typical of the whole town in its rawness and in the temporary and impromptu air of its inhabitants." In boomtown Creede the action never stopped. As stated by poet Cy Warman, "It's day all day in the daytime, And there is no night in Creede."[118]

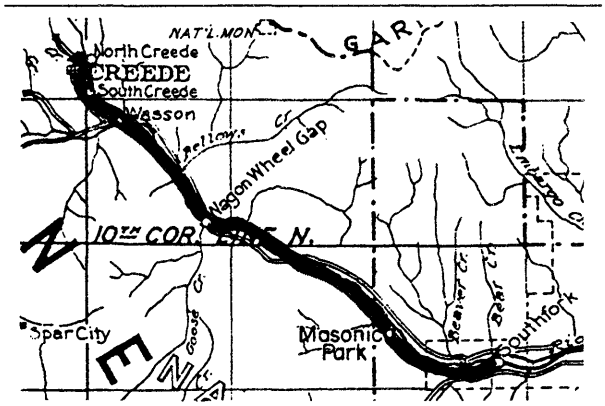


Figure 20. Denver & Rio Grande RR, South Fork-Creede

Gilpin County

In 1887 a group of mining men with interests in Gilpin County met to solve the problem of the expensive overland haul of ore from Bald Mountain to the processing mills at Blackhawk. The group founded a new railroad the same year. The Gilpin Tram was called "a mechanical curiosity" and "a wonderful monument of engineering skill." Built late in 1887 when the D&RG was well on its way to converting as much of its line as possible to standard gauge, the Gilpin Tram built on a two-foot gauge. Although two-foot-gauge railroads were not unheard of, they were unusual. The Gilpin Tram was the only two-foot-gauge railroad ever to operate in Colorado; in a rare kind of symmetry, Gilpin County, Colorado's smallest, built Colorado's narrowest railroad. Because its track stretched 20 miles between Blackhawk and Bald Mountain, it became known as the "2 by 20."[119]

The Gilpin Tram ran steadily, if not profitably, hauling tons of coal and water to the mines and gold ore to Blackhawk but paying a dividend to its stockholders only once in its history. Tourists

discovered the little line as well, and during the summer months the Gilpin Tram carried excursionists who traveled from Denver on the old Colorado Central narrow-gauge line. The Gilpin Tram ran from the end of its own track over a third-railed section to the Colorado Central depot. There it picked up passengers for a trip up the mountain and to the Fifty Gold Mines Mill, where the entrepreneurial owners gave tours. Running for thirty years, the tram was abandoned in 1917 when the quality of the gold ore no longer matched the cost of processing.[122]

Pacific Ambitions

Three lines were built during the 1880s with ambitions of connecting Colorado with the Pacific coast. Jay Gould controlled one and General Palmer controlled another. Otto Mears controlled the third line, planning to build off Palmer's success and connect the San Juans with the Pacific.

Georgetown: Jay Gould's Gateway to the Pacific

Georgetown had been Colorado's first silver city, with its 1864 discovery of silver. Colorado's first locally incorporated railroad, the Colorado Central, had planned from its inception to transport ore from the mines here, down Clear Creek canyon and ultimately to the Union Pacific line in Wyoming. Despite these intentions, Georgetown waited until 1877 for the Colorado Central to reach it. Almost immediately the district was eclipsed by Leadville as the state's silver city. Between 1877 and 1883 Georgetown remained the end of the Colorado Central line. During that time Jay Gould had acquired control of the Colorado Central and had renamed the road the Georgetown, Breckenridge & Leadville Railway. In the early 1880s Gould was about to leave the Union Pacific, and was trying to take over financial control of the D&RG. He wanted control of a transcontinental road that would compete with the Union Pacific, and perhaps with the D&RG and the D&RG Western, preferably through Colorado where the road would benefit from the local traffic provided by the mines. Georgetown, a railroad terminus for six years, became the jumping-off point for Gould's own trans-Colorado, transcontinental ambitions.[123]

The leg just west of Georgetown posed the first topographical challenge. At a place called Devil's Gate the canyon narrowed and climbed more steeply than a railroad–even a narrow gauge–could mount. Union Pacific engineer Robert Blickenderfer designed an ingenious solution: a 300-foot-long trestle that would allow the track to ascend in a more feasible grade by doubling back over itself in an engineered loop. Combined with miles of curves surveyed over the canyon's landforms, the Georgetown Loop would allow the train to traverse the two miles to the next mining camp of Silver Plume on a steep, but feasible, 4 percent grade [*see Figure 21*].

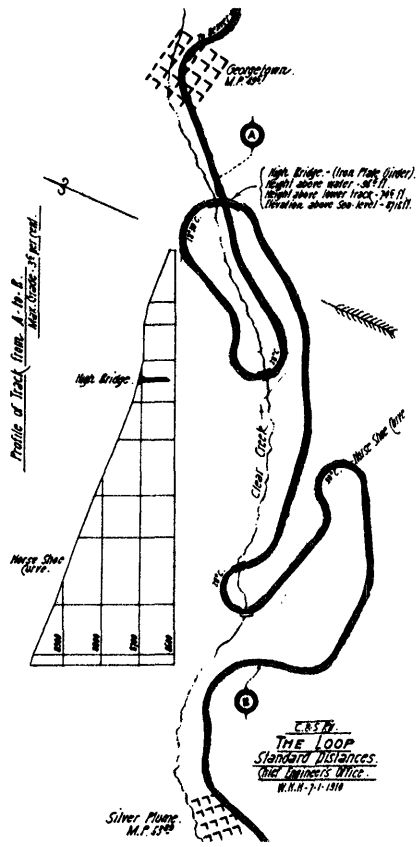


Figure 21. Georgetown Loop, from 1910 drawing

Robert Brewster Stanton implemented Blickenderfer's design. Stanton ordered the bridge towers fabricated by contractors Clark Reeves and Company of Phoenixville, Pennsylvania, a company that would later incorporate as the Phoenix Bridge Company, one of the country's premier bridge fabricators. The contractors initially installed the wrought iron towers backwards over the stone pedestals so that the trestle ran downhill instead of uphill. After Stanton rejected the initial installation, they hastily reconstructed the trestle in the right configuration. Stanton also found riveting problems, which Clark Reeves fixed, attributing it to the difficulty of convincing skilled riveters to scale the dizzying structure over the rocky canyon and rushing waters of Clear Creek.

Finally in 1884 trains steamed from Georgetown, over the "High Bridge" and into Silver Plume. Subsequent construction laid about six miles of track beyond Silver Plume and then stopped. Neither Breckenridge, Leadville nor a transcontinental route would come from Jay Gould's Georgetown line, as engineering difficulties later combined with Gould's shifting strategies. Instead, Georgetown and Silver Plume became a Gilded Age tourist destination, after William Henry Jackson photographed the breathtakingly tall trestle and the railroad advertised it. From 1884 through the end of the century, tourists came to "do the loop."[124]

Utah: William Palmer's Gateway to the Pacific

At Gunnison the D&RG stood poised to push even further westward toward its partner road, the Denver & Rio Grande Western, then just organizing in Utah. Palmer articulated his vision in the company's 1881 annual report: "The primary object of the completion of the link of 618 miles between Pueblo and Salt Lake City is to meet the requirement of the tributary mining districts and the interchange of ores and general traffic between Colorado and Utah. The agricultural resources of Utah, with the consequent low prices prevailing there for such products, and the constantly increasing demand of the mining districts of Colorado for these supplies, must give to

the Salt Lake connection a satisfactory eastbound traffic. The westbound traffic will consist largely of Colorado Coke and Colorado Anthracite, machinery, and other articles made in Colorado, of iron, steel, etc., manufactured there, also for eastern supplies of all kinds. There is also the special attraction to the travelling public of the extraordinary scenic grandeur of the route. The road when completed will make a new line to the Pacific coast via the Central Pacific Railroad from Ogden, which will be as short, both in distance and time, as any existing line between New York and San Francisco."[125]

Blocking Palmer's vision, however, was the gaping Black Canyon of the Gunnison River. Long considered impassable, the Black Canyon in some places had walls that rose 3,000 sheer feet directly from the water's edge. The small amount of light that penetrated into its depths accounted for its name. In these places the only way the river itself could be forded was when it was frozen and could be glided over on foot. During the summer of 1881, though, Rio Grande survey crews located a new route through the upper portion of canyon that avoided the deepest section. Although the new route required a steep grade on Cerro Summit, the route seemed feasible and construction began.[126]

The Rio Grande reportedly employed more than a thousand men for an entire year to build through the Black Canyon. Passage through the canyon reportedly cost more than the entire line through the much longer Royal Gorge. By August 1883, however, tracks crested Cerro Summit; by September they reached Montrose; and in November the Rio Grande steamed into the new city it had created on the western slope, Grand Junction [*see Figure 22*].

In March 1833 the D&RG crews met those of the Western at Desert Station, Utah, and pounded in the celebretory silver spike. Many miles of rails on the route came from Palmer's Pueblo-based subsidiary, the Colorado Coal and Iron Company. Service on the circuitous 735-mile trip between Denver and Salt Lake City began in April 1883, and could be completed in 35 hours. Elegant Pullman sleepers and club cars traveled the line so that passengers could spend their rail time in relative comfort. In May the D&RG offered a link from Denver to the Central Pacific's transcontinental line in Ogden, even though the line lacked a strategic bridge. At Weber River between Salt Lake City and Ogden, passengers and baggage detrained and rode in horse carriages to the other side of the river where a train waited to take them on.[127]

The reward for the gritty, focused work of engineers and crews and the determination of Palmer in creating a Denver-to-Pacific link was financial failure. The toll of building on so many different fronts combined with a general downturn in the economy and the incessant maneuvering among railroad men of the era had placed financial strain on the D&RG. Under fire for having expanded too quickly, Palmer resigned his presidency of the D&RG in 1884, giving way to Frederick Lovejoy, a Union Pacific man. Palmer maintained leadership of the Western, but in 1884 both lines went into receivership.

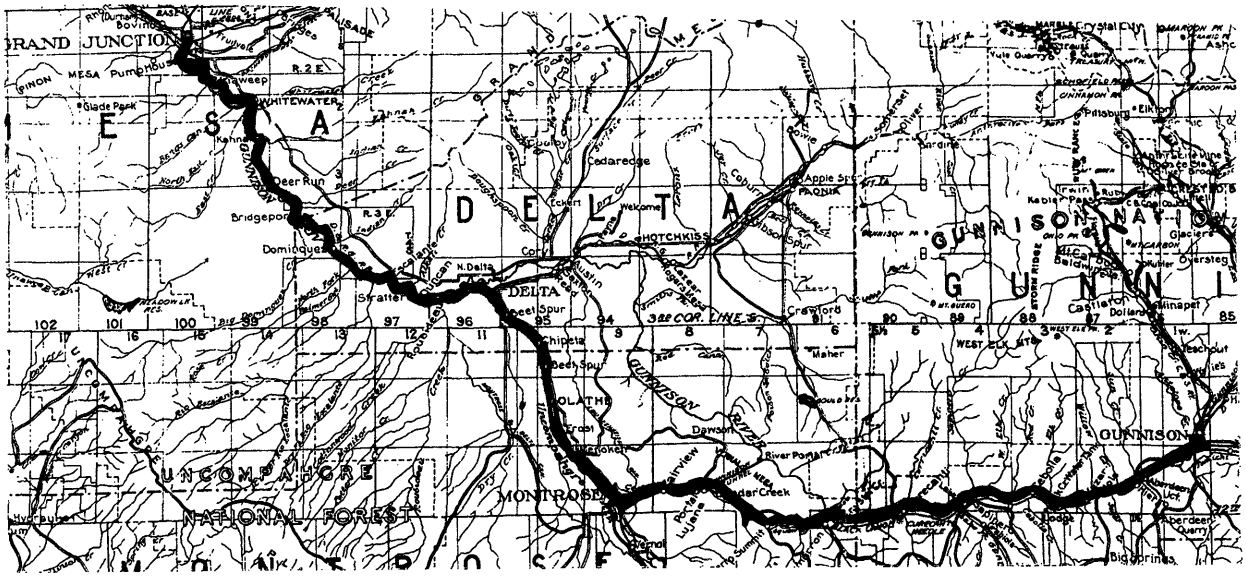


Figure 22. Denver & Rio Grande Railroad, Gunnison-Grand Junction, from 1913 Colorado state map

The history of western railroads includes myriad tales of firms on the brink of receivership and bankruptcy. The plunge down the other side, although often protracted and complex, rarely ended with a crash at the bottom, due to government intercessions to provide for the common good. The government usually provided a receiver, a custodian who swept the railroad under his arm, while another group of players determined who will pay how much for what. In the end the railroad reemerged "reorganized," with a different name, although sometimes so subtly different that the last word "railway" merely became "railroad," and the railroad continued to function. Often bankruptcy and receivership read very much like a more sensational and involved way to finesse financial difficulties or transfer ownership.

The mid-1880s bankruptcy of the D&RG and the Western was this latter type. Palmer-friendly receivers took charge of the Rio Grande and the Rio Grande Western, and when both companies emerged from receivership in 1886, they were returned to his control. The most significant difference was that the previous lease no longer held, and the lines existed as two separate entities. They both became "railroads" instead of "railways." Palmer remained president of the Western and focused most of his energy there. It was at this point that the D&RG raced the Colorado Midland to Aspen. Palmer formed an alliance with the Colorado Midland, and together they built standard-gauge track from Glenwood Springs, a point on the Midland's way to Aspen, west down the Colorado River to Grand Junction.[128]

Palmer then embarked upon an aggressive campaign to change the Western's track to standard gauge. Despite his foresight in laying standard-sized ties across Utah, the undertaking required an extensive reworking of the line. Crews had to widen roadbeds, flatten out curves and undulations in alignment, and actually create about 100 miles of new railroad. In fact, the extent of the work was greater than the Western's resources, and Palmer organized a new company to do it. In 1889 he incorporated a new company called the Rio Grande Western Railway, essentially a joining of the Denver & Rio Grande Western and the standard-gauge track built jointly with the Colorado Midland from Glenwood Springs to Grand Junction.[129] By 1890 the conversion from narrow gauge to standard gauge was complete, and Palmer spent the next two years extending branches to new sources of traffic along the line. Trains beginning in Denver using the Colorado Midland route to Glenwood Springs and then Palmer's Western, could ride standard-gauge trains from Denver via Ogden all the way to California.[130]

Durango: Otto Mears's Gateway to Utah and the Pacific

Once the Rio Grande built west from Gunnison to Utah, Otto Mears saw a way to connect the San Juan Mountains with the rest of the country. After completing construction on the Rainbow Route from Silverton to the mines up the Mineral River, Mears initiated another San Juan railroad venture. In 1889 he organized the Rio Grande Southern [RGS] to link Durango with the D&RG track at Ridgway. Mears borrowed from Palmer's construction strategy and put crews to work at both ends of the line, with one crew building west and north from Durango and another building south from the D&RG track at Ridgway. Construction began in 1890 and reached Telluride later that year, then extended deeper into the high valley to tap the silver shipments from the Pandora Mine. Mears' crews built the narrow-gauge line over some of the most rugged terrain in Colorado and performed the engineering feats required by the challenging circumstances of the landscape. The Ophir Loop, for example, required miles of winding track and several trestles to create a railworthy grade. By 1891 the northern and southern crews met at Muldoon, completing the connection [*see Figure 23*].

Access to stupendous scenery had become an expected benefit of every Colorado mountain road. Railroad entrepreneurs looked for the most unusual or spectacular vistas and features on each new route and hired photographers to introduce them to the public. In 1893 Mears organized a special train to take the favorite photographer of the D&RG, William Henry Jackson, out to the Lizard Head summit to photograph Lizard Head Peak, the most notable among other scenic byways along the line for use in marketing. Mears maintained a cooperative relationship with the D&RG, borrowing not only their favorite photographer, but also buying older narrow-gauge engines and rolling stock from the line.[131]

RAILROADS IN COLORADO 1858-1948

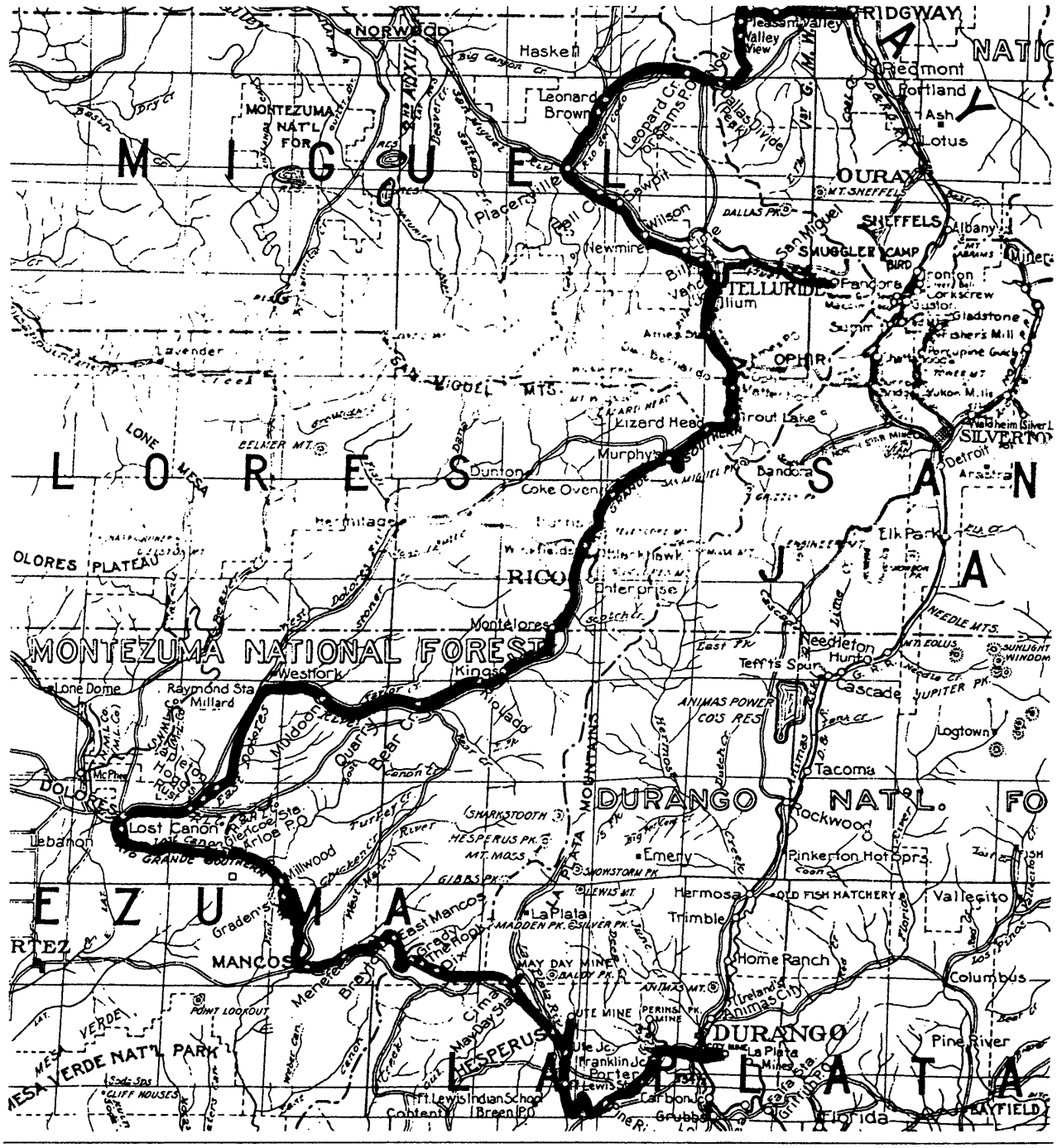


Figure 23. Rio Grande Southern Railroad, Durango-Ridgway, from 1913 Colorado state map

The Eastern Plains

During the 1870s the Union Pacific held a virtual monopoly on traffic and freight eastbound from Colorado. The bittersweet reality for Colorado merchants, farmers and miners was that they had achieved a rail connection, only for their products to be uncompetitive in eastern markets because the freight rates dictated by their sole carrier, the UP, were high. During the 1880s additional trunk lines from the east would be built by three railroads: the Chicago, Burlington & Quincy [CB&Q], the Missouri Pacific [MP], and the Chicago Rock Island & Pacific [CRI&P]. In addition, a new local Gould line–the Greeley, Salt Lake & Pacific–would connect Denver with such front range towns as Boulder, Fort Collins and Greeley. And another new Colorado line from Denver to the Gulf of Mexico would ease the UP's hold on Colorado.[132]

The Chicago, Burlington & Quincy provided the first and second new connections across Colorado's eastern plains. An Illinois company that had formed in 1856 as the consolidation of several smaller lines, the CB&Q grew within its home state before expanding into Iowa and Missouri in the 1870s. Over the next decade the Burlington built prolifically in Nebraska, from which it extended lines into virtually every other midwestern state. In that single decade the Burlington almost tripled its aggregate trackage. Despite the company's prodigious building during the 1880s, it tended to be conservatively managed and would prove to be one of the most durable railroads in the West.[133]

The Burlington built a standard-gauge road from Nebraska to Denver during its period of midwestern expansion. In 1881 Burlington crews began laying track at both ends of the route, one crew working from the Nebraska/Colorado border and the other building out from Denver. The company bought rails from Colorado Coal and Iron Company, which in the early 1880s operated the only Bessemer steel process west of the Mississippi. In the spring of 1882 the line was complete [*see Figure 24*], and the first train steamed into Denver. Within days the Atchison, Topeka & Santa Fe also began service to Denver over the newly third-railed tracks of its former enemy and new-found ally, the Denver & Rio Grande. Together the Burlington and the Santa Fe posed alternative routes for Denver passengers and freighters whose only eastern railroad option for over a decade had been the Union Pacific.[134]

Once in Colorado, the Burlington built a second line and acquired a third. In 1887 the CB&Q built another standard-gauge track extension through the state. The new line ran from Nebraska to Cheyenne north of its original road, crossing the UP's LaSalle-Julesburg route at Sterling.[135] The acquired line had been incorporated in 1880 to bring coal from Mitchell to the Argo Smelter in Denver. This small-scale, narrow-gauge mining road had the misleading title of the Denver, Utah & Pacific Railroad. The Burlington backed the extension of the line north of Denver to Longmont and the sandstone quarries at Lyons and Tower. In the late 1880s the Burlington acquired controlling interest in the little coal and sandstone line, converting it to standard

gauge. The Burlington operated its stone quarry line under a lease agreement for the next twenty years, before finally absorbing it into its system in 1908.[134]

As part of its investigation into the strategic value of the new acquisition, the Burlington performed surveys looking for possible Pacific routes west of Denver. Although the company acquired several rights-of-way between Denver and Rollins Pass, it never built any Pacific-bound track through the Rockies. These rights-of-way would re-emerge during the early 20th century as part of the last Colorado-to-Pacific mainline attempt.

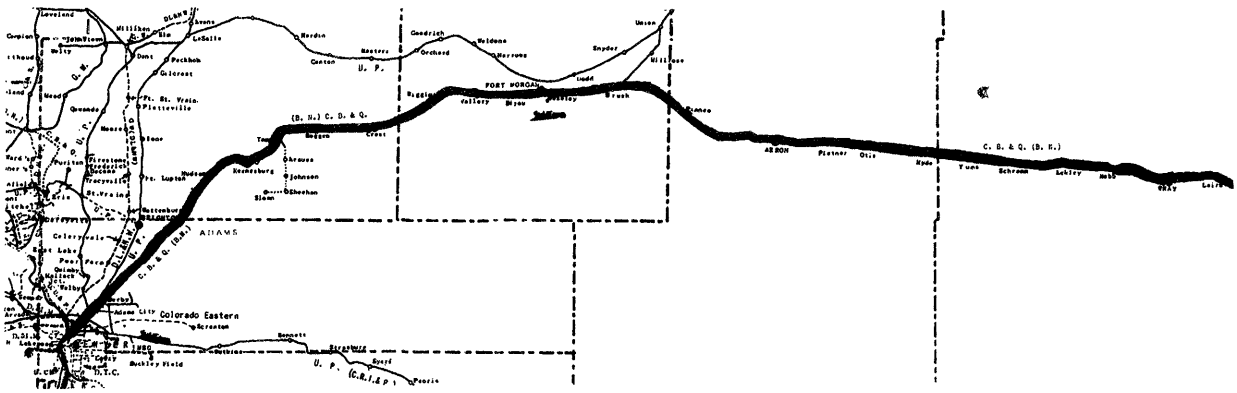


Figure 24. Chicago, Burlington & Quincy RR, Wray-Denver, from 1986 map by Colorado Railroad Historical Foundation

In 1887 Jay Gould's Missouri Pacific extended a line from Kansas to Pueblo, paralleling Santa Fe track for the last leg of the journey. This new route worked to the advantage of the D&RG because it transported MP passengers up its line from Pueblo to Denver. The primary purpose of this line seemed to be to pose competition for the AT&SF from Kansas to Pueblo.[135]

The last new railroad into Colorado from the east was built by another Illinois firm: the Chicago, Rock Island & Pacific Railway Company. Dating back to 1851, the Rock Island line had consolidated with several other railroads in 1880. In 1886 the company embarked on a major westward expansion. As part of this expansion, a CRI&P subsidiary in 1888 built west from Kansas, crossed the UP at Limon, tunneled under the Santa Fe near Colorado Springs, and joined the D&RG line near that city [*see Figure 25*]. From there the CRI&P arranged to run trains north and south along the D&RG track to both Denver and Pueblo. In addition, the CRI&P subsidiary contracted with the UP to run trains directly to Denver from the railroad crossing at Limon. Extending through lonely, barren plains country, the CRI&P's route failed to generate enough business to keep the subsidiary solvent. By 1891 CRI&P absorbed its subsidiary line and owned it outright.[136]

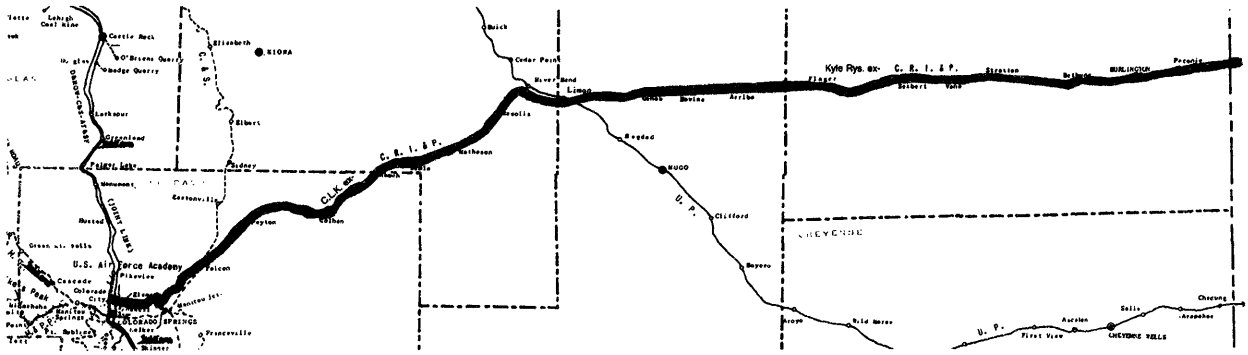


Figure 25. Chicago, Rock Island & Pacific RR, Burlington-Colorado Springs, from 1986 map by Colorado Railroad Hist. Found.

Greeley, Fort Collins and Boulder

In 1881 the Union Pacific backed the incorporation of a railroad that extended branches from the old Colorado Central line up nearly every canyon on the front range. The Greeley, Salt Lake & Pacific actually built in two locations off the old Colorado Central line. In the north it built standard-gauge lines from Fort Collins to stone quarries at Stout, from Fort Collins to the agricultural colony at Greeley, and from Loveland to the Buckhorn quarries at Arkins. Further south, the line laid narrow-gauge tracks from Boulder west up rugged Boulder Canyon, and then up Four Mile Canyon to a place that became known as Sunset.[137]

The Boulder line was unusual in that grading was carried out by a crew of some 200 African-Americans recruited from Kansas and paid about half the prevailing wages than those for white laborers. The crew was commanded by a pugnacious, southern subcontractor named W.H. Cox. His tactics included having disgruntled workers who walked off the job jailed for breach of contract and mustering people to work at the point of a shotgun. The shotgun tactic backfired strategically, if not literally. Cox's workers charged him with assault, a Boulder judge found him guilty and fined him, and the *Boulder News & Courier* censured him as a "bulldozer" with the mistaken impression that "the crack of the slave-whip has the same ring as of old."[138]

Boulder Canyon offered challenging terrain for building. Crews readily built bridges rather than dig and blast through the hard rock terrain. As a result, in the roughly fifteen miles between Boulder and Sunset, the railroad crossed 66 mostly wooden bridges and trestles, spanning Boulder Creek six times and Four Mile Creek 45 times. Plagued by steep grades and tight curves, the road was described by one Boulder newspaper as "doubtless the worst road for curves and reverse curves in the state."[139] The Greeley, Salt Lake & Pacific built no more track after the road up Boulder Canyon, and in 1890 the Union Pacific absorbed it in a major consolidation.

The Gulf of Mexico

In 1881 John Evans embarked on his third Colorado railroad enterprise with the purpose of providing an outlet to the East. Evans had played a central role in the organization of the Denver Pacific, the second line to lay track in the state. The Denver Pacific had later passed under the control of the Kansas Pacific and, eventually, the Union Pacific. Evans subsequently organized the Denver, South Park & Pacific and in 1881 found himself newly "in funds" after the sale of that line to Gould. Still passionately committed to advancing rail mileage in Colorado, Evans saw transportation as the key to the prosperity of Denver, and the railroad as the cutting edge in transportation.[142]

Rather than thinking trans-prairie, as had the Burlington and the Rock Island, Evans envisioned a line south of Denver, through New Mexico and Texas and out to the Gulf of Mexico, where steamers would ship Colorado goods to eastern markets. In 1881 the Union Pacific still monopolized Colorado's eastern trade, frustrating Evans by Colorado's inability to compete because of high freight rates. He reasoned that a friendly rail line connected with Atlantic ships would provide the kind of affordable shipping costs to allow Denver and Pueblo to thrive.[143]

In 1881 Evans incorporated the Denver & New Orleans [D&NO] Railroad to realize these goals. News of the new enterprise drew two different reactions. On one side, the two other lines traveling south from Denver–the Rio Grande and the Santa Fe–both viewed the venture with hostility. On another side, General Grenville Dodge, chief engineer on the Union Pacific's transcontinental railroad and then interested in building a UP-backed line north from Texas, saw Evans' timing as fortuitous for his own venture. Evans and Dodge entered into an agreement: Evans would build south from Denver, and Dodge would build northeast from Fort Worth, Texas, to join their roads at the Canadian River.[144]

Evans began laying track south from Denver in 1881. He encountered his first major obstacle less than a month later, though, when the Rio Grande refused to grant permission for a crossing at South Denver Junction. Evans bested the D&RG by building the crossing on a Sunday before the other company could get an injunction. Evans tried not to threaten the D&RG: he routed the D&NO well east of the D&RG and did not even enter Colorado Springs when the road was completed in 1882 [*see Figure 26*]. But Evans' consideration won him no good will from the other southern lines. The D&RG and AT&SF refused to connect or cooperate with his road and conspired with the Union Pacific and the Burlington to avoid routing via the D&NO. These obstructions, combined with the lack of either passengers or freight on its lonely route, forced the D&NO into receivership in 1885.

Although Evans' latest railroad failed financially, it did ultimately succeed in linking Colorado with the Gulf of Mexico. In 1887 the D&NO passed into the hands of a UP-backed company,

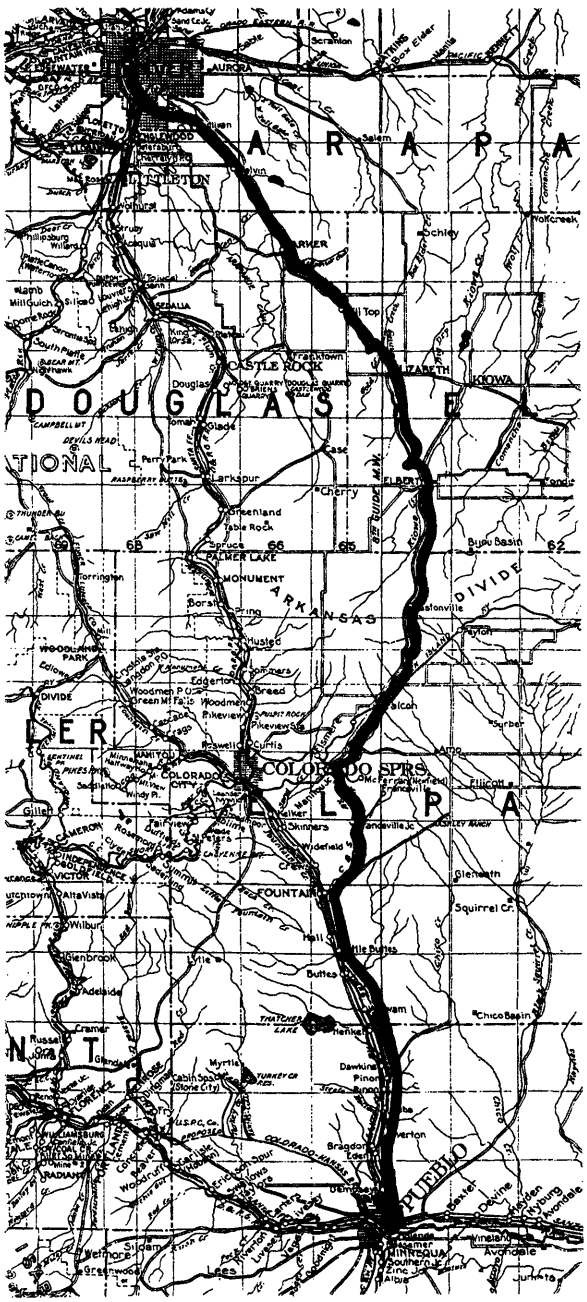


Figure 26. D&NO RR, Denver-Pueblo, from 1913 map

the Denver, Texas & Gulf [DT&G], whose purpose was to complete the interstate connection with Fort Worth.[143] With John Evans as one of its directors, the newly reorganized company completed its first leg southward by arranging with then-D&RG president David Moffat to use the Rio Grande's tracks between Pueblo and Trinidad. Dodge calculated a savings of two years by this cooperative stroke. The DT&G then laid new rails south from Trinidad over the New Mexico state line. In March 1888 the DT&G crew met Dodge's workers building the Fort Worth & Denver City road north from Texas.[144]

John Evans gave the keynote address at the celebration of the completion of a continuous rail line between Denver and the Gulf of Mexico, holding the first spike driven in the Denver road high as the audience burst into applause. Grenville Dodge admitted in a letter that Colorado had been kept from developing its resources fully as long as it had been dependent on a single transcontinental road. The *Rocky Mountain News* called the gulf line "the crowning event in the history of our railway and commercial progresses... and may well mark the end of our provincial period."[145]

By the end of the 1880s, Colorado had three additional trunk lines with the East and a connection with the Gulf of Mexico. Two lines by the Burlington, one by the Missouri Pacific and one by the Rock Island completed Colorado's eastern rail connections. Evans and Dodge had led the DT&G link to the Atlantic shipping lanes. Future rail construction would focus on internal Colorado destinations and a more direct through-route from Denver to the Pacific coast. By the end of the decade, the Union Pacific, the Burlington, the Rock Island and the Santa Fe railroads all provided rail transport east.

Denver

Although both Colorado Springs and Pueblo stood on the main route for several trunk lines, Denver still figured as the center of Colorado's rail network. Some mining equipment manufacturing and smelting operations had opened in the city (including the landmark Boston and Colorado Smelter relocated from Blackhawk), but Denver remained without a significant industrial complex. Instead it owed its prominence to its function as a regional distribution, supply and financial center. During the 1870s several depots scattered throughout the town serviced its various railroads.[148] Transferring people and freight from one line to another had proved logistically cumbersome, though it had opened up opportunities for entrepreneurs providing ground transportation. In the early 1880s a group of Denver citizens backed by Jay Gould's resources built a large, new station to unify the Denver terminus of all the city's railroads.[149]

In 1881 Union Station opened on Wynkoop Street in western Denver on the site of a former duck pond. It was the largest building in Colorado, and some argued that it was the largest building west of the Missouri River. Designed in Gothic Revival style by architect William E. Taylor, the building stretched 503 feet long, 65 feet wide and two stories high. A three-story center section was topped by a 180-foot-high clock tower lit with enough electricity to shed light for a half a mile. Rough-hewn, pink-tinted lava stone quarried south of Castle Rock at the Madge Quarry comprised most of the depot's exterior walls. Manitou sandstone quoins quarried north of Morrison bordered the corners, windows and doors. Two columns of Scotch granite with carved caps flanked the main entrance.[150]

The original tenants were also the original owners: Gould's Union Pacific and its subsidiaries, Palmer's Denver & Rio Grande, and Evans' Denver, South Park & Pacific. Ownership was by share of stock, with the UP holding 3/5s, the South Park 1/5, and the D&RG 1/5. Soon after completion of the depot, Gould took over the South Park and its shares in the Union Depot, leaving Palmer's offices alone to share the building with the megalithic UP. Both operations maintained offices in the sumptuous walnut chambers of the second floor. The depot's main floor hosted the public with its ticket offices, waiting rooms, baggage office, express offices, dining room and telegraph office. Steam heated the building and, except for the tower, gaslights gave it light.[151] The UP and D&RG did not remain the depot's only tenants for long. In 1882 the AT&SF rented access from the D&RG as it began running its trains up from Pueblo on the D&RG's newly third-railed lines. In 1882 the CB&Q and the D&NO also became tenants. In 1887 the Chicago Rock Island & Pacific and the Missouri Pacific arranged to enter the depot via the D&RG tracks.[152]

Union Station enhanced the city's role as a transportation and supply center. As more railroads reached Denver, the city grew. In 1870 the population stood at 4,759, virtually the same size it had been ten years earlier; by 1880 the population had grown to 35,629. In 1890, after the

RAILROADS IN COLORADO 1858-1948

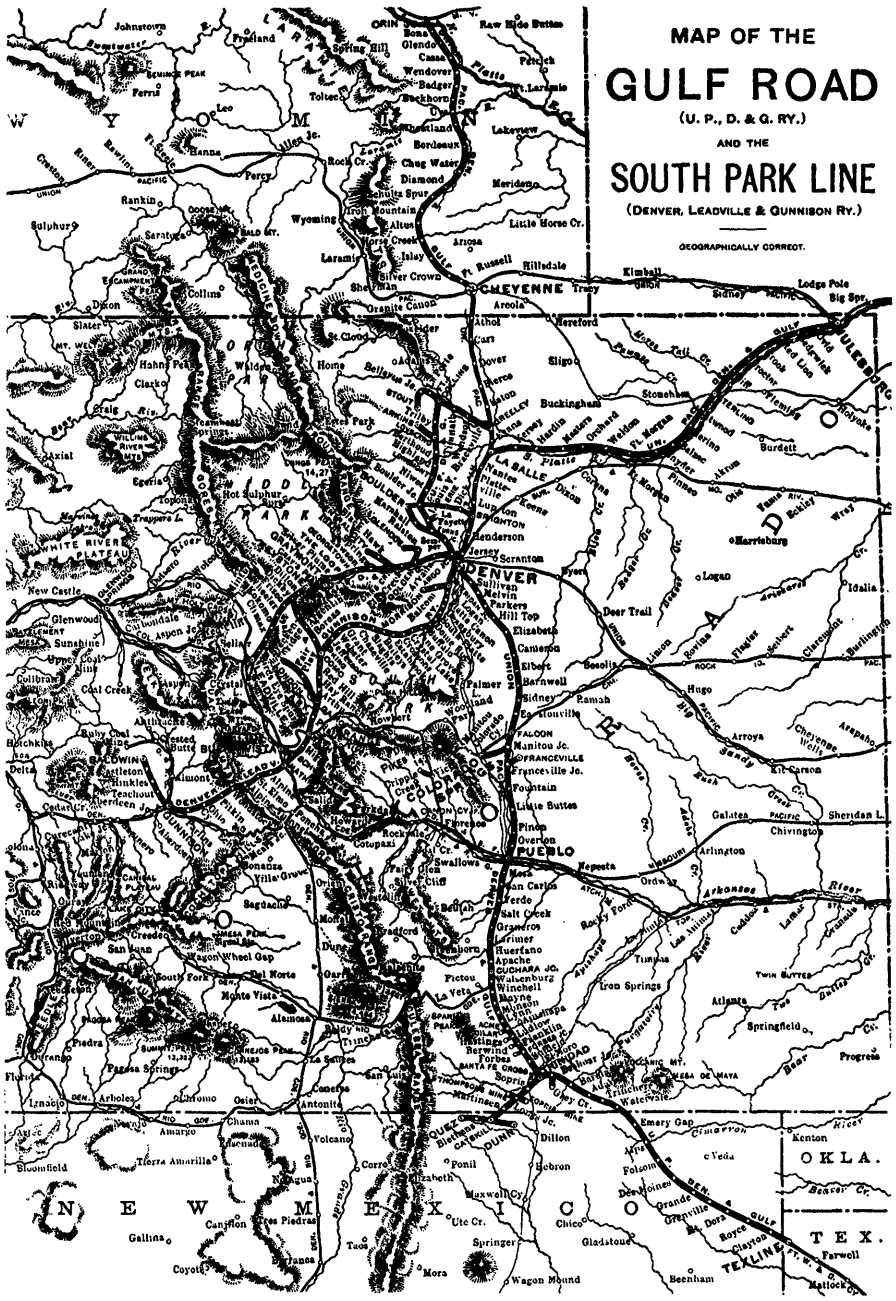


Figure 27. Union Pacific, Denver & Gulf Railroad, from 1898 map

rail expansion of the 1880s, 106,000 people lived in Denver. The city's impression on visitors changed as well. In the 1860s Denver was still a dry and barren destination, so much so that one missionary stationed here urged his congregation sing the hymn, "Lord what a wretched land is this!" By 1870, by contrast, Denver had "a dash and animation... along with a finish and elegance that suggests prosperity, wealth, and Eastern stability, as well as the progressive and aggressive frontier."

During the 1880s the Union Depot joined with electric lights, street cars, an elegant opera house and the famous Windsor Hotel to give Denver a more sophisticated urban profile. During the 1888 celebration of the new rail link between Denver and Fort Worth, Wichita Falls Sheriff Frank Davis delivered this sobriquet, "I ain't much on big towns, but Denver knocked me as flat as a gang of Panhandle cowboys." It was the railroads that had put Denver on the map.[151]

The Bonanza Years at the Close

By the end of the 1880s rails reached deep into the mountains to tap most of the major mining districts. Leadville, Gunnison, Aspen, Durango, Silverton, Creede–all of these formerly remote locations now had regular rail connection, and some locations boasted more than one line. Denver was firmly linked to Nebraska and points east, and its traffic no longer depended on the Union Pacific alone as its eastern carrier. A route south through Texas to the Gulf of Mexico provided deep-water access to the eastern markets as well. And a winding, narrow-gauge route climbed west through the mountains to link Denver with Utah and points west.

Throughout the 1880s the Rio Grande and the Union Pacific had been the two most powerful rail contenders in the state. The D&RG reached its zenith of construction during the 1880s. The aggressive line had been the first to complete a transcontinental link west of Denver, although it was completed along a meandering, narrow-gauge route that was more scenic than efficient. By the end of the decade, it had become more accessible to standard-gauge traffic by third-railing along its north-south route and building standard-gauge track west of Glenwood Springs to Salt Lake City. With future construction limited to small extensions, most of the company's activity would occur in boardrooms and bank conference rooms as it organized and reorganized.

The Union Pacific would also make most of its future moves by acquisition and reorganization, although this had for years been standard fare for Gould. In 1890 the Union Pacific spearheaded a major consolidation of twelve western railroads into a single new entity called the Union Pacific, Denver & Gulf [UPD&G] Railway Company. The new conglomerate included several Wyoming and Texas lines, as well as roads in Colorado. Within the state, the consolidation controlled traffic from Julesburg to LaSalle, Greeley to Fort Collins, Fort Collins south through Loveland, Longmont, Boulder, Denver and Colorado Springs to Pueblo, coal mining roads in the Boulder valley and in the southern part of the state around Trinidad, the Denver, Texas & Forth Worth line south to New Mexico, and the Colorado Central's old line west of Denver to the Georgetown Loop [*see Figure 27*].[154]

Denver was no longer isolated on the brink of the Rockies, but neither was it on a main transcontinental line. During the next two decades–from 1893 to 1913–Colorado would continue trying to get itself directly on a main transcontinental line, would build rails to new mining areas, and would fill in the gaps in its rail network. But first it had to contend with an economic depression that focused on a major Colorado export–silver.

4 The Peak Years: 1893 - 1913

Colorado's peak railroad period began with a severe financial depression and ended with the state at the height of its operated railroad mileage. In 1890 some 1,570 miles of railroad extended across Colorado; by 1910 there would be 5,532, climbing just a bit higher by 1913 before beginning the slow decline to the present. At the turn of the century, silver would no longer be the holy grail of railroad construction; gold, coal, lumber, stone, agricultural products and tourists would inspire new construction instead.

Much of the state's railbuilding entailed filling gaps in the system. Fewer new lines incorporated and built track, although one–the Moffat Road–would build substantial mileage over difficult terrain with transcontinental ambitions. Three or four big railroad powers then dominated the state. The Union Pacific, Denver & Rio Grande, and the Chicago, Burlington & Quincy, through its subsidiary the Colorado & Southern, became the major railroad powers in Colorado. Each of these big players was transformed during this period, and none looked the same at the end of the period as it had in the early 1890s.

Neither, of course, did Colorado itself. The state's population would double between 1890 and 1910. In 1890 Colorado's population numbered 413,249. By 1900 it would grow to 539,700. A surge occurred during the first decade of the 20th century so that by 1910 the census counted almost 800,000 residents. During the same period irrigated acreage nearly tripled, the number of people working in agriculture doubled and the number of people working in manufacturing grew two-and-a-half times. Throughout all this, railroads remained a pivotal part of the state's growth.[155]

Depression

The national depression of the 1890s played an important role in Colorado railroads by changing the economic climate. Ever since the close of the Civil War, the U.S. economy had been fighting an economic depression. During the war itself President Lincoln had used the inflationary tactic of printing greenbacks to help finance the conflict. At the close of the war, the government bought back some of the dollars and, motivated by "sound money men" of both parties, allowed only money to stay in circulation that could be backed with specie, that is no more than the government's gold and silver supply could back. In 1873 the government shifted to a gold standard, paralleling the economic policies of Germany, France and other European governments. The silver dollar, with silver demonetized, then gave way to the gold dollar, the new basic unit of currency; paper money was directly exchangeable for gold.

These policies precipitated two trends, both of which affected the Colorado economy. First, the conservative money policy brought the country as a whole closer to an economic depression. After implementation of the gold standard and specie-backed paper money, the wholesale price index dropped steadily, marking a 30 percent drop from 1870 to 1880 and an additional 20 percent drop from 1880 to 1890. The clear diagnosis was that there was not enough money in circulation to accompany the explosive economic growth of the country's economy.[156]

Secondly, the 1873 demonetization of silver occurred just as Colorado's silver production was increasing. Government policy set the price of silver at one-sixteenth the price of gold. With private parties paying more than the government because of silver's relative scarcity, virtually no silver had been sold to the government prior to the mid-1870s. The 1870s silver booms in Nevada and Colorado increased the supply of silver, further driving the price downward. In the mid-1870s both silver producers and inflationists supported the remonetization of silver. Silver producers could receive a stable price; inflationists hoped to increase the money supply. The Bland-Allison Act in 1878 and the Sherman Silver Purchase Act in 1890 were both attempts to appease silver interests with government purchases. Neither succeeded in stabilizing the price of silver, however, and neither addressed the problem of the short money supply.

The demonetization policy could not have come at a worse time for Colorado. By 1889 the state produced more than half of the nation's silver, and prices had dropped to $0.93 an ounce. The Sherman Silver Purchase Act seemed to help initially, as silver prices climbed to $1.00 in 1890. That year a foreign financial crisis caused many eastern creditors to sell their capital holdings in the West. A gold drain challenged the U.S. Treasury to maintain an adequate gold reserve. Consequently, the price of silver slipped back past its former low, holding at $0.83. Banks nationwide called in loans following commercial failures. A severe drought hit the Colorado plains. Some of the older mines had played out, producing only low quality ore. India stopped coining silver, driving silver prices worldwide downward again. And in the face of these troubles, Congress repealed the Sherman Act in 1894. The price of silver plunged to $0.62.[157]

The economic crash struck Colorado during the summer of 1894. Banks closed, smelters closed, mines stopped shipping ore, real estate values plunged and unemployment skyrocketed. In September the Colorado Bureau of Labor Statistics listed 377 business failures, 435 mines closed (almost half of the number of producing mines from 1892) and over 45,000 people out of work. Heavily dependent upon the mines for revenues, railroads in the state began failing as well. But the financial panic of 1893-1894 was not limited to Colorado alone. Some 65 railroads failed throughout the country, including many national lines such as the Union Pacific, the Northern Pacific and the Atchison, Topeka & Santa Fe. The Colorado Midland, recently acquired by the AT&SF, Otto Mears' Silverton Railroad, and Jay Gould's recently formed consolidation, the UPD&G, all went into receivership. Gould himself had gone into a sort of receivership as well; in 1892 the old man died, leaving his fortune, his railroads and his desire to control a coast-to-

coast road to his son George Jay Gould. After financial reorganization and the settlement of the estate, only one road with trackage in Colorado remained in George Gould's hands: the Missouri Pacific running from Kansas to Pueblo. This would not keep Gould Jr. out of Colorado railroads, however, and he would eventually return to play a major role.[158]

The depression of the 1890s affected Colorado railroads in several ways. First, it virtually halted construction. Second, it redirected further railroad development by removing silver mines as the goal. Finally, it presaged a change in the way railroads were organized. After the depression, railroads began to consolidate and operate as larger systems, somewhat like the UPD&G consolidation had attempted. This strategy allowed later roads to benefit from increased economies of scale, avoid rate wars, and provide more complete and varied service to the public. These consolidations were unpopular with people outside the industry, however. Coloradans, already openly hostile to monopolies such as railroads and irrigation companies, opposed larger railroad consortiums. Their protests, along with similar ones that echoed nationwide, led to greater government regulation of railroads. In the meantime, though, the economic activity of the 1890s acted as a spur to greater railroad consolidation.[159] An overview of a key consolidation and of the activities of a few of Colorado's bigger railroads is necessary to understand Colorado's rail industry at the turn of the century.

Colorado & Southern Railway

The Colorado & Southern Railway Company incorporated late in 1898 with some of the bankrupt Union Pacific's former properties. For most of its corporate life, the UP had been an east-west road. During the late-1880s, though, it had begun building a north-south component through Colorado. One of Jay Gould's last acts, the acquisition of John Evans' gulf line and the incorporation of the UPD&G, had been part of this plan. In 1893 the Union Pacific went into receivership, and five years later the Colorado & Southern [C&S] emerged with two of the UP's former property groups: the Union Pacific, Denver & Gulf and the Denver, Leadville & Gunnison with its famous Georgetown Loop. These properties gave the new company a substantial length of trackage in Colorado but did not form a continuous north-south line.

Over the next several years, the C&S set out to fill in the gaps in its system between Cheyenne and the Gulf of Mexico, and to arrange its Denver routes so that it connected with friendly roads to both the Pacific and Atlantic coasts. To attain this goal, the C&S built its own track and bought up other small companies. In 1900 the C&S bought half-interest in the Colorado Midland, and the Rio Grande Western bought the other half, thereby giving both passage over the critical standard-gauge link from Glenwood Springs to Grand Junction and the RGW transcontinental link. Its control of the old Colorado Central line north of Denver terminated at Fort Collins; the newly reorganized UP controlled the line north from there. The C&S built its own tracks

from Fort Collins to Cheyenne to avoid the UP, but it did so slowly. Finally, in 1911 the C&S owned a continuous system of north-south rails in Colorado [*see Figure 28*].

By then the Colorado & Southern had passed under the financial control of the Chicago Burlington & Quincy.[160] The C&S continued to operate under its own name, but with the financial backing and partnership of the CB&Q. This partnership lasted until 1963, when the CB&Q merged with the Great Northern and Northern Pacific lines to form a new organization, the Burlington Northern [BN]. That same year the C&S ceased operating under its own name and began operating as the Burlington Northern. About twenty years later the C&S dissolved as a separate corporate entity, and the Burlington Northern absorbed it entirely.[161]

Denver & Rio Grande and the Colorado Midland

In 1891 David Moffat resigned from his four-year presidency of the D&RG. Under his leadership, the Rio Grande had re-emerged from its receivership of the 1880s, had resumed its aggressive growth in the Colorado mountains, notably during its race to Aspen, and had either third-railed or completed standard-gauge conversions on its flatland track and on the Denver-to-Grand Junction route.

The silver slump and depression that followed soon afterwards hit the Rio Grande and the Rio Grande Western especially hard, because they depended heavily on silver hauling. Although they stopped paying dividends in the mid-1890s, the lines survived by hauling other minerals, particularly coal, and by adopting a policy of frugality and deferred maintenance. Many of the towns they serviced languished, however. At Creede, for example, traffic during the boom days of 1892 had been so heavy that it took two daily passenger trains to service the town. In 1893 only a single combination freight/passenger train ran, and that one stopped short of town because ore was no longer being shipped out. Townspeople were reduced to bringing their supplies and mail in by horseback from Jim Town, the new end of the line. The Rio Grande's frugal ways brought a mixed blessing. The railroad survived the 1890s, but it did so at the expense of quality and safety. Poor service diminished the line's reputation, even as its passenger department embarked on a major campaign to promote the road to tourists. Climbing accident rates posed an even greater problem, and by the end of the decade the D&RG's management seemed to have adopted the attitude that accidents were simply a part of doing business.[162]

At the turn of the century the already deteriorating D&RG passed into the hands of financial interests that would further diminish its vitality. In 1901 George Gould set about fulfilling his father's dream of owning a transcontinental railroad from coast to coast. He acquired controlling interest in the Rio Grande as well as control of the Rio Grande Western, Palmer's Utah line.

RAILROADS IN COLORADO 1858-1948

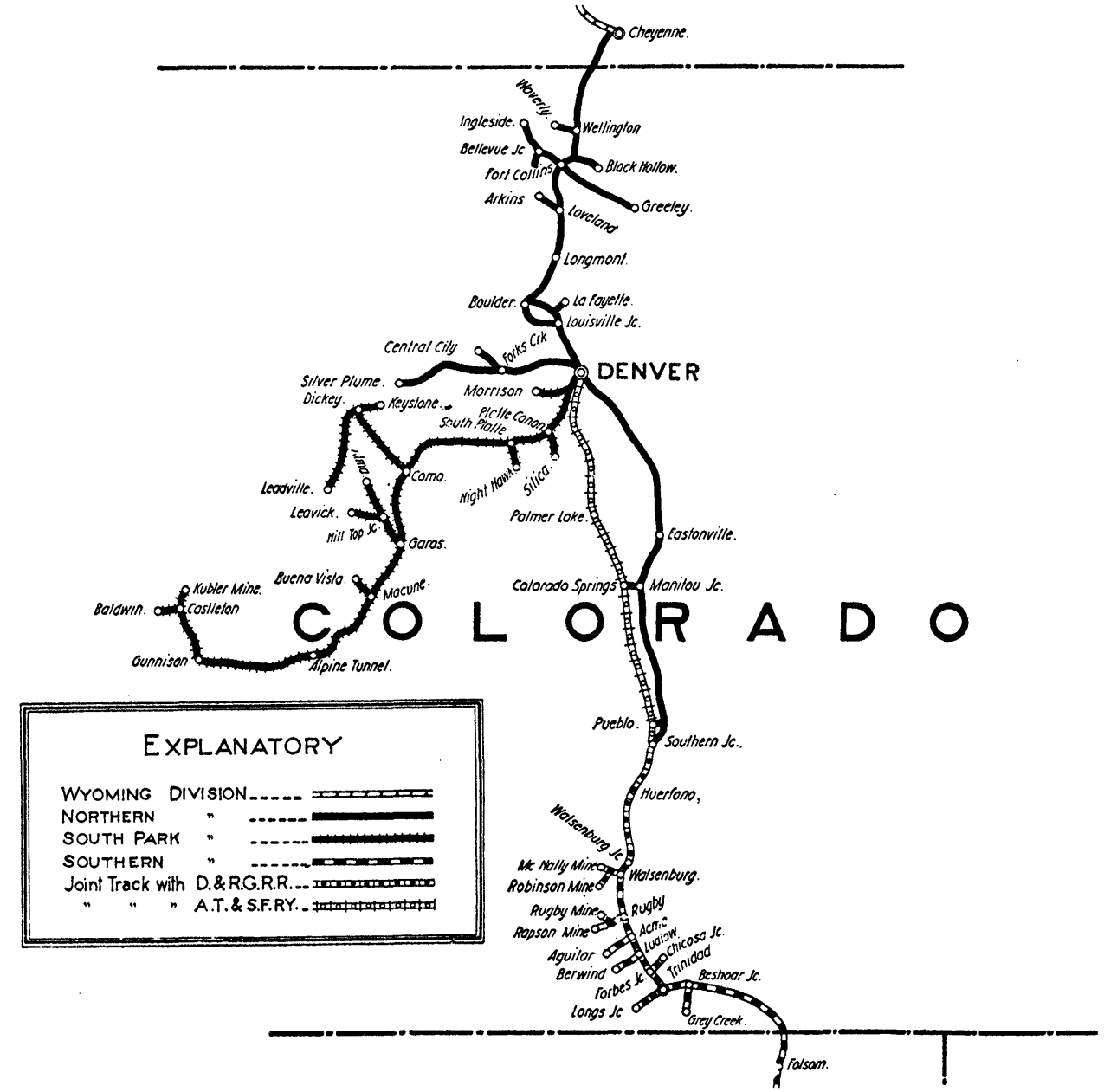


Figure 28. Colorado & Southern Railroad, from 1912 map

Gould forced Palmer to sell, an act that brought Palmer a $1 million profit. Palmer's biographer, John Fisher, tells a remarkable story about what Palmer did with his windfall. "In the spirit of his dream of a road in which each workman should have a part," wrote Fisher, "that million dollars was divided among the employees on the line, everyone, from section hand to manager, receiving a share. This splendid act was not announced publicly; when the story of it went round it was at first hardly believed, and one scoffer was only convinced, years later, by meeting the Utah passenger agent who had himself received $35,000. It was said that to many a navvy or grader there came a check for $5,000." With this buy-out, Palmer left the Colorado railroad stage once and for all, concentrating his interests on other business ventures and his family for the remaining few years of his life. He died before the decade was out.[163]

With Palmer out of the picture, Gould put his own man in place as president of the RGW and began work on a new railroad. In 1905 construction began on the Western Pacific, a road that would build from Utah to California and challenge the UP's dominance over transcontinental traffic along that route. Gould financed the work largely by diverting D&RG and RGW revenues in service of his new line. As conditions deteriorated further on the two railroads, accident rates on the Rio Grande climbed even higher, drawing the censure of the press. In 1910 through-traffic commenced on the Western Pacific, and subsequently the new railroad, the D&RG, the RGW, and Gould's Missouri Pacific operated as one system. In 1913 this situation held, but the financial wheels were about to come off. Strategic maneuvering by Gould's UP enemies, aided by his own mistakes, would bring his Western Pacific railway into receivership in 1915. In 1918 the Rio Grande would fail as well.[164]

Union Pacific

When the Union Pacific emerged from receivership in 1898 as "two dirt ballasted streaks of rust," it passed into capable hands. UP President Edward H. Harriman rebuilt it into a great railroad, which continued to wield power and influence in Colorado, particularly in its east-west connections from Denver north. The Union Pacific emerged from receivership with its properties intact, although in worse condition, minus the properties taken up by the Colorado & Southern. The UP at the turn of the century essentially controlled the same track it had in 1881. It built from there, adding the Denver and Boulder Valley Railroad, the "Switzerland Trail," by the turn of the century. A series of transactions during the first decade of the 20th century left the Union Pacific in an unusual situation for a western railroad: it was cash rich. Managed by Harriman and backed by the powerful Kuhn, Loeb & Co. banking house, the UP embarked upon an aggressive construction program to strengthen its line.[165]

Cripple Creek

Cripple Creek constituted the one bright spot in Colorado's otherwise gloomy economic landscape in the mid-1890s. During the 1859 gold rush, "Pikes Peak or Bust" referred to the mountain that argonauts used to navigate by on their way to Cherry Creek and the foothills. In 1890 the mountain itself yielded gold from an unusual geologic setting, the throat of an old volcano. "Crazy Bob" Womack, a "poor and only occasionally sober cowboy" made the discovery moonlighting as a prospector while herding cattle at the base of Pikes Peak. Initial skepticism greeted his findings, perhaps partially because Womack was considered unreliable and partly because the area had been salted with gold before. By 1892, though, it was clear that Cripple Creek was no hoax. That year the district produced more than $500,000 in gold. The following year output quadrupled to $2 million. In fact, Cripple Creek would become Colorado's biggest bonanza ever, producing $16 million in gold in 1899, $18 million in 1900, and $10 million as late as 1917.[166]

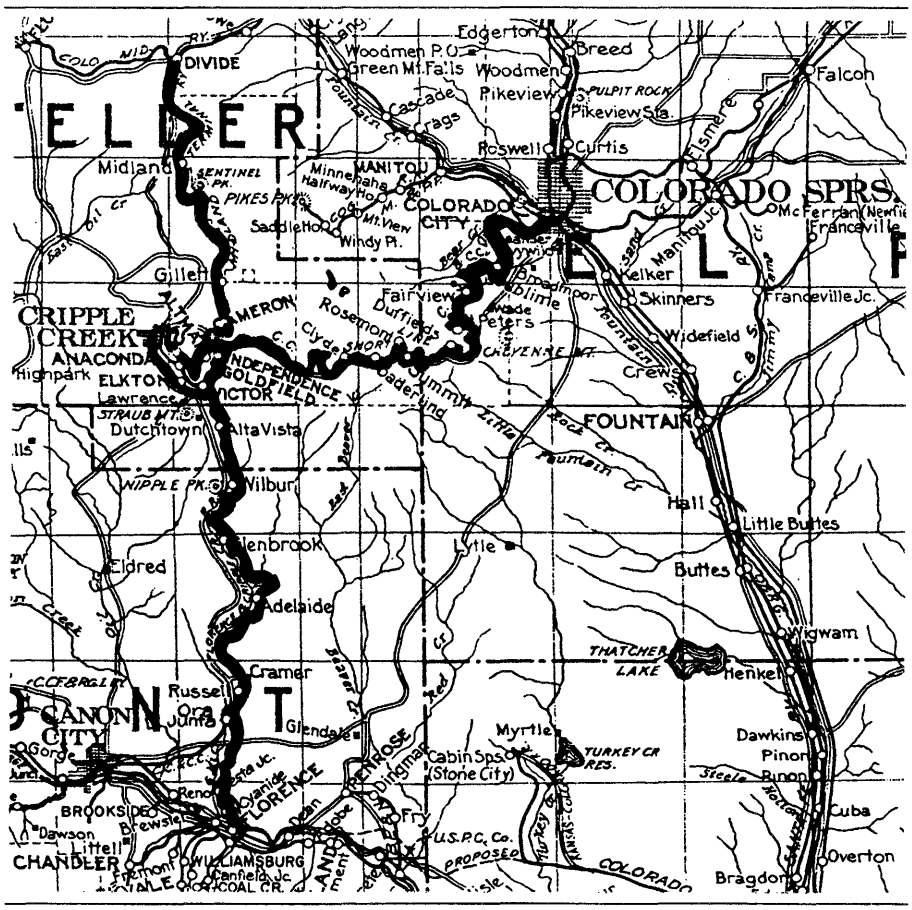


Figure 29. Railroads to Cripple Creek, from 1913 Colorado state map

Three railroads extended tracks to Cripple Creek [*see Figure 29*]. David Moffat stood behind the first railroad to reach town. In 1893 he and three associates incorporated the Florence & Cripple Creek [F&CC] Railroad Company to build from the D&RG at Florence, along Eight Mile Creek to Victor and Cripple Creek. Florence offered coal and a smelting center for Cripple Creek, and a narrow-gauge line linking the two towns could connect with the double-gauged tracks of the Rio Grande between Florence and Pueblo. For the tracks, F&CC chief engineer H.A.

Sumner used the route laid out the year before by the abortive Florence Cripple Creek & State Line Railroad. The 40-mile road would snake up Eight Mile Creek through Phantom Canyon, a steep-sided, narrow chasm criss-crossed by the creek. The railroad hired prominent Pueblo-based railroad contractors Orman & Crook to build the line, and construction proceeded up the canyon at breakneck pace through 1893 and early 1894. The contractors bored two tunnels through rock fins and built a series of low timber bridges over the serpentine creek.

Completed in 1894, six months after construction began, the railroad found itself immediately in such high demand that it had to lease additional engines and cars from the Rio Grande. The F&CC freighted equipment and supplies in, ore out, and provided local transportation for the mining force. Much of its track lay along the bottom of the narrow canyon, however, without adequate regard for flooding. The railroad lasted little more than a year before a nine-mile-long section through the Narrows was destroyed in a late-summer flash flood. The lower three miles were then raised above the streambed in a grade that was only slightly less temporary than the first, but the upper six miles were slanted up the canyon walls at a constant, and relatively flood-proof, 4-percent grade. Costing about $1 million, the construction and reconstruction of the railroad entailed 10 timber and 7 combination bridges, 142 trestles and one steel bridge–a three-span trestle erected near the Adelaide Station in April 1894. Although virtually all of the other low spans were washed away at one point or other, the Adelaide Bridge functioned in place.[167] After rebuilding, a fire destroyed much of Cripple Creek, but the F&CC survived that as well. In 1896 it incorporated another leg–from Victor to Altman–into its network.[168]

A branch of the Colorado Midland reached Cripple Creek next. The Midland Terminal [MT] was incorporated in 1892 to build a standard-gauge railroad from Divide on the Colorado Midland line west of Colorado Springs. Almost as soon as the MT incorporated, however, both the Midland and its owner, the Santa Fe, went bankrupt.[169] After some delay, the Midland Terminal continued building, reaching Cripple Creek in 1895. The MT functioned for four years before it and the F&CC were acquired by a holding company that operated them as a single entity. The newly formed combine routed ore and coal over the F&CC and machinery, food and supplies over the MT.[170] With a monopoly on Cripple Creek traffic, the company charged "exorbitant freight rates," which raised the ire of Colorado Springs investors who owned 90 percent of the Cripple Creek mines. In addition, neither railroad ran directly to Colorado Springs and neither brought ore to be smelted to Colorado Springs.[171] This proved fertile soil for the ideas of Irving Howbert, President of the First National Bank of Colorado Springs, who succeeded in convincing a group of mine owners to construct their own line to Cripple Creek.

The third railroad to build to Cripple Creek–the Colorado Springs & Cripple Creek District [CS&CCD] Railway Company–offered a shorter route to Cripple Creek than the other roads, but it took steep grades, nine tunnels and numerous tight curves to get the standard-gauge tracks up the mountain. By March 1901 the tortuous route had been completed, and crews drove in the

celebratory golden spike. The CS&CCD's aggressive backers inaugurated service on the line simultaneously with a rate war that brought the F&CC/MT combination to its knees. The CS&CCD became profitable almost immediately. Quality in every particular earned it the appellation "the gold-plated road." The natural and man-made scenery it traversed became famous with such sights as the Silver Cascades, Devil's Slide, Double Horseshoe and Cathedral Park. When Theodore Roosevelt rode the route, he reportedly called it the trip that "bankrupts the English language." All three roads subsequently passed into the hands of the Colorado & Southern, which operated them into the 1910s.[172]

The San Juans

Otto Mears' railroads in the rugged San Juan Mountains suffered from bad timing. After the silver crisis of the early 1890s, the winding narrow-gauge mountain roads that Mears had built out from Durango and Silverton both fell into financial trouble. The Silverton Railroad, Mears' first venture, had just begun to make money when the depression hit. The company operated for the rest of the decade, but when it failed in 1899, its losses nearly equalled its former profits. Mears reorganized it in 1904 as the Silverton Railway, and the line kept running–although not at a profit–until it finally closed its terminal for good in 1921.[173]

Mears' second line, the meandering Rio Grande Southern between Durango and Ridgway, had barely been completed when the crash came. When the company failed soon thereafter, the D&RG kept it operating by buying a majority of its stock and making it a subsidiary. Coal and lumber shipments gave the RGS freight to haul, in lieu of its original silver cargo. Despite frequent derailments and a high accident rate, it also became a popular tourist excursion train and a key link in the "Narrow Circle." Tourists would board a Rio Grande train at Salida and ride south to Alamosa, northwest to Durango, north over the Rio Grande Southern's tracks to Ridgway, north to Montrose, and then return west to Salida via Gunnison. The Rio Grande Southern section provided some of the most identifiable natural and engineered scenery in the state, including Lizard Head Mountain, Trout Lake and the trestles of Ophir and Telluride. As a Rio Grande subsidiary, the road began operating in the black after the turn of the century.[174]

Despite the failure of his two railroads, Mears built one more and bought a fourth, both from Silverton. He had by then moved to the east coast, where he devoted most of his energy to building the Chesapeake Beach Railroad. Mears maintained ownership and interest in his San Juan lines, but the supervision and construction direction fell to a 35-year old Scottish immigrant named Alexander Anderson. Anderson suffered from an inconvenient malady for someone headquartered at 9,000 feet above sea level: altitude sickness. As a result, he occasionally interrupted his on-site leadership at Silverton by stints recuperating at lower altitudes. Despite this, the Silverton Northern was incorporated in 1895, and by 1896 the route had reached the mine

at Eureka. It was not until 1903-04 that the road completed the sharp uphill climb to Animas Forks (Mears' toll road provided the connection during the intervening years). In 1903 the Silverton Northern also completed its own connection with the Silverton Railroad, laying its own track parallel to that of the D&RG over a short stretch near Silverton.[175]

Stockholders of the Gold King Mine incorporated the fourth road to build from Silverton, giving the remote mountain town the unusual distinction of having a railroad radiating from each of its four transverse valleys. Incorporated in 1899, the Silverton, Gladstone & Northerly built from Silverton up Cement Creek to the gold mine at Gladstone. The seven-mile-long road was completed in 1899, and, of all the Silverton lines, it was the only one to make money. It operated independently of Otto Mears until 1910, when Mears began leasing it. He bought it at foreclosure in 1915, operating it as part of the Silverton Northern. The combined Silverton Northern stayed solvent through the 1910s, thrived during the 1920s, and finally failed in the 1930s.[176]

Boulder Canyon

Both financial and natural disaster plagued the Greeley, Salt Lake & Pacific [GSL&P] up Boulder Canyon. During the Panic of 1893 GSL&P's parent company, the Union Pacific, failed. The Boulder road's precarious position was made even worse shortly thereafter when a devastating flood wiped out miles of track in the canyon, destroying trestles and dumping Engine No. 155 into the creek. When the bankrupt company determined not to rebuild, Boulder lost its connection with the nearby mines. Among the many mines closed in the wake of the silver crisis was the venerable Caribou, which had heralded the Colorado silver boom of the 1870s.

Boulder languished without a railroad for three years, but as the economy began improving in 1897, eastern capitalists formed a new company. The Colorado & North-Western [C&NW] Railway rebuilt the old line, extending it in 1898 to the gold camp at Ward. From Boulder to Ward the terrain climbed 4,000 feet in 26½ miles of track over a grade that averaged 3½ percent and attained 5 percent for a short distance near Salina. The steep road required special engines, and the C&NW boasted the very first narrow-gauge, Climax type, three-truck locomotive ever made, and the only such engine in Colorado.

As crews built the rails, they also built a tourist destination named Mont Alto Park, a picnic resort near the crest of the train's rise out of Sunset. Workmen constructed a dancing pavilion, picnic tables and a fountain of white quartz. "One need not go to Switzerland, to Italy or to Spain for sublime mountain scenery," one passenger remarked. "The ride over the C&NW from Boulder to Ward is surpassingly grand and you may challenge any country to produce its equal." The comparison stuck, and, after company promoters began advertising tours to "the Switzerland of America," the C&NW became known as "the Switzerland Trail."[177]

But the tourist trade only filled the summer months. Disappointing ore hauls from the mines along the route and difficulties in keeping the line open during the winter took a financial toll on the C&NW. In 1904 the struggling company reorganized under new ownership, changing its name from "railway" to "railroad." The Colorado & Southern agreed to add a narrow-gauge third rail along the UP's old Denver-Boulder route, allowing ore from C&NW trains to ship to Denver smelters without changing trains and excursionists to ride the Switzerland Trains directly from Denver. The combination of these two encouraging events and the quantity of ore produced at the Eldora Mine convinced the new ownership of the C&NW to extend the track 20 more miles to Eldora. This line was, if anything, steeper than the last. It climbed at an average gradient of almost 4 percent between Boulder and Pinnacle, its high point, and for a brief stretch actually attained an improbable 7 percent grade. The route introduced the touring public to stunning views from Glacier Lake, a new picnic resort built by the railroad.

After failing in 1909, the railroad reorganized as the Denver, Boulder & Western. Tourists kept coming, as a guidebook entitled "A Trip to Cloudland" described such sights as Lover's Leap, Long's Peak, North Boulder Falls and "Beautiful Glacier Lake." Stanley Steamers ran excursions from the Switzerland Trail to points along the trail. Tourists and tungsten kept the road operating for almost ten years. When Colorado reached its railroad mileage peak in 1913, the Switzerland Trail could be counted among the state's operating lines.[178]

Glenwood Springs

Several miles down the valley from Glenwood Springs, the Crystal River flowed in a valley that yielded coal and marble. A succession of companies operated standard-gauge railroads to tap these materials. Incorporated in 1892 by financiers associated with Palmer's Colorado Coal & Iron Co, the Crystal River Railway was first to build south of Carbondale toward Redstone. Construction halted during the depression of the mid-1890s, but by the turn of the century the railroad had built to the coal mines at Placita.[179]

Similarly, the Colorado Yule Marble Company operated a short, steep line south of Glenwood Springs. Formed in 1906 to quarry and mill the "superb white marble" found in the Yule Creek valley, the company did not build a railroad initially, although it seems to have absorbed the Crystal River & San Juan River Railway. Teams of horses and then steam-powered tractors had also hauled the huge pieces of marble down the steep valley. In 1910 the company completed three miles of electrically powered, standard-gauge railroad. For a half-mile stretch the gradient exceeded 15 percent, making it "probably the steepest ordinary railroad grade in the nation." In 1931 the railroad hauled its most famous piece of marble–the world's largest marble block–a 56-ton piece carved into the Tomb of the Unknown Soldier. The railroad operated until World War II, when the company, its mill and its railroad were closed and dismantled.[180]

Pikes Peak and the Argentine Central

Two popular tourist lines in different parts of Colorado joined the railroading scene at the turn of the century. Improbably steep, both attracted the attention of Western tourists, attracted as much by their engineering marvels as by natural wonders along their routes. The first of the two ascended Pikes Peak, Colorado's most famous mountain, and it did so for no greater purpose than to take people to the top.[181] The Anglo-American urge to scale Pikes Peak had dated back to 1806 with Lieutenant Zebulon M. Pike, who failed in his attempt. In 1820 a member of Stephen Long's expedition, Dr. Edwin James, became the first U.S. citizen to get to the top of the mountain. In 1858 the "Bloomer Girl," Julia Holmes, became the first Anglo woman to climb the peak. During the 1860s, John Wesley Powell mapped the mountain, and by the 1870s numerous foot trails ran up its sides. By the late 1880s an entrepreneurial livery stable owner built a 17-mile carriage road from the Colorado Midland station at Cascade to the top of Pikes Peak. He carried on a lively business carting tourists to the mountaintop on day trips.[182]

With so much traffic up the mountain, a railroad was certain to follow. A Michigan veteran of the Civil War, Major John Hulbert, organized the Manitou and Pikes Peak [M&PP] Railway, the directors of which included leaders of the Rio Grande, railroad men from the Rock Island and the Colorado Midland, and Colorado mining magnates. The majority shareholder, Zalmon Simmons, is said to have become convinced of the necessity of a railroad up Pikes Peak after having made the trip in slippery silk breeches on the back of a stiff-legged mule. No matter what the motivation actually was, the M&PP was incorporated in 1888, and its engineers had built to the mountain's top in 1890. It carried its first passengers in 1891.[183]

The M&PP had no equal in Colorado. First, it served tourists as its original purpose and not as an ancillary function, which had been the case for all of Colorado's preceding railroads. Second, it was the only rack-and-pinion railroad west of the Mississippi River, and the only cog line to use the double-rack ABT construction for propulsion. Its maximum gradient was the steepest in the state, a startling 25 percent, and its nearly nine miles of track climbed higher than any other line in North America, besting its nearest rival by 1,000 feet.[184] The M&PP, although physically connected to no other line, lay less than a mile from Rio Grande and Colorado Midland trains at the Manitou Springs terminal. The Colorado Springs & Interurban Company, formed at the turn of the century, offered a third means of access nearby. The M&PP closed in winter and opened in the summer for tourists. Financial stability came almost immediately to the M&PP and stayed; in 1913 the company paid its investors a 40 percent dividend.[185]

The Argentine Central [AC] was the second steep, high, short railroad to gain favor with tourists. Unlike the M&PP, the AC was not built for tourists, but for the silver trade. Ignoring the failures of virtually all previous silver-based rail lines in Colorado, Edward Wilcox, a Methodist minister turned mine owner, organized the Argentine Central in 1905 from Silver Plume to the silver mines at Waldorf. It took crews a year to build the 16-mile, narrow-gauge line from the top of

the Georgetown Loop up Mt. McClellan. Completed in 1906, the Argentine was the highest regular-traction railroad in North America, with a maximum elevation of 13,110 feet.[186] The AC built one switchback for every two miles of track, and climbed a gradient of almost 7 percent.[187]

Unfortunately, the road's financial record failed to match its technological performance. During the first decade of the 20th century, silver prices tumbled yet again, seriously depressing the AC's earnings. When tourists discovered the railroad, the AC promoted itself as "the world's highest railway." It combined with the Georgetown Loop as a tourist attraction easily accessible from Denver, although its success as a tourist attraction was not helped by Wilcox's unwillingness to operate on Sundays. "The Lord is my partner in all my business, " Wilcox explained to a business associate. "He has done well by me and I am going to honor His day." Wilcox was compelled to sell his railroad three years later to new owners, who added 500 feet of track and a seventh switchback. In 1912 the railroad was sold at a foreclosure sale to yet another group of owners who operated the line unprofitably until World War I, when the little railroad finally closed for good.[188]

Along the Continental Divide

On the Colorado Midland's road to Aspen, the most significant change during this period involved construction of a new tunnel under the Continental Divide. The line had proved extremely expensive to operate because of its many curves, steep grades and high passage through the Hagerman Tunnel west of Leadville. To mitigate these expenses, the Midland built a new, lower-gradient bypass around Leadville and in 1893 completed construction of a new bore 600 feet in elevation below the Hagerman Tunnel. The separate, but affiliated, Busk Tunnel Company drilled the 1½-mile Busk-Ivanhoe Tunnel through the divide at about 10,800 feet. Construction took over three years, cost more than $1 million, and claimed the lives of 20 workers.

The Busk-Ivanhoe Tunnel served the Colorado Midland well, but the railroad itself failed during the silver slump of the mid-1890s. When it emerged from receivership later in the decade, it stopped using the expensive new tunnel to avoid paying the lease and in 1898 resumed traffic through Hagerman Tunnel. This led to the odd situation, noted by *Engineering News* in 1898, of "a tunnel for sale or to let and no customers in sight." The decision turned out to be equally bad for both the Midland and the Busk Tunnel Company. Severe snows during the winter of 1898-99 kept the line snowbound for nearly three months and cost several lives. In 1899 the CM bought the tunnel outright, using it until the company ceased operations during World War I.[189] The Busk-Ivanhoe Tunnel was both high and long for its time. Archibald Black found it important enough to cover in his 1937 treatise, *The Story of Tunnels*. It may have been the strange history of being jilted by its sponsor as much as its technical achievement that earned it notice. Black devoted more ink to the Busk-Ivanhoe's remarkable circumstances than to its technology.[190]

Small-scale Specialty Railroads

In southern Colorado rail tendrils stretched to connect main lines with mines or resources in support of industry. Four companies built rails in support of four industries: steel, lumber, stone and coal. The Colorado & Wyoming [C&W] railroad, incorporated in 1899, served steel. A fill-in line created by the Colorado Coal & Iron Company (by then renamed the Colorado Fuel & Iron Company), it linked the blast furnaces and steel mill at Minnequa near Pueblo with coking coal west of Trinidad and an unusual new deposit of iron ore discovered at Sunrise, Wyoming. The company laid about fifty miles of track over four years, connecting coal mines and limestone quarries with Santa Fe, Cheyenne Northern, and Rio Grande main lines [*see Figure 30*]. The C&W transported both minerals and miners who commuted along its rails.[188]

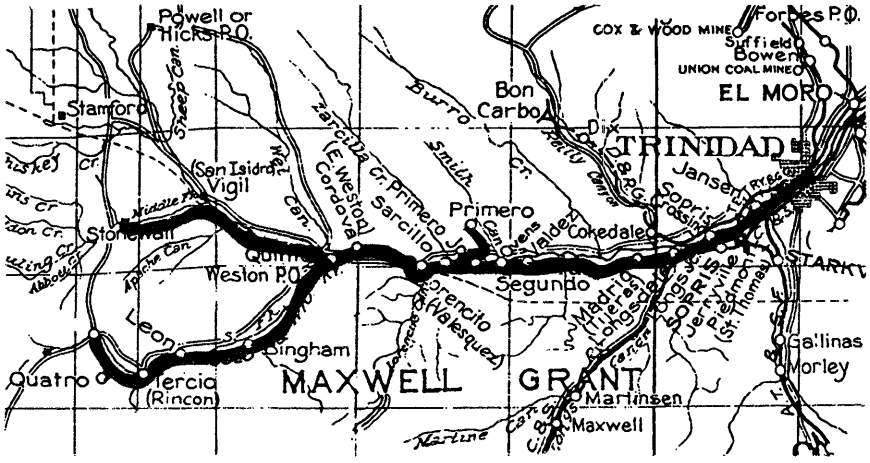


Figure 30. Colorado & Wyoming Railroad, from 1913 Colorado state map

The Rio Grande, Pagosa & Northern [RGP&N] Railroad formed in 1899 to serve the lumber industry, which in turn served the railroads. Original construction on the Rio Grande in southern Colorado had created a demand for wooden ties. This demand subsided after the tracks were laid, but as the green ties later began to age, a more consistent need for new ties emerged. The lumber industry in southern Colorado grew from the need for replacement ties; in 1886 three of the pioneer lumbering operations began on the New Mexico side of the Rio Grande line. The lumber entrepreneurs expanded beyond ties, providing shingles, flooring, siding and other kinds of milled and finished lumber for building, as well as wood for further railroad construction such as trestles, bridges and cross ties. The regional railroads made for a mutually beneficial partnership: they provided transportation to market, as well as a buyer for Colorado timber, and the lumbermen provided the railroads with freight.

Before long the loggers realized that trains could also haul raw logs to the mill, spawning the RGP&N. In 1899 the company built from Pagosa Junction toward Pagosa Springs. The 14-mile line was completed the following year. Within two years the Rio Grande acquired a good portion of its stock; by 1908 the RGP&N became part of the D&RG system. The road shipped lumber well into the 1920s.[189]

The Colorado-Kansas Railway Company incorporated in 1911 to serve the stone quarrying industry. The Colorado-Kansas laid track between Pueblo and a sandstone quarry located about 22 miles away. The company built its standard-gauge line west to Turkey Creek, and then up the creek to the quarries. Completed in 1912, the road had good connections in Pueblo with the Santa Fe and the Rio Grande, and hauled sandstone for nearly 20 years before sandstone fell from favor as a building material and the quarry closed.[193]

The fourth small southern Colorado railroad–the Colorado & Southeastern [C&SE]–incorporated in 1903 to deliver coal from the Victor Fuel Company's mines to the C&S, AT&SF, and D&RG railroad main lines. The Colorado & Southeastern laid track between the Rio Grande line at Barnes and the C&S Ludlow-to-Hastings Branch, creating the new station of Barnes Junction. The C&SE then purchased the C&S track between Barnes Junction and Hastings. The railroad controlled a second short connection near Florence that allowed for access to the AT&SF. These two pieces of track comprised the entire rail possessions of the C&SE, less than ten miles total.[194]

The Eastern Plains

Other than the Cripple Creek district, mining in Colorado had begun to yield less during the 1890s, and agriculture began to yield more. As a result, railroads built several lines to service agriculture. Three companies–one well-established and two newcomers–added track across Colorado's northern and eastern plains. The Union Pacific built east to service wheat, the Great Western Railway served the emerging sugar beet industry, and the Denver, Laramie & Northwestern built toward Idaho in apparent service to the industry of milking the unwitting of their investments; that is to say fraud.

In the late 1800s the Colorado plains had made a liar of Major Stephen Long, who in 1820 had pronounced them "almost wholly unfit for cultivation." Native Americans statewide and Mexican Americans in the San Luis Valley had grown subsistence agricultural crops long before the gold rush. After the gold rush, demand from the mines had pushed agricultural development, and Anglo farmers joined Native Americans and Mexican-Americans in the fields. Farmer entrepreneurs, among them the young Otto Mears, established flour mills in the San Luis Valley and concentrated efforts at producing surplus crops for export up the winding mountain trails and rails to the mines. Potatoes, corn meal and wheat flour were among the first agricultural products produced in quantity for sale.

Farmers experimented on the dry plains with types of wheat seed and planting schedules to make the crops yield so that by the turn of the century wheat had became Colorado's number one crop. The Union Pacific found wheat profitable enough to warrant new track construction,

in 1910 building two branch lines, one from Greeley Junction to Purcell and another from Cloverly to Briggsdale [*see Figure 31*]. Known as the Dent Lines, these branches left the UP's main Denver-Cheyenne road at Dent to bring Colorado plains wheat more readily to the mills.[192]

At the same time the government sent Colorado's mining economy tumbling with its silver policies, its increased tariffs on imported sugar provided a tremendous boost to the economy of a Colorado specialty crop. Sugar beets had been grown commercially in northeastern Colorado, particularly in the area around Loveland and Greeley, since the 1870s. Northern European immigrants here had predicted that sugar beets would "produce more gold than all the mines in the mountains." Raising the capital to build a processing factory had proved elusive, however, and sugar beets remained a relatively small crop. They existed, along with potato farming, as a staple but not a bonanza crop.[193]

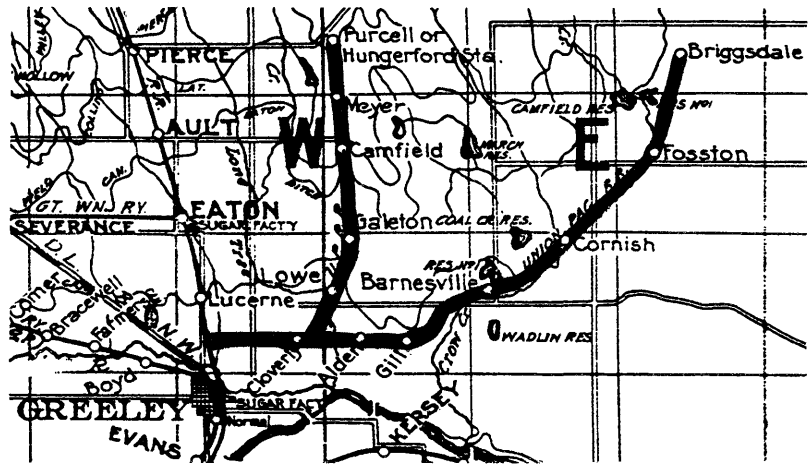


Figure 31. Union Pacific Dent Lines, from 1913 Colorado state map

Buoyed by the new demand for domestic sugar, four processing plants were constructed in northern Colorado after the turn of the century. The first opened in Loveland, a town named after one of the founders of the old Colorado Central and located on the Colorado & Southern. As the sugar beet factory was under construction east of town, the C&S extended a spur to it from the main line. Other plants soon opened in Greeley, Eaton and Windsor, and by 1905 six beet processing plants dotted the northern plains. That year they consolidated into one firm, which took the name of the Loveland plant: the Great Western Sugar Company.[194]

Heavy and dense, sugar beets were poorly carried by horse-drawn conveyances and ideally suited to rail transport. The Great Western [GW] Railway began as a two-mile-long spur track laid by the C&S in Loveland in 1901. That year the railroad incorporated as a subsidiary of the sugar company to transport sugar beets from the fields to the factory and processed sugar from factory to market. In 1901 the Great Western laid additional track to Buda southeast of Loveland and over the next few years built branches between various factory locations based on need and the growth of the company. By 1907 all the company's branches were connected [*see Figure 32*].[195]

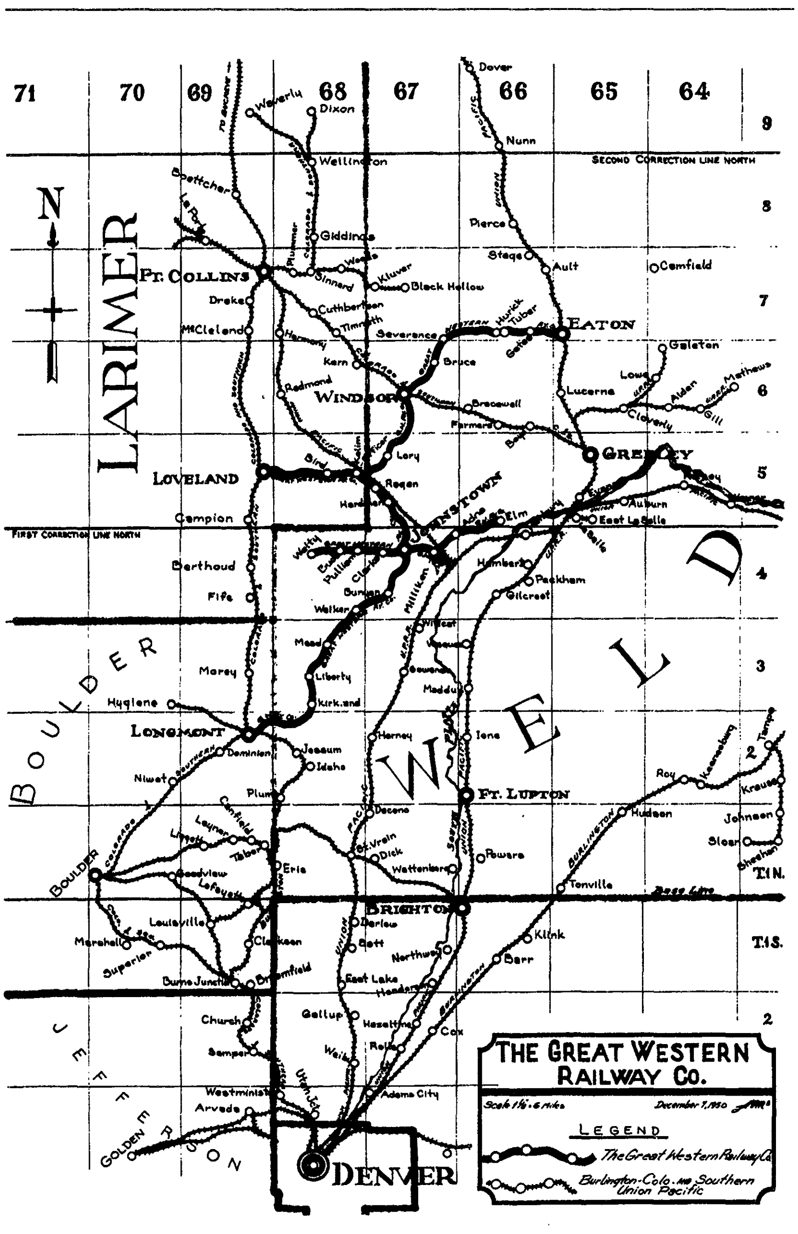


Figure 32. Great Western Railway, from 1950 map

The Great Western Railway extended from Loveland to Officer Junction near Dent and the Union Pacific's Fort Collins extension on the Denver-LaSalle-Julesburg coal mine extension line. From Officer Junction one branch ran northeast to Windsor and Eaton, where it connected with the UP's Denver-Cheyenne line. Another branch ran south through Johnstown to Longmont, where it stopped at an intersection with both the C&S and the CB&Q lines, either of which could take it to Denver. In the center of its route, track extended from Johnstown west to Welty and east to Milliken and Elm.[196]

The Great Western Railway transformed the landscape of northern Colorado. Beet fields expanded beside the railroad rights-of-way, where farmers could obtain easy access to the railroad. Great Western station stops developed a built environment suited to the sugar beet industry. Although crews of shovel-wielding men initially provided the unloading power, conveyers, flumes and cranes were later used to move sugar beets from train to factory. To protect the weather-sensitive beets between unloading and processing, long sheds were built in Loveland and at the other plants. Trains pulled into these for unloading, and piles of sugar beets stood sheltered by these sheds until they could be processed.[197]

RAILROADS IN COLORADO 1858-1948

During World War I the Great Western purchased another railroad that extended south from Milliken to the UP's Boulder Valley line near Brighton. The Great Western operated this road until just after World War II, when it abandoned it and removed its rails. The railroad that had actually built the line was the Denver, Laramie & Northwestern [DL&NW]. Incorporated in 1906, the Denver, Laramie & Northwestern Railway has been called "one of the most ill-advised and overly ambitious railroad projects" in Colorado's rail history.

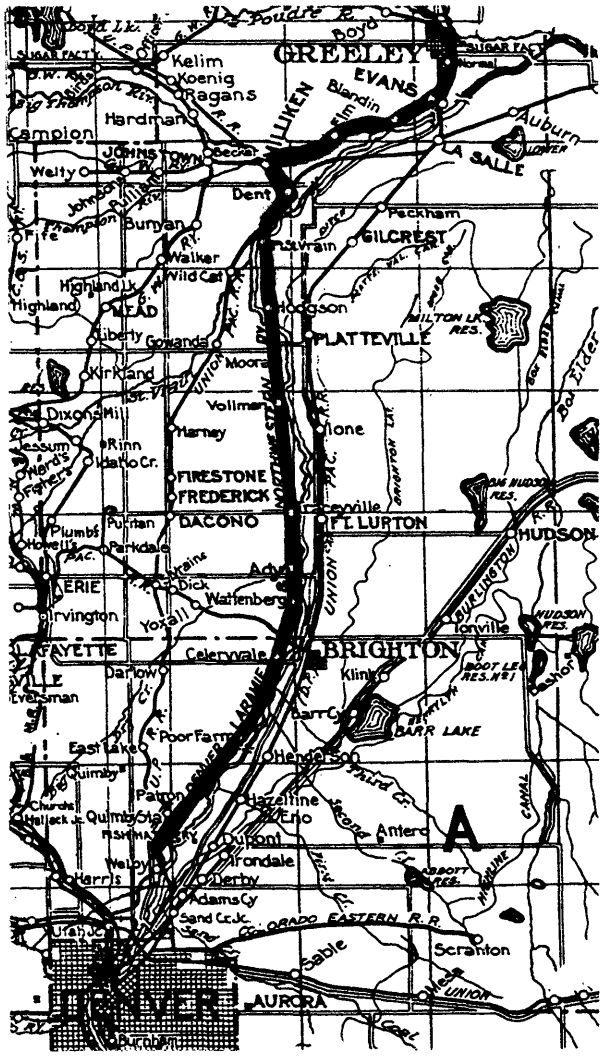


Figure 33. DL&NW Railroad, from 1913 map

In terms of both its stated ambition and its financing, the company was a throwback to an earlier period of Colorado rail construction. At a time when the Union Pacific dominated Pacific traffic north of Colorado, the new company announced its intention to build a standard-gauge line from Denver to Laramie, Boise, and on to Seattle and the Pacific coast, a direct challenge to the UP that the larger line took seriously. Most railroads at that time were financed by Wall Street banking houses, but the DL&NW, by contrast, raised capital through local sale of common stock. By 1908 the company's investors numbered some 1,600 small stockholders. By announcing transcontinental ambitions supported by local funding, the railroad was reminiscent of an 1880s Colorado line.[198]

Tracklaying began in 1909 on a 36-mile stretch from just north of Denver to Fort St. Vrain, a new town created by the railroad. The DL&NW followed the often-exercised railroad penchant for organizing a real estate affiliate to promote land sales along its line. Between Denver and Fort St. Vrain, the railroad created other new towns at Welby and Wattenberg. With the company already running short of funds, the DL&NW solicited bond support from both Fort Collins and Greeley in 1910. But before the outcome could be determined, the Union Pacific began building a line to Fort Collins to preempt the DL&NW. Fort Collins declined to help the upstart company, but Greeley contributed money. In 1910

DL&NW crews built from Fort St. Vrain to Milliken, another new town, and then on to Greeley in the face of UP harassment. The tracks stopped at the southern limit of Greeley and only reached into the town itself because local citizens organized to build the last 1.3 miles of road and a modest depot [*see Figure 33*].[202]

The DL&NW never got any closer to Wyoming, Idaho or the Pacific than Greeley. The railroad failed in 1910, reorganized, and then resumed work. Despite additional grading and construction of the nearly 400-foot-long Butte Royal tunnel in northern Colorado, no additional track was ever laid. The railroad failed again in 1912. At the receivership proceedings, Denver District Court Judge Harry C. Riddle applied an extremely unusual selection process in his appointment of a receiver. The judge "look[ed] across his courtroom, spotted his bailiff, Marshall B. Smith, and appointed Smith as the railroad's receiver." Perhaps even stranger, Smith and his brother ran the railroad fairly successfully over the next five years. When the railroad failed one last time in 1917, it was sold for scrap. The Great Western Railway bought the Milliken-to-Wattenburg branch, operating it until just after the second world war.[203]

Investors lost over $26 million on the DL&NW. Naivete cannot account for the DL&NW's quixotic challenge to the UP and its meandering, disorganized construction patterns. The primary driving force behind the railroad, John Milliken, had more than thirty years of experience as legal counsel to the Union Pacific and the Rock Island before undertaking his new venture. Fraud, on the other hand, may work well to explain the DL&NW's eccentricities. Historian Kenneth Jessen has suggested that land development and speculation may have been the railroad's real purpose. Railroad president Charles Johnson bought land in advance of railroad construction and sold it at inflated prices to the real estate arm of the DL&NW; construction loans proved to be significantly larger than the actual cost of construction.

The large number of minority stockholders made for an easily manipulated and disorganized group of investors, who would have trouble taking action against Milliken and Johnson.[204] If, as Jessen asserts, the DL&NW was "nothing but a humbug from the start," it is clear that the Union Pacific took the threat seriously. The legacy of the humbug company includes the UP's defensive line to Fort Collins, as well as new settlements created by the railroad on the Colorado plains. Ironically, the town of Milliken, named for the "king of the humbugs" himself, attained the most lasting importance. Milliken developed into an important center of sugar beet activity and a UP connection to Fort Collins and points north.[205]

The Interurban Lines

With more people moving to Colorado cities at the turn of the century, Denver grew from just over 100,000 in 1890 to over 200,000 by 1910, and Colorado Springs's population over the

same period tripled from about 11,000 to nearly 30,000. Population growth in Denver and other front range cities around 1900 encouraged railroads to offer intra- and inter-city passenger service. The distinguishing features of these lines were their passenger focus, relatively short routes, and often their use of electricity rather than steam for power. Electric interurban lines first entered the Colorado cityscape in Cripple Creek, between Denver and its satellite communities, around Trinidad, and in Grand Junction and the Grand River Valley. Many of these interurbans operated into the 1950s before being replaced by cars and buses.[206]

The Denver Tramway Company [DTC] controlled two of the three major interurban railroads operating from Denver. Trailing an impressive and complex genealogy that dated back to the 1867 Denver City Horse Railroad Company, the DTC by 1914 operated nearly 250 miles of track and nearly as many cars. DTC lines extended from Denver to Aurora, Englewood, Golden and Arvada.

A DTC subsidiary organized in 1890, the Denver & Intermountain [D&IM] first extended from Denver to Golden, home of one of its founding directors, W.A.H. Loveland.[207] The original D&IM planned to transport passengers by day in electric cars and freight by night using steam locomotives. The company began first with steam power and inaugurated its first section of electric-powered service in 1893 to the Denver subdivision owned by circus entrepreneur P.T. Barnum. As the *Denver Republican* reported, "Denver has thrown out another tentacle of iron and drawn an additional suburb more close to herself." The line also implemented its night freight hauling strategy by carrying such domestic cargo as bricks, beer, paper and flour. The dismal economic condition of the 1890s took its toll, however, and the company failed. It reemerged in 1904 and completed electrification of its entire line by 1910. Shortly afterward it became part of the Denver Tramway Company, maintaining connections to Denver's western neighbors, Lakewood and Golden. The D&IM operated into the 1950s.[208]

David Moffat backed Denver's second DTC-controlled interurban, the Denver & Northwestern [D&NW] Railway Company. The D&NW hauled coal, not passengers, from the DTC-controlled Leyden coal mine. Completed in 1903, the original road was later extended to Golden. This line was completely electric and built on a 3½-foot gauge to match the Denver Tramway's tracks. The D&NW operated its yellow cars until 1950.[209]

The last of Denver's electric interurbans was the Denver & Interurban [D&I], a subsidiary of the Colorado & Southern. Incorporated in 1904, the D&I originally planned for electrified trains to run from Denver to Fort Collins via Boulder. When trails reached Boulder in 1908, the Burlington assumed control of the C&S and its subsidiaries, however, and the fiscally conservative company opted to terminate the line there. The D&I reached Boulder via either Louisville or Marshall. Despite the fact that both Louisville and Marshall mined coal, the D&I carried only passengers, leaving the freight to the C&S. The bird's eye view of the D&I's route with the line

from Denver, diverging at Louisville Junction to Louisville on the east and Marshall on the west, and then converging in Boulder, looked something like a kite. This gave the D&I its nickname, the "Kite Route." The D&I suffered financially for most of its operating life because population along its line was sparse. In 1926 the line failed and was not reinstated. Instead, the C&S became the first of the Denver interurbans to begin motorized bus transport, under the name of the Denver & Interurban Motor Company.[210]

All three Denver interurbans operated from a point in Denver known as "The Loop." The Denver Tramway pioneered construction of the loop in order to serve its passengers better, by building from its terminus on the South Platte River down Champa to downtown Denver. Two loops constructed between Lawrence and Curtis and 14th and 15th Streets became the heart of all three interurban routes and the end of the line. Because all of the local passenger carriers passed through this section, the area grew to be the heart of downtown.[211]

Electric interurban provided a popular means of transport for several other Colorado cities as well during the early 20th century. The Colorado Springs & Interurban [CS&I] grew from a standard-gauge horsecar line in 1888, converting to electric propulsion by 1890. The CS&I carried passengers in and around Colorado Springs until the 1930s.[212] In nearby Cripple Creek, the Cripple Creek District [CCD] Railway incorporated in 1897 to provide a mass transit system for the mining area. Unlike other electric passenger railroads, which ran on fairly level ground, the CCD route included a stretch with a 7½ percent gradient, allowing it to pull only one car. The electric-powered CCD operated independently for only a year before incorporating as the Colorado Springs & Cripple Creek District Railroad.[213]

Trinidad's electric interurban system linked the city with coal and coking operations around it. The Trinidad Electric Railroad first began operating in 1904 from Trinidad to Starkville and Sopris, running over thirteen miles of third-railed, electrified track. In 1906 the road expanded to serve Cokedale. Between 1908 and 1911 it organized and reorganized several times, the latest in 1913, transporting passengers until 1923. After that time most of its track was taken up, with only a stretch of track to the company's power plant functional into the 1950s.[214]

The Grand Junction and Grand River Valley Railway has been called "perhaps the most typical of Colorado's interurbans." Begun as a city street car line in 1909, it had by 1910 reached Fruita via electrified track. The line failed and reorganized twice as it operated into the 1920s and finally stopped providing passenger service in 1928 and freight service in the 1930s.[215] Two other small, non-interurban lines also operated from Grand Junction. The Little Book Cliff Railway ran narrow-gauge tracks from Grand Junction to the Book Cliff Coal Mine between 1899 and 1922. The Little Book Cliff transported passengers as well as coal. The Uintah Railway ran from Mack through rimrock canyon country to Waston, Utah, to bring gilsonite to the D&RG. It built from 1903 to 1911 and operated until 1939.[216]

Transcontinental Ambitions: Utah and the Pacific

At the turn of the century Colorado's last important, locally created railroad with genuine transcontinental ambitions emerged. In 1902 David Moffat, then just over 60 years old, incorporated the Denver, Northwestern & Pacific [DNW&P] Railway Company in a bid to realize Denver's longstanding quest for a mainline transcontinental route. Since the 1880s, when the Denver & Rio Grande had completed its labyrinthine road through the Royal Gorge and the Black Canyon to Grand Junction, Denver had maintained a Pacific outlet. But the route was winding, slow and increasingly dangerous as George Gould began diverting assets away from track maintenance. It was also a narrow-gauge route that would never earn it a place on a mainline route.

Why Moffat chose this project at this point in his career is not entirely clear. He had by then been involved in many railroad ventures, including the DP, the F&CC, the DT&G and the D&RG.[217] He had been president of the First National Bank in Denver for over twenty years, giving him an opportunity to pledge bank assets in support of numerous Colorado projects. He had owned or invested in scores of mines and had developed a reputation for buying relatively young claims, developing them, extracting the easy-to-get minerals and then, as production began to decline, soliciting investors. By the turn of the century, Moffat had realized his ambition to become rich in the West; with a fortune of over $7 million, he was the wealthiest man in Colorado. Despite his prosperity, Moffat had rarely been given to public charity. With the exception of a few gifts bestowed on his hometown, he was more often disposed to make personal profit at public expense.[218] This pattern changed during the building of the DNW&P, however, as Moffat open-handedly applied his own fortune to the railroad and undertook its advocacy and direction at great personal cost.[219]

The idea behind the DNW&P–often referred to as the Moffat Road–was to drill the kind of long tunnels used in the European Alps to avoid the steep grades of the Rocky Mountains.[220] In the early 1880s the 9½-mile St. Gotthard Tunnel between Switzerland and Italy had been successfully completed, and at the time the Moffat Road was incorporated, the 12½-mile Simplon Tunnel between Italy and France was nearing completion.[221] Moffat planned to build west from Denver to the side of James Peak and pass beneath the continental divide via a six-mile tunnel that would avoid the steep mountain grades and heavy snowfall. The route would take the train between the D&RG and UP roads, passing through Steamboat Springs and Craig where rich coal mines would provide revenue, and then on to Utah. In so doing, Moffat planned to open up the most remote part of Colorado on his way to the Pacific.

The company incorporated in 1902 and, outside of a $2 million loan received from Moffat's own bank, faced immediate fundraising problems. Rather than delay construction, Moffat used his personal fortune to begin work as he tried to raise capital from outside sources. He appointed as chief engineer H.A. Sumner, the man who had worked on Moffat's Florence & Cripple Creek

Railroad as well as on an earlier, aborted effort by the Burlington to build west of Denver.[219] The Moffat Road involved several second-generation Colorado railroad men as well. William Evans, son of South Park and Denver, Texas & Gulf backer John Evans, participated as Moffat's full partner. Moffat's mentorship of John Evans was fitting, given the longstanding relationship between Moffat and Evans' father. The Moffat Road's number two engineer was Arthur Ridgway, the son of a doughty D&RG engineer famous enough to have a town named after him in Ouray County.[220]

By 1904 rail crews had completed track to the location of the proposed tunnel. When finances would not support construction of a long tunnel, the men built up an additional 2,500 vertical feet in a long, steep, expensive route that crested the divide at 11,600 feet, forming the country's highest open crossing. The line reached Kremmling in 1907 [*see Figure 34*], Steamboat Springs in 1908 [*see Figure 35*]. That year, assisted by financing from retired principal of the D&RG David Dodge, the Moffat Road built its own depot in Denver, the Union Pacific and D&RG having refused to give it space in Union Station.[221]

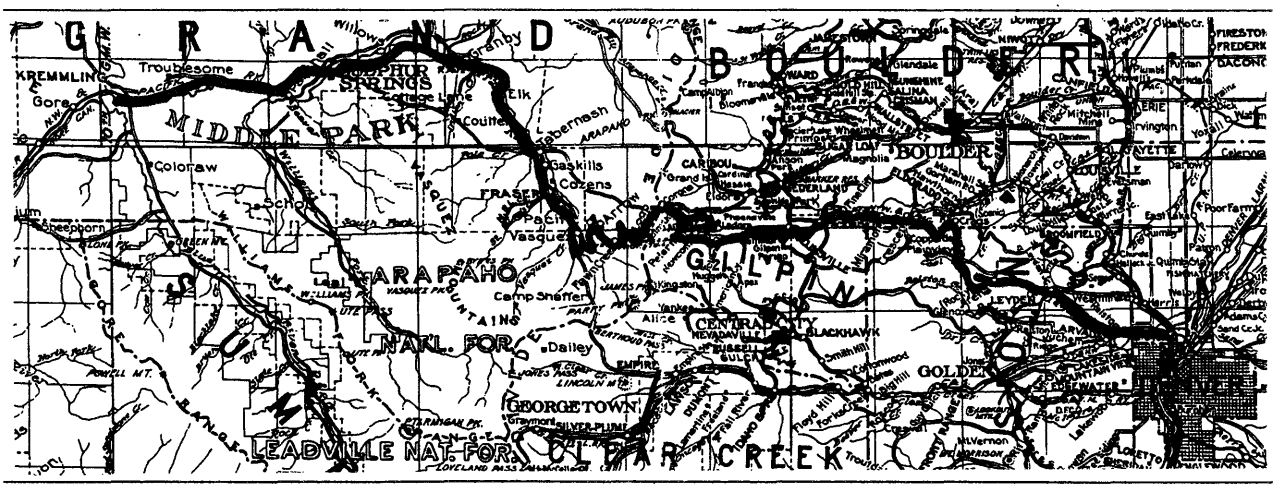


Figure 34. Denver, Northwestern & Pacific Railroad, Denver-Kremmling, from 1913 Colorado state map

Engineering General Manager Arthur Ridgway pronounced the 176-mile stretch between Denver and Toponas, "the most successful route through the most difficult country ever built in all of America." The railroad climbed at a 2 percent grade from Denver to the site of the proposed tunnel and then held at continuous 3-4 percent grades to Rollins Pass over the divide. From there track dropped steeply on the west side and wound its way through rocky Gore Canyon before rounding the corner toward Steamboat Springs. The route required 56 tunnels in all, more than that of all the other railroads in Colorado combined.[222]

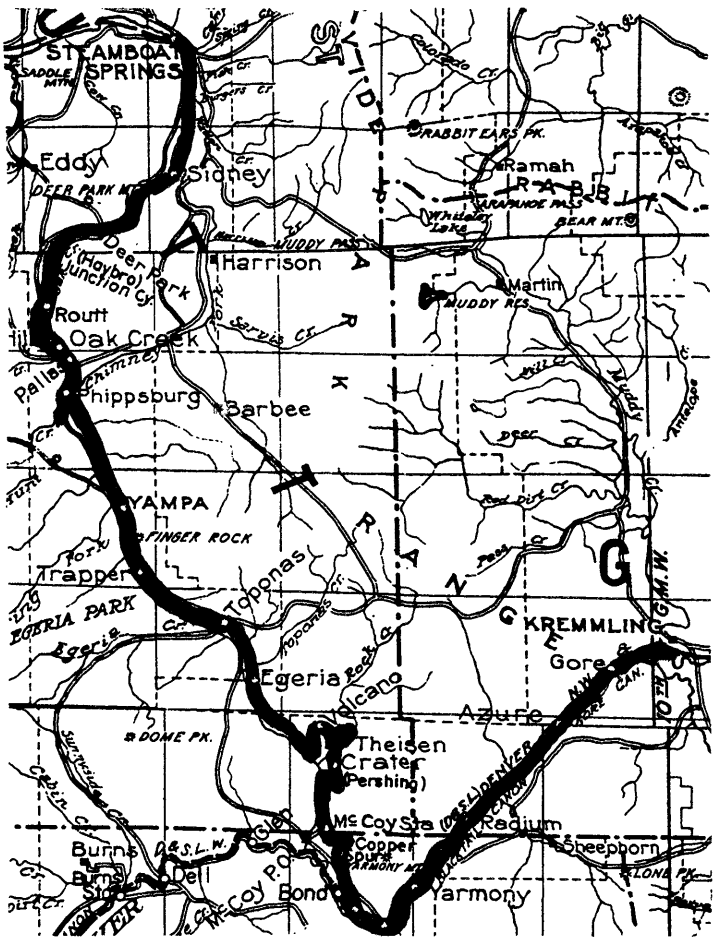


Figure 35. DNW&P RR, Kremmling-Steamboat Spgs, from 1913 map

Ridgway may not have been thinking about snow when he pronounced the route "successful." The Corona section of Rollins Pass averaged some of the heaviest snowfall in the state, requiring nearly year-round use of massive rotary snowplows. Additionally, workers built miles of snowsheds, which were largely ineffectual in sheltering the tracks and virtually useless for controlling the spring thaw that flowed over the tracks by day and froze solid by night.

Despite spending as much as 41 percent of total revenues on snow removal over Rollins Pass, the railroad still failed to keep the line open continuously. The exorbitant operating costs could hardly be paid by revenues from the sparsely settled region through which the railroad ran. Reaching Steamboat Springs helped by tapping the rich coal mines and cattle trade there, but even these revenues were insufficient to keep the railroad financially afloat. To make matters worse, cattle transported through the frigid route in ordinary cattle cars sometimes died of exposure before reaching their markets, making the railroad less attractive for ranchers.[223]

By 1911 the Moffat Road had succeeded in traversing difficult terrain and had penetrated the most remote corner of Colorado. In the process, though, Moffat had exhausted his entire fortune, put his bank's stability at risk, spent an addition $4 million from New York investors that he was unable to repay, and had used up additional money collected from Denver investors and community bond issues. As he immersed himself in a strategy to renegotiate the $4 million bond repayment in March 1911, David Moffat died at the age of 71. He was virtually penniless; his estate could not even afford to erect an appropriate tombstone. Several years later the city of Denver itself bought a tombstone for the grave. Shortly after Moffat's death, the Moffat Road fell into receivership. Its resurrection came in 1913 in the sympathetic hands of William Evans, who

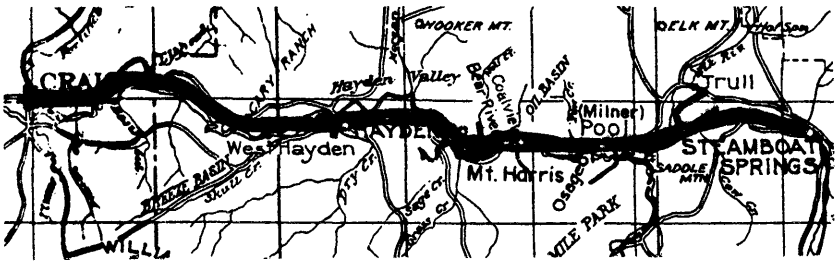


Figure 36. DNW&P Railroad, Steamboat Springs-Craig, from 1913 map

kept the transcontinental objective alive by building from Steamboat Springs west along the Yampa River to Craig [*see Figure 36*].[227] After emerging from receivership in 1913, the line struggled for several more years. Another failure and another resurrection would follow.

The Railroad Net in 1913

By 1913 a fully developed system of railroads traversed the mountains and plains of Colorado. Standard gauge dominated track width, although narrow gauge still held sway in the mountains, and odd widths could be found on some specialty lines. Colorado's big three–Union Pacific, Burlington and Rio Grande–controlled much of the state's rail traffic. The three essentially stayed out of each other's way; Union Pacific country lay north of Denver, the Burlington dominated north-south traffic along the front range and its own connections east, and the D&RG still held the mountains. These patterns would hold to the end of the 20th century. Of the three, the Rio Grande was by far the weakest. In fact, it would totter into the next period of Colorado rail history only to expire before the end of the 1920s. During its next resurrection, however, it would be the only one of the big three to make a significant contribution to the Colorado railroad landscape during the last period of rail history.

Colorado railroads, at the peak of their operating influence, carried the seeds for their own decline. The expense and difficulty of building and operating railroads coupled with the undeniable advantage that railroad access gave to any community it reached had combined to make the rail companies powerful. Any community served by only one railroad could almost count on paying higher freight rates than areas where two or more railroads competed for passengers and freight, as railroads used their advantage to the fullest. This practice angered and frustrated people who were dependent on railroads to ship their products to market, and who despaired of getting the best return because higher freight rates made their products less competitive. In addition, railroads were notorious for giving favorable freight rates to high-volume shippers, often in the form of rebates, further frustrating small-scale shippers who found it hard to compete with larger enterprises. Railroads laborers also began to band together to negotiate for safer working conditions, better pay and shorter days. All of these changes at the turn of the century meant that railroads, although critical to Colorado's communications and commerce, had garnered little good will in the hearts of the people dependent upon them. This climate of resent-

ment set the stage for shippers to embrace a different form of transportation as soon as the technology presented itself.

Representing a new transportation technology, the automobile began to capture the state's imagination at the turn of the century. It also became the object of organizational efforts. In 1902 the Colorado Automobile Club organized, and in 1905 and 1906 the club sponsored several "Good Roads" conferences, leading to the establishment of a Colorado Good Roads Association. In 1909 a State Highway Commission began operating, and in 1911 and 1912 bond issues supported the development of a mountain park system around Denver specifically to provide pleasant destinations for automobile tourists. In Colorado Springs entrepreneur Spencer Penrose was about to build an automobile road to the top of Pikes Peak, and farther north on the front range an automobile passenger service began operating from Loveland to Estes Park.[228]

By 1913, rail transportation was still vastly superior to automobile transportation. Rail transportation was faster, more comfortable, could be conducted year round, could carry tons of freight, and it reached many more places in the state than did automobile "good roads." Automobiles, however, appealed to the independent spirit of Westerners. They could be driven wherever there were roads to carry them and could stop wherever they wanted. Perhaps most importantly, they were controlled by the people who drove them, and not some external, monopolistic, inflexible power.

5 The Years of Retrenchment: 1913-1967

As the automobile slowly gained in technical sophistication and popular support, Colorado railroads entered a period in which abandonments began to outpace construction. From just before World War I until just after World War II, railroads in the state would reach a state of dynamic equilibrium. Much of the trackage abandoned during this period would be vacated in the cause of greater efficiency and improved corporate cooperation. Railroads would give way to automobiles as the preferred mode of passenger travel, and a significant amount of freight hauling would pass to automotive trucks as well. Motive power on the railroads changed due to the technological advances in automobile motors, and after World War II trains most often operated on diesel fuel instead of steam power. This precipitated further rail abandonments as coal deposits no longer formed a necessary destination. Sightseers would discover the narrow-gauge route between Durango and Silverton, and a resurgence in interest in the narrow gauge as a curiosity would bring back several abandoned routes. Trains, by their very antiquity, would provide new tourist appeal. Finally, in contrast with the industry-wide retrenchment, several stretches of new construction would occur in the state.

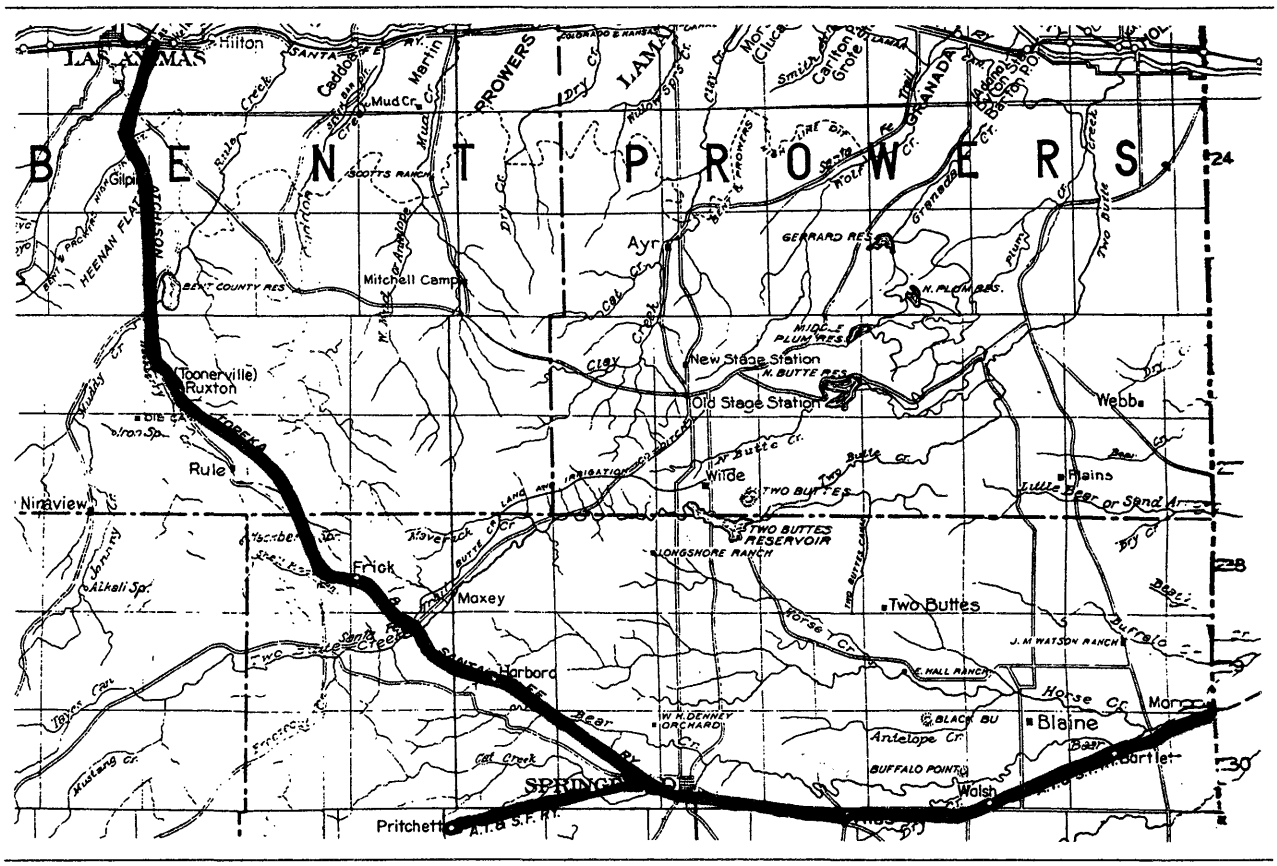


Figure 37. Atchison, Topeka and Santa Fe Railroad, Bartlett-Las Animas, from 1913 Colorado state map

Union Pacific and Atchison, Topeka & Santa Fe

Both the Union Pacific and the Atchison, Topeka & Santa Fe built new branch lines after 1913. The well-funded UP extended several new routes around Denver and Cheyenne to ease grades and streamline approaches to cities, a relatively luxurious expenditure for the formerly hard-scrabble, placer-railroad West. The UP developed new coal mines north of Denver and rails to support them, eventually running the line to La Salle. It built rail into the wheat country east of Greeley and west to Fort Collins. In 1924 the railroad completed its last new line in Colorado: from Fort Collins to Buckeye and Orcutt. In 1936 the Union Pacific purchased an existing road, the Laramie, North Park & Western, that had built south from Laramie into northern Colorado during the 1920s. This line operated under its own name until the 1950s, when the UP gave it its own name and called it the Coalmont Branch after the name of its Colorado terminus.[226]

The AT&SF built two additional branch lines into southeastern Colorado as it worked to improve the efficiency of its southern rail network. In 1927 the AT&SF built westward from Kansas through Springfield to Pritchett. Ten years later the AT&SF completed the last major section of its new rail in the state, connecting Springfield with the Santa Fe main line near Las Animas [*see Figure 37*].[230]

The Moffat Road

David Moffat's ambitious standard-gauge railroad from Denver to Steamboat Springs emerged from receivership in 1913 as the Denver & Salt Lake [D&SL] Railroad. The company struggled for several years, built from Steamboat Springs to Craig, consumed the personal assets of its new president, William Evans, as it had the more substantial ones of his mentor, and failed again in 1917. A kind of success came during the 1920s, however, when the City of Denver took up Evans' and Moffat's view of the necessity for a railroad tunnel through the continental divide. As envisioned by city officials, the tunnel would convey both the railroad and a pipeline to carry water from the western slope.[231]

In 1923 the Moffat Tunnel Commission floated a bond issue to finance construction and commissioned New York engineer J. Vipond Davies to oversee it.[232] Davies chose the "parallel tunnel" system, pioneered in the 1906 Simplon Tunnel through the Alps. The parallel system called for drilling two parallel tunnels–one main bore and a smaller one for facilitating drainage and transportation during construction. The smaller bore would eventually house the water conduit, while the larger tunnel carried the track. Both tunnels would be excavated from opposite ends to meet in the middle. By February 1926 the tunnel was three-quarters complete and ahead of schedule. But difficulties plagued the remainder of the construction. Both shafts encountered heavy water flow, expected in tunnels drilled under mountain peaks but still troublesome to deal with. Later tons of rock caved in, crushing six men. Despite the troubles, the worst stretch was completed by February 1927, and only eight feet of rock still remained to be cleared from the tunnel. In a well-executed ceremony that epitomized 1920s-style high tech, President Coolidge detonated the blast that opened the tunnel via telegraph from Washington, D.C. Crews completed the remaining excavation work by the end of the year.[233]

At the time of its completion, the 6½-mile-long Moffat Tunnel was the longest in the Western Hemisphere. The first train through the "epoch making" tunnel ran in February 1928, passing through in twelve minutes. Although the tunnel shortened the Rollins Pass route by only 27 miles, it reduced travel time nearly seven hours by eliminating the steep grades and serpentine turns. Avoiding the worst of the snowfall at Corona also made the new route less expensive to maintain. Still, the winding route from Denver to the mouth of the tunnel was difficult and slow, and the Moffat Road failed to provide a mainline transcontinental route.[234]

Denver & Rio Grande

The final leg in the Moffat Road's Utah connection would come from the Denver & Rio Grande, which had itself experienced a number of changes since 1913. Strategic maneuvering by George Gould's UP enemies, aided by his own mistakes, combined to bankrupt his Western Pacific railway in 1915. In 1918 the Colorado Midland, plagued by high operating costs and cutthroat competition, also collapsed. Half owner of the CM and pursued by creditors for the Western Pacific's debts, the Rio Grande failed in turn.[235] During the early 1920s, the company emerged from receivership, failed again, and reemerged as a new entity called the Denver & Rio Grande Western [D&RGW]. The new railroad controlled all of the former D&RG and RGW lines, the strategic strip of track between Glenwood Springs and Grand Junction once operated with the Midland, and all the mileage of the Western Pacific. (The Colorado Midland did not fare as well. Three years after its bankruptcy, dismantling of its track began, making it the largest American rail abandonment to date, a dubious distinction it held for fifteen years.)

Although it controlled a lot of strategic trackage in the late 1920s, the Rio Grande Western was still financially dependent on the Kuhn, Loeb & Co. banking house, whose sympathies lay more with the Union Pacific. In 1928 the D&RGW made a small profit as railroad revenues throughout the country rose in the general prosperity of the 1920s. The feeling of well-being proved fleeting for its directors, though, as they soon felt threatened by the Moffat Road and its newly completed tunnel.

Despite the feeble fiscal condition of the Rio Grande Western, they decided to take over their competitor. The acquisition made sense logistically. The D&RGW operated the line closest to the Moffat Road; its line from Leadville climbed Tennessee Pass and then descended to the Colorado River valley and ran to Glenwood Springs and Utah. A connecting link between the two roads that would intersect the D&RG near Glenwood Springs would provide the standard-gauge connection to Utah that the Moffat Road needed to put it on a main transcontinental line. Control of this link by the D&RGW would allow the road to compete with its rival, the UP, and control its upstart rival, the Moffat Road. But the acquisition made little sense financially, and the Rio Grande Western lacked the resources to finance construction of a cutoff.

Nevertheless, the D&RGW began buying Moffat Road stock in 1930, acquiring the other railroad the following year. Unable to finance the construction that might make its new acquisition pay, the Rio Grande Western secured $4 million from Franklin Roosevelt's new Reconstruction Finance Corporation. In 1934 the railroad completed the Dotsero Cutoff between Bond Station, on the Moffat Road line, and Dotsero Station, east of Glenwood Springs [*see Figure 38*]. The Dotsero Cutoff shortened the rail distance between Denver and Salt Lake City by 173 miles and finally fulfilled Colorado's ambition to be the through-route of a major transcontinental line. It could not save the Rio Grande Western, however; almost immediately after the cutoff's completion, the company dropped into receivership yet again.[236]

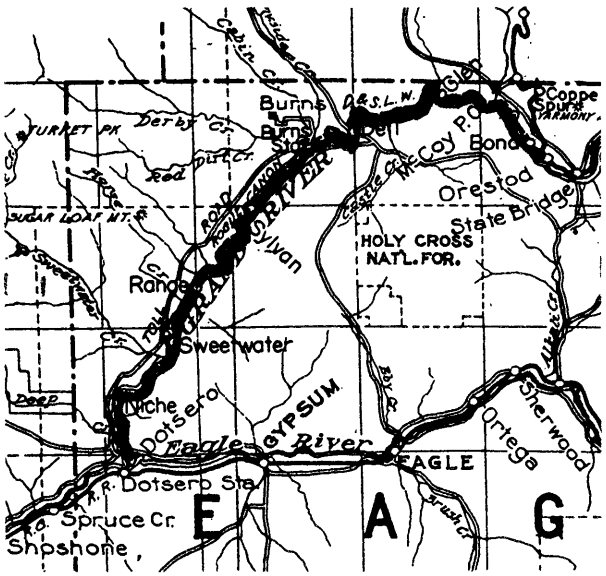


Figure 38. D&RGW RR, Dotsero Cutoff, from 1913 map

Over the next twelve years, the Rio Grande Western would remain in receivership but in the hands of the railroad's first Colorado-based management in sixty years. Near the end of this period the D&RGW became part of the route of the "Exposition Flyer," later to be renamed the "California Zephyr," a popular transcontinental sleeping car service between New York and Oakland. When the D&RGW returned from receivership in 1948, it had become a "first class competitive railroad" as a result of substantial rehabilitation work along its length. With control of the two most difficult crossings of the Continental Divide, the Moffat Tunnel route and the Royal Gorge route over Tennessee Pass, it remained solvent into the late 20th century. The Rio Grande Western took its place, along with the Union Pacific and the Burlington, as one of the three largest rail systems in the state.[237]

Abandonments and Retrenchment

Between 1915 and 1967 Colorado's railroad net declined by nearly 2,000 miles. Just six years after reaching its peak of 5,764 miles, Colorado in 1918 experienced its biggest railroad abandonment year in history. The Colorado Midland accounted for the majority of these: about 240 of the total 300. Abandonments fell into two general categories: those brought on by insufficient traffic and revenues to keep lines open, and those undertaken to improve efficiency of rail systems. Some of the second type occurred south of Denver, where duplicate tracks extended to Colorado Springs and Pueblo. During the 1910s the Colorado & Southern had begun traveling over the Santa Fe line between Denver and Pueblo, allowing it to remove the old Denver, Texas & Gulf track. Ironically, this occurred just a few years after the C&S had succeeded in building a continuous north-south rail through Colorado.

At the end of World War I, the Santa Fe and the Rio Grande operated their lines between Denver and Pueblo as a paired double track, and the C&S had rights on both lines. The C&S would begin operating as the Burlington Northern after 1970 when its parent line merged with the Great Northern and the Northern Pacific. The D&RGW abandoned its own line between Walsenburg and Trinidad after a 1936 flood washed out a section of the track, and it used C&S tracks thereafter.[238]

Most of the rail abandonments occurred in the mountains, and since the mountains were the domain of the narrow gauge, Colorado's three-foot track gradually diminished in aggregate length. A brief listing of some of the destinations that found themselves abandoned by the railroads demonstrates how extensive the mountain rail abandonment was. Central City, Blackhawk, Georgetown, Silver Plume, the Cripple Creek District, Breckenridge, Keystone, Gunnison, Crested Butte, Westcliffe, Pagosa Springs, Telluride and Creede all lost rail service during this period of retrenchment. When the Rio Grande Western abandoned the Alamosa-to-Durango line during the 1950s, it severed a link in its narrow-gauge mainline passenger route to Utah.[239]

Passenger service declined throughout the state as well as more travelers used buses and private cars. During the 1940s the Union Pacific began cooperating with Colorado's dude ranch operators to offer rail/ranch vacation packages in an attempt to bolster passenger traffic. This was essentially a rearguard action, however; the railroad's role in long-distance tourist travel was by then moribund. The last passengers to ride interurban trains did so in the 1950s, a decade that witnessed the automobile's final ascendancy over trains as the preferred mode of short-distance transportation, and air travel provided an alternative for longer distances. The federal government reinforced this trend, pouring billions of dollars into highway improvement from 1916 on, and in 1966 shifting mail transport from trains to trucks and airplanes. Later in the decade the Rio Grande Western acknowledged this shifting trend by launching a new corporation with broader abilities to pursue trucking and other businesses that the railroad, by charter, could not legally undertake. By 1970 the D&RGW ran only two passenger trains: the Colorado Zephyr and the Durango-Silverton mixed.[240]

Tourism

The D&RGW road between Durango and Silverton defied the trend in the decline of both passenger service and the narrow gauge. As the Rio Grande Western continued its abandonment of mountain lines throughout the 20th century, tourists discovered the Durango-Silverton line. In 1961 the Silverton mixed, that is the train that hauled freight as well as passengers between Durango and Silverton, became the last narrow-gauge passenger train operated by the company. Although the D&RGW cut service back to summer only, ridership began to grow, gaining in popularity throughout the decade and into the 1970s. The popularity of this line probably sparked interest by Colorado and New Mexico in the railroad from Antonito to Chama when the D&RGW instigated abandonment proceedings in the mid-1960s. By 1970 a new organization, the Cumbres & Toltec Scenic Railroad, emerged to take over the line and restore it for tourism. Sensing a trend, rail buffs banded together with preservationists to rebuild the Georgetown Loop in 1973. All three narrow-gauge lines remain in operation today. What was old became new again for tourists with an interest in scenery and 19th century railroad technology.[241]

In another trend, what was old became old again. As railroads nationwide began the systematic abandonment of routes, outdoor enthusiasts saw an opportunity to convert railroad grade to hiking trails. In Colorado particularly, where railroads had made the spectacular scenery of the Rocky Mountains accessible to tourists, abandoned railroad grades frequently proved ideal for conversion to hiking trails. The prepared ground, trestles, embankments, culverts and grade of the railroad transferred naturally to use by hikers, and more recently, mountain bike riders. During the 1990s the conversion of part of the Colorado Midland's grade into a bike trail in Chaffee County presents one example of a rails-to-trails conversion. Such conversions complete a circle of transportation evolution. Early foot paths along stream sides into the mountains often became railroad rights of way as engineers sought the path of least resistance into the mountains. Much, much later as rails revert to trails, the ground again conveys pedestrians.[242]

Colorado Railroads Today

Rail traffic remains an important part of Colorado's transportation fabric. Freight trains run daily over tracks of the Burlington Northern, Union Pacific and Denver & Rio Grande Western (recently merged with the UP). Passengers travel primarily in automobiles and planes, although the city of Denver recently initiated a new light rail system for city passenger traffic. In 1996 a study was undertaken to determine whether the old tracks and train cars of the Denver Intermountain Railway could be revived to extend light rail service along the old line from the Union Station area west to Lakewood. A 1996 merger between the Union Pacific and Central Pacific may open up additional track for possible use by hikers and bicycle riders; the merger may result in the abandonment of the old D&RG track through the Royal Gorge, Leadville, and over the Tennessee Pass to Dotsero.[243]

Rail abandonments have changed Colorado's landscape as the decline in railroad traffic has changed patterns of American life. Depots once featured at the center of town life, the place farmers and business people went to get the latest stock and commodities prices, sports scores and the time, since the railroads were the 19th century timekeepers. The propensity for automobile traffic has failed to replace the depot with a similar focus of attention. Depots at deserted stations have often been left to deteriorate, looted for material, or turned into homes for people and even livestock. The number of depots in the state is dramatically smaller than it was in 1913. Many iron bridges built for the railroads, such as those along the Colorado Midland, were dismantled to provide scrap during World War II. Secondary railroads structures such as water towers and section houses have also disappeared. Culverts and fills under abandoned railroad grade no longer serve their original purpose. An opportunity exists to document, preserve and interpret the railroad's role in Colorado history each time an abandonment takes place, with the appropriate application of historical knowledge, land use management and education.

6 Colorado Railroad Summaries[244]

Argentine & Grays Peak Railway Company [A&GP]

incorporated:	Jul 1913	
construction:	Aug 1905 - Aug 1906	
first train:	Feb 1906	
operated:	Jul 1913 - Sep 1918	
predecessors:	Argentine Central Railway Company	Aug 1905 - Jul 1905
	Georgetown & Grays Peak Railway Company	Mar 1913 - Jul 1913
headquarters:	Denver, Colorado	
main line:	Silver Plume to Waldorf and top of McClellan Mountain	
trackage:	15.9 miles (narrow gauge; 40 lb. rails; 6.6% maximum grade)	
traffic:	common carrier, mine and passengers (heavy tourist traffic)	
disposition:	abandoned in 1919, with scrapping completed Jan 1922	

Arkansas Valley Railway Company [AV]

incorporated:	Sep 1871
construction:	Dec 1871 - Dec 1875
first train:	Nov 1873
operated:	Nov 1873 - Oct 1877
predecessors:	none
headquarters:	St. Louis, Missouri
main line:	Kit Carson to La Junta
trackage:	76.5 miles (standard gauge; 56 lb. rails)
traffic:	common carrier
disposition:	abandoned in May 1878 as Colorado's first rail abandonment

Aspen & Western Railway Company [A&W]

(see Crystal River Railroad Company)

Beaver, Penrose & Northern Railway Company [BP&N]

incorporated:	Jan 1909
construction:	Mar 1909 - Jun 1909
first train:	May 1909
operated:	Jun 1909 - 1919
predecessors:	none
headquarters:	Colorado Springs, Colorado
main line:	Beaver to Penrose
trackage:	6.5 miles (standard gauge; 75 lb. rails; 2.0% maximum grade)
traffic:	common carrier, agriculture
disposition:	abandoned and scrapped in 1919

Book Cliff Railroad Company [BC]

incorporated:	Jan 1899
construction:	Jan 1890 - Dec 1890
first train:	Sep 1890
operated:	Oct 1899 - 1922
predecessors:	Little Book Cliff Railway Company Sep 1889 - Oct 1899
headquarters:	Grand Junction, Colorado
main line:	Grand Junction to Book Cliff
trackage:	14.0 miles (narrow gauge; 60 lb. rails; 5.0% maximum grade)
traffic:	mine, coal
disposition:	abandoned and scrapped in 1925

Burlington & Colorado Railroad Company [B&C]

incorporated:	Sep 1881
construction:	Nov 1881 - Jul 1882
first train:	May 1882 (to Akron)
operated:	May 1882 - Feb 1908
predecessors:	none
headquarters:	Omaha, Nebraska
main line:	Denver to Wray (and state line beyond)
trackage:	174.9 miles (standard gauge)
traffic:	common carrier
disposition:	sold to CB&Q Railroad in Feb 1908

Burlington & Missouri River Rail Road Company in Nebraska [B&MR]

incorporated:	May 1869
construction:	Jul 1869 - Sep 1872
first train:	Jul 1870 (to Lincoln, Nebraska)
operated:	Jul 1870 - Jul 1880
predecessors:	none
headquarters:	Plattsmouth, Nebraska
main line:	Plattsmouth to Kearney, Nebraska (with lines in northeast Colorado to Denver, Brush and Lyons)
trackage:	191.8 miles (standard gauge; 56 lb. rails; 0.1% maximum grade)
traffic:	common carrier, agriculture
disposition:	sold to CB&Q Railroad in Jul 1880

RAILROADS IN COLORADO 1858-1948

Canon City & Cripple Creek Railroad Company [CC&CC]

incorporated:	Jun 1899
construction:	Sep 1899 - Feb 1900
first train:	Feb 1900
operated:	Feb 1900 - Jul 1912
predecessors:	none
headquarters:	Denver, Colorado
main line:	Canon City to Oro Junta
trackage:	7.2 miles (narrow gauge; 45/60 lb rails; 2.5% maximum grade)
traffic:	common carrier, passengers
disposition:	abandoned, with track removed in 1915

Chicago, Kansas City & Nebraska Railway Company [CKC&N]

incorporated:	Mar 1886
construction:	Jun 1886 - Nov 1888 (main line)
first train:	1886
operated:	1886 - Jun 1891
predecessors:	none
headquarters:	Topeka, Kansas
main line:	Elwood, Kansas, to Roswell, Colorado
trackage:	1,486 miles (166 miles in Colorado; standard gauge; 60 lb. rails)
traffic:	common carrier, agriculture
disposition:	sold under foreclosure to CRI&P Railroad in Jun 1891

Chicago, Rock Island & Pacific Railroad Company [CRI&P]

incorporated:	Jul 1902	
construction:	1852 - 1910	
first train:	Oct 1852 (to Joliet)	
operated:	Aug 1902 - Mar 1980	
predecessors:	Rock Island & La Salle Railroad Company	Feb 1847 - Feb 1851
	Chicago & Rock Island Rail Road Company	Feb 1851 - Aug 1866
	Chicago, Rock Island & Pacific Railroad Co.	Aug 1866 - Jun 1880
	Chicago, Rock Island & Pacific Railway Co.	Jun 1880 - Jul 1902
headquarters:	Chicago, Illinois	
main line:	Chicago to St. Paul, Memphis, Dallas, Santa Rosa and Colorado Springs	
trackage:	7,793 miles in 1973	
traffic:	common carrier, agriculture	
disposition:	declared bankrupt in Mar 1975; ceased all operations in Mar 1980	

Colorado & Clear Creek Railroad Company [C&CC]

(see Colorado Central Rail Road Company)

Colorado & New Mexico Railroad Company [C&NM]

(see Pueblo & Arkansas Valley Railroad Company)

Colorado & Southeastern Railroad Company [C&SE]

incorporated:	Aug 1909	
construction:	Jun 1903 - 1907	
first train:	Aug 1903	
operated:	Sep 1909 - Apr 1952	
predecessors:	Colorado & Southeastern Railway Company	May 1903 - Aug 1909
headquarters:	Denver, Colorado	
main line:	Barnes to Delagua	
trackage:	6.3 miles (standard gauge; 75/85 lb. rails; 3.0% maximum grade)	
traffic:	common carrier, coal	
disposition:	abandoned in May 1952	

Colorado & Southern Railway Company [C&S]

incorporated:	Dec 1898	
construction:	(consolidated several existing lines)	
first train:	(consolidated several existing lines)	
operated:	Jan 1899 - Mar 1970	
predecessors:	Denver, Leadville & Gunnison Railway Company	Jul 1889 - Jan 1899
	Union Pacific, Denver & Gulf Railway Company	Apr 1890 - Jan 1899
headquarters:	Denver, Colorado	
main line:	Orin Junction, Wyoming, to Sixela, Texas, with narrow-gauge branches	
trackage:	1,082.9 miles (standard and narrow gauge; 56/75 lb. rails; 4.2% max. grade)	
traffic:	common carrier, mine	
disposition:	merged into Burlington Northern Railroad in Mar 1970	

Colorado & Wyoming Railway Company [C&W]

incorporated:	May 1899
construction:	Aug 1899 - Mar 1903
first train:	May 1900 (to Sunrise)
operated:	May 1900 - present
predecessors:	none
headquarters:	Denver, Colorado
main line:	Trinidad to Cuatro (in Colorado); Guernsey to Sunrise (in Wyoming)
trackage:	166.6 miles in 1916 (std., narrow gauge; 65/85 lb. rails; 2.0% max. grade)
traffic:	common carrier, mine
disposition:	still in operation

Colorado & North-Western Railway Company [C&NW]

(see Denver, Boulder & Western Railroad Company)

Colorado & Southwestern Railroad Company [C&SW]

(see Montezuma Lumber Company)

Colorado Central Rail Road Company [CC]

incorporated:	Jan 1869	
construction:	Jul 1868 - Nov 1881	
first train:	Sep 1870	
operated:	Oct 1870 - Mar 1890	
predecessors:	Colorado & Clear Creek Railroad Company	Feb 1865 - Jan 1866
	Colorado Central & Pacific Railroad Company	Jan 1866 - Jan 1869
headquarters:	Central City, Colorado	
main line:	Denver to Cheyenne and Julesburg to La Salle (standard gauge); Golden to mountains (narrow gauge)	
trackage:	327.4 miles (standard and narrow gauge; 32/60 lb. rails; 4.5% max. grade)	
traffic:	common carrier, mine	
disposition:	consolidated into Union Pacific, Denver & Gulf Railroad in Apr 1890	

Colorado Eastern Railroad Company [CE]

incorporated:	May 1894	
construction:	Jun 1886 - Sep 1886	
first train:	Aug 1886	
operated:	May 1894 - 1916	
predecessors:	Denver & Eastern Railway and Coal Company	Jan 1885 - Jan 1887
	Denver Railroad, Land & Coal Company	Jan 1887 - Jun 1888
	Colorado Eastern Railway Company	Jun 1888 - May 1894
headquarters:	Denver, Colorado	
main line:	Denver to Scranton	
trackage:	16.9 miles (narrow gauge; 14/21 lb. rails; 1.0% maximum grade)	
traffic:	mine, coal	
disposition:	abandoned in 1916	

Colorado-Kansas Railroad Company [CK]

(see Colorado Railroad, Inc.)

Colorado Northern Railroad Company [CN]

(see Denver, Utah & Pacific Railroad Company)

Colorado Midland Railroad Company [CM]

incorporated:	May 1917	
construction:	Apr 1886 - Oct 1888	
first train:	Jul 1887 (to Buena Vista)	
operated:	Jun 1917 - Aug 1918	
predecessors:	Colorado Midland Railway Company	Nov 1883 - Nov 1893
	Colorado Midland Railroad Company	Dec 1893 - Oct 1897
	Colorado Midland Railway Company	Nov 1897 - May 1917
headquarters:	Colorado Springs, Colorado	
main line:	Colorado Springs to New Castle	
trackage:	259.5 miles (standard gauge; 50/90 lb. rails; 4.0% maximum grade)	
traffic:	common carrier, mine	
disposition:	abandoned in Aug 1918	

Colorado Railroad Company

incorporated:	Jul 1906	
construction:	Jul 1906 - Oct 1911	
first train:	Aug 1906	
operated:	Aug 1906 - Mar 1930	
predecessors:	Fort Collins Development Railway Company	Nov 1902 - Jan 1908
headquarters:	Denver, Colorado	
main line:	Southern Junction to Walsenburg and Dixon to Cheyenne	
trackage:	122.5 miles (standard gauge; 75 lb. rails)	
traffic:	common carrier, agriculture	
disposition:	merged into Colorado & Southern Railroad in Mar 1930	

Colorado Railroad, Inc.

incorporated:	Mar 1938	
construction:	Oct 1908 - Aug 1912	
first train:	Jun 1912 (to Stone City)	
operated:	Sep 1938 - Aug 1958	
predecessors:	Kansas-Colorado Railroad Company	Jun 1908 - Apr 1911
	Colorado-Kansas Railway Company	Mar 1911 - Aug 1938
headquarters:	Pueblo, Colorado	
main line:	Pueblo to Stone City	
trackage:	22.8 miles (standard gauge; 70/75 lb. rails; 2.0% maximum grade)	
traffic:	common carrier, mine, sandstone	
disposition:	abandoned in Aug 1958	

Colorado Springs & Cripple Creek District Railway Company [CS&CC]

incorporated:	Nov 1899	
construction:	Jan 1900 - Mar 1901	
first train:	Sep 1900	
operated:	Apr 1901 - Sep 1920	
predecessors:	Cripple Creek District Railway (electric line)	Apr 1897 - Nov 1899
headquarters:	Colorado Springs, Colorado	
main line:	Colorado Springs to Cripple Creek	
trackage:	85.7 miles (standard gauge; 75 lb. rails; 3.8% maximum grade)	
traffic:	common carrier, mine	
disposition:	abandoned in Oct 1922	

Cripple Creek & Colorado Springs Railroad Company [CC&CS]

incorporated:	Apr 1915	
construction:	1893	
first train:	1893	
operated:	Apr 1915 - Dec 1921	
predecessors:	Florence & Cripple Creek Railroad Company	May 1893 - Apr 1915
	Golden Circle Railroad Company	May 1896 - Apr 1915
headquarters:	Cripple Creek, Colorado	
main line:	Cripple Creek to Victor	
trackage:	12.4 miles (narrow gauge; 45 lb. rails; 4.0% maximum grade)	
traffic:	common carrier, mine, passengers	
disposition:	sold to Midland Terminal Railroad in Jan 1922	

Crystal River & San Juan Railroad Company [CR&SJ]

incorporated:	Oct 1906
construction:	Nov 1906 - Nov 1906
first train:	Jun 1907
operated:	Jun 1907 - Aug 1942
predecessors:	none
headquarters:	Marble, Colorado
main line:	Marble to Placita
trackage:	7.8 miles (standard gauge; 45/75 lb. rails; 1.2% maximum grade)
traffic:	common carrier, marble
disposition:	abandoned in Aug 1942

Crystal River Railroad Company [CR]

incorporated:	Sep 1898	
construction:	Oct 1892 - Nov 1900	
first train:	Nov 1898	
operated:	Jul 1899 - Dec 1919	
predecessors:	Aspen & Western Railway Company	Jun 1886 - Nov 1892
	Crystal River Railway Company	Aug 1892 - Sep 1898
headquarters:	Denver, Colorado	
main line:	Carbondale to Placita	
trackage:	20.7 miles (standard and narrow gauge; 57/75 lb. rails; 2.0% max. grade)	
traffic:	common carrier, mine	
disposition:	leased to Crystal River & San Juan RR in Apr 1922; abandoned in Aug 1942	

Denver & Boulder Valley Railroad Company [D&BV]

incorporated:	Aug 1870
construction:	Oct 1870 - Sep 1873
first train:	Dec 1870 (to Dick)
operated:	Jan 1871 - Mar 1898
predecessors:	none
headquarters:	Denver, Colorado
main line:	Brighton to Boulder City
trackage:	27.0 miles (standard gauge; 56 lb. rails; 1.1% maximum grade)
traffic:	common carrier, mine, coal
disposition:	merged into Union Pacific Railroad in Apr 1898

Denver & Eastern Railway and Coal Company [D&E]

(see Colorado Eastern Railroad Company)

Denver & Intermountain Railroad Company [D&IM]

incorporated:	Apr 1909	
construction:	1890	
first train:	1890	
operated:	Apr 1909 - Jun 1953	
predecessors:	Denver, Lakewood & Golden Railroad Company	Jul 1890 - Jun 1904
	Denver & Inter-Mountain Railway Company	May 1904 - Mar 1909
	Intermountain Railway	Oct 1907 - Apr 1909
headquarters:	Denver, Colorado	
main line:	Denver to Golden	
trackage:	15.3 miles (standard gauge; 75 lb. rails; 1.7% maximum grade)	
traffic:	common carrier, passengers	
disposition:	abandoned in 1953	

Denver & Middle Park Railroad Company [D&MP]

incorporated: Apr 1883
construction: Nov 1884 - Dec 1884
first train: Dec 1884
operated: Dec 1884 - Mar 1890
predecessors: none
headquarters: Boston, Massachusetts
main line: Ralston to Glencoe
trackage: 4.6 miles (narrow gauge; 35 lb. rails; 2.3% maximum grade)
traffic: common carrier, mine
disposition: merged with Union Pacific, Denver & Gulf Railroad in Apr 1890

Denver & Rio Grande Western Railroad Company [D&RGW]

incorporated: Nov 1920
construction: lines completed:

1871	Denver to Colorado Springs	(76 mi. narrow gauge)
1872	Colorado Springs to Pueblo	(79 mi. narrow gauge)
1874	Coal Branch Junction to Canon City	(8 mi. narrow gauge)
1876	South Pueblo to Cucharas and El Moro	(87 mi. narrow gauge)
	Cucharas to La Veta	(22 mi. narrow gauge)
1877	La Veta to Garland	(29 mi. narrow gauge)
1878	Garland to Alamosa	(31 mi. narrow gauge)
1880	Canon City to Texas Creek	(22 mi. narrow gauge)
	Texas Creek to Malta and Leadville	(110 mi. narrow gauge)
	Alamosa to Chama, New Mexico	(80 mi. narrow gauge)
	Antonito to Espanola, New Mexico	(80 mi. narrow gauge)
	Colorado Springs to Manitou Springs	(80 mi. narrow gauge)
	Leadville to Kokomo	(18 mi. narrow gauge)
1881	Kokomo to Wheeler	(6 mi. narrow gauge)
	Chama to Durango	(108 mi. narrow gauge)
	Durango to Rockwood	(19 mi. narrow gauge)
	Salida to Gunnison and Crested Butte	(102 mi. narrow gauge)
	Alamosa to South Fork	(42 mi. narrow gauge)
	Grape Creek Junction to West Cliff	(32 mi. narrow gauge)
	Mears Junction to Orient	(28 mi. narrow gauge)
	Crane's Creek to Red Cliff	(21 mi. narrow gauge)
	Denver to Pueblo	(121 mi. added third rail)
1882	Gunnison to Grand Junction	(170 mi. narrow gauge)
	Rockwood to Silverton	(26 mi. narrow gauge)
	Wheeler to Dillon	(13 mi. narrow gauge)
	Malta to Rock Creek	(30 mi. narrow gauge)

construction: continued:

1883	South Fork to Wagon Wheel Gap	(14 mi. narrow gauge)
	Maysville to Monarch	(9 mi. narrow gauge)
1887	Rock Creek to Glenwood Springs, Aspen	(105 mi. narrow gauge)
	Montrose to Ouray	(36 mi. narrow gauge)
	Minnequa to Cucharas	(47 mi. added third rail)
	South Pueblo to Coal Banks	(37 mi. added third rail)
	Cucharas Junction to Trinidad	(45 mi. added third rail)
1889	Sapinero to Lake City	(36 mi. narrow gauge)
	Glenwood Springs to Rifle Creek	(27 mi. narrow gauge)
	Cucharas Junction to Trinidad	(45 mi. narrow to std. gauge)
1889	Grape Creek Junction to West Cliff	(32 mi. narrow gauge)
1890	Villa Grove to Alamosa	(54 mi. narrow gauge)
	Leadville Junction to Pando	(15 mi. standard gauge)
	Minnequa to Walsenburg	(53 mi. 3-rail to std. gauge)
	Walsenburg to La Veta	(15 mi. narrow to std. gauge)
	Canon City to Malta	(111 mi. added third rail)
	Red Cliff to Rifle Creek	(93 mi. narrow to std. gauge)
	Glenwood Springs to Aspen	(43 mi. narrow to std. gauge)
	Rifle Creek to Grand Jct. / Utah line	(80 mi. narrow to std. gauge)
	Helper, Utah, to Ogden, Utah	(152 mi. narrow to std. gauge)
	Grand Junction to Helper	(176 mi. narrow to std. gauge)
1891	Wagon Wheel Gap to Creede	(10 mi. narrow gauge)
1893	Crested Butte to Floresta	(11 mi. narrow gauge)
1895	Espanola to Santa Fe	(34 mi. narrow gauge)
1899	Alamosa to Wagon Wheel Gap	(34 mi. narrow to std. gauge)
	La Veta to Alamosa	(62 mi. narrow to std. gauge)
1900	Alamosa to Monte Vista	(17 mi. added third rail)
1901	Moffat to Cottonwood	(17 mi. narrow gauge)
	Alamosa to Antonito	(29 mi. added third rail)
	Texas Creek to Westcliffe	(17 mi. standard gauge)
1902	Delta to Somerset	(43 mi. narrow gauge)
	Denver to Pueblo	(119 mi. 3-rail to std. gauge)
	Alamosa to Del Norte and Creede	(59 mi. narrow to std. gauge)
1903	Salina to Nioche, Utah	(20 mi. standard gauge)
1905	Durango to Farmington, NM	(48 mi. standard gauge)
1906	Grand Junction to Montrose / Somerset	(114 mi. narrow to std. gauge)
1923	Carbon Junction to Farmington, NM	(48 mi. std. to narrow gauge)
1924	Leadville to Dillon	(37 mi. narrow gauge)
1932	Lake City branch	(36 mi. narrow gauge)

Denver & Rio Grande Western Railroad Company (continued)

first train:	Aug 1871	
operated:	Aug 1921 - 1996	
predecessors:	Denver & Rio Grande Railway Company	Oct 1870 - Jul 1886
	Rio Grande Western Railway Company	Jun 1889 - Jul 1908
	Denver & Rio Grande Railroad Company	Jul 1886 - Jul 1921
headquarters:	Denver, Colorado	
main line:	Denver to Ogden and Silverton	
trackage:	2,488.9 miles in 1917 (std. / narrow gauge; 30/36 lb. rails; 4.5% maximum grade)	
traffic:	common carrier, mine	
disposition:	merged with Union Pacific Railroad in 1996	

Denver & New Orleans Railroad Company [D&NO]

incorporated:	Jan 1881
construction:	Jul 1881 - Dec 1882
first train:	Feb 1882
operated:	Jan 1883 - Dec 1885
predecessors:	none
headquarters:	Denver, Colorado
main line:	Denver to Pueblo
trackage:	138.0 miles (standard gauge; 52 lb. rails; 2.0% maximum grade)
traffic:	common carrier; mine
disposition:	sold under foreclosure to Denver, Texas & Gulf Railroad in Mar 1886

Denver & Salt Lake Railway Company [D&SL]

incorporated:	Aug 1926	
construction:	1902 - 1913	
first train:	1902	
operated:	Jan 1927 - Apr 1947	
predecessors:	Denver, Northwestern & Pacific Railway Co.	Jul 1902 - Apr 1913
	Denver & Salt Lake Railroad Company	Dec 1912 - Dec 1926
headquarters:	Denver, Colorado	
main line:	Denver to Craig	
trackage:	252.0 miles (standard gauge; 80/85/90 lb. rails; 4.0% maximum grade)	
traffic:	common carrier, coal	
disposition:	merged into Denver & Rio Grande Western Railroad in Apr 1947	

Denver & Santa Fe Railway Company [D&SF]

incorporated:	Mar 1887	
construction:	Apr 1887 - Oct 1887	
first train:	Oct 1887	
operated:	Oct 1887 - Jan 1900	
predecessors:	Denver Circle Rail Road Company	Nov 1880 - Jun 1887
headquarters:	Denver, Colorado	
main line:	Denver to Pueblo	
trackage:	124.1 miles (standard gauge)	
traffic:	common carrier, mine	
disposition:	acquired by Atchison, topeka & Santa Fe Railroad in Jan 1900	

Denver, Boulder & Western Railroad Company [DB&W]

incorporated:	Mar 1909	
construction:	Aug 1897 - Dec 1904	
first train:	Feb 1898	
operated:	Apr 1909 - Jul 1919	
predecessors:	Inter-Mountain Railroad Company	Apr 1895 - Jul 1897
	Colorado & North-Western Railway Company	Jul 1897 - Jul 1904
	Colorado & Northwestern Railroad Company	Apr 1904 - Mar 1909
headquarters:	Boulder, Colorado	
main line:	Boulder to Ward and Eldora	
trackage:	46.8 miles (narrow gauge; 56 lb. rails; 4.8% maximum grade)	
traffic:	common carrier, mine	
disposition:	abandoned in Aug 1919, with scrapping completed in Oct 1920	

Denver Circle Rail Road Company [DC]

incorporated:	Nov 1880
construction:	Dec 1881 - 1886
first train:	Jan 1882
operated:	Feb 1882 - Jun 1887
predecessors:	none
headquarters:	Denver, Colorado
main line:	south side of Denver
trackage:	6.2 miles (narrow gauge; 35 lb. rails; 5.0% maximum grade)
traffic:	passengers
disposition:	sold to Denver & Santa Fe Railway in Jun 1887

Denver, Lakewood & Golden Railroad Company [DL&G]

(see Denver & Intermountain Railroad Company)

Denver, Laramie & Northwestern Railroad Company [DL&N]

incorporated:	Feb 1910
construction:	May 1908 - May 1910
first train:	Jan 1909
operated:	Mar 1910 - Dec 1916
predecessors:	Denver, Laramie & Northwestern Railway Co. Feb 1906 - Mar 1910
headquarters:	Denver, Colorado
main line:	Denver (Utah Junction) to Greeley
trackage:	51.4 miles (standard gauge; 75/85 lb. rails; 1.0% maximum grade)
traffic:	common carrier, agriculture
disposition:	abandoned in Sep 1917

Denver, Leadville & Gunnison Railway Company [DL&G]

incorporated:	Jul 1889
construction:	Aug 1873 - Oct 1884
first train:	Jun 1874 (to Morrison)
operated:	Aug 1889 - Jan 1899
predecessors:	Denver, South Park & Pacific Railway Company Oct 1872 - Jun 1873
	Denver, South Park & Pacific Railroad Company Jun 1873 - Jul 1889
headquarters:	Denver, Colorado
main line:	Denver to Leadville and Baldwin
trackage:	324.7 miles (narrow gauge)
traffic:	common carrier, mine
disposition:	sold under foreclosure to Colorado & Southern Railroad in Jan 1899

Denver, Longmont & Noland Stone & Railway Company [DL&N]

incorporated:	Apr 1893
construction:	1893
first train:	1893
operated:	1893 - 1898
predecessors:	none
headquarters:	Denver, Colorado
main line:	Noland to Zoe Park and Shady Side
trackage:	37.0 miles (standard grade; 65 lb. rails)
traffic:	common carrier, mine
disposition:	abandoned in 1898

Denver, Marshall & Boulder Railway Company [DM&B]

incorporated:	May 1885
construction:	Mar 1881 - Aug 1886
first train:	Aug 1886
operated:	Aug 1886 - Mar 1890
predecessors:	Denver, Western & Pacific Railway Company Nov 1880 - Sep 1885
headquarters:	Boston, Massachusetts
main line:	Denver (Argo Junction) to Boulder
trackage:	30.0 miles (standard gauge; 56 lb. rails; 1.1% maximum grade)
traffic:	common carrier, mine
disposition:	merged with Union Pacific, Denver & Gulf Railroad in Apr 1890

Denver, Northwestern & Pacific Railway Company [DNW&P]

incorporated:	Jul 1902
construction:	Apr 1903 - Jan 1909
first train:	Nov 1903
operated:	Jun 1904 - Apr 1913
predecessors:	none
headquarters:	Denver, Colorado
main line:	Denver (Utah Junction) to Steamboat Springs
trackage:	210.8 miles (standard gauge; 80/85 lb. rails; 4.0% maximum grade)
traffic:	common carrier, mine, coal
disposition:	sold under foreclosure to Denver & Salt Lake Railroad in May 1913

Denver Pacific Railway & Telegraph Company

incorporated:	Nov 1867
construction:	May 1868 - Jan 1871
first train:	Dec 1869
operated:	Dec 1869 - Jan 1880
predecessors:	none
headquarters:	Denver, Colorado
main line:	Denver to Cheyenne
trackage:	104.1 miles (standard grade; 56 lb. rails; 1.7% maximum grade)
traffic:	common carrier, mine
disposition:	merged into Union Pacific Railroad in Jan 1880

Denver Resort Railway & Telegraph Company

incorporated:	Dec 1889
construction:	1890
first train:	1890
operated:	1890 - 1896
predecessors:	none
headquarters:	Denver, Colorado
main line:	Denver to Golden
trackage:	14.0 miles (narrow gauge)
traffic:	common carrier
disposition:	abandoned in Jun 1896

Denver, South Park & Hill Top Railway Company [DSP&HT]

incorporated:	Sep 1896
construction:	Sep 1896 - Dec 1896
first train:	Dec 1896
operated:	Dec 1896 - Nov 1897
predecessors:	none
headquarters:	Denver, Colorado
main line:	Hill Top Junction to Leavick
trackage:	11.3 miles (narrow gauge; 6.0% maximum grade)
traffic:	common carrier, mine
disposition:	sold to Denver, Leadville & Gunnison Railroad in Oct 1897

Denver, South Park & Pacific Railway Company [DSP&P]

(see Denver, Leadville & Gunnison Railway Company)

Denver, Texas & Fort Worth Railroad Company [DT&FW]

incorporated:	Apr 1887
construction:	May 1887 - Mar 1888
first train:	Mar 1888
operated:	Apr 1888 - Mar 1890
predecessors:	none
headquarters:	Denver, Colorado
main line:	Trinidad to New Mexico-Texas line
trackage:	168.8 miles (standard gauge; 52/56 lb. rails)
traffic:	common carrier
disposition:	merged with Union Pacific, Denver & Gulf Railroad in Apr 1890

Denver, Texas & Gulf Railroad Company [DT&G]

incorporated:	May 1885	
construction:	consolidated existing line	
first train:	consolidated existing line	
operated:	Jan 1886 - Mar 1890	
predecessors:	Denver & New Orleans Railroad Company	Jan 1881 - Sep 1886
headquarters:	Denver, Colorado	
main line:	Denver to Pueblo	
trackage:	138.0 miles (standard gauge)	
traffic:	common carrier	
disposition:	merged with Union Pacific, Denver & Gulf Railroad in Apr 1890	

Denver, Utah & Pacific Railroad Company [DU&P]

incorporated:	Apr 1884	
construction:	Apr 1881 - Sep 1888	
first train:	Nov 1881	
operated:	Apr 1884 - Feb 1908	
predecessors:	Longmont & Erie Railroad Company	Jan 1878 - Mar 1881
	Denver, Longmont & Northwestern Railroad Co.	Mar 1881 - May 1883
	Colorado Northern Railway Company	Jan 1883 - Apr 1884
	Denver, Utah & Pacific Rail-road Company	Dec 1880 - Apr 1884
headquarters:	Denver, Colorado	
main line:	Denver to Lyons	
trackage:	49.3 miles (narrow gauge; 35/45 and 75/85 lb. rails; 3.0% maximum grade)	
traffic:	common carrier, mine, coal	
disposition:	sold to Chicago, Burlington & Quincy Railroad in Feb 1908	

Denver, Western & Pacific Railway Company [DW&P]

(see Denver, Marshall & Boulder Railway company)

Dodge City & Cimarron Valley Railway Company [DC&CV]

incorporated:	May 1893
construction:	Dec 1893 - Sep 1894
first train:	Apr 1894
operated:	May 1894 - Apr 1915
predecessors:	none
headquarters:	Cripple Creek, Colorado
main line:	Florence to Cripple Creek
trackage:	40.5 miles (narrow gauge; 45 lb. rails; 4.0% maximum grade)
traffic:	common carrier, mine
disposition:	merged with Cripple Creek & Colorado Springs Railroad in Apr 1915

Dolores, Paradox & Grand Junction Railroad Company [DP&GJ]

(see Montezuma Lumber Company)

Florence & Cripple Creek Railroad Company [F&CC]

(see Cripple Creek & Colorado Springs Railroad Company)

Fort Collins Development Railway Company [FCD]

incorporated:	Nov 1902
construction:	Jul 1903 - 1905
first train:	Oct 1903
operated:	Oct 1903 - Jan 1908
predecessors:	none
headquarters:	Denver, Colorado
main line:	Fort Collins to Waverly
trackage:	17.1 miles (standard gauge)
traffic:	common carrier, agriculture
disposition:	merged with Colorado Railroad Company in Jan 1908

Georgetown, Breckenridge & Leadville Railway Company [GB&L]

incorporated:	Feb 1881
construction:	Jan 1882 - Jun 1884
first train:	Mar 1884
operated:	Apr 1884 - Mar 1890
predecessors:	none
headquarters:	Denver, Colorado
main line:	Georgetown to Graymont
trackage:	8.5 miles (narrow gauge; 50 lb. rails; 3.7% maximum grade)
traffic:	common carrier, mine
disposition:	merged with Union Pacific, Denver & Gulf Railroad in Apr 1890

Gilpin Railroad Company

incorporated:	Jun 1906	
construction:	Apr 1887 - 1914	
first train:	Dec 1887	
operated:	Jun 1906 - Jan 1917	
predecessors:	Gilpin Tramway Company	Jul 1886 - Jun 1906
headquarters:	Denver, Colorado	
main line:	Black Hawk to Russell	
trackage:	26.5 miles in 1904 (24" gauge; 35 lb. rails; 5.0% maximum grade)	
traffic:	mine	
disposition:	abandoned and sold for scrap in 1917	

Golden, Boulder & Caribou Railway Company [GB&C]

incorporated:	Oct 1877
construction:	Nov 1877 - Jan 1878
first train:	Jan 1878
operated:	Jan 1878 - 1889
predecessors:	none
headquarters:	Boulder, Colorado
main line:	Boulder to Marshall coal mines
trackage:	5.6 miles (standard gauge; 56 lb. rails; 2.5% maximum grade)
traffic:	mine
disposition:	abandoned by Jun 1890

Golden Circle Railroad Company

incorporated:	May 1896
construction:	Nov 1896 - Apr 1899
first train:	Nov 1896
operated:	Nov 1896 - Apr 1915
predecessors:	none
headquarters:	Denver, Colorado
main line:	Victor to Altman
trackage:	7.1 miles (narrow gauge; 45 lb. rails; 4.1% maximum grade)
traffic:	common carrier, mine
disposition:	name changed to Cripple Creek & Colorado Springs Railroad in Apr 1915

Great Western Railway Company [GW]

incorporated:	Oct 1901
construction:	Mar 1902 - Dec 1907
first train:	Aug 1902
operated:	Jan 1903 - present
predecessors:	none
headquarters:	Loveland, Colorado
main line:	Loveland to Eaton, Longmont and Wattenberg
trackage:	85.0 miles (standard gauge; 60 lb. rails; 1.8% maximum grade)
traffic:	common carrier, agriculture
disposition:	still in operation

Greeley, Salt Lake & Pacific Railway Company [GSL&P]

incorporated:	Jan 1881
construction:	May 1881 - Apr 1887
first train:	Mar 1882
operated:	Jul 1882 - Mar 1890
predecessors:	none
headquarters:	Boston, Massachusetts
main line:	Greeley to Stout; Loveland to Arkins; Boulder to Sunset
trackage:	62.6 miles (standard and narrow gauge; 41 lb. rails; 4.4% maximum grade)
traffic:	common carrier, mine
disposition:	merged with Union Pacific, Denver & Gulf Railroad in Apr 1890

Kansas-Colorado Railroad Company [KC]

(see Colorado Railroad, Inc.)

Kansas Pacific Railway Company [KP]

incorporated:	Mar 1869
construction:	Sep 1863 - Sep 1870
first train:	Apr 1864
operated:	Mar 1869 - Jan 1880
predecessors:	Leavenworth, Pawnee & Western Railroad Co. Aug 1855 - Jun 1863
	Union Pacific Railway Co. - Eastern Division Jun 1863 - Mar 1869
headquarters:	St. Louis, Missouri
main line:	Denver to Kansas City
trackage:	674.4 miles (standard gauge; 56 lb. rails; 1.8% maximum grade)
traffic:	common carrier, agriculture
disposition:	merged with Union Pacific Railroad in Jan 1880

London, South Park & Leadville Railroad Company [LSP&L]

incorporated:	Mar 1882
construction:	Apr 1882 - Oct 1882
first train:	Nov 1882
operated:	Nov 1882 - 1891
predecessors:	South Park & Leadville Short Line Railroad Co. 1885 - 1897
headquarters:	Fairplay, Colorado
main line:	London Junction to London Hill
trackage:	7.4 miles (narrow gauge; 30 lb. rails; 5.0% maximum grade)
traffic:	common carrier, mine
disposition:	abandoned and scrapped in 1920

Longmont & Erie Railroad Company [L&E]

(see Denver, Utah & Pacific Railroad Company)

Manitou & Pikes Peak Railway Company [M&PP]

incorporated:	Nov 1888
construction:	Sep 1889 - Oct 1890
first train:	Oct 1890
operated:	Jun 1891 - present
predecessors:	none
headquarters:	Manitou Springs, Colorado
main line:	Manitou Springs to summit of Pikes Peak
trackage:	8.9 miles (standard gauge; 40 lb. rails; 25% maximum grade)
traffic:	passengers
disposition:	still in operation

Midland Terminal Railway Company [MT]

incorporated:	Aug 1892
construction:	Jan 1893 - Dec 1895
first train:	Dec 1893
operated:	Dec 1893 - Feb 1949
predecessors:	none
headquarters:	Denver, Colorado
main line:	Colorado Springs to Cripple Creek
trackage:	56.4 miles (standard gauge; 56/60/75 lb. rails; 4.0% maximum grade)
traffic:	common carrier, mine
disposition:	abandoned in Feb 1949

Missouri Pacific Railroad Company [MP]

incorporated:	Mar 1917	
construction:	standardized trackage in Jul 1869	
first train:	Dec 1852	
operated:	May 1917 - present	
predecessors:	Pacific Railroad	Mar 1849 - Oct 1876
	Missouri Pacific Railway Company	Oct 1876 - May 1917
headquarters:	St. Louis, Missouri	
main line:	St. Louis to Pueblo, El Paso, Brownsville, New Orleans and Chicago	
trackage:	9,292 miles in 1973 (66" gauge; 52/75 lb. rails; 1.4% maximum grade)	
traffic:	common carrier, agriculture	
disposition:	still in operation	

Montezuma Lumber Company

incorporated:	unknown	
construction:	Feb 1907	
first train:	1907	
operated:	Oct 1935 - Mar 1948	
predecessors:	Montezuma Lumber Company	May 1902 - Nov 1914
	Dolores, Paradox & Grand Junction RR Co.	Aug 1913 - Jun 1925
	Colorado & Southwestern Railroad Company	Jun 1924 - Jul 1933
headquarters:	Durango, Colorado	
main line:	Glecoe and Dolores into the forest	
trackage:	45.0 miles (narrow gauge; 30/40 lb. rails; 8.0% maximum grade)	
traffic:	logs and lumber	
disposition:	abandoned	

Pueblo & Arkansas Valley Railroad Company [P&AV]

incorporated:	Sep 1878	
construction:	Jul 1874 - Oct 1878	
first train:	Sep 1875	
operated:	Sep 1878 - Jan 1900	
predecessors:	Colorado & New Mexico Railroad Company	Jul 1873 - Sep 1875
	Pueblo & Salt Lake Railway Company	Dec 1873 - Sep 1875
	Pueblo & Arkansas Valley Railroad Company	Mar 1875 - Sep 1878
	Canon City & San Juan Railway Company	Feb 1877 - Sep 1878
headquarters:	Denver, Colorado	
main line:	Granada to Texas Creek and New Mexico line	
trackage:	290.1 miles (standard gauge; 50/56 lb. rails; 3.7% maximum grade)	
traffic:	common carrier, mine	
disposition:	sold to Atchison, Topeka & Santa Fe Railroad in Jan 1900	

Pueblo & State Line Railroad Company [P&SL]

incorporated:	Apr 1887
construction:	Jun 1887 - Dec 1887
first train:	Dec 1887
operated:	Dec 1887 - Jan 1910
predecessors:	none
headquarters:	St. Louis, Missouri
main line:	Pueblo to Kansas line
trackage:	152.1 miles (standard gauge; 60 lb. rails; 0.9% maximum grade)
traffic:	common carrier, mine
disposition:	sold to Missouri Pacific Railroad in Jan 1910

Rio Grande & Pagosa Springs Railroad Company [RG&PS]

incorporated:	Feb 1895
construction:	Jun 1895 - 1904
first train:	Jul 1895
operated:	Sep 1895 - Jun 1914
predecessors:	none
headquarters:	Edith, Colorado
main line:	Lumberton, New Mexico, to Chromo and Flaugh in Colorado
trackage:	30.0 miles (narrow gauge; 30 lb. rails; 7.0% maximum grade)
traffic:	common carrier, logging
disposition:	abandoned in Jun 1914

Rio Grande Junction Railway Company [RGJ]

incorporated:	Jun 1889
construction:	Nov 1889 - Nov 1890
first train:	Aug 1890 (to De Beque)
operated:	Nov 1890 - Apr 1947
predecessors:	none
headquarters:	Denver, Colorado
main line:	New Castle to Grand Junction
trackage:	62.1 miles (standard gauge; 85 lb. rails; 1.0% maximum grade)
traffic:	common carrier, mine
disposition:	merged into Denver & Rio Grande Railroad in Apr 1947

Rio Grande, Pagosa & Northern Railroad Company [RGP&N]

incorporated:	Apr 1899
construction:	Aug 1899 - Oct 1900
first train:	Oct 1900
operated:	Nov 1900 - Jul 1908
predecessors:	none
headquarters:	Pagosa Junction, Colorado
main line:	Pagosa Junction to Pagosa Springs
trackage:	30.8 miles (narrow gauge; 30 lb. rails; 3.6% maximum grade)
traffic:	common carrier, logging
disposition:	merged with Denver & Rio Grande Railroad in Aug 1908; abandoned in 1936

Rio Grande Railroad Company

incorporated: Jul 1900
construction: 1901 - 1906
first train: Jun 1901
operated: Jun 1901 - Jul 1908
predecessors: none
headquarters: Denver, Colorado
main line: Texas Creek to Westcliffe; Delta to Somerset; Maitland Junction to Big Four
trackage: 77.4 miles (standard and narrow gauge)
traffic: common carrier; mine
disposition: merged with Denver & Rio Grande Railroad in Aug 1908

Rio Grande Southern Railroad Company [RGS]

incorporated: Nov 1889
construction: Mar 1890 - Jan 1892
first train: Nov 1890 (to Telluride)
operated: Oct 1890 - Dec 1951
predecessors: none
headquarters: Denver, Colorado
main line: Durango to Ridgway
trackage: 181.5 miles (narrow gauge; 30/40/57 lb. rails; 4/0% maximum grade)
traffic: common carrier, mine
disposition: abandoned in Dec 1951

Rocky Mountain Railway Company

incorporated: Apr 1905
construction: 1906
first train: 1907
operated: Jun 1907 - 1917
predecessors: none
headquarters: Boulder, Colorado
main line: Granby to Monarch
trackage: 13.6 miles (standard gauge; 2.0% maximum grade)
traffic: common carrier, logging
disposition: abandoned in 1917

San Luis Central Railroad Company [SLC]

incorporated:	Feb 1913
construction:	May 1913 - Aug 1913
first train:	Sep 1913
operated:	Sep 1913 - present
predecessors:	none
headquarters:	Denver, Colorado
main line:	Sugar Junction to Center
trackage:	12.2 miles (standard gauge; 56 lb. rails; 0.1% maximum grade)
traffic:	common carrier, agriculture
disposition:	still in operation

San Luis Valley Southern Railway Company [SLVS]

(see Southern San Luis Valley Railroad Company)

Silverton, Gladstone & Northerly Railroad Company [SG&N]

incorporated:	Apr 1899
construction:	Apr 1899 - Jul 1899
first train:	Jul 1899
operated:	Jul 1899 - Jul 1915
predecessors:	none
headquarters:	Silverton, Colorado
main line:	Silverton to Gladstone
trackage:	7.5 miles (narrow gauge; 45 lb. rails; 3.8% maximum grade)
traffic:	common carrier, mine
disposition:	sold to Silverton Northern Railroad in Jul 1915

Silverton Northern Railroad Company [SN]

incorporated:	Nov 1895
construction:	Nov 1895 - Sep 1905
first train:	Jun 1896
operated:	Jun 1896 - 1939
predecessors:	none
headquarters:	Silverton, Colorado
main line:	Silverton to Gladstone and Animas Forks
trackage:	17.2 miles (narrow gauge; 45 lb. rails; 7.5% maximum grade)
traffic:	common carrier, mine
disposition:	abandoned; scrapped in Sep 1942

RAILROADS IN COLORADO 1858-1948

Silverton Railway Company

incorporated:	Nov 1904	
construction:	Jul 1887 - Jan 1889	
first train:	Jun 1888	
operated:	Nov 1904 - 1921	
predecessors:	Silverton Railroad Company	Jul 1887 - Nov 1904
headquarters:	Denver, Colorado	
main line:	Silverton to Ironton	
trackage:	21.5 miles (narrow gauge; 30/45 lb. rails; 7.0% maximum grade)	
traffic:	common carrier, mine	
disposition:	abandoned; scrapped in 1923	

South Park & Leadville Short Line Railroad Company [SP&LSL]

(see London, South Park & Leadville Railroad Company)

Southern San Luis Valley Railroad Company [SSLV]

incorporated:	Dec 1953	
construction:	Jul 1909 - Sep 1910	
first train:	Apr 1910 (to San Acacio)	
operated:	Jan 1955 - present	
predecessors:	San Luis Southern Railway Company	Jul 1909 - Jan 1910
	San Luis Valley Southern Railway Company	Feb 1928 - Dec 1954
headquarters:	Blanca, Colorado	
main line:	Blanca to Jarosco	
trackage:	31.7 miles (standard gauge; 65 lb. rails; 0.3% maximum grade)	
traffic:	common carrier, agriculture	
disposition:	still in operation	

Uintah Railway Company

incorporated:	Nov 1903
construction:	Jan 1904 - Nov 1911
first train:	1904
operated:	Feb 1905 - May 1939
predecessors:	none
headquarters:	Mack, Colorado
main line:	Mack, Colorado, to Watson, Utah
trackage:	68.5 miles (narrow gauge; 30/60 lb. rails; 7.5% maximum grade)
traffic:	common carrier, mine
disposition:	abandoned in May 1939 and scrapped

Union Pacific, Denver & Gulf Railway Company [UPD&G]

incorporated:	Apr 1890	
construction:	1890	Ludlow to Berwind
		Martensen to Vasquez
		Denver west side
		Catskill, New Mexico, down Red River
		Wendover, Wyoming, to Orin Junction, Wyoming
	1892	Acme Junction to Aguilar and Ludlow
		Beshoar Junction to Grey Creek
		Allen-Bond Mine spur
	1893	Catskill to Dunn's
	1895	Walsenburg Junction to Acme Junction
	1895	Forbes Junction to Trinidad Rolling Mill
	1897	Dunn's to Newton, New Mexico
	1898	Ludlow to Berwind extension
first train:	Apr 1890	
operated:	Apr 1890 - Jan 1899	
predecessors:	lines consolidated in Mar 1890:	
	Canon de Agua Railroad Company	(3.3 miles)
	Cheyenne & Northern Railway Company	(125.2 miles)
	Chicosa Canon Railway Company	(4.1 miles)
	Colorado Central Rail Road Company	(300.9 miles)
	Denver & Middle Park Railroad Company	(4.6 miles)
	Denver, Marshall & Boulder Railway Co.	(30.0 miles)
	Denver, Texas & Fort Worth Railroad Co.	(168.8 miles)
	Denver, Texas & Gulf Railroad Company	(138.0 miles)
	Georgetown, Breckenridge & Leadville RR	(8.5 miles)
	Greeley, Salt Lake & Pacific Railway Co.	(62.6 miles)
headquarters:	Denver, Colorado	
main line:	Cheyenne to Orin Junction; Fort Collins to Sixela; La Salle to Julesburg	
trackage:	915.2 miles (standard and narrow gauge; 75/85 lb. rails; 2.0% maximum grade)	
traffic:	common carrier	
disposition:	reorganized as Colorado & Southern Railroad in Jan 1899	

7 Colorado Railroad Network Maps

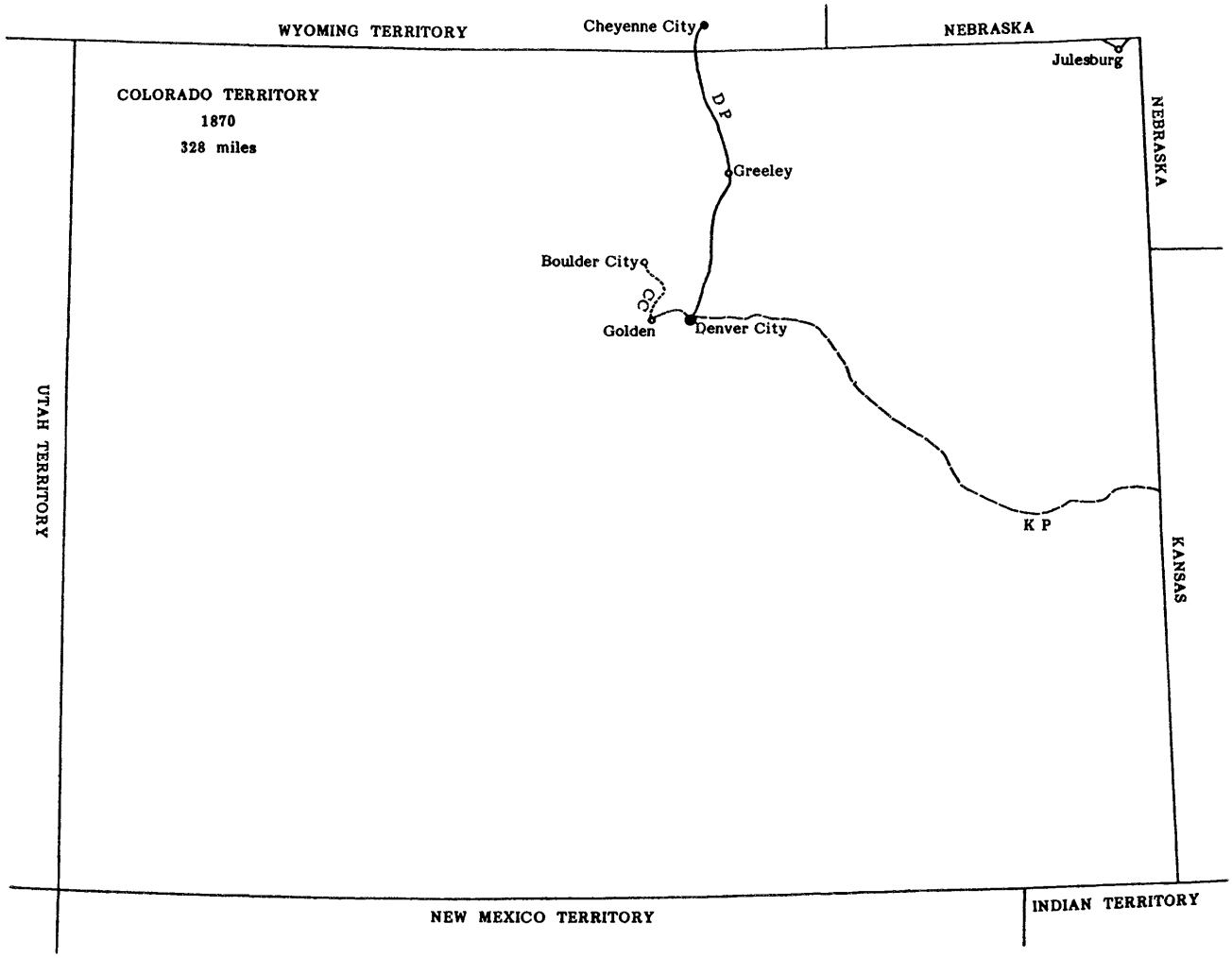


Figure 39. Colorado railroad network: 1870, from Donald B. Robertson, *Encyclopedia of Western Railroad History*

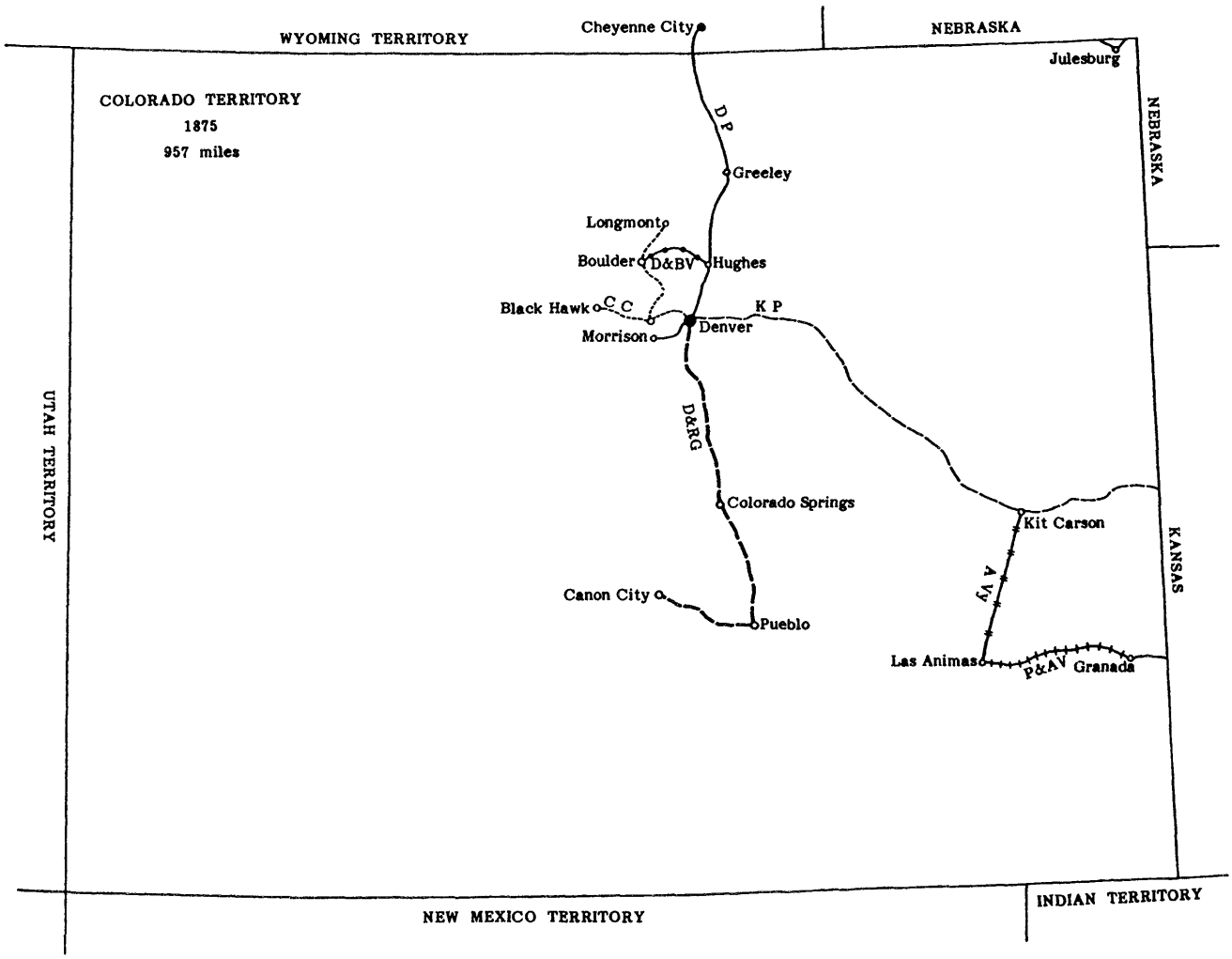


Figure 40. Colorado railroad network: 1875, from Donald B. Robertson, *Encyclopedia of Western Railroad History*

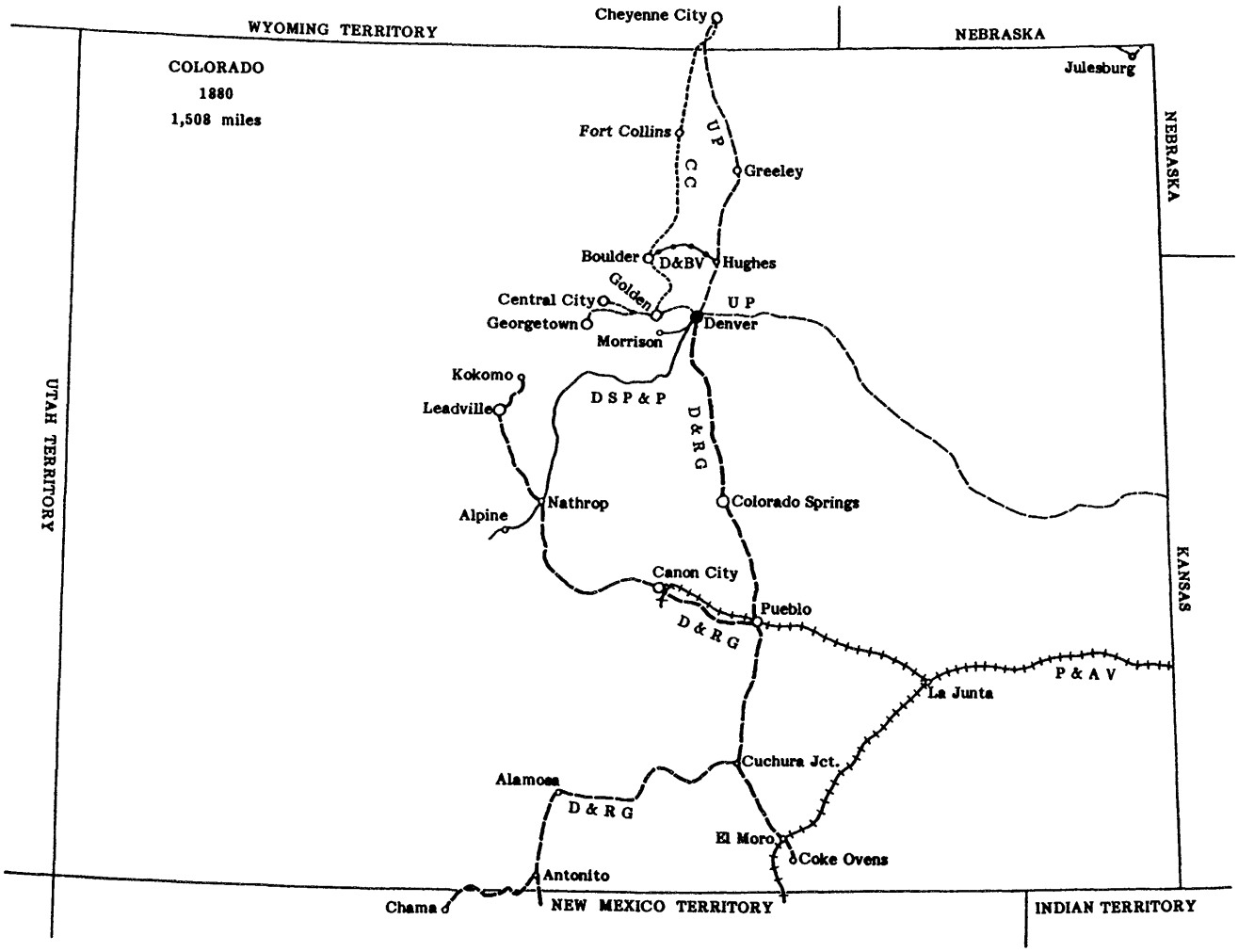


Figure 41. Colorado railroad network: 1880, from Donald B. Robertson, *Encyclopedia of Western Railroad History*

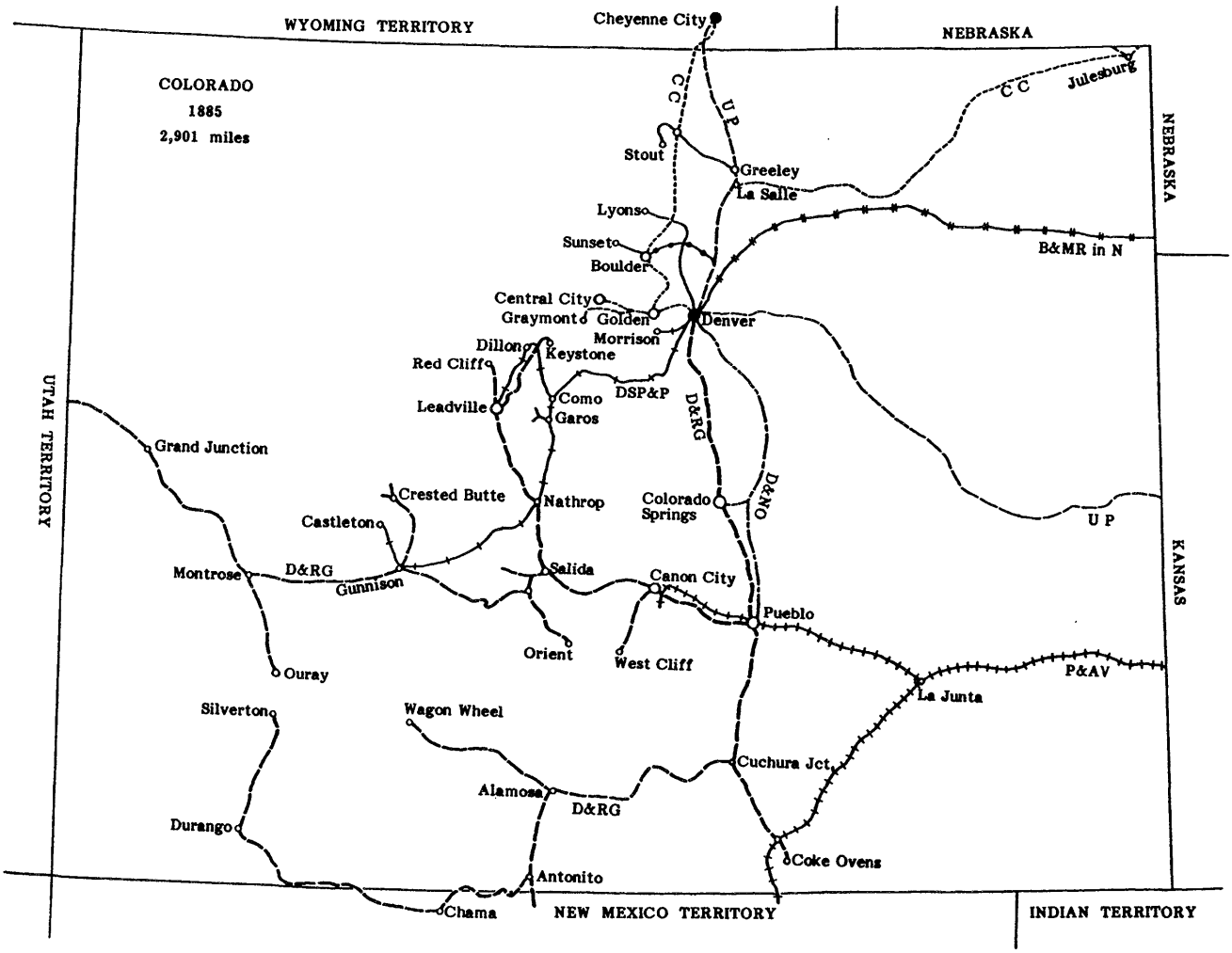


Figure 42. Colorado railroad network: 1885, from Donald B. Robertson, *Encyclopedia of Western Railroad History*

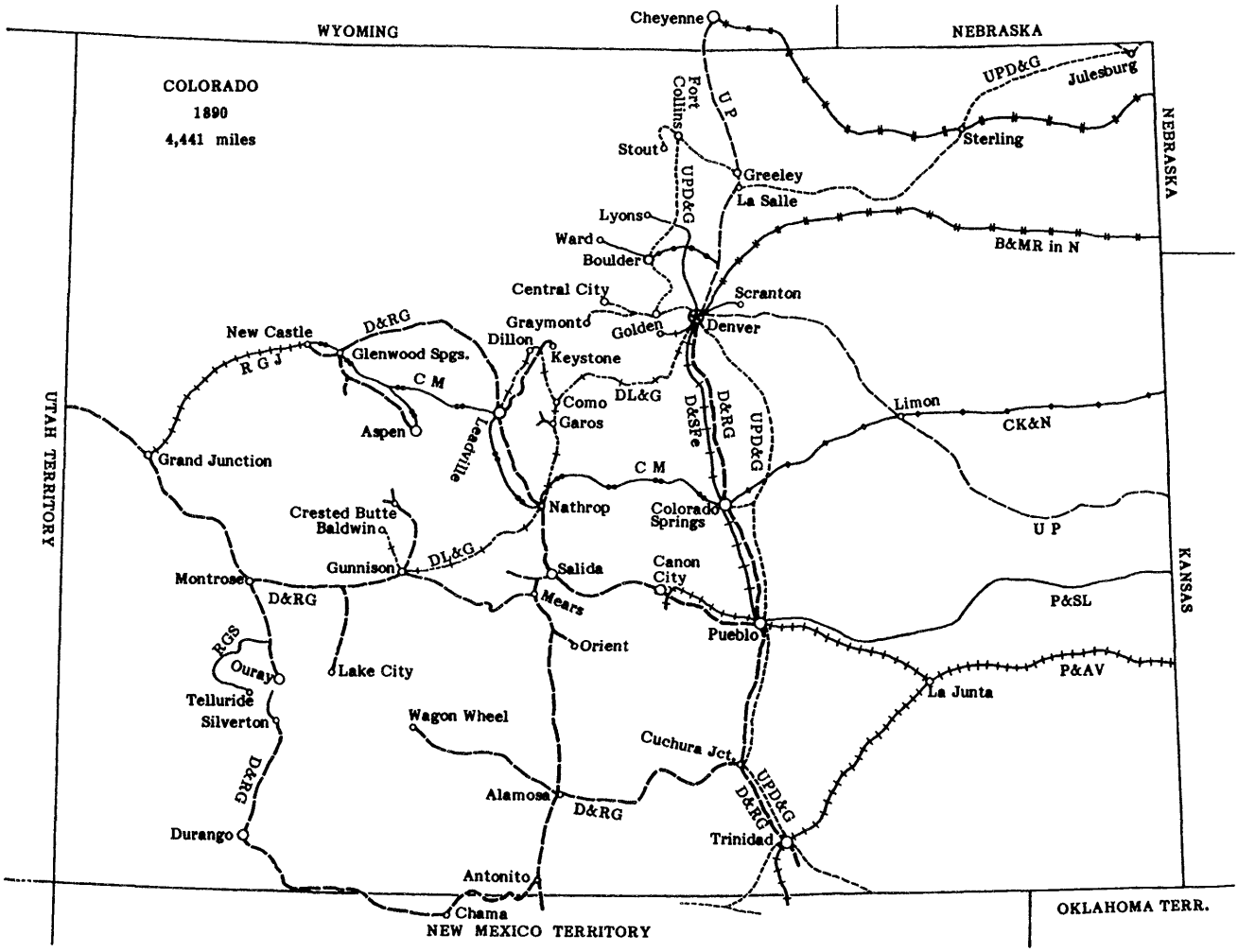


Figure 43. Colorado railroad network: 1890, from Donald B. Robertson, *Encyclopedia of Western Railroad History*

RAILROADS IN COLORADO 1858-1948

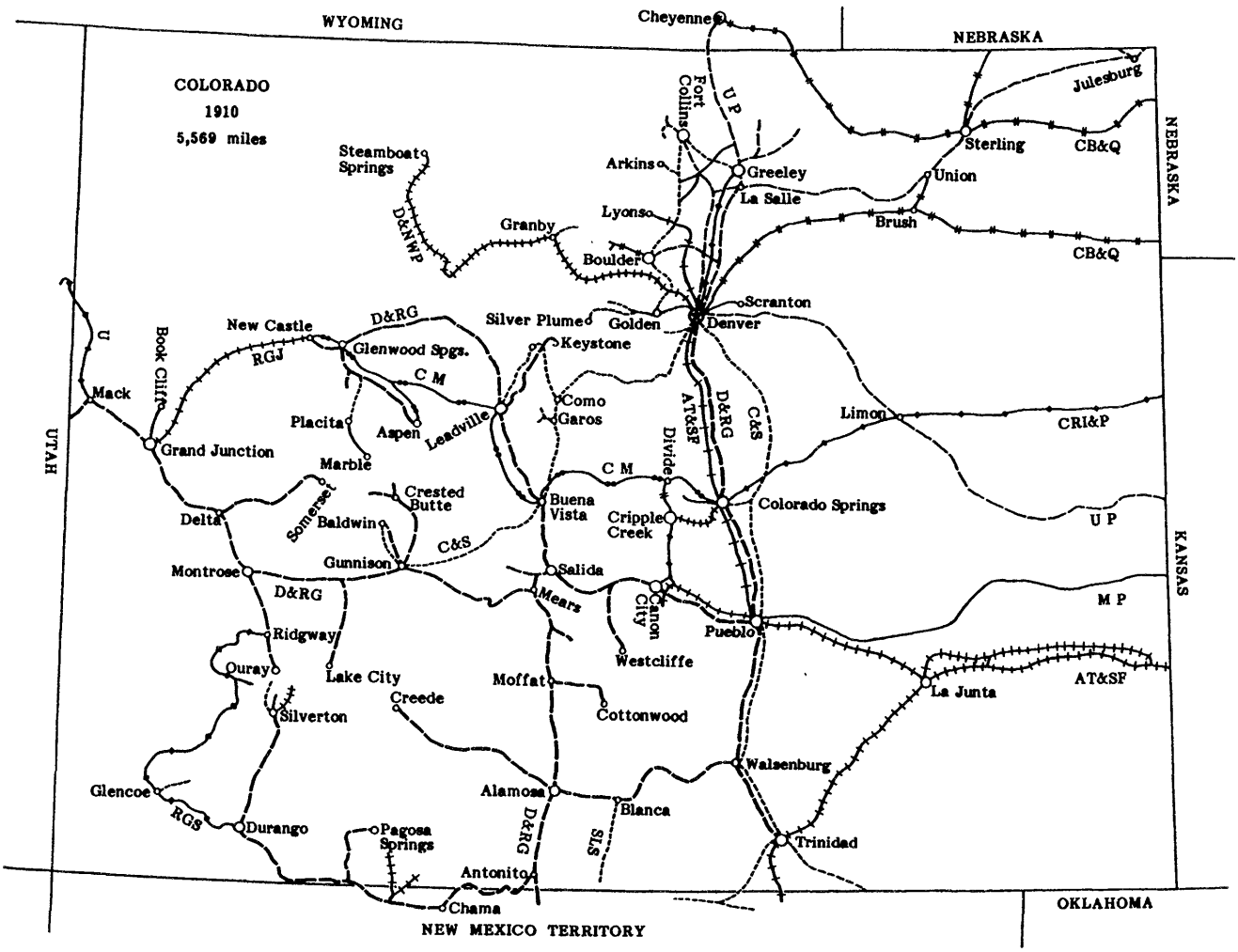


Figure 45. Colorado railroad network: 1910, from Donald B. Robertson, *Encyclopedia of Western Railroad History*

RAILROADS IN COLORADO 1858-1948

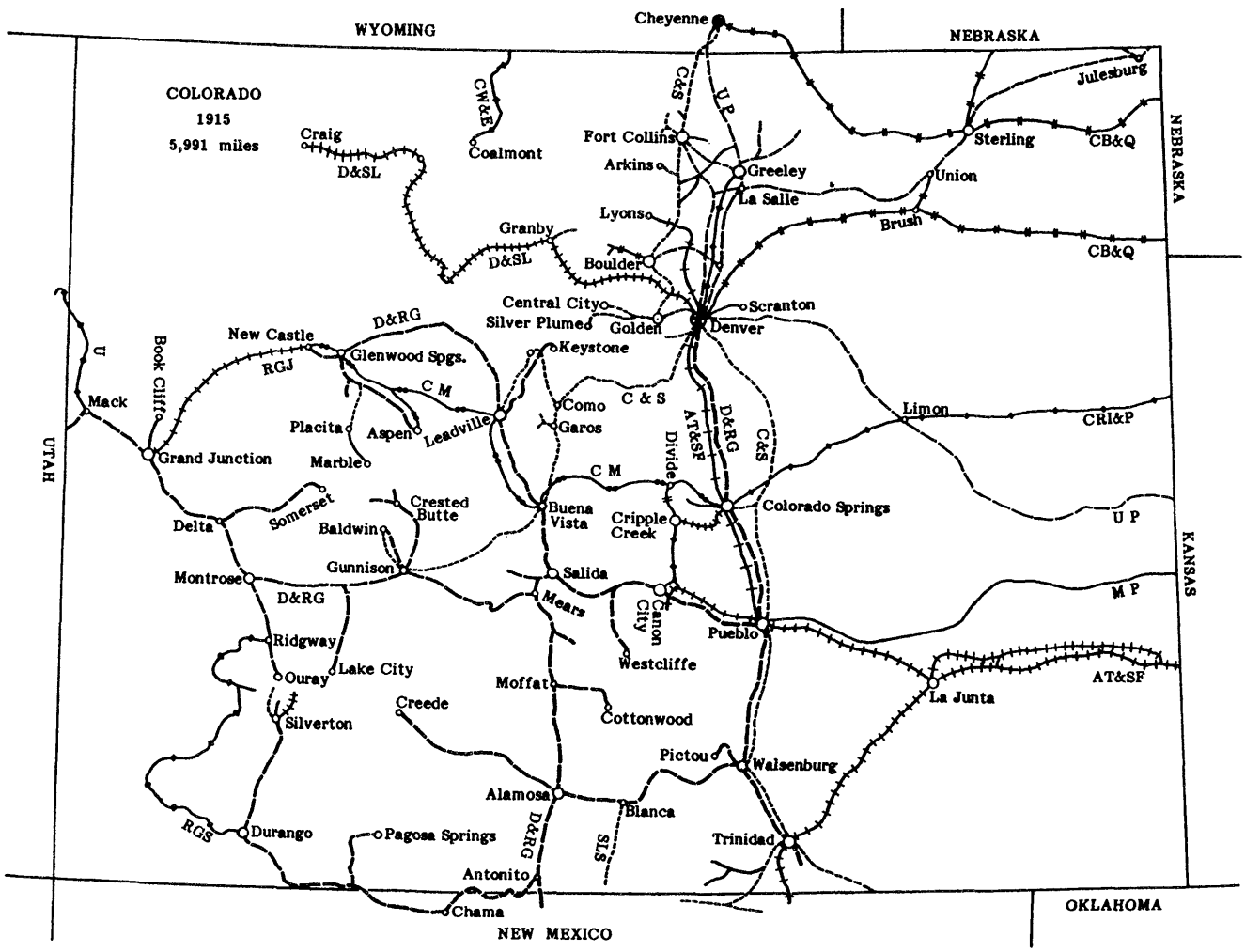


Figure 46. Colorado railroad network: 1915, from Donald B. Robertson, *Encyclopedia of Western Railroad History*

8 Endnotes

[1]Thomas J. Noel, Paul F. Mahoney, and Richard E. Stevens, *Historical Atlas of Colorado* (Norman: University of Oklahoma Press, 1994), 4; Robert M. Ormes, *Railroads and the Rockies* (Denver: Sage Books, 1963), 15; Samuel David Mock, "Railroad Development in the Colorado Region to 1880," (Ph.D. dissertation, University of Nebraska, Lincoln, 1938), 15-16. Mock writes: "How Colorado developed its own railroad system to support its mining industry once the Pacific railroad passed it by is the Colorado railroad story."

[2]Mock's and Tivis Wilkins' organization of Colorado railroad history and the one presented in the *Encyclopedia of Western Railroad History* have been particularly influential in determining these periods. Tivis Wilkins, *Colorado Railroads: Chronological Development* (Boulder: Pruett Publishing Company, 1974); Samuel David Mock, "Railroad Development in the Colorado Region to 1880"; Donald B Robertson, *Encyclopedia of Western Railroad History: The Mountain States* Vol. 2 (Dallas: Taylor Publishing Company, 1991).

[3]Noel, Mahoney and Stevens, *Historical Atlas of Colorado*, 1-4.

[4]Noel et al., 25.

[5]Noel, 9; Carl Abbott, Stephen J. Leonard and David McComb, *Colorado: A History of the Centennial State* (Boulder: Colorado Associated University Press, 1982), 5-7.

[6]Forest Crossen, *The Switzerland Trail of America* (Boulder: Pruett Press, Inc., 1962), 1-2; Mock, 17; O. Meredith Wilson, *The Denver and Rio Grande Project, 1870-1901: A History of the First Thirty Years of the Denver and Rio Grande Railroad* (Salt Lake City: Howe Bros., 1982), 2.

[7]Noel, 26.

[8]Mock, 21; Wilson, 2. For clarity, this narrative will generally use modern spellings and place names for towns. Blackhawk, for example, is often spelled Black Hawk, and both Denver and Golden were initially called Denver City and Golden City.

[9]The concept of rivalry among the towns for control of access to the mines is articulated by both Robert Riegel (p. 8) and David Mock (p. 78). Randall E. Rohe, "Feeding the Mines: The Development of Supply Centers for the Goldfields," (*Annals of Wyoming* 57:1 (Spring 1985): 40.

[10]Mock, 29-31, 32-37; Noel, 27.

[11]Some say that the first American railroad was the Granite Railroad of Quincy, Massachusetts, a tramway constructed in 1826.

[12]The quotation is from Taylor. It is not known when the first idea for the transcontinental railroad occurred. In 1832 an anonymous writer in the *Emigrant*, a paper published in Ann Arbor, Michigan, proposed the idea. Robert Riegel wrote that so many people took credit for the first idea of a transcontinental railroad, that it became a frequent topic of after-dinner conversation by men during the mid-19th century. George Rogers Taylor, *The Transportation Revolution, 1815-1860*, Vol. IV. *The Economic History of the United States* (New York: Rinehart & Company, Inc., 1951), 75-76, 79, 102; James E. Vance, *The North American Railroad* (Baltimore: Johns Hopkins University Press, 1995), 148, 151, 155-157; Riegel, 3, 14-16.

[13]George R. Taylor and Irene D. New, *The American Railroad Network, 1861-1890* (Cambridge: Harvard University Press, 1956), 43-45.

[14]Mock, 25-26, 52-3.

[15]Wesley S. Griswold, *A Work of Giants: Building the First Transcontinental Railroad* (New York: McGraw-Hill Book Company, Inc., 1962), 163; Mock, 45-47, 52-58, 62, 67, 72-74.

[16]Rodman Paul, *Mining Frontiers of the Far West: 1848-1880* (New York: Holt, Rinehart and Wilson, 1963), 9.

[16]Colorado's 1862-1863 gold production amounted to $3.4 million per year. Larson, 149.

[17]Rodman Wilson Paul, *Mining Frontiers of the Far West, 1848-1880* (New York: Holt, Rinehart and Winston, 1963), 125.

[18]Mock, 79-81, 91-92; Robert W. Larson, "Populism in the Mountain West: A Mainstream Movement," *The Western Historical Quarterly*, April 1982, 149; Randall E. Rohe, "Feeding the Mines: The Development of Supply Centers for the Goldfields," 54-55; Taylor, p. 123.

[19]Taylor wrote, "It has been axiomatic in Colorado that success in mining and treating ore has never been solely dependent on overcoming technological obstacles, nor even on finding rich ores. Rather, it has been a question of what was financially practicable at the prevailing level of costs, and of these costs transportation has been one of the most important, largely because of the rugged terrain for which Colorado is so famous." Taylor, 125.

[20]Robert A. LeMassena, *Colorado's Mountain Railroads* (Denver: Sundance Publications, Limited, 1984), 337.

[21]W. Elliot Brownlee, *Dynamics of Ascent: A History of the American Economy* (New York: Alfred A. Knopf, 1974), 139.

[22]W. Elliot Brownlee, *Dynamics of Ascent...*," 139.

[24]The Kansas Pacific was originally incorporated in 1855 as the Leavenworth, Pawnee & Western Railroad. In 1863 it changed its name to the Union Pacific Railway Co., Eastern Division. In 1869 it again changed its name to the Kansas Pacific Railway. For simplicity and clarity, the name Kansas Pacific is used in this narrative.

[25]The two routes ran along the 32nd and 35th parallels.

[26]By 1869 the land grant extended for the entire distance, but the government never granted any bond aid. Mock, 87-89, 204; LeMassena, 247; Riegel, 113.

[27]The line was first chartered in February 1865 as the Clear Creek and Colorado Railway Company. It changed its name the following year to the Colorado Central and Pacific. In 1856 the company changed its name to the Colorado Central Rail Road. The name Colorado Central is used throughout the narrative for clarity.

[28]LeMassena, 45-46; Mock, 79-81, 85, 94-101.

[29]LeMassena, 120; Mock, 103-105.

[30]Richard C. Overton, *Gulf to Rockies: The Heritage of the Fort Worth and Denver, Colorado and Southern Railways, 1861-1898* (Austin: University of Texas Press, 1953), 39-43.

[31]Edward T. Bollinger and Frederick Bauer, *The Moffat Road* (Chicago: Ohio University Press, 1962), 15.

[32]Mock, 109.

[33]The Denver Pacific broke ground on May 1868.

[34]Mock, 125, 128, 129, 133-135; Riegel, 114; LeMassena, 120.

[35]Wilkins, 3-4.

[36]Riegel, 114; Mock, 144-151.

[37]Taylor, 123-124.

[38]Ubbelohde, 118-123, 162; Larson, 149; Mock, 93; Crossen, 4.

[39]James A. Henretta, et al, *America's History* (Chicago: The Dorsey Press, 1987), 507; Riegel, 76-77; Wilson, 25; Wilkins, 13.

[40]Paul, 125; Frank R. Hollenback, *The Gilpin Tram* (Denver: Sage Books, 1958), 10.

[41]Wilkins, 8-13; LeMassena, 45-47; Mock, 237-250.

[42]The line originally incorporated as the Denver, South Park & Pacific Railway. In 1873 it reorganized as the Denver, South Park & Pacific Railroad. LeMassena, 213; The poet was Cy Warman, quoted in Lucius Beebe and Charles Clegg, *Narrow Gauge in the Rockies* (Berkeley: Howell-North, 1958), 124.

[43]Wilson, 26; Riegel, 6.

[44]Riegel, 21-22. Western railroad financing is an extremely complex topic. Robert Riegel devoted a chapter in his excellent book, *The Story of the Western Railroads*, to railroad finance and the Panic of 1873. George Taylor deals with the subject with a less strictly western focus in his classic *The Transportation Revolution*.

[45]Taylor, 88, 102.

[46]Mock, 179; Wilson, 1.

[47]Mock, 175-177

[48]Wilson, 5-6, 110, 113.

[49]Wilson, 12.

[50]Wilson, 12.

[51]Lincoln first decreed that the transcontinental railroad should be built on a five-foot gauge. Wilson, 13-14; Vance, 116; Riegel, 73, 263.

[52]The first narrow-gauge railroad in North America is thought to have been constructed in Canada. Wilson, 14-15, 92.

[53]Other directors of the D&RG also raised money through bond sales. Palmer was not alone in raising funds for the railroad.

[54]Wilson, 12, 17-20.

[55]Wilson, 22-23.

[56]At the time, Florence was called Labran.

[57]LeMassena, 121; Wilson, 21-25.

[58]Wilkins, 13; Wilson, 24-27.

[59]Wilkins, 11-14; Riegel, 116-117, 184; Mock, 204-207; LeMassena, 247.

[60]James A. Henretta et al., *America's History* (Chicago: The Dorsey Press, 1987), 507; Riegel, 76-77; Wilson, 25; Wilkins, 13.

[61]Henretta, *America's History*, 507; Riegel, 76-77; Wilson, 25; Wilkins, 13; Robert W. Larson, "Populism in the Mountain West: A Mainstream Movement," *The Western Historical Quarterly*, April 1982, 149.

[62]Henretta, 519.

[63]LeMassena, 45-48, 120, 247-248.

[64]Wilkins, 13, 21.

[65]Ubbelohde et al., 151-156.

[66]Larson, 149.

[67]Abbott, 84-85; Wilson, 26.

[68]James Sherow, "Watering the Plains: An Early History of Denver's Highline Canal," *Colorado Heritage* (Issue 4, 1988): 4-5; Noel, 28; Morris Cafky, *Colorado Midland* (Denver: Rocky Mountain Railroad Club, 1965), 282.

[69]Wilson, 26; Riegel, 6.

[70]Wilson, 26-31; Marshall, 133-134.

[71]Wilson, 34; James Marshall, *Santa Fe: The Railroad that Built an Empire* (New York: Random House, 1945), 130-140.

[72]Leadville's was the second largest silver discovery in the United States to that time, after the Comstock Load in Nevada. According to Rodman Paul in *Mining Frontiers of the Far West*, Leadville's annual output of silver soon surpassed every foreign nation but Mexico, and its lead production was nearly comparable to that of England. Paul, 128.

[73]Abbott, 102.

[74]Paul, 127-129.

[75]Paul, 129-130; Marshall, 142-152.

[76]Athern, *Rebel*, 84; Marshall, 152-153.

[77]Marshall, 153-155; Athern, 80-86; Wilson, 38-43.

[78]Athern, 85; Wilson, 59-60; Riegel, 188.

[79]Ubbelohde et al., 205-206.

[80]Wilkins, 29.

[81]Athern, 90.

[82]Athern lists five roads acquired by the Western and LeMassena lists three. Athern's five roads include the Sevier Valley Railway, the Salt Lake and Park City Railway, the Bingham Canyon and Camp Floyd Railroad, the Wasatch and Jordan Valley Railroad, and the Utah and Pleasant Valley Railway Company. Athern, 115-116. LeMassena mentions the acquisitions of all but the Sevier Valley and the Salt Lake and Park City Railway. LeMassena, 202-203.

[83]Henretta, 183, 590; Riegel, 200.

[84]LeMassena, 203; Athern, 120-125.

[85]Vance, 116; Wilson, 13-14; Riegel, 73, 263-265; George Taylor and Irene D. Neu, *The American Railroad Network, 1861-1890* (Cambridge: Harvard Univ. Press, 1956), 43-45.

[86]Athern, 123-126.

[87]Wilson, 66, 70-71.

[88]Athern, *Rebel of the Rockies*, 92-98.

[89]Robert E. Sloan and Carl A. Skowronski, *The Rainbow Route* (Denver: Sundance, Ltd, 1975), 17-19; Noel, 36.

[90]Noel, 356.

[91]Athern, 101-102; Wilson, 64.

[92]Athern, 104.

[93]Athern, 104-105; Wilson, 65; Choda, i.

[94]Spencer Wilson and Vernon J. Glover, *The Cumbres & Toltec Scenic Railroad: The Historic Preservation Study* (Albuquerque: University of New Mexico Press, 1980), 58-60.

[95]Sloan, 24-34.

[96]Colorado Historical Society, "Salida Historical Overview," 1961; George G. Everett, *The Cavalcade of Railroads in Central Colorado* (Denver: Golden Bell Press, 1966), 23, 26.

[97]Paul, 129; Beebe and Clegg, *Hear the Train Blow*, 227.

[98]Paul, 129; Abbott, 104-109; Noel, 35.

[99]LeMassena, 213; Beebe, 127-129.

[100]Athern, *Rebel*, 110.

[101]Both of the books written by Lucius Beebe and Charles Clegg convey this sentiment well. The quotation is from *Hear the Train Blow*, 219.

[102]M.C. Poor collected three versions of the elephant story, one from veteran Chaffee County Surveyor J.M. Cuenin, one recorded by Lewis R. Lathrop in a 1941 article for *Railroad Magazine*, and one from a 1936 *Rocky Mountain News* article written by Edith Townsend. The stories vary in the details and in the name of the circus company involved, but the stalled train and the elephant rescue is the same in each. Lucius Beebe and Charles Clegg recorded a version of the story in their book that is similar to the Lathrop version. M.C. Poor, *Denver South Park & Pacific*, Memorial edition (Denver: Rocky Mountain Railroad Club, 1976), 376-377; Lucius Beebe and Charles Clegg, *Narrow Gauge in the Rockies* (Berkeley: Howell-North, 1958).

[103]George G. Everett, *The Cavalcade of Railroads in Central Colorado*. (Denver: Golden Bell Press, 1966), 156-157.

[104]Abbott, 107-109; Ubbelohde et al., 170-171.

[105]Abbott, 109.

[106]Beebe and Clegg call the Denver, South Park & Pacific Railroad "beyond doubt the best-loved and most-remembered narrow gage (sic) in the record." *Hear the Train Blow*, 219.

[107]Beebe, 127-129; Ubbelohde et al., 171; Wilkins, 31, 40.

[108]Wilkins, 34, 37.

[109]Lucius Beebe and Charles Clegg, *Narrow Gauge in the Rockies*, 129-130.

[110]LeMassena, 214-215.

[111]LeMassena, 214-215; Beebe and Clegg, *Narrow Gauge*, 25; Beebe and Clegg, *Hear the Train Blow*, 219. The financial/ownership etymology of the South Park somewhat confusing.

[112]Beebe and Clegg, *Narrow Gauge In the Rockies*, 146; Helphand, 183.

[113]Wilkins, 62-63; LeMassena, 53; Edward M. McFarland, *The Midland Route: A Colorado Midland Guide and Field Book* (Boulder: Pruett Publishing Company, 1980), 17.

[114]LeMassena, 139; Wilkins, 61.

[115]Wilkins, 65, 72; Sloan and Skowronski, 54-61.

[116]LeMassena, 311; Sloan and Skowronski, 58-59.

[117]C.W. Gibbs, M. Am. Soc. D.E., "The Turn-Table on the Main Track of the Silverton Railroad in Colorado." *Transactions of the American Society of Civil Engineers*, Vol. 23, No. 450 (September 1890), reprinted in Sloan and Skowronski, 63. In a critique, J. Foster Crowell stated: "It would have been better to obtain an engine capable of running in either direction and not requiring to be turned, rather than resort to a turn-table in the main track which contains an element of danger as well as of delay to the traffic. The device, however, is an ingenious one to meet the peculiar conditions of the line..." Gibbs replied that "if a special engine had been procured, as Mr. Crowell suggests, it would have been at an extra expense, owing to the limited number wanted; and even with a special design, it might have been difficult for any engine to have backed its load over so steep a grade and such sharp curves without more danger than was suggested there might be at the turn-table."

[118]Sloan and Skowronski, 53-54, 61-62, 99.

[119]In 1891 the D&RG built from Alamosa to South Fork; in 1883 from South Fork to Wagon Wheel Gap; in 1891 from Wagon Wheel Gap to North Creede. Wilkins, 37, 48, 88.

[120]Ubbelohde et al., 171-172; W. Storrs Lee, *Colorado: A Literary Chronicle*, (New York: Funk & Wagnalls, 1970), 349. Lee quotes Richard Harding Davis from his book, *The West From a Car Window*, 1892; Noel, 60.

[121]Hollenback, 9; Mallory Hope Ferrell, *The Gilpin Gold Tram: Colorado's Unique Narrow-Gauge* (Boulder: Pruett Publishing Company, 1970), 67.

[122]Ferrell, *Gilpin Tram*, 64-65.

[123]Riegel, 198; Walter R. Borneman, "Ride the Historic Georgetown Loop: Relive Colorado Mining-Glory Days," *American West* (Issue 3, 1987): 42-47; Wilson, 66-67.

[124]Borneman, 42-44.

[125]Athern, *Rebel*, 114-115.

[126]Wilson, 70, 74-75.

[127]Athern, *Rebel*, 115, 120-122; Wilson, 76.

[128]The entity formed to build this track was called the State Line & Denver Railway.

[129]For purposes of simplicity and clarity, this narrative will continue to refer to Palmer's newly organized line as "the Western."

[130]LeMassena, 293; Athern, 170-173; Wilson, 94-95.

[131]LeMassena, 277-280; Wilkins, 85, 89-91, 94.

[132]Richard C. Overton, *Gulf to Rockies: The Heritage of the Fort Worth and Denver–Colorado and Southern Railways, 1861-1898* (Austin: University of Texas Press, 1953), 39.

[133]Patrick C. Dorn, *Everywhere West: The Burlington Route* (Seattle: Superior Publishing Company, 1876), 9-11.

[134]LeMassena, 32.

[135]This was the line built by the Colorado Central.

[136]LeMassena, 226-227; Wilkins, 56, 63, 75, 77.

[137]Wilson, 89; LeMassena, 265; Wilkins, 70.

[138]LeMassena, 40-41; Rebecca Conard, "Advent and Development of Railroad in Iowa: 1855-1940," National Register of Historic Place Multiple Property Documentation Form, 1990.

[139]Wilkins, 40, 45, 51, 65; Forest Crossen, *The Switzerland Trail of America* (Boulder: Pruett Press, 1978), 17-18.

[140]Crossen, 19-21.

[141]Crossen, 27-28.

[142]Evans' first project was the Denver Pacific, also by 1880 delivered by Jay Gould into the hands of the Union Pacific.

[143]Overton, 39-40.

[144]LeMassena, 113; Overton, 80-81.

[145]LeMassena comments succinctly about the complex reorganizations: "The Denver, Texas & Gulf Railroad, incorporated in 1885, was organized by the creditors of the construction company which had built the Denver & New Orleans Railroad, and the DT&G took, possession of

the D&NO in 1886. Two year later the Denver Texas & Ft. Worth Railroad acquired the securities of the DT&G, but did not absorb the company, although operations were combined."

[146]Wilkins, 63, 72.

[147]Overton, 185-189.

[148]The Denver Pacific and Kansas Pacific operated from a brick depot on Wazee Street between 21st and 22nd Streets. The Denver Pacific used another station, a simple wooden building, at 16th and Wynkoop. The Denver & Rio Grande's long wooden depot stood at 19th and Wynkoop from 1871-1879. A critical bridge over Cherry Creek washed out in 1879, sending the D&RG to bunk with the South Park until Union Station opened in 1881. The Denver South Park & Pacific's stone depot stood at 6th and Larimer Streets. The simple wooden Colorado Central Depot at 16th and Delgany Streets was unpopular with the people of Denver. It was too small for the three roads that used it, the South Park and the D&RG stopping in as well. The Denver & New Orleans operated from a wooden depot at 11th and Wynkoop. The misleadingly named Denver Utah & Pacific which ran from Denver to the coal mines and stone quarries of the Boulder and Lyons valleys built its Denver depot at 19th and Chestnut Streets. Kenton Forrest and Charles Albi, *Denver's Railroads: The Story of Union Station and the Railroads of Denver* (Golden: Colorado Railroad Museum, 1986), 11.

[149]Forrest and Albi, 15-20; Paul, 124-127.

[150]Forrest and Albi, 12-14, 20-21.

[151]Forrest and Albi, 21, 32.

[152]Forrest and Albi, 24, 32. The D&RG initially blocked the D&NO from using the depot, then relented.

[153]Paul, 125-126; Ubbelohde et al., 206, 209-210; Overton, 189.

[154]Wilkins, 77.

[155]Abbott, 335-336.

[156]Henretta, 630-631.

[157]Larson, 145, 150; Ubbelohde et al., 220-230; Henretta, 630-631; Meredith Wilson, 95; Riegel, 305-306.

[158]Meredith Wilson, 107; Riegel, 305-306; LeMassena, 145.

[159]Riegle, 308-312; Larson, 151.

[160]In the complex transactions that defined turn-of-the-century railroading in America, the Northern Pacific owned a 50 percent interest in the CB&Q. LeMassena, 344.

[161]LeMassena, 65-76.

[162]Meredith Wilson, 100-102.

[163]John Fisher, *A Builder of the West: The Life of General William Jackson Palmer* (Caldwell, Idaho: The Caxton Printers, Ltd., 1939), 304. Part of the buy-out included a promise from Palmer to remove himself from the Colorado railroad business.

[164]George Gould had put up the D&RG and the RGW as security for the financing of his WP railroad.

[165]Meredith Wilson, 107; Riegel, 305-306; LeMassena, 145.

[166]Rodman Paul, 132-133; Ubbelohde et al., 211-212; Noel, 37.

[167]The Adelaide Bridge remains in place today as part of County Road 67. It is presently in essentially unaltered condition, but planned alterations to the guardrails threaten to change its appearance.

[168]Morris Cafky, *Rails Around Gold Hill* (Denver: Rocky Mountain Railroad Club, 1955), 15-24; LeMassena, 232, 237. The Victor-Altman line had been constructed by the Golden Circle Railroad in 1896.

[169]It was subsequent to this that the D&RG and C&S each bought half ownerships in the Colorado Midland.

[170]The holding company was called the Denver & Southwestern Railway. LeMassena, 260.

[171]One of the peculiarities of Cripple Creek ore was that it "required smelting, or even more complex chemical operations such as cyanidation of chlorination." Ubbelohde, 213. A pathbreaking geologic study conducted by Whitman Cross of the United State Geological Survey with Richard Penrose, Jr., of the University of Chicago, and Edward Mathews of Johns Hopkins University yielded much useful information about "the different rock species at Cripple Creek." Rodman Paul, 133.

[172]Short Line Gold Camp Road Auto Tour.

[173]LeMassena, 311.

[174]Management decisions made by George Gould on the larger line worked to the RGS's disadvantage, and in 1929 it failed a final time. Much later, during WWII the government found a need for the RGS's rails and trains rode them again. The line was finally abandoned in 1951. LeMassena, 277-286; Beebe, 198-199.

[175]Sloan and Skowronski, 48, 195; LeMassena, 319.

[176]Sloan and Skowronski, 48, 134-135, 195; LeMassena, 319.

[177]Crossen, 46, 53 58, 82; LeMassena, 58-59.

[178]Soon afterward, the increasing popularity of automobiles, the Stanley Steamers and the expense of snow removal combined to bring the demise of the Switzerland Trail. In 1917 the railroad ceased operating and was dismantled in 1920. LeMassena, 100; Crossen, 145-176, 286; Wilkins, 146-147.

[179]LeMassena, 94-96.

[180]LeMassena, 89.

[181]Pikes Peak is one of those oddities of the English language. Although "Pikes" is a possessive in terms of usage, it has come to be written without an apostrophe.

[182]Frank R. Hollenback and William Russell, Jr., *Pikes Peak by Rail* (Denver: Sage Books, 1962), 13-20.

[183]Morris Abbott, *The Pike's Peak Cog Road* (San Marino: Golden West Books, 1972), 19.

[184]Its nearest rival was the Argentine Central. The M&PP was the nation's only railroad with a locomotive roster comprised entirely of Vauclain compound locomotives.

[185]This was an unusually high dividend, but serves to illustrate how profitable the line was. In 1925 the Manitou & Pikes Peak Railway became the property of the Broadmoor Hotel. Instead of being threatened by the increasing popularity of automobiles, the M&PP existed alongside them and offered an attractive alternative route for the excursionist. The M&PP still operates. Hollenback and Russell, 46-55.

[186]The Manitou & Pikes Peak climbed 1,000 miles higher, but it used a rack-and-pinion.

[187]LeMassena, 12.

[188]Hollenback, *The Argentine Central*, 12; Abbott, 9; LeMassena, 12.

[189]The tunnel was renamed Carlton Tunnel. The Colorado State Highway Department acquired it with most of the CM's right of way and turned it into a public highway. Use of the highway today seems to have been discontinued in favor of the Independence Pass route in the summer, or access to Aspen via Interstate 70 from Glenwood Springs year-round.

[190]Archibald Black, *The Story of Tunnels* (New York: Whittlesby House, McGraw-Hill Book Company, Inc., 1937), 198-201. Black opens his chapter on "Some Western Tunnels" under the subheading "Old Railroad History" by saying, "Few other tunnels, if any, can show a history more varied than that of the old 'Busk-Ivanhoe'..."; George Everett, *The Cavalcade of Railroads in Central Colorado* (Denver: Golden Bell Press, 1966), 159.

[191]LeMassena, 82-83; Wilkins, 135, 139, 141, 163, 253.

[192]Gordon Chappell, *Logging Along the Denver & Rio Grande: Narrow Gauge Logging Railroads of Southwestern Colorado and Northern New mexico* (Golden: Colorado Railroad Museum, 1971), 5-8; Wilkins, 123, 129.

[193]LeMassena, 52; Wilkins, 183, 189.

[194]LeMassena, 62-63. The railroad did well until WWI. After 1917 it struggled to break even, and the mine played out after 1945. In 1951 dismantling began.

[195]Kenton Forrest, co-author with Charles Albi of *Denver's Railroads*, is currently researching the UP's wheat lines. LeMassena, 345.

[196]Noel, 21; Gary Morgan, *Sugar Tramp: Colorado's Great Western Railway* (Fort Collins: Centennial Publications, 1975), 5-6.

[197]Morgan, 5-10.

[198]LeMassena and Wilkins each provide the sequence of construction. According to LeMassena, p. 239, the Great Western Railway originally intended "to construct a long loop which would pass through Johnstown and connect with the Colorado & Southern at both Loveland and Berthoud, the GW began to build eastward from Loveland in 1901. It reached Buda in 1902, continuing on to Welty in 1903 where it stopped. In 1904 it built eastward from Johnstown to Milliken. A disconnected segment between Windsor and Eaton was built in 1905, while another finger was extended from Johnstown to Liberty. This latter line was completed to Longmont in 1906, and in the next year a connection from Officer to Windsor joined the previously built track. Some of this seemingly odd behavior was due to an amalgamation in 1905 which added sugar refineries at Eaton, Windsor, and Longmont. Hence, the GW was rerouted to interconnect the various plants, as well as to provide transportation between the beet fields and the sugar factories."

[199]Wilkins, 266; LeMassena, 239-240.

[200]Morgan, 11-19, 71.

[201]LeMassena, 108.

[202]Kenneth Jessen, "The Denver, Laramie and Northwestern: What a Way to Run a Railroad," *Colorado Heritage* (Summer 1993): 22-38; Wilkins, 177, 179-181, 201.

[203]Jessen, 35-36.

[204]Jessen, 22-23, 37-38; LeMassena, p. 108, also suggests fraud, "... contemporary observers felt that the whole undertaking was little more than a stock promotion scheme thinly disguised as a railroad."

[205]Jessen, 23-26, 38.

[206]Abbott, 335.

[207]The early incarnation of this line was named the Denver, Lakewood & Golden Railway.

[208]Kenton Forrest and Charles Albi, *Denver's Railroads*, (Golden: Colorado Railroad Museum, 1981), 218-220.

[209]Forrest and Albi, 224-227.

[210]William C. Jones and Noel T. Holley, *The Kite Route: Story of the Denver & Interurban Railroad* (Boulder: Pruett Publishing Company, 1986), 1-28; Forrest and Albi, 230.

[211]Forrest and Albi, 224.

[212]LeMassena, 81.

[213]LeMassena, 93.

[214]LeMassena, 325; Robert Ormes, *Tracking Ghost Railroads in Colorado* (Colorado Springs: Century One Press, 1975), 41.

[215]Ormes says that the Grand Junction interurban ceased operations in 1933 and LeMassena puts the date at 1935. Ormes, 145; LeMassena, 239.

[216]Ormes, 145-146; Lyndon Lampert and Robert McLeod, *Little Book Cliff Railway: The LIfe and Times of a Colorado Narrow Gauge* (Boulder: Pruett Publishing Company, 1984), 5-79.

[217]Bollinger wrote that "through forty years he [Moffat] backed the establishment of every railroad, save the Colorado Midland...."

[218]The Las Animas land deal is a case in point. While serving as Territorial Treasurer in 1874-1876, Moffat used inside information to secure cheap land along the proposed Kansas Pacific Railroad expansion in order to sell when the railroad increased the land's value. In 1876 the General Land Office sought to regain the land and send Moffat to jail. Although the courts abrogated Moffat's land claims, he avoided jail. Moffat rarely lost money on mines, either. "Investors came to view Moffat as a man who took mines, skimmed the cream and then sold out at great personal advantage." Stephen Frederick Mehls, "David H. Moffat, Jr: Early Colorado Business Leader." (Ph.D. Thesis, University of Colorado, 1982), 37, 43-44, 150-151.

[219]Bollinger, 19. The other possibility is that Moffat's business judgement had finally failed him.

[220]The Moffat Road appellation was much more than a nickname. Some of the early engines and rolling stock had "The Moffat Road" emblazoned on their sides.

[221]Black, *The Story of Tunnels*, 42-49. In 1871 the first long European tunnel opened, the nearly eight-mile long Mount Cenis Tunnel between France and Italy. Each of these three Alpine tunnels was longer than its predecessor and, despite the increased length, each took less time and more money to build.

[222]Many of the Moffat Road's rights of way west of Denver were purchased from the Burlington.

[223]Bollinger, 23.

[224]Wilkins, 149, 157, 165; Bollinger, 22; LeMassena, 204.

[225]LeMassena, 204.

[226]Steven Mehls, "David H. Moffat, Jr: Early Colorado Business Leader."

[227]The name of the new company was the Denver and Salt Lake Railway.

[228]Abbott, 223-229.

[229]LeMassena, 344-345; Wilkins, 185. The Laramie, North Park & Western had three names under three different organizations prior to adopting LNP&W. In 1901 it was called the Laramie Hahns Peak & Pacific, in 1914 the Colorado, Wyoming & Eastern, in 1924 the Northern Colorado & Eastern, and finally, later in 1924 the Laramie North Park & Western. In 1951 it became the Coalmont Branch of the Union Pacific.

[230]Wilkins, 195.

[231]Black, 201-202; LeMassena, 205.

[232]A 1923 Denver civic bond issue ended up embroiled in the courts.

[233]Black, 49-50, 202.

[234]Black, 202-205; Helphand, 183. Bollinger and Baur put the first through-date at 17 February 1927.

[235]George Gould had put up the D&RG and the RGW as security for the financing of his WP railroad.

[236]Wilkins, 195.

[237]LeMassena, 182-195; Bollinger and Baur, 221-244.

[238]Wilkins, 195, 204-205.

[239]Wilkins, 195.

[240]LeMassena, 172-202.

[241]Spensor Wilson and Vernon Glover, 1-8; Lawrence R. Borne, "Western Railroads and the Dude Ranching Industry," *The Pacific Historian* (Winter 1986): 47-59; Walter Borneman, et al., "The Story of a Valley: Georgetown Loop Historic Mining and Railroad Park," *Colorado Heritage* (Issue 3, 1984): 17-48.

[242]Monica Bargielski Weimer, "Cultural Resources Inventory of the Colorado Midland Bike Trail Project Area, Chaffee County, Colorado." Report No. CR-050-RG-90-20 (P), prepared for the Bureau of Land Management, Royal Gorge Resource Area, 11 September 1990.

[243]*Rocky Mountain News*, 26 February 1996. The light rail study has both supporters and detractors. On one hand RTD board chairman Ben Kline said, "Vintage cars may be pizazzful, but they're not practical." On the other hand, locomotive engineer and rail buff Ira Schreiber said, "The beauty of this system is that it's available and can be brought up and running for a relatively small amount of money... These cars don't have all the bells and whistles, but they do go from point A to point B."

[244]The data given in this section are from Donald B. Robertson, *Encyclopedia of Western Railroad History*, 64-168.

Property Type: Railroad tracks and roadbed

Description: By the time railroads stretched west of the Mississippi River, the experimental stage of rail development had passed. The relatively late development of Colorado's railroads, beginning essentially in the 1870s, meant that Colorado avoided such experiments as iron-topped wooden rails. The first rails laid in the state were iron, but as freight loads and traffic increased, wear on the track indicated that a harder material was called for. The adoption and perfection of the Bessemer process during the 1860s made steel more commercially available.

Initially steel cost too much for use by most railroads, particularly those in the placer-railroad West. After the depression of the 1870s, however, efficiencies in steel production allowed for lowered costs, and about a third of the rail manufactured in the United States was steel. By the end of the decade, most rail in America, including that laid in Colorado, was steel. During its earliest days, the Denver & Rio Grande imported its rails from Europe until Pueblo's Colorado Coal and Iron Company (predecessor to Colorado Fuel and Iron) developed the first Bessemer process plant west of the Mississippi and began producing indigenous rails for state construction. The first steel rails produced in Colorado were laid on the last 45 miles of the D&RG's Durango-to-Silverton route in 1882.

During the late 19th century, the shape of the rails varied considerably from mill to mill. In 1893 the American Society of Civil Engineers [ASCE] established standards to promote industry-wide consistency among rail producers. The ASCE sections, augmented by the 1898 standards of the American Railway Association [ARA] and the 1915 standards of the American Railway Engineering Association [AREA], were eventually adopted by American steelmakers. After the turn of the century, the Bessemer process was gradually superseded by open-hearth steel in rail production, with special-alloy steels typically employed for switches, frogs, diamond crossings and other points where wear was excessive.

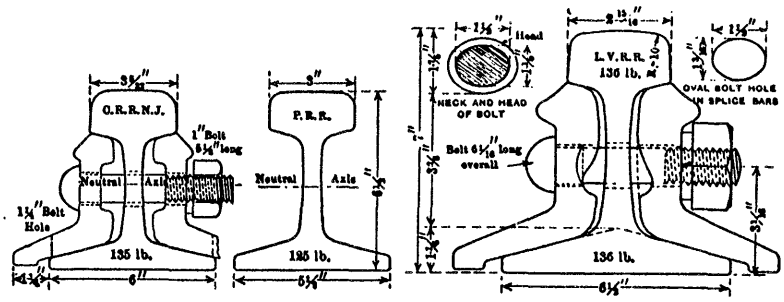


Figure 47. Profiles of heavy rail sections, from Orrock

Colorado's iron or steel tracks were laid in different gauges–the distance between the inside edges of the two rails. Standard-gauge tracks, used by the majority of the state's railroads, were built with a separation of 4'-8½". Narrow-gauge lines, used primarily in the mountains, employed

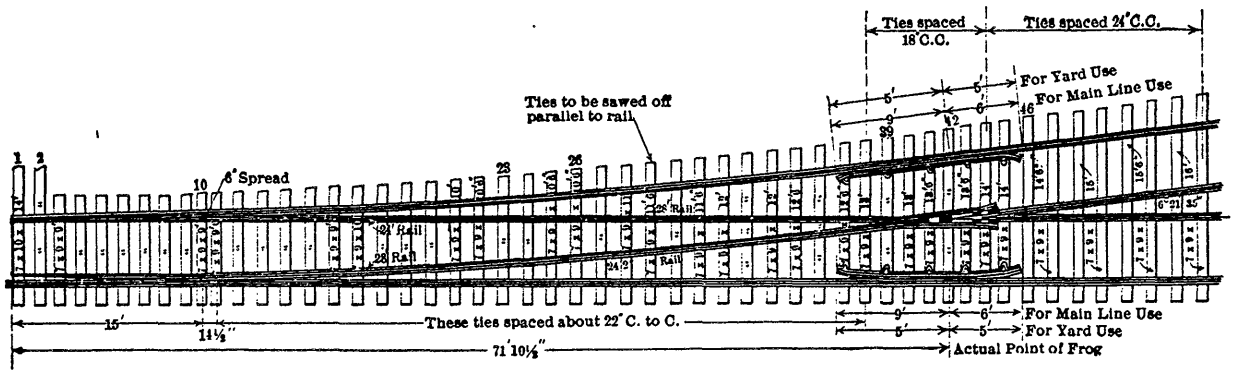


Figure 48. Typical rail and tie layout, with turnout, from Orrock

a three-foot separation. Other, specialized lines (e.g., the 24-inch gauge of the Gilpin Tramway between Black Hawk and Russell) used different gauges, but the standard and narrow gauges comprised the overwhelming majority of trackage laid in Colorado. Standard-gauge railroads typically employed rails that weighed between 45 and 135 pounds per yard. With their lighter engines and cars, narrow-gauge lines could employ lighter rails. Narrow-gauge rails in Colorado were originally 20-30 pounds to the yard, but as the technology of both steel production and rolling stock developed, replacement rails were heavier, climbing to 40-45 pounds. Later narrow-gauge tracks, and replacement rails for the early lines, weighed up to 60 pounds per yard.

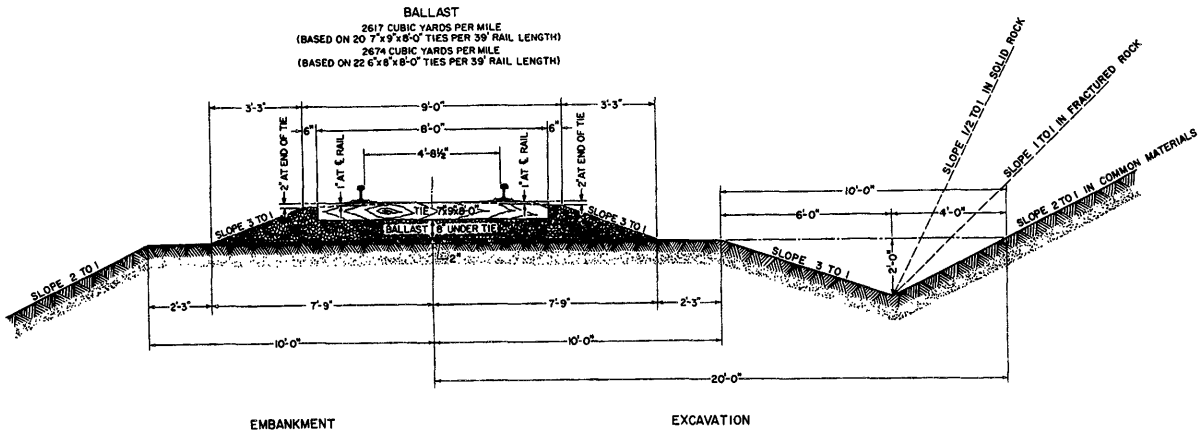


Figure 49. Typical standard gauge railroad profile, from Union Pacific standards

Colorado's introduction of the three-foot gauge to the United States and its extensive use in the mountains meant that hundreds of miles of both standard and narrow gauge snaked through the state. Where a narrow-gauge mountain road met a standard-gauge main line, cargo had to be transferred from cars on one road to the other. To eliminate this laborious process, many Colorado lines adopted the practice of laying a third rail so that both standard- and narrow-gauge trains could be carried over a single line. This practice was not without inconvenience, however. The rails required on standard-gauge track typically weighed more than twice that of a narrow-gauge rail and they stood higher. As a result, narrow-gauge cars on third-railed track always tilted a bit, sometimes causing freight to shift. Known as a "hot box," this created greater friction in the axle hubs, raising heat dangerously high under the car and sometimes igniting the grease-soaked rags used as lubrication packing. With the railroads constantly upgrading or abandoning lines, adding third rails, or converting lines from narrow to standard gauge, the rails were regularly removed and re-used in other locations, sometimes after re-rolling them in the mills.

These rails were, with few exceptions, spiked to timber ties laid perpendicular to the line. Ties for standard-gauge railroads were typically 6 to 7 inches in thickness, 6 to 12 inches in width, and 6 to 8 feet in length. Special length ties, called switch ties, were used at switches, wyes and other places where longer ties were required. Generally short-lived, untreated wood ties were expected to last no more than ten years under the best of circumstances, and western pine ties were rated at a five-year life expectancy. Cottonwood ties, sometimes used by start-up lines, frequently required replacing after only a year's use. Over time the technology improved for even this most basic element of railroad construction. During the first decades of Colorado rail construction, railroad ties were hewn from green wood and laid on earth embankments or directly on the ground. As these first-generation ties quickly rotted, they were replaced with cured, creosote-treated second generation ties (either planked logs or sawn timbers) and laid on a ballast base, making them more resistant to the corrosive effects of moisture and therefore longer lasting.

Standard-gauge rails were typically rolled by the mills in 33-foot lengths and bolted together on-site using rail joints or splices. By the time that the first rails were laid in Colorado, fish plates had largely been superseded by angle joints for rail splicing. Other patented joints, such as the Bonanzo, the Continuous, the Duquesne and the Hundred Per Cent, later came into use, and many of the railroads developed their own standard joint designs. The point of contact between the steel rails and the wooden ties was of critical importance. "It is conceded that with the present day rail fastenings treated ties are destroyed by mech-

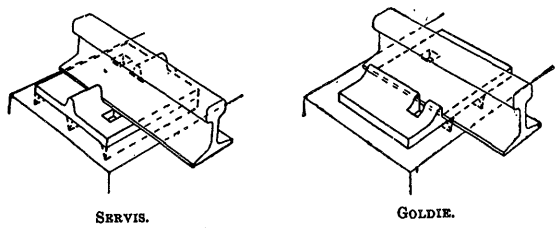


Figure 50. Typical tie plates, from Trautwine

anical wear sooner than by decay," John Orrock writes in his 1918 *Railroad Structures and Estimates*, "and the American practice is therefore to make the treatment only sufficient to well outlast the mechanical life of the average tie which for estimating purposes may be considered to be 14 years." The ties typically wore out from friction by the rails ("cutting") or from the spikes ("killing"). To protect the ties from this deterioration, variously configured steel tie plates were employed, which could be spiked or screwed to the ties. After 1915 railroads also began using steel rail anchors or rail creepers to anchor rails more securely to the ties.

Although some of the earliest lines laid ties directly over the earth grade, most of the railroads employed 6- to 24-inch-thick ballast beds. Ballast, the material placed on the roadbed to distribute the track's weight and drain moisture away from the ties, could consist of crushed stone, cinders, sand, slag or other materials. Its use varied from railroad to railroad and location to location. The Union Pacific, for instance, preferred the decomposed granite ballast that it quarried itself near its mainline track at Sherman, Wyoming. "The beauty of the Sherman gravel lies in the fact that it tamps readily, lies where it is placed, and is absolutely free from dust," the *Denver Times* reported in 1899. The newspaper compared various ballasts, stating:

> The dust nuisance has become a serious problem on all of the roads. Every one is more or less engaged in fighting it. Oil is being experimented with, but is found to work better in the East than on the Mississippi valley lines. Rock and cinders have been tried to cover up the dirt, but rock is too stiff, that is, there is no spring to it, which works a hardship on the rails. Cinders do very well, but the Union Pacific has discovered that it has a world beater in the gravel pits at Sherman.

All of these components–rails, ties, connectors, ballast–had as their foundation the roadbed itself. The importance of the alignment and grade of the roadbed could hardly be overstated: even minor changes in grade elevation or curves along the line cost railroads tremendous amounts of money in operating costs. For this reason, maintaining steady grades with gentle curves lay at the heart of railroad surveying and tracklaying. Of the two, the curves could be addressed more readily. Before 1890, when much of Colorado's winding Rocky Mountain tracks were first laid, the banking tended to begin abruptly at or before the beginning of the curve. During the late 19th century as railroads began to travel at greater speeds, these sharp turns served to slow trains down unnecessarily. During the 1890s a new kind of curve was introduced: the "circular" or "transition" curve, which provided a more gradual change of degree of curvature and banking.

Maintaining grade proved more difficult and expensive, however. Railroads made extensive cuts into hillsides and poured tons of earth and rocks to fill canyons in order to maintain constant grades. In the most extreme cases, they tunneled beneath mountains and erected lengthy viaducts across valleys to avoid heavy grades. In Colorado's mountains, maintaining grades under 2 percent was largely impossible, a fact that steered the transcontinental railroad away from the state in the 1860s. Later Colorado rail lines–many of them narrow-gauge–employed torturously

curved tracks and such arcane structures as corkscrew trestles and turntables to wend their way through the mountains at feasible grades.

Significance: The graded railroad route forms the basis for the entire railroad, virtually defining the line itself. The roadbed, and to a broader extent the legal right-of-way for the railroad and adjacent railroad-related structures and natural features, delineates the historic corridor constituted by the railroad. It forms the linear feature along which associated sites such as depots, division complexes, bridges, water tanks, mining tipples and mountain passes are aligned. As integral parts of the rail line, the rails and ties form the functioning road that stretches along the grade. These elements are central to the construction, maintenance and operation of any railroad.

As the principal feature for any rail line, the graded road and tracks provide the best opportunity to test the historical and technological significance of the line itself: Did the railroad play a discernible role in opening a region to settlement and development? Did the railroad facilitate significant commercial, industrial or agricultural development in a region? Did the railroad play a discernible role in the transportation history of a region? Did the railroad embody any technological advancements? Did the railroad play a discernible role in planning and physical growth of one or more communities along its length? Most of Colorado's railroads satisfy at least one of these questions, distinguishing them as historically or technologically significant.

Registration Requirements: The period of significance for railroad tracks and grade begins in 1867, with the construction of the first railroad in the state. Although the functionality of the railroads and associated right-of-way structures continues to the present–with many rail lines still in active use–for purposes of this nomination the period of significance ends with the year 1948, the 50-year cutoff date maintained by the National Register. Railroad-related alterations made during the period of significance may be considered part of a rail line's historic fabric, provided they do not substantially diminish the line's historical association or its technological distinction. Integrity of a rail line's historic materials and design is essential for its National Register eligibility under any criteria. The definition of integrity may vary, however, depending on the criterion.

The need for continual maintenance on railroads makes the issue of integrity for railroad grade and tracks problematic: those railroads still in use have generally undergone periodic repair and replacement of their roadbed and tracks, and those railroads that have been abandoned frequently have had rails, ties and appurtenant structures removed for materials salvage or use elsewhere. Few railroads therefore exist in Colorado that feature original track and grade in functioning condition. For this reason, the elements of integrity–location, design, setting, materials, workmanship, feeling and association–must be weighed against each other and mitigated by a railroad's

relative significance when evaluating National Register eligibility. An abandoned grade that has had its tracks and ties removed may still be considered eligible for the National Register if it continues to convey a collective image and association of a historically significant rail line. Similarly, a currently operating railroad that has undergone continued maintenance may still be considered eligible for the National Register as an ongoing entity if it continues to convey the overall design, setting and feeling of the original line. In other words, the whole of a railroad may be greater than the sum of its (sometimes missing) parts. Moreover, an entire rail line need not be preserved for noteworthy segments of that line to be considered NRHP eligible, but the remaining segments must be of sufficient length and integrity to convey the feeling and association of the historic railroad.

For a rail line to be considered eligible for the National Register, it must first retain integrity of location. The nominated roadbed and tracks must have been built during the period of significance for that line. Changes in grade and alignment and replacement of track components are acceptable if made by the railroad during the historic period. The road must also retain sufficient integrity of design, workmanship and materials to allow it to be readily identified as a railroad. This includes such features as the roadway's alignment, grade and width, its right-of-way, grading points such as cut banks and fill slopes, and appurtenant structures such as bridges, stream rectification works, on-grade crossings, etc. The alteration or loss of one or more of these features may be mitigated by other aspects of integrity, principally integrity of feeling and association.

Nominated segments of a rail line must be sufficiently long enough to retain integrity of setting, feeling and association. Because settings differ between flatlands and mountains and rural and urban areas, this length cannot be specified, but it should be sufficient to provide the nominated segment with an uninterrupted viewshed. The present setting should embody the same overall character as the historic setting, with minimal visual or physical intrusions. Natural features (e.g., mountain passes, distinctive canyons, singular rock formations) that were important to the railroad during its historic period may be considered part of the road's historic setting and included in the nominated corridor.

Loss of integrity is most serious for rail lines that have been substantially damaged or altered since abandonment. Subsequent intrusions such as fences and modern buildings built on the original roadbed; major alterations of the original alignment, grade and roadbed width caused by subsequent grading for roads, landslides, washouts, etc.; and removal of historic bridges and other distinctive structures are all considered serious losses of integrity that blunt the historical significance of a rail line. These losses are even more serious for railroads that are significant for technological reasons. Railroad lines with sufficient integrity are considered eligible for the National Register using the following criteria:

Criterion A: Railroads demonstrably associated with the settlement of a region; railroads that played a significant role in the commercial, industrial or agricultural development in a region; railroads that played a significant role in the transportation history of a region; railroads that played a significant role in planning and physical growth of one or more communities along their length.

Criterion B: Railroads that are demonstrably associated with the lives of significant Colorado personages.

Criterion C: Railroads that embody the distinctive design or construction methods associated with a significant railroad complex; railroads that embody the work of a significant engineer or builder; railroads that exemplify the standard designs of a significant railroad company; railroads that represent the evolving technology of railroad transportation.

Criterion D: Railroad ruins or sites with demonstrable potential to document the spatial arrangement, extent and/or uses of railroad-related complexes.

Property Type: Miscellaneous right-of-way structures

Description: Colorado railroads were lined with numerous small-scale structures built to facilitate operation of the rolling stock and maintenance of way. These include such diversely configured structures as snowsheds, siding switches, traffic signals and highway crossings. Although all are thematically and functionally related to the railroad, each serves a specific function and was shaped specifically to that function. Following is a list of these support structures, with a brief description of each. The list includes the structures most typically constructed by the railroads and may omit uncommon or unique equipment. It should be noted that although all of the structural types included here have been built in Colorado, subsequent attrition has rendered some of them exceedingly rare, and others may have disappeared entirely.

Snow and sand fence: Fences of varying lengths were frequently used in open country or along cut banks to shelter the tracks from drifting snow or sand. Usually positioned on the windward side of the tracks, they were typically built of wood–either logs or boards– but may also have consisted of living tree or shrub hedges or earth banks. Wooden fences were classified as either permanent or temporary and open- or closed-board. Generally built parallel to the tracks and sometimes in multiple rows, they featured post-and-rail, picket, or buck-and-rail configurations.

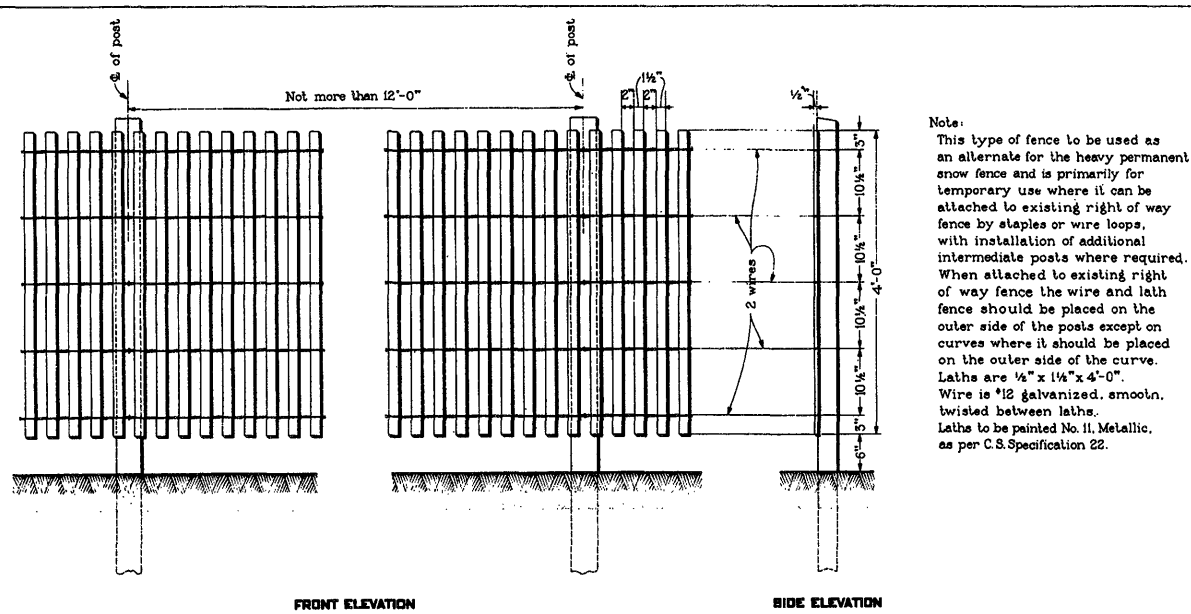


Figure 51. Wire and lath sand and snow fence, from Union Pacific standards

Right-of-way fence: Railroads in livestock grazing areas typically fenced their tracks to prevent collision with stock and delineate their rights-of-way. These fences usually consisted of barbed wire, with wood, steel or concrete posts. The State of Colorado required that four strands of wire be used, with a 20-foot spacing between posts and a single stay per fence panel. The railroads developed standard fences that evolved with time. Due to periodic maintenance and replacement of the fence posts and wire, the right-of-way fences often featured several variations of type within single stretches.

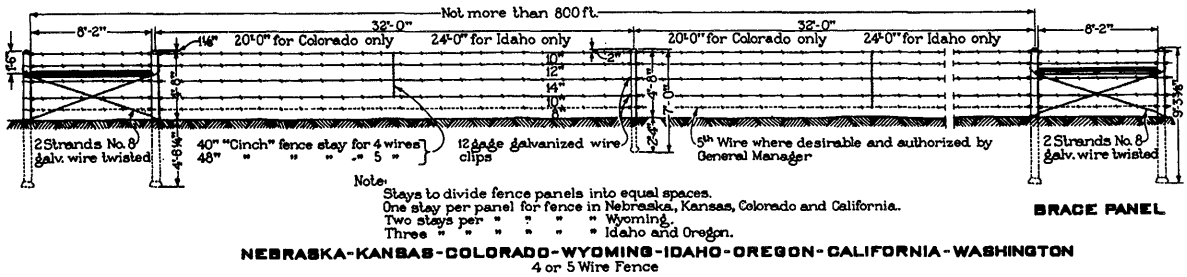


Figure 52. Wire and lath sand and snow fence, from Union Pacific standards

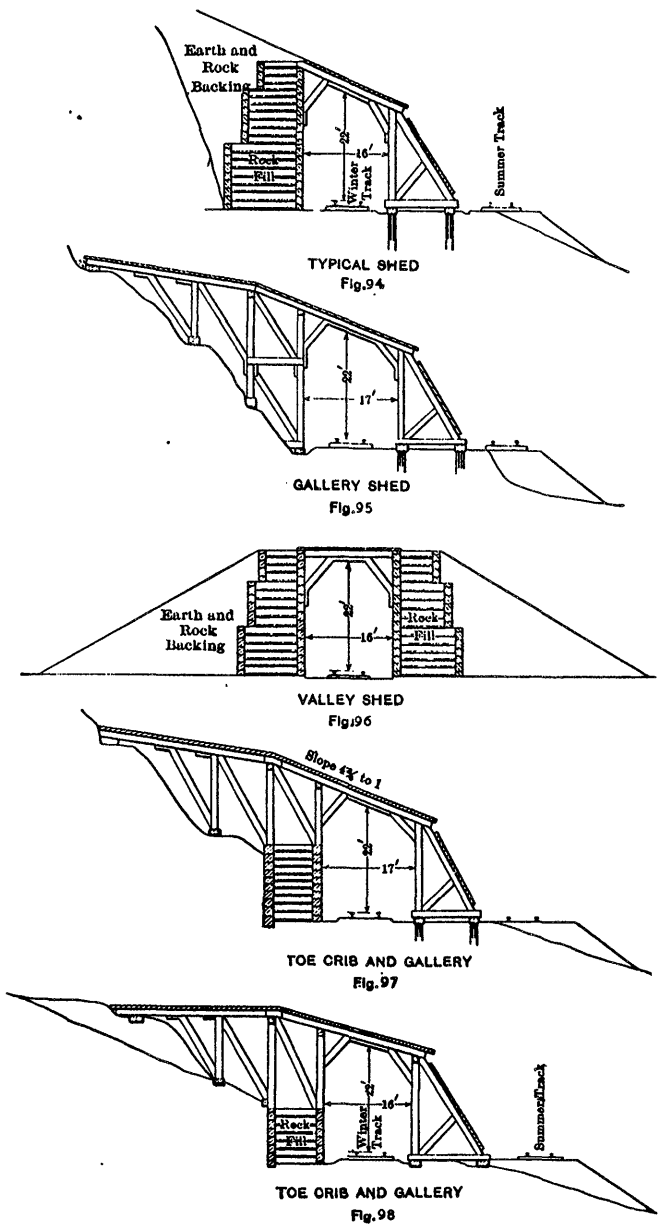


Figure 53. Snow shed types, from Orrock

Snowshed: Snowsheds were built principally in the mountains, where deep snows, avalanches and rock slides threatened closure of rail lines. Typically constructed using heavy-timber or cribbed log construction (and sometimes built using concrete components), they were long, open-ended structures that spanned over the grade to divert snow and rocks. Snowsheds were divided into four general types, depending on location and configuration. The standard crib-bed sidehill shed featured a crib on the uphill side to hold back loose rocks and timber construction on the downhill side that supported a sloped roof. The gallery shed was also built on a sidehill location, with a timber trestle on both sides of the track and a sloped roof. The toe crib and gallery shed combined elements of the standard and gallery configurations, with a partial-height crib and trestlework on the uphill side of the sidehill location and trestlework to support the sloping roof on the downhill side. The last type of snowshed was built to house deep cuts on more level terrain. The valley shed used cribs and rock or earth fill on both sides of the track with a flat or slightly pitched roof overhead.

Traffic signal: Railroads typically used signal poles installed at strategic points along their length to inform train engineers of traffic on the tracks ahead. These signals were typically designated as "block", "home block", or "distant" to indicate their relationship with nearby stations, sidings, etc. Early poles used movable signal blades, the positions of which acted as a semaphore for the engineers. Lights were later installed on the blades, and, more recently, the blades have been eliminated altogether in favor of a universal three-light signalling system. Like most of

the right-of-way structures, the railroads maintained standard plans and/or purchased pre-fabricated traffic signals from manufacturers.

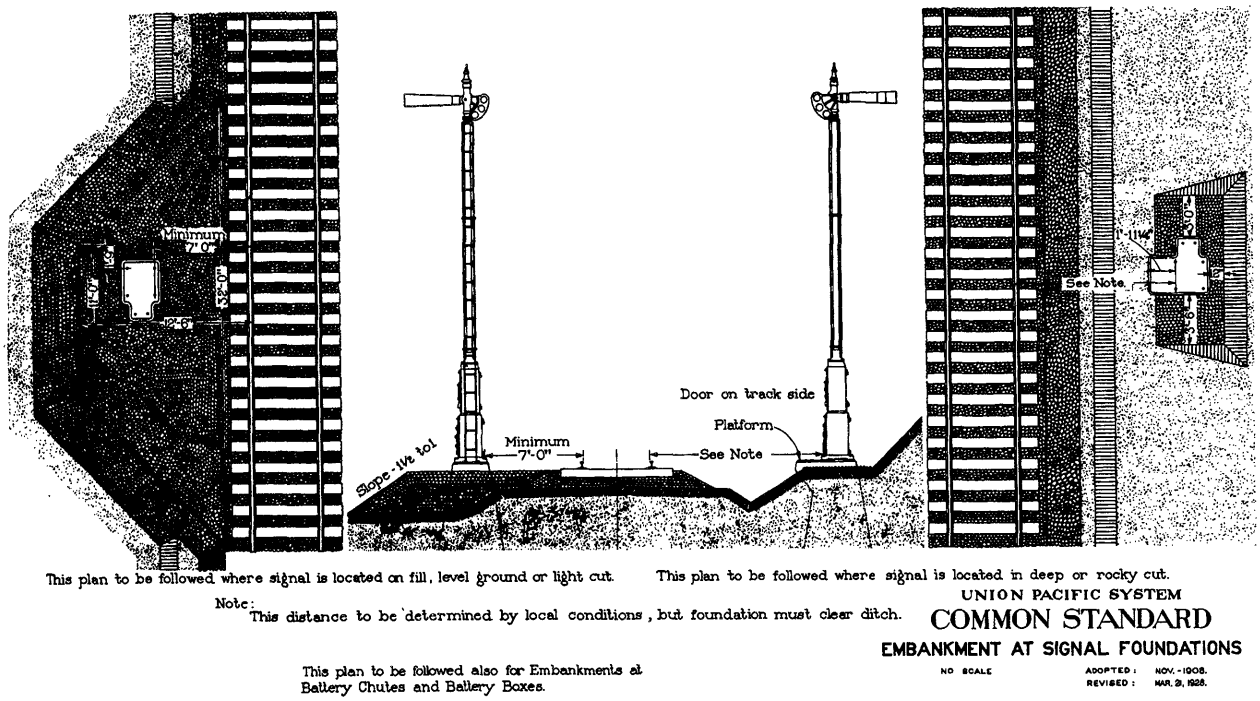


Figure 54. Typical trackside signal, from Union Pacific standards

Track sign: Numerous small-scale signs were located along the grade to alert train engineers, maintenance crews and the public to functioning aspects of the railroad. These were typically fixed signs with painted messages, built using metal, wood and/or concrete. Each railroad company maintained its own set of standards for these signs, which were generally manufactured in large numbers and stockpiled for use along the line. Some of the more common right-of-way signs included: mileposts, elevation posts, bridge and culvert number signs, whistling posts, snowplow and flanger posts, stop and slow posts, railway crossing and highway signs, station signs, yard limit signs, derail signs, speed limit signs, section number signs, trespass signs, bridge warning signs and tell-tales.

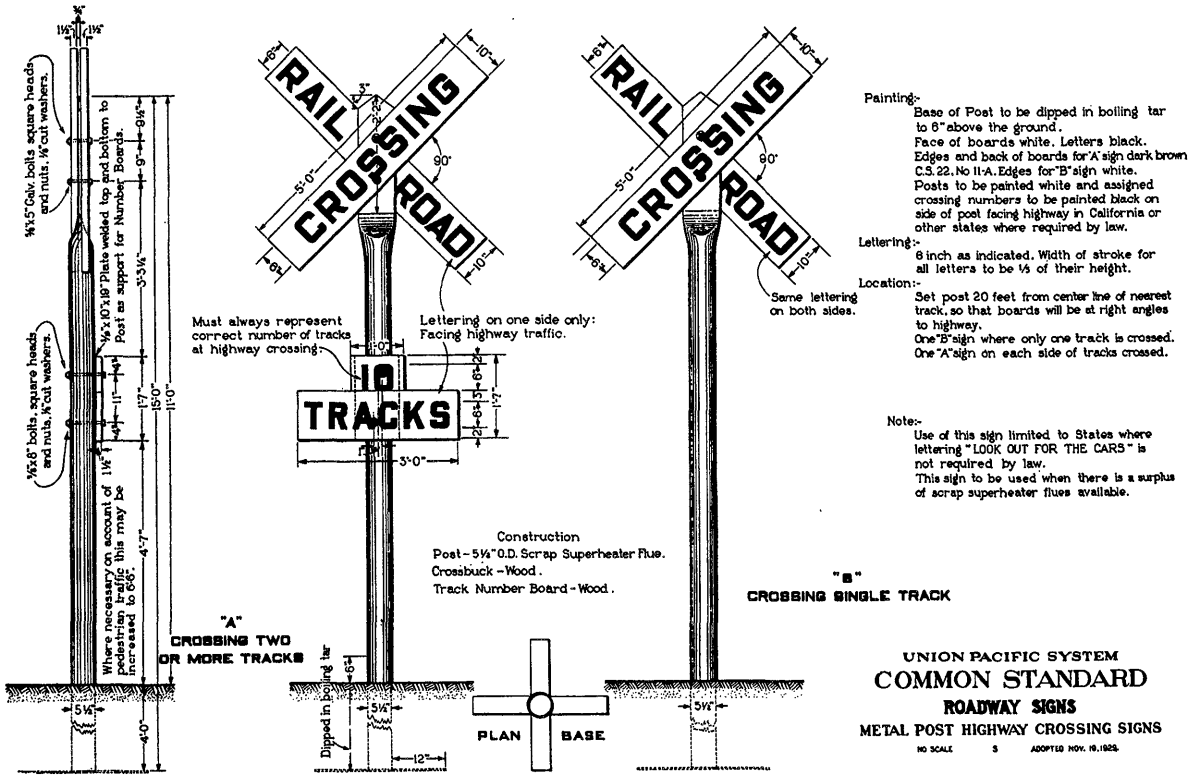
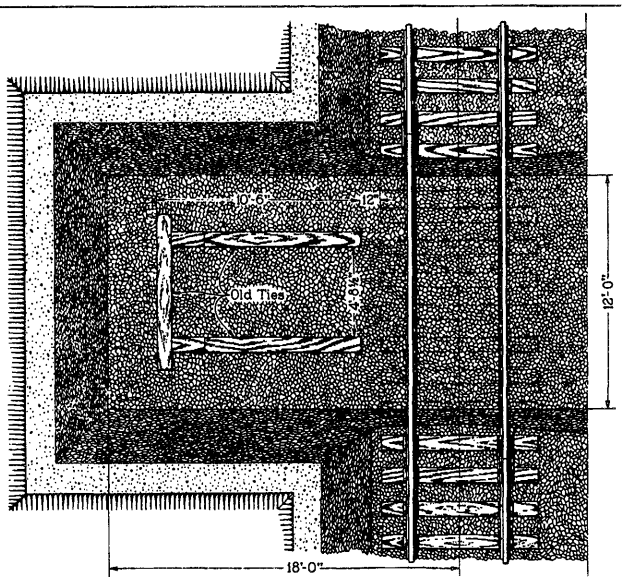


Figure 55. Railroad crossing sign, from Union Pacific standards

Switching device: At junctions between main lines and branch lines and turnouts for spurs and side tracks, railroads employed a variety of hand-, electrical- or pneumatic-powered, mechanical switching or crossover devices to direct the trains over the tracks. According to Orrock: "The switches in common use for turnouts are the stub and split or point switch. If the ends of the rails are cut off at a bevel so as to lap slightly when thrown it is called a lap switch." The fixed end of the switch was called the heel, the movable end the toe. The heel was nearest the frog (a cast-steel intersection of track), and the toe was the switch point; the length of the switch was the dimension from toe to heel. Related track components included crossovers, turnouts, frogs, lead rails, guard rails, switch stands (both rigid and automatic), switch targets, turnouts, diamonds, interlockers, derails, bumping posts and car stops, among other devices.



HALF PLAN - DOUBLE TRACK

Figure 56. Handcar turnout, from Union Pacific standards

Handcar turnout: Railroad maintenance crews patrolled and traveled over the lines in small two-or four-man handcarts and later motorized cars, which had to be diverted from the tracks to make way for the trains. At intervals along the line, small-scale handcart turnouts were built to provide places for the men to pull off of the tracks. These typically consisted of treated timber ties set in the ballast bed immediately adjacent to the tracks.

Rail rest: Railroad maintenance crews used rail rests for short-term storage of iron or steel replacement rails. Located at intervals along the line, these minor stops were typically little more than widened spots on the roadbed, with treated timber ties used to keep the rails elevated above the ground.

Rectification structure: Railroads frequently followed rivers and streams as the paths of gentlest grade, necessitating the construction of rectification structures to control or direct the flow of these watercourses. Such structures included dams, dikes, fill slopes, jetties, retaining walls, culverts, ditches, siphons and bank reinforcement.

On-grade crossing: Railroads by necessity crossed a large number of roads, streets and highways. These on-grade crossings featured a variety of driveways to carry the roads over the tracks, cattle guards to protect against stray livestock, and crossing warning devices, ranging from simple crossed-bar signs to elaborate lighted signals with retractable gates.

Utility line: Electrical, telephone and telegraph lines typically followed railroad rights-of-way for use by the railroad and surrounding area. These lines were typically supported above the roadbed by timber or metal posts.

Watchman's and flagman's cabin: Watchmen or flagmen were sometimes positioned at strategic points on a railroad such as long bridges, highway crossings or difficult grades, necessitating construction of small cabins for temporary habitation. Indicative of their incidental importance, these cabins were typically small, wood-frame structures, often salvaged from other structures or rail cars.

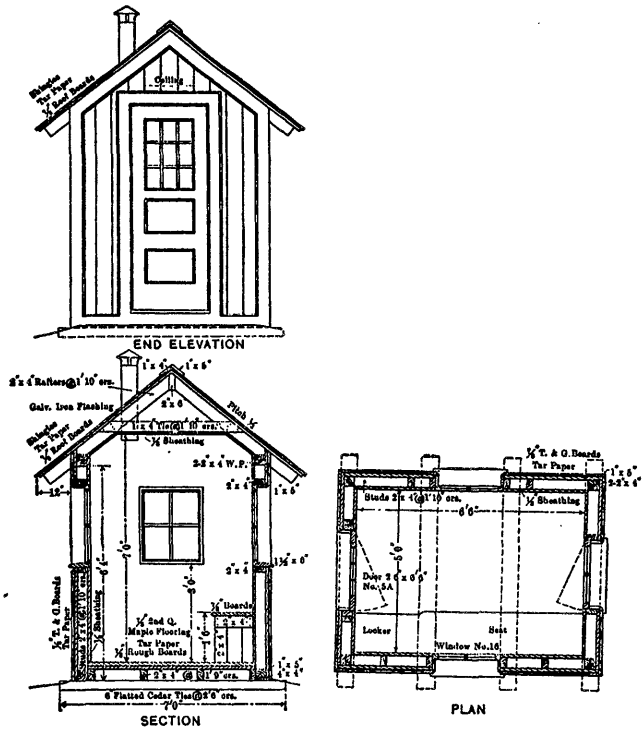


Figure 57. Watchman's cabin, from Orrock

Agricultural facilities: Colorado's railroads were instrumental in shipping tons of agricultural products in the form of crops (both raw and processed) and meat (both livestock and processed meat). This shipping necessitated construction of a variety of trackside structures to load, unload and store the produce. These facilities included permanent and temporary loading chutes, corrals and pens, watering troughs (with water supply structures such as wells and windmills), feedlots, cold storage plants, grain elevators, granaries, silos, beet dumps and produce bins, houses, sheds and platforms.

Mining facilities: The state's mountain railroads were the principal means to ship goods into and mining products (principally hard-rock ore, coal and milled minerals) out of the mining districts. Trackside facilities related to shipping and storage of mining products included tipples, cranes, ore chutes and storage bins and platforms.

Significance: Located at intervals along every rail line in Colorado, these miscellaneous right-of-way structures were important to the railroads' function. Although almost all were small-scale features built using standard designs or prefabricated components, these utilitarian structures were instrumental in the continued operation of the line. They were often removed for salvage or allowed to deteriorate following the railroad abandonments and retrenchments that began in the 1910s. This attrition has diminished the number and integrity of remaining right-of-way structures. As a result, those that remain with integrity are considered significant for their association with specific railroad lines and for their representation of evolving railroad trends.

Registration Requirements: The period of significance for miscellaneous right-of-way structures begins in 1867, with the construction of the first railroad in the state. Although the structures' functionality continues to the present–with many still in active use–for purposes of this nomination the period of significance ends with the year 1948, the 50-year cutoff date maintained by the National

Register. Railroad-related alterations made during the period of significance may be considered part of a structure's historic fabric, provided they do not substantially diminish the structure's historical association with that line or its architectural/technological distinction. Integrity of a structure's historic materials and design is essential for its National Register eligibility under any criteria. The definition of integrity may vary, however, depending on the criterion. Because location is of primary importance under Criterion A, a structure will rarely qualify under this criterion if it does not remain on its historic site (original or moved by the railroad during the period of significance) along its associated railroad line. Location can also have importance under Criterion C, but this association is not as vital.

Right-of-way structures were frequently replaced, altered and/or moved to serve changing functions, upgrade facilities on an expanding line or retrench facilities on a faltering line. As a result, relatively few examples of some of these property types remain structurally intact with their original use in their original location. Loss of integrity, whether it is integrity of location, design, setting, materials, workmanship, feeling and/or association, may be mitigated by demonstrable historical association or by architectural or technological significance for unique or rare structural types. Structures or equipment may be moved from one functioning location to another by a railroad and retain integrity of location and setting if the move was made during the period of significance. Structures, equipment or machinery moved for the purpose of display in a museum or park away from the railroad, however, have lost integrity of location and setting and usually association and feeling. They are rarely considered eligible under Criterion A.

As typically small-scale, ancillary features of the railroads, the right-of-way structures listed here are rarely considered individually eligible but may be categorized as contributing elements in a railroad-related corridor or district. Those that have retained sufficient integrity are considered eligible for the National Register using the following criteria:

Criterion A: Structures demonstrably associated with the construction and/or operation of significant railroads; structures associated with important locations along significant railroads; structures associated with important events or historical trends that occurred along significant railroads.

Criterion B: not applicable.

Criterion C: Structures that embody the distinctive design or construction methods associated with significant railroads; structures that embody the work of a significant engineer or builder; structures that represent the evolving technology of railroad transportation or civil engineering.

Criterion D: Structure ruins or sites with demonstrable potential to document the spatial arrangement, extent and/or uses of railroad-related facilities along a significant railroad.

Property Type: Depots

Description: Depots provided the primary focus for train business conducted at the stations. Typically housing the passenger waiting room, ticket office, telegraph office, freight office and sometimes even the station agent's living quarters, they formed the corporate identity for the communities served by a railroad. In the beginning railroad depots looked like other public buildings. It took about 30 years for America to evolve a building type that is now readily recognizable as a railroad depot. The profile remains so consistent, in fact, that railroad depots are now easily identified in the landscape, even when they have been moved away from the tracks. Depots were typically rectangular buildings with the longer side parallel to the railroad tracks, surrounded on two or more sides by platforms. They were typically configured with a single story without stairs or raised entryways, so that baggage and freight could be easily wheeled through the terminal to the trackside platform. The roof featured generous overhangs to shelter passengers and freight from the weather. Trackside bay windows, introduced in the 1870s, gave agents better visibility along the tracks. And after railroads instituted standard time in the United States in 1883, many depots often featured prominent clock towers.

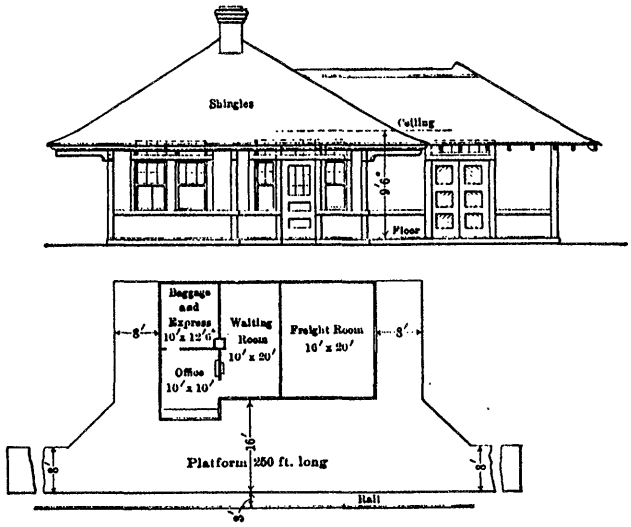


Figure 58. Small combination depot, from Orrock

Railroad depots were classified into five subtypes: combination, flag, passenger, temporary and terminal. The first–the **combination depot**–was by far the most common in Colorado, where rail lines often served sparsely settled regions. With passenger service, freight shipping and train management housed under a single roof, combination depots were used largely at rural stations that lacked sufficient passenger and freight traffic to justify separate buildings for each. Combination depots were typically built using standard plans, sometimes even constructed from pre-fabricated components shipped by rail to the site, and they may have incorporated minor architectural elements such as brackets, dormers and decorative window and door trim to distinguish them from other depots. They typically featured a freight room at one end and a passenger waiting room at the other, separated in the middle by the railroad's business offices. Walter G. Berg described the requirements for a combination depot in his 1893 *Buildings and Structures of American Railroads*:

For the freight business a freight room is required, with platform space along a wagon-road for transferring freight to and from wagons; and also the necessary platforms and facilities for handling freight to and from cars in freight trains or cars standing at the depot. A separate freight-office is not needed, because at stations where combination depots are used the entire business at the station is generally in charge of one man, with one or more assistants at important points, and the necessary clerical work, therefore, is done in one office, which serves as freight-office, ticket-office, and telegraph-office. This office should always have a projection on the track side, in the nature of a bay-window, so that the track is visible in both directions from inside the office.

The passenger business is served by the introduction of waiting-rooms, either one general waiting-room or separate waiting-rooms for ladies and gentlemen. Where the passenger business warrants it, toilet-rooms are added. Separate baggage-rooms are also provided, where the passenger business is heavy, or a small space in one corner of the freight-room is picketed or partitioned off, so that baggage left at the station can be locked up, as the freight-doors of the freight-room are usually left open during the day-time. In a few individual cases, although very seldom, a separate room for express and mail-room are added. A very frequent addition to a combination depot, however, is the provision for bedrooms and living-rooms for the agent and other help around the depot, or for the agent's family. This is very customary in the Western and Southern sections of the country, where it is not always feasible to get a dwelling quarters in the neighborhood.

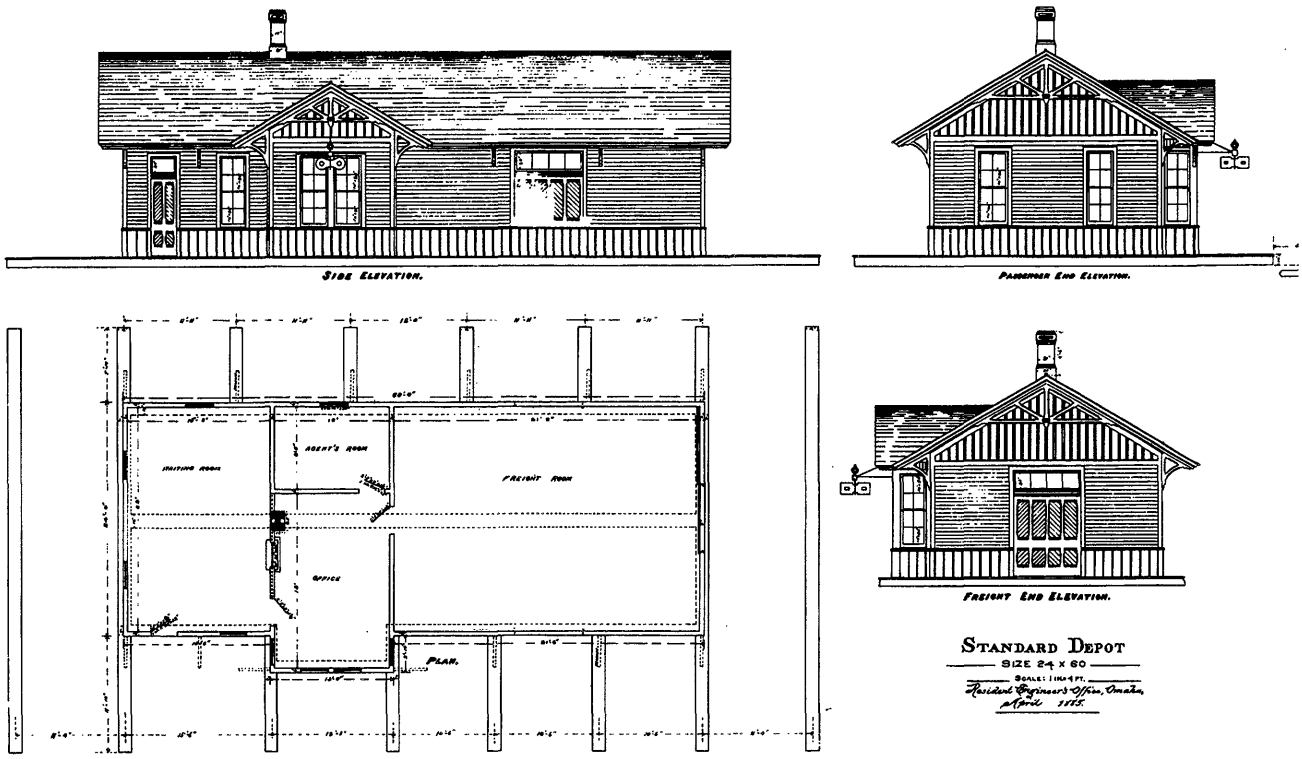


Figure 59. Combination depot, from Union Pacific standards

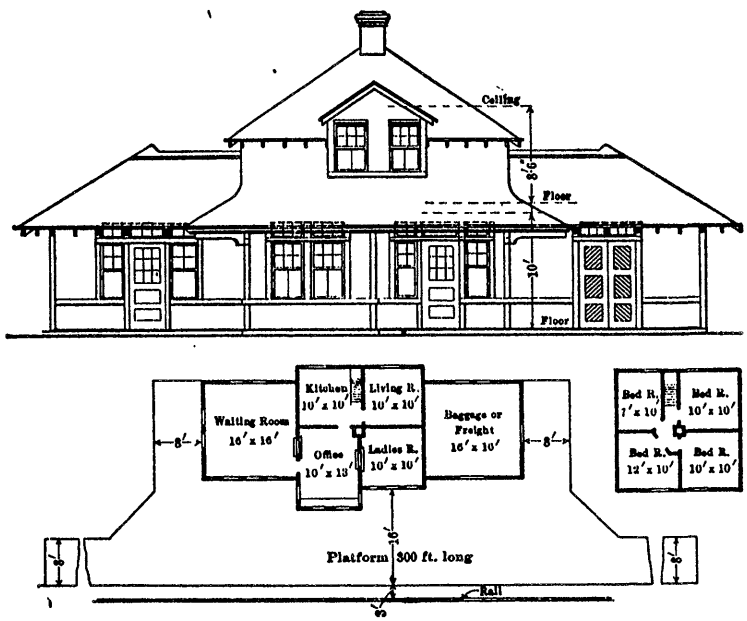


Figure 60. Combination depot, from Orrock

Combination depots featured a variety of configurations, reflective of the relative importance of the functions they housed. The simplest was a small dwelling with a freight room attached, where the agent conducted business and passengers waited in his quarters. Other combination depots offered bunk rooms for the railroad employees on a second floor or beside the passenger and freight facilities. The most involved examples featured separate, clearly defined spaces for the functions they housed. Most combination depots in Colorado featured wood-frame construction, although some were built using brick or stone masonry. At Ridgway, for example, the Denver & Rio Grande and the Rio Grande Southern shared the depot. The two-story, clapboarded frame structure featured wide eaves with decorative brackets on its passenger end. The D&RG station agent and his family lived in quarters on the second floor of the depot. Coal-burning pot belly stoves provided heat and hand-operated pumps provided water for drinking and cooking. A clothesline in the depot yard gave a homey touch to the gateway between passengers and destination.

The building was painted D&RG colors of buff with brown trim, but featured the RGS's standard trim on all roof ridges. Choosing a distinct architectural or color feature was common among 19th century railroads. Even then promoters were aware of marketing and of the importance of consumers associating a logo or color scheme with their companies. The D&RG had a distinctive logo developed during its initial Royal Gorge days that adorned the outsides of its depots.

The Colorado Midland, like the D&RG, built brick or sandstone depots only in Colorado Springs. Otherwise its depots were wood frame. The Midland employed three types of frame construction: a very modest, simple frame building; a moderate structure marked by a decorative eave treatment at the building's ends; and a frame building with more architectural investment, gabled windows and other ornamentation. Buildings of the third kind were rare and individually designed. Standing completely alone was the Colorado Midland's Leadville depot, an elaborate wooden structure with decorative shingles and gable brackets.

Flag depots, also called second-, third- or fourth-class passenger depots, were the smallest passenger structures. Positioned at points where passenger traffic was sparse and intermittent, they provided a place for passengers to wait and flag down passing trains. According to Berg:

> The business at flag-stations is necessarily limited. Where there is a freight business as well as a passenger trade, a small combination depot is usually erected. In other cases, a separate passenger building is constructed in addition to a small, separate freight-house. In the great majority of cases, however, flag-stations have only a depot building with accommodations for the passenger business, as a small amount of freight at such a station, if any, is handled on the platform, or else separate tracks and facilities are provided for it.

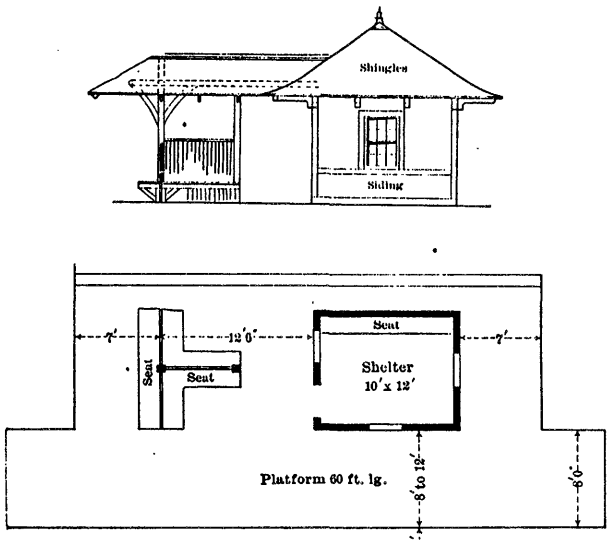


Figure 61. Flag depot, from Orrock

In their simplest form, flag depots consisted of platforms covered with three-sided, roofed structures. Rarely built in Colorado because freight traffic usually surpassed passengers, flag depots were small, single-pen structures built from standard plans using simple wood-frame construction. Their use in the state was primarily limited to the interurban lines.

Passenger depots were built at stations where traffic was sufficient to warrant separate passenger and freight facilities. Like combination depots, their size, configuration, construction and detailing varied from railroad to railroad and location to location. "The requirements for and the division of the interior of the local passenger depots vary considerably," according to Berg, "starting with a small building containing waiting-rooms, a ticket-office and a baggage-room, and ending with large 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." Typically located in larger towns and cities, passenger depots in Colorado often featured masonry construction and individual designs, with substantial architectural detailing. They functioned in conjunction with nearby freight houses–warehouse buildings used for temporary storage of goods being shipped or received by rail.

Typically small, inexpensive and plainly detailed, **temporary depots** were built by start-up railroads or by existing railroads in retrenchment stages. As their name implies, their function was only intended to be stop-gap, either until a more permanent structure could be built or until service at that station was terminated. Often housing both freight and passenger service, tempo-

rary depots were often built from standard plans and shipped to the site partially or completely pre-fabricated on railroad cars. In Colorado, the railroad cars themselves sometimes served as temporary depots, as was the case with the D&RG's depot at Creede established in 1891. The depot there consisted of a trackside boxcar with windows and doors cut into its sides.

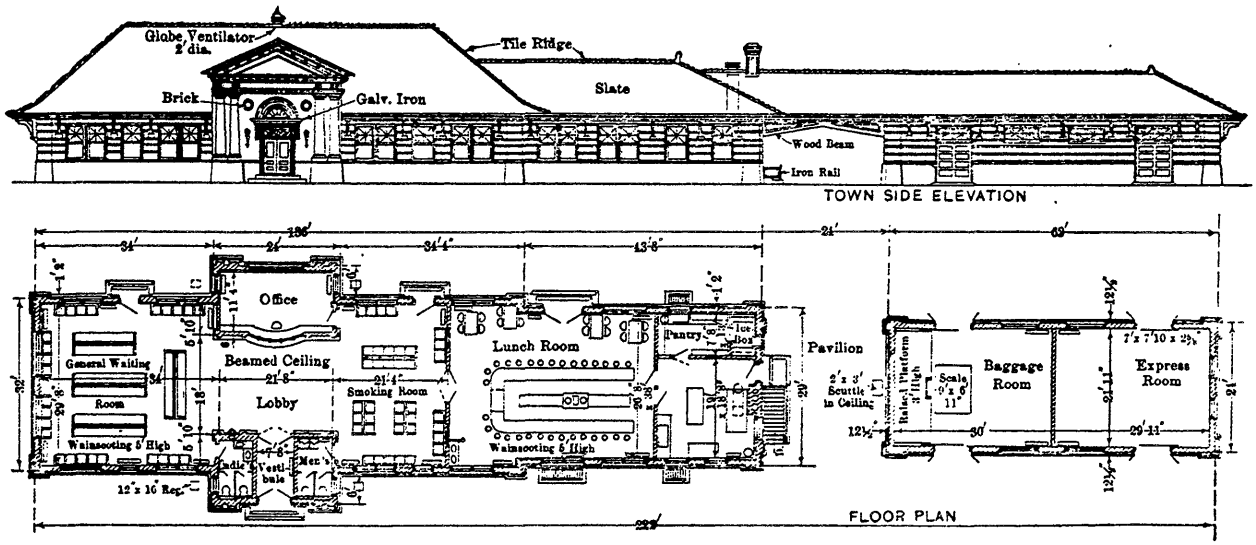


Figure 62. Large-scale passenger depot with attached freight depot, from Orrock

Essentially large passenger depots, **terminal or union depots** represented the top of the line in railroad-related buildings. Typically located in large cities (e.g., Denver and Colorado Springs), they were generally architect-designed and featured singular layout and detailing with masonry construction. According to Berg:

> Terminal passenger depots are buildings erected for the accommodation of the passenger service at passenger terminals of a railroad. Frequently, several railroads entering the same town unite and use conjointly a so-called "Union Depot." It follows, therefore, that terminal passenger depots are located in large cities or towns, or at ferry terminals, or at important junction points of several railroads. As a rule, all tracks of a railroad terminate at a terminal station, but very frequently certain tracks run past the depot, while others terminate at the depot. A terminal depot involves such heavy expenditures, that it is a mistake to build it at the start on too small outlines... Relative to the style of architecture to be adopted for a terminal passenger depot, it will depend, more or less, on the importance of the station, the surroundings, the proximity and style of neighboring buildings, the size of the structure, the desires of the railroad management, the wishes of the public, the prevailing class of architecture and building materials in general use in the locality in question, and the individual views of the architect making the design... The character of the building should be built on broader and grander lines than local depots, presenting a bold and prominent front, relieved, however, by suitable disposition and divisions of the wall surface, the fenestration, roof lines, and other details, without detracting from the general features of the design as a whole.

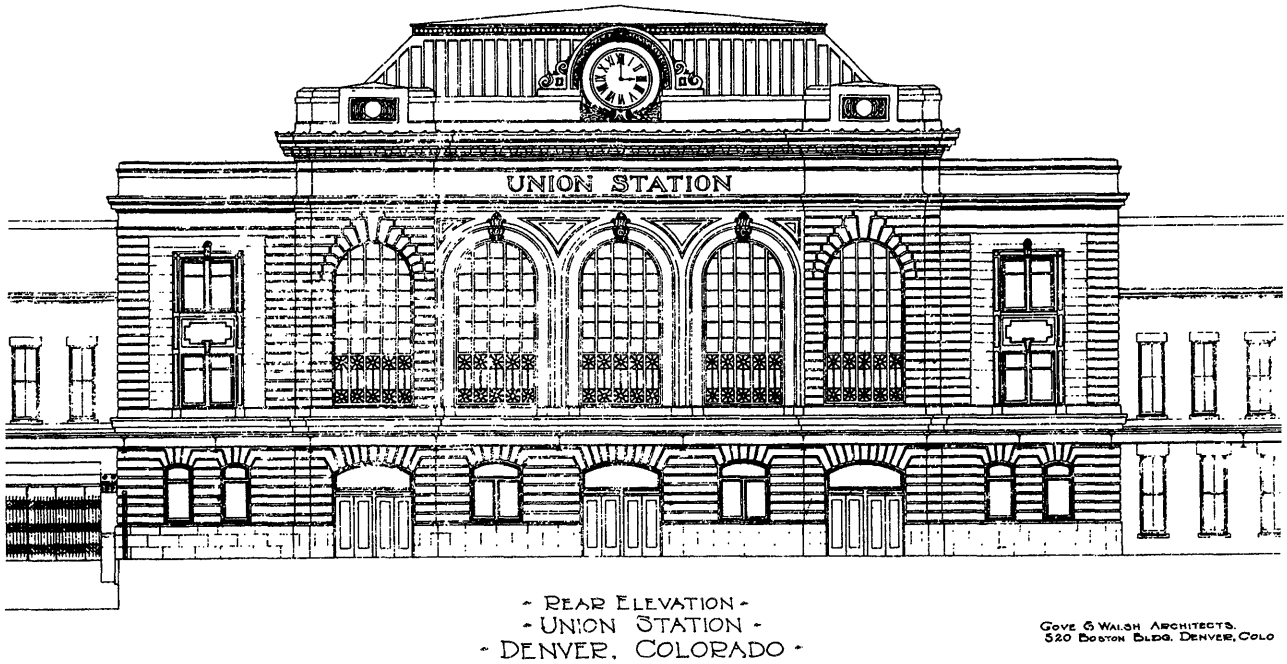


Figure 63. Center section of Union Depot, Denver

Terminal depots were classified as side stations, head stations and island stations, depending on their relationship to the adjacent main line and side tracks. They typically housed a variety of passenger-related functions, including the ticket office, men's and women's waiting rooms, bathrooms, baggage rooms, telegraph or telephone offices, express office, news stand, restaurant or lunch counter and hotel, among many other similar areas. They often also housed business offices of the railroad as well as facilities for the station master, train master and telegraph clerk and other employees. Other separate buildings related in use and proximity to major railroad depots included freight houses, express buildings (small warehouse/office structures used to house express freight services), hotels, restaurants and a variety of platforms, sheds and shelters for freight and passengers.

Significance: Depots of all sizes were focal points and objects of pride in the communities in which they were situated. Often pivotal points for community planning and social and economic structure, they formed the nexus of passenger and freight commerce between railroads and the public they served. Beyond this, they were the point of social and familial contact, as loved ones

came and left and citizens congregated here for special occasions; the source of news, through telegraph and the mail; the source of commerce, through express and common carrier freight; and even the source of the correct time. Depots represented points of public contact for the railroad, and many railroad companies relied on the architecture of their depots to establish corporate identity. For this reason, depots were typically the most architecturally accomplished buildings along a rail line and sometimes the only individually designed buildings erected by a railroad. Even when depots were built from pre-fabricated components using standard designs, they were positioned as the central buildings in station complexes. Depots–sometimes temporary facilities housed in boxcars–were usually the first buildings constructed along a new rail line. And they have often proved the most durable structures on lines after retrenchment or abandonment. As the buildings most closely related, both emotionally and visually, to railroading, depots are virtually all significant, at least on a local level.

Registration Requirements: The period of significance for railroad depots begins in 1867, with the construction of the first depot in the state along the Union Pacific line. Although the buildings' functionality continues to the present–with many depots still in active use–for purposes of this nomination the period of significance ends with the year 1948, the 50-year cutoff date maintained by the National Register. Railroad-related alterations made during the period of significance may be considered part of a depot's historic fabric, provided they do not substantially diminish the building's historical association with that line or its architectural/technological distinction. Integrity of a structure's historic materials and design is essential for its National Register eligibility under any criteria. The definition of integrity may vary, however, depending on the criterion. Depots, more than any other railroad-related building, have often been moved from their original locations, sometimes to nearby parks or museum grounds. Those depots so moved have lost integrity of location, setting and usually association and feeling. Because location is of primary importance under Criterion A, a depot will rarely qualify under this criterion if it does not remain on its historic site (original or moved by the railroad during the period of significance) along its associated railroad line. Location can also have importance under Criterion C, but this association is not as vital.

Depots and associated buildings such as freight houses were frequently modified and/or moved to serve changing functions, upgrade facilities on an expanding line, or retrench facilities on a faltering line. As a result, many of these buildings have been altered and/or moved. Loss of integrity, whether it is integrity of location, design, setting, materials, workmanship, feeling and/or association, may be mitigated by demonstrable historical association or by architectural or technological significance for unique or rare structural types. Depots and associated buildings with sufficient integrity are considered eligible for the National Register using the following criteria:

Criterion A: Depots demonstrably associated with the construction and/or operation of significant railroad lines; depots associated with important locations (e.g., stations, terminal or divisional points) along significant railroad lines; depots associated with important events or historical trends that occurred along significant railroad lines.

Criterion B: not applicable.

Criterion C: Depots that embody the distinctive architectural design or construction methods associated with significant railroad lines; depots that embody the work of a significant architect, engineer or builder; depots that possess high artistic values; depots that represent the evolving architecture or technology of railroad transportation.

Criterion D: Building ruins or sites with demonstrable potential to document the spatial arrangement, extent and/or uses of railroad-related facilities at important locations along significant railroad lines.

Property Type: Housing and maintenance structures

Description: Colorado's railroads have built a wide variety of structures to maintain rolling stock and right-of-way, house employees and store freight, supplies and equipment. These include such diversely configured buildings and structures as section houses, water tanks, engine houses, corrals and storage sheds. Although all are thematically and functionally related to the railroad, each served a specific function and was shaped specifically to that function.

Following is a list of these support structures, with a brief description of each. This list relies on four sources for its taxonomic and descriptive content: *Buildings and Structures of American Railroads* (1893) by Walter Berg, *Maintenance of Way and Structures* (1915) by William Willard, *Military Railways* (1917) by W.D. Connor, and *Railroad Structures and Estimates* (1918) by John Orrock. The list includes the structures most typically constructed by the railroads and may omit uncommon or unique buildings. It should be noted that although all of the structural types included here have been built in Colorado, subsequent attrition has rendered some of them exceedingly rare, and others may have disappeared entirely.

Section House: Railroad lines were divided for maintenance purposes into relatively short segments or sections. To provide living quarters for the maintenance crews near their sections, section houses were built in the maintenance complexes alongside the tracks. "The general requirements for a section house are that it be cheap and built to suit the local climatic conditions," states Berg. "There are two kinds in use, namely, one for accom-

modation of one or more families and the other for a number of men. The section foreman and the married hands who have their families with them generally live in the first-mentioned style of house, while the single men or men without their families are expected to club together under one roof."

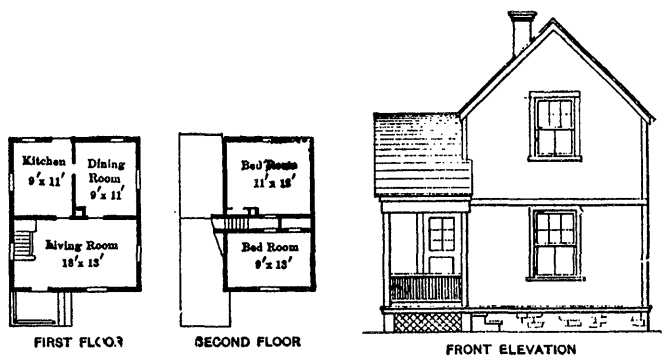


Figure 64. Single section house, from Orrock

Typically one- or two-story frame buildings with wood siding and shingled or metal-sheeted roofs, section houses featured single or duplex configurations to house one or two crews or families. The quarters generally consisted of a living room, kitchen/dining room and one to three sleeping chambers. Unlike most of the support buildings, which were simple wood-framed boxes, section houses often featured a greater degree of architectural expression that included tee- or el-shaped footprints, intersecting gabled or hipped roofs, open porches, ganged doub-double-hung windows and/or decorative gable treatments with gable and porch brackets. They were typically the most prominent buildings in section maintenance complexes, second only to the depots in architectural sophistication along a rail line.

Section houses were usually built along railroad lines that passed through relatively unpopulated regions, where in-town employee housing was impractical. Because this characterization applied to virtually every line in Colorado at one time, numerous section houses were built along railroads throughout the state. According the Berg, "In the West the class of the employees on a section is of a more roving nature than where there is, hence, more of a disposition on the part of the railroad management to provide pleasant homes for them." Most section houses in Colorado were constructed from standard plans maintained by the railroads and generally built from materials shipped in by train.

Bunk House: Bunk houses were small- or medium-scale dormitory buildings that provided temporary sleeping quarters for train crews. Typically frame structures that featured a series of sleeping chambers along a single hallway, they were built, according to Orrock, "only at points where crews have to lay over, when away from their home-quarters, or where the town is too far away from the junction point, or where there is no accommodation for railway men." Like section houses, bunk houses were typically built from standard plans. They tended to be more austerely detailed than section houses, with rectangular

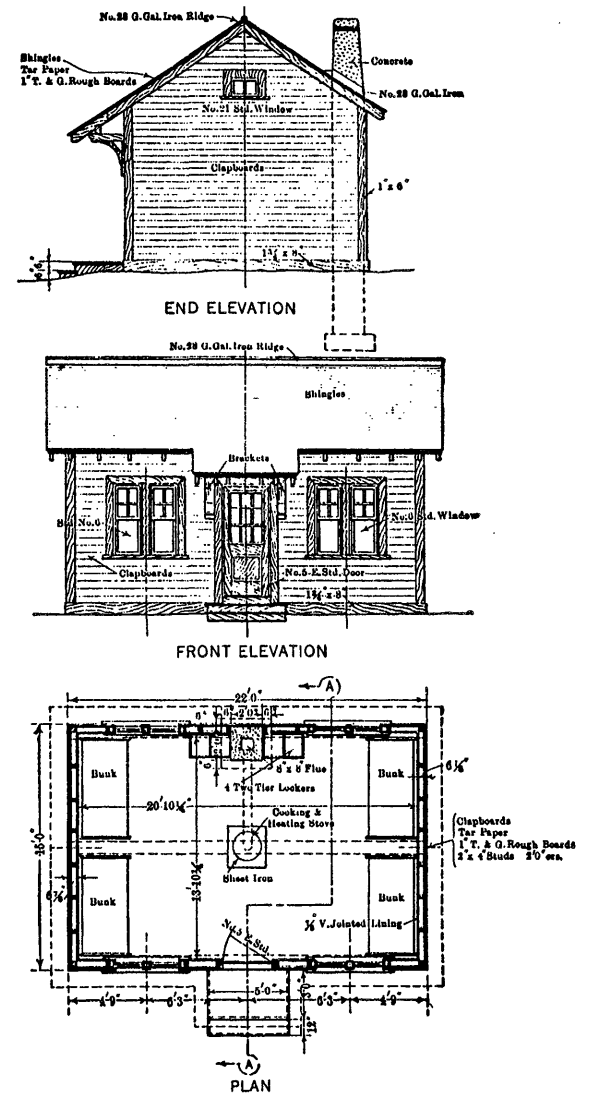


Figure 65. Small bunk house, from Orrock

footprints, simple rooflines and regularly spaced fenestration. Boxcars outfitted for sleeping and light cooking were occasionally used as bunk houses.

Rest House: Rest houses were typically built in railroad yards to provide lounging and sleeping quarters for track workers and train crews. Also called club houses, reading rooms, changing rooms or lounges, they were configured much like bunk houses, with the addition of locker rooms and lounge or living rooms on the first floor or at one end. "One of the important features about a rest house is to obtain a good site for it," states Orrock. "As often as not it is located in the corner of a yard where it is subjected to noise and periodical deluges of smoke from the roundhouse which not only causes irritation and dissatisfaction, but also adds greatly to its maintenance as it requires constant painting to keep the building from looking dingy... Freedom from smoke and noise, attractive outlook and genial surroundings have a value in efficiency that is too often overlooked and more money is often spent in trying to counteract a poor site by providing lavish indoor attractiveness, that would otherwise not be necessary if the site had been more congenial." Rest houses typically resembled bunk houses in their construction and detailing.

Dwelling House: Section workers were housed in section houses, train crews in bunk houses and rest houses, and other types of railroad employees were sometimes provided company housing in what were generically called dwelling houses. Located near the tracks, near division points or sometimes even off of the railroad right-of-way, dwelling houses ranged from sparsely detailed, single-pen frame boxes to more elaborate two-story residences with extensive architectural treatment. Like all of the other residence types, dwelling houses

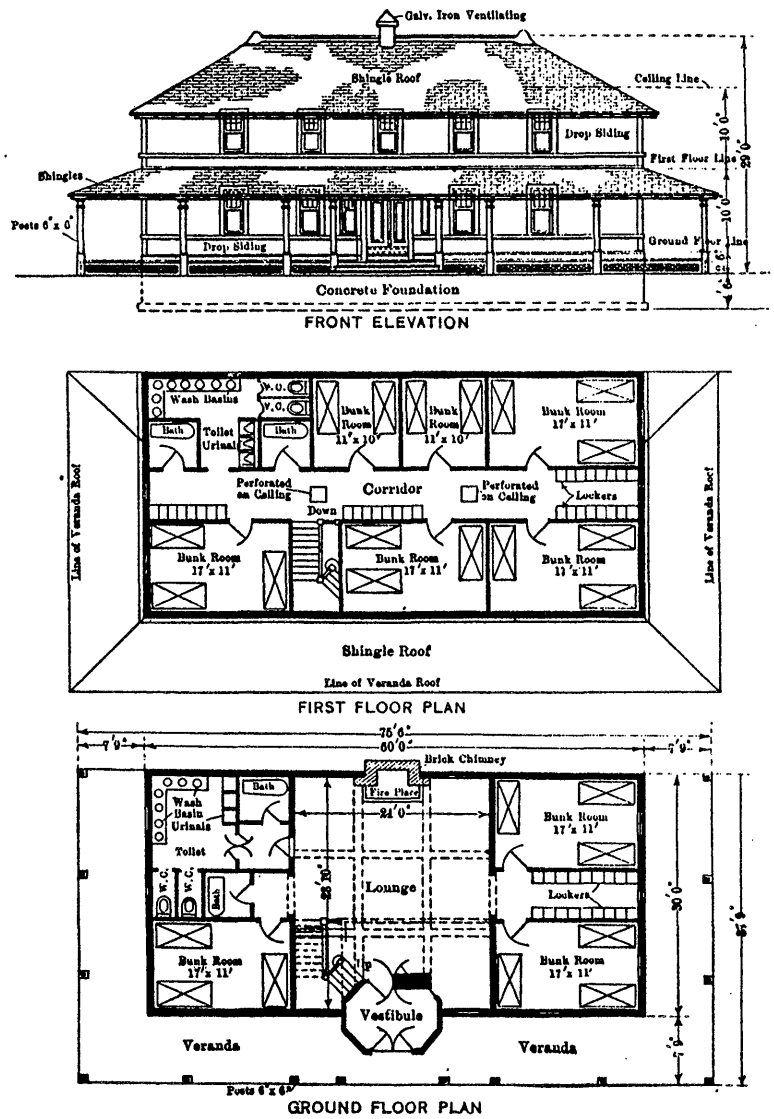


Figure 66. Two-story rest house, from Orrock

were typically one- or two-story frame buildings built by the railroads from standardized designs using materials brought to the site by train.

Tool House: Generally located near a section house or station for use by the section crew in maintaining the right-of-way, the tool house held a hand car and miscellaneous tools and supplies. One or more tool houses were usually located in each section complex, with the size and number correlating to the size of the complex. They were generally situated near a public road and set back somewhat from the tracks to provide parking room for the handcar, with a short section of track that provided access to the main line. Tool houses were typically single-story, frame buildings with standardized dimensions of 10x14, 12x18 or 14x20. They featured wood siding, minimal fenestration and a sloped roof with shingle or sheet-metal sheathing. As minor, ancillary structures, they were generally built empirically or from standard designs.

Engine House: Engine houses were generally large-scale structures used to shelter locomotives for storage or maintenance. Engine houses were generally located at terminal or division yards, at junction stations or at points where engines were housed and changed. When used to perform maintenance and/or repairs to engines, they were typically ganged with auxiliary structures such as coal chutes, water

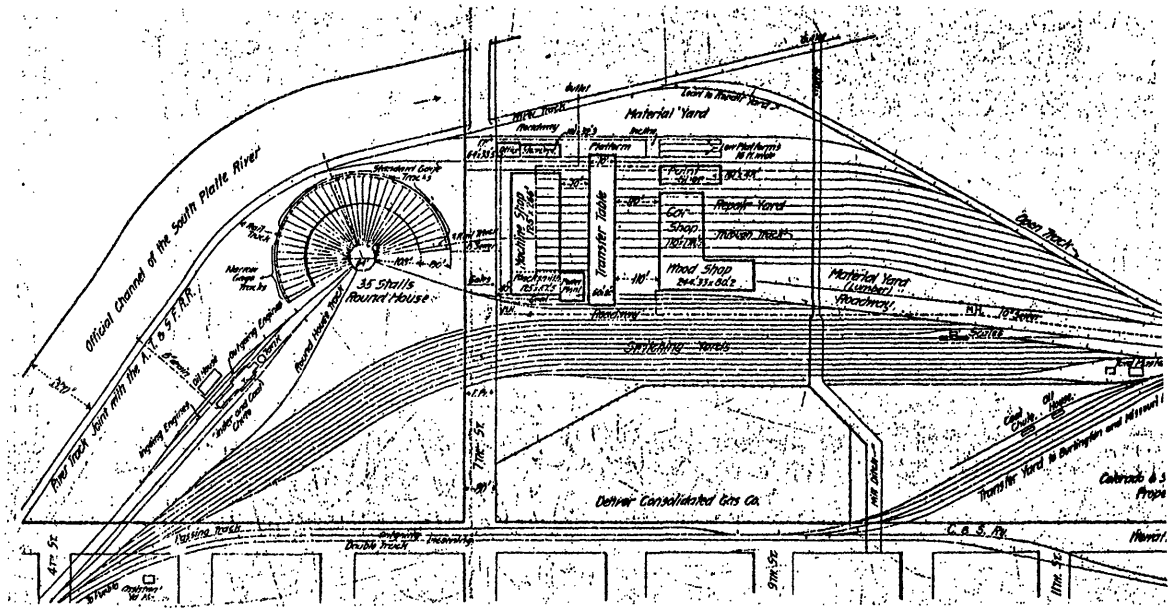


Figure 67. Engine house and rail yards of Colorado & Southern Railroad, Denver, from Railroad Gazette

tanks, oil and sand houses and storage and maintenance sheds. The size, configuration and materials used for engine houses were dependent upon their relative importance, location, prosperity of the railroad company, amount of traffic and availability of materials. "Relative to how substantial and fire-proof a structure to erect," Berg states, "the importance of the house, in connection with the operation of the road, should be considered." He continues:

> If the building is to serve as an auxiliary house at some subordinate point, or intended to house one or more engines for a branch line at a junction point, the choice of a cheaper class of building is warranted, as, in the case of fire or a rush of business, engines can be drawn from other points and allowed to stand on open tracks. If, however, an engine-house is to be located at an important terminal or division yard, where the traffic is consistent and steady and large interests would suffer in case of a fire or a block, tying up a large number of engines at once, then the best policy is to build as first-class and substantial a structure as the financial condition of the road will permit.

Engine house designs were divided into two categories that were descriptive of their configuration and appearance: roundhouses and square houses. Square houses were typically used for smaller operations in which only a handful of engine bays were needed. More typically rectangular, with a free-spanning frame or iron roof system, they were

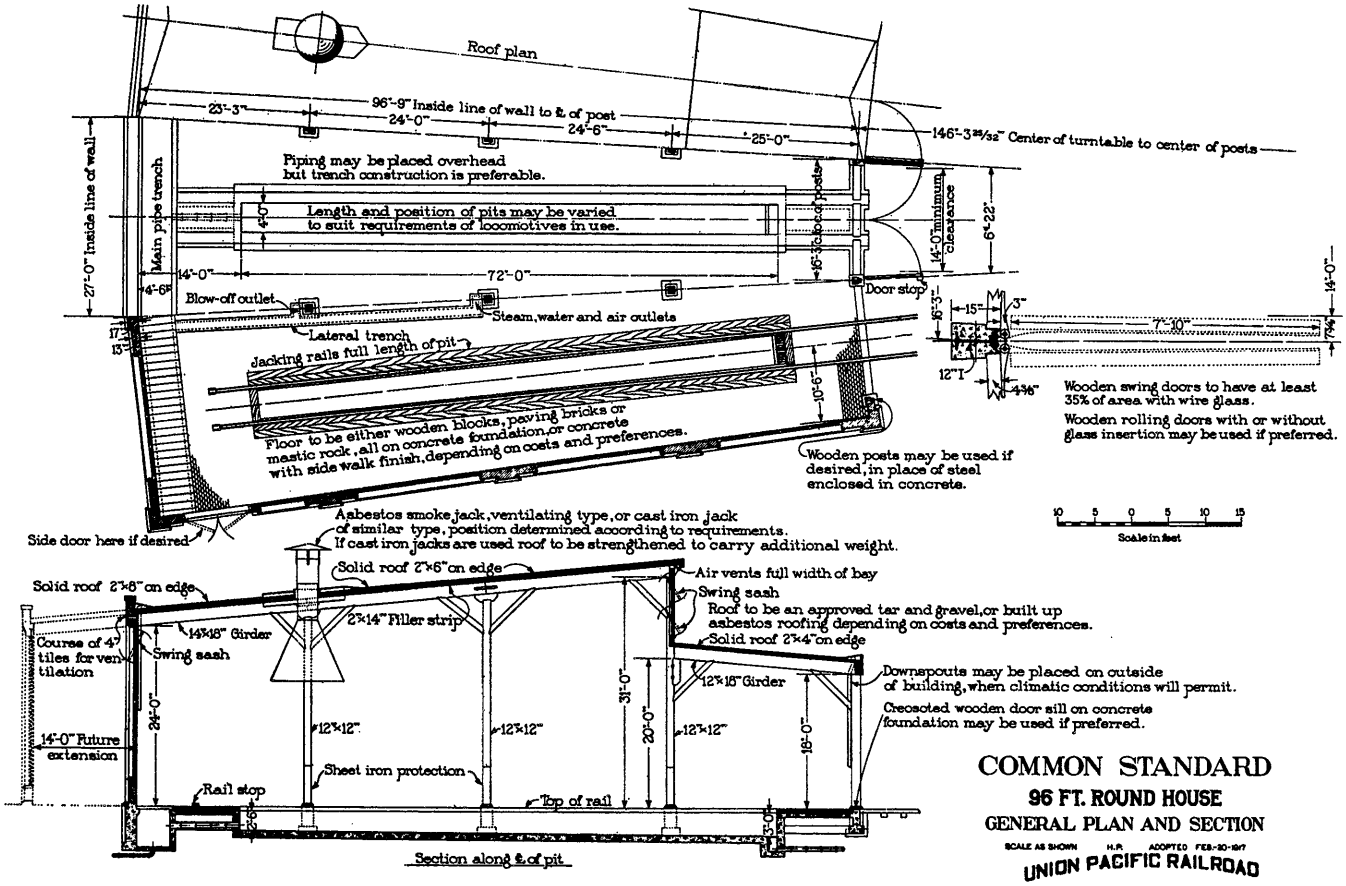


Figure 68. 96-foot-deep roundhouse, from Union Pacific standards

ured with the doorway(s) situated at one gable end. Inside, parallel pairs of tracks formed two or more bays, with the length of the building dimensioned to accommodate one or two engines in each bay. With their limited capacity, square engine houses were typically used to house engine maintenance at smaller complexes. According to Berg:

> The approach to these houses is, usually, by a track system leading off a leader, although sometimes, to economize space, the tracks run out of the building to a turn-table, which, however, is not good practice, unless a turn-table to turn engines would have to be built and maintained anyhow in the vicinity, in which case the turn-table could serve for both purposes. But, unless such is the case, a regular track approach is the best method to pursue with a small square house, provided there is sufficient ground-space available for that purpose.

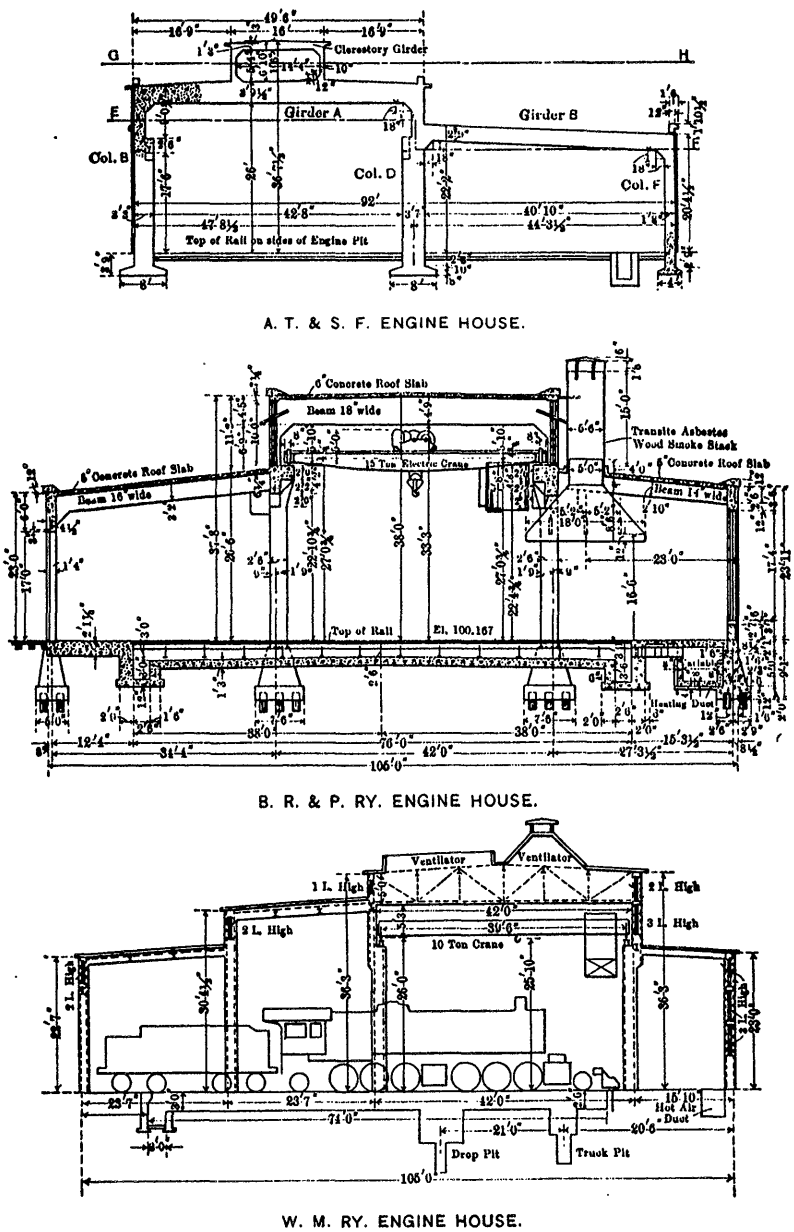


Figure 69. Engine-house profiles, from Orrock

For very large square engine-houses a transfer-table is used with good results, especially were the transfer-table is located some distance from the house, so as to give a space for engines to stand between the transfer-table and the face of the house, so that in case of fire the engines can be run out of the house quickly. The transfer-table system requires the least ground-space of all engine-house designs; but it has the same disadvantage compared with a track-approach system as a turn-table system has, namely, a breakdown of the transfer-table or of a turn-table, or a blockade on the open track leading immediately to or from the table, will cause a serious blockade of the entire business of the road, similar to the consequences of an accident on the main track.

Larger engine houses were almost always configured as circular or polygonal buildings–roundhouses–with evenly spaced stalls or bays arrayed in a fan around a central turntable. The circle could be complete (called a closed or full-circle roundhouse) or a segment (called an open or segmental roundhouse), with wedge-shaped bays added or subtracted as needed.

Like square houses, roundhouse stalls were proportioned to engine lengths and ranged from 60 feet to 112 feet in depth. Masonry firewalls were typically incorporated at intervals between bays to contain the inevitable engine fires. According to Walter Berg:

It is customary to provide two passage-ways into a closed round-house, through two of the stalls, so that in case of a block on one track the other track can be used. Two approach tracks to the turntable are frequently introduced in a segmental roundhouse, but in this case they do not usually run through the building, but in front of it, so that all stalls in the building are available to stand engines.

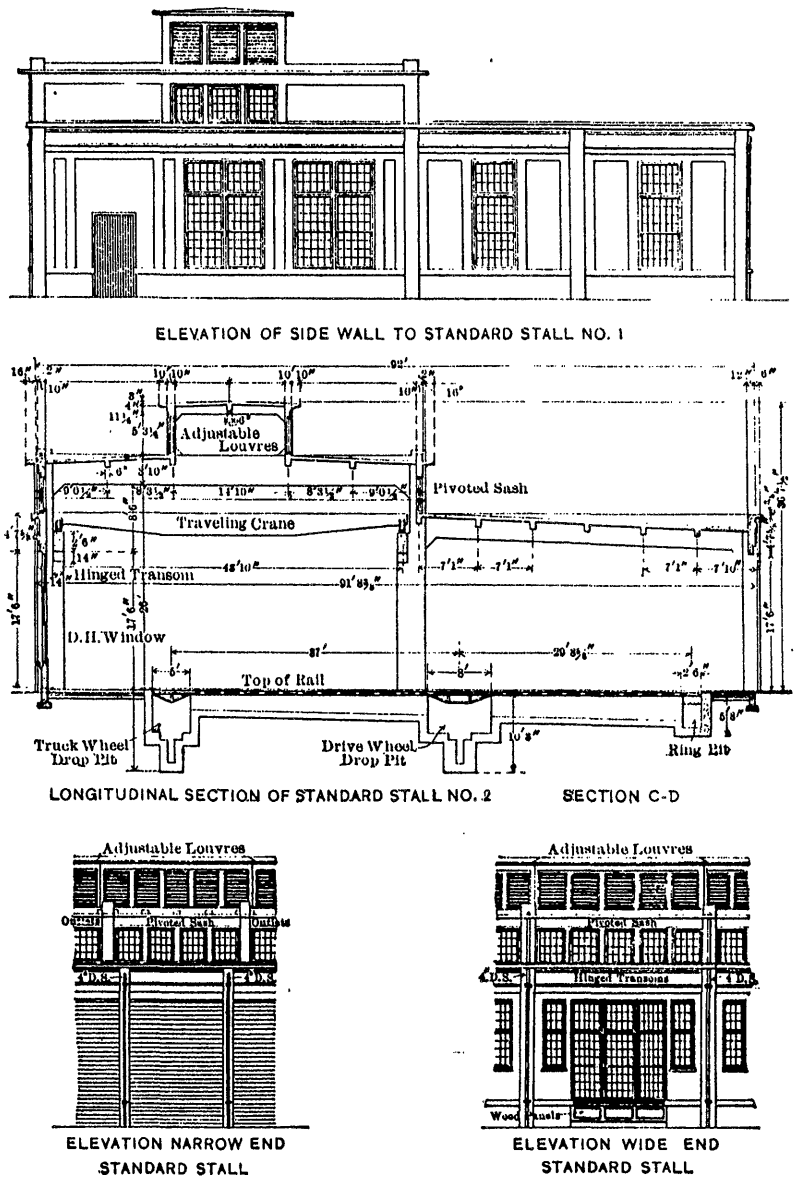


Figure 70. AT&SF standard engine-house, from Orrock

Square houses and roundhouses were built with a variety of materials, ranging from simple frame structures with weatherboard or corrugated iron siding and shingle roofing to substantial brick or stone masonry structures with fireproof metal or slate roofs. These roofs usually featured numerous clerestories or dormers to ventilate the buildings and direct sunlight to their interiors. (Ventilation of the engines' stacks was often augmented by smoke jacks–asbestos or metal roof hoods that fit over the smokestacks.)

Structural systems similarly ranged from wood frame walls with rafters or combination wood/iron roof trusses to masonry bearing walls and free-spanning iron roof trusses. Ironwork in the roof was often limited or protected because of the corrosive nature of the sulfuric engine exhaust. Floors, usually laid flush with the tracks, could be concrete, stone, cinder, asphalt or timber. Exterior walls were typically punctuated with large transomed doorways– virtually always hung in pairs– on the turntable-side walls and numerous multiple-pane windows on the outside walls. Fabricated by companies such as the

Edge Moor Iron Works, that also manufactured bridges, the turntables were typically plate girders or trusses installed over pivot mechanisms in circular pits. Berg describes the requirements for turntables:

> Relative to turn-tables, the size should be ample not only to accommodate the largest engine in use on the road, but to allow for the probable increase in the length of engines within the life of the turn-table or engine-house. Timber turn-tables are practically obsolete to-day, excepting for very small engines in lines with light traffic. Cast-iron turn-tables, while having some good features, are also seldom used to-day. Wrought iron or steel plate-girder turn-tables are the best in use, provided they are not built to carry only the weight of an engine the same as for a bridge, but are proportioned with a great excess of strength to give ample stiffness, and also to allow for the probable increase in the weights of engines... Turn-tables are usually turned by hand, although for tables 60 ft. in diameter and over steam and electricity have been introduced. Transfer-tables are worked by steam, wire-cable, or electricity.

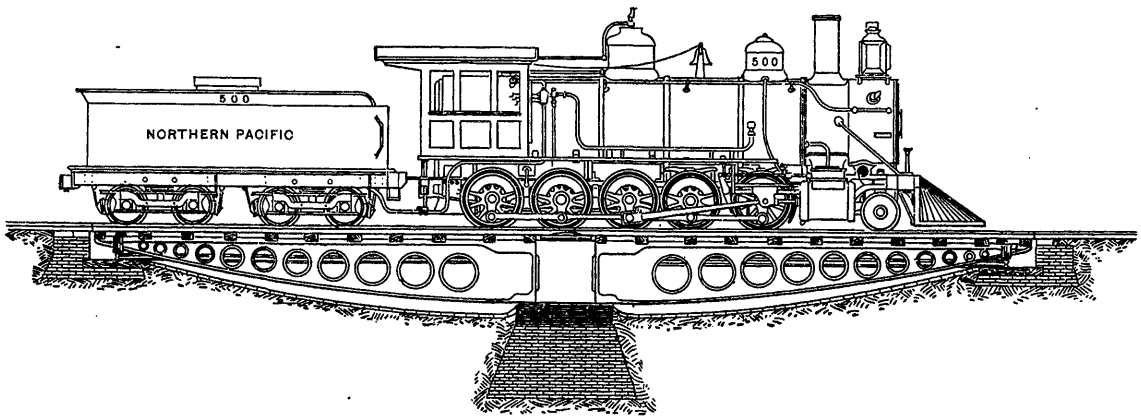


Figure 71. Deck girder turntable, from Trautwine

After 1910 the standard turntable length ranged from 80 to 100 feet. Although standard-design trusses–in both through and pony configurations–were used by the Burlington and other railroads, plate girders predominated throughout the industry. These featured either semi-through or deck configurations and were often tapered from the central pivot point to the ends to economize on materials.

Power House: Typically located adjacent to the engine house, the power house contained a boiler to provide power for the mechanical tools and often heat for the interior spaces. Power houses ranged widely in their construction, from simple wood-framed structures to massive masonry buildings with fireproof construction.

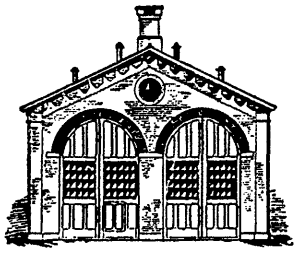


FIG. 128.—FRONT ELEVATION.

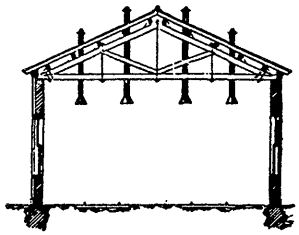


FIG. 129.—CROSS-SECTION.

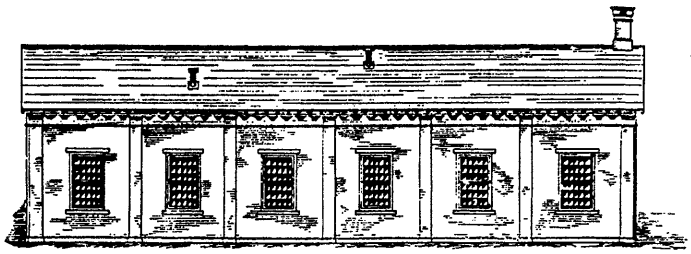


FIG. 130.—SIDE ELEVATION.

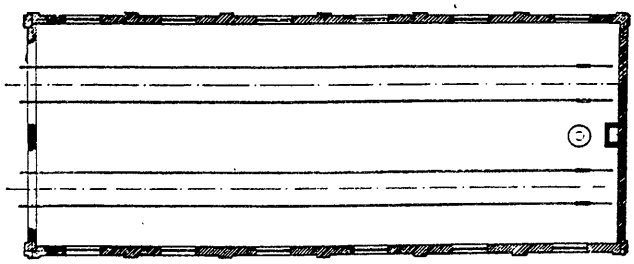


FIG. 131.—GROUND-PLAN.

Figure 72. Car shed, from Berg

Car Shed: Car sheds were used at terminal and junction points to shelter expensive passenger cars from the weather and provide indoor space for their maintenance and cleaning. Seldom used in Colorado other than on the interurban lines, they were generally configured like square engine houses, with gabled roofs and wood frame or masonry walls that housed cars inside on parallel tracks.

Snowplow Shed: Typically configured like car sheds, snowplow sheds were situated at strategic points along a line to house snowplows– rotary, wedge and flange type–for use during winter months.

Coaling Station: Coaling stations were required to store and distribute massive quantities of coal, the source of motive energy on 19th and early 20th century locomotives. Coaling facilities included a variety of structures, including coal houses, tipples, chutes, cranes, platforms, bins, sorters, terminal piers and stocking and transfer systems. Coaling stations, in which coal was stored and distributed to the trains, were typically situated at all important stations, junction points, division and section yards and at any point where engines were stored, maintained or changed. According to Berg:

> The choice of a design [for coaling facilities] will depend to a large extent on the topographical features of the locality, the ground space available, its shape and its value, the number of engines to be coaled at a given time, the kind of cars in which coal is to be delivered at the coaling station, the quality of the coal, whether hard or soft, and whether the coal will be supplied regularly all the year around, or only at certain seasons of the year; also, whether coal is to be delivered to engines on a side track with ample time allowance for coaling, or whether trains will stop to take coal on the main tracks, making a quick coal-delivery a prerequisite.

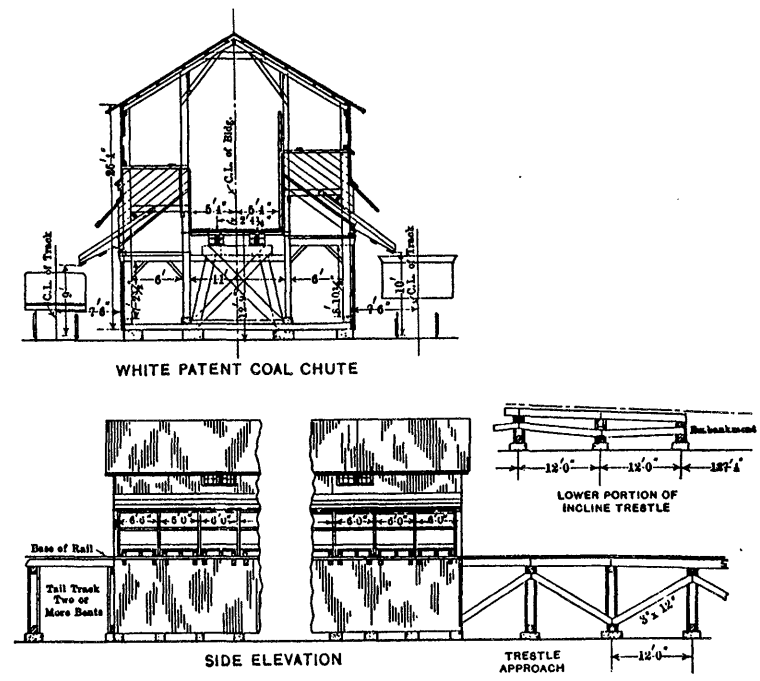


Figure 73. Coal chute, from Orrock

Coal houses were typically small wood-framed structures, sheathed with wood or metal, but many of the coaling facilities were open-air structures built either of timber or iron/steel. Given the variety of coal-related structures, their forms and configurations varied considerably from railroad to railroad and from site to site.

Coal was loaded onto the locomotive tenders in several ways. The simplest was by hand-shoveling it from coal cars parked next to the tender. This required no specialized apparatus and was by far the slowest transfer method. In larger yards coal was loaded onto the tenders by cranes with buckets that pivoted from storage piles over the tenders and dumped their contents by tipping or opening trap doors.

The crane was either fixed in a stationary position (forming a derrick station or clamshell station, depending upon whether the coal was tipped or dropped into the tenders) or movable, "consisting either of a traversing crab on fixed end-trestles or of a so-called Goliath crane, in which the side supports of the overhead bridge travel on tracks laid on the ground," according to Berg. Coal was also loaded onto trackside platforms or bins elevated above the tenders and tipped onto the trains using tipping boxes. Finally, it could be delivered by chutes or conveyors from chute stations or bins located further from the trains. Requiring the most sophisticated, usually all-steel equipment, this last method provided for relatively rapid coaling of several trains on parallel tracks.

Water Station: Prodigious quantities of water were required for the locomotives' boilers, and water stations were situated alongside tracks at intervals of between 5 and 20 miles (with an average of 10 miles, less on heavy grades). The supply of water for these stations–nearby watercourse, well, pipeline, tank car–varied with the location, and the means for storage and delivery of the water varied accordingly. Typically located near coaling stations, water stations usually consisted of elevated water tanks that fed the locomotives'

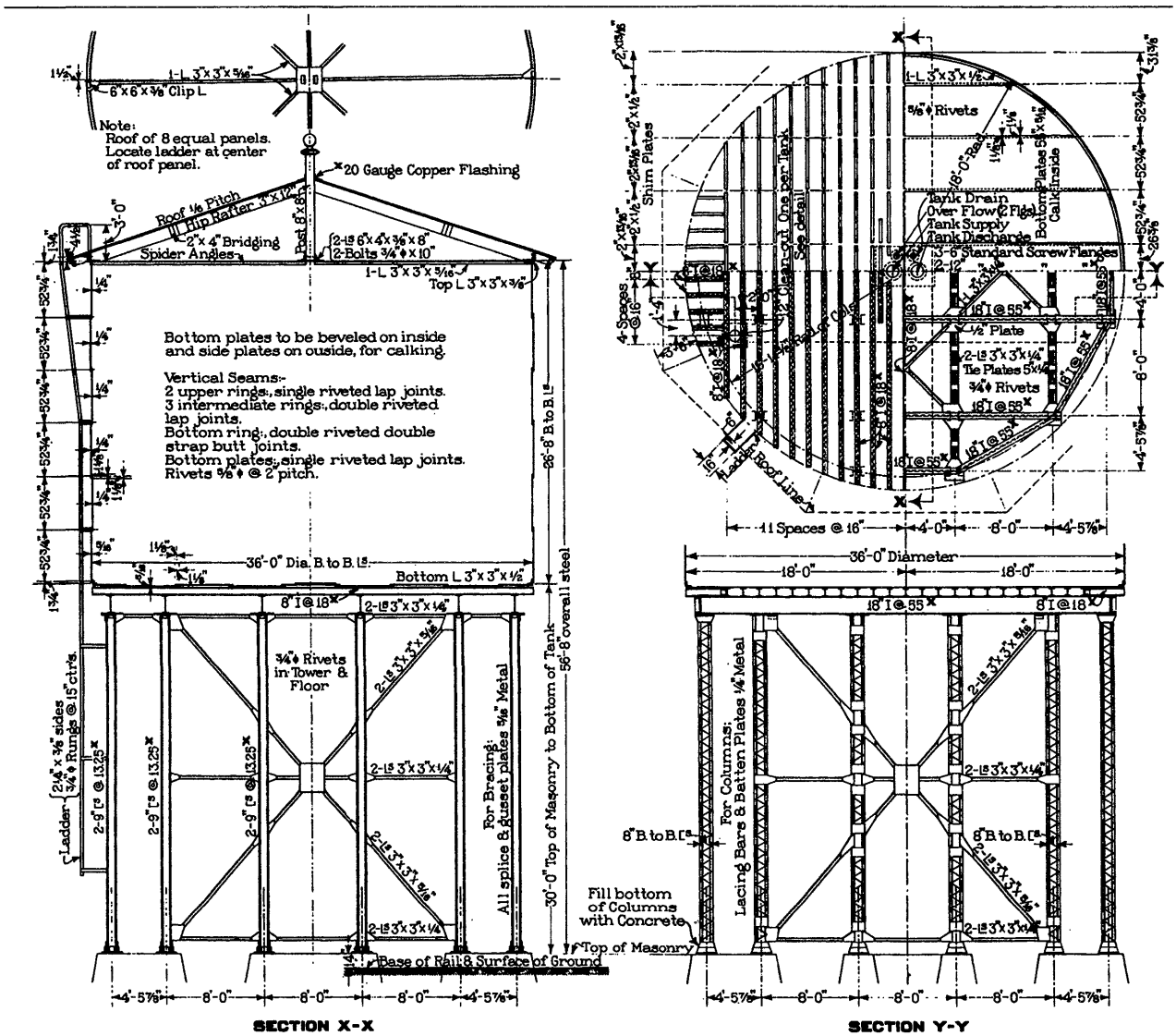


Figure 74. 200,000-gallon steel water tank, from Union Pacific standards

boilers by gravity pipes. These tanks were almost all wooden cylinders in the 19th and early 20th centuries, comprised of 14-to-16-foot wood staves secured by iron hoops in 12-to-30-foot diameters. Steel tanks began to replace wood on some railroads after the turn of the century. According to Berg:

For filling engine-tanks the water... is stored in water-tanks located near the tracks and drawn from them, as required, by gravity, either through a goose-neck delivery-spout attached to the tank and projecting over the track, or through stand-pipes located along or between tracks either adjacent to or some distance from the water-tanks.

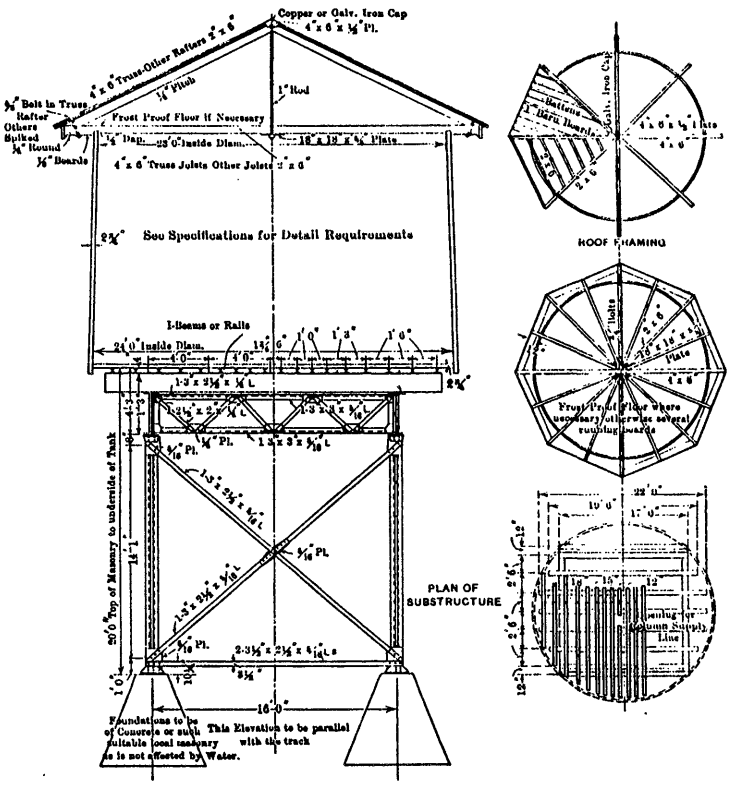


Figure 75. 50,000-gallon wooden water tank, from Orrock

Water was delivered to the storage tanks by means of windmills, mechanical pumps or gravity pipes from upgradient reservoirs or watercourses. The tanks were supported by timber trestle bents, concrete or stone posts or laced steel legs and were typically covered with flat or conical roofs. At water stations that employed mechanical pumps to feed the towers, pump houses were often built. As utilitarian structures used to house gas- or electrically powered pumps, these pump houses typically featured wood frames and wood siding and roofing. Other types of water stations did not use elevated water tanks or stand pipes, instead delivering water to the engines by steam injectors or siphons, but these were inefficient and little-used.

Sand House: Located at divisional or section points near coaling and water stations, sand houses were used to store and distribute sand to trains for use in increasing traction on steep grades or in inclement weather. Sand houses were typically small-scale, simply configured frame structures with wood or corrugated iron siding and roofing with facilities for storing, drying and delivering sand to the locomotives. They often incorporated tipples, bins and/or conveyors to transport and store materials.

Ice House: Railroads provided ice for domestic use by passengers and crew and for preservation of perishable freight in refrigerator cars or freight depots before the development of mechanical refrigeration. They harvested ice from rivers and lakes and stored the

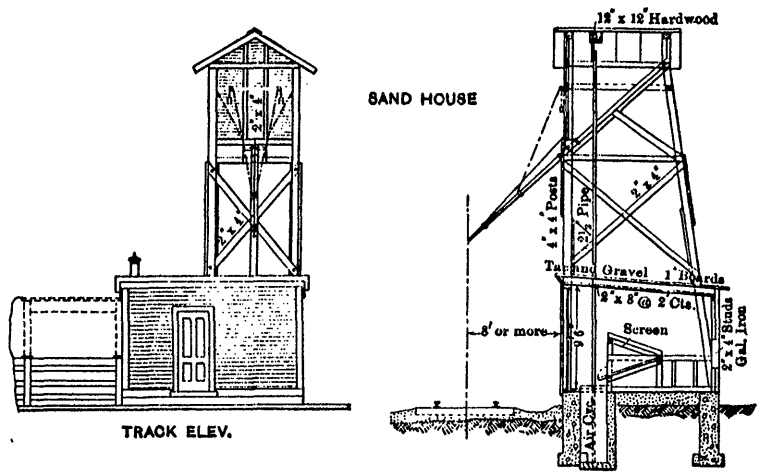


Figure 76. Sand house, from Orrock

blocks in ice houses at junction or terminal points or at convenient storage locations. Ice houses were typically small wood structures with stud walls and raftered roofs filled with sawdust, ashes, wood shavings or some other insulating material and sheathed with planks or layers of building felt. To facilitate ventilation above the ice blocks (and thereby limiting condensation), they were sometimes built with plank-covered windows halfway along their walls, which could be opened at night when the house was less than halfway full of ice.

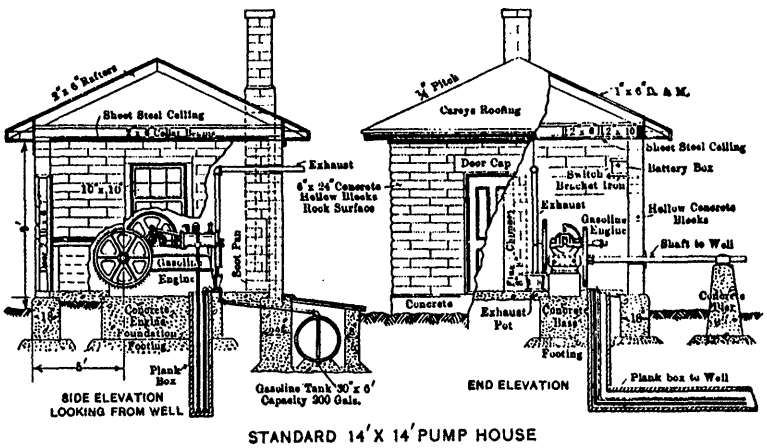


Figure 77. Pump house, from Orrock

Pump House: Pump houses were small, typically wood-sided frame buildings used to house steam-, gas-, or electric-powered water pumps. They were typically situated as ancillary structures in section or division complexes.

Oil House: Located in rail yards, typically near the coaling and water stations near the engine house, oil houses were used to store, mix and distribute petroleum products for use in the engines and cars. They were generally wood-sided frame structures that stored oil in barrels or cans on shelves, benches or trestles or in large metal tanks located in a basement or an adjacent platform. Because of the volatile nature of their contents and proximity to fired locomotives, oil houses were often built of fireproof materials.

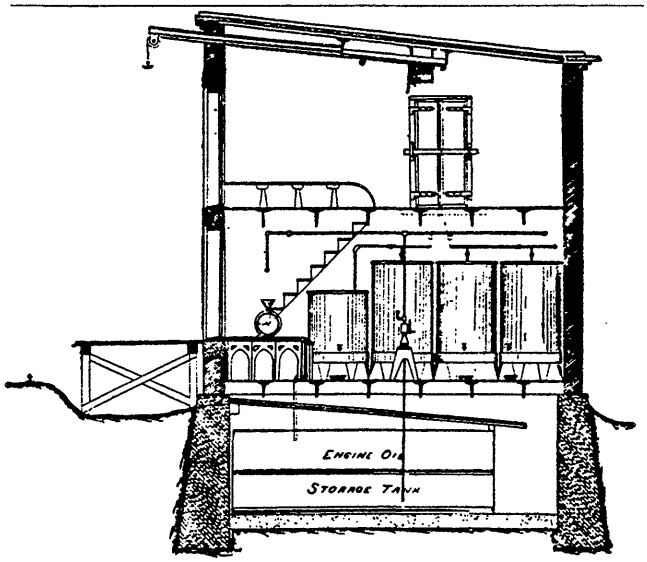


FIG. 211.—CROSS-SECTION.

Figure 78. Oil house, from Berg

Store House: Store houses were used to store and distribute supplies for engine, car and general service. Sometimes combined with the oil house, the store house was typically a utilitarian, wood-sided frame structure.

Blacksmith Shop: With the large amount of iron-working required to maintain the rolling stock and tracks, the blacksmith shop was a necessary part of a sectional or divisional complex. They varied considerably in size, reflective of the size and complexity of the adjacent railyards. Most blacksmith shops were frame structures with wood or metal siding and roofing, outfitted with boilers, forges and storage and working areas.

Carpentry Shop: Carpentry shops were used to build, repair and maintain the large quantities of woodwork on the rolling stock and service buildings. They were typically simple frame buildings and may also have housed cabinet and upholstery shops.

Machine Shop: Machine shops were simple frame structures used, like carpentry shops, to build, repair and maintain iron and steel components of the rolling stock. These may have been combined with car truck shops, which were devoted to maintenance of wheels, axles and suspensions for the cars and engines.

Other shops: Other small-scale shops were often built in larger railyards to service the rolling stock and track. These were generally classified into three categories: running repair shops, in which minor repairs were made to engines and their component parts; back shops, which housed more major repair and dismantling of engines; and freight car shops, in which minor repairs were made to other rolling stock. These included paint shops, freight and passenger car shops, cabinet shops, upholstery shops, planing mills, wheel foundries, electrical shops, pattern shops, and other special-purpose facilities.

Privy: Also called water closets, privies, by nature small-scale structures, were located near virtually all of the domestic and shop structures. These varied in finish and sophistication, depending on usage but almost all were wood-frame, gable- or shed-roofed buildings with corrugated steel or wood weatherboard or board-and-batten siding.

Significance: Located at intervals along every rail line in Colorado, housing and maintenance buildings were critical to the railroads' operation. Although typically not as visible or as architecturally accomplished as depots, these utilitarian structures were instrumental in the continued functioning of the rolling stock and right of way, both of which required constant and extensive upkeep. With the exception of major structures such as masonry engine houses or Victorian section houses, housing and maintenance buildings tended to be inexpensive, plainly detailed wood-frame structures, often hastily erected and indifferently maintained. Moreover, they were used to house heavy construction and maintenance operations and were subjected to a variety of environmental hazards that included fire, corrosive chemicals and steam, and severe weather. Like most structures used in heavy industry, their function sometimes changed with the evolution of railroading in the 19th and early 20th centuries. For these reasons, maintenance buildings were almost all repaired and modified repeatedly over time, sometimes obscuring their original materials and configurations and other times changing them entirely as they were salvaged, recycled and/or moved to serve other functions. These structures were often razed during the railroad abandonments and retrenchments that began in the 1910s. This attrition has left relatively few intact today. As a result, those that remain with integrity are considered significant for their association with specific railroad lines and for their representation of evolving railroad trends.

Registration Requirements: The period of significance for housing and maintenance structures begins in 1867, with the construction of the first railroad in the state. Although the buildings' functionality continues to the present–with many buildings still in active use–for purposes of this nomination the period of significance ends with the year 1948, the 50-year cutoff date maintained by the National Register. Railroad-related alterations made during the period of significance may be considered part of a structure's historic fabric, provided they do not substantially diminish the structure's historical association with that line or its architectural/technological distinction. Integrity of a structure's historic materials and design is essential for its National Register eligibility under any criteria. The definition of integrity may vary, however, depending on the criterion. Because location is of primary importance under Criterion A, a structure will rarely qualify under this criterion if it does not remain on its historic site (original or moved by the railroad during the period of significance) along its associated railroad line. Location can also have importance under Criterion C, but this association is not as vital.

Maintenance buildings were frequently altered and/or moved to serve changing functions, upgrade facilities on an expanding line or retrench facilities on a faltering line. Similarly, dwellings were renovated or moved to serve changing employee needs. As a result, relatively few of these building types remain structurally intact with their original use in their original location. Loss of integrity may therefore be mitigated by demonstrable historical association or by architectural or technological significance for unique or rare structural types.

Larger, more important structures such as engine houses and section houses may be considered individually eligible for the National Register as major components of significant rail lines. Smaller ancillary structures such as ice houses or repair shops are rarely considered individually eligible but may be categorized as contributing elements in a railroad-related corridor or district. Housing and maintenance structures with sufficient integrity are considered eligible for the National Register using the following criteria:

Criterion A: Structures demonstrably associated with the construction and/or operation of significant railroad lines; structures associated with important locations (e.g., stations, terminal or divisional points) along significant railroad lines; structures associated with important events or historical trends that occurred along significant railroad lines.

Criterion B: not applicable.

Criterion C: Structures that embody the distinctive architectural design or construction methods associated with significant railroads; structures that embody the work of a significant architect, engineer or builder; structures that represent the evolving architecture and technology of railroad transportation.

Criterion D: Building or structure ruins or sites with demonstrable potential to document the spatial arrangement, extent and/or uses of railroad-related facilities at important locations along significant railroad lines.

Property Type: Drainage and separation structures

Description: Colorado railroads built a variety of structures to carry their tracks over–and sometimes under–obstacles in their paths. Culverts crossed over ditches and minor drainages, single-span, simply supported bridges extended over larger drainages and streams, longer-span girders or trusses or multiple-span trestles crossed major streams and rivers, viaducts crossed entire valleys to maintain grade, grade separations (overpasses and underpasses) segregated railroad lines from roads and highways that crossed them, and tunnels carried the lines beneath mountains and rock outcroppings. These structures took on a range of forms and configurations, characterized by their materials, shapes and bearing characteristics.

Railroad bridges were built for utility, economy and speed of construction, with architectural design incorporated in only a few monumental urban structures. Thomas Curtis Clarke, an eastern bridge builder, could have described Colorado when he said that since bridges "had to be built in a short time, aesthetic considerations are little regarded. Utility alone governs their design. So long as they are strong enough, few care how they look." He added the final explanation for the look of western railroad bridges, which, while "not a thing of beauty... we hope it may be a joy forever to its stockholders."

Bridges, viaducts and grade separations (all lumped together as bridges for this discussion) were divided for structural and maintenance purposes into separate subsystems. Supporting the bridge above the streambed, the **substructure** consisted of the below-grade foundation and the load-bearing abutments and piers. Short of some type of structural failure or massive flood-caused scouring, the foundations were rarely seen once the bridge was completed. They consisted generally of long piles (log, timber, steel or concrete) driven into the earth by a pneumatic pile-driver, or spread footings, usually made of concrete. Other more esoteric foundations such as pneumatic caissons were rarely if ever used in Colorado.

Solid abutments and piers were generally built of stone masonry or concrete. These usually incorporated short wingwalls that angled off to the sides to contain the approach fills. Long-span trusses built in the 19th and early 20th centuries were often carried at their four corners by steel or iron cylinder piers, which were supported by driven piles and packed with concrete. The cheapest and most frequently used piers and abutments were timber or steel piles, joined together with cross-members to form bents. These bents were sometimes classified by their leg numbers (e.g., four-legged bet, two-legged bent). For instance, the Colorado Midland's Maroon Creek Viaduct, the state's most outstanding railroad viaduct, employed four-legged, braced steel bents.

The **superstructure** was the bridge component that spanned between the piers and abutments. Forming the most technologically noteworthy part of a bridge, superstructures were generally typed by material (concrete, timber, stone, steel), structural configuration (truss, arch, slab, girder, stringer), position relative to the roadbed (deck, through, pony) and bearing (simply supported, continuous, cantilevered). Bridge superstructures were almost always built separately from the substructure and isolated from the piers and abutments by bearing shoes, which rocked, rolled or slid to compensate for substructural movement and superstructural expansion and contraction.

Iron or steel superstructures were typically prefabricated by bridge manufacturers (e.g., the Pueblo Bridge Company of Pueblo, the King Bridge and Iron Company of Cleveland or the American Bridge Company of New York), shipped in pieces to the site by train and assembled by contractors or railroad crews. Timber and stone bridges were traditionally constructed on-site, often built using indigenous materials. And, modern pre-cast girders excepted, concrete superstructures were always built on-site, usually with cement and steel reinforcing bars shipped in by rail.

The superstructure carried the **floor system**, which was comprised of floor beams, stringers and roadway. Roadways for railroad bridges were classified as open or solid (or ballasted) depending on whether the rails and ties were supported directly by the bridge with gaps inbetween (open) or atop a ballast bed (solid). **Guardrails** often lined the roadway on both sides. Although used much more sparingly on railroad bridges than on highway structures, guardrails were typi-

cally made up of steel angles or latticework or timber planks supported by steel posts. The **approach spans** comprised the last structural system. Railroads often used steel truss or girder main spans over the primary channel of a river, with shorter approach spans (often timber or steel stringers) over secondary channels and the surrounding floodplain. To economize on construction costs, they frequently used different types of piers for the channel spans and the approach spans.

The most rudimentary drainage structures were simple pipe culverts, manufactured from wood, metal or concrete and buried beneath the tracks by earth fill or ballast. Used extensively in the 19th century, wood stave pipes consisted of tapered wood staves arranged in a cylinder and held in place by continuous iron banding. They were typically small-diameter pipes, with outside dimensions ranging from 12 to 36 inches. With the wood in constant contact with groundwater, stave pipes were intrinsically short-lived. Metal pipes served the same function, but with a longer life expectancy. Typically comprised of iron tubes cast in interlocking single- or double-hub sections, metal pipe culverts ranged in diameter from 8 to 72 inches and could be built to almost any length.

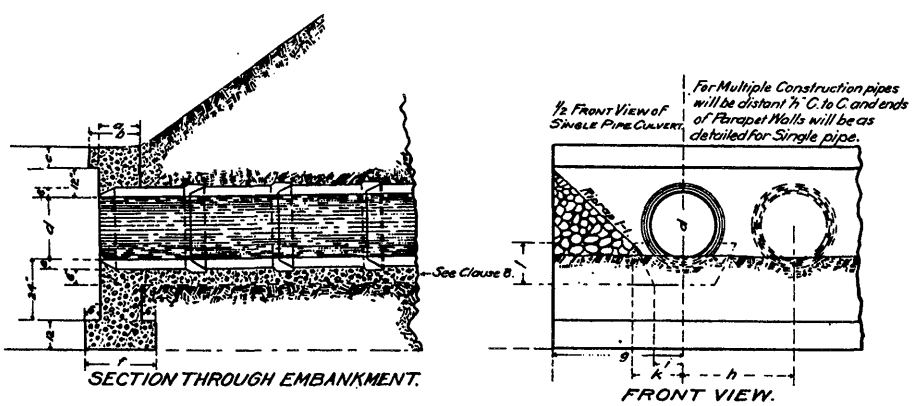


Figure 79. Pipe culvert, from Union Pacific standards

More recent pipe culverts, called multiplate culverts, employed corrugated steel sheets riveted into segmental sections to form large-diameter cylinders or ovaloid shapes. Railroads sometimes used salvaged metal parts, such as boiler tubes, to form culverts, and they often faced the culverts' upstream and downstream ends with concrete or stone masonry endwalls. These endwalls ranged in complexity from dry-laid fieldstones to dressed and mortared ashlar structures with angled wingwalls and stepped copings. After the turn of the century, railroads began using cast concrete sections with single-hub ends for pipe culverts.

Arch culverts represented the next logical step in bridge hierarchy. Using a structural form that dates back to Roman origins, arch culverts built in the 19th century typically featured semicircular stone masonry arches that sprang from the culverts' stone sidewalls. Constructed with varying barrel lengths and sidewall heights, these structures ranged from 5 to 25 feet in intrados diameter. Because of their arched shape, they were always separated from the railroad ballast

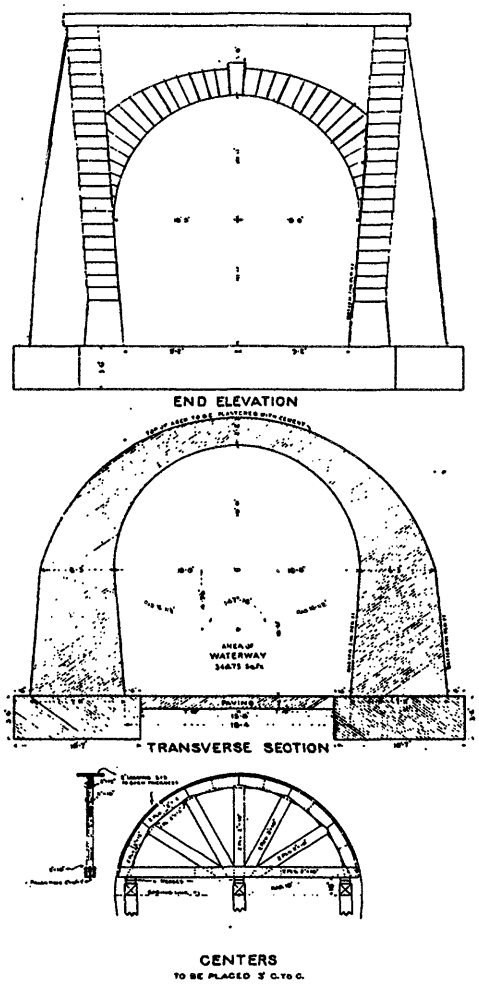


Figure 80. Arch culvert, from Union Pacific

by earth overburden. Arch culverts were rarely built in more than a single-barrel configurations, and they often featured extensive masonry wingwalls with massive coping stones. Concrete arch culverts and bridges, sometimes faced with stone veneers, were built after about 1900.

Concrete was also used for box culverts–square-barreled spans with integrally cast walls, ceilings and floors. Generally spanning less than 20 feet, concrete box culverts could be ganged in multiple-barrel configurations, with angled or straight wingwalls at the upstream and downstream faces. They were installed either with the ballast bed bearing directly on the concrete tops or beneath varying-depth layers of earth overburden.

Concrete slab bridges resembled culverts in their boxlike shape, but their superstructure (the spanning slab) and substructure (abutments and/or piers) were cast separately. Built after the turn of the century, concrete slabs with imbedded steel reinforcing were the simplest bridge types used by the railroads. Their chief advantage was their durability: concrete bridges kept in good repair had an almost indefinite life span. Concrete slabs rarely spanned more than 25 feet and could be ganged in multiple-span structures for wider crossings.

Concrete girder bridges resembled slabs, but their multiple concrete beams beside or beneath the roadbed allowed them to span greater lengths. Capable of extending in excess of 50 feet, concrete girder bridges were seldom used by railroads.

Although concrete girders were seldom built in Colorado, their iron and steel counterparts received widespread use. Plate girders, made up of deep metal plates with riveted flanges and web stiffeners, were an industry standard for medium-span railroad bridges. They could be fabricated at the mill and shipped whole to the site. Limited only by the length of a railroad car (and extended even beyond that using special, articulated cars), plate girders ranged in span

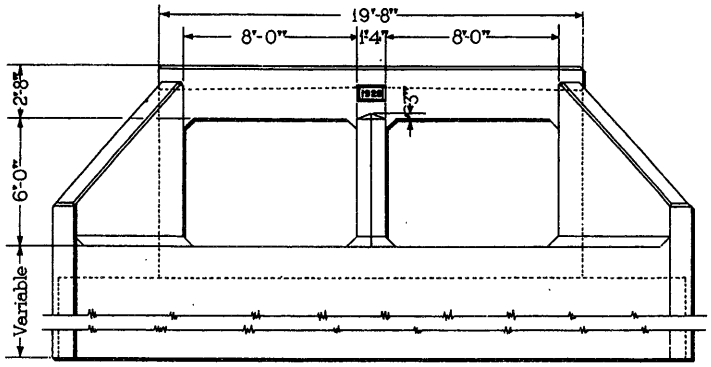


Figure 81. Concrete box culvert, from Union Pacific standards

length from 25 to well over 100 feet. They were built in both deck (with the girders entirely beneath the roadway) and through (with the roadway between the two girders) configurations and could be supported by masonry, concrete, timber or steel substructures. For shorter spans– between 20 and 40 feet– railroads relied alternately on steel stringer bridges, which, like plate girders, consisted of parallel steel beams. Stringer bridges differed from girders in substituting a large number of relatively shallow beams for the two deep girders. These stringers were generally rolled I-beams instead of built-up plates.

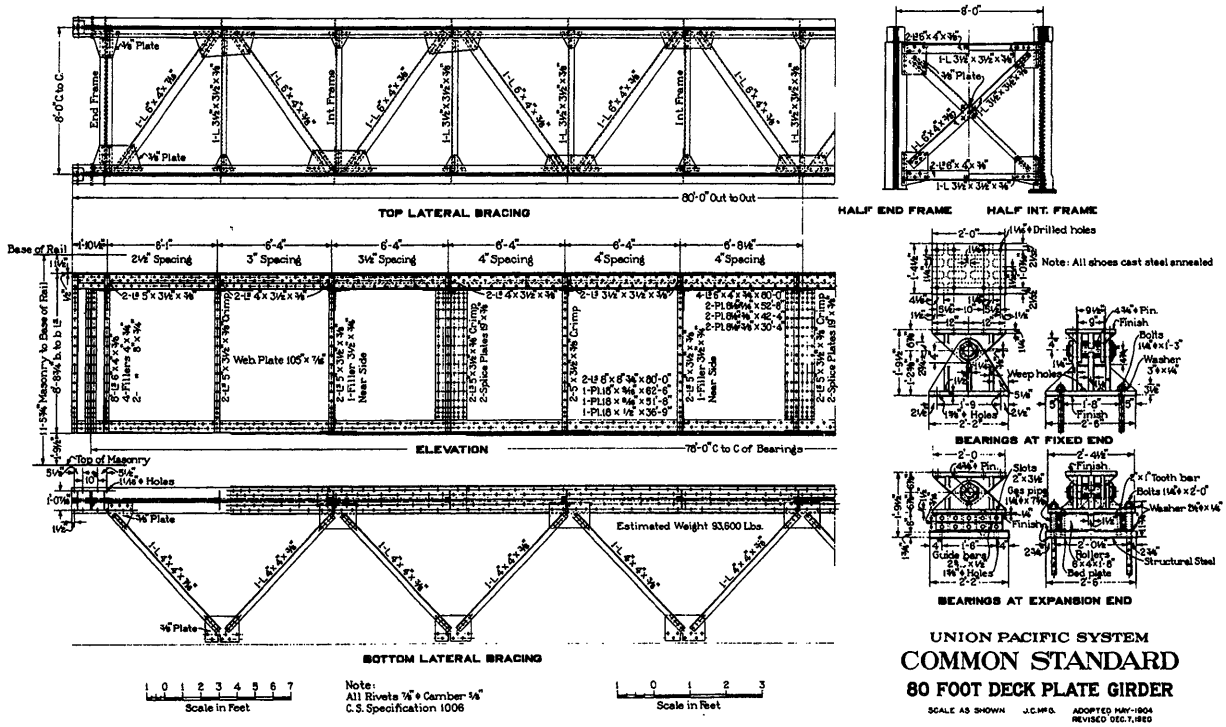


Figure 82. 80-foot deck plate girder, from Union Pacific standards

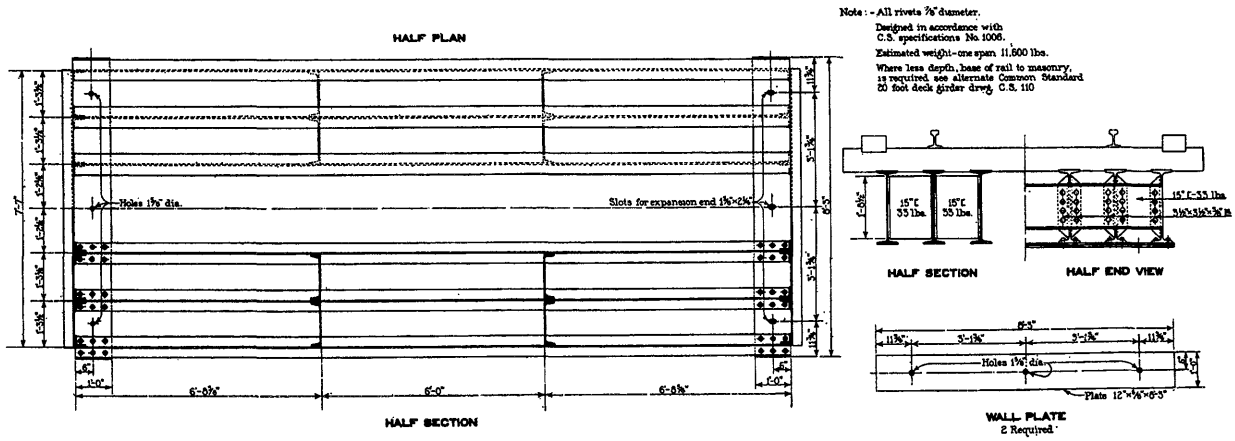


Figure 83. Steel stringer bridge, from Union Pacific standards

Wood was the state's most widely available and economical building material, particularly in the mountains where the majority of bridges were needed. It was not surprising, then, that the most commonly built railroad bridge in Colorado was the timber trestle, also called the timber pile or timber stringer bridge. The timber trestle was made up of timber beam or stringer spans supported by heavy timber plates atop timber pile bent piers and abutments. The individual spans were never very long, rarely exceeding 20 feet in length. Each consisted of a series of timber beams, laid in rows parallel with the tracks, over which a second row of perpendicular ties was bolted.

Timber stringer bridges in single- and multiple-span configurations were built in abundance in both the flatlands and the mountains, but the mountain bridges have proved more memorable. Spindly mountain trestles such as the Trestles of Ophir on the Rio Grande Southern made the mountainside look like a roller coaster. With their successive steps of trestlework built high over the precipitous canyons, they provided as much passenger interest, if not out-and-out terror, as the spectacular scenery in which they were built. Wooden trestles were generally expected to last 20-30 years, fitting well into Colorado's placer railroad tradition of construction. They could be readily replaced in part or in whole as needed, if the railroad was still in business.

Though by far the most common bridge type, the timber stringer was not really very sophisticated and was limited to short-span applications. More technologically innovative was a bridge type that has been termed "primarily an American achievement"–the truss. Timber was used on the first railroad trusses in Colorado, combined with wrought iron tension rods to form Howe combination trusses. Patented by William Howe of Massachusetts in 1840, the Howe truss featured wooden diagonals in compression and iron verticals in tension. Another important truss design,

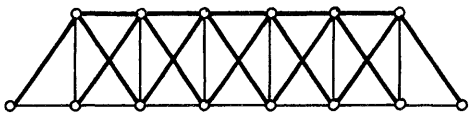


Figure 84. Howe truss schematic

patented by Thomas and Caleb Pratt in 1844, was characterized by upper chords and vertical members acting in compression and lower chords and diagonals that acted in tension. The parallel chords and equal panel lengths of the Pratt truss resulted in standardized sizes for the verticals, diagonals and chord members, making fabrication and assembly relatively easy. In the highly competitive bridge manufacturing industry, in which efficiency equated with profit, Pratts received almost universal acceptance. "The Pratt truss is the type most commonly used in America for spans under two hundred and fifty feet in length," noted bridge engineer J.A.L. Waddell wrote in 1916. "Its advantages are simplicity, economy of metal, and suitability for connecting to the floor and lateral systems."

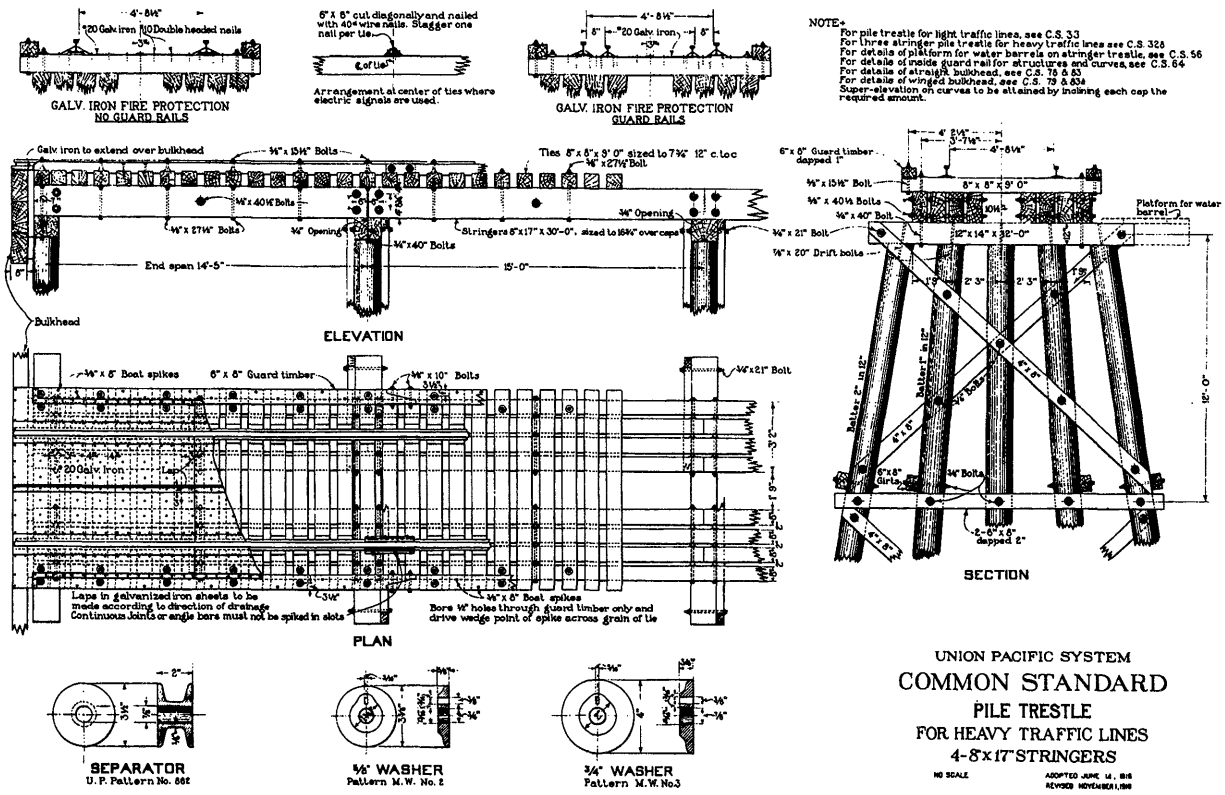


Figure 85. Timber pile trestle bridge, from Union Pacific standards

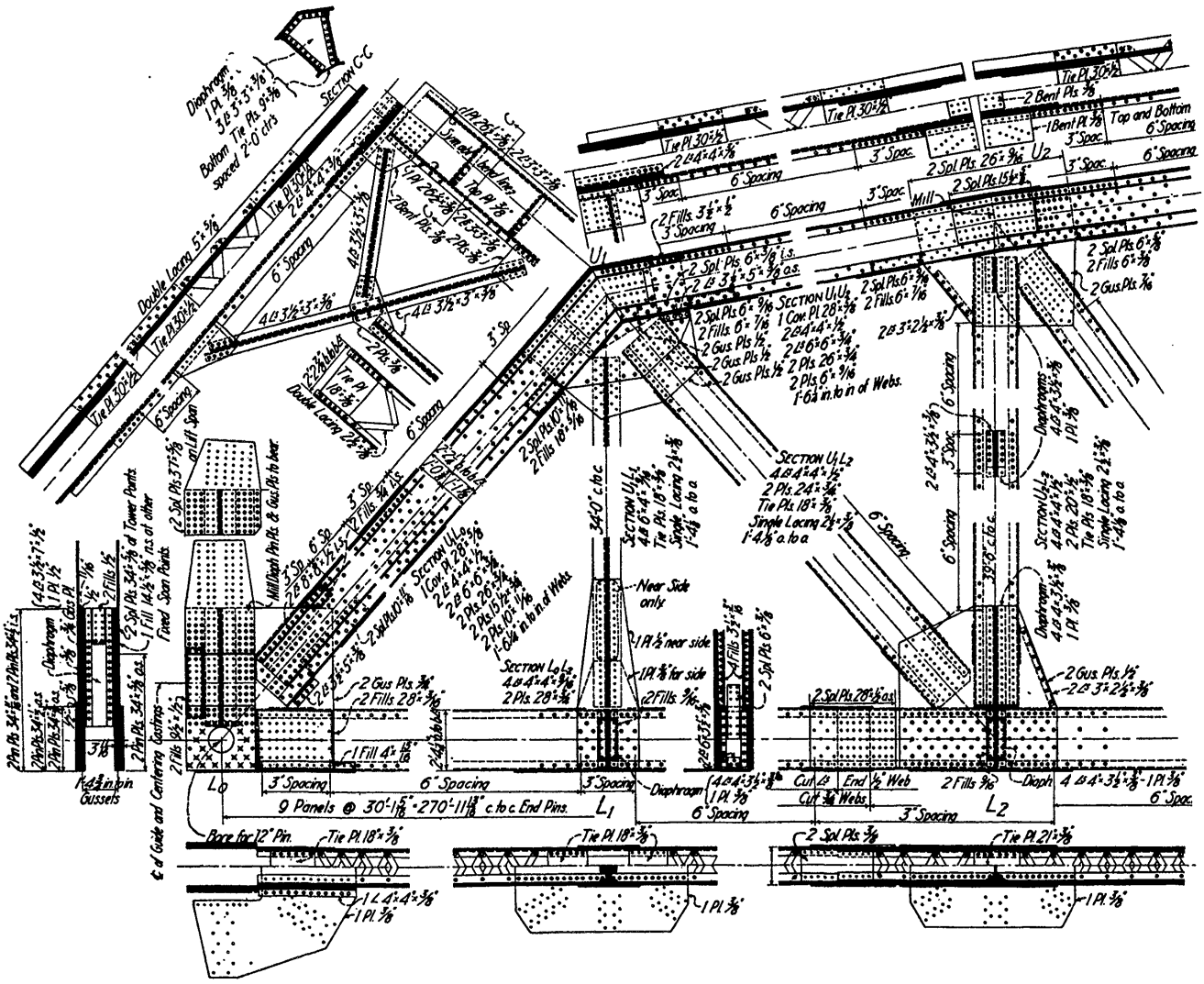


Figure 86. Railroad truss detail, from Waddell

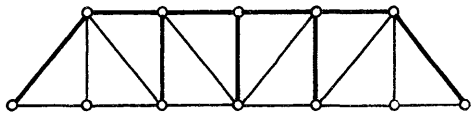


Figure 87. Pratt truss schematic

From the standard, straight-chorded Pratt form, a variety of long-span structural subtypes evolved in the late 19th century. The most common of these was the Parker truss. Developed in the mid-19th century by C.H. Parker, the Parker truss employed the Pratt's tension/compression configuration, but with sloped upper chords. These inclined chords afforded a degree of efficiency in long span trusses, where bending moment stresses at mid-span greatly exceed the sheer stresses at the ends. The Parker's drawback was that, unlike the straight-chorded Pratt truss, the polygonal chords necessitated different-length verticals and diagonals at each panel, increasing its fabrication costs somewhat. Because trusses were generally priced on the basis of their superstructural iron or steel weight, the lighter overall weight of a polygonal chord truss more than offset the slight increase in fabricating costs in long spans.

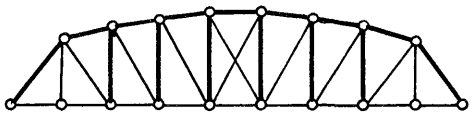


Figure 88. Parker truss schematic

The Whipple truss also resembled the Pratt in its arrangement of compression and tension members. Its primary difference lies in its diagonals, which extend over two panels. Patented in 1847 by esteemed civil engineer Squire Whipple, the Whipple (or double-intersection Pratt) truss was a popular choice for longer span crossings–generally in excess of 150 feet–between 1850 and 1900. Although more costly than the single-paneled Pratt, this variation provided greater lateral support for the diagonals, a critical consideration in deep, long-span trusses. Another long-span variant of the straight-chorded Pratt was the Baltimore truss, which employed sub-struts or sub-ties to brace the long two-panel diagonals. As the Baltimore represents a sub-divided Pratt, the Pennsylvania truss is a subdivided Parker.

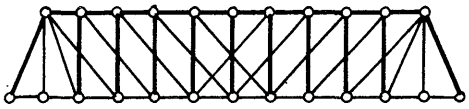


Figure 89. Whipple truss schematic

In Colorado the Pratt and its various modified designs rode a wave of popularity well into the 20th century. Proponents of the Pratt resisted its replacement by the Warren truss, another mid-19th century invention. Patented by English engineer James C. Warren in 1848, the Warren truss was characterized by diagonal members in both compression and tension. Perhaps Colorado's oldest iron span, a railroad truss salvaged from the Atchison, Topeka & Santa Fe Railroad for use on a Prowers County road, uses a Warren web configuration.

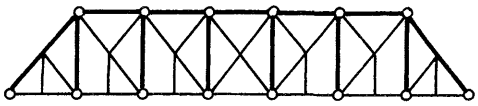


Figure 90. Baltimore truss schematic

Evolution of truss components and connections paralleled that of truss design. Cylindrical pins were first used to connect metal truss members on a Lehigh Valley Railroad bridge in 1859. Two years later, a complementary truss member–the forged iron eyebar–was introduced. Steel eyebars appeared in the 1870s. Pinned connections, typically used on Pratt trusses, allowed quick erection, but they lacked rigidity and could loosen from vibrations caused by traffic and wind. Riveting created stronger, sturdier connections but was not practical in the field before portable pneumatic riveters became available in the late 1880s. In Colorado Pratt trusses typically employed pinned connections until around 1900, when rigid connections began to supersede the older technology. Bridge companies used both structural types during the transitional period after the turn of the century.

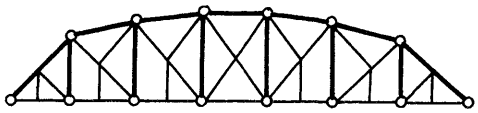


Figure 91. Pennsylvania truss schematic

Tunnels comprised another essential element of mountain railroad construction. Tunnel construction technology in Colorado benefitted from advancements made in Europe. In 1841 the longest tunnel in existence was the 1.8-mile-long Box Tunnel in Great Britain. In 1871 just as the D&RG was building south from Denver the Mount Cenis Tunnel between Italy and France became the new longest tunnel, at 8 miles. The St. Gotthard Tunnel between Switzerland and Italy surpassed the Mount Cenis in length and efficiency of construction. The new tunnel, completed in 1880, was over nine miles long and had taken about eight years to complete. Over 200 men died in its construction, many from the bad air inside the tunnel. The Simplon Tunnel, completed in 1906, became the new superlative in tunneling. It was 12 miles long, had been completed in seven years, and dealt much more effectively with the now expected problems of heat and air flow.

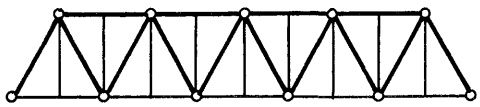


Figure 92. Warren truss schematic

Colorado's early tunnels were short bores through rock undertaken to lessen grade or blaze routes through territory where no more convenient passage presented itself. They were generally avoided during construction because they were expensive and slow, two conditions Colorado railroads avoided if they could. Colorado's most significant tunnels were the Alpine, Hagerman, Busk-Ivanhoe and Moffat. The South Park built the Alpine Tunnel in 1881-1882 at 11,524

feet between Nathrop and Gunnison. At the time of its construction, it was the highest tunnel in North America. The Colorado Midland built both the 2,200-foot-long Hagerman Tunnel in 1886-1887 at 11,530, and the 9,395-foot-long Busk-Ivanhoe Tunnel at 10,800 feet above sea level between Leadville and Basalt. The 6.2-mile-long Moffat Tunnel, built in 1925-1928 at 9,242 feet above sea level became the longest tunnel in the Western Hemisphere at the time of its completion. Over fifty additional smaller tunnels were constructed on the Moffat Road as well, doubling the total number of tunnels in Colorado.

Significance: Located along every rail line in Colorado, culverts, bridges, viaducts, grade separations and tunnels formed vital links in the roadway. They represented considerable construction and maintenance expense for the railroads–so much so that rail lines were routed to avoid or at least optimize major river crossings. The need for bridges that were both structurally sound and economically built prompted civil engineers to pioneer new structural types in the 19th and early 20th centuries, and virtually all major bridge configurations in America during this period were first developed for the railroads.

Generally the most technologically sophisticated components of any rail line, bridges are also the most prominent. No property types other than depots are as evocative of railroading as bridges and tunnels, especially in the mountains where trusses and trestles span dramatically over ravines and tunnels bore through sheer mountainsides. "There can be little doubt that in many ways the story of bridgebuilding is the story of civilization," Franklin Roosevelt stated in 1931. "By it we can readily measure an important part of a people's progress." Bridges on abandoned rail lines have frequently been removed for salvage or allowed to deteriorate, however, and some of the tunnels have partially collapsed. This attrition has left relatively few intact today. As a result, those that remain with integrity are considered significant for their association with specific railroad lines and for their representation of evolving railroad trends.

Registration Requirements: The period of significance for drainage and separation structures begins in 1867, with the construction of the first railroad in the state. Although the buildings' functionality continues to the present–with many buildings still in active use–for purposes of this nomination the period of significance ends with the year 1948, the 50-year cutoff date maintained by the National Register. Railroad-related alterations made during the period of significance may be considered part of a structure's historic fabric, provided they do not substantially diminish the structure's historical association with that line or its architectural/technological distinction. Integrity of a structure's historic materials and design is essential for its National Register eligibility under any criteria. The definition of integrity may vary, however, depending on the criterion. Because location is of primary importance under Criterion A, a structure will rarely qualify under

this criterion if it does not remain on its historic site (original or moved by the railroad during the period of significance) along its associated railroad line. Location can also have importance under Criterion C, but this association is not as vital.

Loss of integrity on bridges varies in gravity with the structural subsystem that is affected. Repair or replacement of guardrails, approach spans and/or floor system components is routine and generally not considered serious loss of integrity. Substructures were frequently repaired and sometimes replaced. As a more serious issue, this loss must be weighed with the bridge's relative historical and technological importance and the effect on its feeling and association. Loss of superstructural integrity is the most serious: minor repair of individual components may not impinge on National Register eligibility, but large-scale alterations or replacement of the superstructure effectively destroys a bridge's integrity.

Larger, more important bridges and tunnels may be considered individually eligible for the National Register as major components of significant rail lines or as noteworthy accomplishments in civil engineering. Short-span bridges and culverts and short-bore tunnels are rarely considered individually eligible but may be categorized as contributing elements in a railroad-related corridor or district. Bridges, culverts and tunnels with sufficient integrity are considered eligible for the National Register using the following criteria:

Criterion A: Structures demonstrably associated with the construction and/or operation of significant railroad lines; structures associated with important locations (e.g., major river crossings, urban grade separations, mountain passes) along significant railroad lines; structures associated with important events or historical trends that occurred along significant railroad lines.

Criterion B: not applicable.

Criterion C: Structures that embody the distinctive engineering design or construction methods associated with significant railroads; structures that embody the work of significant engineers or builders; structures that represent the evolving technology of railroad transportation or civil engineering.

Criterion D: Structure ruins or sites with demonstrable potential to document the spatial arrangement, extent and/or uses of railroad-related facilities at important locations along significant railroad lines.

Geographic Data: State of Colorado

Identification and Evaluation Methods: This Multiple Property Documentation (MPD) Form was generated as part of the Colorado Rail Abandonment and Trail Study, a multi-disciplinary study of railroad corridors in the state. The Rail Abandonment and Trail Study was administered by Ms. Chris Ford, Rail Project Manager for the Foundation for Colorado State Parks. Funding and oversight for the historical component of the Study was provided through a grant from the State Historical Fund, administered by the Colorado Historical Society. This Multiple Property Documentation was researched and produced by Clayton Fraser, Principal, and Jennifer Strand, Research Historian, of Fraserdesign, Loveland, Colorado.

Colorado's history has been inexorably tied with the development of railroads. Railroads have historically advanced settlement, have facilitated commercial and industrial development and, in many cases, have been instrumental in shaping the cultural landscape for entire regions within the state. Just as railroad empire-building has formed a compelling historical theme, subsequent abandonment of defunct or obsolete rail lines has formed a recognizable corollary. Class 1 railroad companies in recent years have been removing from service and abandoning unprofitable routes. Rail abandonments have recently occurred with the rights-of-way lost in El Paso, Elbert and Lincoln counties. Abandonments are currently underway in El Paso, Weld, Morgan and Jackson counties, and others are expected or rumored in Logan, Sedgwick, Alamosa, Rio Grande, Mineral, Conejos, Costilla, Huerfano, Lake, Pueblo, Fremont, Chaffee, Montrose, Eagle, Pitkin and Garfield counties. In addition to these, numerous historic rail lines have stood unused–and unprotected–for decades in Colorado's mountains.

Each abandonment entails, to some extent, a loss of historic resources: rails, ties, switching equipment, bridges, depots, the right-of-way itself. This loss can be mitigated and reduced by finding alternative uses for historic rail corridors. Without assessment of the state's abandoned and threatened rail lines, Colorado runs the risk of forfeiting access to resources that provide invaluable links to scenic areas and our historic past. Without an information clearinghouse to draw attention to these corridors, local constituencies may miss opportunities for their preservation. Without clearly stated guidelines for acquisition and management of the corridors, Colorado may lose rights-of-way for possible use as excursion or commuter rail lines, roadways, utility corridors, trails and rails, or heritage rail trails. And without the historical context provided by this Multiple Property Documentation, historical and technological evaluation of these rail corridors must rely on piecemeal research and analysis.

To address the threats to Colorado's historic rail corridors, the Colorado Division of Parks and Outdoor Recreation (CDPOR) has undertaken the Rail Abandonment and Trail Study. The Study provides a comprehensive look at rail abandonment issues in Colorado, with an eye to eventual conversion of abandoned rail corridors into heritage trails. Its goal is to help preserve and find beneficial use for the corridors before they are further diminished by adjacent land uses, natural deterioration and/or the loss and abuse of historic resources.

The Rail Abandonment and Trail Study has been structured as two concurrent phases: programmatic and historical. Previously funded by CDPOR and the Colorado Department of Transportation [CDOT], the programmatical phase was conducted with the cooperation and input from the State Rail Advisory Committee, CDOT, the Colorado Public Utilities Commission and relevant state, local and private entities. In it, transportation planners have developed criteria for evaluation of alternative use, surveyed some of the corridors, gathered more detailed information on the most promising corridors, and provided this information to appropriate agencies and citizen groups.

The historical phase of the Study has been geared toward historic preservation issues, as it looked at the railroads–and the specific structures and sites along their lengths–as cultural resources worth preserving. During this phase, historians researched the development of Colorado's railroads to produce a concise narrative history of Colorado railroad development. This narrative forms the basis for Section E of this Documentation. The history differs from the many existing railroad publications in that it will be directed specifically toward cultural resource issues. Combined with Section F, it provides the framework by which individual lines may be evaluated for National Register significance and integrity. Upon completion of the MPD, reconnaissance-level surveys will be made of selected railroads that are imminently threatened with abandonment. The historical phase of the Rail Abandonment and Trail Study will culminate with a general resource management plan, which will be incorporated with the management plan produced for the programmatical phase in a publication that will be distributed statewide.

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