Colorado State Freight and Passenger Rail Plan

March 2012

DEPARTMENT OF TRANSPORTATION

Colorado State Freight and Passenger Rail Plan

Prepared for

COLORADO DOT
DEPARTMENT OF TRANSPORTATION

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IHS Global Insight

March 2012

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Acronyms and Abbreviations

AADT	average annual daily traffic
AAR	Association of American Railroads
AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disabilities Act of 1990
AGS	advanced guideway system
Amtrak	National Railroad Passenger Corporation
ARRA	American Recovery and Reinvestment Act of 2009
ATSF	Atchison, Topeka and Santa Fe Railroad
BN	Burlington Northern Railroad
BNSF	Burlington Northern Santa Fe Railway
BTU	British thermal unit
C&NW	Chicago & Northwestern Railway
C&S	Colorado and Southern Railway
CB&Q	Chicago, Burlington & Quincy Railroad
CCD	City and County of Denver
CDOH	Colorado Department of Highways
CDOT	Colorado Department of Transportation
CKP	Colorado, Kansas & Pacific Railway Company
CMAQ	Congestion Mitigation and Air Quality Improvement Program
CML	Consolidated Main Line (BNSF/UP)
CMStP&P	Chicago, Milwaukee, St. Paul and Pacific Railroad
COFC	container on flatcar
COSIB	Colorado State Infrastructure Bank
CR	county road
CRIP	Chicago, Rock Island and Pacific Railroad, Rock Island Line
CS&E	Colorado Springs & Eastern Railroad
CSS	context-sensitive solutions
CTC	centralized traffic control
CVR	Cimarron Valley railroad

CWT	constant warning time
D&NO	Denver & New Orleans Railroad
D&RG	see D&RGW
D&S	Durango and Silverton Narrow Gauge Railroad
DIA	Denver International Airport
DMU	diesel multiple unit
DOLA	Colorado Department of Local Affairs
DOT	Department of transportation
D&RGW	Denver and Rio Grande Western Railroad
DRCOG	Denver Regional Council of Governments
DRGW	see D&RGW
DRIR	Denver Rock Island Railroad
DTR	Division of Transit and Rail
DUS	Denver Union Station
EIS	environmental impact statement
EMU	electric multiple unit
FAF3	Freight Analysis Framework (3)
FAK	freight all kinds
FHTF	Federal Highway Trust Fund
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FW&D	Fort Worth and Denver Railway
GHG	green house gas (emission)
GIS	geographic information system
GTM	gross ton miles
GWR	Great Western Railway of Colorado
HB	House Bill
HSIPR	High Speed Intercity Passenger Rail Program
HSR	high-speed rail
HUTF	Highway User Tax Fund

ICC	Interstate Commerce Commission
ICS	Interregional Connectivity Study
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
K&O	Kansas and Oklahoma Railroad
KP	Kansas Pacific
LOS	level of service
LRFA	Local Rail Freight Assistance Program
LRSA	Local Rail Service Assistance Program
MILW	Milwaukee Railroad
MP	mile post
MPO	metropolitan planning organization
MUTCD	Manual on Uniform Traffic Control Devices
MWRRI	Midwest Regional Rail Initiative
NHS	National Highway System
NKCR	Nebraska Kansas Colorado Railway
NLV	net liquidation value
NMDOT	New Mexico Department of Transportation
O&M	operations and maintenance
OLS	Operation Life Saver
OSRPPI	Office of State Rail Planning and Project Implementation
PEIS	programmatic environmental impact study
PMT	Project Management Team
PNR	Park ‘n Ride
PRB	Powder River Basin
PRIIA	Passenger Rail Investment and Improvement Act of 2008
PTC	positive train control
PUC	Public Utilities Commission
RCR	Railroad Cost Recovery Index
RED	railroad economic development
RFTA	Roaring Fork Transportation Authority

RMRA	Rocky Mountain Rail Authority
ROW	right-of-way
RR	railroad
RRIF	Railroad Rehabilitation and Improvement Financing
RTD	Regional Transportation District
RTP	regional transportation plan
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SC	steering committee
SFPRP	State Freight and Passenger Rail Plan
SG	stakeholder group
SH	state highway
SLC	San Luis Central
SLRG	San Luis & Rio Grande Railway
SP	Southern Pacific
SRSIF	State Rail Service Improvement Fund (Kansas)
SSM	Supplemental Safety Measures
STAC	State Transportation Advisory Committee
STB	Surface Transportation Board
STP	Surface Transportation Program
STRACNET	Strategic Rail Corridor Network
STTF	State Transportation Trust Fund (Florida)
Sub	railroad subdivision
TAC	Technical advisory committee
TAFS	Transportation Alternatives Feasibility Study (North Front Range)
TCSP	Transportation, Community, and System Preservation Program
TEA-21	Transportation Equity Act for the 21st Century
TGV	**train à grande vitesse** (French high-speed train)
TIFIA	Transportation Infrastructure Finance and Innovation Act
TLRC	Transportation Legislation Review Committee

TNM&O	Texas, New Mexico and Oklahoma Coaches, Inc.
TOFC	trailer on flatcar
TRAC	Transit and Rail Advisory Committee
TTX	TTX Company—North American company providing rail cars
TWC	track warrant control
UP	Union Pacific Railroad
V&S	Victoria & Southern Railroad
VMT	vehicle miles traveled
WBAPS	Web Based Accident Prediction System
WYDOT	Wyoming Department of Transportation

Glossary

286,000 lbs Rail Car	The standard freight car weight has elevated to a gross weight of 286,000 lbs, and carries roughly 220,000 lbs (110 tons) of cargo.
Abandonment	Elimination of a segment from the rail network. Abandonments must be approved by the Surface Transportation Board.
Abt Rack System	A rack-and-pinion railway (also rack railway, cog railway) is a railway with a toothed rack rail, usually between the running rails. The trains are fitted with one or more cog wheel or pinions that mesh with this rack rail. This allows the trains to operate on steep gradients.
Advanced Guideway System (AGS)	New technology and non-conventional rail transportation system operating within a fixed guideway, capable of being elevated for longer than bridge length sections.
Amtrak	Informal name for the National Railroad Passenger Corporation created by the federal government in 1971 to operate the nation's intercity passenger rail services.
Average Annual Daily Traffic (AADT)	The average number of vehicles passing a given point on a roadway during a 24-hour period.
Ballast	Selected rock (crushed stone) material placed on the railroad roadbed for the purpose of holding the track in line.
Branchline	The trackage of a railroad which extends from the principal lines of rail traffic to connect external shipping points.
Car Miles	The movement of a rail car one mile.
Class of Railroads	Refers to Surface Transportation Board (STB) classification of railroads based on their level of annual operating revenue.

Class of Railroad	Annual Operating Revenues
Class I	More than $378.8 million
Class II	$40.0 million to $378.8 million
Class III	Less than $40.0 million

<table>
<tr><td>Class of Track</td><td>Refers to the general condition of a section of track measured in terms of the maximum speed at which trains may be operated safely over the track. Classes are as follows:
<table>
<tr><th></th><th colspan="2">Maximum Allowable Operating Speed</th></tr>
<tr><th>FRA Class</th><th>Freight</th><th>Passenger</th></tr>
<tr><td>1</td><td>10 mph</td><td>15 mph</td></tr>
<tr><td>2</td><td>25 mph</td><td>30 mph</td></tr>
<tr><td>3</td><td>40 mph</td><td>60 mph</td></tr>
<tr><td>4</td><td>60 mph</td><td>80 mph</td></tr>
<tr><td>5</td><td>80 mph</td><td>90 mph</td></tr>
<tr><td>6</td><td>110 mph</td><td>110 mph</td></tr>
</table></td></tr>
<tr><td>Commuter Rail</td><td>Short-haul rail passenger service operating in metropolitan and suburban areas on trackage that is usually part of the general railroad system.</td></tr>
<tr><td>Container on Flat Car (COFC)</td><td>An intermodal shipment that refers to the practice of moving highway or steam ship containers on rail intermodal cars for the long-haul portion of the total freight trip.</td></tr>
<tr><td>Demurrage</td><td>Fee that a railroad bills to industries for the amount of time the industry is in possession of a rail car beyond a certain amount of time; i.e., for use of the rail car more than 48 hours.</td></tr>
<tr><td>Density</td><td>Reflects the amount of freight traffic moving over a segment of rail line measured in million gross ton-miles per mile.</td></tr>
<tr><td>Derailment</td><td>When one or more cars or locomotives leave the rails.</td></tr>
<tr><td>Diesel Multiple Unit (DMU)</td><td>A self-propelled rail passenger car with the engines under the floor and the driver's compartment as part of the coach.</td></tr>
<tr><td>Double Stacks/Hi-Cube Rail Cars</td><td>Presently the most efficient method to transport shipping containers by rail. Special Well Car equipment has a container sized depression in the middle of the car which allows two containers to be stacked one on top of the other in a double stack configuration.</td></tr>
<tr><td>Federal Railroad Administration (FRA)</td><td>A division of the U.S. Department of Transportation responsible for administering all federal programs related to rail transportation.</td></tr>
<tr><td>Fixed Guideway System</td><td>All transportation systems which run on and are attached to rails. Including freight rail, passenger rail, commuter rail, light rail, and high-speed rail.</td></tr>
</table>

Gauge	The distance between the two rails measured at right angles. Standard gauge is 4 feet, 8 ½ inches.
Geographic Information System (GIS)	A computer-based tool for mapping and analyzing data and events.
Greenfield Corridors	New Right-of-Way for use by high-speed rail, commuter rail, etc.
Gross Ton Miles	The movement of a ton of freight one mile, including the weight of the goods, cars and locomotives.
Industrial Spur Track	Short tracks extending from a mainline track, siding, or yard leads to serve industries.
Intercity Rail	Long distance passenger train service, similar to existing Amtrak routes, connecting the national network and regional city pairs.
Intermodal	The use of two or more modes to complete the movement of a shipment of freight or a passenger trip from origin to destination.
Intermodal Facility	Location where cargo is transferred from one mode of transport (such as rail) to another (such as a truck).
Interstate Shipment	Traffic that originates in one state and terminates in another.
Intracity Rail	Short distance passenger train service within cities.
Intrastate Shipment	Traffic that originates and terminates in the same state.
Light Rail	An urban rail passenger transportation system that uses electric-powered rail cars along exclusive rights-of-way at ground level, on aerial structures, in subways, or occasionally in streets.
Linehaul Railroad	A railroad principally involved in the movement of freight from one town or city to another.
Main Line	1. A designation by each railroad of its own track signifying a line over which through-trains pass with relatively high frequency. Main lines generally have heavier weight rail, more sophisticated signaling systems, and better maintenance than branchlines. 2. A designation by the U.S. Department of Transportation based on gross ton miles per mile passing over a segment of track. Main lines carry more than 5 million gross ton miles per mile annually.
Magnetic Levitation	A high speed rail technology by which a train can travel free of friction at speeds up to 300 miles per hour or more; suspended on a magnetic cushion approximately ½ above an elevated magnetic track.

Merger	The combination of two or more railroads where one corporation retains its existence while acquiring the property and assets of the other and that is regulated primarily by the Surface Transportation Board
Multi-modal Transportation Plan	Transportation Plan that includes several modes of transportation, such as highways, aviation, rail, transit, bicycles, pedestrians, etc.
Net Ton-mile	The movement of a ton of freight one mile.
Operation Lifesaver	A public education and information program designed to reduce collisions, deaths, and injuries at rail/highway grade crossings.
Performance Measure	A quantitative or qualitative tool to assess progress towards an outcome or goal.
Quiet Zone	A section of rail line that contains one or more consecutive public crossings at which locomotive horns are not routinely sounded. Upgrades may be required at a public highway/railway grade crossing to provide additional safety measures in lieu of horns being blown.
Rail Weight	The weight of rail measured in pounds per yard.
Rail/Highway Crossing	A location either at-grade or grade separated where one or more railroad tracks intersect a public highway, street or alley.
Railroad Capital Projects	Investments by a railroad in their infrastructure, or replacement and improvement projects; including strengthening track structure, replacing locomotives and rolling stock, and adding new tracks and infrastructure.
Railroad Cost Recovery Index (RCR)	A measure of railroad inflation indicating the change in the price levels of inputs to railroad operations including wages, fuel, materials and supplies, and other expenses.
Regional Railroad or Carrier	A railroad company earning less than $378.8 million annually and operating more than 100 miles of track. (Class II)
Short Line Railroad	A railroad company which is typically less than 100 miles in length. (Class III)
Spur Track	A short track extending out from or alongside another track that is connected at only one end with the other track.
Strategic Rail Corridor Network (STRACNET)	An interconnected network of rail corridors important to national defense.

Surface Transportation Board (STB)	The federal body charged with enforcing acts of Congress affecting interstate rail traffic.
Switching Railroad	A railroad involved in the shifting of rail cars between two points, both of which are within the same vicinity of an industry, a group of industries, a station or a city. (Class IV)
Team Track	A small railroad siding or spur track for the use of area merchants, manufactures, farmers or small businesses to personally load or unload relatively small quantities of products/merchandise.
Through Traffic	A railroad's traffic which originates and terminates on other railroads, off-line, or outside of the state. Also known as overhead or bridge traffic.
Ties	The wooden, concrete or steel cross pieces that keep the two rails in gauge to provide a guide way.
Trackage Rights	An agreement allowing a Class I railroad or a short line railroad to operate its train on a track owned by another railroad for a fee.
Trailer on Flat Car (TOFC)	An intermodal shipment that refers to the practice of moving highway trailers on rail intermodal cars for the long-haul portion of the total freight trip.
Transload	The process of transferring a shipment from one mode of transportation to another; i.e., pipeline to rail cars or rail cars to a ship.
Turnout	A track structure used to divert cars and locomotives from one track to another.
Warning Devices	Signs, signals, markings, and devices placed along highways approaching and at railroad/highway crossings on, over or adjacent to a street or highway used to direct and assist vehicle operators and pedestrians in crossing the rail line safely.
Weight Limit	The maximum gross weight per four-axle rail car, including the equipment and goods that can be handled over rail lines.

Chapter 1 Introduction

Introduction

The creation of the Division of Transit and Rail within the Colorado Department of Transportation in 2009 was a critical milestone for the future of rail planning and further implementation of the freight and passenger rail system with the state. Recognizing the importance of rail to the future of the Colorado transportation system and to the economic health of the state, the Division initiated the state Freight and Passenger Rail Plan (Plan) to provide a framework for future freight and passenger rail planning in Colorado. The Plan will comprise the railroad element of the state's next long-range multi-modal transportation plan.

The rail system that was very important in the development of early Colorado, as discussed in detail in Chapter 2 and Appendix D, has evolved in recent years as a primary economic driver in the movement of freight to, from, and through the state. This Plan will move freight rail transportation forward with a focus on economic development, as well as set the stage for the state to take advantage of the momentum around the country in regard to the re-birth of passenger rail service. The Plan has been developed to ensure that the benefits of both freight and passenger rail are fully realized as Colorado plans for the future.

Colorado was involved in state rail planning activities in the 1970s and early 1980s, as described in Appendix B. This Plan represents the first comprehensive freight and passenger rail planning effort in the state in nearly 20 years.

Purpose of the State Freight and Passenger Rail Plan

The purpose of the Plan is to improve the overall effectiveness of the freight and passenger rail system within the state. In addition, the Plan has created a vision for rail improvements in the state that can greatly enhance the effectiveness and efficiency of the state's overall transportation system.

In 2008, the U.S. Congress passed the Passenger Rail Investment and Improvement Act (PRIIA) for the purpose of improving passenger rail service in the United States. The Act required the states to have an approved state rail plan as a condition for applying for future passenger rail funding.

The Colorado State Freight and Passenger Rail Plan is in compliance with Chapter 227 of Title 49 of U.S. Code Section 22705 as enacted in the PRIIA and addresses the following 12 requirements of PRIIA:

- Inventory of the existing rail transportation network and rail services and facilities in the state and an analysis of the role of rail transportation within the state's surface transportation system
- Review of all rail lines within the state, including proposed high-speed rail corridors and significant rail line segments not currently in service in the state
- A statement of the state's passenger rail service objectives, including minimum service levels, for rail transportation routes in the state
- General analysis of rail's transportation, economic, and environmental impacts in the state, including congestion mitigation, trade and economic development, air quality, land use, energy use, and community impacts
- A long-range investment program for current and future freight and passenger rail infrastructure in the state
- Discussion of public financing issues for rail projects and services in the state listing of current and prospective public capital and operating funding resources, public subsidies, state taxation, and other financial policies relating to rail infrastructure development
- An identification of rail infrastructure issues within the state that reflects consultation with all relevant stakeholders.
- Review of major freight and passenger intermodal rail connections and facilities and prioritized options to maximize service integration and efficiency between rail and other modes of transportation within the state
- Review of publicly funded projects that improve rail-related safety and security, including all major projects funded under Section 130 of title 23
- Performance evaluation of passenger rail services operating in the state, including possible improvements to those services, and a description of strategies to achieve those improvements
- Compilation of studies and reports on high-speed rail corridor development within the state not included in a previous State Rail Plan and a plan for funding any recommended development of such corridors in the state
- Statement that the Plan complies with PRIIA Section 22102

Vision, Goals, and Objectives

Colorado's population is projected to grow to over 7 million residents by 2030. A great majority of this growth will occur within the I-25 and I-70 corridors. In addition to residents traveling to work, school, appointments, and visiting family and friends, the state benefits from tourists and vacationers throughout the year. Freight volumes will also increase to serve this growth as well as move goods to other growth areas in the U.S.

Well-planned and well-timed rail infrastructure investments for people and freight could significantly reduce the impending problems of longer travel times, deteriorating air quality, rising fuel prices and risk of crashes. Rail will help the state to attract innovative economic development by competing with regions that are already designing and investing in rail infrastructure improvements.

Recognizing this, the Rail Plan Steering Committee (SC), discussed in more detail in Chapter 4, took responsibility for drafting the "Rail Vision for Colorado" at its initial meeting. The Committee reviewed vision statements from other state rail plans as well as the Vision for the Division of Transit and Rail created by the Transit and Rail Advisory Committee. Following the identification of key factors and elements that should be included in Colorado's Rail Vision, the Steering Committee finalized a *Draft Rail Vision for Colorado*. This draft was then reviewed by the Stakeholder Group and the Steering Committee adopted the following rail vision at its July 6, 2011 meeting:

Adopted Colorado Rail Vision

The Colorado rail system will improve the movement of freight and passengers in a safe, efficient, coordinated and reliable manner. In addition, the system will contribute to a balanced transportation network, cooperative land use planning, economic growth, a better environment and energy efficiency. Rail infrastructure and service will expand to provide increased transportation capacity, cost effectiveness, accessibility and intermodal connectivity to meet freight and passenger market demands through investments which include public-private partnerships.

The Stakeholder Group, described in more detail in Chapter 4, used this Vision as the basis for developing Draft Goals. Members of the Stakeholder Group took part in breakout sessions to develop preliminary Freight Rail and Passenger Rail Goals. These preliminary goals were then reviewed and modified by the Steering Committee on September 13, 2011. The following Plan Goals linked to the *Colorado Rail Vision* were adopted:

- Create a balanced transportation system utilizing cooperative land use planning to create intermodal connectivity and accessibility without compromising existing service and infrastructure
- Provide for the safety of people, infrastructure, and goods
- Expand rail infrastructure and freight and passenger rail services to meet future demand through strategic investments which include public-private partnerships
- Promote through education the energy efficiency, environmental, and economic benefits of freight and passenger rail transportation throughout the state
- Use the efficiencies of freight and passenger rail to develop livable communities which enhance economic growth throughout the state

The Stakeholder Group next developed specific freight and passenger rail objectives for each of the above goals. As was done earlier, breakout groups were created focusing on either freight or passenger issues. Draft Freight and Passenger Rail Objectives for each goal were identified and forwarded to the Steering Committee. The Steering Committee determined that many of the freight and passenger rail objectives applied to both categories, so an additional category, General Rail Objectives, was created. The goals and objectives described below were finalized by the Steering Committee on September 13, 2011.

Goal #1—Create a balanced transportation system utilizing cooperative land use planning to create freight and passenger rail connectivity and accessibility without compromising existing rail service and infrastructure

General Objectives	#1—Provide a venue to identify and discuss issues pertaining to local government/railroad interface issues (e.g., blocked grade crossings, environmental impacts, planning related to land uses adjacent to rail lines/yards, etc.)
	#2—Increase the number of freight and passenger intermodal connections/facilities to help create balanced transportation systems
Freight Objectives	#1—Provide a venue to identify and discuss issues pertaining to the locating of rail intermodal facilities
	#2—Encourage development of rail served industrial parks, including on short line railroads
Passenger Objective	#1—Increase travel choices and improve connectivity throughout the state

Goal #2—Provide for the safety of people, infrastructure, and goods

General Objectives	#1—Maximize the safety of existing and future railroad/highway at-grade crossings and consider grade separation as appropriate
	#2—Minimize safety risks for future expanded rail capacity
	#3—Provide adequate emergency response access along and across rail lines
	#4—Reduce rail-related incidents due to trespassing
	#5—When designing joint freight/passenger facilities, maximize safety at passenger stations without impacting freight operations
	#6—When planning for rail in public rights-of-way, consider appropriate elements of the complete streets concept

Goal #3—Expand rail infrastructure and freight and passenger rail services to meet future demand through strategic investments which include public-private partnerships with privately owned service providers

General Objectives	#1—Streamline public processes to expedite rail expansion projects
	#2—Position Colorado for future funding opportunities
	#3—Seek out innovative financing and partnerships (both public and private)
	#4—Recognize both rural and urban criteria in establishing prioritization
	#5—Expand sidings on joint passenger/freight lines, as appropriate
Freight Objectives	#1—Develop state program for improving infrastructure of short line, and possibly, Class I, railroads
	#2—Encourage short line railroads, Class I railroads, and shippers to work cooperatively to expand freight rail service and usage
Passenger Objectives	#1—Support implementation of the National High Speed and Intercity Passenger Rail Program
	#2—Focus on completing gaps in the existing system

Goal #4—Promote through education the energy efficiency, environmental, and economic benefits of freight and passenger rail transportation throughout the state

General Objectives

#1—Division of Transit and Rail to develop and assess a marketing plan targeted for specific audiences (e.g., elected officials, general public, etc.)

#2—Division of Transit and Rail to assemble and/or develop documentation related to energy efficiency, environmental, and economic benefits of rail transportation and provide presentations to appropriate audiences in communities/regions

#3—Develop the educational program around the improvement identification, evaluation, and prioritization process

#4—Use Context Sensitive Solutions processes in developing plans when local communities may be impacted

#5—Develop Frequently Asked Questions and responses

Goal #5—Use the efficiencies of freight and passenger rail to support communities and enhance economic growth throughout the state

General Objectives

#1—Provide modal options that allow more efficient use of the existing infrastructure

#2—Consider the implementation of quiet zones and associated safety improvements, where appropriate

Freight Objectives

#1—Promote economic development in rural areas utilizing rail access, including on short line railroads

#2—Coordinate with economic development agencies to enhance rail freight opportunities

Passenger Objectives

#1—Evaluate the potential for urban area redevelopment near stations and provide “city center” service to revitalize communities

#2—Improve connections between rural areas and population centers

#3—Identify ways to better connect work centers with residential areas

#4—Support the expansion of rail based tourism within the state

The above-described Vision, Goals, and Objectives were used to develop the Plan's project evaluation criteria and to create the Investment Program described in Chapter 6.

The Vision, Goals, and Objectives relate overall to the State of Colorado and its rail-related stakeholders. They were not developed specifically for the Colorado Department of Transportation (CDOT), the railroads, rail-served businesses, rail passengers, or cities and towns. The Vision, Goals, and Objectives are intended to guide the future activities of the state in partnering with the railroads and all rail stakeholders in order to implement rail-related improvements required to enhance the state's multimodal freight and passenger transportation system.

Rail Policies

The Colorado Transportation Commission has developed only one railroad-related Policy Directive since the creation of the Colorado Department of Transportation in 1991. The Transportation Commission passed Policy Directive #1607.0 in July 2000. The purpose of the *Rail Corridor Preservation Policy* was to provide a framework for determining the conditions CDOT would consider for defining and preserving railroad corridors (Policy Directive #1607.0 is described in more detail in Appendix B).

It is expected that with the recent creation of the Division of Transit and Rail within CDOT, additional railroad-related policy will be forthcoming, based on findings and recommendations contained in this Plan or future updates to this Plan.

Chapter 2 History

Railroads played a significant role in the development of the state of Colorado. Following the discovery of gold in the state in the late 1850s, the railroad network began to develop in earnest. The demand for additional transportation in the state was met by both both passenger and freight rail for approximately 100 years. A majority of today's highways and roadways in the state are adjacent to existing or now abandoned railroad corridors.

The advent of the Interstate Highway System in the mid-1950s changed the way Americans traveled. The automobile began to replace passenger rail as the preferred mode of long-distance travel for a majority of Americans. Commercial air travel also led to the demise of long-distance passenger rail service. As passenger rail began to decline in popularity, the private railroad companies began to focus predominantly on the movement of freight.

The creation of the National Railroad Passenger Corporation (Amtrak) in 1971 signaled the end of most passenger service in Colorado. While the Denver and Rio Grande Western Railroad continued its passenger service between Denver and Salt Lake City, other passenger services were eliminated other than the two routes that Amtrak currently operates: the California Zephyr from Chicago to San Francisco and the Southwest Chief from Chicago to Los Angeles.

The railroads continued to take a larger share of the movement of freight into, out of, and through Colorado. This took the burden of much of the movement of bulk freight commodities off of Colorado's highway network. The demand for Colorado and Wyoming coal to fuel electrical-generating facilities in Colorado and other states also led to an increase in railroad traffic in the late 1970s and early 1980s.

There were seven Class l railroads in Colorado when the state developed its first state rail plan in 1979. Through mergers, consolidations, and bankruptcies, there are two Class l railroads in Colorado today: Union Pacific Railroad (UP) and BNSF Railway (BNSF). The importance of railroads in the state in recent years has been primarily for the movement of bulk and other freight products demanded by Colorado's growth. As the state continues to grow, railroads must continue to play a significant role in the transportation of the goods and commodities required by Colorado's citizens and businesses, as well as providing for shipment of coal and agricultural commodities for export to serve the global economy.

The last several years have seen a re-birth in passenger rail services around the country. There is interest by several Colorado communities to re-establish passenger rail service as an option for providing mobility to Colorado's citizens and tourists alike.

A brief history of railroading in Colorado is contained in Appendix D. This history is the basis and background for many of the developments that occurred later in the 20th century and which made the railroad of great importance to Colorado, particularly in the handling of coal, iron, and steel; agricultural and food products; and intermodal traffic. Key events in later years include the following:

1956 Federal-Aid Highway Act of 1956 signed into law on June 29 for the construction of 41,000 miles of Interstate highways over a 20-year period. This national highway network had immense economic consequences for the nation's railroads.

1968 In January, the nation's two largest railroads blanketing the Northeast and Midwest, the Pennsylvania and New York Central, merged to become Penn Central (PC) Transportation Company.

1970 The Chicago, Burlington and Quincy Railroad (serving Colorado), Northern Pacific, Great Northern, and Spokane Portland & Seattle Railroads merged, to form the Burlington Northern (BN) Railroad in March. In June, Penn Central tumbled into bankruptcy—the largest business failure in the United States at that time. By 1976, PC was one of seven major Northeast and Midwest railroads in bankruptcy.

1971 On May 1, Amtrak (the National Railroad Passenger Corporation) was created to eliminate the passenger burden from the private railroads so that the nation would not become void of passenger service resulting from the private railroads discontinuing nearly all intercity trains. A few railroads kept running their passenger trains rather than join Amtrak, including the Denver & Rio Grande Western Railroad (DRGW), which continued its Denver-Salt Lake City service into the 1980s.

1974-78 Development of the Powder River Basin (PRB) in northeastern Wyoming into the largest coal mining region in the U.S. resulted in heavy coal movement through Colorado to Texas by BN. Chicago & Northwestern Railway (C&NW) began providing rail service to the PRB in 1984. (C&NW merged into the UP in 1995.)

1975 Bankruptcies of the major railroads reached Colorado when the Chicago, Rock Island & Pacific (CRIP or Rock Island) Railroad went into bankruptcy in February. Rock Island served Colorado on a route across the eastern plains to Limon, then split to serve Denver (over UP) and Colorado Springs.

1980 Rock Island shut down at the end of March and was later liquidated. Freight service on the previous Rock Island route connecting Chicago to Colorado Springs was re-instated from Limon to the Kansas state line when Kyle Railroad began operations over this segment. The Limon to Colorado Springs line was abandoned.

The Staggers Rail Act of 1980 deregulated the American railroad industry (to a significant extent) and replaced the regulatory structure that existed since the 1887 Interstate Commerce Act. The Staggers Act was one of three major acts passed in a two-year period as the cumulative result of efforts to reform transportation regulation, which had begun in 1971. The other two acts were the Airline Deregulation Act (1978) and the Motor Carrier Regulatory Reform and Modernization Act (1980). The Staggers Act was meant to restore the economic health of the nation's freight rail network following the wave of industry bankruptcies in the 1960s and 1970s, which also affected Colorado.

1982 Missouri Pacific Railroad and Western Pacific Railroad merge into the UP. The legal merger of Missouri Pacific into UP was delayed until 1997 due to outstanding Missouri Pacific bonds.

1980s Coal development in Western Colorado resulted in UP coal traffic on the Moffat Line to Denver and east. Both BN and UP increased the development of intermodal yards.

1988 The DRGW's parent corporation purchased the Southern Pacific Transportation Company and, as a result of a merger, the larger Southern Pacific Railroad (SP) name was chosen for identity.

1995 BN and Atchison, Topeka and Santa Fe Railroad (ATSF) merged to become the Burlington Northern Santa Fe (BNSF) Railway Co., now the BNSF Railway.

1996 UP and SP/DRGW merged, which shifted much of SP's overland traffic to the UP's main line across Wyoming, redirected flows on the Moffat Tunnel route, and caused the UP to place the Tennessee Pass Route in Colorado into an "out of service" category. This was the stimulus for Colorado acquiring the "Towner Line" from the UP in 1998 to continue freight service to the eastern plains communities of Colorado. This was the former Missouri Pacific line in southeastern Colorado between North Avondale (just east of Pueblo) and Towner, Colorado (just west of the Kansas state line), which had been used by SP as a main line between Pueblo and Kansas City.

2004 Passage by the voters of the Denver metropolitan area of the Regional Transportation District's FasTracks Program. This multi-billion dollar transit expansion plan is proposed to integrate light rail, commuter rail and bus rapid transit technologies into a comprehensive region-wide system.

Chapter 3 Colorado Rail System

The Colorado transportation system infrastructure includes a broad array of multimodal elements that are privately and publicly owned and operated. The transportation system consists of highways, local roadways, freight and passenger railroads, private and public transit systems, airports, and pedestrian and bicycle facilities. This system is interconnected with regional, national, and North American transportation systems and economies.

The Colorado rail system currently includes both a freight rail network and a limited passenger rail network. The role of the railroads and rail transportation in the state is to provide efficient transportation choices for the movement of goods and people while connecting effectively to the other transportation modes. The rail system in the state is an inter-connected component of much larger regional, national, and global multi-modal transportation systems and economies.

As discussed earlier, the freight rail system has been in place for many years and has been a key contributor to the growth and development of the state throughout its history. It is expected that, as the state continues to grow in population and economic base, rail service also will expand to meet the needs of commerce.

Alternatively, passenger rail service is currently very limited, with Amtrak providing the only long-distance passenger service in Colorado. However, there is a growing sentiment to support the development of an improved passenger rail system in Colorado. This chapter serves as an inventory of the rail system as it exists today.

Freight Rail System

Overview

Freight railroads represent a significant industry that is critical to the economic health and competitiveness of the state. Currently 14 privately owned freight railroads operate in Colorado; these railroads own more than 2,800 miles of track in the state and currently operate on 2,684 miles of those tracks. This represents about 1.9 percent of the nation's 140,000 miles of network trackage. The extent of this network is also reflected in the fact that 48 of Colorado's 64 counties are directly served by the freight rail network.

The 14 freight railroads fall into one of four categories:

- **Class I railroads**—Line haul freight railroads with 2009 operating revenue of $378.8 million or more.

- **Class II (Regional railroads)**—Operate at least 350 miles of track and/or have revenue of between $40 million and the Class I threshold. Regional railroads that qualify using the 350 miles operated criterion must have minimum revenue of $20 million.
- **Class III (Short Line or Local railroads)**—Line haul railroads that do not qualify as a Class I or Class II railroad. Seventy-five percent of these railroads operate fewer than 100 miles of railroad track.
- **Class IV (Switching and Terminal railroads)**—Primarily provide switching and/or terminal services. Rather than point-to-point transportation, they usually perform pick-up and delivery services within a special area or funnel traffic between other railroads.

Table 3-1 lists the 14 freight railroads in Colorado, miles of track owned, miles of trackage rights, and their appropriate category.

Table 3-1. Colorado Rail Operators with Miles Owned and Trackage Rights

Railroad Operators	Miles of Track Owned (in Colorado)	Miles of Trackage Rights (in Colorado)	Railroad Category
BNSF	773	533	Class 1
Cimarron Valley Railroad	23.5	0	Short Line
Colorado & Wyoming Railway	0	4.5	Switching and terminal
Denver Rock Island Railroad	6.2	3.2	Switching and terminal
Great Western Railway	80	5	Short Line
Kansas & Oklahoma Railroad	0	3	Short Line
Kyle Railroad	89	0	Short Line
Nebraska, Kansas & Colorado Railway	67.6	0	Short Line
Rock & Rail	14.7	40	Short Line
San Luis & Rio Grande Railroad	150	5	Short Line
San Luis Central Railroad	12.2	1	Short Line
Union Pacific	1,463	680	Class 1
Utah Railway	0	32	Short Line
Victoria & Southern Railway	122	0	Short Line

Source: Rail operators and American Association of Railroads (AAR)

Figure 3-1 displays a map of the Colorado freight railroad network. It should be noted that for this graphic and throughout this Plan, all non-Class I railroads are referred to as short line railroads. As illustrated, the rail network is most extensive along the Front Range and on the Eastern Plains. For obvious topographical reasons, rail access across the Continental Divide is very limited, and the rail system on the Western Slope is relatively sparse.

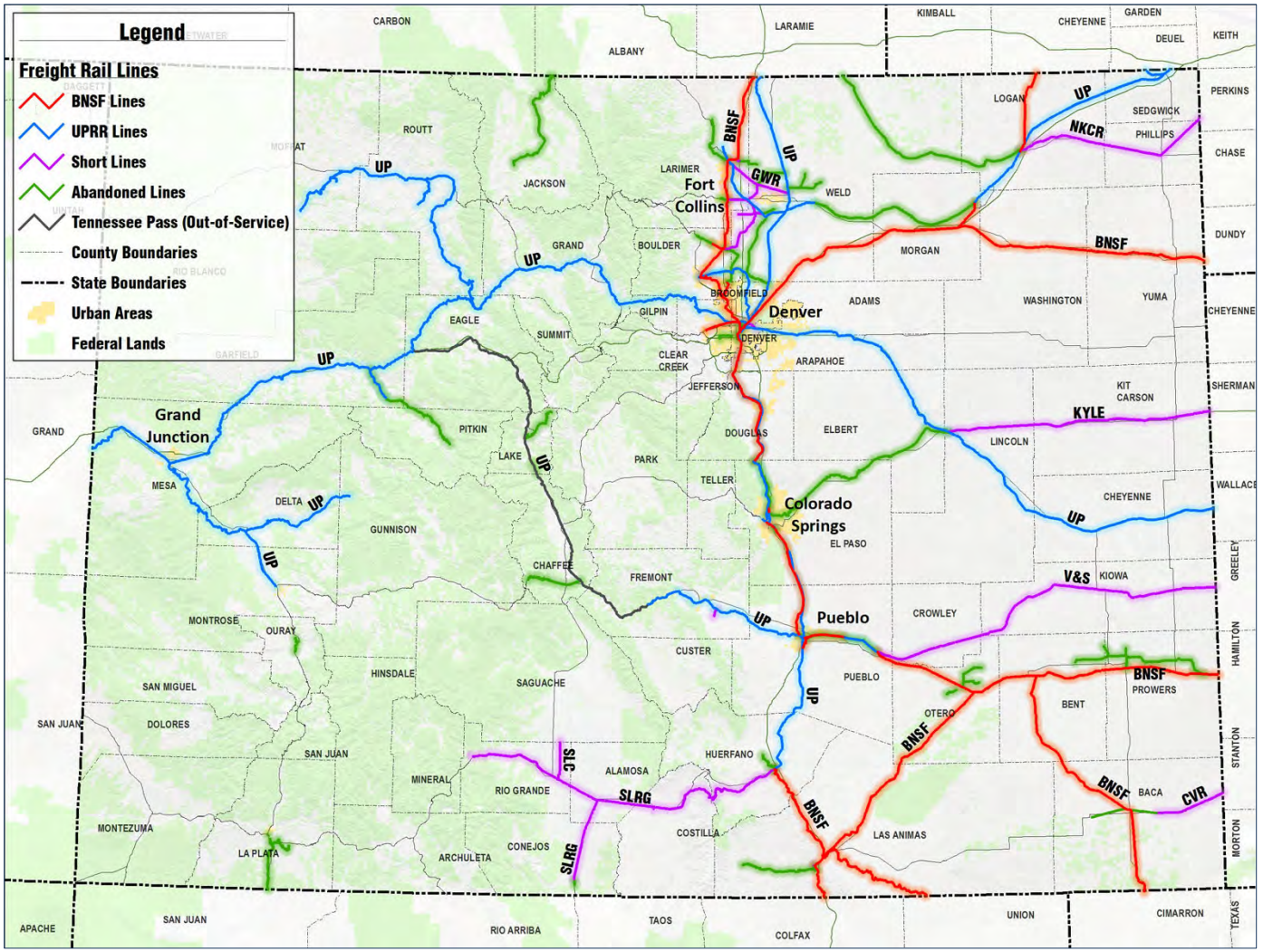
According to the *2007 Commodity Flow Survey* prepared by the U.S. Department of Transportation, freight rail moves approximately 33 percent of the total tonnage hauled in Colorado, compared to 67 percent of total tonnage being moved by truck. In 2009, railroads operating in Colorado carried nearly 164 million tons of commodities, the majority of which was coal. While this tonnage has fluctuated with the state of the economy, it is anticipated that rail volumes will increase in the future as the economy grows. The U.S. Department of Transportation estimates that the demand for freight rail transportation (tonnage) in the U.S. will increase by 88 percent by 2035. As a growing state, Colorado can expect at least this level of increase in total tonnage.

Figure 3-2 depicts Colorado's 2009 levels of freight rail tonnage, measured in million gross tons (MGT), on each of the lines on its freight rail network.

Class I Railroads

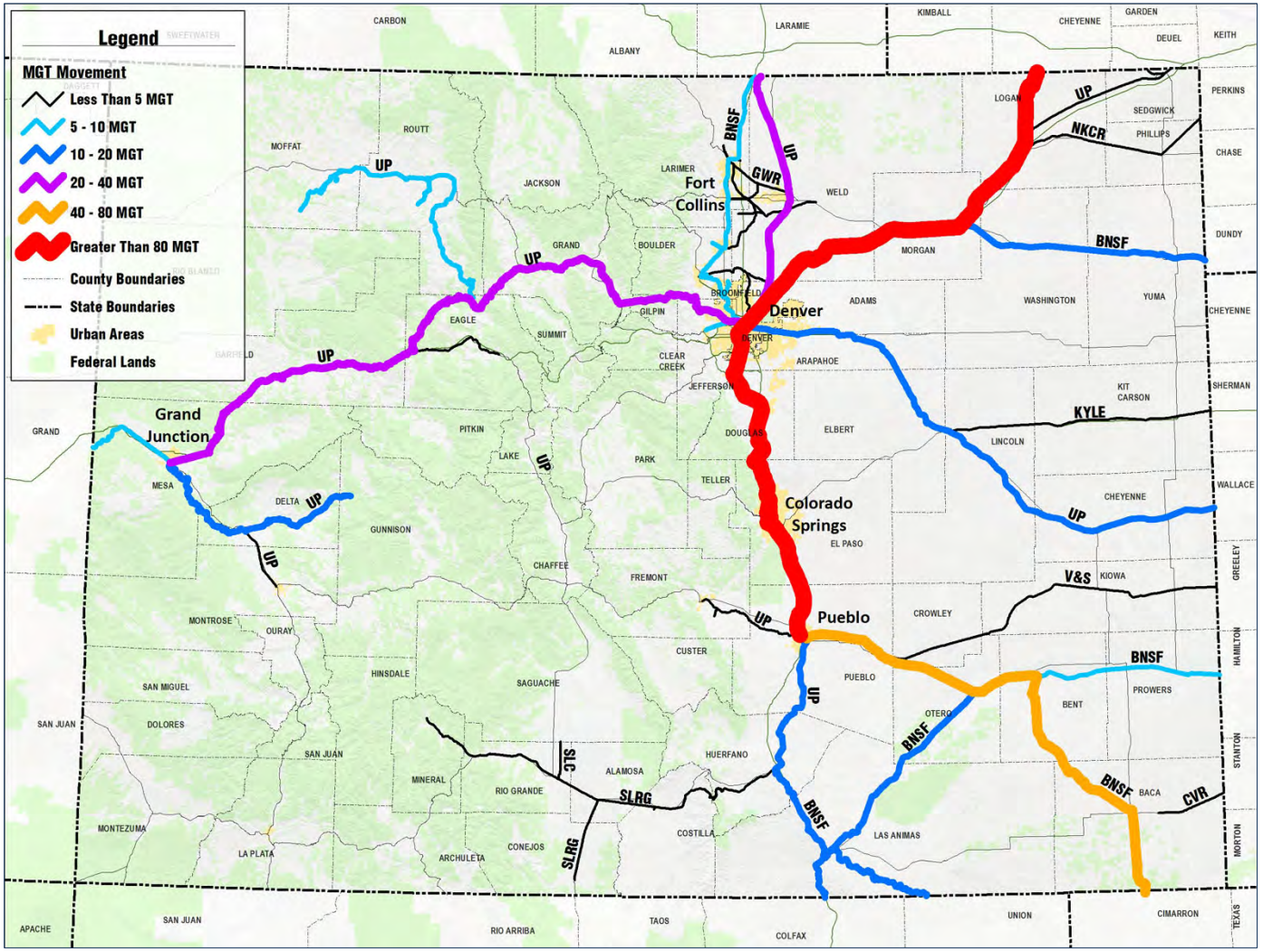
The two Class I railroads in Colorado, the BNSF and the UP, operate over 80 percent of the miles of track and carry the majority of freight in the state. They both provide service that runs north-south and east-west in Colorado, although only the UP owns trackage across the Continental Divide. In a number of cases, these railroads provide trackage rights to each other to support their services by jointly operating trains over a single line owned and maintained by one of them. As illustrated on Figure 3-2, the line that carries the greatest amount of freight is the consolidated mainline, which runs along the Front Range between Denver and Pueblo. Portions of this line are owned by BNSF and UP, but they both operate on it for the length of the line.

Detailed statistical bios for the BNSF and UP follow. These bios provide a summary description of the railroad, a map of their lines and other key facilities and track, and economic and commodity data.



Source: Railroad operators, CDOT, and the U.S. Bureau of Transportation Statistics

Figure 3-1. Colorado's Freight Railroad Network



Source: Railroad operators and the 2009 Surface Transportation Board Waybill Sample

Figure 3-2. Million Gross Ton Movement (2009)

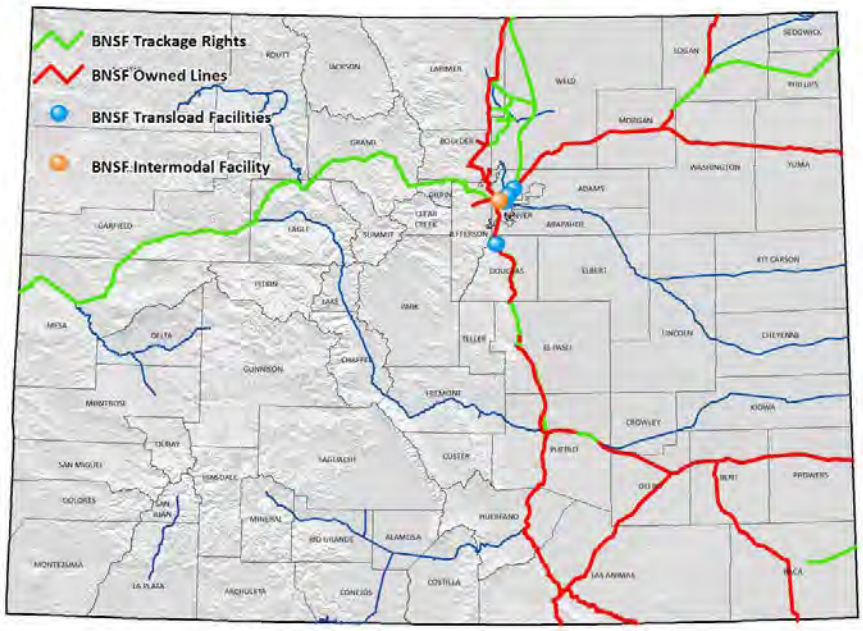
Railroad Bio

BNSF Railway

The BNSF Railway (BNSF) is the product of nearly 400 different railroad lines that merged or were acquired over the course of 160 years. BNSF is a subsidiary of Berkshire Hathaway Inc. and is headquartered in Fort Worth, Texas. BNSF was formed December 31, 1996, as the Burlington Northern and Santa Fe Railway, when the Atchison, Topeka and Santa Fe Railway was merged into the Burlington Northern Railroad. BNSF directly owns and operates track in 28 U.S. states. BNSF also operates a small amount of track in Canada. BNSF directly owns and operates over 32,000 route miles of track. When second, third and fourth main-line trackage, yard trackage, and siding trackage are included the length of track which the railway directly controls rises to more than 50,000 miles.

For administrative purposes, BNSF is divided into fourteen operating divisions: California, Chicago, Colorado, Gulf, Kansas, Los Angeles, Montana, Nebraska, Northwest, Powder River, Southwest, Springfield, Texas, and Twin Cities. BNSF operates numerous transfer facilities throughout the western United States, facilitating the transfer of intermodal containers, trailers, and other freight traffic. BNSF has direct control over a total of 33 intermodal hubs and 23 automotive distribution facilities in the U.S. Amtrak provides passenger service over BNSF east of Denver, connecting Denver with Chicago, and over BNSF across southeastern Colorado, connecting Lamar, La Junta, and Trinidad with Chicago, Kansas City, and Los Angeles.

BNSF moves more than 635,000 carloads of freight in Colorado annually. Since 2008, BNSF has been instrumental in locating 21 new or expanded facilities in Colorado, creating more than 550 jobs and more than $220 million in investments. Projects include Vestas American Wind Technology in Pueblo, the G&G Trucking sand transload facility in Keenesburg, and Arkansas River Power in Lamar. BNSF has 4 transload facilities in Colorado, located in Denver, Littleton, Commerce City and Henderson.



Railroad Bio

BNSF Railway

Track Data (Colorado)

Miles of Owned Track Operated - **773**
Miles of Trackage Rights - **533**
Miles of Abandoned Track (Since 2007) - **1.6 Miles**
Miles of Out-of-Service Track - **0**
Class of Track
Class 1 = 8 Miles
Class 2 = 37 Miles
Class 3 = 157 Miles
Class 4 = 687 Miles
Rail Yards
Denver, La Junta, Pueblo, Sterling, Trinidad
Intermodel Hub Centers
Denver
Shops
Denver, Golden

Economic Data

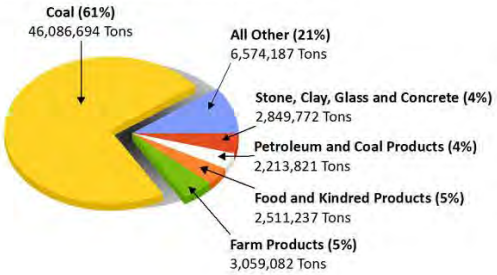
2010 Employees (In Colorado) - **1,112**
2010 Annual Payroll - **$83,130,150**
2010 In-State Purchases - **Data Not Available**
2010 Capital Improvement Spending - **Data Not Available**

Rail Cars Originated in CO	Rail Cars Terminated in CO
2007 - **Data Not Available**	2007 - **Data Not Available**
2008 - **Data Not Available**	2008 - **Data Not Available**
2009 - **Data Not Available**	2009 - **Data Not Available**
2010 - **81,009**	2010 - **172,459**

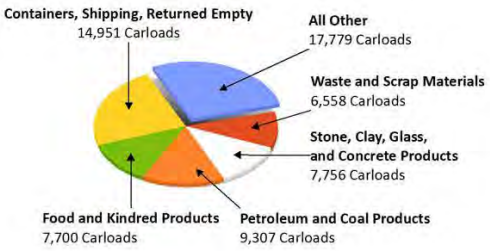
Colorado Top Commodities
(By Total Tonnage, Including Overhead)

Coal - **46,086,694 Tons**
Farm Products - **3,059,082 Tons**
Food and Kindred Products - **2,511,237 Tons**
Petroleum and Coal Products - **2,213,821 Tons**
Stone, Clay, Glass and Concrete Products - **2,849,772 Tons**

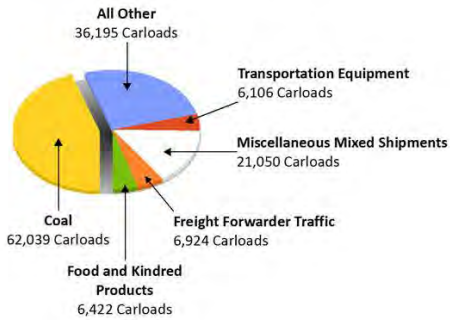
Top 5 Commodities by Total Tons (Including Overhead)



Top 5 Commodities by Colorado Originating Carloads



Top 5 Commodities by Colorado Terminating Carloads



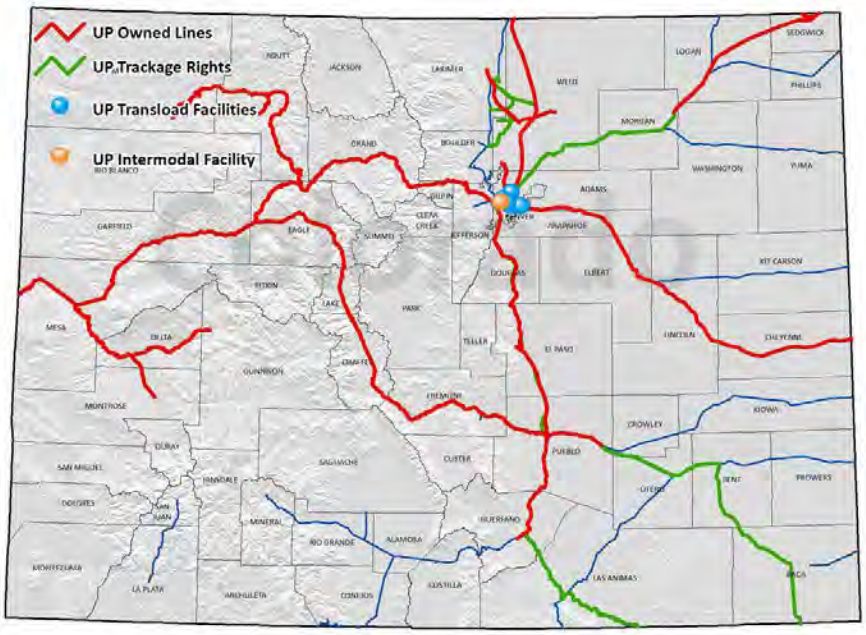
Railroad Bio

Union Pacific Railroad

The Union Pacific Railroad (UP) was incorporated under the Pacific Railroad Act of 1862, an act of Congress devised as a measure for the preservation of the Union during the U.S. Civil War. Union Pacific's presence in Colorado dates back to 1867, when track was laid across the northeastern tip of the state as the transcontinental railroad progressed across the country. Today, UP's network covers 23 states in the western two-thirds of the country and serves many of the fastest growing U.S. population centers. Amtrak provides passenger service over the Union Pacific line west of Denver, connecting Denver with California.

Union Pacific achieved it's size as a result of purchasing a number of other railroads, notably the Missouri Pacific, Chicago and North Western, Western Pacific, Missouri-Kansas-Texas, and the Southern Pacific (including the Rio Grande). Currently, Union Pacific owns 26% of Ferromex, a Mexican railroad, while Grupo Mexico owns the remaining 74%. UP currently owns over 32,000 route miles of track and has over 50,000 miles of track when passing track, switching lines, yards lines, and other main lines are included. In Colorado, UP operates at 1 intermodal and 7 transload facilities located in the Denver Metropolitan area.

UP serves a major automobile distribution center just north of Denver, where new automobiles are delivered for sale throughout the mountain and high plains states. In the last two years, Union Pacific's capital investment in Colorado was more than $120 million. Union Pacific connects with Canada's rail systems and is the only railroad serving all six major gateways to Mexico. Union Pacific's overall 2010 operating revenue nearly reached $17 billion, a 20 percent increase from the prior year.



Railroad Bio

Union Pacific Railroad

Track Data

Miles of Owned Track Operated - **1,463**
Miles of Trackage Rights - **680**
Miles of Abandoned Track (Since 2007) - **2.2 Miles**
Miles of Out-of-Service Track - **126.6 Miles**
Class of Track
Class 1 =
Class 2 = **Less Than 25 Miles Combined**
Class 3 = 44 Miles
Class 4 = 1,394 Miles
Rail Yards
Denver, Grand Junction, Pueblo, Trinidad
Intermodel Hub Centers
Denver
Shops
Denver, Pueblo, Grand Junction

Economic Data

2010 Employees (In Colorado) - **1,294**
2010 Annual Payroll - **$106,000,000**
2010 In-State Purchases - **$173,000,000**
2010 Capital Improvement Spending - **$36,800,000**

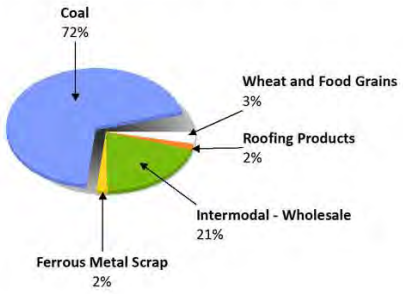
Rail Cars Originated in CO	Rail Cars Terminated in CO
2007 - **346,894**	2007 - **161,326**
2008 - **311,187**	2008 - **141,017**
2009 - **244,766**	2009 - **108,949**
2010 - **240,576**	2010 - **121,511**

Colorado Top Commodities

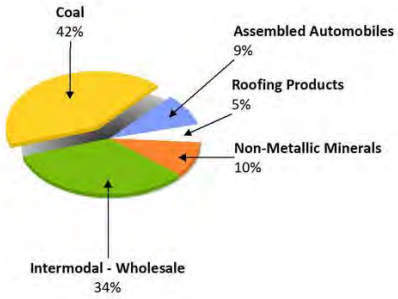
Top 5 Commodities by Colorado Originationg Volume (By Percent Total, Including Overhead)

Coal - **72%**
Intermodal - Wholesale - **21%**
Wheat and Food Grains - **3%**
Ferrous Metal Scrap - **2%**
Roofing Materials - **2%**

Top 5 Commodities by Colorado Originating Volume



Top 5 Commodities by Colorado Terminating Volume



Short Line Railroads

As noted in Table 3-1, there are 12 short line railroads operating in Colorado. Their locations are illustrated on Figure 3-3. These railroads, comprising about 20 percent of the track miles in the state, primarily provide localized service with connections to the Class I railroads. In most cases, they principally serve the agricultural industry. Hence, these short line railroads are very valuable assets to both local and statewide economies. In several cases, they provide switching services between other railroads, which is critical to the connectivity of the state rail network. Brief statistical bios for each of the 12 short line railroads in Colorado follow.

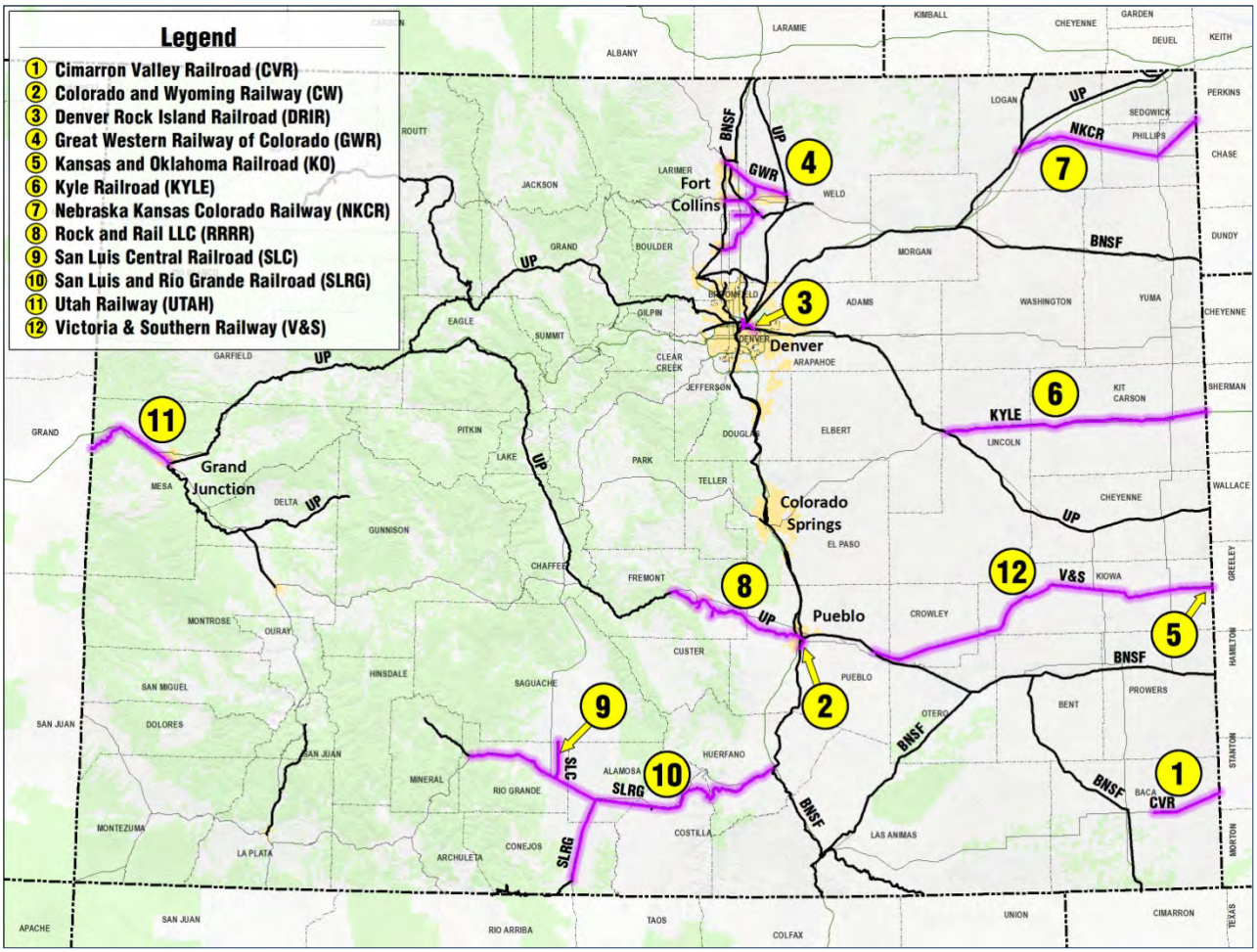
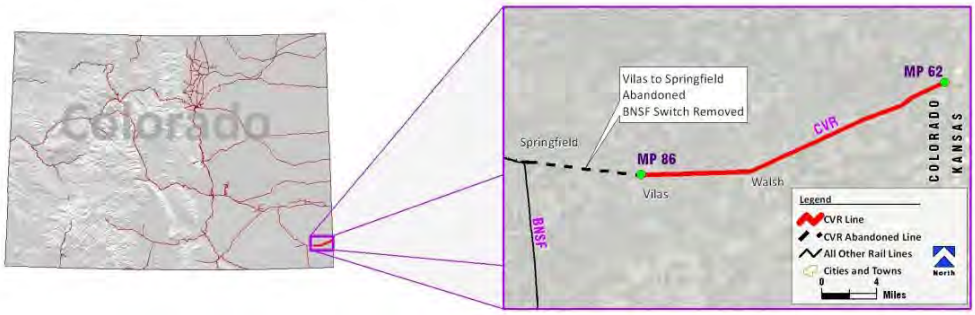


Figure 3-3. Short-Line Railroads

Railroad Bio

Cimarron Valley Railroad

The Cimarron Valley Railroad (CVR) was originally constructed in 1912 and was purchased from Burlington Northern Santa Fe Railroad in February 1996. It runs a total of 254 miles of track and hauls mostly agricultural commodities (such as wheat, corn, and milo), along with sand, cement, poles, pipe, and fertilizers. The line in Colorado runs from Satanta, KS to Vilas, CO in Baca County. The line previously extended to Springfield, CO, though this section of the line was abandoned and BNSF has removed the switch to connect to the BNSF Boise City Subdivision. In Colorado, the CVR owns approximately 23 miles of track and hauls mostly agricultural products. Between 2006 and 2009, the CVR was at risk of abandonment, but was saved through the establishment of a public/private partnership between the Kansas Department of Transportation (KDOT), local counties, and economic development interests. In late 2009, KDOT and partners began planning a renovation and upgrade of the line. The CVR line to Colorado was damaged in 2011 by brush fires in Haskell County, KS. Ten box culverts, five small bridges and the CVR Railroad bridge were damaged or destroyed in the fire. CVR began repairing the damage and is scheduled to complete the repairs by January 2012.



Track Data (Colorado)

Miles of Owned Track Operated - **23.5**
Miles of Trackage Rights - **0.0**
Miles of Abandoned Track (Since 2007) - **0.0**
Miles of Out-of-Service Track - **0.0**

Economic Data

2010 Employees (In Colorado) - **Data Not Available**
2010 Annual Payroll - **Data Not Available**
2010 In-State Purchases - **Data Not Available**
2010 Capital Improvement Spending - **Data Not Available**

Rail Cars Originated/Terminated in CO
2007 - **Data Not Availble**
2008- **Data Not Availble**
2009 - **Data Not Availble**
2010 - **Data Not Availble**

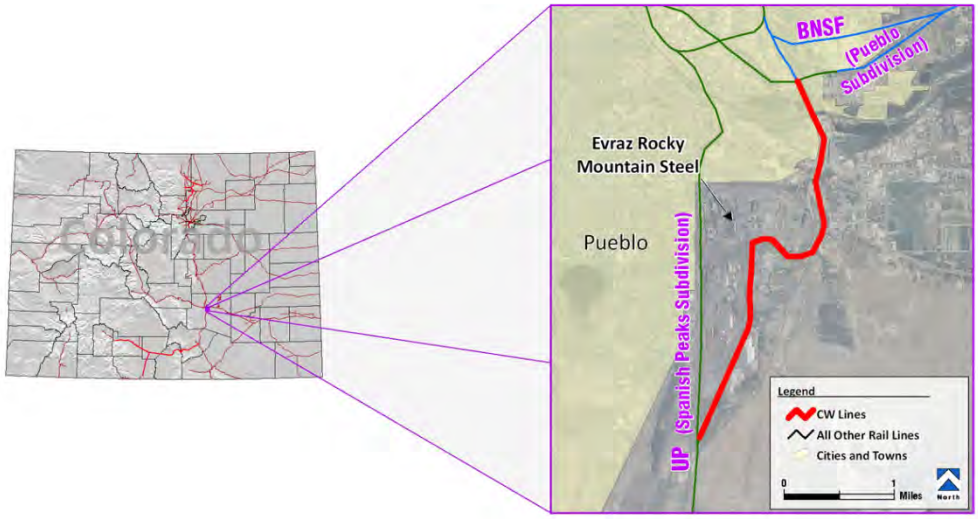
Colorado Top Commodities (By Volume)

Wheat
Corn
Milo

Railroad Bio

Colorado and Wyoming Railway

The Colorado and Wyoming Railway Company (CW) operates a 4.5 mile long switching line at Minnequa, CO connecting with UP Railroad and BNSF Railway. Traffic includes coal, ore and steel products. CW is a wholly owned subsidiary of the Rocky Mountain Steel Mills Division, which is a unit of Evraz Oregon Steel Mills. The company was incorporated May 9, 1899 and was comprised of three non-contiguous divisions located in Pueblo and Weston, Colorado and near Guernsey, Wyoming. The Middle Division at Pueblo is the only active line served by UP and BNSF.



Track Data

Miles of Owned Track Operated - **0**
Miles of Trackage Rights - **4.5 (from BNSF)**
Miles of Abandoned Track (Since 2007) - **0**
Miles of Out-of-Service Track - **0**

Rail Cars Originated/Terminated in CO
2007 - **Data Not Available**
2008 - **Data Not Available**
2009 - **Data Not Available**
2010 - **Data Not Available**

Economic Data

2010 Employees (In Colorado) - **Data Not Available**
2010 Annual Payroll - **Data Not Available**
2010 In-State Purchases - **Data Not Available**
2010 Capital Improvement Spending - **Data Not Available**

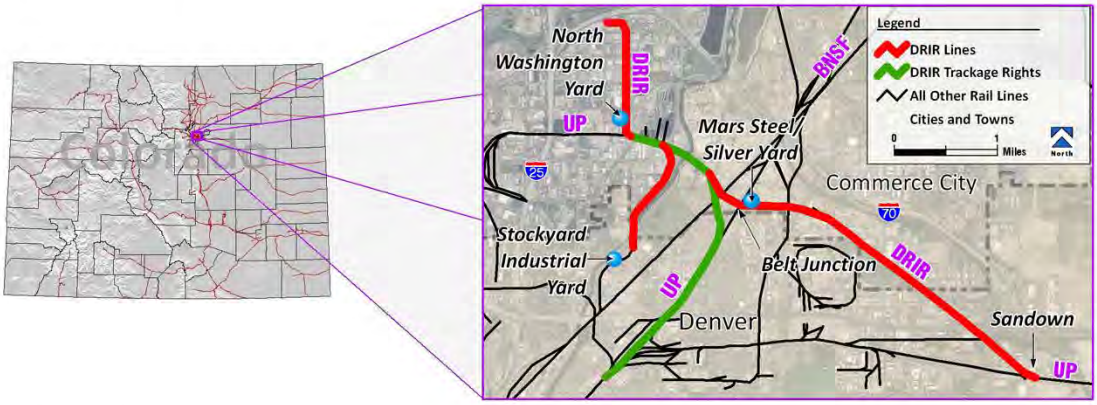
Colorado Top Commodities (By Volume)

Steel
Coal
Mineral Ore

Railroad Bio

Denver Rock Island Railroad

The Denver Rock Island Railroad (DRIR) is a short line railroad switching carrier that was started in 1993 and is privately owned and operated. DRIR has a number of trans loading sites, also privately owned and operated, in Commerce City. The Union Pacific and BNSF railroads deliver cars to interchanges where the Denver Rock Island takes possession of the rail cars and delivers them to customers. Mars Steel Corporation is one of the operators that trans loads on a 30 acre site along the DRIR. DRIR owns and operates 6.2 miles of switching track in Denver. This includes four miles of former Chicago, Rock Island and Pacific Railroad, of which UP owns 3.2 miles and DRIR has operating rights to serve the shippers. DRIR owns and operates two former UP industrial switch areas known as the Stockyard Lead and North Washington Industrial Yard that were transferred to DRIR ownership in an exchange agreement with UP for the Sandown to Belt Junction line in 2005. DRIR has a third yard, Silver Yard, located west of Brighton Boulevard in Commerce City. DRIR has connections with both UP and BNSF.



Track Data

Miles of Owned Track Operated - **6.2**
Miles of Trackage Rights - **3.2 (from UP)**
Miles of Abandoned Track (Since 2007) - **0.0**
Miles of Out-of-Service Track - **0.0**

Economic Data

2010 Employees (In Colorado) - **Data Not Available**
2010 Annual Payroll - **Data Not Available**
2010 In-State Purchases - **Data Not Available**
2010 Capital Improvement Spending - **Data Not Available**

Rail Cars Originated/Terminated in CO
2007 - **Data Not Availble**
2008- **Data Not Availble**
2009 - **Data Not Availble**
2010 - **Data Not Availble**

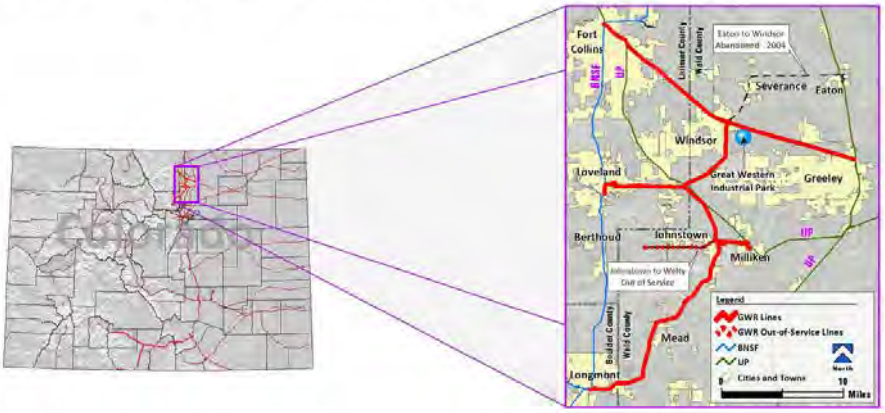
Colorado Top Commodities (By Volume)

Steel

Railroad Bio

Great Western Railway

The Great Western Railway of Colorado (GWR) operates 80 miles of track in Colorado and interchanges with the Union Pacific Railroad as well as the BNSF Railway. It is a subsidiary of Denver-based OmniTRAX and was founded in 1901 to serve the Great Western Sugar Company and other sugar, beet, and molasses companies in Colorado. It also operated passenger services from 1917 to 1926. Great Western served the Great Western Sugar Company out of Longmont until 1977 when trucks took over this service. It has since expanded service to include customers such as Anheuser-Busch, Eastman Kodak and Simplot. Their routes consist of a line from Loveland to Johnstown, where it splits to Milliken and Longmont. South of Windsor the line splits to go to the Great Western Industrial Park, Greeley, and Fort Collins. All of Great Western's track remains in place, except for the Windsor to Eaton line that was abandoned in 2004. The Johnstown to Welty line still has track, but is out of service. The company was acquired from Great Western Sugar by the Castle Corporation (BROE Corporation) in June 1986. It is now managed by OmniTRAX. Commodities transported include agricultural products, paper, plastics, sand, forest products, brewing grains, beer, and miscellaneous by-products.



Track Data

Miles of Owned Track Operated - **80.0**
Miles of Trackage Rights - **5.0 (from BNSF)**
Miles of Abandoned Track (Since 2007) - **0**
Miles of Out-of-Service Track - **12**

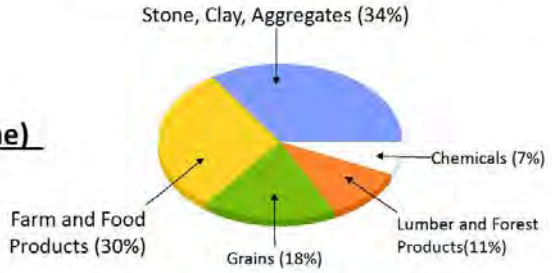
Rail Cars Originated/Terminated in CO
2007 - **16,785**
2008 - **15,404**
2009 - **13,508**
2010 - **14,245**

Colorado Top Commodities (By Volume)

Stone, Clay, and Aggregates
Farm and Food Products
Grain
Lumber and Forest Products
Chemicals

Economic Data

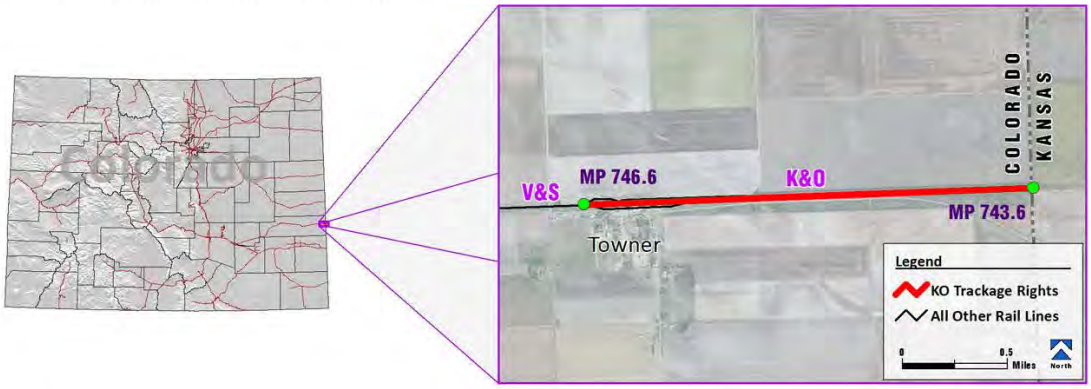
2010 Employees (In Colorado) - **25**
2010 Annual Payroll - **Data Not Available**
2010 In-State Purchases - **Data Not Available**
2010 Capital Improvement Spending - **Data Not Available**



Railroad Bio

Kansas & Oklahoma Railroad

The Kansas and Oklahoma Railroad (K&O) began operations in July 2001. In Colorado, the K&O operates on 3 miles of trackage rights from Victoria & Southern Railway. The K&O has over 920 miles of track reaching out in three directions from Wichita, KS to the Colorado border and carries more than 50,000 carloads annually. The K&O carries diverse agricultural commodities such as grain, grain products, and industrial products such as chemicals, fertilizers, and paper. In Colorado, the K&O carries exclusively wheat. The K&O trackage rights in Colorado begin at the eastern terminus of the Towner line and extend into Kansas. The K&O is a subsidiary of the Watco Companies and is one of the largest single short line railroad operators in the industry.



Track Data

Miles of Owned Track Operated - **0.0**
Miles of Trackage Rights - **3.0 (from V&S)**
Miles of Abandoned Track (Since 2007) - **0.0**
Miles of Out-of-Service Track - **0.0**
Weight of Rail
MP 743.6 - MP 746.6 = 115 lb Bolted
Non-286,000 lb Rail and Structures = 0
Track in Colorado is capable of 286,000 lb loads

Economic Data

2010 Employees (In Colorado) - **0**
2010 Annual Payroll - **$0**
2010 In-State Purchases - **$0**
2010 Capital Improvement Spending - **$0**

Rail Cars Originated in CO	Rail Cars Terminated in CO
2007 - **1,257**	2007 - **0**
2008- **571**	2008- **0**
2009 - **1,123**	2009 - **93**
2010 - **1,794**	2010 - **0**

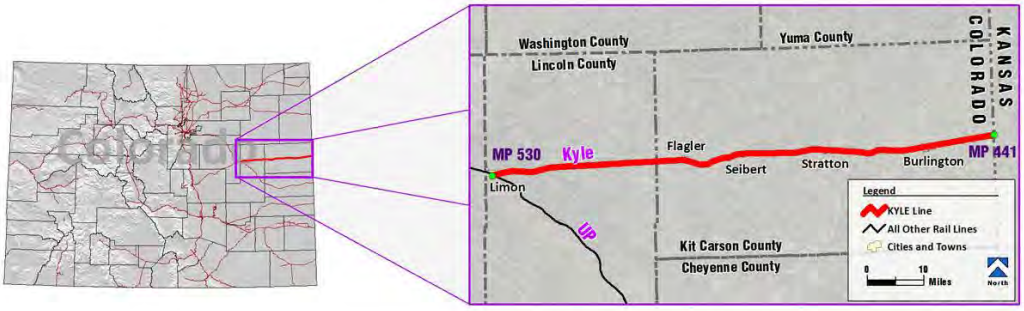
Colorado Top Commodities (By Volume)

Wheat

Railroad Bio

Kyle Railroad

The Kyle Railroad (Kyle) runs from North Central Kansas into Eastern Colorado. It is based in Phillipsburg, Kansas and runs on 625 miles of track, 89 of which are in Colorado, a portion of the former Rock Island Railroad's Chicago to Denver main line. The Kyle has been owned by Rail America since 2002. The Kyle Railroad operated the line for the Mid-States Port Authority from 1982 until the Kyle purchased the line in 2010. The Kyle carries primarily agricultural commodities from Colorado and chemicals and building materials to Colorado. The Kyle moved more than 21,000 cars in 2010 over its tracks in Kansas and Colorado. The Kyle has made significant investments in infrastructure in recent years, taking advantage of 2008-2009 federal legislation providing tax credits designed to encourage rural railroads to invest in track improvements. Between 2007 and 2010, the Kyle invested in excess of $1.5 million in infrastructure improvements in Colorado.



Track Data (Colorado)

Miles of Owned Track Operated - **89.0**
Miles of Trackage Rights - **0.0**
Miles of Abandoned Track (Since 2007) - **0.0**
Miles of Out-of-Service Track - **0.0**
Weight of Rail
MP 441 - MP 530 = 100 lb
Non-286,000 lb Rail and Structures = All

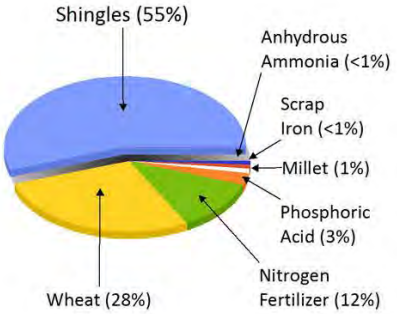
Rail Cars Originated in CO	Rail Cars Terminated in CO
2007 - **2,297**	2007 - **1,761**
2008- **2,050**	2008- **1,097**
2009 - **1,836**	2009 - **1,082**
2010 - **2,551**	2010 - **904**

Colorado Top Commodities (By Volume)

Shingles - Phillipsburg, KS to Denver, CO - **543 Tons**
Wheat - Seibert, CO to Houston, TX - **272 Tons**
Nitrogen Fertilizer - Williams, OK to Burlington, CO - **114 Tons**
Phosphoric Acid - Don, ID to Stratton, CO - **27 Tons**
Millet - Genoa, CO to Pantaco, Mexico - **10 Tons**

Economic Data

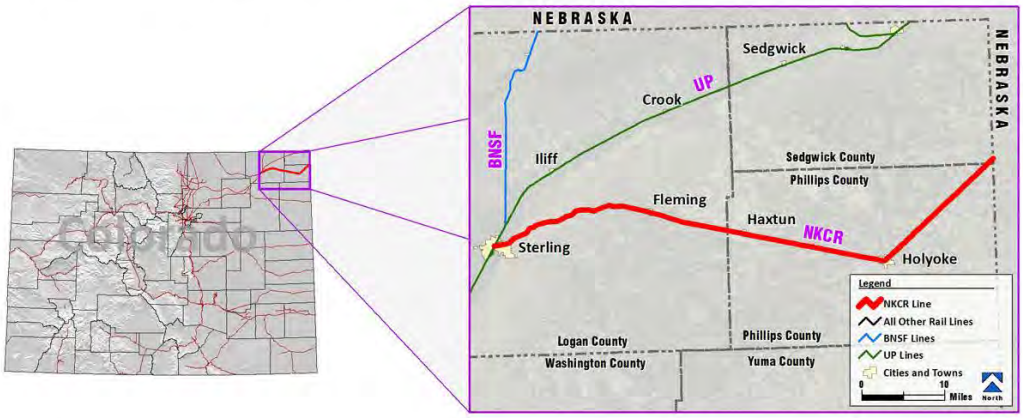
2010 Employees (In Colorado) - **0**
2010 Annual Payroll - **Data Not Available**
2010 In-State Purchases - **Data Not Available**
2010 Capital Improvement Spending - **$650,000**



Railroad Bio

Nebraska, Kansas & Colorado Railway

The Nebraska, Kansas & Colorado Railway (NKCR), formerly the Nebraska, Kansas and Colorado RailNet, is based in Grant, NE and operates about 559 miles of track in Southwestern Nebraska, Northern Kansas and Northeastern Colorado. NKCR owns and operates about 68 miles of track in Colorado. NKCR carries mainly agricultural related products, especially grains, as well as coal to the Nebraska Public Power District's Gerald Gentleman Station, which is Nebraska's largest coal fired power plant. NKCR recently made considerable track improvements in conjunction with upgrade investments by the owners of grain elevators at Venango, Loomis and Maywood, Nebraska, each of which now loads 110-car shuttle trains. NKCR is owned by Denver-based OmniTRAX, which also owns Great Western Railway in Northern Colorado.



Track Data (Colorado)

Miles of Owned Track Operated - **67.6**
Miles of Trackage Rights - **0.0**
Miles of Abandoned Track (Since 2007) - **0.0**
Miles of Out-of-Service Track - **0.0**

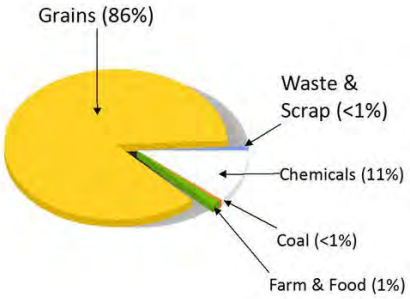
Rail Cars Originated/Terminated in CO
2007 - **36,615**
2008- **39,582**
2009 - **28,722**
2010 - **30,911**

Economic Data

2010 Employees (In Colorado) - **35**
2010 Annual Payroll - **Data Not Available**
2010 In-State Purchases - **Data Not Available**
2010 Capital Improvement Spending - **Data Not Available**

Colorado Top Commodities (By Volume)

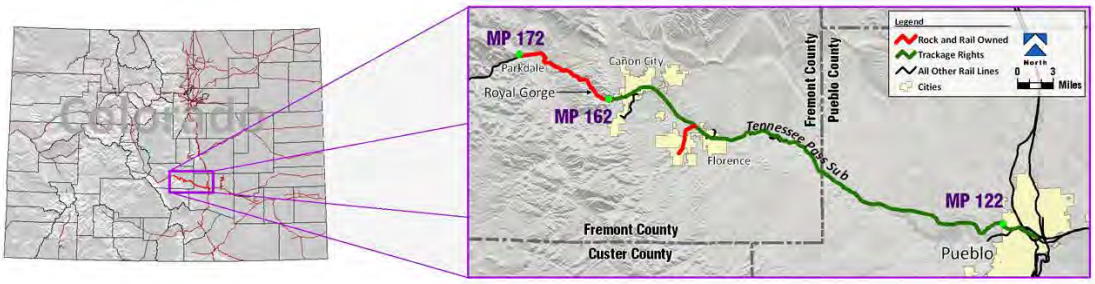
Grains
Chemicals
Farm and Food
Waste and Scrap
Coal



Railroad Bio

Rock and Rail

Rock and Rail is a federally chartered short-line railroad that operates between Pueblo and Parkdale, Colorado. It is a wholly owned subsidiary of CIG LLC, a Colorado owned and based company. Rock and Rail operates on both owned tracks and rights that have been purchased from the Union Pacific Railroad (UP). BNSF also holds trackage rights on the Rock and Rail's section of trackage rights. Rock and Rail also owns a 50% interest in the Royal Gorge Express, LLC ("RGX"), which in 1998 purchased from the UP approximately 11.75 miles of track running through the Royal Gorge from Cañon City west to Parkdale. RGX's other 50% owner, the Cañon City Royal Gorge Railroad ("CCRG"), operates a tourist passenger train running on the same track through the Royal Gorge. Rock and Rail also owns the loop track in Parkdale Quarry that connects to the main line RGX track at Parkdale.



Track Data

Miles of Owned Track Operated - **14.75 (11.75 at 50%)**
Miles of Trackage Rights - **40.0 (from UP)**
Miles of Abandoned Track (Since 2007) - **0**
Miles of Out-of-Service Track - **0**
Weight of Rail - **MP 162 to MP 172 = 136 lbs**
Non-286,000 lb Rail Structures - **0**

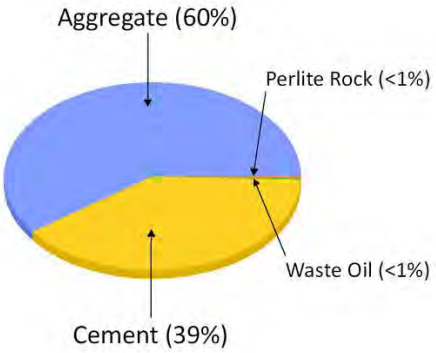
Economic Data

2010 Employees (In Colorado) - **7**
2010 Annual Payroll - **$367,500**
2010 In-State Purchases - **$683,000**
2010 Capital Improvement Spending (In Colorado) - **$0**

Rail Cars Originated in CO	Rail Cars Terminated in CO
2007 - **12,327**	2007 - **12,327**
2008 - **7,422**	2008 - **7,422**
2009 - **5,739**	2009 - **5,739**
2010 - **6,068**	2010 - **6,068**

Colorado Top Commodities (By Volume)

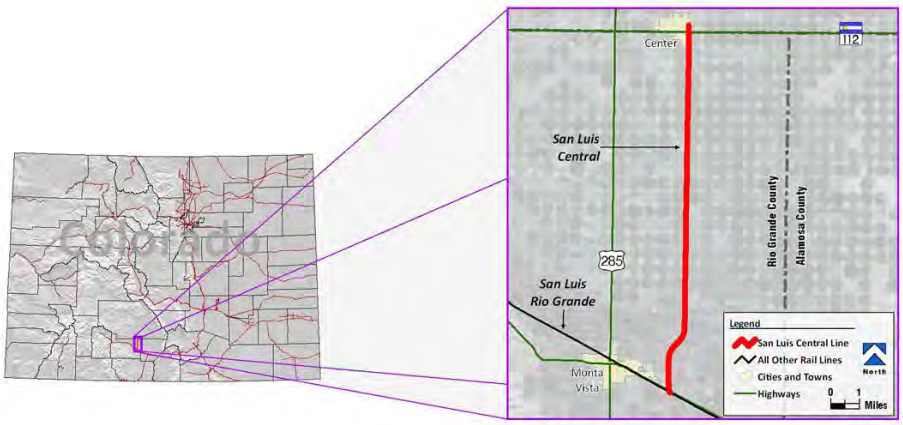
Aggregate - Parkdale, CO to CO Springs, CO - **363,400 Tons**
Cement - Portland, CO to Pueblo, CO - **238,000 Tons**
Perlite Rock - Florence, CO to Pueblo, CO - **1,800 Tons**
Waste Oil - Cañon City, CO to Pueblo, CO - **2,100 Tons**



Railroad Bio

San Luis Central Railroad

The San Luis Central Railroad (SLC) was founded in 1913 to haul sugar beets to an online mill from grower to processor. The railroad was acquired in 1969 by the Pea Vine Corporation and today operates freight traffic through a connection with the San Luis and Rio Grande Railroad hauling mainly grain, potatoes and fertilizer. SLC is also a railcar owner, mostly refrigerator cars and boxcars. The railroad is 13 miles long and is located between Sugar Junction (Monte Vista, Colorado) and Center, Colorado. The railroad's shops and yard are located just north of US-160 near Sugar Junction. Between 2007 - 2010, the SLC replaced approximately 1-mile of 56 lb. rail with 90 lb. rail. The SLC owns two locomotives and operates on an as-needed basis. The company is owned by Rail World, Inc.



Track Data

Miles of Owned Track Operated - **12.2**
Miles of Trackage Rights - **1.0 (from SLRG)**
Miles of Abandoned Track (Since 2007) - **0**
Miles of Out-of-Service Track - **0**
Weight of Rail - **MP 2.0 - MP 6.7 = 90 lbs**
MP 6.7 - MP 15.2 = 56 lbs
Non-286,000 lb Rail Structures - **MP 10.1 - MP 15.2**

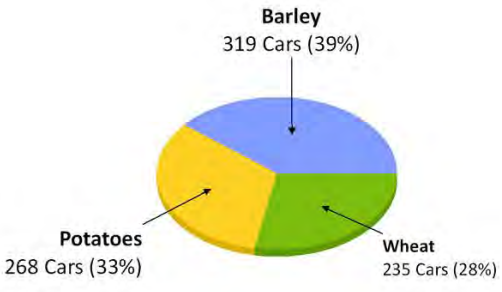
Rail Cars Originated in CO	Rail Cars Terminated in CO
2007 - **1,534**	2007 - **324**
2008- **1,429**	2008- **238**
2009 - **937**	2009 - **252**
2010 - **822**	2010 - **217**

Colorado Top Commodities (By Volume)

Barley
Potatoes
Wheat

Economic Data

2010 Employees (In Colorado) - **8**
2010 Annual Payroll - **$205,000**
2010 In-State Purchases - **Data Not Available**
2010 Capital Improvement Spending - **$0**



Railroad Bio

San Luis & Rio Grande Railroad

The San Luis & Rio Grande Railroad (SLRG) runs west from a connection with the Union Pacific Railroad at Walsenburg, CO, over the Sangre de Cristo Mountains at La Veta Pass and into the San Luis Valley. At Alamosa, the railroad splits with a branch extending south to Antonito, just north of the New Mexico border, and northwest to South Fork. In addition to the Union Pacific, the SLRG connects with the shortline San Luis Central Railroad (SLC) at Monte Vista and the Denver and Rio Grande Historical Foundation at Derrick, just west of South Fork. The San Luis & Rio Grande Railroad operates passenger excursion trains over scenic La Veta Pass and through the San Luis Valley to connect with the Cumbres & Toltec Scenic Railroad May through October. The trains operate in conjunction with the Denver & Rio Grande Historical Foundation. The primary commodities hauled by the SLRG are grain, minerals, specialty rock products and produce. SLRG also handles substantial bridge traffic to and from the SLC. On June 29, 2003, Union Pacific sold the Walsenburg - Alamosa, Alamosa – Antonito and Alamosa – Derrick (just west of South Fork) to the shortline railroad conglomerate RailAmerica (RA). The Derrick – Creede line, which had been out-of-service, was sold to the Denver and Rio Grande Historical Foundation as a tourist line. RA sold the SLRG to Permian Basin Railways on December 22, 2005.

Track Data

Miles of Owned Track Operated - **150.0**
Miles of Trackage Rights - **5.0 (from UP)**
Miles of Abandoned Track (Since 2007) - **0**
Miles of Out-of-Service Track - **0**
Weight of Rail -
MP 180 to MP 195 = 90 lb
MP 195 to MP 213 = Mixed 110-115 lb
MP 213 to MP 250 = 90 lb
Mixed 85-90 lb from MP 250 to MP 299 (Alamosa Sub)
Mixed 85-90 lb from MP 252 to MP 282 (Cumbres Sub)
Non-286,000 lb Rail Structures - **0**

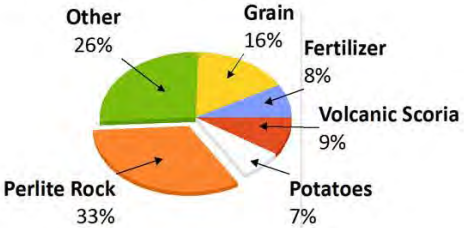
Economic Data

2010 Employees (In Colorado) - **100 (Includes Part-Time)**
2010 Annual Payroll - **$1,680,000**
2010 In-State Purchases - **Data Not Available**
2010 Capital Improvement Spending - **$63,300**

Rail Cars Originated in CO	Rail Cars Terminated in CO
2007 - **3596**	2007 - **867**
2008 - **2957**	2008 - **1684**
2009 - **2702**	2009 - **1735**
2010 - **1878**	2010 - **1092**

Colorado Top Commodities (By Carloads)

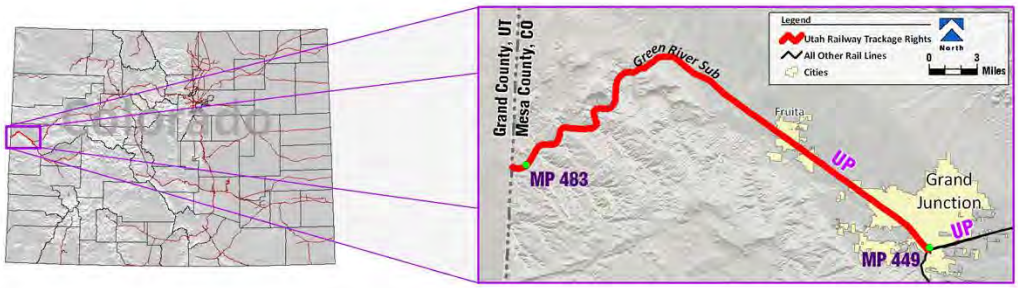
Perlite Rock - Antonito, CO to IL, MN, MI - **1337**
Other Commodities - CO to Various US Locations - **1075**
Grain - CO to Various US Locations - **670**
Volcanic Scoria - Antonito, CO to MO, IL, FL - **382**
Fertilizer - Various US Locations to Monte Vista, CO - **339**
Potatoes - Center, CO to Houston, TX - **294**



Railroad Bio

Utah Railway

The Utah Railway Company was incorporated in January, 1912. It was founded to haul coal from the company's mines to Provo, Utah, in reaction to company disappointment in the service and route of the existing Denver and Rio Grande Railroad nearby. The Denver & Rio Grande operated the line until 1917 when Utah Railway began independent service. Utah Railway was a subsidiary of Mueller Industries, Inc. until it was sold to Genesee & Wyoming, Inc. in August 2002. Utah Railway has trackage rights over UP from Grand Junction, CO to Ogden, UT (378 miles, 32 miles of which are in Colorado). Traffic on the Utah Railway's trackage rights consists of coal moving through Colorado from Wildcat, Utah to Tuco, Texas on the Green River Subdivision in 84-105 car unit trains. Utah Railway is primarily a coal-hauling railroad. Other commodities transported (in Utah) include aggregates, brick and cement, building materials, chemicals, coal and petroleum products.



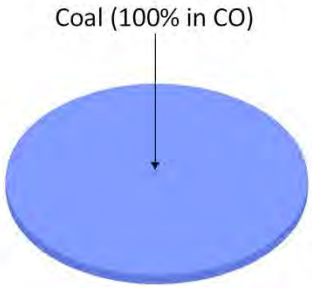
Track Data

Miles of Owned Track Operated - **0**
Miles of Trackage Rights - **32.0 (from UP)**
Miles of Abandoned Track (Since 2007) - **0**
Miles of Out-of-Service Track - **0**
Non-286,000 lb Rail Structures - **0**

Economic Data

2010 Employees (In Colorado) - **0**
2010 Annual Payroll - **$0**
2010 In-State Purchases - **$0**
2010 Capital Improvement Spending (In Colorado) - **$0**

Rail Cars Originated in CO	Rail Cars Terminated in CO
2007 - **0**	2007 - **840**
2008 - **0**	2008 - **1,750**
2009 - **0**	2009 - **309**
2010 - **0**	2010 - **227**



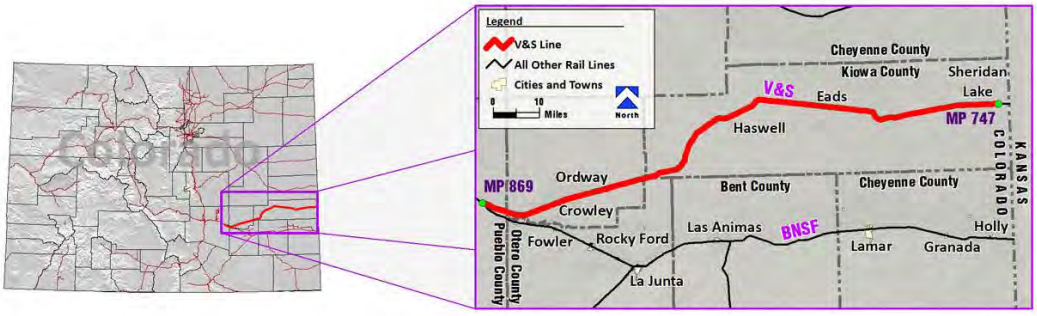
Colorado Top Commodities (By Volume)

Coal - Wildcat, CO to Tuco, TX - **Tonnage Not Available**

Railroad Bio

Victoria & Southern Railway

The Victoria & Southern Railway (V&S) purchased the Towner Line from the Colorado Department of Transportation in October, 2011. V&S acquired rights to the Towner Line from CDOT in 2005, executed in a lease-purchase agreement. CDOT acquired the Towner Line from Union Pacific Railroad in 1998 to prevent abandonment of the line after the merger of Missouri Pacific Railroad with Union Pacific. The Towner Line consists of 122 miles of track extending from North Avondale Junction, CO to Towner, CO. The line interchanges with BNSF and UP at North Avondale Junction, CO and with the Kansas and Oklahoma Railroad (KO) at Towner, CO. Commodities historically transported consisted primarily of wheat and barley shipped from the Bartlett Grain Company and the Tempel Grain Company. In January 2006, the V&S began rehabilitation and improvements of the line which included: track repair, track replacement, repair of active crossing equipment, and returning the track to Class II operating standards. The first grain train returning the line to service was conducted in September 2006. In April 2008, the line experienced the loss of two culverts and roadbed damage due to fires in the Ordway area. The V&S has repaired the line, replaced the damaged culverts, and is able to provide full service. V&S is storing cars on the west portion of the line for Union Pacific. In December of 2011, V&S notified CDOT of their intent to abandon the line from North Avondale Junction, CO to Eads, CO



Track Data

Miles of Owned Track Operated - **122**
Miles of Trackage Rights - **0.0**
Miles of Abandoned Track (Since 2007) - **0.0**
Miles of Out-of-Service Track - **0**
Weight of Rail -
53 Miles of 136 lb
55 Miles of 115 lb
14 miles of > 100 lb
Non-286,000 lb Rail Structures - **Data Not Available**

Economic Data

2010 Employees (In Colorado) - **0**
2010 Annual Payroll - **Data Not Available**
2010 In-State Purchases - **Data Not Available**
2010 Capital Improvement Spending - **Data Not Available**

Colorado Top Commodities (By Volume)

Wheat
Barley
Milo
Corn

Rail Cars Originated in CO	Rail Cars Terminated in CO
2007 - **574**	2007 - **0**
2008 - **183**	2008 - **0**
2009 - **285**	2009 - **0**
2010 - **478**	2010 - **0**

Intermodal Facilities

Colorado's freight railroads use a number of intermodal facilities. Intermodal facilities involve the transportation of freight in an intermodal container or highway trailer using multiple modes of transportation (rail, truck, ship, etc), without handling any of the freight itself when changing modes. This method of transport reduces cargo handling, damages, and losses, and allows freight to be transported faster.

Two intermodal facilities currently operate in Colorado, both of which are owned and operated by the BNSF and the UP and are located in the Denver Metropolitan Area.

Railroads frequently use trailer on flatcar and container on flatcar equipment. Trailer on flatcar is a method by which semi-trailers are transported on flatcars, whereas container on flatcars involves the shipment of containers. Trailer on flatcar facilities typically have large areas for trailers pending loading or pickup. A trend occurring in the U.S. involves the use of rail container well cars. These cars resemble flatcars but have a container-sized depression in the middle of the car, allowing for two containers to be stacked in a double-stack configuration. These double-stack containers are heavier and require a track structure capable of carrying 286,000 pound loads. Double-stack containers also require additional vertical clearance. In Colorado, not all rail lines and structures are currently double-stack capable. The Moffat Tunnel, and other tunnels on UP's primary east-west line through the state currently cannot accommodate double-stack containers and would need to be upgraded to do so.

Transload Facilities

Transloading is the process of transferring a commodity from one mode of transportation to another. Since transfer between modes requires handling of commodities, transload facilities are typically designed with the intent to minimize handling. Due to differing capacities of different modes, transload facilities typically require storage facilities, such as warehouses or rail yards. As listed in Table 3-2, Colorado has a number of transload facilities, all located in the Denver Metropolitan Area. Another example of a transload facility is a grain elevator, where specialized material handling and storage

Table 3-2. Colorado Transload Facilities

Facility	City
Adams Reload Company	Denver
American Warehouse Denver	Denver
Aspen Distribution	Denver
BULKMATIC Transport Company	Commerce City
Cast Transport Henderson	Henderson
LG Everist	Henderson
Mountain States Logistics	Aurora
Truck Rail Handling	Commerce City
Rocky Mountain Commerce City	Commerce City
Savage Services Corporation	Littleton
Union Pacific Distribution	Denver
Wagner Logistics Service	Denver

are typically provided. Colorado's rail network includes 97 grain elevators located throughout the state.

Colorado Commodity Flow Characteristics

Nearly one-fourth of all freight handled in Colorado is moved via rail. This section summarizes the characteristics and patterns of that freight rail flow. The 2009 Surface Transportation Board (STB) Carload Waybill Sample served as the primary data source for the freight rail commodity flow analysis. The Carload Waybill Sample is a stratified sampling of carload waybills for all U.S. rail traffic, obtained from rail carriers that terminate 4,500 or more revenue carloads annually.

Nationally, more than 1.7 billion tons of freight was originated by U.S. railroads in 2009. The tonnage of freight movement in Colorado is greatest along the Consolidated Main Line, the primary north-south rail route through the state, owned by BNSF and UP. Figure 3-4 displays the routing by tonnage of all freight rail traffic originating, terminating, and traveling through Colorado as it travels across the nation.

The commodities carried totaled nearly 2.4 million carloads, with a total value of $107 billion. Of the commodities carried in Colorado in 2009, by weight, 71 percent were overhead, or goods not originating or terminating in Colorado but only traveling through the state. This through-traffic equates to $90 billion worth of goods and materials. The vast majority of this through-traffic was coal from Wyoming destined for Texas and states east of Colorado [1]. Railroads in Colorado carried a total of 164 million tons in the state. Table 3-3 summarizes the tonnage, carloads, and value of all commodities traveling by rail in the state by commodity flow direction.

[1] 2009 STB Carload Waybill Sample

Source: 2009 STB Carload Waybill Sample

Figure 3-4. Tonnage of Rail Freight Originating, Terminating, and Traveling through Colorado

Table 3-3. Colorado Tonnage, Carloads, and Value of Commodities Moved by Rail (2009)

Flow Direction	Tons (million)	Percent of Tonnage	Carloads	Percent of Carloads	Value ($ billion)	Percent of Value
Interstate outbound	19.8	12.1%	250,821	10.7%	5.2	4.9%
Interstate inbound	18.4	11.2%	265,250	11.3%	11.8	11.0%
Intrastate	9.3	5.7%	84,813	3.6%	0.7	<1%
Through freight (overhead)	116.3	71.0%	1,750,686	74.4%	89.1	83.4%
Total	**163.8**	**100%**	**2,351,570**	**100%**	**106.8**	**100%**

Source: 2009 STB Carload Waybill

In 2009, railroads operating in Colorado originated about 29 million tons of goods and materials, or 335,634 carloads, including intrastate trips. Of this, approximately 21 million tons (73 percent) was coal. Of the 29 million originated tons, roughly 0.8 million tons (3 percent) was intermodal. Rail commodity flow is dynamic and is influenced by numerous economic factors. As a result, key commodities and dominant flows may change from year-to-year. The weight of goods has very little to do with their corresponding values. For example, while coal represents 73 percent of the originating tonnage, it represents only 14 percent of the overall originating value of rail freight within the state.

Table 3-4 and Table 3-5 list Colorado's top originating and terminating commodity categories for 2009 by tonnage, respectively. These categories group together similar commodities (e.g., farm products include grain, vegetables, fruit, etc). Coal is the dominant import, export, and intrastate commodity in Colorado by weight. Farm products, food products, cement, and petroleum/coal products represent about the same percentage of tonnage from import to export.

Table 3-6 displays Colorado's key intrastate commodity characteristics. Colorado intrastate traffic by rail moved more than $760 million in goods and materials in 2009. Colorado's intrastate traffic is primarily coal and other heavy materials.

Table 3-4. Colorado Originating Rail Traffic by Net Tons (2009)

Originating Category	Net Tons	Carloads	Percentage of Total
Coal	21,288,000	189,000	73%
Farm products (primarily grain)	1,309,000	12,700	5%
Food products	1,234,000	18,800	5%
Cement	1,223,000	11,000	4%
Petroleum and coal products	1,155,000	13,300	4%
Other	2,471,000	84,700	9%

Source: 2009 STB Carload Waybill, 2009 AAR

Table 3-5. Colorado Terminating Rail Traffic by Net Tons (2009)

Terminating Category	Net Tons	Carloads	Percentage of Total
Coal	16,409,000	143,300	60%
Stone, sand, gravel	1,631,000	16,100	6%
Food products (primarily grain)	1,127,000	13,600	4%
Farm products	1,081,000	10,700	4%
Chemicals	1,034,000	11,200	4%
Other	6,229,000	153,300	22%

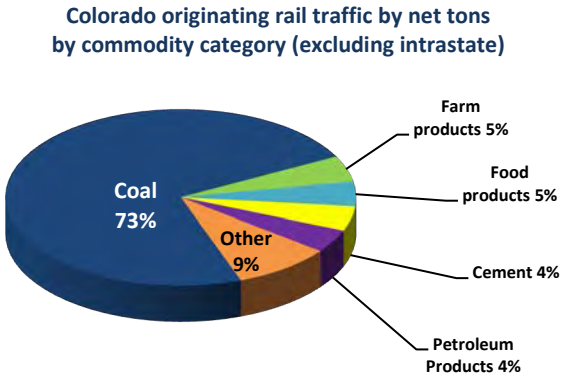
Source: 2009 STB Carload Waybill, 2009 AAR

Table 3-6. Colorado Intrastate Key Commodities (2009)

Originating Category	Net Tons	Carloads	Percentage of Total
Bituminous coal	7,708,885	67,731	83%
Portland cement	412,680	3,728	4%
Petroleum refining products	401,244	4,400	4%
Metal scrap or tailings	272,080	6,120	3%
Broken stone or riprap	245,448	2,436	3%
All other	222,086	3,318	3%

Source: 2009 STB Carload Waybill, 2009 AAR

Figure 3-5 graphically depicts the percentage of tonnage originating and terminating rail traffic by commodity category. The tonnage of commodity category "Other" is 3.7 million tons greater in terminating rail trips than in originating rail trips. This is largely due to Freight All Kinds (FAK) shipments. FAK shipments consist of mixed goods that are pooled together and shipped on an intermodal train in a freight container or highway trailer.



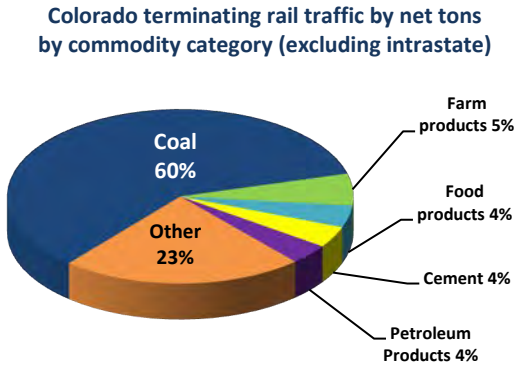


Figure 3-5. Colorado Commodity Categories by Weight

The heaviest commodities with the greatest number of carloads in Colorado were not necessarily the commodities of greatest monetary value. FAK shipments are typically higher-dollar value and represent a significant percentage of both originating and terminating rail shipment values in the state. Figure 3-6 displays key originating and terminating commodities by value.

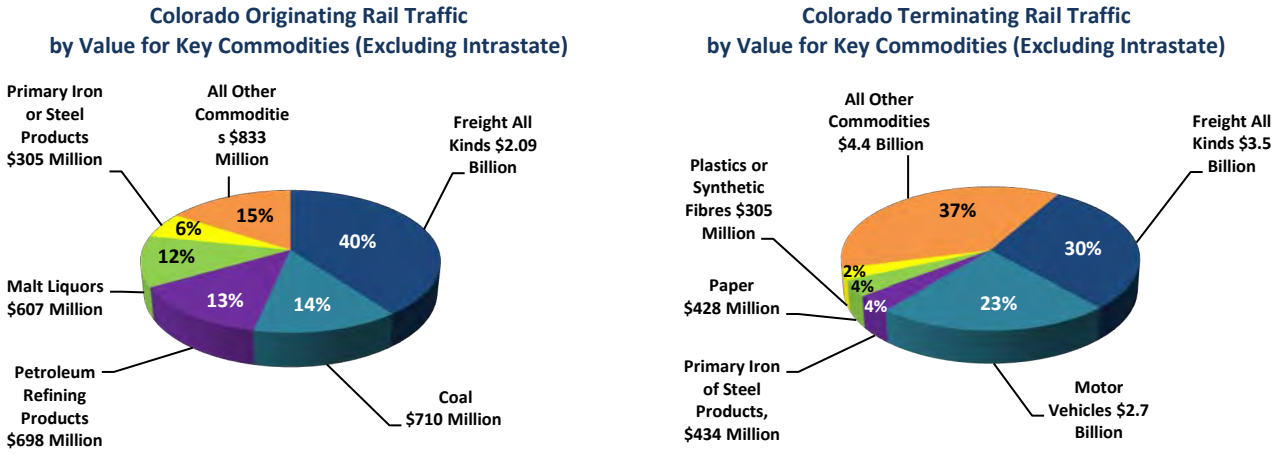


Figure 3-6. Key Colorado Commodities by Value

Coal Activity in Colorado

In 2009, Colorado ranked seventh in coal tons originated by rail among all U.S. states, with railroads transporting nearly 21 million tons[2]. During that year, 69 percent of the coal mined in the state was transported by rail, with the remaining 31 percent shipped short distances from mine-mouth to electric power generating facilities by truck[3]. Roughly 40 percent of the coal mined in Colorado was consumed within the state. Another 56 percent of Colorado coal was sold to 24 other U.S. states while another 4 percent was exported internationally. The top importers of Colorado coal in 2009 were Illinois, Kentucky, Texas, and Mississippi.

Ten mines produce coal within Colorado, five of which are served by UP in the northwestern quadrant of the state. The Deserado Mine, located near the Utah border in the northwestern portion of the state, serves a single power plant in Utah and transports coal by a dedicated electric rail line, disconnected from the rest of the rail system. The remaining four mines are served by truck and typically have production tonnages that are much less than that produced by the mines served by rail. A new coal mine, the New Elk Mine west of Trinidad, opened in 2010. There are plans to serve the mine by a 13-mile rail line, which previously had been abandoned and removed, that would connect to BNSF's line in Trinidad in the future.

[2] American Association of Railroads, State Rankings, 2009
[3] Colorado Geological Survey, Coal Fact Sheet, 2010

Thirteen Colorado power plants annually consume 20 million tons of coal, generating 34.2 million megawatt-hours of electricity[4]. Most of this coal is from Colorado, but some is imported from Wyoming and Montana. Coal mined in Colorado is typically "clean coal," having low-sulfur, mercury, arsenic, and ash properties, and is frequently blended at coal fired power plants across the U.S. with higher-sulfur coal to meet environmental compliance requirements. Colorado coal production decreased nearly 13 percent between 2009 and 2010. This was primarily associated with the economic downturn. Colorado mines are expected to increase production in the coming years, although the trends in the energy industry and new environmental regulations for power plants may change where this coal is sold.

As power plants across the U.S. install scrubbers to help remove sulfur oxide pollutants, the ability of these plants to burn higher sulfur content coal increases. This higher sulfur content coal is typically less expensive than lower sulfur coals. Over the past 15 years, U.S. coal production has steadily increased while coal prices have steadily declined. This is attributed to increased coal production in the Western United States. Figure 3-7 depicts the movement of coal in and through Colorado.

Powder River Basin coal en route to Texas

Figure 3-8 displays Colorado's coal exports to other states by net tonnage. Figure 3-9 displays Colorado's coal imports from other states by net tonnage.

[4] Colorado Geological Survey, Coal Fact Sheet, 2010

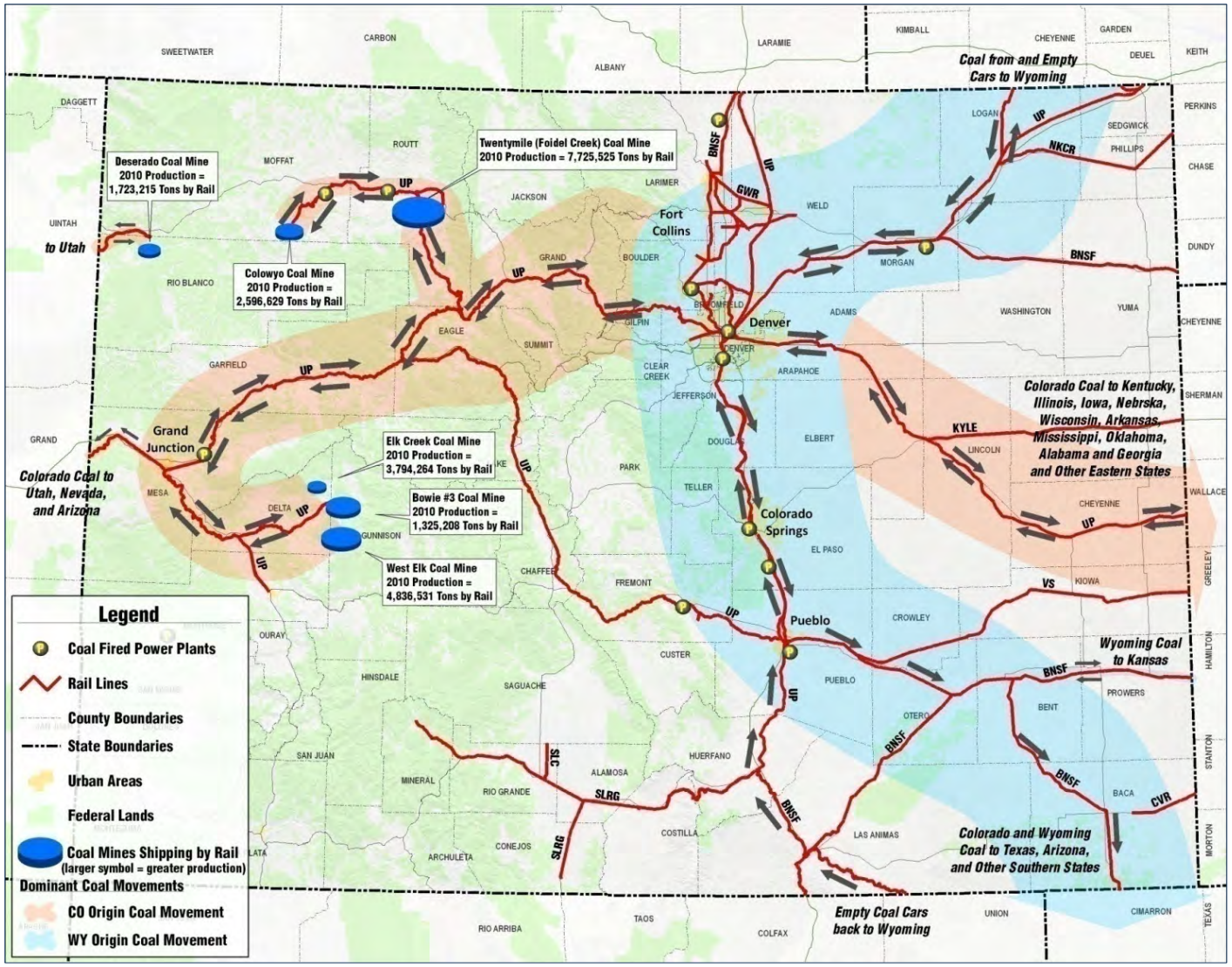


Figure 3-7. Coal Movements by Rail in and through Colorado

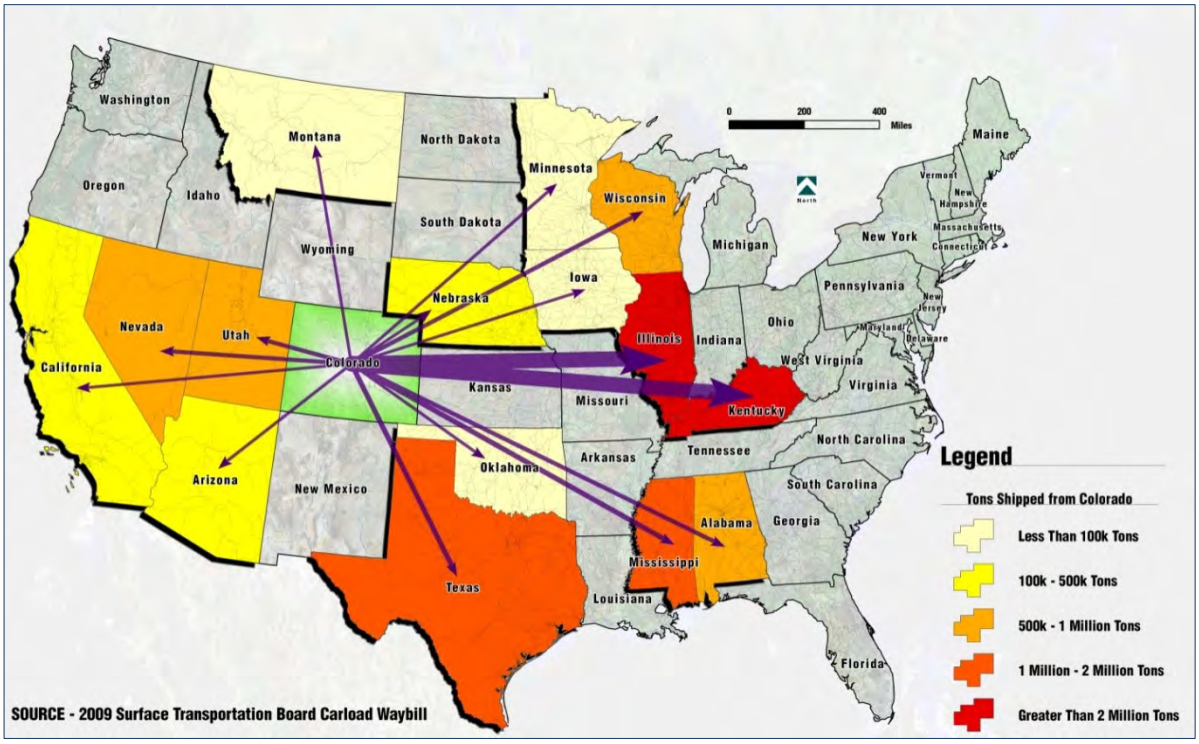


Figure 3-8. Tons of Coal Transported by Rail from Colorado to Other U.S. States (#1 Export Commodity)

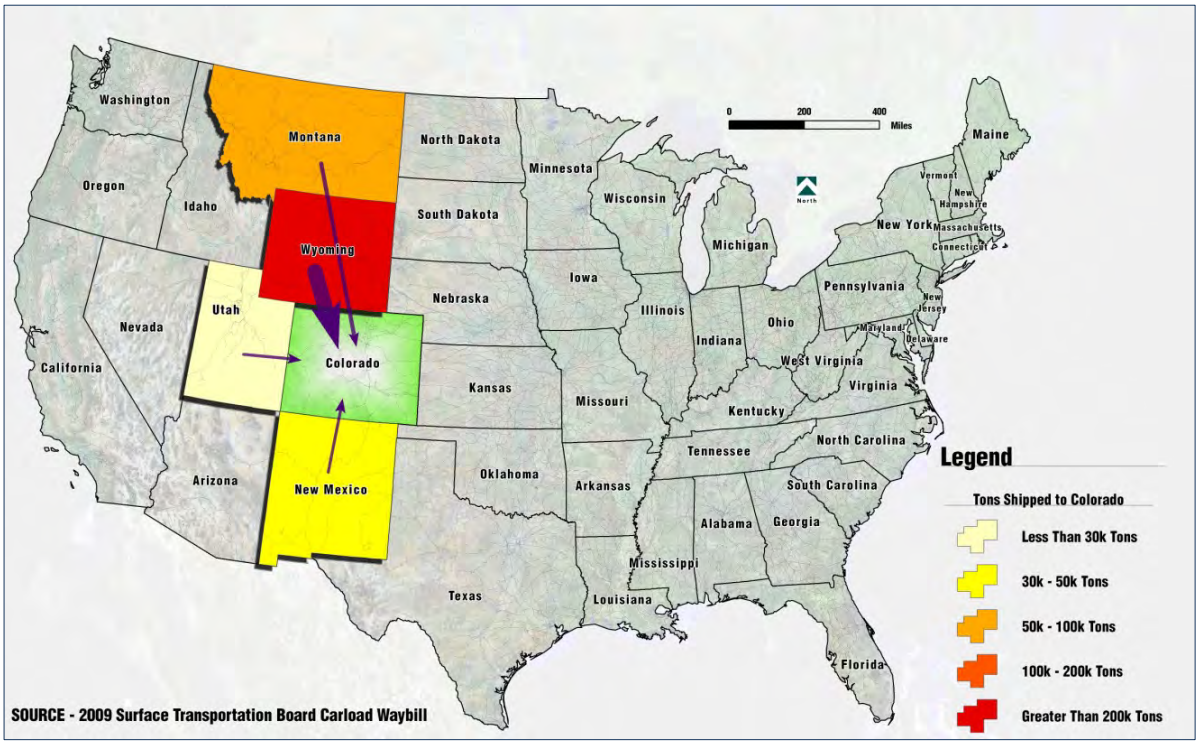


Figure 3-9. Tons of Coal Transported by Rail to Colorado from Other U.S. States (#1 Import Commodity)

Agriculture and Rail

Agriculture represents the primary industry for economic development in the rural counties of Colorado. While Colorado's crop harvest is concentrated from May through November, the subsequent movement of these products from first storage site to market continues year-round. Colorado has more than 36,000 farms and 31 million acres of agricultural land.[5] Colorado's food crops (predominately wheat) find their markets outside the U.S., with more than 80 percent of all wheat harvested in Colorado being exported, first by rail and then by ship to markets around the world. Roughly 32,000 rail cars are required to harvest and market Colorado's entire agricultural production[6].

Unit grain train bound for the Gulf Coast

On average, 90 rail cars every day are moving Colorado's crops from field to storage and on to market. Wheat and wheat products are Colorado's top value agricultural export. Colorado is ranked eighth among all wheat-producing states.[7] Colorado's feedlots and ethanol plants consume the majority of the corn grown in the state. In addition to corn grown in Colorado, feedlots, dairy farms, and ethanol plants depend on efficient rail service to bring in an additional 20,000 rail cars of corn each year[8].

Colorado's rail network has 97 grain elevators located throughout the state. These elevators allow for storage for surplus crops during harvest and for the transfer of grains between truck and rail as market demands. Figure 3-10 displays agricultural lands in Colorado and the locations of grain elevators along the freight rail network.

There are only five high-volume "shuttle" loader facilities in Colorado: two on BNSF, two on UP, and one is located on the Great Western Railroad that is open to service by both BNSF and UP. The lack of similar infrastructure in Colorado leaves many producers and feed grain users with more expensive transportation options than many of their peers in neighboring states.

[5] National Agricultural Statistics Service, *Colorado State Agricultural Overview*, 2009
[6] Colorado Department of Agriculture, *Transportation and Colorado's Agribusiness Industry,* 2007
7 U.S. Department of Agriculture, *Colorado State Fact Sheet,* 2010
8 Colorado Department of Agriculture, *Transportation and Colorado's Agribusiness Industry*, 2007

The primary infrastructure model in Colorado is the "country elevator" with limited load-out capacity that causes rail shipments to be less efficient and more costly due to shipping in small groups of rail cars versus large unit trains. "Shuttle" facilities in Kansas and Nebraska that are in close proximity to Colorado production areas attract longer truck hauls from Colorado to these out-of-state elevators.

Colorado exports and imports agricultural products to and from numerous other states. Figure 3-11 and Figure 3-12 depict the movements of grain by rail from and to Colorado, respectively.

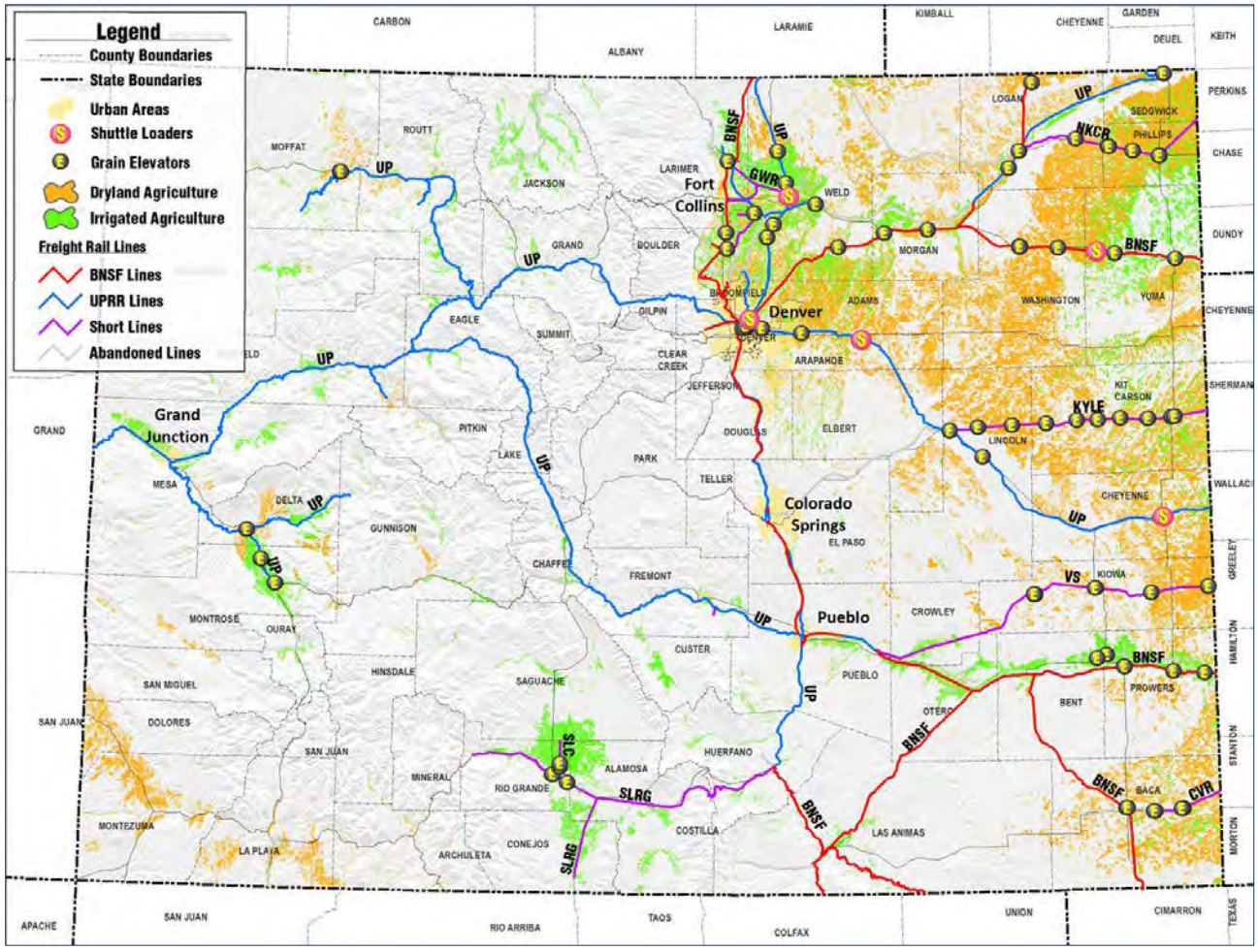


Figure 3-10. Colorado Agricultural Lands and Grain Elevators

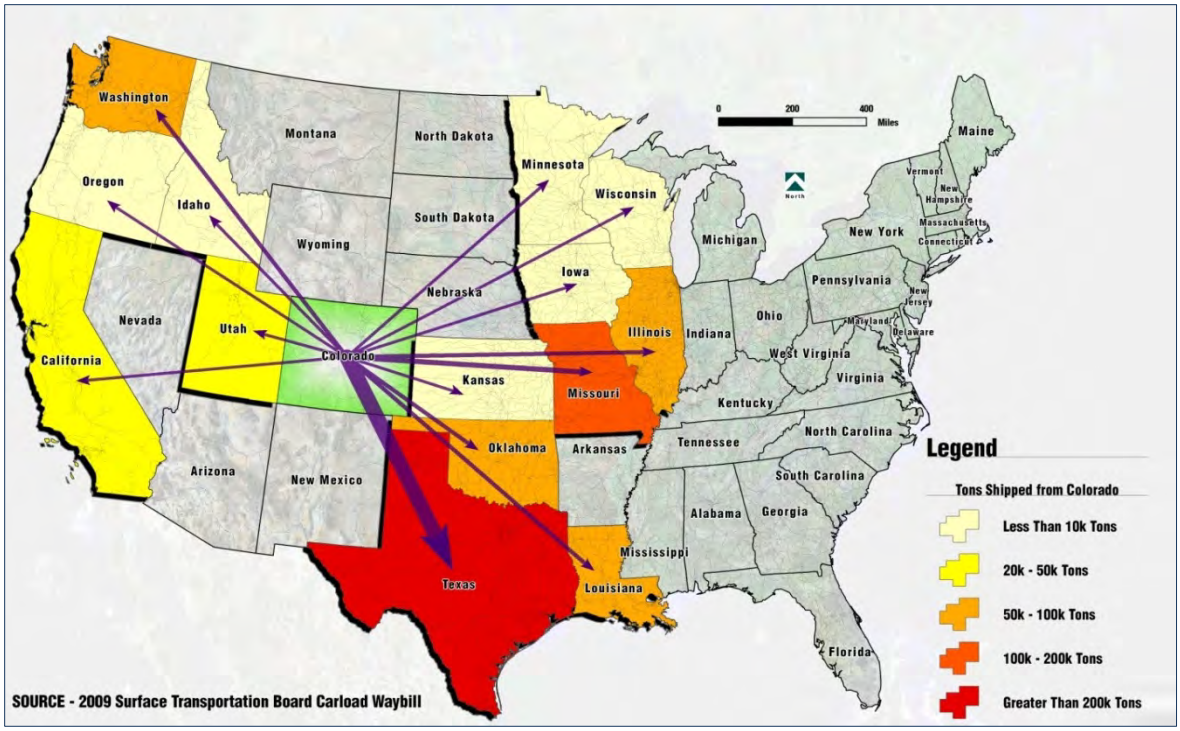


Figure 3-11. Tons of Grain Transported by Rail from Colorado to Other U.S. States (#2 Export Commodity)

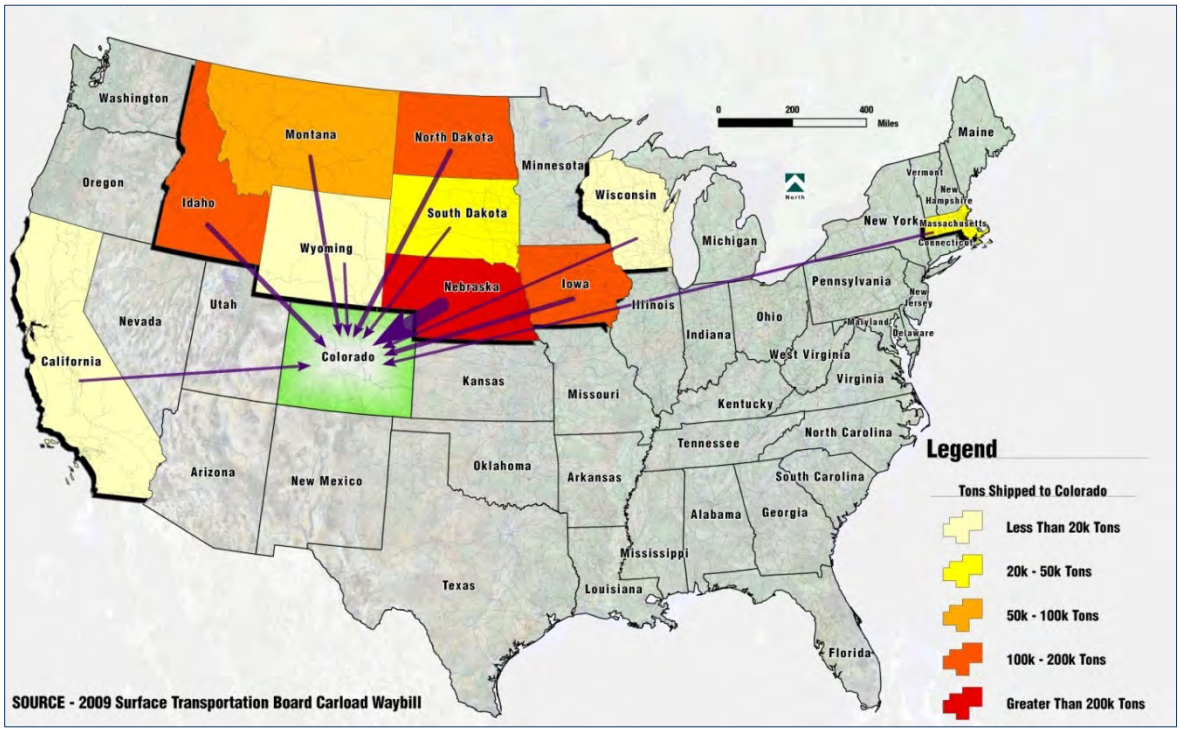


Figure 3-12. Tons of Grain Transported by Rail to Colorado from Other U.S. States (#3 Import Commodity)

Other Key Commodity Flows

Colorado receives and provides goods by rail from and to numerous other states. Colorado's greatest tonnage of commodities in 2009 were destined for Illinois, Kentucky, Texas, Utah, and California, in that order. During the same period, the greatest monetary value of goods and materials went to California, Illinois, Texas, Washington, and Utah, in that order.

The greatest tonnage of goods destined for Colorado in 2009 originated from Wyoming, Illinois, Nebraska, Minnesota, and Texas. The greatest value of goods during the same period originated from Illinois, California, Texas, Washington, and Utah. Figure 3-13 through Figure 3-18 depict the movement of several of Colorado's key import and export goods and materials within the U.S.

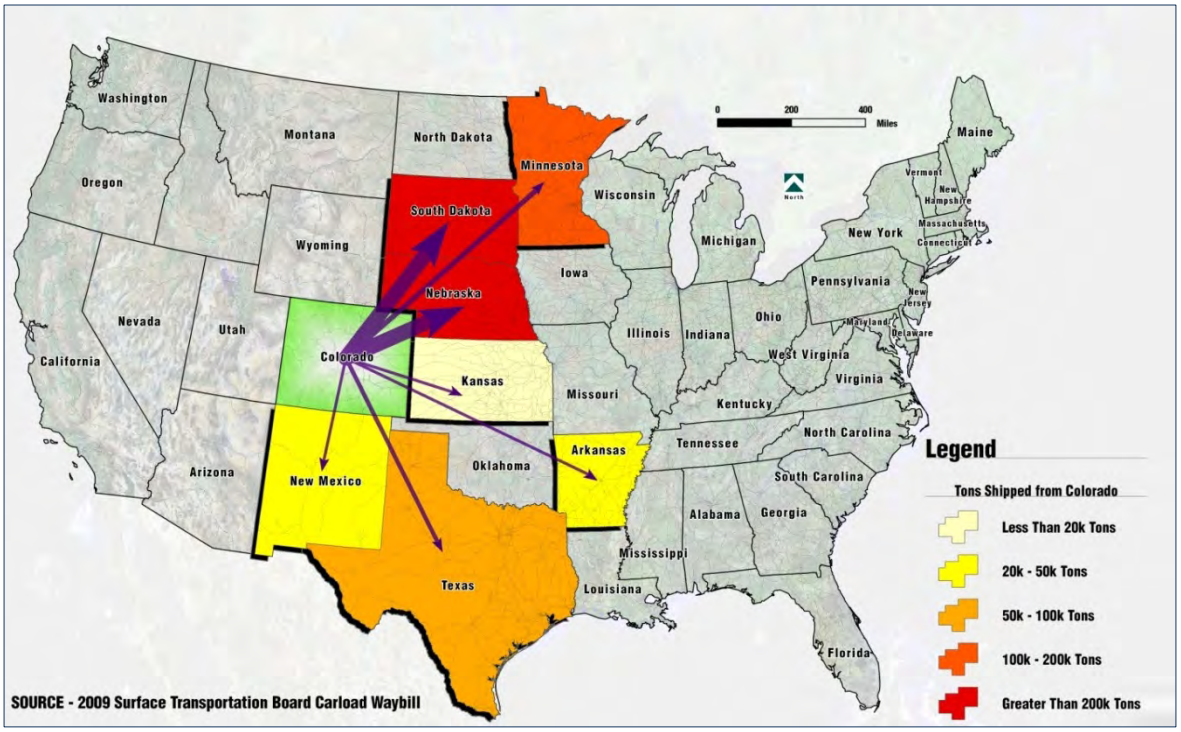


Figure 3-13. Tons of Cement Transported by Rail from Colorado to Other U.S. States (#3 Export Commodity)

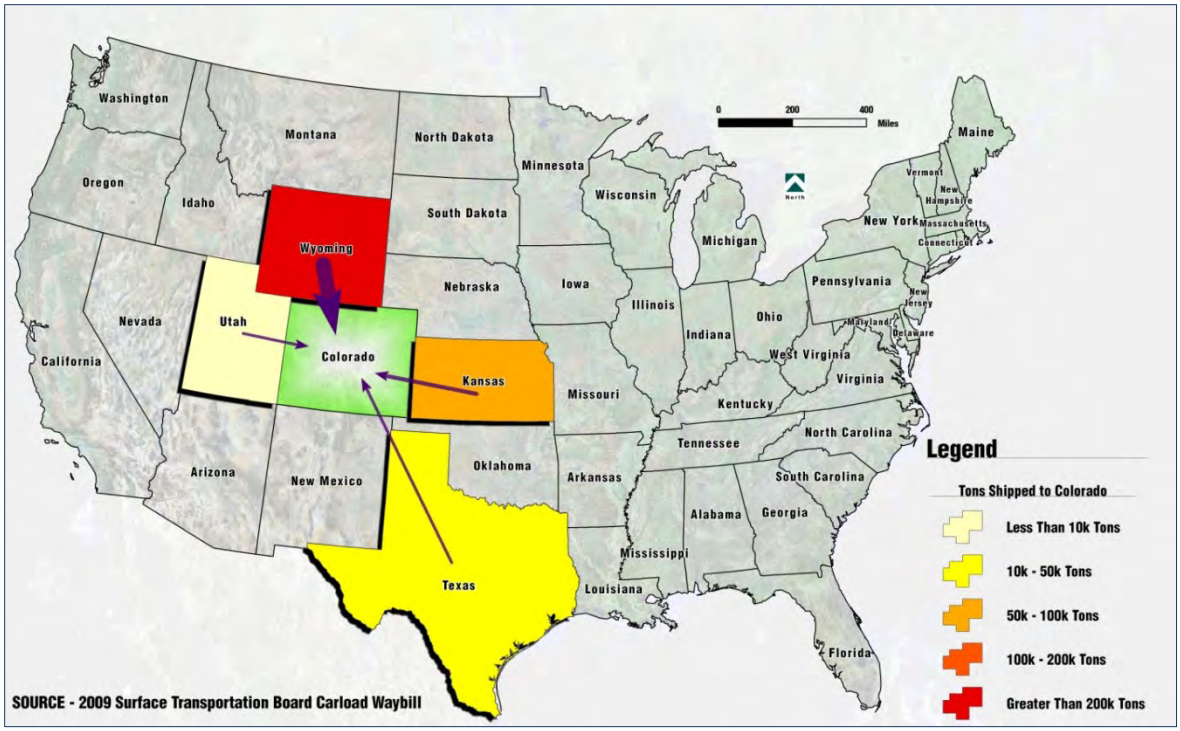


Figure 3-14. Tons of Cement Transported by Rail to Colorado from Other U.S. States (#5 Import Commodity)

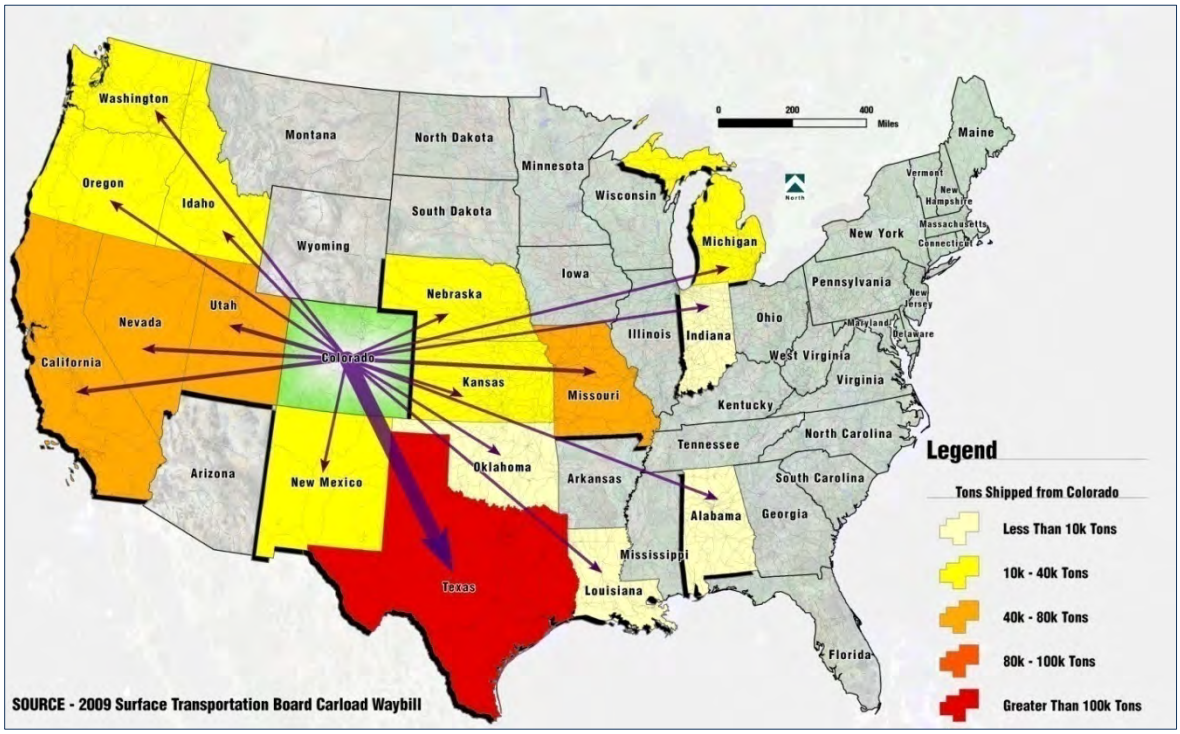


Figure 3-15. Tons of Petroleum Products Transported by Rail from Colorado to Other U.S. States (#4 Export Commodity)

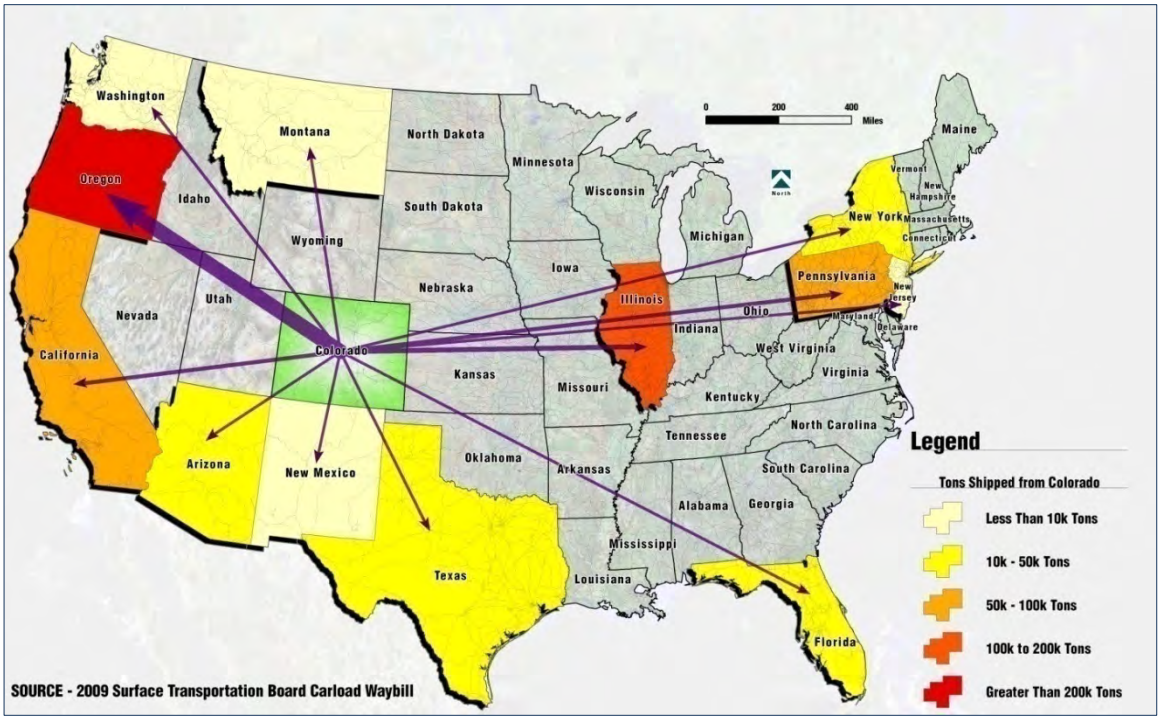


Figure 3-16. Tons of Malt Liquor Transported by Rail from Colorado to Other U.S. States (#5 Export Commodity)

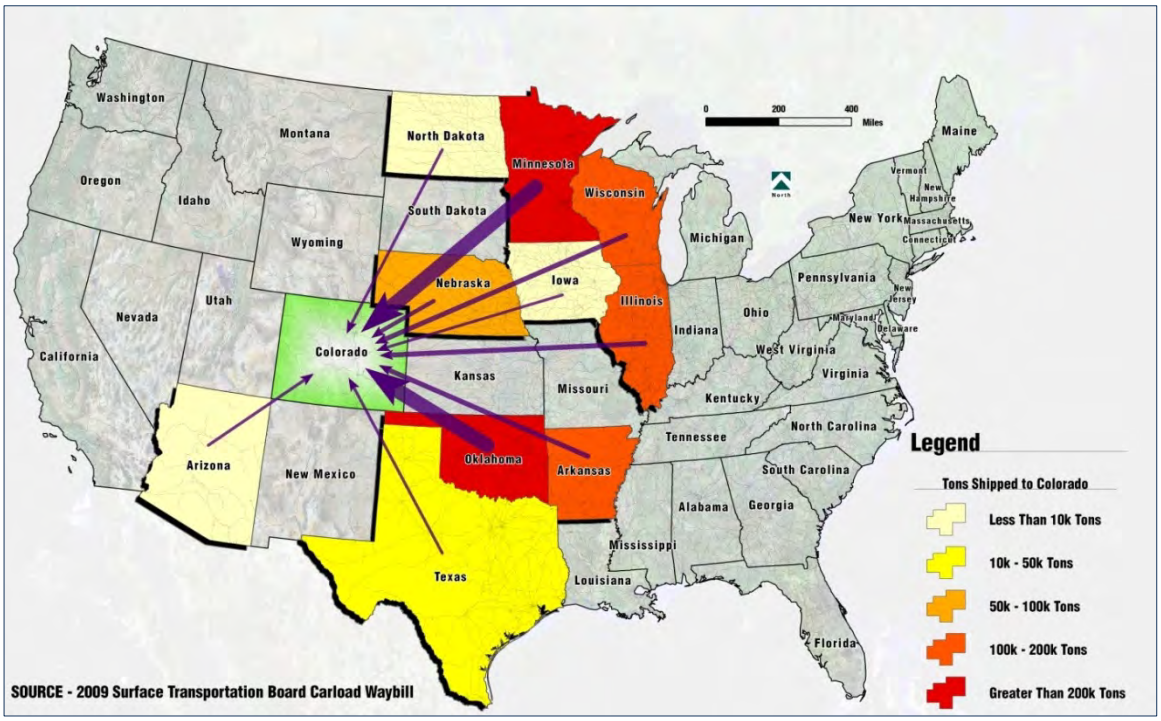


Figure 3-17. Tons of Gravel and Sand Transported by Rail to Colorado from Other U.S. States (#2 Import Commodity)

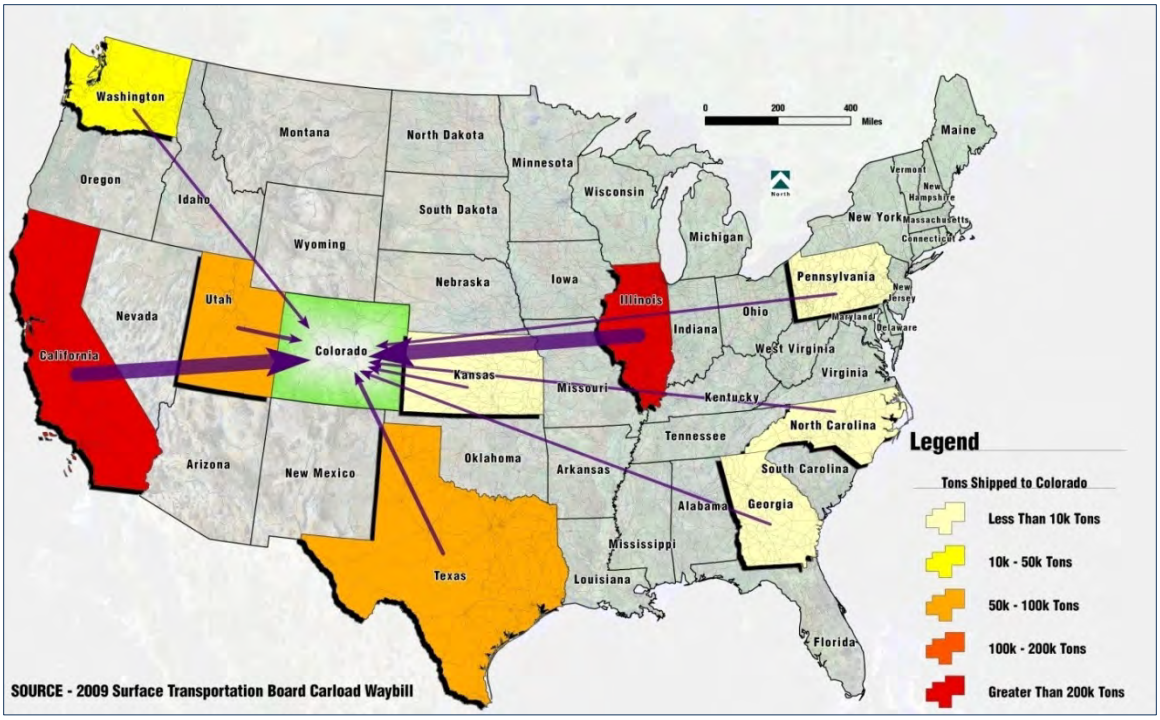


Figure 3-18. Tons of Freight of All Kinds Transported by Rail to Colorado from Other U.S. States (#4 Import Commodity)

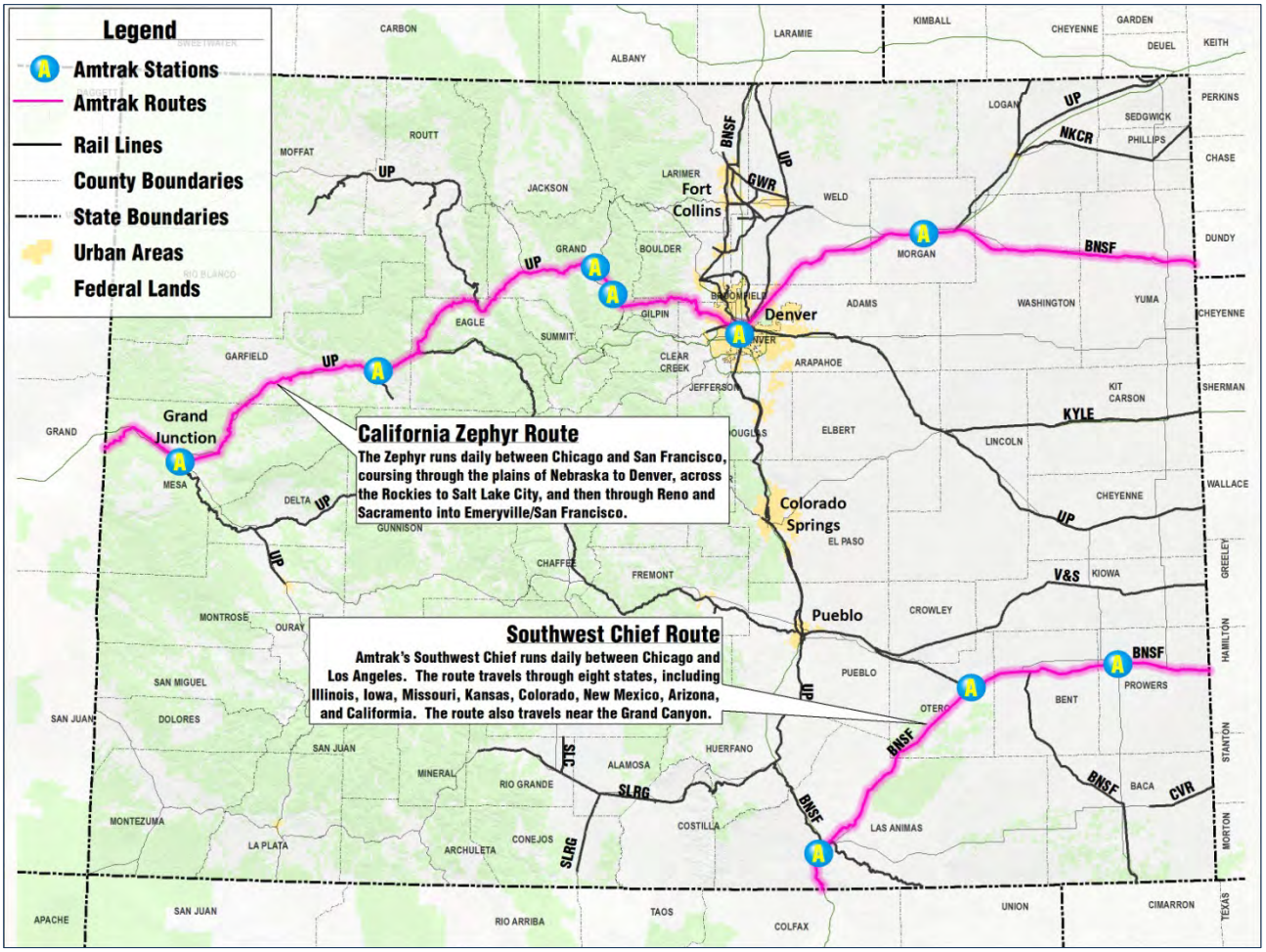
Passenger Rail System

Overview

The passenger rail system in Colorado is presently provided by Amtrak, with two routes in the state as part of its national long-distance passenger rail service network. The Regional Transportation District (RTD) in the Denver metro area will use some commuter rail service to supplement its light rail service as part of its FasTracks program. In addition, given Colorado's railroad history and the state's natural beauty, a number of scenic railroads provide tourist-oriented service in locations throughout the state.

Amtrak

The National Railroad Passenger Corporation, also known as Amtrak, was created by Congress in 1971 and is the sole provider of intercity long-distance passenger rail service in the U.S. Amtrak operates on more than 21,000 miles of rail and serves more than 500 stations in 46 states. In federal fiscal year 2011(October 2010 through September 2011), Amtrak provided service to nearly 30.2 million passengers throughout the U.S. Amtrak's long-distance routes, which provide critical intercity service to many rural communities, had their highest ridership in sixteen years. Colorado is served by two long-distance Amtrak routes, the *California Zephyr* and *Southwest Chief* (as depicted on Figure 3-19).



Source: Amtrak

Figure 3-19. Colorado Amtrak Routes and Stations

Colorado had two additional Amtrak routes that were discontinued in 1997 due to reductions in federal funding support. These two trains were the *Pioneer*, operating between Denver and Seattle, and the *Desert Wind*, which operated from Denver to Los Angeles by way of Salt Lake City and Las Vegas.

The California Zephyr ("Zephyr") runs daily between Chicago and San Francisco with major stops in Omaha, Nebraska; Denver, Colorado; Salt Lake City, Utah; Reno, Nevada; and Emeryville, California. The California Zephyr is Amtrak's longest route, serving 34 communities and covering 2,438 miles in a little over 51 hours. In Colorado, the line has stations in Fort Morgan, Denver, Fraser/Winter Park, Granby, Glenwood Springs, and Grand Junction. East of Denver, the BNSF Railway owns, operates, and maintains the majority of the route to Chicago. West of Denver, the UP owns the track on which Amtrak operates this route.

The Zephyr line served more than 355,300 passengers in 2011, or 975 passengers daily, and had 2011 revenues in excess of $44 million.[9] The Zephyr serves a diverse set of markets between Chicago and Emeryville; nearly three-quarters of the passengers are spread among dozens of smaller markets, each with less than 3 percent of the total ridership. Five larger markets comprised the remaining 25 percent of the riders. The Chicago-to-Denver portion of the route accounts for the largest percentage of ridership at 9 percent and frequently sells out during the peak summer months. Because of the proximity of Glenwood Springs to several of Colorado's ski areas, Amtrak limits sales in the Denver to Glenwood Springs market to ensure availability of seats for longer distance travelers. Only 4 percent of Amtrak's ridership on the line travels the full distance from Chicago to Emeryville.[10] Figure 3-20 displays a breakdown of 2009 Zephyr ridership by market.

Amtrak placed orders valued in excess of $3 million for goods and services in Colorado during 2011 and employed 69 Colorado residents. Table 3-7 includes ridership to and from stations along the Southwest Chief and California Zephyr lines in Colorado from 2006 through 2011. As shown, total ridership in Colorado was approximately 206,000 riders in 2011.

The Southwest Chief is a 2,256-mile Amtrak route through the Midwestern and Southwestern U.S., operating between Chicago and Los Angeles. The route travels through eight states: Illinois, Iowa, Missouri, Kansas, Colorado, New Mexico, Arizona, and California. The Southwest Chief has 33 stops over 42 hours and operates daily service.

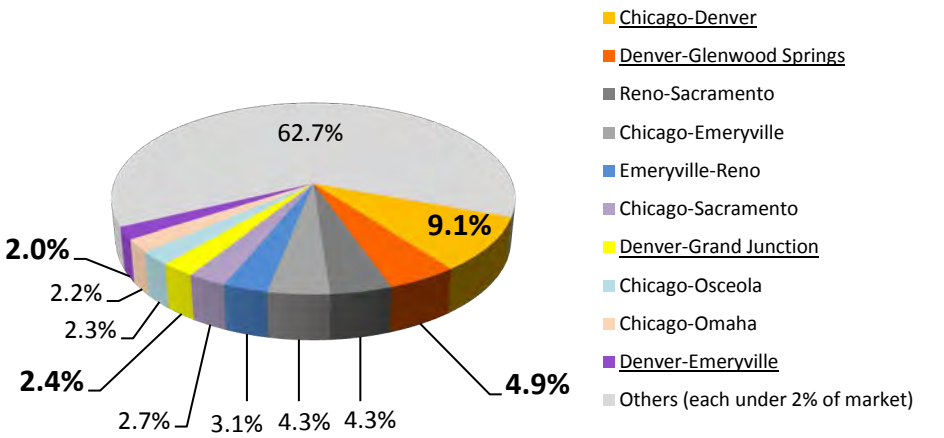


Figure 3-20. California Zephyr Route Ridership Breakdown by Market (2009)

[9] Amtrak, CDOT Data Request, 2012
[10] Amtrak, PRIIA *Section 210 FY 2010 Performance Improvement Plan*, 2010

Table 3-7. Amtrak Ridership in Colorado (2006–2011)

Station	FY 2006			FY 2007			FY 2008			FY 2009			FY 2010			FY 2011		
	Boarding	Alighting	Total	Boarding	Alighting	Total	Boarding	Alighting	Total	Boarding	Alighting	Total	Boarding	Alighting	Total	Boarding	Alighting	Total
Fort Morgan	1,311	1,333	2,644	1,465	1,455	2,920	1,523	1,655	3,178	1,438	1,541	2,979	1,591	1,758	3,349	1,578	1,613	3,191
Denver	61,136	58,228	119,364	63,530	59,743	123,273	65,979	63,794	129,773	61,487	58,749	120,236	65,129	63,281	128,410	58,968	56,374	115,342
Fraser	4,169	4,408	8,577	4,195	4,649	8,844	4,478	4,922	9,400	3,986	4,404	8,390	3,771	4,142	7,913	3,913	4,339	8,252
Granby	1,238	1,490	2,728	1,914	1,594	3,508	1,757	1,872	3,629	1,477	1,544	3,201	1,789	1,866	3,655	1,684	1,937	3,621
Glenwood Spring	13,207	14,305	27,512	14,946	17,751	32,697	17,471	19,013	36,484	13,943	15,428	29,371	16,502	17,725	34,227	16,216	17,560	33,776
Grand Junction	10,574	11,182	21,756	11,979	13,136	25,115	13,779	14,523	28,302	11,148	12,244	23,392	14,193	14,642	28,835	14,218	15,000	29,218
Lamar	946	792	1,738	925	758	1,683	885	759	1,644	983	739	1,722	1,065	832	1,897	1,030	810	1,840
La Junta	3,439	3,492	6,931	3,231	3,325	6,556	3,828	3,647	7,475	3,506	3,303	6,809	3,753	3,511	7,264	3,256	3,397	6,653
Trinidad	2,294	2,101	4,395	2,010	1,946	3,956	2,447	2,181	4,628	1,961	1,962	3,923	1,977	2,125	4,102	2,262	2,273	4,535
Total	98,314	97,331	195,645	104,195	104,357	208,552	112,147	112,366	224,513	99,929	99,914	200,023	109,770	109,882	219,652	103,125	103,303	206,428

In Colorado, the Southwest Chief has stations in Lamar, La Junta, and Trinidad. In 2011, the Southwest Chief carried more than 354,900 passengers, had a daily ridership of 972, and generated revenues in excess of $44 million. [11] The Southwest Chief operates on track owned by BNSF Railway.

Figure 3-21, Table 3-8, and Table 3-9 describe the connections between the two Amtrak routes within the state and the various intercity and regional bus routes operating in Colorado.

In January 2010, BNSF announced to Amtrak that all maintenance costs for continued operation of the Southwest Chief between La Junta, Colorado, and Lamy, New Mexico, would have to be borne by Amtrak, if Amtrak wished to continue operating service over the same right-of-way. BNSF also declared that it will maintain the tracks between Hutchinson, Kansas, and La Junta, Colorado, at a 60-mph passenger train maximum speed instead of the existing 79 mph passenger train maximum speed unless Amtrak chose to bear the cost of maintaining the tracks at the higher speed limit, as agreements between the parties permit Amtrak to do. BNSF and Amtrak had discussed rerouting the Southwest Chief over the BNSF's freight route through Kansas, Oklahoma, Texas and New Mexico, effectively eliminating the Southwest Chief service in Colorado. At this time, Amtrak has chosen to maintain the current service and pay the additional costs of maintaining the line. BNSF will continue to accommodate Southwest Chief service on the existing route at whatever speeds Amtrak is willing to support.

[11] Amtrak, CDOT Data Request, 2012

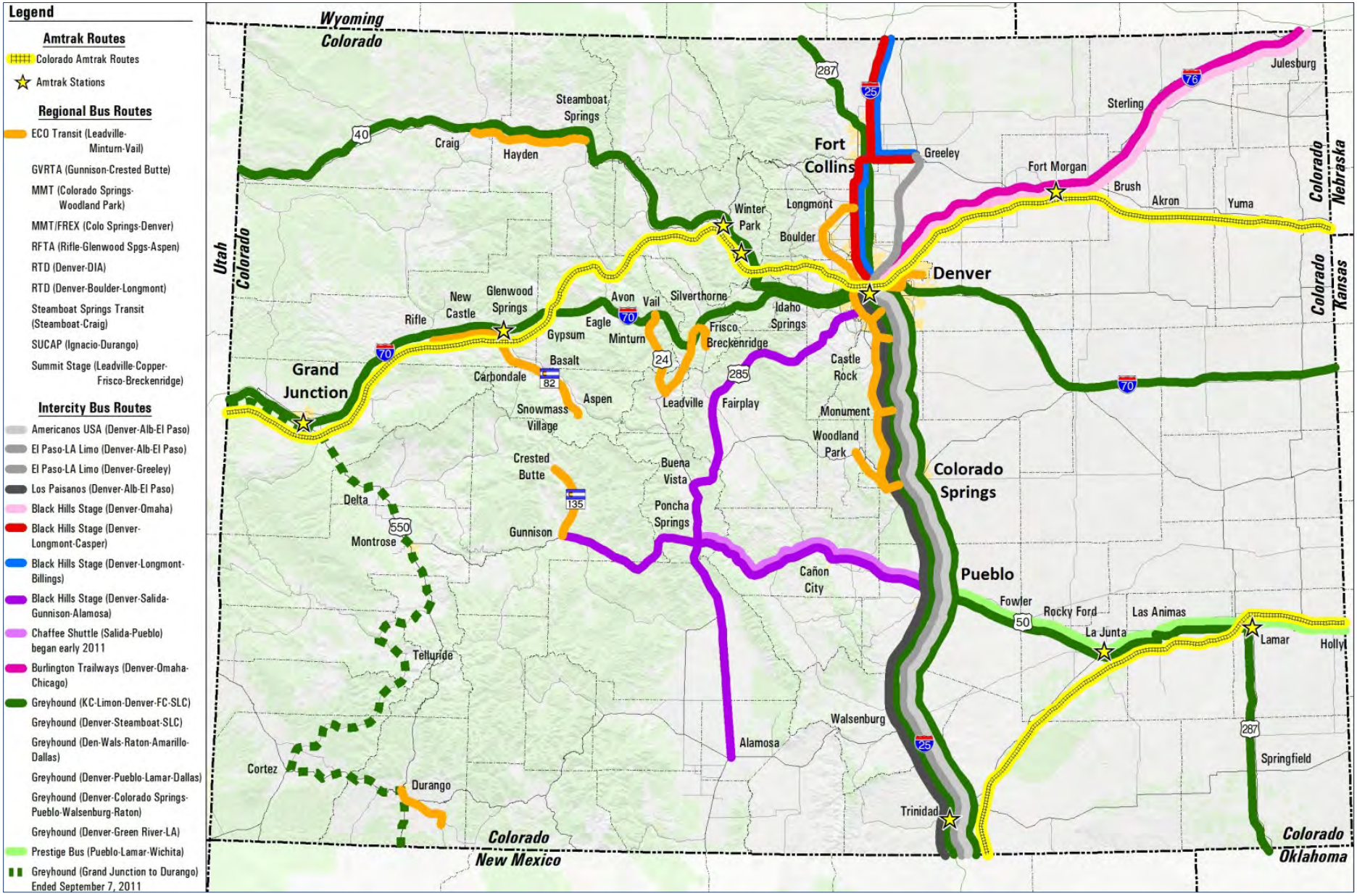


Figure 3-21. Amtrak and Intercity/Regional Bus Routes

Table 3-8. Amtrak's California Zephyr Stations and Connectivity

	Town / City	Existing Connections	Existing Intercity Bus Service
1	Fort Morgan	Northeast Colorado Association of Local Governments local demand-response service operates Monday through Saturday, 6:00 a.m. to 5:00 p.m., and serves the Amtrak station upon request. Dash-About Taxi also serves the Amtrak station.	Black Hills Stage Lines and Burlington Trailways serve Fort Morgan at a station located roughly 14 blocks from the Amtrak station.
2	Denver Union Station (DUS)	RTD Service, Greyhound Thruway buses to Glenwood Springs, Colorado Springs, and Raton, New Mexico. Taxi service also available.	• Thruway bus service between Denver-Colorado Springs-Pueblo (Greyhound). • Thruway bus service between Denver-Vail-Glenwood Springs (Greyhound). • Thruway bus service connected to the Southwest Chief in Raton, New Mexico. • Black Hills Stage Lines service between Alamosa/Gunnison and Denver. • Greyhound service between Denver and Salt Lake City.
3	Fraser/Winter Park	Only seasonal transit service is available in Winter Park.	Greyhound serves Winter Park but does not currently connect with the Amtrak station.
4	Granby	No local transit service is available in Granby. Greyhound service between Denver and Salt Lake City stops roughly two blocks from the Granby Amtrak station.	Greyhound service between Denver and Salt Lake City stops roughly two blocks from the Granby Amtrak station.
5	Glenwood Springs	Greyhound, Roaring Fork Transportation Authority, and Glenwood Springs Transit serve Glenwood Springs.	Amtrak Thruway bus service (provided by Greyhound) between Glenwood Springs and Denver stops at the Amtrak station. Additional Greyhound service stops at a Greyhound station on the west end of Glenwood Springs.
6	Grand Junction	Grand Valley Transit operates between 5:15 a.m. and 7:15 p.m. and has several routes with stops near the Amtrak station but does not stop at the Amtrak station. Paratransit service is available for elderly and disabled and serves the Amtrak station upon request. Taxi service is also available in Grand Junction.	Greyhound serves Grand Junction. The Greyhound station is located roughly four blocks from the Amtrak station.

Table 3-9. Amtrak's Southwest Chief Stations and Connectivity

	Town / City	Existing Connections	Existing Intercity Bus Service
1	Lamar	Prowers Area Transit/Prairie Dog Express operates local demand response transit service between 7:30 a.m. and 5:00 p.m. They serve the Amtrak station upon request. No taxi service available.	• Greyhound serves Lamar on a route between Dallas-Lamar-Pueblo-Denver but does not stop at the Amtrak station. • Prestige Bus Lines serves Lamar but does not stop at the Amtrak station.
2	La Junta	The City of La Junta operates demand response service between 8:00 a.m. and 4:30 p.m. and serves the Amtrak station upon request. No taxi service available.	• Greyhound goes through La Junta on a route between Dallas-La Junta-Pueblo-Denver but does not currently stop in La Junta. • Prestige Bus Lines serves La Junta but does not stop at the Amtrak station.
3	Trinidad	South Central COG Transit operates demand response service between 7:00 a.m. and 6:00 p.m. and serves the Amtrak station upon request. SCCOG also operates a fixed route service between 8:00 a.m. and 5:00 p.m. that stops on Commercial Street adjacent to the Amtrak station. No taxi service available.	Greyhound and Los Paisanos both stop in Trinidad but do not currently service the Amtrak station.

The Regional Transportation District FasTracks Program

The Regional Transportation District (RTD) FasTracks Program is a multi-billion dollar transit expansion plan designed to integrate new transit modes into a comprehensive region-wide system. The FasTracks program is designed to increase transit mode share during peak travel times, provide improved transportation choices and options, and balance transit needs with future regional growth. As part of FasTracks, commuter rail and bus rapid transit technologies will be introduced to the region in addition to a new light rail corridor and some additional extensions of existing light rail corridors. RTD's current system uses buses and light rail to meet the Denver metro area's transit needs. Commuter rail is a passenger train used for local or regional service, typically of longer distances, operating between a hub city and surrounding communities or activity centers. Commuter rail vehicles usually operate in an existing rail corridor along freight and/or passenger lines, and have a heavier frame and larger body than light rail vehicles. Commuter rail also has higher maximum and average speeds due to longer distances between stops.

Figure 3-22 depicts RTD's FasTracks' existing light rail and commuter rail network, with proposed commuter rail lines (orange) and light rail expansion of existing lines (dark blue). The four proposed commuter rail lines are the Gold Line, East Corridor, Northwest Rail, and North Metro. Electric multiple unit (EMU) technology is the proposed equipment on the Gold

Line, East Corridor, and North Metro lines. Most of the Northwest Rail Corridor will use diesel multiple unit (DMU) technology with only the initial segment using EMU. This will be a critical element regarding the potential for future operations/interoperability of these corridors.

As part of introducing commuter rail, RTD also has proposed building a Commuter Rail Maintenance Facility to repair, maintain, clean, fuel, and store the commuter rail vehicles. The following is a status of the FasTracks commuter rail-related projects:

- **Denver Union Station (DUS)—**DUS will serve as a multimodal transportation hub, integrating light rail, commuter rail, and intercity rail (Amtrak), as well as regional, express, and local bus service; the 16th Street Mall shuttle; the Downtown Circulator; intercity buses, taxis, shuttles, vans, and limousines; and bicyclists and pedestrians. Construction on the project began in 2010 and is scheduled for completion in 2014. The current DUS design will construct an eight-track stub end station for Amtrak and commuter rail adjacent to the historic station. Once FasTracks is fully operational, there will be additional capacity for more passenger trains in this facility. If an agreement can be reached with UP and BNSF to operate passenger trains on the consolidated mainline (CML), the DUS design allows for future added track connections to permit service on the CML to points south of Denver. Such an agreement with the Class I railroads has not yet been reached.
- **Commuter Rail Maintenance Facility**—RTD needs the Commuter Rail Maintenance Facility to repair, maintain, clean, fuel, and store the vehicles that will serve the four FasTracks commuter rail corridors: Gold Line, East Corridor, Northwest Rail, and North Metro. The maintenance facility is a 30-acre site located at 48th Avenue and Fox Street, just northwest of Interstates 70 and 25. The facility will be adjacent to the Gold Line and Northwest Rail alignments and will be operational in 2015. The Commuter Rail Maintenance Facility and the East Corridor, Gold Line, and the Northwest Rail Corridor (to the S. Westminster station) are being funded and constructed as a part of the Eagle P3, a public-private partnership finance, design, build, operate, maintain project.

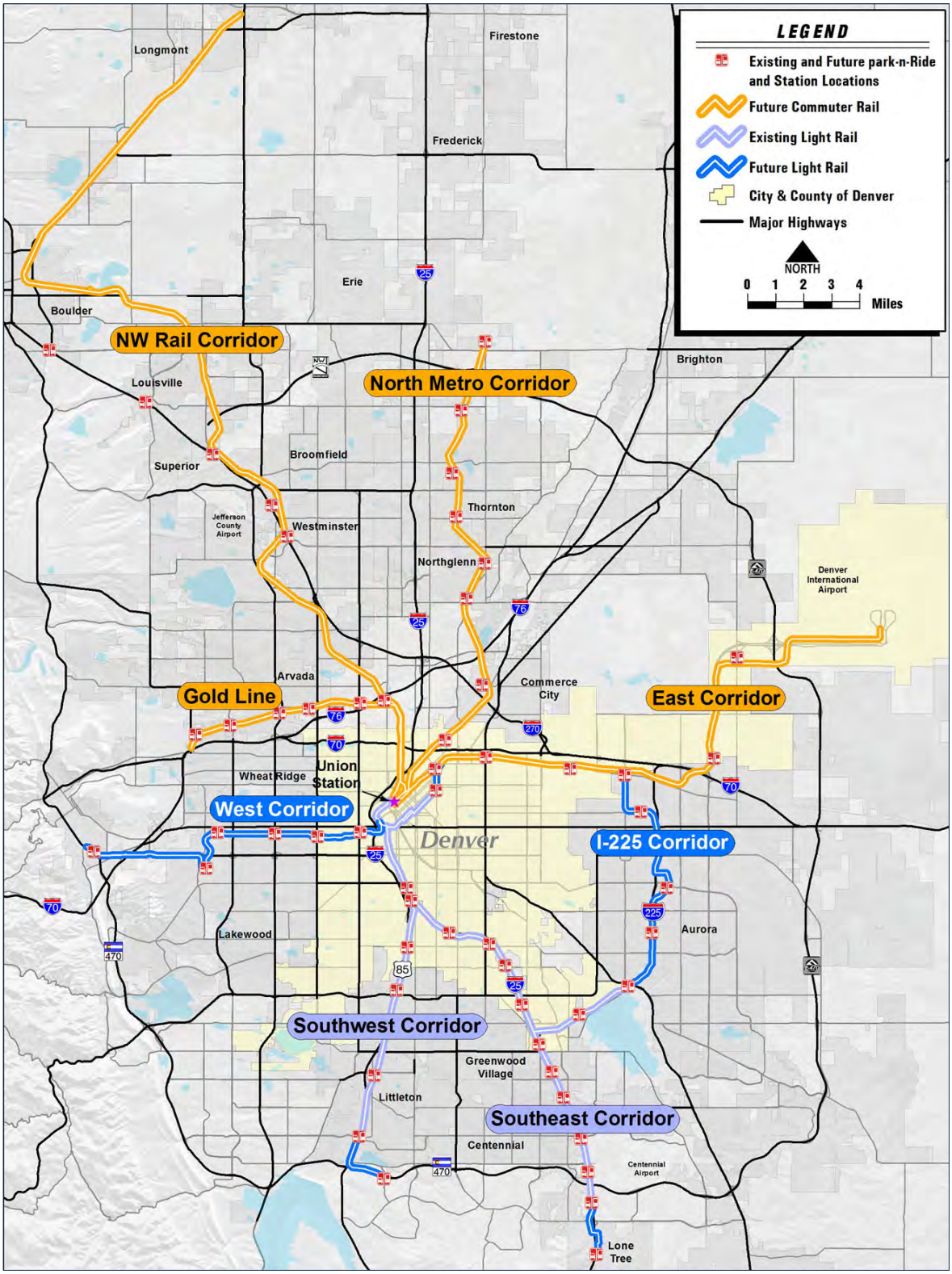


Figure 3-22. FasTracks Existing and Future Light Rail and Commuter Rail Corridors

- **East Corridor Commuter Rail**—The East Corridor Commuter Rail Line will be a 22.8-mile commuter rail transit corridor between DUS and Denver International Airport and will have five intermediate stations. An Environmental Impact Statement (EIS) was completed for the line and a Record of Decision was issued in 2009. Final design of the project began in 2010 and construction began in 2011. The line, part of the Eagle P3 project noted above, is scheduled to open in January 2016.
- **Gold Line**—The Gold Line, also part of the Eagle P3 project, is an 11.2-mile commuter rail transit corridor that will connect DUS to Wheat Ridge, passing through northwest Denver, Adams County, and Arvada. The line will include seven stations. An EIS was completed for the project and a Record of Decision was issued in 2009. Gold Line construction is scheduled to begin in 2012 and will open to the public in 2016.
- **North Metro Rail Line**—The North Metro Rail Line is a proposed 18-mile corridor from DUS north through Adams County, Commerce City, Northglenn, and Thornton. An EIS was completed for the project in 2011 and construction of the first phase of the project from Denver Union Station to the National Western Stock Show will begin in 2012. Without additional funding implementation of this line will be substantially delayed.
- **Northwest Rail Corridor Line**—The Northwest Rail Corridor Line is a 41-mile route from DUS to Longmont, passing through North Denver, Adams County, Westminster, Broomfield, Louisville, and Boulder. A Final Environmental Evaluation for the first phase of the project between Denver and Boulder was released in 2010. Without additional funding implementation of this line will be substantially delayed.

Scenic Railroads

Colorado is home to eight scenic railroads that operate on standard or narrow gauge tracks, or in one case, on a cog rail system. These tourist oriented carriers typically operate under different authority than do short line rail operators and usually do not fall under the jurisdiction of the STB, with two exceptions. Because both the Rio Grande Scenic Railroad and the Royal Gorge Railroad operate on shared lines on which freight service operates, the STB has regulatory jurisdiction over these lines.

Table 3-10 lists Colorado's scenic railroads, routes lengths, and dates of operation.

Table 3-10. Colorado's Scenic Railroads

Scenic Railroad	Route Miles Operated	Gauge	Trips per Day Max/Min	Operates
Cripple Creek and Victor Narrow Gauge Railroad	4	Narrow	10/2	Mid-May—Mid-October
Cumbres & Toltec Railroad	63	Narrow	2	Late May—Mid-October
Durango & Silverton Narrow Gauge	45	Narrow	4/1	Year-Round
Georgetown Loop Railroad	4	Narrow	6/1	Late April—December
Leadville Colorado & Southern Railroad	22	Standard	2/1	Late May—Early October
Manitou and Pikes Peak Railway Co.	9	Abt Rack System	8/1	Year-Round
Rio Grande Scenic Railroad	62	Standard	3/1	Late May—October
Royal Gorge Route Railroad	12	Standard	4/1	Late May—December

Rio Grande Scenic Railroad on La Veta Pass

The Rio Grande Scenic Railroad operates over the San Luis & Rio Grande's lines through the San Luis Valley and connects to the Cumbres & Toltec Railroad. The Royal Gorge Route Railroad operates on UP's line between Cañon City and Parkdale. Rock and Rail, a short line freight railroad operating on the same UP line, owns a 50 percent interest in the Royal Gorge Route Railroad. The Manitou and Pikes Peak Railway Co. operates on an Abt Rack System also know as a "cog railway" because it utilizes a cog wheel that meshes into a special middle track. Figure 3-23 displays Colorado's scenic railroad corridors that generate significant economic activity in the communities and regions in which they operate.

The Ski Train[12]

The Ski Train was originally operated between Denver and the Winter Park ski area by the DRGW beginning in 1940. The train was youth oriented in the 1950s and 1960s and was

[12] www.skitrain.com

dominated by the Eskimo Ski Club, whose members ranged in age from 7 to 17. Many Coloradoans today credit the Ski Train for their introduction to the sport of snow skiing.

In 1988, the Ski Train came under new ownership following the DRGW's parent company's acquisition of the Southern Pacific Railroad. The equipment was upgraded and new services were introduced, including Saturday summer trains to Winter Park.

The Ski Train operated at a consistent loss from 1988 to 2009. While profitability was not an issue, more recently the Ski Train faced additional serious challenges, including liability coverage, operational conflicts with UP freight traffic, and uncertainties with the redevelopment of DUS. The Ski Train made its last run on March 29, 2009.

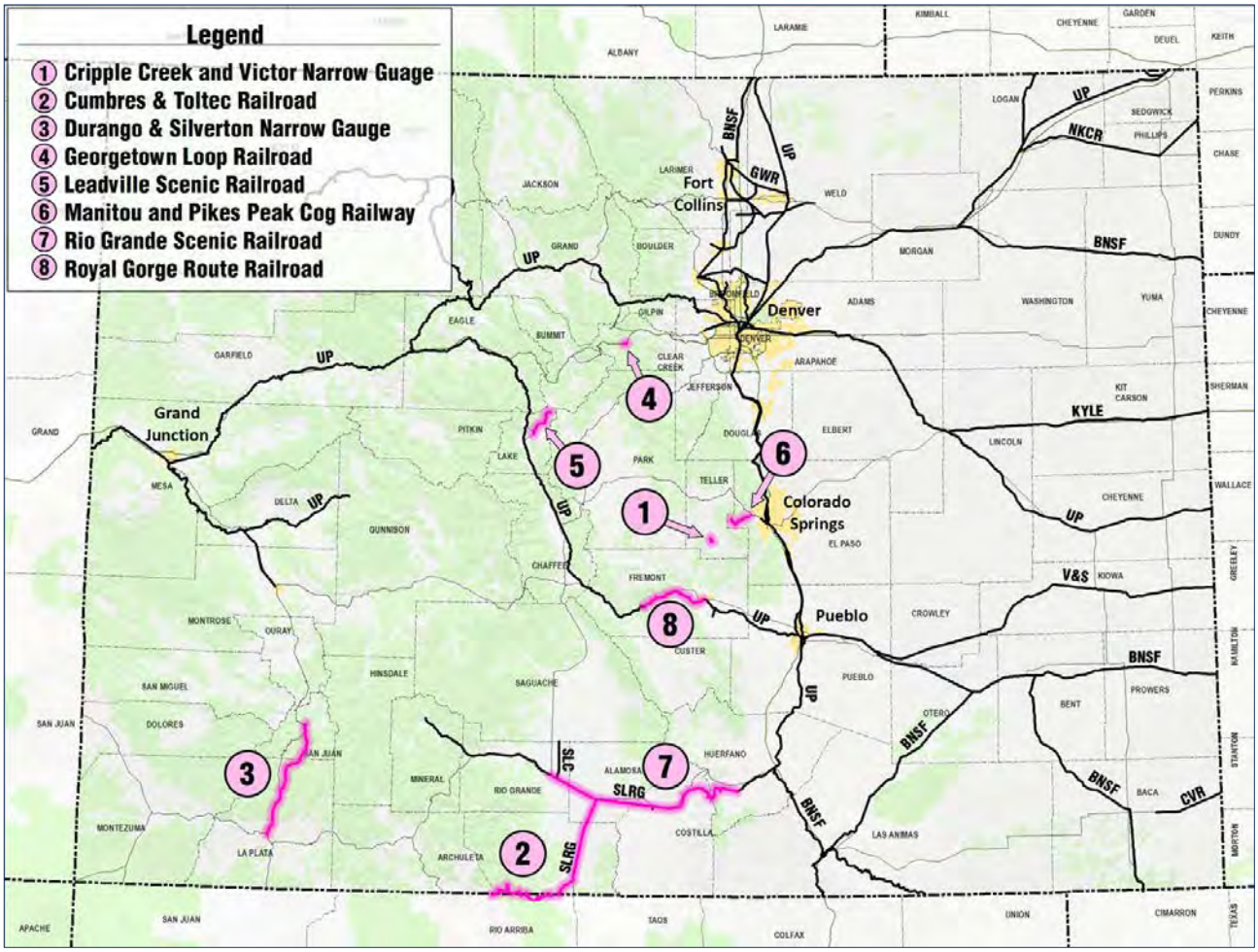


Figure 3-23. Colorado Scenic Railroads

Other Passenger Rail Services under Study

There are currently no other regional, interregional, or commuter passenger rail services in Colorado. However, interest exists in passenger rail service in several of Colorado's Front Range and mountain communities. This interest is based on the belief that the amount of land and financing available for an expanded highway system is very constrained and that passenger rail can provide a viable alternative to travelers. Two studies related to passenger rail recently were completed, and two other high-speed passenger rail studies are planned. The following is a summary of the status of these studies:

- **Rocky Mountain Rail Authority High Speed Rail Feasibility Study**—The Rocky Mountain Rail Authority (RMRA) was a multi-jurisdictional government body comprised of more than 50 Colorado cities, towns, counties, and transit authorities. In 2010, RMRA completed a study that evaluated the I-70 corridor from Denver International Airport to Grand Junction and the I-25 corridor from Cheyenne, Wyoming to Trinidad, Colorado, through the metropolitan areas of Fort Collins, Denver, Colorado Springs, and Pueblo. The 18-month feasibility study focused on determining whether options exist that are capable of meeting technical, financial, and economic criteria for high-speed rail feasibility. In coordination with CDOT, the study identified a number of options between Fort Collins and Pueblo in the I-25 corridor and between Denver International Airport and Eagle County Airport in the I-70 corridor that exceed the Federal Railroad Administration's (FRA) threshold for high-speed rail feasibility.
- **North I-25 Environmental Impact Statement**—In the summer of 2011, CDOT released the *North I-25 Final EIS*. The purpose of the study was to identify reasonable transportation improvements to address mobility, accessibility, safety, and the aging infrastructure along I-25 while providing more transportation choices. In addition to highway improvements along the North I-25 corridor, the Preferred Alternative included commuter rail service (Figure 3-24) with nine stations connecting Fort Collins to Longmont using the BNSF Railway right-of-way, generally paralleling SH 119 then Weld County Road 7 and tying into FasTracks North Metro line in Thornton to provide service to downtown Denver.

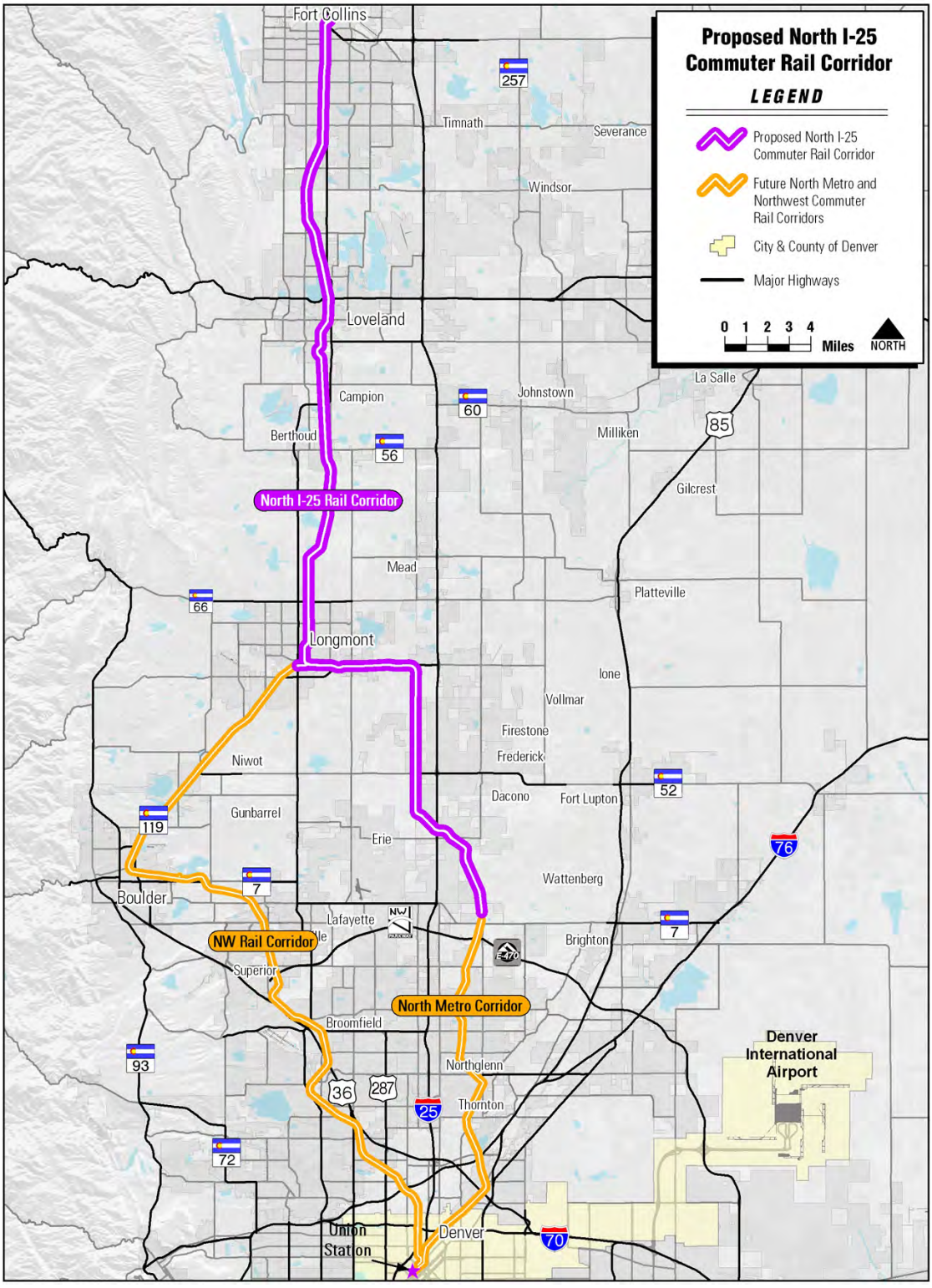


Figure 3-24. Proposed North I-25 Commuter Rail Corridor

- **I-70 Mountain Corridor Advanced Guideway System (AGS) Feasibility Study**—The *AGS Feasibility Study* is a result of selection of the Preferred Alternative in the *I-70 Mountain Corridor EIS* Record of Decision (ROD) by CDOT and the Federal Highway Administration. The ROD specifies a multi-modal solution, including an AGS that will best meet the need for a long-term transportation solution in the I-70 Mountain Corridor from Eagle County to C-470. The purpose of the study is to identify alternatives (alignments, technologies, and stations) to implement a high-speed rail system along the I-70 Mountain Corridor. The study began in early 2012 and will be coordinated with the *Colorado Interregional Connectivity Study.*
- **Colorado Interregional Connectivity Study**—In 2009, CDOT applied for High-Speed Intercity Passenger Rail federal planning funds. A $1 million grant was awarded by the FRA along with $1 million of state matching funds. The primary purpose of the *Interregional Connectivity Study* (ICS) is to serve as a planning document and provide preliminary recommendations for High-Speed Intercity Passenger Rail alignments, technologies, and station locations in the Denver Metropolitan Region that will maximize ridership for the proposed RTD FasTracks system and future high-speed rail service. Scenario development and screening are expected to result in an analysis that supports a short list of alternatives that are technically feasible, cost-effective, and provide favorable system connectivity. The study began in early 2012 and is scheduled to be completed in 2013. The study will run concurrently with the *I-70 Mountain Corridor AGS Feasibility Study.*
- **Western High Speed Rail Alliance**—The Denver regional Council of Governments (DRCOG) is a founding member of the Western High Speed Rail Alliance along with the metropolitan planning organizations in Phoenix, Las Vegas. Reno and Salt Lake City. The Alliance proposes the development of high-speed rail connections between the cities of Denver, Salt Lake City, Las Vegas, Phoenix and Los Angeles with an additional connection between Salt Lake City, Reno and San Francisco which ultimately connects to Portland and Seattle. Alliance members have agreed to work together to acquire funding to study high-speed rail options, develop plans for high-speed rail infrastructure and construct high-speed rail facilities throughout western U.S. that are determined to be viable.

- **Statewide Transit Plan**—It is the intent of CDOT's Division of Transit and Rail to complete a Statewide Transit Plan. That Plan will synthesize past and current studies into a vision for transit and passenger rail in the state, including both capital and operations and maintenance expenditures. The passenger rail elements of this State Rail Plan will become part of the Statewide Transit Plan, and combined with studies on transit performance measures, an intercity and regional bus study, a transit capital/asset inventory study, human service coordination plans, and the ICS and AGS studies noted above. The Statewide Transit Plan, in turn, becomes an input to the multi-modal long range Statewide Transportation Plan.

Chapter 4 State Rail Plan Outreach

The commitment by CDOT to obtain input from, and inform the public about the Plan required a public involvement process that brought together multi-level, multi-interest stakeholder groups to discuss priorities, values, vision, and goals for Colorado's rail network.

Given the geographic diversity of stakeholders, a flexible approach to communication was implemented to ensure all citizens had opportunities to provide input. Several means of communication were used, including meetings, open houses, workshops, the media, and the Internet, to disseminate and receive information and feedback throughout the process of developing the Plan. By using some of the core principles of Context Sensitive Solutions, including continuous communication with a full range of stakeholders, comments from both the state's freight and passenger interests were able to be incorporated in a balanced and meaningful way.

Stakeholders

The Plan was guided throughout the entire process by input from the Project Management Team (PMT), the Steering Committee (SC), the Stakeholder Group (SG), and the public.

Project Management Team

The PMT consisted of CDOT leaders from the Division of Transit and Rail, the Division of Transportation Development, and the Government Relations Office as well as representatives from the FRA and key members of the Consultant Project Team. The PMT met 12 times. The group provided overall direction related to the study's scope, tasks, and upcoming meetings.

Steering Committee

The SC included representatives of passenger and freight rail interests from across the state, identified by the PMT and the Consultant Project Team. The SC met five times throughout the study. The initial meeting focused on the history of rail in Colorado, an outline of the study's outreach plan and the study's vision. The SC also was asked to help identify key stakeholders. The second meeting focused on the proposed workshops and open houses to engage the public, a discussion of best practices in rail planning, and an initial outline of the Plan's goals. Refining the Plan's goals and objectives was a major focus of the third meeting in September. The fourth meeting in December focused on the preliminary draft recommendations and freight and passenger project priority lists. The final meeting in March was spent discussing major themes of the comments to the Draft Plan. Steering Committee members are listed in Table 4-1.

Table 4-1. Steering Committee Members

Name	Organization	Representing
Gary Beedy	Lincoln County Commissioner	Colorado Counties, Inc.
Mark Radtke	Colorado Municipal League	Colorado Municipal League
Craig Casper	Pikes Peak Area Council of Governments	Metropolitan Planning Organizations
Vince Rogalski	Statewide Transportation Advisory Committee	Transportation Planning Regions
Jonathan Hutchison	Amtrak	Passenger Rail
Steve Gregory	San Luis & Rio Grande Railroad	Short line Railroads/Freight Rail
Mike Ogborn	OmniTRAX	Short line Railroads/Freight Rail
Alice Destigter	Union Pacific Railroad	Class I Railroads/Freight Rail
Sarod Dhuru	BNSF Railway	Class I Railroads/Freight Rail
Cathy Shull	Progressive 15	Progressive 15, Action 22, Club 20
Ann Rajewski	Colorado Association of Transit Operators	Transit
Henry Stopplecamp	Regional Transportation District	Transit
Tim Larsen	Colorado Department of Agriculture	Agricultural Interests
Matt Cheroutes	Office of Economic Development	Economic Interests
Mehdi Baziar	Colorado Department of Transportation	Study Project Manager
Wendy Wallach	Colorado Department of Transportation	Study Deputy Project Manager
Sandi Kohrs	Colorado Department of Transportation	Statewide Planning and Performance Measures Manager

Stakeholder Group

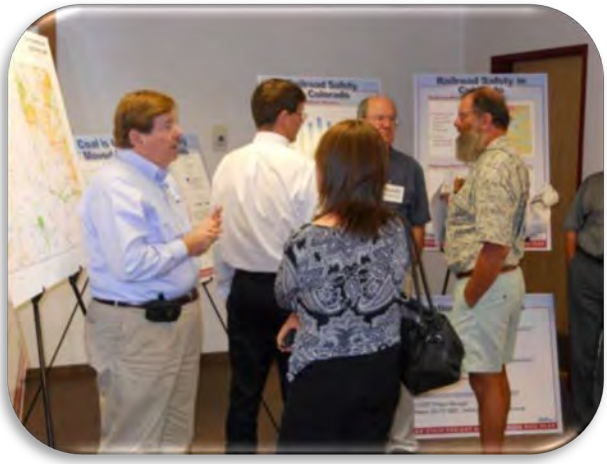
The SG consisted of self-selected community leaders who represented a diverse population of individuals and ideas from across the state. The SG was charged with providing feedback and input to the Steering Committee. It initially consisted of a few members and quickly grew to more than 325 members throughout the course of the study. The SG met three times during the study and served as the study's public ambassadors. During its first meeting, the SG discussed the project's scope of work, the public outreach plan, and the plan's vision and broke into small working groups to propose freight and passenger rail goals for the Plan. During the second meeting the stakeholders again broke into small working groups to refine the study's goals and objectives. The SG also was asked to help publicize six open houses in order to gather additional input for the Plan. In its final meeting, the SG discussed the draft study's project evaluation criteria and its prioritization effort. An overview of key public involvement themes also was presented. Meeting notes from SG meetings are included in Appendix A.

State Transportation Advisory Committee and Transit and Rail Advisory Committee

Presentations to update State Transportation Advisory Committee (STAC) and Transit and Rail Advisory Committee (TRAC) were made throughout the study. Presentations of the Final Draft Plan were provided to the STAC and TRAC at their March 2012 meetings. Several comments received at these meetings from STAC and TRAC members were incorporated into the Final Plan.

Meetings, Workshops, and Open Houses

The Public Involvement effort included a series of meetings with key stakeholders throughout the state. The effort targeted Colorado's two Class l railroads, the agricultural, coal, and economic development sectors, as well as elected and appointed officials, including representatives from four Congressional offices (Senators Bennet and Udall and Representatives Gardner and Tipton), representatives of state and federal agencies, and members of the public and the media.



Alamosa open house

La Junta workshop

Meeting summaries for meetings in Table 4-2 and Table 4-3 are included in Appendix A.

Table 4-2. Plan Workshops/Open Houses

Date	Location
August 15, 2011	Akron
August 17, 2011	Limon
August 23, 2011	Denver
August 25, 2011	Grand Junction
August 31, 2011	La Junta
September 1, 2011	Alamosa

Table 4-3. Other Stakeholder Meetings

Date	Title	Location
May 5, 2011	BNSF Railway	Fort Worth, TX
May 16, 2011	Union Pacific Railroad	Omaha, NE
August 3, 2011	Agriculture Commissioner John Salazar and Colorado Agricultural Community Representatives	Denver
August 22, 2011	Colorado Coal Industry Representatives	Denver
September 1, 2011	North Front Range Metropolitan Planning Organization	LaSalle
September 14, 2011	Pikes Peak Area Council of Governments	Colorado Springs
October 5, 2011	Colorado League of Women Voters	Loveland
October 11, 2011	Office of Economic Development	Denver
November 1, 2011	City of Colorado Springs Citizens Transportation Board	Colorado Springs
November 25, 2011	Pikes Peak Area Council of Governments	Colorado Springs

Comments and Feedback

Hundreds of comments were received as a result of these efforts. All comment cards and e-mail comments have been transcribed verbatim and are included in Appendix A. Formal letters also are included in Appendix A. The comments and input received throughout the stakeholder outreach focused on several themes.

Providing expanded rail passenger service—intercity, commuter, and high speed rail—was a common theme of input. The future commuter rail service from the Denver area north to Fort Collins received a considerable amount of public support as is shown in the Comments Section of Appendix A. This level of support contributed to the project receiving a "high" ranking in the category of "Proposed Passenger Service—Commuter Rail" in the Rail System Improvement Program shown in Chapter 6.

Another focus of comments and input was support for short line railroads. One of the Plan's recommendations, shown below and in more detail in Chapter 8, calls for the development of a "Short Line Assistance Program" similar to models developed by other states. This theme was closely linked to the rail-related economic development theme that was consistently brought forward at the workshops and open houses.

The strong support for highway/rail crossing safety improvements are reflected in the large list of railroad/public safety projects shown in Table 6-3 in Chapter 6.

Comments in "opposition to" as well as "in favor of" rail relocation onto the eastern plains led to the more detailed discussion of this issue in Chapter 5.

Other comments and input themes, such as retaining all rail lines and services, shipper-access issues, improved communication between railroads and all interested parties, and ensuring that freight and passenger rail are fully incorporated into the state's long-range transportation planning processes, were also incorporated into the Plan's recommendations.

All comments were reviewed and evaluated by members of the CDOT/Consultant team as they were received throughout the process of developing the Plan. Many of the comments provided during the process led to the projects that are shown in the various freight-and-passenger project categories discussed in more detail in the Rail System Improvement Program highlighted in Chapter 6.

Also, the input and the themes were instrumental in the development of the detailed Plan recommendations included in Chapter 8. The following is an overview of those recommendations made to improve the freight-and-passenger rail systems in Colorado to enhance rail planning activities within the state.

- Position Colorado for future federal funding for freight-and-passenger-related infrastructure improvements.
- Explore new state and local funding sources for rail-related programs, infrastructure, and services.
- Facilitate improved communication between communities and railroads.
- Coordinate to ensure integration and connectivity with other existing and planned transportation system improvements.
- Embrace a performance based evaluation process to incorporate rail alternatives into transportation corridor planning when appropriate.
- Develop and explore implementation options for a regional commuter rail system

- Maximize use of existing infrastructure and monitor significant rail corridor infrastructure to ensure future corridor preservation and expansion.
- Facilitate meetings between the Colorado Office of Economic Development, the Class I and short line railroads, regional economic development agencies, and representatives of various economic sectors, such as agriculture, defense, and energy, to explore win/win opportunities to grow the Colorado and local/regional economies.
- Develop and implement a Short Line Railroad Assistance Program.
- Support the linking of Colorado's passenger-rail systems to the developing national intercity and high-speed rail networks.
- Utilize the Stakeholder Group convened for the State Freight and Passenger Rail Plan as a resource for the upcoming Interregional Connectivity and Advanced Guideway Systems (AGS) studies and to advise on future updates to the State Rail Plan.

Chapter 5 Rail Issues and Opportunities

Freight and passenger rail have a significant impact on the economy, environmental resources, land use, communities, and of course, transportation. The freight and passenger rail systems in Colorado have the opportunity to move people and goods, create jobs, increase access and connections, manage highway congestion, and help reduce greenhouse gas (GHG) emissions. This chapter outlines the issues and opportunities related to the economic, environmental, land use/community, and safety/security aspects of rail transportation in Colorado.

Economic

Freight railroads make a significant contribution—nearly $265 billion—to the U.S. economy by shipping commodities and generating and supporting jobs.[13] Additional economic benefits of the rail industry are identified later in this chapter.

Impact of Recent Recession

Since 2008, freight rail traffic has been either declining or growing slowly due to the global recession. In recent history, 2006 was the peak year for rail traffic, while 2009 was the lowest in terms of average weekly carloads of freight. Although traffic still remains lower than levels prior to 2008 according to the American Association of Railroads (AAR), 2010 was better than 2009 and "was a good year for coal and grain commodity carloads, as well as intermodal traffic." Freight rail traffic is trending upward, and the nation's largest railroads have confirmed this growth. UP reported an increase of 8 percent between 2010 and 2011 in industrial product traffic.[14]

Despite the recession, freight shipments are still expected to rise significantly in the next several decades, with population and economic growth as the driver. The AAR's National Rail Freight Infrastructure Capacity and Investment Study projects an 88 percent increase in tons moved by 2035.

Passenger rail traffic has been increasing for many years. Despite a downturn in 2009 due to the recession, Amtrak reported a 44 percent national increase in ridership from 2000 to 2011. In fact, 2011 brought record numbers of ridership for Amtrak.[15] This is consistent with recent Amtrak trends as ridership has set records for eight of the last nine years.

[13] American Association of Railroads, *Great Expectations 2011*
[14] Jakcson, Anna-Louise and Feld, Anthony, "No Sign of Recession with Rail Shipments Showing Growth Trend," *Bloomberg*, September 22, 2011. Percentage growth as of September 2011.
[15] *The Economist*, "Amtrak: Another Record Year on America's Rails," October 23, 2011.

Railroad Capital Spending

Class I railroads regularly invest in infrastructure replacement and improvement and positive train control projects. These capital investments include strengthening track infrastructure, replacing or adding locomotives and freight cars, adding new tracks or facilities, and other improvements. The two Class I railroads in Colorado have recently made the following investments:

- In 2010, UP invested $36.8 million in Colorado. This is less than, but comparable to, previous years, with nearly $43 million invested in 2008.[16]
- In 2008–2010, BNSF invested more than $104 million in Colorado for capital expenditures and maintenance and expects to make similar investments in the years ahead.[17]

The cost of rail projects is significant. For instance, the cost of adding an additional main passing track or rail siding costs approximately $5 million per track mile. In addition, the average cost to upgrade an existing at-grade rail/highway crossing with flashing lights, cross-arm gates, and constant warning circuitry ranges between $300,000 and $400,000. According to the 2035 Statewide Transportation Plan, "the greatest hurdle to meeting transportation demand in Colorado will be finding the resources to pay for it."[18]

Employment

In 2009, there were 2,734 active employees of freight railroads in Colorado, which resulted in $276 million in wages. Additionally, there were 7,403 retired beneficiaries of the freight railroad industry in the state, resulting in $132 million in retirement benefits.[19]

Although the Research and Innovative Technology Administration of the U.S. Department of Transportation does not compile similar data on passenger

Loading lava rock in the San Luis Valley

[16] Union Pacific in Colorado, www.up.com, access December 2011.
[17] BNSF's 2011 fact Sheet "Colorado—Delivering the World to the Mile High State".
[18] CDOT, *2035 Statewide Transportation Plan*, 2008.
[19] Research and Innovative Technology Administration, *State Transportation Statistics 2010.*

rail, the agency does report such data for the entire transit and ground transportation industry. In 2009, there were 5,228 employees in this industry in Colorado, resulting in $120 million in wages.

Rail Opportunities

Many opportunities exist for freight and passenger rail to fuel economic growth by providing jobs, moving people or goods, generating revenue, and creating places of commerce, such as intermodal centers or stations/terminals and rail served industries or industrial parks. Passenger rail investment can also generate significant employment and economic growth around station areas. Improvements to and expansion of rail in Colorado would benefit the economy in those ways.

Shipping Savings

Rail shipments of freight have the opportunity to save money, as compared to shipment by other modes. Since 1980, regulation changes have resulted in lower shipping rates. According to AAR, "based on revenue per ton-mile, on average it cost 54 percent less in inflation-adjusted terms to move freight in 2007 than it did in 1981."

In 2009 Colorado imported 18.4 million tons of rail shipments and exported 19.8 million tons. The total number of shipments, including through and internal movements, totaled 163.8 million tons, according to the 2009 Surface Transportation Board Carload Waybill. If this amount of tonnage was carried by trucks instead of rail, shippers would have paid substantially more. Table 5-1 shows the potential difference in cost. This assumes average shipping costs that were presented in the 2001 Kansas State Rail Plan.

Transportation Fuel Savings

On average, rail is more fuel efficient than light cars or trucks. Fuel efficiency translates to cost savings for both shippers and passengers. According to the AAR, freight rail is four times more fuel efficient, on average, than trucks. Table 5-2 shows the potential cost increase if freight were shifted from rail to trucks. This value, over $10 billion, helps demonstrate the economic savings of freight shipping by rail.

Table 5-1. Comparison of Shipping Costs in Colorado for Rail versus Truck

Shipment Statistics	
Total rail shipments (million tons)	163.8
Total freight rail length (miles)	2,684
Billion ton-miles of goods for rail	439
Average rail shipping cost ($ per ton-mile)	$0.033
Average truck shipping cost ($ per ton-mile)	$0.105
Total shipping cost for rail (millions)	$14,487
Total shipping cost for trucks (millions)	$46,095

Source: AAR, Kansas Statewide Rail Plan (2011)

Table 5-2. Comparison of Fuel Costs in Colorado for Rail versus Truck

Shipment Statistics	
Billion ton-miles of goods for rail	439
Average rail fuel efficiency, 2010 (gallon per ton-mile)	0.00207
Average truck fuel efficiency (gallon per ton-mile)	0.00826
Rail fuel consumption (million gallons)	909
Truck fuel consumption (million gallons)	3,626
Addition fuel consumption for trucks (million gallons)	2,717
Additional fuel cost for trucks (millions)	$10,596

Source: AAR. Assumes that on average, freight rail is four times more fuel efficient than truck. Also assumes a diesel fuel cost of $3.90 per gallon

Environmental

Emissions and Air Quality

The Colorado Air Pollution Control Division regularly monitors six criteria pollutants in the state, per the Clean Air Act. With the exception of ozone, most pollutants meet the federal standards. The Denver and North Front Range metropolitan areas have been categorized as being in nonattainment status for ozone per the Clean Air Act since 2007.[20] Ground-level ozone results from the emissions of motor vehicles, industry, and vegetation. The Regional Air Quality Council in Denver has studied transportation strategies to reduce ozone levels. In 2010, the ideas explored included fuel reformulation for reduced emissions, stricter motor vehicle emission standards, alternative transportation, land use planning to reduce vehicle miles traveled, and transportation pricing to create incentives to reduce driving.

[20] Colorado Air Quality Control Commission, *Report to the Public 2010-2011*, 2011.

GHG emissions have been increasing worldwide for several decades, and Colorado is no exception. In fact, largely due to population growth, GHG emissions in Colorado between 1990 and 2005 increased 35 percent, compared to 16 percent nationally.[21] Table 5-3 shows the historical and projected GHG emissions by sector.

Table 5-3. Colorado Historical and Projected Greenhouse Gas Emissions by Sector (in million metric tons of CO_2)

Sector	1990	2000	2005	2010	2020
Electricity, consumption based	32.7 (38%)	40.9 (37%)	42.9 (37%)	48.2 ((37%)	52.6 (36%)
Residential/commercial/industrial fuel use	16.3 (19%)	20.2 (18%)	21.2 (18%)	23.6 (18%)	27.9 (19%)
Transportation	19.0 (22%)	25.5 (23%)	28.0 (24%)	30.6 (24%)	36.2 (25%)
Fossil fuel industry	7.5 (9%)	9.3(8%)	10.1 (9%)	11.8 (9%)	12.3 (8%)
Industrial processes	0.76 (1%)	2.1 (2%)	2.9 (3%)	3.8 (3%)	5.9 (4%)
Waste management	1.2 (1%)	1.9 (2%)	2.1 (2%)	2.5 (2%)	3.5 (2%)
Agriculture	8.7 (10%)	9.6 (10%)	8.9 (7%)	8.9 (7%)	9.1 (6%)
Total Gross Emissions	**86.1**	**109.6**	**116.1**	**129.3**	**147.5**

Source: Center for Climate Strategies, Final Colorado Greenhouse Gas Inventory and Reference Case Projections 1990-2020, October 2007

Energy and transportation are the largest GHG emissions sources, comprising 61 percent of the gross emissions in 2005. The projections for 2020 are similar; emissions from transportation are expected to be approximately 25 percent of gross. Within the transportation category, motor gasoline is the largest contributor to GHG emissions, followed by diesel and then jet fuel. These projections are based on data from the Colorado State Demography Office, the Department of Labor and Employment, the U.S. Department of Energy, the Federal Highway Administration, metropolitan planning organizations, and the Department of Public Health and Environment.

Air Quality Benefits of Rail

Railroads are the most environmentally sound way to move freight. In 2010, railroads moved a ton of freight an average of 484 miles per gallon of fuel consumed. According to the AAR, railroad fuel efficiency has increased 106 percent since 1980. Currently, rail transportation is up to four times more fuel efficient than using trucks. Greater use of freight rail offers a simple, inexpensive, and immediate way to meaningfully reduce GHG and other emissions. This is significant in Colorado because truck traffic is a significant contributor to ground-level ozone and GHG emissions. Ground-level ozone is an issue in Denver and the North Front Range. Shipping or traveling by rail instead of by truck or car could help reduce both of these emissions by reducing overall fuel consumption and, in some cases, by using cleaner fuel or

[21] Center for Climate Strategies, Final Colorado Greenhouse Gas Inventory and Reference Case Projections 1990-2020, October 2007.

power sources. According to the AAR, moving the same amount of freight on rail instead of by truck would reduce average GHG emissions by 75 percent.

Energy

On average, both passenger and freight rail consume less energy than cars or trucks. Table 5-4 shows this comparison. According to the U.S. Department of Energy's Transportation Energy Data Book, in 2009, the Btu per passenger mile for cars was 3,538, whereas for intercity rail it was 2,435.[22]

According to the Data Book, in 2009, the Btu per vehicle mile for heavy single unit and combination trucks was 21,127, compared to 13,907 for freight car mile for Class I railroads. However, the publication warns against comparing modes as there are complex differences.

Table 5-4. Transportation Energy Use by Mode (2009)

Mode	Trillion Btu	Percentage by Mode
Cars	8,811	32.0
Light trucks	7,608	27.6
Medium/heavy trucks	6,084	22.1
Buses	200	0.7
Total highway	**22,703**	**82.5**
Air	2,138	7.8
Water	1,291	4.7
Pipeline	857	3.1
Rail (Class I freight and passenger)	540	2.0

Source: U.S. Department of Energy, Transportation Energy Data Book: Edition 30—2011

Demographics

Population Growth

According to the U.S. Census Bureau, the population of the state of Colorado was 5,029,196 in 2010. The State Demography Office of the Colorado Department of Local Affairs projects the statewide population will be approximately 7,800,000 by 2035. Figure 5-1 shows the distribution of population percentages by 2035 for the state's Transportation Planning Regions as shown in Figure 5-2. The population of the Denver metropolitan area, which includes all or portions of Boulder, Broomfield, Gilpin, Clear Creek, Jefferson, Douglas, Denver, Adams, Arapahoe, and Weld Counties, will be over 4 million.

[22] Stacey C. Davis, Susan W. Diegel, Robert G. Boundy, U.S. Department of Energy. *Transportation Energy Data Book: Edition 30—2011*.

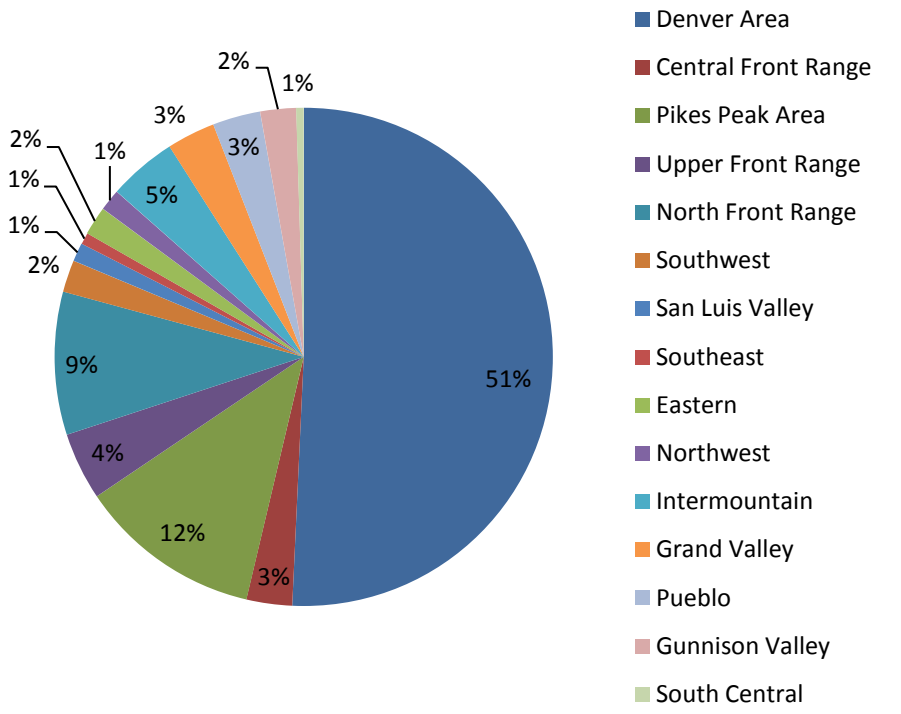


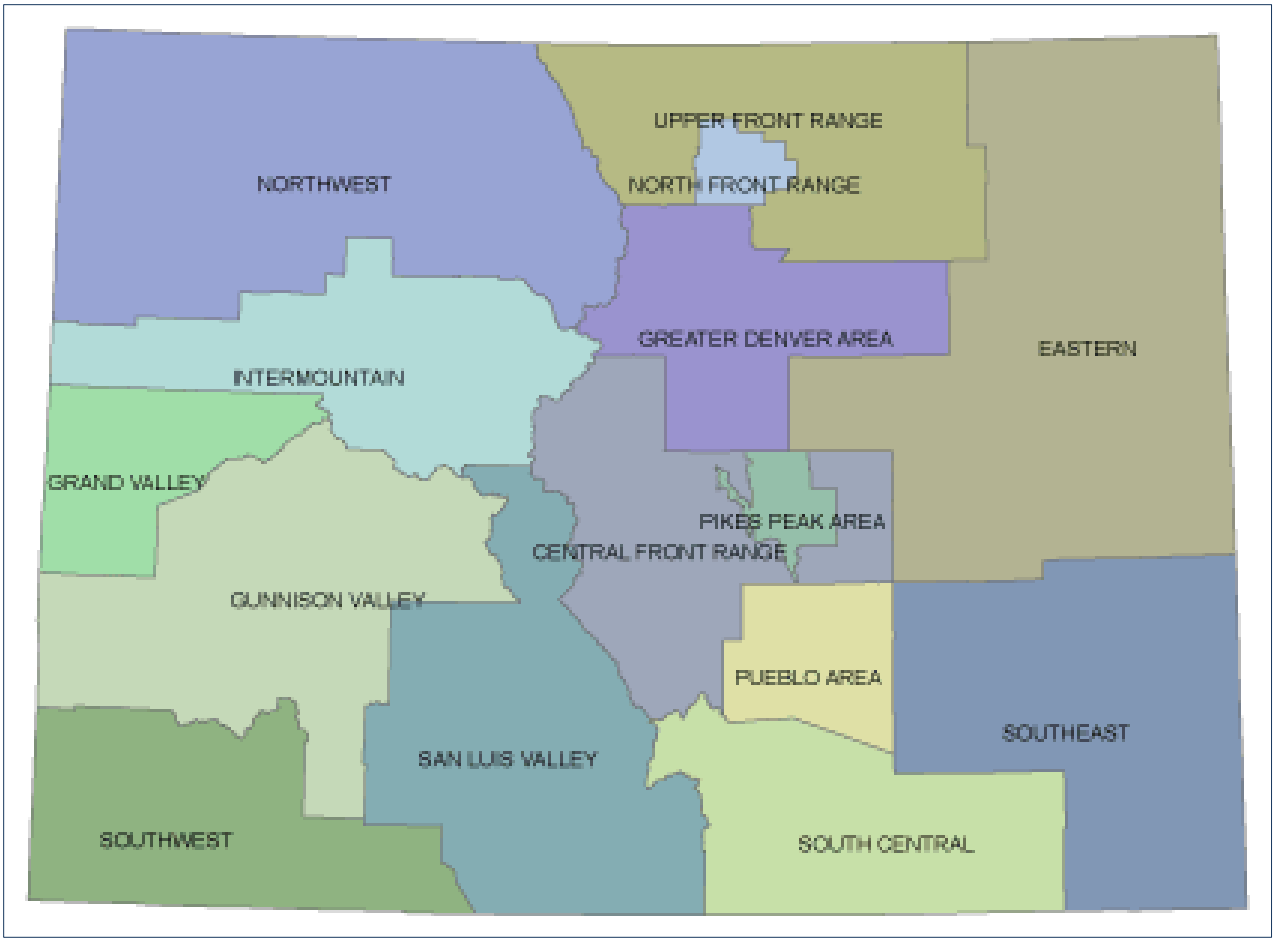
Figure 5-1. Population by Transportation Planning Region (2035)

Job Growth

Job growth in Colorado, like much of the country, has been slow or absent in recent years due to the recession. Between 2001 and 2010, the total number of jobs increased only 1.9 percent to 2,752,452. For the transportation sector, the number of jobs in this same timeframe decreased by 2.6 percent according to the State Demography Office of the Colorado Department of Local Affairs.

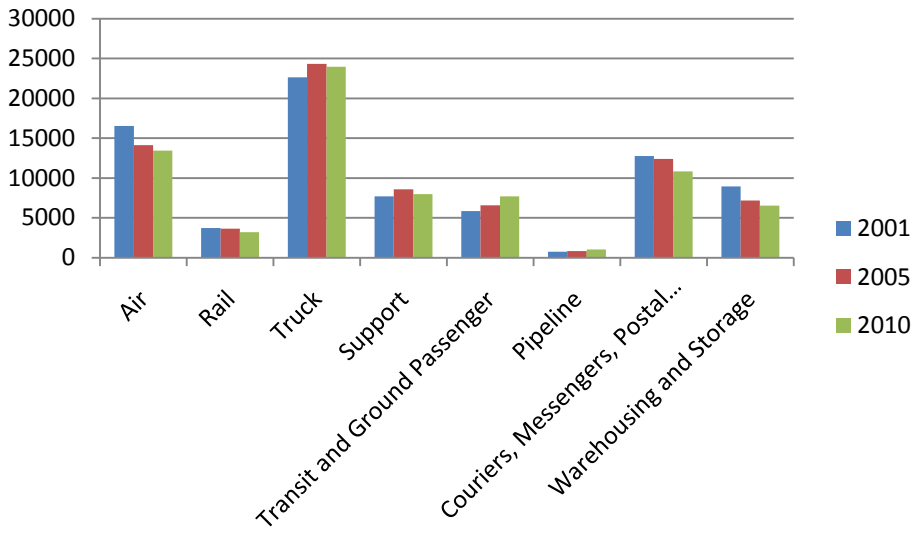
Transportation jobs showed mixed growth. Figure 5-3 shows that rail industry jobs have decreased, but truck and transit jobs have increased. The State Demography Office also expects jobs in the state to grow after 2010. Figure 5-4 shows a forecast to 2040.

Figure 5-5 illustrates the state's planning and management regions. Job growth is forecasted to be most significant in Region 3, which includes the Denver metropolitan area. Regions 2 and 4 (north and south of Denver) contain the next largest share of jobs, as will also be the case in 2040, as shown in Figure 5-6. Most Coloradoans will continue to live and work in the Front Range.



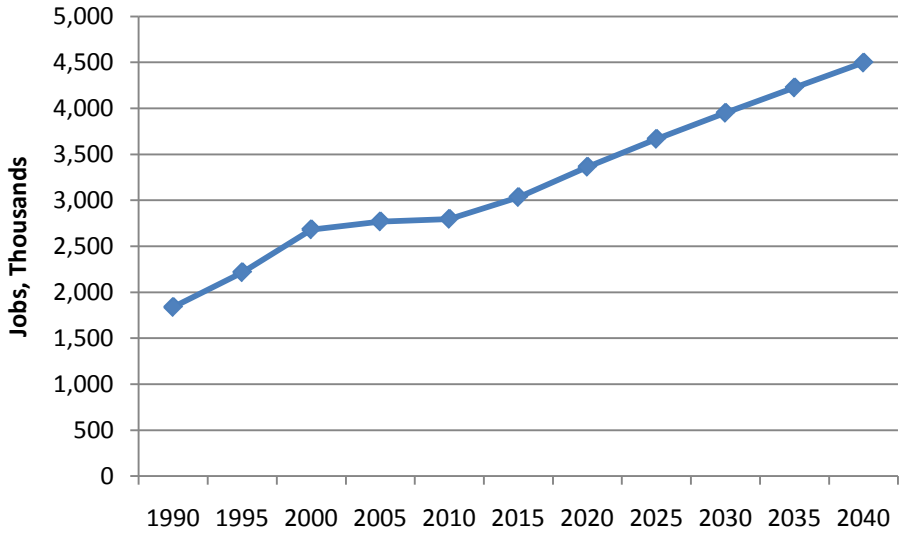
Source: Colorado Department of Transportation

Figure 5-2. Colorado Transportation Planning Regions



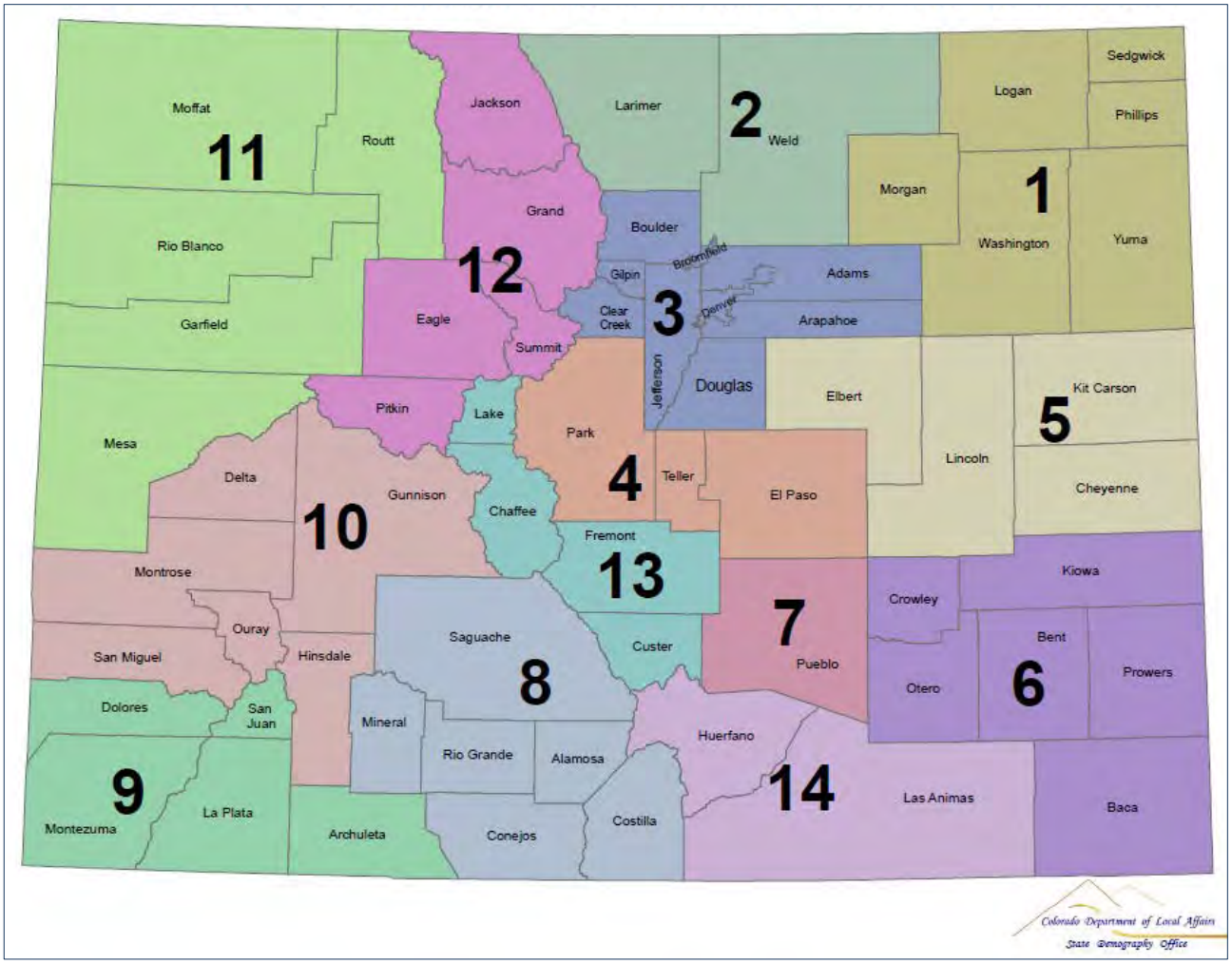
Source: Colorado Department of Local Affairs

Figure 5-3. Colorado Jobs in the Transportation Industry (2001, 2005, 2010)



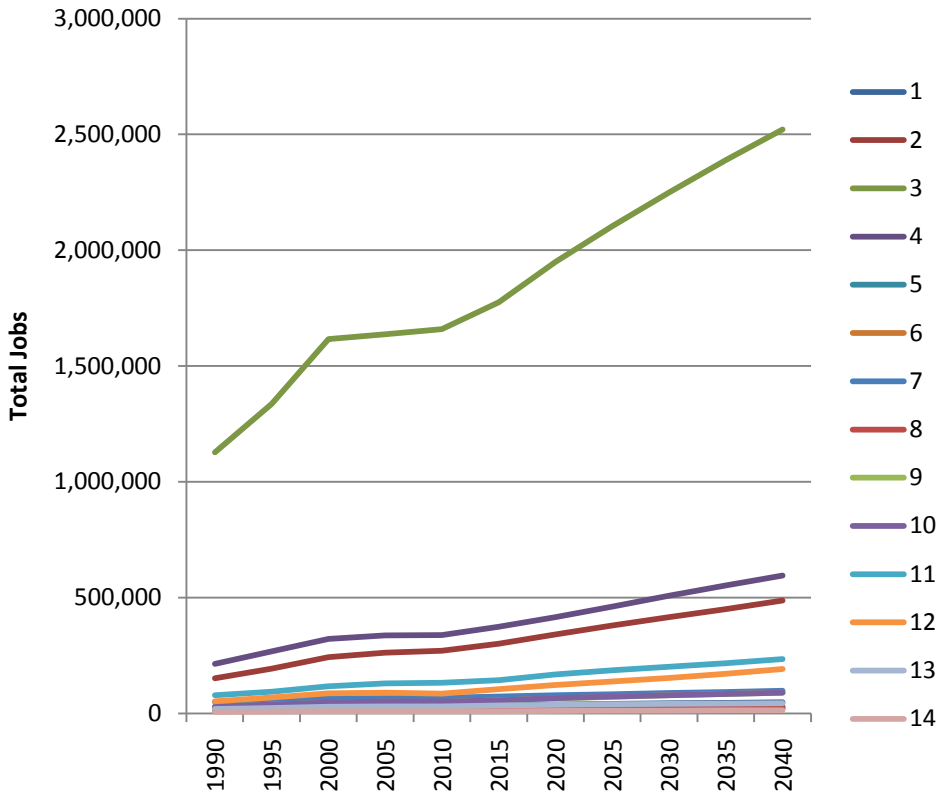
Source: Colorado Department of Local Affairs

Figure 5-4. Total Jobs in Colorado, Estimates and Forecasts (1990–2040)



Source: Colorado Department of Local Affairs

Figure 5-5. Colorado Planning and Management Regions

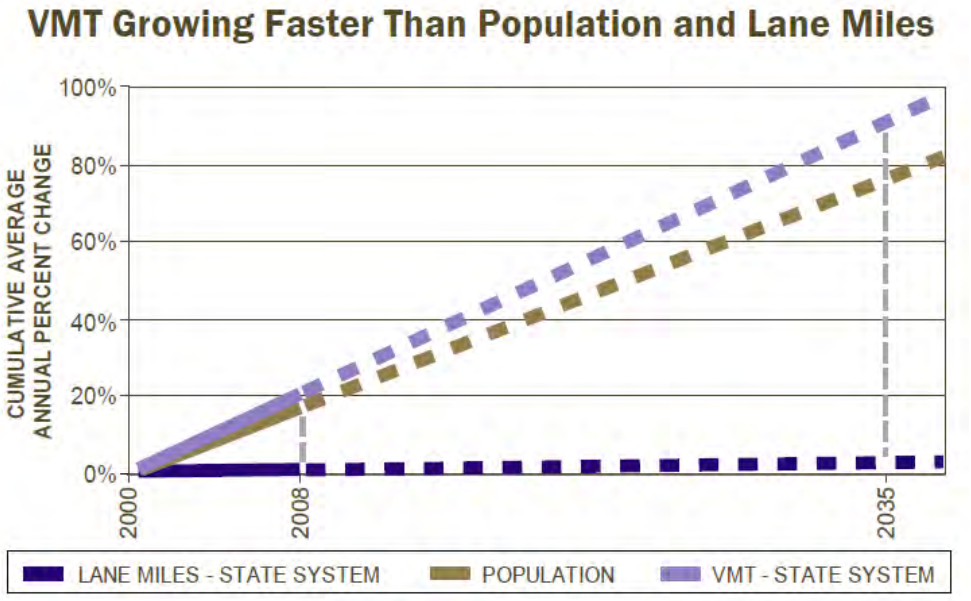


Source: Colorado Department of Local Affairs

Figure 5-6. Total Jobs in Colorado by Planning and Management Region (1990–2040)

Future Rail Demand

In 2010, the daily vehicle miles traveled (VMT) on Colorado's state highways was 76,434,230.[23] This is an 11 percent increase from 2000, when the value was 68,772,454.[24] Future VMT is projected to grow substantially, doubling between 2000 and 2035, according to the CDOT Statewide Transportation Plan. However, CDOT is only planning to grow lane miles of roadway by 1 percent during this time (Figure 5-7). In congested corridors, many of which are freight corridors such as I-70 and I-25, average daily delay is forecasted to increase from 17 to 44 minutes between 2010 and 2035, respectively. Both of these corridors are recommended for long-term passenger rail projects as discussed in Chapter 6.

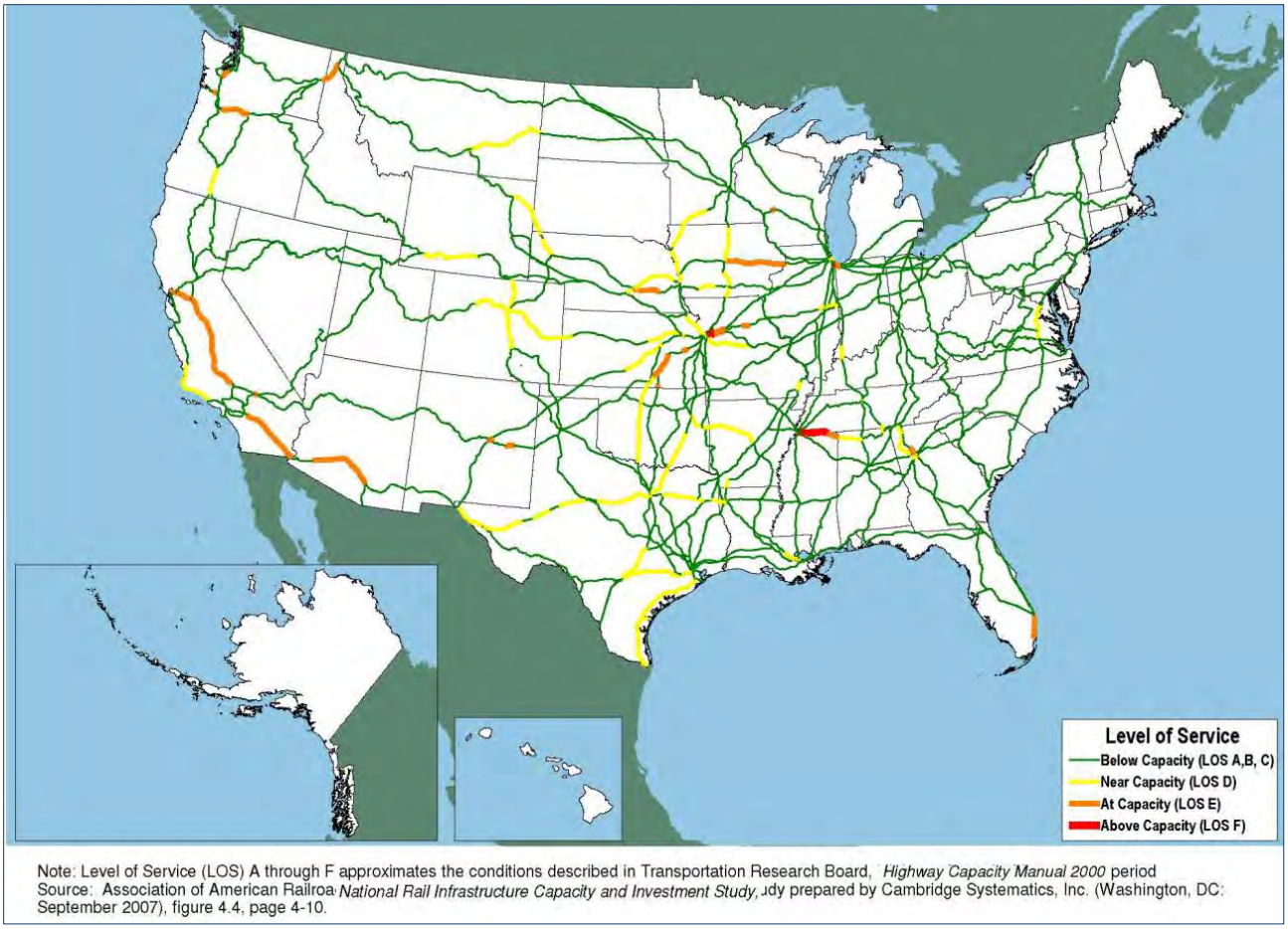


Source: CDOT, 2035 Statewide Transportation Plan

Figure 5-7. Vehicle Miles Traveled Growth in Colorado

Population and job growth means more demand for travel and goods. Because of the economic and environmental benefits of rail, along with the constraints of the highway system, much of that demand could be met with rail. However, some freight rail corridors in Colorado are already probably near capacity, as shown in Figure 5-8. When the economy recovers, improvements may be necessary in these corridors to meet future demand.

[23] CDOT DTD Data Access.
[24] CDOT DTD Data Access.



Note: Level of Service (LOS) A through F approximates the conditions described in Transportation Research Board, *Highway Capacity Manual 2000* period
Source: Association of American Railroa*National Rail Infrastructure Capacity and Investment Study,* dy prepared by Cambridge Systematics, Inc. (Washington, DC: September 2007), figure 4.4, page 4-10.

Figure 5-8. Freight Train Volumes Compared to Capacity of Railways (2007) [25]

Community Impacts and Opportunities

Noise

One of the compatibility challenges faced by both railroads and the communities through which they traverse is the safety concerns of railroads and cities and towns at highway-rail grade crossings and the noise impacts on adjacent neighborhoods caused by the federal requirement for locomotives to sound their horns as they approach the crossings. One process for addressing this challenge that has been gaining interest among Colorado communities is the implementation of safety measures for the establishment of a "Quiet Zone."

A Quiet Zone is a section of rail line that contains one or more consecutive public crossings at which locomotive horns are not routinely sounded. The criteria under which a Quiet Zone can be established have been outlined in the *Final Rule on Use of Locomotive Horns at Highway-*

[25] FHWA Freight Management and Operations, National Statistics and Maps website: http://ops.fhwa.dot.gov/freight/freight_analysis/nat_freight_stats/index.htm accessed December 2011.

Rail Grade Crossings (*Final Rule*), which was made effective on June 24, 2005, by the FRA and amended on August 17, 2006.

Only the public entity that is responsible for the safety and maintenance of the roadway that crosses the rail corridor can apply for the establishment of a Quiet Zone. Private companies, citizens, or neighborhood associations cannot create or apply for the establishment of a Quiet Zone independent of local roadway authorities. The planning, design, approval, and implementation of a Quiet Zone will typically require coordination with the respective railroad, the Colorado Public Utilities Commission (PUC) and the FRA.

The *Final Rule* contains guidelines and the following minimum requirements for the establishment of a quiet zone:

- A new Quiet Zone must have a minimum length of one-half mile along the railroad right-of-way.
- Each public highway-rail grade crossing within a new Quiet Zone must be equipped with active grade crossing warning devices. These devices are comprised of both flashing lights and gates that control traffic over the crossing, and must be equipped with constant warning time devices, if reasonably practical, and power-out indicators. Any necessary upgrades to or installation of active grade crossing warning devices must be completed before the new Quiet Zone implementation date.
- Each highway approach to every public and private highway-rail grade crossing within a new Quiet Zone shall be equipped with a *Manual on Uniform Traffic Control Devices* (MUTCD) compliant advanced warning sign that advises motorists that train horns are not sounded at the crossing.
- Each public highway-rail grade crossing within a new Quiet Zone that is subjected to pedestrian traffic and is equipped with automatic bells shall retain those bells in working condition.
- Each pedestrian grade crossing within a new Quiet Zone shall be equipped with an MUTCD compliant advanced warning sign that advises pedestrians that train horns are not sounded at the crossing.

There are currently nine established Quiet Zones in Colorado. Based on that experience, it has been found that the most efficient way to establish a Quiet Zone is to implement Supplemental Safety Measures (SSMs) at each crossing. The SSMs that can be considered, as identified in the *Final Rule*, include the following:

- Temporary closure (used with a nighttime-only quiet zone)
- Four-quadrant gate system

- Gates with raised medians or channelization devices
- Conversion to one-way street with gates across the roadway
- Permanent crossing closure

Construction costs can be comprised of two elements: Roadway Approach Improvements (non-railroad) and Railroad Element Improvements. Roadway Approach Improvements such as raised medians and curb and gutter can typically be completed for $20,000 to $70,000 per crossing. Railroad Element Improvements such as upgraded circuitry, gates, and lights can cost $300,000 to $400,000 per crossing, depending upon the specific elements to be included.

Shared Corridors Versus Greenfield Alignments

When planning for new intercity passenger rail services, two basic concepts are frequently evaluated. One is to use an existing rail corridor with added infrastructure to accommodate new passenger train services. The second concept is to develop an entirely new corridor in undeveloped or "Greenfield" property, with corridor facilities designed exclusively for the new passenger services. Each scenario has opportunities and issues that are described in the following sections.

Opportunities: Shared Corridors

Nearly all of the commuter and intercity passenger rail services in the United States operate on existing freight railroad tracks. Even the Northeast Corridor, owned by Amtrak, is used by freight trains, except for limited segments through station areas such as Penn Station in New York. This can permit the use of existing rights-of-way (ROW) in dense urban areas and can spur redevelopment and transit-oriented development at stations. By using the ROW, tracks, and bridges for passenger rail service, less property acquisition is usually required and a lower cost can potentially be achieved for start-up of a limited service on those existing tracks. Multi-modal stations are often possible with light rail, bus connections, and bicycle and pedestrian networks at downtown stations.

Shared corridors occur only when the freight railroads agree that a shared operation is viable. This can occur if the existing capacity is reserved for freight railroad expansion or if the freight corridor has declining demand. A win-win arrangement is possible if the passenger operations replace the capacity their service will consume. Environmental impacts are less likely to be identified by using the existing ROW and infrastructure rather than a Greenfield alignment. Freight trains already cause noise and vibration; they whistle at crossings; and they cause grade crossing delays for roadway traffic. In addition, existing rail lines are located in more densely developed areas, resulting in better market penetration. The use of existing ROW may make passenger rail projects more acceptable to the public.

Issues: Shared Corridors

Whenever freight and passenger trains use the same tracks, operational conflicts occur due to the differing service requirements. Shared corridors often have limited capacity for new passenger services due to the volume of existing freight traffic. Passenger train speeds can be limited due to conflicts with slower freight trains. Shared corridors require agreements to share operating and maintenance costs. Private railroads will require protection of their present and future freight capacity and will insist that the public fully pay for the capacity it consumes. For future passenger train operations, FRA regulations will require a Positive Train Control (PTC) signal system. While these systems are costly, future development of these systems may provide the ability to increase capacity on a particular line. To preserve the capacity required for the railroad's existing and future freight service, additional mainline track and passing sidings and possibly collision avoidance technology likely will be required. Passenger trains require higher track standards and improved signals for higher speeds. Even with the added tracks and signal improvements, delays to passenger trains can occur on shared tracks due to freight operations such as switching on-line industries.

Slow orders that are acceptable for freight operations must be carefully managed to avoid passenger delays. Freight operations limit allowable super elevation on curves, limiting passenger speeds. Freight railroads have to agree to any changes made to their track structure (i.e. super elevation) or their signal system. Potential disruptions with freight derailments are always possible, including hazardous materials spills.

Opportunities: Greenfield Alignments

With an entirely new "Greenfield" alignment, a new corridor ROW can be designed and built for higher speeds with standards for higher speed passenger trains. The new corridor, if only used by passenger trains, has many distinct advantages as witnessed by the TGV intercity passenger trains in France, the Shinkansen in Japan, and the new HSR lines in China. This can include steeper grades to reduce cuts and fills. In France, grades up to 4 percent are used as compared to a desired maximum of 1 percent in the U.S. for freight operations. Higher rates of super elevation on curves without freight trains are acceptable allowing passenger trains to attain higher speeds. All of the new capacity is available for passenger trains.

High-level platforms can be used for faster boarding and deboarding, and Americans with Disability Act accessibility requirements can be provided more easily. The potential also exists to use lighter weight rolling stock if the passenger trains do not operate on shared track with freight. Without the clearance requirements for freight trains, a new service could use a joint corridor with a freeway or a toll road. Lower track maintenance costs result from operations with only passenger trains without the track loads of heavy freight trains, particularly unit coal trains. Operations of the trains also are often under the control of the passenger rail

entity. This provides more flexibility in scheduling frequent passenger trains without freight conflicts. The new corridor could serve outlying areas and new stations where new developments are occurring.

Issues: Greenfield Alignments

Offsetting these opportunities is the need for a new railroad ROW. This can result in very high property acquisition costs in developed areas. As a result, Greenfield alignments usually do not serve downtown areas directly. Creating a new linear corridor also could create a physical barrier to future development with the need for added bridges to cross the corridor. A new corridor could divide farm and ranch lands or residential neighborhoods. Construction of a brand new corridor would result in construction impacts, including numerous potential environmental impacts to wetlands, Section 4f properties, historic sites, protected species, etc.

Rail Relocation off the Front Range

Since 2003, at the request of the Class I railroads, CDOT and the railroads have been analyzing the public and private benefits of freight rail relocation from the Front Range to eastern Colorado and examining the merit of a public-private partnership where some expenditure of public funds would be required for implementation. In 2009, the *Colorado Rail Relocation Implementation Study* was completed. Next steps CDOT identified included compiling results of the I-25 portion of the *Rocky Mountain Rail Authority Study* and the *Colorado State Freight and Passenger Rail Plan* before taking further action.

During the development of this Plan, specific rail freight projects were solicited from Class I and short line railroads. An eastern bypass relocating through freight rail traffic off the Front Range was not proposed. This omission reflects a change in the Class I railroads' priorities in reaction to changing market conditions that currently do not emphasize the north/south movement of coal from the Powder River Basin in northeast Wyoming to Texas. The railroads have identified other higher priority projects at this time. To complete a project of this magnitude, significant railroad investment is needed. Additionally, state and federal funding for this type of project is extremely limited for the foreseeable future. Throughout the public outreach process of the *Colorado Rail Relocation Implementation Study*, CDOT received comments from eastern Colorado stakeholders and communities opposing the relocation of the through freight rail movements off the Front Range to any new north/south alignment in eastern Colorado. Conversely, CDOT also received comments encouraging further study and eventual implementation of a bypass for freight rail traffic east of the Front Range.

The concept of through freight rail relocation to a yet to be determined location in eastern Colorado is included in the Plan's list of Rail Facilities/Relocation projects. This list also includes potential relocation of the intermodal facilities of the BNSF and UP out of the

downtown Denver area and potential tunneling improvements of the UP's Moffat Tunnel mountain corridor. The prioritization evaluations ranked these projects as "medium" while the concept of rail relocation to eastern Colorado received a "low" ranking.

In addition, since completion of the *Colorado Rail Relocation Implementation Study,* CDOT has clarified its position on a future rail relocation effort. CDOT will not take the lead, initiate discussion, or take action on a rail relocation effort. However, CDOT would participate in discussions of such an effort if initiated by another party. Should the Department be notified of interest in such an effort, CDOT will inform affected jurisdictions for inclusion in any discussions. Further, if at any time in the future a rail relocation effort is initiated by another party, CDOT will work to ensure all applicable state and federal regulations are adhered to, including but not limited to, the National Environmental Policy Act (NEPA). Rail relocation to eastern Colorado could divide farms, ranch lands and residential neighborhoods; NEPA would require a detailed assessment of the proposed action containing: an alternatives analysis, an evaluation of impacts to natural, cultural and historic resources (including wetlands, Section 4(f) and historic properties, threatened and endangered species, etc.), mitigation of impacts, and public involvement in the NEPA decision making process. CDOT will continue to coordinate with the railroads and other stakeholders on transportation priorities and participate in any subsequent discussions related to the need for further study of a north/south rail bypass off the Front Range. Additionally, CDOT will work in partnership with stakeholders in eastern Colorado to ensure they are engaged in any subsequent rail relocation discussions.

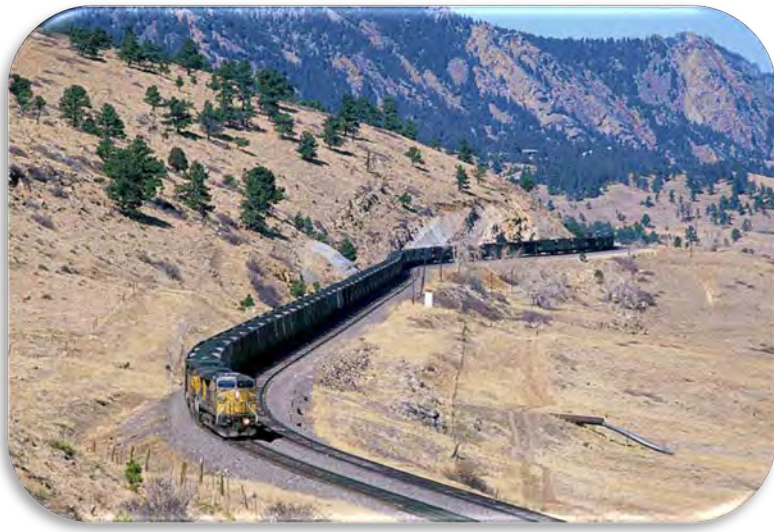
As a result of the project's "low" priority ranking and CDOT's position on the rail relocation effort, the project is considered inactive.

Moffat Corridor

Another issue that was identified in the stakeholder outreach process was the capacity-related constraints of east/west rail traffic through the state. There is one active east-west contiguous rail route through Colorado: the UP Moffat Corridor that connects Denver and Salt Lake City through Grand Junction. This line is constrained by numerous single-track tunnels, most notably the 6.2-mile-long Moffat Tunnel. The length of the Moffat Tunnel causes ventilation issues that limit the number of trains that can be moved through this tunnel. The Tennessee Pass line between Dotsero and Pueblo at one time provided additional east-west rail capacity through the state when it was part of the Southern Pacific, and previously the D&RGW, but it was placed in "out of service" status by UP in 1998 following the UP/SP merger. Unless the UP determines at some point in the future that the significant infrastructure investments required to bring the Tennessee Pass route back in service are

justified, that line will remain "out of service." Appropriate regulatory filing would also be required to re-open that line.

The issue of congestion from heavy truck traffic in the I-70 mountain corridor has been one that CDOT and its stakeholders in that corridor have dealt with for many years. The potential exists in the future to provide an alternate to the vehicle-related bottlenecks in the I-70 corridor, primarily at Vail Pass and the Eisenhower/Johnson Memorial Tunnels, by creating a short distance "truck shuttle" service between Denver and Glenwood Springs or Grand Junction. Such a service could take heavy truck traffic off of this section of I-70 creating more capacity for passenger vehicles. Such a "piggy-back" service was previously operated by the D&RGW between Salt Lake City, Grand Junction, and Denver through the Moffat Tunnel.



Union Pacific's Moffat Corridor

Double-stack Corridor Traffic

Colorado and neighboring states, partnering with UP and BNSF, could work to establish competitive high-cube double-stack intermodal service through Colorado, paralleling I-70 east, I-25 north-south, I-76 Denver east, US 85 (Denver to Cheyenne using the existing UP line), and US 287 (Denver—Amarillo—Ft. Worth). The purpose of such a program would be to position Colorado on the emerging freight rail equivalent to the interstate highway network. The state and its businesses could then benefit from more freight container service offerings that are available to cities and businesses located along transcontinental routes. Both UP and BNSF could use Denver as a hub for these high-cube double-stack cleared routes.

The concept of improving the numerous tunnels along the Moffat Corridor to accommodate double-stack intermodal freight traffic also was identified during the public outreach process. However, this east-west double-stack traffic currently moves from the Salt Lake City area to the Colorado Front Range by using UP's high-speed double-track mainline from Utah to Cheyenne and then to Denver through Greeley. These trains make this trip much faster than if the same traffic were to move over the Moffat Corridor. As an example, Amtrak's Zephyr, when detoured through Wyoming due to maintenance issues on the Moffat Corridor, arrives

in Salt Lake City four hours ahead of schedule. The topography of UP's route through southern Wyoming is conducive to a much higher operating speed than the Moffat Corridor. This allows for operation over double mainline track at 79 miles-per-hour while the Moffat Corridor over the Continental Divide in Central Colorado operates at much lower average speeds. This extreme time differential makes the very expensive improvements to adapt the corridor for double stacks impractical.

Neither railroad has placed a priority on developing nor expanding double-stack services in any of these corridors. However, looking far ahead to 2040, these corridors could be developed to remedy the current situation in which Denver and the Colorado Front Range finds itself: far off the nation's primary freight rail intermodal corridors. This network of rail lines would allow existing businesses, or businesses seeking to locate in Colorado and the Denver region, access to domestic, North American, and international trade flows. In addition, these corridors will take a long time to finance and begin operations if the public and private partners are willing to see them developed. In the eastern U.S., Class l railroads CSX and Norfolk Southern have paired with states and federal agencies to develop such high-cubed double-stacked corridors, including enlarging tunnels, lowering tracks, developing inland terminals, etc. These projects would be worth examining from the standpoint of developing such corridors throughout Colorado and the West.

Rails to Trails

A tool that is sometimes used in "rail corridor preservation" is known as "Rails to Trails". Rail-trails are multi-purpose public paths created from former railroad corridors. Most often flat or following a gentle grade, they traverse urban, suburban and rural areas. Rail-trails are popular as recreation and transportation corridors and can have many uses such as walking, bicycling, equestrian, and cross-country skiing.

In order to create a rail-trail, the rail corridor must be abandoned. This takes place when the Surface Transportation Board (STB) officially approves the abandonment of the railroad. After abandonment the railroad company usually removes the tracks and ties for salvage and re-grades the corridor with the original ballast left in place by the railroad. Many trails are later surfaced with asphalt, crushed stone, wood chips or another material appropriate for the intended trail uses. Ideally, bridges and tunnels are left intact so the trail agency need only add wood decking, appropriate railings and other safety features. Road crossings must be properly striped and signed for both trail and road users.

In most cases the local, state or federal government agency that buys the corridor builds the trail as well. The agency develops it using its own labor and equipment or hires an independent construction company. In a few cases, groups of citizen volunteers have constructed a trail. Trails are generally managed and maintained by public agencies, but can

be operated by other types of organizations, including nonprofit citizen groups, land trusts and community foundations.

While this concept technically allows for future rail use in the corridor, it should be noted that it can often be difficult to get public support for putting rail service back into the corridor once the corridor has been used for other trail related purposes.

Safety and Security

Rail Safety

A safe and secure railroad system is vital to rail transportation efficiency and success. Laws at both the federal and state levels regulate railroad operations while also promoting transportation safety. CDOT and the state's rail service operators strive to provide a transportation system that addresses the need of safely moving goods, services, and people, while maximizing the personal safety of the traveling public and ensuring the security of the transportation infrastructure.

Rail Incident History in Colorado

Figure 5-9 shows rail incidents in Colorado reported to the FRA from 2003 to 2010. While there was an increase in incidents from 2003 to 2006, over the past four years there has been a steady decrease in the number of railroad incidents. The total number of incidents reported in 2010 was almost 42 percent lower than the number reported in 2003, and it was nearly 53 percent lower than the highest amount reported in 2006. As shown, this trend is generally true of both categories of incidents (rail equipment incidents and highway/rail crossing incidents). This figure also reveals that the majority of incidents occurred within rail yards or only involved rail equipment and rail personnel.

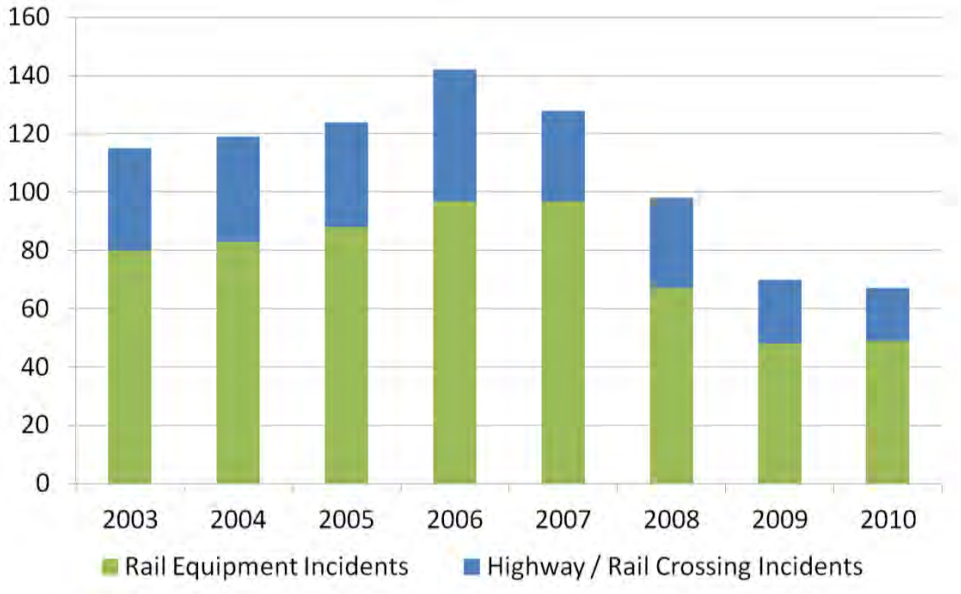


Figure 5-9. FRA-Reported Incidents in Colorado (2003–2010)

Highway/Rail Grade Crossing Safety

Across Colorado there are 1,730 public railroad crossings. Figure 5-10 shows that Denver, Weld, and Adams Counties each have more than 100 public crossings. Larimer, Boulder, Jefferson, Logan, and Las Animas Counties are in the second category, with 50 to 100 crossings each.

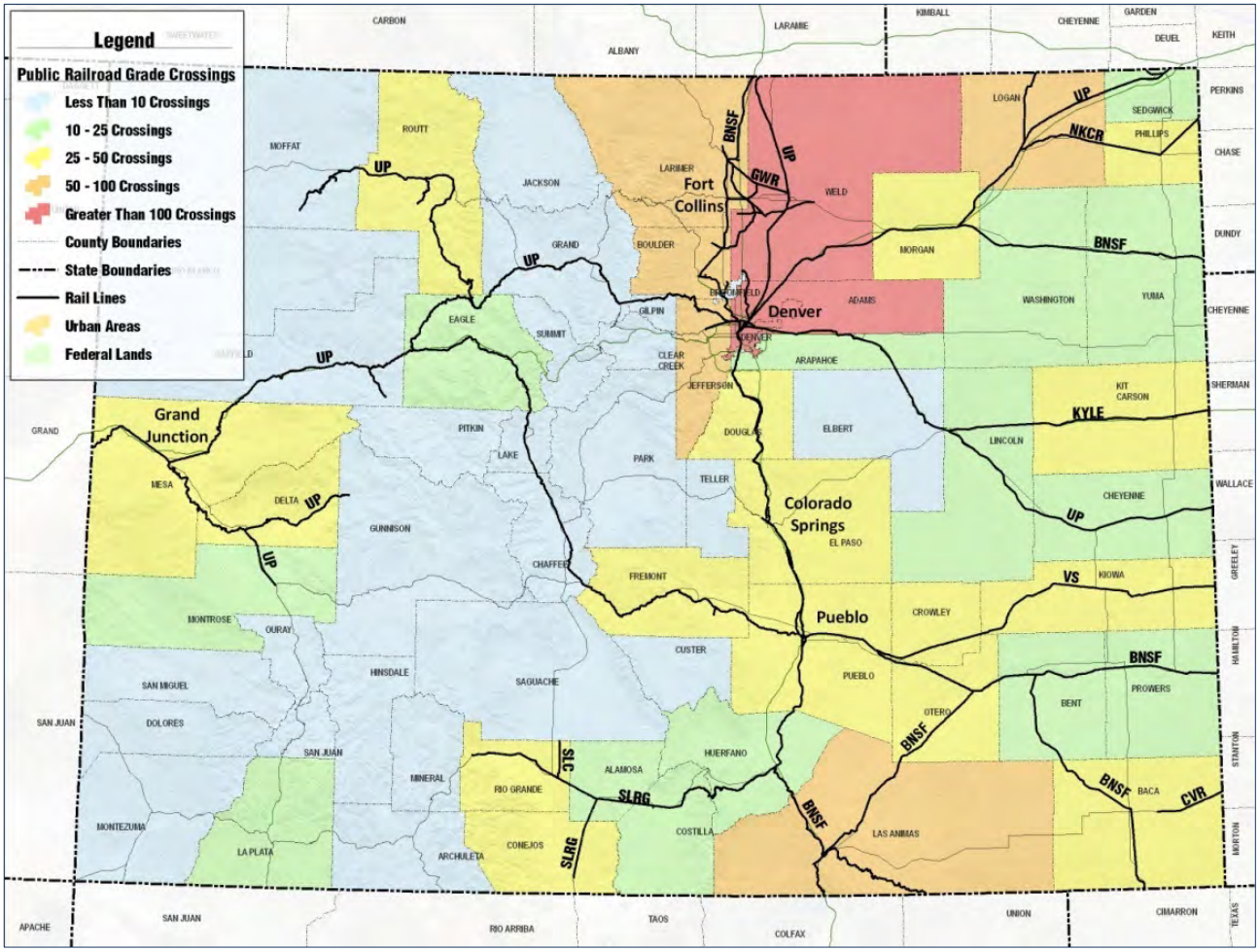


Figure 5-10. Public Railroad Crossings by County (2010)

Figure 5-11 shows that more than 10 highway/rail crossing incidents occurred in Weld County, and 6 to 9 incidents occurred in both Denver and Pueblo Counties in 2010. Note that even though Adams, Larimer, Boulder, and Las Animas Counties have more than 50 crossings, each of these counties had five or fewer incidents in 2010. Jefferson and Logan Counties also have more than 50 crossings and reported no incidents in 2010. Active warning devices (lights, gates, bells, etc.) are installed at 39 percent (675 devices) of the 1,730 public highway/rail grade crossings in Colorado. Half of the grade crossing incidents in 2010 occurred at crossings with active warning systems in place.

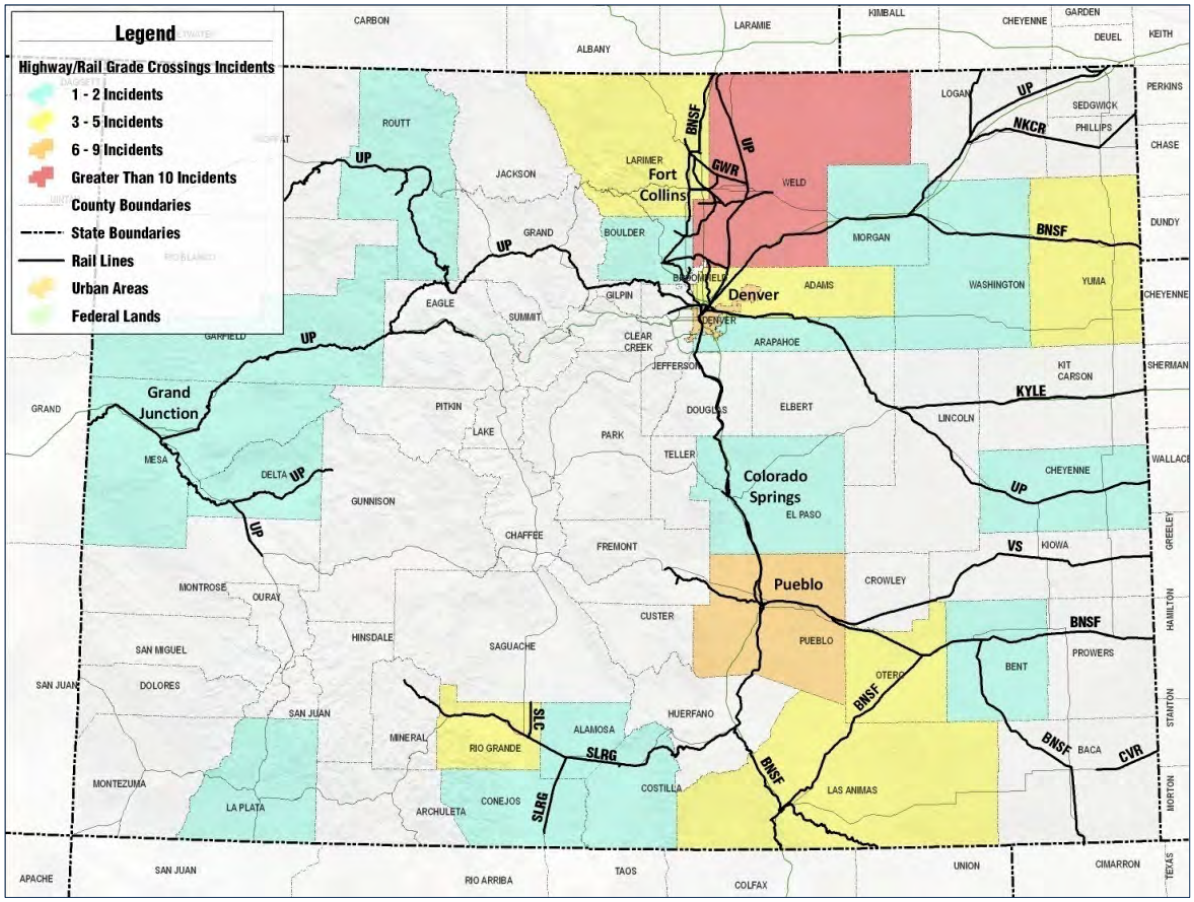


Figure 5-11. Public Highway/Rail Crossing Incidents by County (2010)

Figure 5-12 summarizes the severity of highway/rail crossing incidents in Colorado for 2008-2010. More than half of these incidents, 63 percent, resulted in property damage only. Of the remaining 37 percent, the number of incidents with injuries (20 percent) and the number of incidents with fatalities (17 percent) are nearly equal. There were seven fatalities at railroad crossings in Colorado in 2010 ranking it 15th in the nation. This figure only shows the number of incidents with fatalities and not the total number of fatalities. The 12 incidents with

fatalities over three years shown below actually account for 16 deaths because three incidents had multiple fatalities. In addition, one incident may injure others along with a fatality but the incident is counted in the fatality category even if there are also injuries associated with the incident.

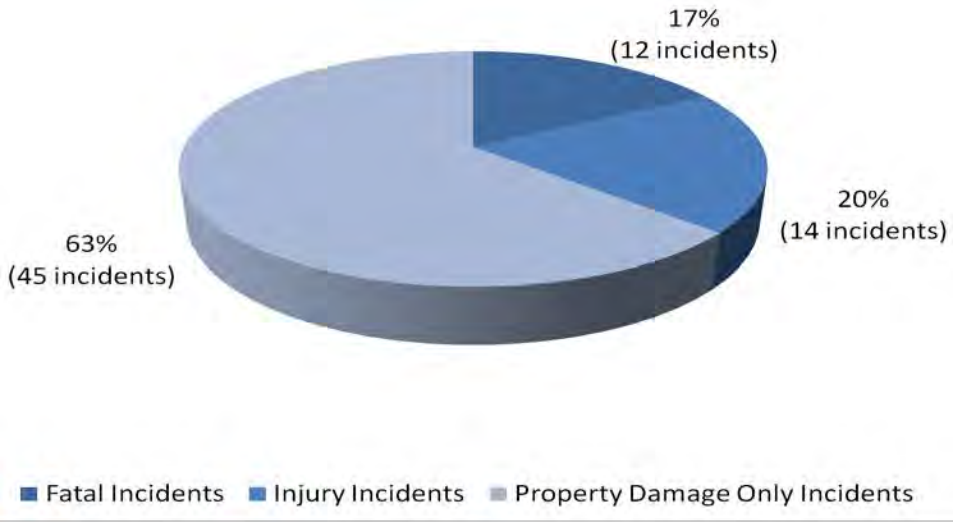


Figure 5-12. FRA Highway/Rail Crossing Incidents in Colorado by Severity (2008–2010)

Clearly, as evidenced by these data, at-grade highway/rail crossings represent a critical factor in the safe operation of the rail system and the highway network in Colorado. Common challenges at such crossings include the adequacy of active warning devices, lighting and crossing surface conditions. Local governments recognize the importance of these crossings and the benefits of improvements at the crossings. For example, the Upper Front Range Regional Planning Commission (Morgan County and the rural portions of Larimer and Weld Counties) recently conducted an inventory of public highway/rural crossings in their region to assist in prioritizing crossing improvements and to aid in applying for funds for needed improvements. Continuing efforts similar to this should be encouraged.

Other Rail Safety Issues

Trespasser Issues

Incidents resulting from individuals trespassing on railroad property are a significant safety concern. Trespassing can be defined as actions prohibited on railroad property, such as unauthorized entry to railroad ROW by walking on, across, or around the tracks, sleeping on the tracks, driving or walking around downed crossing gates, fishing from railroad bridges, and intentionally jumping into the path of oncoming trains. Each year, preventable railroad fatalities occur because of individuals and motorists trespassing on railroad property.

The state and the railroad industry are committed to decreasing incidents of trespassing. The following are representative actions that have helped achieve this goal:

- Educational efforts directed at potential victims of trespassing incidents (Operation Life Saver)
- Enforcement of state and local laws concerning motorist responsibilities at crossings and access to railroad property
- Funding physical improvements, as well as funding research on new technological solutions, that reduce the likelihood of mishaps from trespassing
- Promoting good behaviors that help decrease trespassing activity through education

Hazardous Materials Transportation Safety

The FRA Office of Safety Assurance and Compliance administers a regulatory program that focuses on the safe transportation of hazardous materials. This program is administered through the FRA's Incident Reduction Program and the Spent Nuclear Fuel and High-Level Nuclear Waste Program. Colorado is required to collect information on the transport of hazardous materials by rail in the state. The U.S. Congress also enacted the recommendations from the 9/11 Commission Act of 2007, which required the U.S. Department of Transportation to adopt rules regarding routing of hazardous materials shipments through urban areas. The FRA and the Pipeline and Hazardous Materials Safety Administration adopted these rules in November 2008, thus establishing guidelines for railroads to use in studying hazardous materials shipping patterns, accessing alternate routes to minimize risk, and establishing procedures for reviewing routing decisions. These routing decisions are shared with state and local governments through intelligence fusion centers at the state level that work with the Federal Department of Homeland Security.

While it may seem that building tracks away from urban areas would be the most effective way to avoid problems, many times this is not cost effective or feasible. Water treatment plants, factories, and other users of bulk chemicals are usually located near populated areas, thus requiring continued transport through populated areas. The most cost-effective and feasible solution is to improve the existing track structure to a higher FRA track classification. This maintains the current operating speeds but reduces the risk of hazardous material release by reducing the risk of track-caused derailments. This also has a more significant impact as it is not possible to relocate all hazardous materials movements. However, expenditures are not a one-time fix; tracks and bridges require continued maintenance investments to remain in optimal condition.

Crash Avoidance Technology

A promising area for improving rail safety is crash avoidance at highway/rail crossings. Crash avoidance technologies include communications-based train control systems and technologies intended to improve grade crossing safety, such as motor vehicle intrusion detection systems, moveable highway barriers, median barriers, and four quadrant gates. The Rail Safety Improvement Act of 2008 calls for a policy initiative to develop new technologies that can prevent loss of life and injuries at highway/rail grade crossings. The State of Colorado is committed to working with local municipalities and the railroad industry to install crash-avoidance technology where feasible.

Positive Train Control and Existing Train Safety Technologies

Positive train control (PTC) is a technology designed to prevent train incidents. This technology automatically stops or slows a train before an incident occurs. PTC is designed to prevent collisions between trains and to prevent derailments caused by excessive speed, by incursions by trains on tracks under repair, and by trains moving over switches in the wrong position. PTC systems are designed to determine the location and speed of trains, warn train operators of potential problems, and take action if operators do not respond to a warning. The Rail Safety Improvement Act of 2008 requires railroads to place PTC systems on each Class I carrier, subject to the provisions noted in the bullets below, and each entity providing regularly scheduled intercity or commuter rail passenger transportation by December 31, 2015. PTC systems must be installed on the following:

- Main lines that regularly handle intercity or commuter rail passenger transportation
- Main lines over which hazardous materials are transported that are poisonous or toxic by inhalation
- On other tracks as designated by regulation or order from the Secretary of Transportation.

For PTC purposes a “main line” is defined as a railroad segment that carries 5 million or more gross tons of freight annually. The cost of implementing PTC on rail passenger routes may have implications on future plans for new rail passenger service. As the cost of implementing PTC is expected to range between $10 and $17 billion nationally over the next 20 years, this may also affect freight service to producers of hazardous materials as the full cost of PTC is not considered financially viable for rail carriers alone.

Safety Improvement Programs in Colorado

An Overview of Federal and State Roles in Rail Safety

Colorado's regulatory history with regard to railroad infrastructure includes the following:

1913 The Public Utilities Commission (PUC) was established in Colorado.

1967 The U.S. Department of Transportation (USDOT) and FRA were created. All railroad safety functions of the Interstate Commerce Commission (ICC) were transferred to the FRA.

1970 Federal Railroad Safety Act of 1970 clarified the FRA's specific authority over all rail safety-related matters and authorized the FRA to impose civil penalties for each violation of the regulations set forth in the Act.

Post-1970 Designated state agencies (PUC or DOT) enforced the national FRA safety standards.

1995 The ICC was abolished and its remaining functions (regulation of railroads to ensure fair rates and regulating common carriers) were transferred to the STB.

2008 FRA exercises its rulemaking authority with the Rail Safety Improvement Act of 2008. This act mandates the implementation of PTC technology by 2015, as discussed above.

FRA's Office of Railroad Safety promotes and regulates safety throughout the nation's railroad industry. The office executes its regulatory and inspection responsibilities through a staff of railroad safety experts. The staff includes 400 federal safety inspectors in eight regional offices.

Today in the State of Colorado, the PUC has regulatory authority over all crossings of railroad tracks, including at-grade crossings and grade-separated crossings. Compliance of railroad crossings is governed by PUC rules, and design must follow criteria set forth in the latest version of the Manual on Uniform Traffic Control Devices as adopted by the Colorado State Transportation Commission.

CDOT's Safety and Traffic Engineering Branch manages the prioritization of rail crossings for assignment of safety funding under the Federal Aid Section 130 Railroad/Highway Safety Program. Section 130 provides funds for highway/railroad grade crossing safety improvements such as signing, pavement markings, active warning devices, illumination, and crossing surface repair. Once installed, maintenance and operating expenses of signalized grade crossings are the responsibility of the rail line operator.

Safety Improvements to Grade Crossings in Colorado (Section 130 Program)

Highway/rail crossing safety work may occur as needed on any CDOT transportation improvement project. In addition, the Federal Highway Administration (FHWA) Section 130 program earmarks funds to be applied toward projects for the elimination of hazards at highway/rail crossings, including the separation or installation of warning devices at at-grade crossings and the relocation of highways to eliminate grade crossings. Section 130 projects are identified and prioritized based on an accident prediction analysis using a hazard index. The CDOT Safety and Traffic Engineering Branch, Railroad Program, administers the Section 130 program and is the point of contact with railroads, the PUC, and local agencies on all CDOT/railroad contracts.

The annual program funds are approximately $2 million, of which at least half ($1 million) must be available for the installation of warning devices at rail/highway at-grade crossings. The balance of funds may be applied, at CDOT's discretion, toward at-grade crossing warning devices or a grade-separation project. Under this strategy, CDOT can construct three to six grade crossing upgrades (e.g., installation of flashing lights, gates, bells, and constant warning circuitry) each year. A typical project of this type will cost, on average, about $350,000. Such projects often consist of the installation of Active Warning Devices at locations that only have Passive Warning Devices or inadequate Active Warning Devices. Most such projects are on local roads and streets (most state highway rail crossings already have been upgraded). Due to the high cost of a typical grade-separation structure ($12+ million), it is impractical for CDOT to apply the remaining $1 million annual apportionment to a new grade-separation project each year. States are allowed to "pool" several years' worth of apportionments. CDOT typically funds a grade separation project every four years, providing approximately $3 to $4 million.

FRA State Rail Safety Participation Program

Under the Rail Safety Act of 1970 states are authorized to work with the FRA to enforce federal railroad safety regulations through trained and certified state inspectors. The training of state inspectors is one of FRA's major customer service initiatives; approximately one-third of the FRA's Office of Safety training budget is allocated to state rail safety programs. Currently there are about 170 certified state inspectors in 30 participating states.

Colorado does not participate in this program; only 30 states currently participate, including several states neighboring Colorado. In some states the state rail inspector is overseen by the state DOT, but in others by the PUC. While the FRA funding can cover most of the costs associated with training a state inspector candidate, funding for a state rail inspector position would come from other sources. In the future, CDOT's Division of Transit and Rail may

evaluate the need and ability to become part of the FRA State Rail Safety Participation Program.

Operation Lifesaver

Operation Lifesaver, Inc. (OLI) is a non-profit organization devoted to enhancing public safety in and around railroads. This includes grade crossing safety and prevention of trespassing incidents through public education presentations. OLI is a resource used actively in Colorado by all railroads and state and local transportation agencies. OLI strives to increase public awareness about the dangers around railroads and seeks to educate both drivers and pedestrians to make safe decisions at crossings and around railroad tracks through trained and certified volunteer speakers. Today, the OLI network of certified speakers and trained instructors offer free rail safety education programs in all 50 states where they speak to school groups, driver education classes, community audiences, professional drivers, law enforcement officers, and emergency responders. The programs are co-sponsored by federal, state, and local government agencies; highway safety organizations; and the railroads.

Rail Safety—Summary

Improving rail transportation safety requires ongoing dialogue and cooperation among transportation operators, the traveling public, and state and federal agencies. The state's long-term safety needs also will require continual performance monitoring of the rail system to identify industry-wide trends and issues; this, in turn, will assist CDOT in identifying system improvements resulting in a corresponding reduction in incidents.

Rail Security

There are many challenges in providing security for passenger and freight rail services. Some challenges are common to both passenger and freight modes, while others are unique to specific rail operations. Open access and high ridership of mass transit systems make passenger rail difficult to secure. Tons of hazardous materials are shipped across the state as well. Numerous security-related actions have been implemented since the attacks of September 11, 2001, and more are planned. Risk management, along with better coordination and communication, help enhance rail security.

Federal and State Roles

The U.S. Department of Homeland Security is the primary federal agency responsible for security in the transportation sector and, thus, the rail transportation system. The Colorado Department of Public Safety and the Division of Emergency Management provide support to the U.S. Department of Homeland Security. In the transportation sector, security is addressed mainly by identifying critical infrastructure assets and developing protection strategies for

these assets. Other agencies, such as law enforcement and railroad operators, also play a significant role in addressing rail security needs.

Transportation Technology Center, Inc. (TTCI)

The Transportation Technology Center, Inc. located northeast of Pueblo, Colorado now provides a key function related to rail security. TTCI's is home to the Security and Emergency Response Training Center (SERTC). SERTC is Colorado's state training center for domestic preparedness and emergency response training for hazardous materials teams has been provided since 1986. The Office of Homeland Security as well as numerous other federal state and local agencies utilize this training facility.

TTCI was constructed in the early 1970s and was at that time known as the High Speed Ground Transportation Center. In 1976 the 52 square mile facility was converted to a rail transportation research facility testing rail vehicles, track components, etc. There are 48 miles of railroad track available for testing locomotives, various rail cars and track and bridge components.

The facility is currently a wholly owned subsidiary of the Association of American Railroads and provides research services to both freight and passenger railroads from around the world.

Strategic Rail Corridor Network

The Strategic Rail Corridor Network (STRACNET) is a program under the Department of Defense's Railroads and Highways for National Defense program and is designed to ensure the nation's rail and highway infrastructure can support defense emergencies. STRACNET consists of 38,800 miles of rail lines that are important for national defense and provide service to 193 defense installations. The Railroads for National Defense Program ensures the readiness capability of the national railroad network to support defense deployment and peacetime needs. The program works to integrate defense rail needs into civil sector planning affecting the nation's railroad system.

In Colorado, STRACNET consists of 994 miles of track, focused on BNSF's and UP's primary north-south and east-west rail routes through the state. STRACNET connector lines provide service to the U.S. military's Pueblo Chemical Depot and the Piñon Canyon Maneuver Site. Figure 5-13 displays Colorado's STRACNET network.

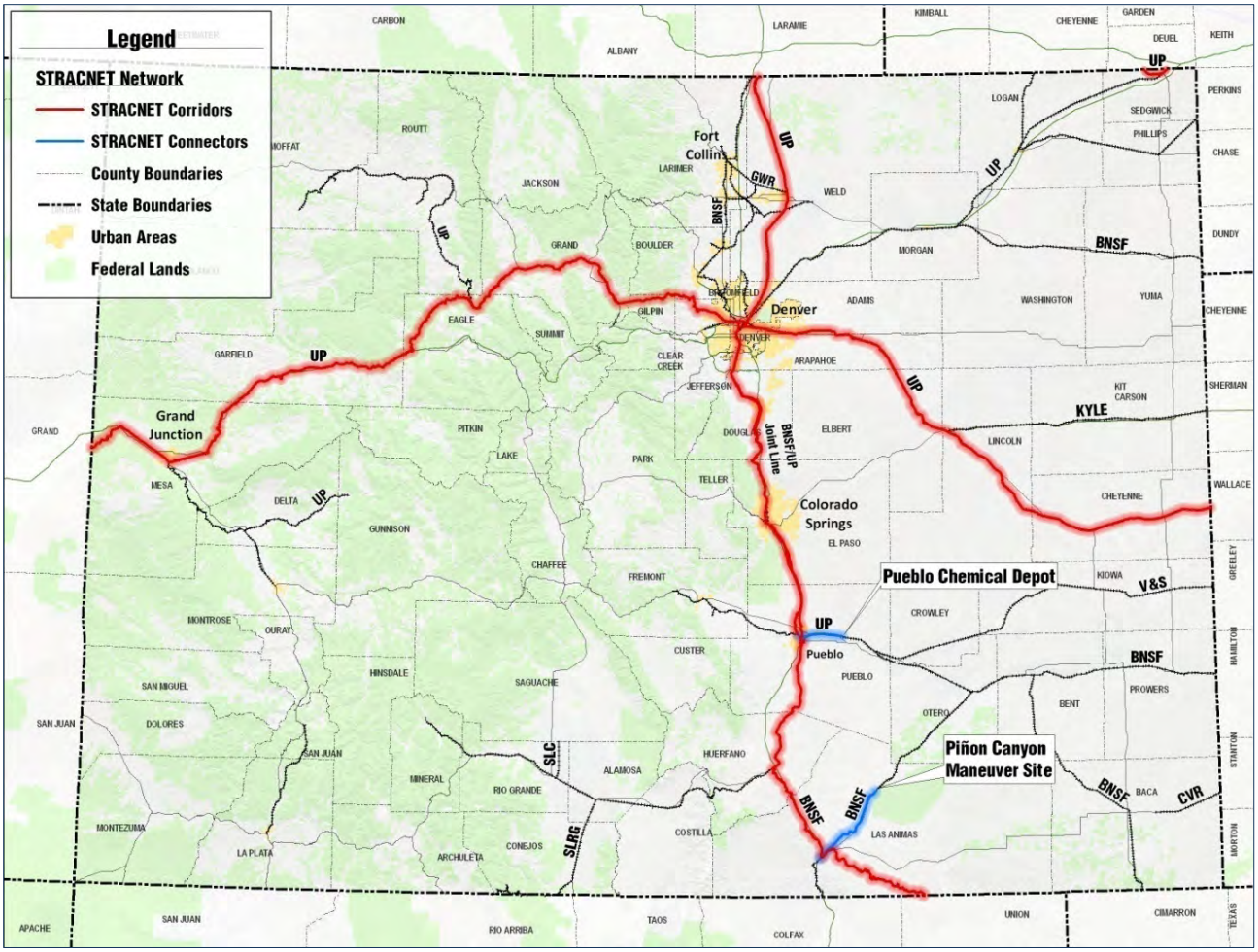


Figure 5-13. Colorado's STRACNET Network

Amtrak

Amtrak is the only provider of long-distance passenger rail service in Colorado. It implements a range of security measures to improve passenger rail security, some of which are conducted on an unpredictable or random basis. The following security measures may be conducted in stations or on board trains:

- Uniformed police officers or mobile security teams
- Random passenger and carry-on baggage screening
- K-9 units
- Checked baggage screening
- Onboard security checks
- Identification checks

Additionally, funding is provided to Amtrak by the U.S. Department of Homeland Security through its Transit Security Grant Program for enhancements to security for Amtrak intercity rail operations.

Freight Security

Following the events of September 11, 2001, the Association of American Railroads established a Railroad Security Task Force. That task force produced the *Terrorism Risk Analysis and Security Management Plan* that was designed to enhance freight rail security. The plan remains in effect today. As a result, freight railroads enacted more than 50 permanent security-enhancing countermeasures. For example, access to key rail facilities and information has been restricted, and cyber-security procedures and techniques have been strengthened. In addition, communication among security officials, law enforcement, and the railroads is critical to ensure secure operations on Colorado's rail transportation system, and continues to be enhanced.

The railroad system in Colorado is vulnerable to trespassers and is difficult to secure. The state and the railroads are building upon the efforts of the Railroad Security Task Force and are identifying key railroad yards, interchange points, and major structures that may need to be secured from open public access. Security strategies to be examined to protect key assets include video monitoring for all major structures; upgrading fencing and installing fencing around the perimeter of major rail yards; securing vehicular access to rail ROW at grade crossings; and securing assets, such as rail equipment and train control signals systems.

Improved communications among railroads and all security-cleared officials at the state, emergency responder, and police agency level to track the location and contents of trains with any high-risk contents hauled throughout the state also would enhance security for Colorado's railroad system.

Rail Security—Summary

Security of transportation infrastructure is a major issue that has faced the nation in new ways since the events of September 11, 2001. Effective and continually improving communication among security officials, law enforcement, and the railroads is critical to ensure secure operations of Colorado's rail transportation system. Continued improvements in technology also help to ensure the security of the state's rail freight shipments and infrastructure. Comparable security initiatives at Amtrak and future commuter railroads will continue to be introduced, thus enhancing Colorado’s ability to protect its citizens.

Chapter 6 Rail System Needs Assessment

The railroad network in Colorado is in good condition. The Class I railroads regularly invest in track and other infrastructure improvements throughout the state to maintain the quality of their lines. They also have been investing in capacity improvements, such as increased siding lengths in recent years. Nearly all Class l rail lines in the state are capable of carrying the standard 286,000 pound freight rail cars.

Short line railroads throughout the state continue to require additional capital investments to bring their infrastructure up to higher standards to allow for the necessary connectivity with their Class I partners. Many short line railroads in the state are not capable of handling 286,000 pound loads. This places the shippers on those lines at an economic disadvantage because they cannot fully load rail cars, resulting in higher shipping costs per ton. Hence, trucks may be a more economical option for these shippers, or new shippers may not choose to locate on these lines.

Alternatively, the passenger rail system is very underdeveloped in the state, with even some of the limited Amtrak service at risk. However, there is considerable public support for improvement of infrastructure to support expanded passenger rail service throughout the state although funding sources have yet to be identified.

Evaluation of Existing and Future Capacity Conditions

In 2007 the AAR published the *National Rail Freight Infrastructure Capacity and Investment Study*, a document that assessed the long-term capacity expansion needs of the Class I freight railroad network throughout the U.S. The study evaluated the existing rail network and approximated the freight rail infrastructure improvements and investments needed to meet the U.S. Department of Transportation's projected demand for freight rail transportation in 2035. The U.S. DOT estimates that the demand for freight rail transportation—measured in tonnage—will increase by 88 percent by 2035.

The study, which was coordinated with the Class I railroads, focused on approximately 52,000 miles of the Class I and significant Class II railroad network, or roughly one-third of the U.S. freight rail network expected to absorb the majority of future growth. These corridors were evaluated on the basis of both current rail volumes compared to current capacity as well as future (2035) volumes compared to current capacity. From this evaluation, current and future levels of service, measured from Level A to Level F, were assigned to each of the corridors. Table 6-1 describes these freight levels of service.

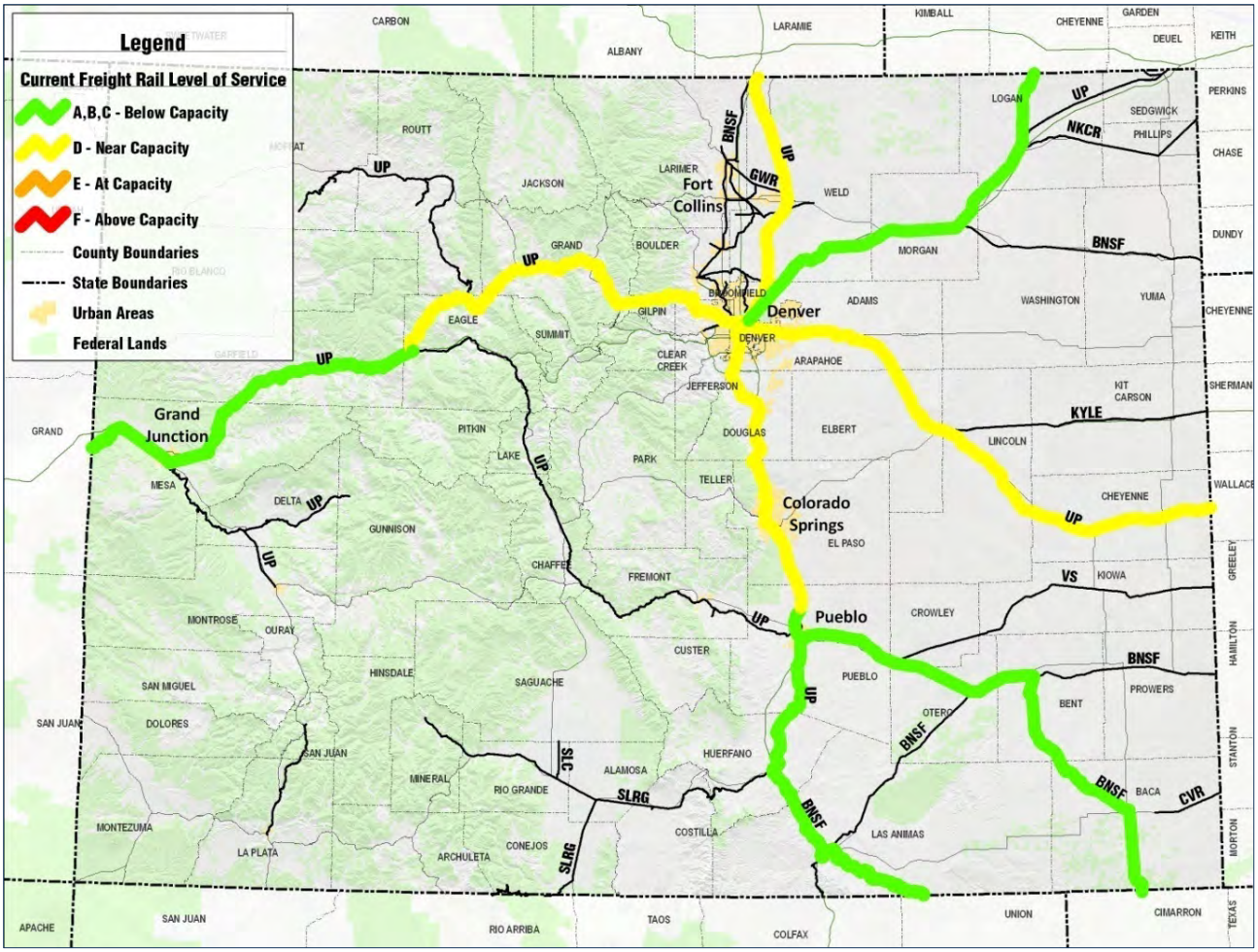
Table 6-1. Freight Rail Level-of-Service (LOS) Definitions

LOS Grade	Description	Definition
A B C	Below capacity	Low to moderate train flows with capacity to accommodate maintenance and recover from incidents
D	Near capacity	Heavy train flow with moderate capacity to accommodate maintenance and recover from incidents
E	At capacity	Very heavy train flow with very limited capacity to accommodate maintenance and recover from incidents
F	Above capacity	Unstable flows; service breakdown conditions

Figure 6-1 displays the 2005 level of service on the primary rail corridors in Colorado as determined by the study. As shown, Colorado's primary railroad network operates at levels of service A through D.

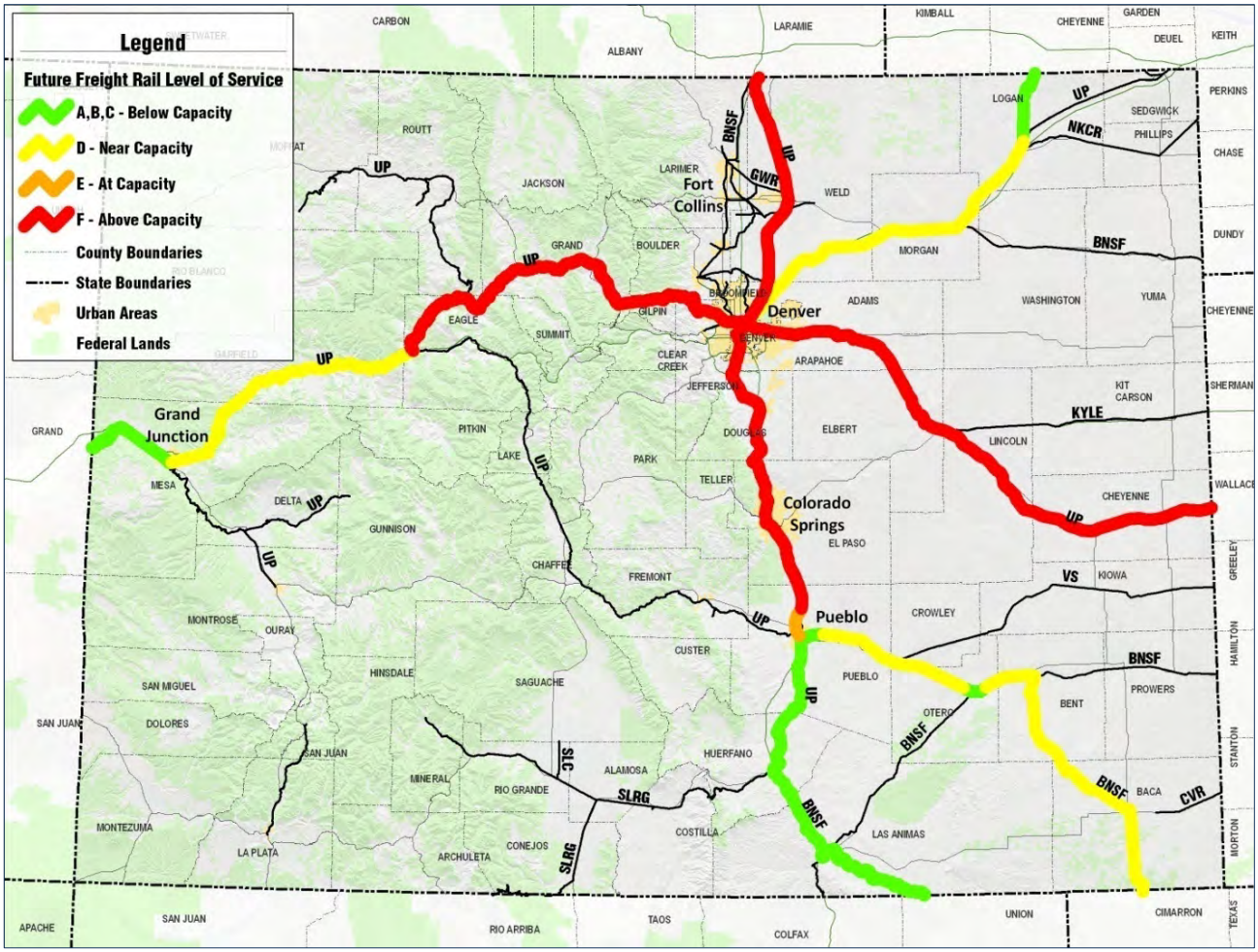
The 2007 study using 2005 and 2006 data further found that meeting the U.S. DOT's forecast demand will require the Class I freight railroads in the U.S. to increase their investment in infrastructure expansion. Ton-miles of rail freight—the movement of one ton of freight over one mile—carried over the national rail system has doubled since 1980. During this same period, the density of train traffic, measured in ton-miles per mile of track, has tripled. The projected rate of growth over the next 30 years comes after two decades of growth in rail freight tonnage that absorbed most excess capacity in the existing rail freight system. The existing U.S. freight rail network is not expected to absorb the projected growth over the next 30 years without capacity improvements.

The study estimated that the number of trains per day will increase by 50 to 100 percent from 2005 to 2035 on the majority of the study corridors in Colorado. Growth in the number of trains per day is expected to more than double on UP's lines from Wyoming to Denver and from Denver to the Kansas border. Figure 6-2 depicts the projected 2035 levels of service on Colorado's freight network, assuming no capacity improvements are made. The study forecasts that the primary lines from the Wyoming border to Pueblo and from Eagle to the Kansas border are anticipated to reach level of service F by 2035. Additional segments of Colorado's network are expected to move from level of service A, B, or C to level of service D by 2035. Based on these projections, Colorado will require capacity improvements to these primary BNSF and UP lines.



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

Figure 6-1. Current Level of Service on the Primary Class I Rail Lines in Colorado



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

Figure 6-2. Projected Levels of Service on the Primary Class I Rail Lines in Colorado (2035)

Identification of Current and Future Needs

In preparing this Plan, an extensive and open process, involving many diverse interested parties, was conducted to identify Colorado's current and future rail system needs. Proposed improvement projects were solicited and compiled from varied sources, including the Class I and short line railroads, the Stakeholder Group, municipalities, metropolitan planning organizations (MPOs), participants in the public open houses and workshops held across the state, and attendees of several industry meetings. These projects were supplemented by those projects that had been recognized through previous studies of passenger and freight rail in Colorado and through other programs at CDOT. The Steering Committee, which was instrumental in developing the project identification and evaluation process, participated extensively in the final review and refinement of the list of projects.

Project Categories

All projects were first separated into two lists: one for freight rail projects and one for passenger rail projects. The projects were then further categorized into major groupings of similar projects. The categories used to refine the project lists are as follows:

Freight Rail-related Projects

- Railroad/Public Safety Projects
- Railroad Overpass/Underpass Projects
- Corridor Preservation Projects
- Short Line Improvement Projects
- Rail Facilities/Relocation Projects
- Class I Railroad Capital Projects

Passenger Rail-related Projects

- Existing Passenger Service
- Proposed Passenger Service—Commuter Rail
- Proposed Passenger Service—Intercity Rail
- Proposed Passenger Service—High Speed Rail
- Rail Station Related Projects

Project Sources/Property Owners

in addition to a brief description of the project, the lists include a "Project Source" (i.e., the entity or other source that suggested the project for inclusion in the Plan), and a "Property Owner" (i.e., the known or anticipated ultimate owner of the project property). In some cases the Property Owner cannot be identified at this time; in those situations, the Property Owner is identified as "to be determined" (TBD).

Project Costs

The estimated costs for the projects were developed from various sources and adjusted as necessary to a year 2011 basis. Cost data and estimates from previous studies were widely used and updated, and in many cases the entity submitting the project provided a cost estimate. The cost estimates for the Short Line Improvement Projects were provided by the short line railroads. Other cost estimates were provided by CDOT or local governmental entities. Many of the estimates related to the passenger rail projects were based on previous studies such as the *Colorado Passenger Rail Study,* 1997, or the Rocky Mountain Rail Authority's *High Speed Rail Feasibility Study,* 2010. To update past cost estimates to a current (2011) basis, the *Engineering News-Record* Construction Cost Index was used to escalate costs. In some cases, insufficient information was available to make a reasonable estimate; in these situations, the cost was identified as TBD.

All costs presented are conceptual and are primarily for order of magnitude understanding and comparison purposes. Detailed studies for each project or segment of a project will be required to determine more accurate costs. Additional notes on cost estimates are as follows:

- Costs for right-of-way are generally not included.
- Costs for trackage rights are not included.
- Costs for Positive Train Control (PTC) are generally not included.
- The Class l railroads were not responsible for any estimated project costs.
- Cost estimates are provided for the individual segments indicated. The costs for combining segments on projects may be different (generally less) than the sum of the parts shown due to efficiencies of scale, duplication of facilities such as stations, and overlapping of rolling stock. Likewise, division of a project into smaller segments should not necessarily be estimated based on unit costs from these projects.

Project Evaluation Process

After the project lists were established, a process was developed to evaluate and place a relative priority on the projects to assist in the creation of an improvement plan. However, not all categories of projects were evaluated; certain categories were deemed inappropriate for further evaluation for one or more of the following reasons:

- Projects that already have an existing evaluation process in place
- Projects that are controlled and funded privately through the plans of the Class I railroads
- Projects that are of a scale not appropriate for a framework document, such as this Plan

Hence, the Railroad/Public Safety Projects, the Railroad Overpass/Underpass Projects, the Class I Railroad Capital Projects, and the Industrial Spur Tracks in the Freight Rail group and the Rail Station Related Projects in the Passenger Rail group were not included in the evaluation process. Projects in the remaining categories went through the evaluation process described below.

Evaluation Criteria

State departments of transportation are increasingly using performance measures to improve their planning and to support their investment decision-making. CDOT's Division of Transit and Rail (DTR) and the Transit and Rail Advisory Committee (TRAC) are currently establishing a framework for performance measures related to the transit and rail modes. This framework is being built upon the vision statement and the values that have been

developed for DTR. While the ultimate performance measures will be specific to transit and rail, it is important that the framework be compatible with the development of performance measures to be used for other modes dealt with throughout CDOT. To date, this exercise has yielded the following categories within which detailed performance measures will be defined:

- Accessibility
- Mobility
- Economic development
- Quality of life
- Environmental and resource conservation
- Safety
- Operational efficiency
- System preservation and expansion

As this is an ongoing process, and the specific performance measures have yet to be developed, 10 evaluation criteria were chosen, with the assistance of the Steering Committee, to be used in the evaluation process for this Plan. These criteria were selected for their applicability to the rail mode and their consistency with the categories identified above. Table 6-2 summarizes these evaluation criteria as well as the descriptors that help to define the key elements of these criteria.

Priority/Time Frame Evaluation

A panel of eight individuals from CDOT, the Stakeholders Group, and the Project Consultant Team evaluated the projects utilizing these criteria according to the various descriptors shown in Table 6-2. Each criterion was rated as one of the following: predominately addresses the criterion; partially addresses the criterion; or does not address the criterion.

The panel evaluated each project independently. These individual results were then compiled, and the panel met on several occasions to reach a consensus. During this process, the ratings were converted into a point system that was used to assign an assessment of High, Medium, or Low priority. It is important to note that these priorities are relative to the projects within each category of projects; they are not meant to imply priority across different types of projects. Higher ranked passenger projects reflect those that have completed environmental studies such as I-25 North and I-70 West.

In addition, as part of the evaluation process, projects were classified as either short-range or long-range projects. If implementation of a project could be underway within approximately five years, the project was classified as short range. Otherwise, the project was categorized as long range.

Table 6-2. Project Evaluation Criteria

	Criteria	Descriptors/Definitions
1	Economic development	Coordinates with economic development plans/agencies. Promotes economic development in rural areas. Reflects coordinated land use planning. Promotes tourism. Increases travel choices. Encourages development of rail served industrial parks (F). Development of passenger stations near "city centers" (P). Stations encourage redevelopment (P). Increases intermodal connections/facilities. Improves short lines access to class 1 lines. Improves connections between rural areas and population centers. Improves connections between modes and rural areas and population centers. Connects work centers to residential areas. (P)
2	Energy efficiency	Reduces VMT. Incorporates energy efficient technology. Reduces fossil fuel consumption.
3	Environmental benefits/impacts	Improves air quality. Reduces carbon footprint. Reduces greenhouse gas emissions. Sensitive to noise pollution. Uses existing corridors. Considers environmental justice.
4	Safety	Upgrades grade crossing warning/grade separates railroad/highways. Reduces trespassing. Provides adequate emergency response. Reduces rail collision risk. Reduces injuries/fatalities. Reduces likelihood of derailments.
5	Capacity enhancement/congestion relief	Adds capacity or completes gaps in existing systems. Expand/add sidings. Expedites passenger rail projects (P).
6	Existing infrastructure maintenance/upgrades	Improves short line access to class 1 lines (F). Short line upgrades to handle heavier loads (F). Upgrades passenger facilities/stations/access (P).
7	Mobility options/community enhancement	Improves connectivity. Uses context sensitive solutions. Complete streets. Quiet zones. Increases travel choices (P). Increases number of intermodal connections/facilities to help create a balanced transportation system.
8	Local/regional/public support	Considers urban and rural priorities. Educational programs/outreach. Streamline public process to expedite rail expansion projects. Consistent with local and regional plans and programs.
9	Funding/potential for private capital	Potential innovative financing and partnerships (P3). Positions Colorado for future funding opportunities.
10	Cost effectiveness	Positive benefit/cost ratio, return on investment.

(F) = Specifically applicable to freight rail
(P) = Specifically applicable to passenger rail

Rail System Improvement Program

By combining the results of the project identification and evaluation processes, a rail system improvement program was developed.

Funding is not currently available for any of the projects proposed in this chapter other than the Section 130 grade crossing improvement projects shown in Table 6-3 and the FasTracks program discussed in the *Proposed Passenger Service—Commuter Rail* section below. Federal, state, local, or private funding sources must be identified before any of these projects can be implemented. Also, the listing of projects does not imply that the projects have been investigated to appropriate levels of detail, designed, or approved. Inclusion on a list does not suggest an ability to proceed with the project.

The following sections summarize the lists of projects by category for both freight and passenger rail. The tables below include the project description (including the estimated project costs) and the overall priority evaluation (if applicable). In addition, shading of a project in the table indicates that it has been identified as a long-range project.

Freight Rail

Railroad/Public-Safety Projects

The highway/railroad at-grade crossing improvement projects shown in Table 6-3 were submitted either by the railroads, local governmental entities, or CDOT (primarily funded by the Federal Section 130 program). There is an existing procedure in place developed by CDOT, the PUC, and the railroads for prioritizing these projects (therefore, these projects are not prioritized in this Plan). These projects could be implemented in the next five years, depending on funding availability. The years shown in Table 6-3 are the currently programmed time frames.

Table 6-3. Railroad/Public Safety Projects

	Project Description	Project Source	Property Owner	Estimated Project Costs	Overall Priority Evaluation	Notes
1	Granada—CR 22.50 add gates/flashers	BNSF	BNSF	$197 K	NA	
2	Wellington—CR 64 add gates/flashers	BNSF	BNSF	$283K	NA	
3	Fort Collins—Prospect Street Interconnect for signals	BNSF	BNSF	$8K	NA	
4	Las Animas—Ash Street add gates/flashers + CWT	BNSF	BNSF	$649K	NA	

Table 6-3. Railroad/Public Safety Projects (continued)

	Project Description	Project Source	Property Owner	Estimated Project Costs	Overall Priority Evaluation	Notes
5	Rocky Ford—15th Road SE add gates/flashers	BNSF	BNSF	$220K	NA	
6	Westminster—W 88th Avenue surface crossing	BNSF	BNSF	$212K	NA	
7	Westminster—Lowell Boulevard-surface crossing	BNSF	BNSF	$81K	NA	
8	Wellington—CR 64 surface crossing	BNSF	BNSF	$81K	NA	
9	Granada—CR 22.50 widen crossing	BNSF	BNSF	$50K	NA	
10	Boulder—Independence Avenue replace crossing surface	BNSF	BNSF	$90K	NA	
11	Boulder—Jay Road replace crossing surface	BNSF	BNSF	$90K	NA	
12	Springfield—Main Street traffic control	BNSF	BNSF	$20K	NA	
13	Comanche Village Drive/BNSF Crossing safety and train horn quiet zone improvements	City of Fountain	BNSF	TBD	NA	
14	Comanche Village Drive/UP crossing safety and train horn quiet zone improvements	City of Fountain	UP	TBD	NA	
15	E. Ohio Avenue/BNSF crossing safety and train horn quiet zone improvements	City of Fountain	BNSF	TBD	NA	
16	W. Ohio Avenue/UP crossing safety and train horn quiet zone improvements	City of Fountain	UP	TBD	NA	
17	Link Road/UP crossing safety and train horn quiet zone improvements	City of Fountain	UP	TBD	NA	
18	Nevada Avenue/CS&E at grade crossing	City of Colorado Springs	CS&E	TBD	NA	
19	Royer/at-grade railroad crossing near Las Vegas	City of Colorado Springs	BNSF/UP	TBD	NA	

Table 6-3. Railroad/Public Safety Projects (continued)

	Project Description	Project Source	Property Owner	Estimated Project Costs	Overall Priority Evaluation	Notes
20	Sierra Madre quiet zone/UP	City of Colorado Springs	UP	TBD	NA	
21	Los Animas quiet zone/UP	City of Colorado Springs	UP	TBD	NA	
22	6th Street w/o Narrow Gauge Ave., Durango, lights, gates, and CWT circuitry	CDOT	D&S	$300K	NA	Section 130 in 2012
23	8th Street w/o Narrow Gauge Avenue, Durango, lights, gates, and CWT Circuitry	CDOT	D&S	$300K	NA	Section 130 in 2012
24	9th Street w/o Narrow Gauge Avenue, Durango, lights, gates, and CWT circuitry	CDOT	D&S	$300K	NA	Section 130 in 2012
25	Washington County, west of Akron, County Road U south of County Road 42, lights, gates, and CWT circuitry	CDOT	BNSF	$300K	NA	Section 130 in 2013
26	Washington County, east of Otis, County Road XX north of County Road 39, lights, gates, and CWT circuitry	CDOT	BNSF	$300K	NA	Section 130 in 2013
27	Yuma County Road 19, north of US 34, lights, gates, and CWT circuitry	CDOT	BNSF	$400K	NA	Section 130 in 2013
28	Washington County, west of Akron, County Road Q south of US 34, lights, gates, and CWT circuitry	CDOT	BNSF	$300K	NA	Section 130 in 2013
29	La Jara, 7th Street east of US 285, lights, gates, and CWT circuitry	CDOT	SLRG	$400K	NA	Section 130 in 2014
30	Baca County, US 160 east of US 287, lights, gates, and CWT circuitry	CDOT	BNSF	$300K	NA	Section 130 in 2014
31	Walsenburg, 6th Street at US 160, lights, gates, and CWT circuitry	CDOT	BNSF	$300K	NA	Section 130 in 2014
32	Weld CR 48, east of US 85, lights, gates, and CWT circuitry	CDOT	UP	$400K	NA	Section 130 in 2015
33	Weld CR 29, east of US 85, lights, gates, and CWT circuitry	CDOT	UP	$300K	NA	Section 130 in 2015

Table 6-3. Railroad/Public Safety Projects (continued)

	Project Description	Project Source	Property Owner	Estimated Project Costs	Overall Priority Evaluation	Notes
34	Weld CR 76, east of US 85, lights, gates, and CWT circuitry	CDOT	UP	$300K	NA	Section 130 in 2015
35	Reconstruction of Mason Street in downtown Ft. Collins with railroad track rehabilitation	Fort Collins	BNSF/Fort Collins	$6.15m	NA	Provide separation of rail and vehicle traffic
36	Larimer CR 50, Willox Lane, lights, bells, gates, concrete crossing material	Larimer County	UP	TBD	NA	Larimer Co. Road 4600 average daily traffic

Railroad Overpass/Underpass Projects

These are grade separation projects submitted either by CDOT, the railroads, or various cities and communities. As shown in Table 6-4, the list is extensive, reflecting the vast need for improvement in this category. Many of these projects are locations at which a grade separation will be needed; others reflect the need for an existing grade separation structure to be rehabilitated or reconstructed. The federal share of these expensive projects typically comes from the Section 130 program or other project-specific funding programs. CDOT is in the process of re-evaluating its existing procedures for prioritizing the grade-separation projects. Accordingly, these projects are not prioritized in this Plan and they will be implemented only as funds become available.

Table 6-4. Rail Overpass/Underpass Projects

	Project Description	Project Source	Property Owner	Estimated Project Costs	Overall Priority Evaluation
1	Broomfield—120th Avenue new underpass	City of Broomfield	BNSF	$8M	NA
2	Greeley Sub grade separations	UP	UP	TBD	NA
3	BNSF at 88th Avenue	DRCOG	BNSF	TBD	NA
4	BNSF at 96th Avenue	DRCOG	BNSF	TBD	NA
5	BNSF at 104th Avenue	DRCOG	BNSF	TBD	NA
6	BNSF at SH-67 and UP at SH-67 (Sedalia)	DRCOG	BNSF/UP	TBD	NA
7	BNSF/UP at Santa Fe Drive/Kalamath Street	DRCOG	BNSF/UP	TBD	NA
8	RTD at 88th Avenue	DRCOG	RTD	TBD	NA

Table 6-4. Rail Overpass/Underpass Projects (continued)

	Project Description	Project Source	Property Owner	Estimated Project Costs	Overall Priority Evaluation
9	UP at 72nd Avenue	DRCOG	UP	TBD	NA
10	UP at 88th Avenue	DRCOG	UP	TBD	NA
11	UP at 96th Avenue	DRCOG	UP	TBD	NA
12	UP at 104th Avenue	DRCOG	UP	TBD	NA
13	UP at Broadway (SH-53)	DRCOG	UP	TBD	NA
14	UP at Quebec Street frontage road ramps	DRCOG	UP	TBD	NA
15	UP at SH-79	DRCOG	UP	TBD	NA
16	UP at Washington Street	DRCOG	UP	TBD	NA
17	UP/RTD at Peoria Street	DRCOG	UP/RTD	TBD	NA
18	SH-72/BNSF grade separation	City of Wheat Ridge	BNSF	TBD	NA
19	44th Avenue/Eldridge BNSF grade separation	City of Wheat Ridge	BNSF	TBD	NA
20	Santa Fe/Kalamath at Consolidated Main Line (CML) new grade separation	City and County of Denver/ CDOT	BNSF/UP	TBD	NA
21	Quebec Street Ramps At UP new grade separation	City and County of Denver	UP	TBD	NA
22	47th/48th @ York/Josephine and UP, new grade separation	City and County of Denver	UP	TBD	NA
23	Bayaud bike/pedestrian bridge	City and County of Denver	BNSF/UP	TBD	NA
24	Jewell/Evans Station bike/pedestrian bridge at CML/RTD Southwest Corridor Light Rail	City and County of Denver	BNSF/UP /RTD	TBD	NA
25	West 38th Avenue underpass rehabilitation	City and County of Denver	BNSF	TBD	NA
26	Alameda Avenue underpass at CML/RTD Central Corridor Light Rail, replacement and lane balancing	City and County of Denver	BNSF/UP	TBD	NA
27	38th Street Railroad underpass reconstruction/replacement	City and County of Denver	BNSF	TBD	NA
28	East 46th Avenue underpass at BNSF	City and County of Denver	BNSF	TBD	NA
29	Iowa Avenue underpass at CML/RTD Southwest Corridor Light Rail	City and County of Denver	BNSF/UP /RTD	TBD	NA

Table 6-4. Rail Overpass/Underpass Projects (continued)

	Project Description	Project Source	Property Owner	Estimated Project Costs	Overall Priority Evaluation
30	Fillmore Street/UP Reconstruct Structure	City of Colorado Springs	UP	TBD	NA
31	Fontanero Street/UP Reconstruct Structures	City of Colorado Springs	UP	TBD	NA
32	Uintah Street/UP Reconstruct Structure	City of Colorado Springs	UP	TBD	NA
33	Nevada Avenue/UP Reconstruct Structure	City of Colorado Springs	UP	TBD	NA
34	Tejon Street/UP Reconstruct Structure	City of Colorado Springs	UP	TBD	NA
35	Rockrimmon/UP Reconstruct Structure	City of Colorado Springs	UP	TBD	NA
36	Costilla Street/RR Reconstruct Structure	City of Colorado Springs	UP	TBD	NA
37	Circle Drive/RR Reconstruct Structures	City of Colorado Springs	UP	TBD	NA
38	US 85 and O Street (CR64)—Construct overpass	Weld County	UP	TBD	NA
39	Future (Long Range Plan) South Powers Boulevard/UP grade separation structure crossing two-fifths mile north of Hanover Road/Old Pueblo Road intersection	City of Fountain	UP	TBD	NA
40	Future (Long Range Plan) South Powers Boulevard/BNSF grade separation structure crossing near I-25 Exit 123	City of Fountain	BNSF	TBD	NA

Table 6-4. Rail Overpass/Underpass Projects (continued)

Rail Corridor Preservation Projects

The rail corridors listed in Table 6-5 are corridors of significance that the state believes should continue to be monitored. These corridors are also noted in an annual report by CDOT to the Transportation Legislative Review Committee. Due to the importance of potential timely action by the Legislature in the event of an abandonment action, these projects are prioritized in the Plan.

Table 6-5. Rail Corridor Preservation Projects

	Project Description	Project Source	Property Owner	Estimated Project Costs	Overall Priority Evaluation
1	Preserve Towner Line Corridor	Stakeholders	V&S	$14M	Medium
2	Preserve Tennessee Pass Line	Stakeholders	UP	$100M +	Medium

Short Line Improvement Projects

These projects were submitted by the short line railroads. These are the types of projects that are sometimes implemented in short line assistance programs in other states such as Kansas. Although these projects have been prioritized in this Plan, if a short line assistance program is developed in Colorado, a rigorous process of analyzing all of these projects, including identification of anticipated public benefits, would be developed and used to prioritize and program such funds. As shown in Table 6-6, the highest-rated projects are those that improve a rail line to allow it to handle 286,000 pound freight rail cars.

Table 6-6. Short Line Improvement Projects

	Project Description	Project Source	Property Owner	Estimated Project Costs	Overall Priority Evaluation
1	Rehabilitate the track between Johnstown and Longmont and restore bridge at MP 28.6 to enable GWR to handle 286,000 pound cars (MP 0.0 to 18.8)	GWR	GWR	$2.9M	High
2	Upgrade the rail line between Miliken and Windsor (MP 30.9 to 18.8) to allow GWR to handle 286,000 pound cars	GWR	GWR	$4.8M	High
3	Upgrade the rail line between Greeley and Windsor (MP 87.6 to 98.3), restore bridge over Poudre River (MP 94.55), construct bypass and connection in Greeley (MP 98.3), and construct bypass at Windsor (wye trackage), all to enable GWR to handle 286,000 pound cars	GWR	GWR	$13.2M	High

	Project Description	Project Source	Property Owner	Estimated Project Costs	Overall Priority Evaluation
4	Upgrade the rail line between Windsor and Loveland (MP30.9 to 23.9 and MP 0 to 6.6) to enable GWR to handle 286,000 pound cars	GWR	GWR	$13.5M	High
5	Replace 56-pound rail with 90-pound rail (MP 6.7—MP 15.2), upgrade to accommodate 286,000-pound cars (includes installing 8,000 ties and 12 90-pound turnouts)	SLC	SLC	$2M	High
6	Upgrade Structures for 286,000-pound cars on Kyle RR—Limon to Kansas State Line	Stake-holders	Kyle RR	TBD	High
7	Construct loop track and connection track in the Windsor industrial park	GWR	GWR	$6.8M	Medium
8	Alamosa-Walsenburg upgrade to FRA Class III	SLRG	SLRG	$5.3M	Medium
9	Hanna—Alamosa upgrade to FRA Class III	SLRG	SLRG	$2.1M	Medium
10	Construct Hanna Bulk Transload Facility	SLRG	SLRG	TBD	Medium
11	Tie and surfacing program between Fort Collins and Windsor (MP 74 to 87.6)	GWR	GWR	$720K	Low
12	100 refrigerated railroad box cars (to support potato industry)	SLRG	SLRG	$25M	Low
13	Tie and resurfacing program for the entire line in Colorado	NKCR	NKCR	$3.5M	Low

Rail Facilities/Relocation Projects

Two of these projects, relocation of the existing Denver intermodal facilities of the BNSF and the UP, were included as projects moving forward into the Plan due to their inclusion in the *Eastern Colorado Mobility Study* in 2002 and both railroads' relatively recent exploration of feasible sites for these facilities. These relocations are not a high priority for either railroad at this time and are shown as medium priority in this Plan.

The other project, the relocation of freight rail off the Front Range, is a substantial and costly project. It was proposed by members of the Stakeholder Group but is also not a priority for either railroad or CDOT at this time. It is discussed in more detail in Chapter 5. The Front Range rail relocation project was rated as a low priority.

All of the projects in this category (Table 6-7) are considered to be long-range projects.

Table 6-7. Rail Facilities/Relocation Projects

	Project Description	Project Source	Property Owner	Estimated Project Costs	Overall Priority Evaluation
1	Relocate BNSF Intermodal Facilities	Stakeholders/Eastern Colorado Mobility Study	BNSF	+/- $200M	Medium
2	Relocate UP Intermodal Facilities	Stakeholders/Eastern Colorado Mobility Study	UP	+/- $200M	Medium
3	Relocate Freight Rail off Front Range to Eastern Plains	Stakeholders	TBD	$1B +/-	Low

Class I Rail Capital Projects

The projects listed in Table 6-8 were submitted by the UP and BNSF as projects in their current short-term capital programs. Since these projects are completed based on the railroads' business plans, no prioritization was conducted in this Plan.

Table 6-8. Class I Rail Capital Projects

	Project Description	Project Source	Property Owner	Estimated Project Costs	Overall Priority Evaluation
1	Greeley sub—complete CTC	UP	UP	TBD	NA
2	Julesburg sub—new siding at Red Lion	UP	UP	TBD	NA
3	Double track UP belt line—Denver	UP	UP	TBD	NA
4	Greeley signal UP grade	UP	UP	TBD	NA
5	UP Connection to Great Western—Greeley	UP	UP	TBD	NA
6	Julesburg sub—signal	UP	UP	TBD	NA
7	Julesburg sub—tie and rail upgrade	UP	UP	TBD	NA
8	Julesburg sub—siding extension at Sterling and Messex	UP	UP	TBD	NA
9	Limon sub—tie and rail upgrade	UP	UP	TBD	NA
10	Moffat sub—Cresent and Plain siding extensions	UP	UP	TBD	NA
11	Moffat sub—Kremmling siding extension	UP	UP	TBD	NA
12	Grand Junction yard upgrade—track extensions	UP	UP	TBD	NA
13	Craig Branch—Toponas siding extension	UP	UP	TBD	NA
14	North Fork sub—install CTC	UP	UP	TBD	NA
15	Pueblo re-construct wye	UP	UP	TBD	NA
16	Brush sub—siding extensions	BNSF	BNSF	TBD	NA
17	Pikes Peak sub—siding extensions	BNSF	BNSF	TBD	NA

Industrial Spur Track Projects

The projects listed in Table 6-9 were submitted in the general request for project input. However, they are considered a level of detail not appropriate for a framework document such as this and, therefore, are included in the Plan but are not prioritized.

Table 6-9. Industrial Spur Track Projects

	Project Description	Project Source	Property Owner	Estimated Project Costs	Overall Priority Evaluation
1	Mountain Plains Industrial Center spur	Arvada	UP	$5M	NA
2	Southeast Arvada Industrial spur	Arvada	UP or BNSF	$5M	NA

Passenger Rail

Existing Passenger Service

The projects listed in Table 6-10 relate to existing passenger services in the state. They were included based on previous studies or because they were suggested by the Stakeholder Group. The highest rated project, Denver Union Station, is essentially funded and under construction.

Table 6-10. Existing Passenger Service

	Project Description	Project Source	Property Owner	Estimated Project Costs	Overall Priority Evaluation	Notes
1	Complete Denver Union Station	RTD	RTD	$182M	High	Remaining funds expected from various sources
2	Amtrak station improvements	Amtrak	Various	TBD	Medium	ADA compliant and in state of good repair
3	Preserve Amtrak Southwest Chief service on the Colorado alignment (Capital Improvements)	Stakeholders	BNSF	$200M	Medium	
4	Upgrade passenger rail cars on Zephyr Route Denver to Grand Junction	Stakeholders	Amtrak	TBD	Low	Amtrak Equipment Issue
5	Acquire additional cars to add seating capacity to California Zephyr between Denver and Grand Junction	Stakeholders	Amtrak/ Colorado	TBD	Low	

Proposed Passenger Service—Commuter Rail

Table 6-11 lists the proposed commuter rail services that were included in earlier studies or proposed by the Stakeholder Group. Commuter rail is defined as conventional rail serving short-haul rail passenger service operating in metropolitan and suburban areas. Only the FasTracks projects and the commuter rail line between the Denver metro area and Fort Collins are considered to be potential short-range projects. The railroads have not agreed to host any new service on their existing routes or ROW.

Table 6-11. Proposed Passenger Service—Commuter Rail

	Project Description	Project Source	Property Owner	Estimated Project Costs	Overall Priority Evaluation	Notes
1	Complete commuter rail portions of FasTracks	RTD	RTD	$1.71B	High	North Metro and Northwest Corridors
2	Develop commuter rail from Fort Collins to Thornton (FasTracks North Metro Terminus) with a connection in Longmont to FasTracks Northwest Rail Corridor through Boulder	North I-25 EIS	RTD/BNSF	$650M	High	
3	Develop commuter rail from downtown Denver to downtown Colorado Springs on existing track with additional double track as required	Stakeholders	BNSF/UP	$540M	Medium	Includes double tracking line from Palmer Lake to Colorado Springs
4	Develop commuter rail from downtown Colorado Springs to Pueblo on existing track with additional double track as required	Stakeholders	BNSF/UP	$340M	Medium	Includes double tracking line from Colorado Springs to Fountain

Proposed Passenger Service—Intercity Rail

Table 6-12 lists proposed long-distance train services similar to existing Amtrak routes connecting the national network or regional city pairs. They were included in previous studies or provided by the Stakeholder Group or other interested individuals. All of these projects are considered to be long-range projects. These intercity rail corridors currently operate at a maximum of 79 miles per hour. However, as these corridors may evolve to higher speeds in the future, they are similar to the FRA's "High Speed Rail Emerging" category of service as discussed in the next section.

The railroads have not agreed to host any new service on their existing routes or ROW nor do freight routes meet high-speed passenger rail standards.

Table 6-12. Proposed Passenger Service—Intercity Rail

	Project Description	Project Source	Property Owner	Estimated Project Costs	Overall Priority Evaluation	Notes
1	Passenger Rail Link to Southwest Chief, Denver to La Junta or Trinidad	ColoRail	BNSF	$875M	Medium	
2	Rail Service from Fort Collins to Trinidad on new additional track within existing railroad right of way	Stakeholders	BNSF/UP	$2B	Medium	
3	Rail Service on existing track from Cheyenne, Wyoming to El Paso, Texas (option through Fort Collins)	Stakeholders	BNSF/UP	$1.5B	Medium	Includes double tracking line from Palmer Lake to Fountain
4	Re-establish Pioneer Line (Denver to Seattle) on BNSF along northern Front Range	Stakeholders	BNSF	$60 to $80M	Medium	Stand-alone cost is rough estimate of Colorado portion of 2009 study cost of $370 to $385 million for Denver to Seattle.
5	Passenger Rail Glenwood Springs to Aspen	I-70 Programmatic Environmental Impact Study	RFTA	$220M	Low	
6	Rail service on existing track from Cheyenne, Wyoming to El Paso, Texas (option through Greeley)	Stakeholders	UP/BNSF	$1.2B	Low	Includes double tracking line from Palmer Lake to Fountain
7	Passenger rail on Tennessee Pass Line Gypsum to Leadville	Stakeholders	UP	$120M	Low	
8	Provide connection to Amtrak's Zephyr, Pueblo to Dotsero via Tennessee Pass	Stakeholders	UP	$120M	Low	
9	Passenger rail Glenwood Springs to Steamboat Springs	I-70 PEIS	UP	$350M	Low	

Proposed Passenger Service—High-Speed Rail

These projects were included in previous or ongoing studies (Rocky Mountain Rail Authority (RMRA), Interregional Connectivity Study (ICS), and Automated Guideway System (AGS) Study) or proposed by the Stakeholder Group. These systems are considered to be non-conventional rail and/or capable of speeds greater than those of conventional rail.

The FRA provides the following definitions for a range of high-speed rail options, any of which could be applicable to the envisioned projects over time:

- **HSR Express**—Frequent service between major population centers 200 to 600 miles apart, with few intermediate stops. Top speeds of at least 150 mph on completely grade-separated, dedicated ROW (with the possible exception of some shared track in terminal areas). Intended to relieve air and highway capacity constraints.
- **HSR Regional**—Relatively frequent service between major and moderate population centers 100 to 500 miles apart, with some intermediate stops. Top speeds of 110 to 150 mph, grade-separated, with some dedicated and some shared track (using positive train control technology). Intended to relieve highway and, to some extent, air capacity constraints.
- **HSR Emerging**—Developing corridors of 100 to 500 miles, with strong potential for future HSR Regional and/or Express service. Top speeds of up to 90 to 110 mph on primarily shared track (eventually using PTC technology), with advanced grade crossing protection or separation. Intended to develop the passenger rail market and provide some relief to other modes.

Because of their high cost and the length of time necessary to prepare for implementation, all of the projects listed in Table 6-13 are considered to be long-range projects.

Table 6-13. Proposed Passenger Service—High Speed Rail

	Project Description	Project Source	Property Owner	Estimated Project Costs	Overall Priority Evaluation	Notes
1	Advanced Guideway System (AGS)—Denver Metro Area to Eagle Airport*	Stakeholders/ I-70 PEIS	TBD	$15.3B	High/ Medium	Priority rating pending out-come of AGS Study
2	HSR—Denver Metro Area to Fort Collins	ICS	TBD	$2.5B	Medium	
3	HSR—Denver Metro Area to Colorado Springs	ICS	TBD	$3.4B	Medium	
4	HSR—Colorado Springs to Pueblo	ICS	TBD	$2B	Medium	
5	HSR in I-25 median—Cheyenne to Albuquerque	Stakeholders	WYDOT, CDOT, NMDOT	$12.8B	Low	
6	HSR in I-70 median east of Denver to Burlington	Stakeholders	CDOT	$4B	Low	
7	HSR in I-76 median—Denver to Julesburg	Stakeholders	CDOT	$4.2B	Low	

*Could include alternate technologies other than rail

Rail Station-related Projects

The determination was made at a Stakeholder Group meeting that this Plan was a framework document and that specific passenger rail station detail would not be included in the prioritized list unless included in an EIS or other project-specific study. However, the projects listed in Table 6-14 were submitted as being in approved regional plans and, while not being prioritized, are shown in this Plan in this separate category.

Table 6-14. Rail Station-related Projects

	Project Description	Project Source	Property Owner	Estimated Project Costs	Overall Priority Evaluation
1	Colorado Springs Downtown Rail Station (intermodal bus/rail/intercity)	Mountain Metropolitan Transit/Colorado Springs	City of Colorado Springs	$20M	NA
2	Intermodal park-and-ride/rail reconstruction—Woodmen/I-25/Railroad	Mountain Metropolitan Transit/Colorado Springs	City of Colorado Springs	$5M	NA
3	Intermodal park-and-ride—Ft. Carson Gate #20 area/ Mesa Ridge Parkway/ Railroad	Mountain Metropolitan Transit/Colorado Springs	City of Colorado Springs	$3M	NA
4	Downtown Rail Station—area pedestrian improvements	Mountain Metropolitan Transit/Colorado Springs	City of Colorado Springs	$1M	NA
5	Downtown Rail Station—railroad pedestrian bridge	Mountain Metropolitan Transit/Colorado Springs	City of Colorado Springs	$5M	NA
6	Monument Rail Station—intermodal/PNR	Mountain Metropolitan Transit/Colorado Springs	Town of Monument	$3M	NA
7	Pedestrian bridge over railroad at PNR	Mountain Metropolitan Transit/Colorado Springs	City of Colorado Springs	$3M	NA

Chapter 7 Public Funding Sources

Funding Needs

Investments in Colorado's rail system, expansion, and maintenance are beneficial to the economy at the local, regional, state, and national levels. To date, rail funding in Colorado has predominantly come from the private Class l and short line railroad companies that own and operate the rail infrastructure in the state.

State and local governments provide matching funds for the Section 130 at-grade rail/highway crossing programs and the rail/highway grade-separation projects built in the state. The only significantly funded passenger rail transportation in the state has been the light rail program of the RTD in the Denver metropolitan area. That agency also is planning some commuter rail projects within the Denver area.

The challenge in Colorado, as well as the rest of the United States, is to find adequate and predictable funding for the projects identified in this Plan. The growing prevalence of public-private partnerships nationwide should be helpful in advancing projects that have mutual public and private benefits. The projects highlighted in Chapter 6 are likely examples where public-private participation could provide the solution for project funding.

The state's short line railroads identified a significant number of project needs in the process of developing this Plan. Based on the importance of these projects to the local and regional economies of the state, a rail freight-assistance program (possibly a revolving loan program) could be created for the short line railroads to advance needed improvements. Such programs have been used for many years in other states.

The tools used to pay for infrastructure development continue to evolve and become more complex as limited funds must be allocated to critical new projects and maintenance of existing assets. Terms like "innovative finance" have been used for years to describe the world of project funding and financing outside of traditional gasoline tax-based federal funding and pay-as-you-go project delivery. Most of what was considered innovative just a few years ago is now commonplace and much more diverse than can be accommodated under a single title.

Financing and funding are different terms, although they often are used interchangeably. Funding is money provided to pay for the capital or operations and maintenance needs of a project. Funding can come from grants, fare revenue, tax collections, a bond program, private equity, or a variety of other sources. Financing refers to a number of mechanisms that accelerate a series of cash flows through borrowing. A number of public and private financing programs are available, and each requires some ongoing (short or long-term) flow of funds to repay the debt. The most attractive financing programs are those that are inexpensive (have

low initial fees and interest charges) and are flexible in the repayment terms. Financing, however, is not cash money; rather it is a transaction to transform a series of cash flows into an upfront sum that fits the needs of a project.

The sections below describe various existing federal and state funding and financing sources that are currently available and could be used to improve the freight and passenger rail infrastructure and services of Colorado. Also included is a discussion of funding and financing programs in other states that should be explored by Colorado.

Funding Sources

Federal Funding Programs

Passenger Rail Improvement and Investment Act of 2008 (PRIIA)

PRIIA was enacted in October 2008 and provided for the reauthorization of Amtrak. The Act tasked Amtrak, the US DOT, the FRA, states, and other stakeholders with improving operations, facilities, and service. PRIIA authorized more than $13 billion between 2009 and 2013 and promotes the development of new and improved intercity passenger rail services and state-sponsored rail corridors throughout the U.S., as well as the development of high-speed rail corridors. However, appropriations have only been averaging about 75% of the authorized amounts in 2009—2012.

PRIIA established three new competitive grant programs for funding high-speed intercity passenger rail improvements. Each of the three programs provides 80 percent federal funding with a required 20 percent non-federal match. Funding for these authorized programs associated with PRIIA must be appropriated annually. The three grant programs established by PRIIA are described below.

Intercity Passenger Rail Service Corridor Capital Assistance Program

Under PRIIA, an intercity passenger rail capital grant program for states was established that requires states to identify passenger rail corridor improvement projects in their state rail plans. The intent is to create the framework for a new intercity passenger rail service corridor capital assistance program. The High-Speed Intercity Passenger Rail (HSIPR) Program provides funding assistance to states, groups of states, interstate compacts, public agencies, and Amtrak (both alone and in cooperation with states). These funds can be used for service development programs; planning projects; and financing the costs of facilities, infrastructure, and equipment necessary to provide or improve intercity passenger rail transportation. Existing or proposed intercity passenger services are eligible under this program.

High Speed Rail Corridor Development Program

PRIIA also authorized $1.5 billion annually to establish and implement a high-speed rail corridor development program. Funding is currently restricted to projects intended to develop the 10 federally designated high-speed corridors for intercity passenger rail services (Figure 7-1) that may reasonably be expected to reach speeds of at least 110 mph.

Figure 7-1. Designated High-Speed Rail Corridors Map

Congestion Grants

PRIIA authorizes $325 million annually for grants to states, or to Amtrak in cooperation with states, for financing the capital costs of facilities, infrastructure, and equipment for high-priority rail corridor projects necessary to reduce congestion or facilitate intercity passenger rail ridership growth.

SAFETEA-LU Programs

The Safe, Accountable, Efficient Transportation Equity Act—a Legacy for Users (SAFETEA-LU), the current authorization bill for the nation's surface transportation program, was scheduled to expire on October 1, 2009; however, temporary extensions of SAFETEA-LU have been passed through March 2012 or until a new transportation authorization bill is approved. The SAFETEA-LU bill contains a number of program provisions with specific eligibility for rail. These include both funding and financing programs, which are described below.

Section 130 Highway-rail Grade Crossing Program

As discussed in more detail on page 5-28, this program provides federal support for grade crossing protecting improvement in an effort to reduce the incidence of accidents, injuries, and fatalities at public rail-highway crossings. States may use funds to improve railroad crossings, including the installation or upgrading of warning devices, the elimination of at-grade crossings through grade separation, or the consolidation or closing of crossings. The federal share for these funds is 90 percent.

Rail Line Relocation and Improvement Capital Grant Program

Section 9002 of SAFETEA-LU authorizes funding for the purpose of providing financial assistance for local rail line and improvement projects. Any construction project that improves the route or structure of a rail line and 1) involves a lateral or vertical relocation of any portion of the rail line, or 2) is carried out for the purpose of mitigating the adverse effects of rail traffic on safety, motor vehicle traffic flow, community quality of life, or economic development, is eligible. The federal share for these funds is 90 percent, not to exceed $20 million. Successful grant applicants must meet cost-benefit requirements (i.e., that the project benefits (for the period of the estimated economic life of the improvements) exceed the costs of the project for the same time period).

Congestion Mitigation and Air Quality (CMAQ) Improvement Program

This program funds transportation projects and programs that improve air quality by reducing transportation-related emissions in non-attainment and maintenance areas for ozone, carbon monoxide, and particulate matter. Examples of CMAQ-funded rail projects include the construction of intermodal facilities, rail track rehabilitation, diesel engine retrofits, idle-reduction projects in rail yards, and new rail sidings.

Funding is available for areas that do not meet the National Ambient Air Quality Standards (nonattainment areas) as well as former nonattainment areas that are now in compliance (maintenance areas). Funds are distributed based on a formula considering an area's population by county and the severity of its ozone and carbon monoxide problems.

SAFETEA-LU requires states and metropolitan planning organizations to give priority in distributing CMAQ funds to diesel engine retrofits and other cost-effective emission reduction and congestion mitigation activities. SAFETEA-LU also requires the Secretary of Transportation to evaluate and assess the effectiveness of a representative sample of CMAQ projects to determine the direct and indirect impact of the projects on air quality and congestion levels, as well as ensure the effective implementation of the program.

Freight initiatives may be eligible under the 1999 CMAQ guidance. Although freight is not mentioned specifically, the provision for public-private partnerships—strengthened considerably with the Transportation Equity Act for the 21st Century to allow public (CMAQ) funds to be used for privately owned and operated services—represents another avenue of support for freight and intermodal projects that generate an air quality benefit. To qualify for CMAQ funding (assuming all other requirements are met), emissions reductions can be generated directly by projects focusing on the vehicles themselves, through treatment of tailpipe exhaust, or application of advanced engine technologies.

State departments of transportation and metropolitan planning organizations select and approve projects for funding. The federal matching share for these funds is 80 percent.

Surface Transportation Program (STP)

The Surface Transportation Program is a general grant program available for improvements on any federal-aid highway, bridge, or transit capital project. The program is meant to provide flexible funding that may be used by states and localities. Eligible applications include highways, bridge projects on any public road, transit capital projects, and intracity and intercity bus terminals and facilities. Eligible rail improvements include lengthening or increasing the vertical clearance of bridges, eliminating crossings, and improving intermodal connectors.

State departments of transportation and metropolitan planning organizations select and approve projects for funding under this program. The federal matching share for these funds is 80 percent.

Rail and Fixed Guideway Modernization

The transit capital investment program (49 U.S.C. 5309) provides capital assistance for new rail systems (New Starts/Small Starts program), bus systems (Bus and Bus Related Equipment and Facilities program), and modernization of existing rail systems (Fixed Guideway Modernization program). Funding can be used for a variety of projects, including purchase and rehabilitation of rolling stock, track, line equipment, structures, signals and communications, power equipment and substations, passenger stations and terminals, security equipment and systems, maintenance facilities and equipment, operational support

equipment including computer hardware and software, system extensions, and preventive maintenance.

Eligible recipients for funding are public entities and agencies (transit authorities and other state/local public bodies and agencies), including states, municipalities, other political subdivisions of states; public agencies and instrumentalities of one or more states; and certain public corporations, boards, and commissions established under state law. Modes eligible for funding include heavy rail, commuter rail, and a number of other transit modes.

Transportation and Community and System Preservation (TCSP) Pilot Program

The Transportation, Community, and System Preservation (TCSP) Program provides funding for initiatives, including planning and implementing grants; performing research to investigate and address the relationships between transportation, community, and system preservation; and identifying private sector-based initiatives.

Funds are available to states, metropolitan planning organizations, local governments, and tribal governments. The law requires equitable distribution of funds to a diversity of populations and geographic locations. For discretionary funding, an interagency team evaluates applications for competitive TCSP Program grants. TCSP Program grants also can be designated by Congress.

SAFETEA-LU authorized TCSP funding, although program funding levels can vary based on Congress' annual appropriations. Congressional support for the program is suggested as a large amount of available money is usually earmarked prior to distribution.

Transportation Enhancement Program

These funds are available to strengthen the cultural, aesthetic, and environmental aspects of the nation’s intermodal transportation system. Eligible projects include the rehabilitation of historic transportation buildings or facilities and the preservation of abandoned rail corridors, although a number of environmental preservation, scenic beautification, and historic preservation projects also would qualify. Projects usually are selected at the local government level. The federal share of the project costs is 80 percent.

Federal Financing Programs

Transportation Infrastructure Finance and Innovation Act (TIFIA)

The Transportation Infrastructure Finance and Innovation Act program provides credit assistance for qualified projects of regional and national significance. Many large-scale surface transportation projects—highway, transit, railroad, intermodal freight, and port access—are eligible for assistance. Eligible applicants include state and local governments, transit agencies, railroad companies, special authorities, special districts, and private entities.

TIFIA offers three distinct types of financial assistance designed to address the varying requirements of projects throughout their life cycles: secured (direct) loans, loan guarantees, and standby lines of credit. The amount of federal credit assistance may not exceed 33 percent of total reasonably anticipated eligible project costs. The exact terms for each loan are negotiated between the US DOT and the borrower based on the project economics, the cost and revenue profile of the project, and any other relevant factors. TIFIA interest rates are equivalent to U.S. Treasury rates. Depending on market conditions, these rates are often lower than what most borrowers can obtain in private markets. Unlike private commercial loans with variable rate debt, TIFIA interest rates are fixed. Overall, borrowers benefit from improved access to capital markets and potentially achieve earlier completion of large-scale, capital-intensive projects that otherwise might be delayed or not built because of their size and complexity and the market's uncertainty over the timing of revenues.

Any type of project that is eligible for federal assistance through existing surface transportation programs (highway projects and transit capital projects) is eligible for the TIFIA credit program. The following types of projects are eligible:

- International bridges and tunnels
- Intercity passenger bus and rail facilities and vehicles
- Publicly owned freight rail facilities
- Private facilities providing public benefit for highway users
- Intermodal freight transfer facilities and projects that provide access to such facilities
- Service improvements on or adjacent to the National Highway System
- Projects located within the boundary of a port terminal under certain conditions

An eligible project must be included in the applicable state transportation improvement program. Major requirements include a capital cost of at least $50 million (or 33.3 percent of a state's annual apportionment of federal-aid funds, whichever is less) or $15 million in the case of Intelligent Transportation Systems. TIFIA credit assistance is limited to a maximum of 33 percent of the total eligible project costs. Senior debt must be rated investment grade. The project also must be supported in whole or in part from user charges or other non-federal dedicated funding sources and be included in the state's transportation plan. Applicable federal requirements include, but are not limited to, Titles 23 and 49 of the U.S. Code, the National Environmental Policy Act, Buy America provisions, and the Civil Rights and Uniform Relocation Acts.

Private Activity Bonds

SAFETEA-LU established a new financial assistance program that allows the issuance of up to $15 billion in private activity bonds for transportation infrastructure projects. States and local

governments are allowed to issue tax-exempt bonds to finance projects sponsored by the private sector subject to rules set forth by the Internal Revenue Service.

Eligible projects include privately owned or operated highway and rail-truck transfer facilities, including any surface transportation project receiving Title 23 assistance. This provision, therefore, extends eligibility to TIFIA-assisted public transportation, intercity bus or rail facilities and vehicles, including vehicles and facilities owned by Amtrak, public freight rail facilities or private facilities providing public benefit for highway users, and intermodal freight transfer facilities.

Railroad Rehabilitation and Improvement Financing (RRIF)

The Railroad Rehabilitation and Improvement Financing Program provides direct federal loans and loan guarantees to finance development of railroad infrastructure. The RRIF program was established by the Transportation Equity Act for the 21st Century and amended by SAFETEA-LU. Under this program, the FRA Administrator is authorized to provide direct loans and loan guarantees of up to $35.0 billion. Up to $7.0 billion is reserved for projects benefiting freight railroads other than Class I carriers.

The funding may be used to acquire, improve, or rehabilitate intermodal or rail equipment or facilities, including track, components of track, bridges, yards, buildings and shops; refinance outstanding debt incurred for the purposes listed above; and develop or establish new intermodal or railroad facilities. Eligible borrowers include railroads, state and local governments, government-sponsored authorities and corporations, joint ventures that include at least one railroad and limited option freight shippers who intend to construct a new rail connection.

Direct loans can fund up to 100 percent of a railroad project with repayment periods of up to 35 years and interest rates equal to the cost of borrowing to the government. All federal financial assistance programs must pay for the cost to the government of providing that financial assistance. In most cases this is done with appropriations from Congress. Since the RRIF program currently does not have an appropriation, this cost must be borne by the applicant, or another entity on behalf of the applicant, through the payment of the Credit Risk Premium. The FRA Administrator will calculate the amount of the Credit Risk Premium that must be paid for each loan before it can be disbursed. In addition to the Credit Risk Premium, which is paid only if a loan is approved, each applicant must pay an Investigation Fee regardless of whether the loan is approved. The Investigation Fee defrays costs the FRA incurs in evaluating RRIF loan applications. The Investigation Fee may not exceed one-half of one percent of the requested loan amount, but it is often substantially less.

State Funding and Financing Programs

State Rail Bank Fund

Pursuant to S.B. 97-037, the General Assembly may from time to time allocate revenues to the State Rail Bank Fund. Appropriations for moneys in the State Rail Bank Fund may be requested and used for the acquisition, maintenance, improvement, or disposal of rail lines, railroad right-of-way, or any other purpose necessary to carry out the implementation of Part 13 of S.B. 97-037, which created a new section of statute related to the acquisition of abandoned railroad rights-of-way.

General Fund Transfers

General Fund transfer funds must be used in the implementation of the strategic transportation project investment program. No more than 90 percent of these funds may be used on reconstruction, repair, maintenance, and capital expansion projects for highway-related capital improvements, including, but not limited to, high-occupancy vehicle lanes, park-and-ride facilities and transportation management systems. At least 10 percent of the funds must be used for transit purposes or for transit-related capital improvements. The designation of 10 percent of the S.B. 97-001 transfer of general fund revenues for transit remains in place for any general fund transfers to CDOT that it may receive from the new transfer mechanism created in S.B. 09-228.

FASTER Safety Revenue

S.B. 09-108 (FASTER) revenue must be used by CDOT for road safety projects only, except that CDOT must set aside $10 million annually of its allocation from the highway safety surcharge distributed to the Department through the Highway User Tax Fund's (HUTF) third stream revenue formula. These revenues may be used for planning, designing, engineering, acquisition, installation, construction, repair, reconstruction, maintenance, operation, or administration of transit-related projects, including, but not limited to, designated bicycle or pedestrian lanes of highway and infrastructure needed to integrate different transportation modes within a multimodal transportation system that enhance the safety of state highways for transit users.

Another $5 million of S.B. 09-108 (FASTER) revenue is deducted from the HUTF's third stream revenue formula distributions to local governments and transferred to CDOT. The Division of Transit and Rail redistributes these funds as transit grants to local governments.

Colorado State Infrastructure Bank

The Colorado State Infrastructure Bank (COSIB) is not a bank but a revolving fund created by the state legislature that is authorized to make loans to public and private entities to facilitate the financing of public transportation projects within the state. The COSIB operates four

distinct programs: one each for highways, transit, aviation, and rail. The overall objective of the COSIB is to seek loan applications for transportation projects that can both benefit from COSIB assistance and meet the terms for loan repayments. The proposed project must ultimately have revenue sources available to it to repay the loan.

Historically, the COSIB program's primary use is within the aviation community. While all elements of the state's transportation system have projects that merit assistance, the aviation sector is unique in its capacity to generate steady revenues that meet or exceed the cost of operating its facilities over time and is willing to ultimately pay for the full cost of its infrastructure improvements. These two factors make the program particularly useful for aviation.

Other State's Rail-funding Options

Funding levels and programs for rail projects vary widely by state based on their priorities relative to other surface transportation investments. As outlined above, states can allocate funds from a number of federal sources, and some states have opted to build specific programs around these sources to address rail safety, freight and passenger movement, and related economic development issues. States that have developed such programs, and sources of state funding to pair with federal funds, are highlighted below.

Arizona

Aside from federal funding programs, Arizona communities have taken the initiative to increase sales taxes to fund transportation improvements. Maricopa County voters approved Proposition 400, a half-cent sales tax to be collected between 2006 and 2025. One-third of these revenues are dedicated to the public transportation fund for capital construction, maintenance, and operation of public transportation (light rail); the remainder of the funds go to the regional roadway program where they are used for capital and maintenance expenses, as well as a variety of implementation studies. Four rail-related studies have been completed using Proposition 400 funding, including a commuter rail system plan and two project-specific commuter rail plans.

California

California has a collection of funding programs to help expand transportation infrastructure, including rail projects. Most of these, including Proposition 1A (2008) and Proposition 1B (2006), are multi-billion dollar general obligation bond issuances.

Proposition 1B includes several functional sub-programs with specific dollar allocations, several of which could be used to fund rail improvements, including the Intercity Rail Improvement Program and the Highway-Railroad Crossing Safety Account. Certain funds are

available directly to the California Department of Transportation while others are allocated to the California Transportation Commission.

Proposition 1A allocates close to $10 billion to the California High-Speed Rail Authority with about 90 percent of this dedicated to fund the core segments of the new high-speed line between San Francisco and Los Angeles. The remainder is to be used to improve connecting rail and transit lines.

While most of the statewide funding programs in California result from general obligation bonds, many local authorities collect dedicated sales taxes that provide for major capital improvement projects. In most cases these programs fund highway projects, but transit and rail projects also are funded locally, especially in major metropolitan areas, such as Los Angeles County, where Measure R will fund $40 billion in transportation projects (highway, transit, and regional rail) over the next 30 years.

Florida

The Florida Work Program outlines funding allocations from the State Transportation Trust Fund (STTF) and Federal Highway Trust Fund (FHTF). The Act Relating to Infrastructure Planning and Funding, which generates revenue from a Documentary Stamp Tax also, allocates funding to rail programs. Together the Work Program (STTF and FHTF) and the Documentary Stamp Tax constitute the vast majority of rail funding in Florida.

The Work Program allocates about 6 percent of funding to rail programs, amounting to $1.8 billion for rail programs over the 2010 to 2014 horizon. Of this, passenger rail programs will receive about $960 million through various programs while $740 million will be allocated through the Strategic Intermodal System (SIS) Program, which includes both freight and passenger rail projects. The major rail programs in Florida are outlined below.

- **Strategic Intermodal System Program**—The SIS was established by the Florida Legislature in 2003 to improve the state's economy and quality of life. The SIS is a network of critical corridors and freight facilities, including intermodal terminals for passengers and freight. The SIS Strategic Plan focuses on both capacity and operational improvements with an emphasis on reducing bottlenecks and improving access to major hubs.
- **The Transportation Regional Incentive Program (TRIP)**—TRIP allocates funding received from the Work Program and the Documentary Stamp Tax for intraregional travel. Multi-county and multi-metropolitan planning organization projects are considered through this program on a competitive basis.
- **Florida New Starts Transit Program**—This program receives funding from the Work Program and Documentary Stamp Tax to develop Florida's projects for competitive

participation in the federal New Starts Program (the Federal Transit Administration's funding for new rapid transit projects) and to help provide the state match required to receive these federal funds, up to 50 percent.

Kansas

Several programs are provided by the Kansas Department of Transportation to fund rail projects in the state. Rail projects are overseen by the Freight and Rail Unit under the Bureau of Transportation Planning. The programs run by the Freight and Rail Unit are described below.

- **Kansas State Rail Service Improvement Fund**—This fund provides low interest loans and grants to railroads and port authorities operating in the state. The program assists in funding the rehabilitation of tracks, bridges, yards, maintenance shops, buildings, and sidings, as well as for rail car purchases. Projects also have contributed to the protection and improvement of short line service across the state. The loan program is structured as a 70 percent state loan and a 30 percent railroad/port authority match funding arrangement. During its 2010 legislative session, the Kansas Legislature approved an increase in funding to $5 million annually beginning July 1, 2013. Project eligibility criteria for the program also were expanded to include shippers and local units of government, in coordination with the serving railroad, eligible program applicants.
- **Highway/Railroad Crossing Program Safety Funds**—The state-funded Highway/ Railroad Crossing Program is a $300,000 per year program that addresses highway/ railroad safety improvements that do not meet federal aid program eligibility requirements. Local jurisdictions must submit crossing candidates for funding through this program. Projects selected for funding are eligible for 80 percent state funding with a required 20 percent rail company funding match. The Railroad Crossing Surfacing Program provides funding for highway/railroad crossing surfaces on the rural state highway system and city connecting links in communities up to 2,500 in population. Project scopes include all necessary materials and activities required for long-term crossing surface and approach improvements. These projects require a 50 percent railroad company match.
- **Rail Intercity Passenger Program**—The Kansas Passenger Development Act was put in place to allow the Kansas Department of Transportation to coordinate with Amtrak and other public and private passenger rail operators to provide passenger rail service. The Act also establishes a revolving fund for capital and operating assistance. This fund will be used to hold and disburse federal passenger rail capital grants and state contributions. No state contributions have been made to the fund to-date.

Kentucky

Kentucky has not allocated a significant amount of state or federal funds to Class I or passenger rail projects, but it has developed a collection of programs specifically geared to assist short line railroads, as highlighted below.

- **Economic Development Tax Credit**—This tax credit is available to any company or business that installs spurs or other connections to connect economic development projects to existing railroads.
- **Nonrefundable Tax Credit for Railroad Improvement**—This 50 percent tax credit is available to any Class II or III railroad, and a number of other entities in Kentucky, to improve or maintain railroads. Another 25 percent tax credit is available specifically for improvements that allow for transmission of fossil fuels or biomass products.
- **Short Line Assistance Fund**—This program provides funds for the construction, reconstruction, or improvement of Class II or III railroad facilities. Both grants and low interest loans are available, including zero interest loans.

New Mexico

The State of New Mexico funds most of its transportation infrastructure improvements, including freight and passenger rail projects, through a series of bonding programs. The most notable of these programs, Governor Richardson's Investment Partnership ("GRIP"), is a $1.4 billion fund that leverages state money to build large-scale public infrastructure improvements. The state recently allocated a significant amount of money to the New Mexico Rail Runner Express commuter rail system serving the cities of Albuquerque and Santa Fe. The system was completed in two phases between 2006 and 2008 for a total of $400 million.

Phase I of the project cost $135 million and was funded through mostly state resources. New Mexico contributed $125 million for the project; $75 million for rolling stock, stations, and track and signal improvements, and $50 million for track and rights-of-way. State funds were pulled from a combination of bond proceeds including GRIP and Severance Tax bonds, both of which are authorized by the legislature to fund infrastructure projects throughout the state. The remaining $10 million was funded through a bond issuance by Sandoval County for the purchase of an additional train set, and for station development within the County.

Phase II of the project cost $265 million for the purchase of existing track and construction of new track, design and construction of stations, and the acquisition of more cars and locomotives. The entirety of Phase II was funded through the same state sources outlined above.

New York

The State of New York generally provides funds for rail capital improvements through competitive grant programs. The grant programs are funding through general obligation bond measures or directly from the state's general fund. The following three programs are the primary vehicles for state funding of rail projects in New York.

- **Rebuild and Renew New York Transportation Bond Act of 2005**—This bond issuance provided $135 million over five years for passenger rail, freight rail, and port capital improvements to the state's major trade and passenger travel corridors, including capacity, clearance, intermodal facilities, yards, and other projects that enhance competitiveness and economic development. This program provided $27 million in 2011 for port and rail capital improvements on a competitive basis.
- **Passenger and Freight Rail Assistance Program**—Since 2003, funding from this program has been used for the annual subsidy which the New York State Department of Transportation pays to Amtrak for operation of its Adirondack service between Albany and Montreal, Quebec. The balance of the annual appropriation is available to fund freight and passenger capital improvements. Funds are appropriated annually from general state revenues.
- **Industrial Access Program**—The Industrial Access Program was established in 1985 for the purpose of providing state funding for necessary road and bridge improvements that facilitate economic development and result in the creation and/or retention of jobs. In 1998, projects that provide rail access were made eligible for funding from this program, which is a combination 60 percent grant and 40 percent loan assistance.

Ohio

The Ohio State Legislature established the Ohio Rail Development Commission, which oversees rail funding from the state. The Rail Commission receives funds from a variety of sources, including general fund allocations, special revenue funds (mainly property management fees, loan repayments, and interest from its revolving loan fund), federal highway safety funds allocated from the Ohio Department of Transportation, and other state and federal grants it receives on an ad hoc basis. The Rail Commission funds rail projects through the following five programs.

- **Freight Development/Rail Spur Program**—This program provides assistance to companies for new rail and rail-related infrastructure to create jobs at Ohio-based companies. Grants are available for projects that directly create jobs. Loans are available for other (non-job creating) projects.

- **Railroad Rehabilitation Program**—This program provides grants and loans to public and private entities for projects that improve safety and operational efficiency. Projects are evaluated on a competitive basis, including expected future increases in use of the improved rail line.
- **Rail Line Acquisition Program**—This program provides assistance for the acquisition of rail lines to prevent cessation of service and preserve the ROW for future use.
- **Railroad Grade Crossing Safety Program**—This program provides funding for highway-railroad crossing safety improvements and other activities designed to reduce highway-railroad hazards. Funding through this program is typically combined with funding from the FHWA for similar projects.
- **Department of Development Logistics and Distribution Stimulus Program**—This program is a joint effort of the Department of Development, the Ohio Department of Transportation, and the Rail Commission who together established a $100-million forgivable loan program for eligible transportation infrastructure projects. Eligible projects include those that expand connectivity to logistics and intermodal centers, reduce bottlenecks, and improve freight flows.

Oklahoma

Oklahoma's freight rail car tax imposes a tax equivalent to 4 percent of the gross earnings of a freight rail car operating in the state. Projections for the eight-year period beginning in 2012 are for the freight car tax to generate about $700,000 per year for the state's Rail Construction and Maintenance Program.

Past funding has come as a result of the appropriations process. In 1993, the legislature established a dedicated fund for passenger rail service from the motor fuel tax. This passenger rail fund amounted to approximately $1.2 million.

House Bill 1873 was passed in 1994 and established a dedicated revolving fund for the public transit investment. This bill combined two funds (an Amtrak earmark of $1.2 million and transit funding of $500,000). House Bill 1078, passed in 2005, provided a $2 million annual subsidy to the Heartland Flyer, the state-supported Amtrak service that operates daily round trip service between Oklahoma City and Fort Worth, Texas. This amount represents approximately half the cost of operating the service.

Oregon

Connect Oregon is a lottery-bond based transportation funding initiative started in 2005. The program is meant to provide investment in transit, air, rail, intermodal, and marine

infrastructure. Since the program's inception, there have been four rounds of funding that have provided close to $350 million in grants and loans to more than 100 projects.

in general, projects most heavily funded include port, freight rail, and aviation projects, or those projects that are not eligible for state highway funds. The four rounds of funding were as follows:

- **Connect Oregon I (2005)**—$100 million authorized for 38 projects
- **Connect Oregon II (2007)**—$100 million authorized for 30 projects
- **Connect Oregon III (2009)**—$95 million authorized for 40 projects
- **Connect Oregon IV (2011)**—$40 million authorized, not yet committed to projects

Texas

The Texas Rail Relocation and Improvement Fund was created within the state treasury to finance the costs of relocating and improving privately and publicly owned freight and passenger rail facilities for the purpose of relieving congestion on public highways, improving safety and air quality, and expanding economic opportunity. The fund is administered by the Texas Transportation Commission, and funds are raised through general obligation debt issuance.

As is also done for highways in Texas, Regional Mobility Authorities can be formed and may sponsor and finance rail projects. One example is the initiative by the North Central Texas Council of Governments to join several independent rail transportation authorities to create a Regional Rail Authority in the Dallas/Fort Worth Area. This authority would be funded with dedicated sales taxes within the counties it serves and include 350 miles of passenger rail (both existing and planned expansion).

Utah

The Utah Transit Authority (UTA) is currently underway with its $2.4 billion FrontLines 2015 initiative to build 70-miles of new light rail and commuter rail infrastructure, including the FrontRunner South commuter rail line extension connecting Provo and Salt Lake City. The FrontLines 2015 program is fully funded and taps a number of local and federal sources. Federal funds come by way of a $570 million FTA grant and American Recovery and Reinvestment Act (ARRA) dollars. UTA agreed to provide $391 million of its own funds for the project in addition to issuing up to $700 million in general obligation and revenue bonds. The remaining funds were raised through a voter-approved quarter-cent local sales tax increase in Utah County, of which 87% will go specifically toward the FrontRunner South project.

The initial 44-mile FrontRunner system opened in 2008 at a cost of $611 million. The Federal Transit Administration provided funding for 80% of the initial project ($489 million), with Salt Lake City taxpayers providing the remaining 20% ($122 million) through a quarter-cent

local sales tax increase passed by voters in 2006 (separate from the aforementioned Utah County sales tax).

Virginia

Virginia's location within the Northeast Corridor has created strong demand for passenger and freight rail capacity to help alleviate highway congestion. Virginia has four primary state funding mechanisms for rail projects that it uses to match federal, local, and private funding. The four programs are as follows:

- **The Rail Enhancement Fund**—A portion of the 3 percent rental car tax is dedicated to this fund, which is controlled by the Commonwealth Transportation Board. Funds are used for acquiring, leasing, and/or improving railways, rail facilities, ROW, or rolling stock for freight or passenger systems. This is the largest rail funding source from the state, providing about $25 million in funding in Fiscal Year 2010.
- **The Rail Preservation Fund**—This fund provides state funding to preserve and increase the efficiency and productivity of short line railway logistics in Virginia. This program helps the state's efforts to attract and maintain business in Virginia. It receives a $3 million allocation annually from the highway construction fund.
- **Capital Project Bonds**—This 2007 to 2018 general obligation bond program allocates 4.3 percent of annual bond proceeds to rail projects, which amounted to about $13 million in 2010 (and is expected to be similar each year until the program sunsets). Projects are administered through the Rail Enhancement Fund or the Rail Preservation Fund.
- **The Rail Industrial Access Program**—This relatively small program provides assistance to projects that improve rail access to industrial areas. The program works in conjunction with several local economic development authorities to identify projects that maximize benefits from relatively small investments. Funding for this program amounts to about $1.5 million annually.

Wisconsin

Wisconsin's overall transportation budget consists of federal, state, and local funding from various sources. The Wisconsin Department of Transportation (WDOT) can use a portion of the state's transportation budget (from the WDOT state operations budget) to fund rail programs. In addition, WDOT has general obligation bonding authority for the 2009 to 2011 period to pay for rail projects in the amounts of $60 million for freight and $40 million for passenger rail. Funding from the transportation budget and bonding is allocated to projects through the following programs:

- **Freight Rail Infrastructure Program**—This loan program provides assistance for projects that improve the rail system, primarily on privately owned lines. Projects that enhance transportation safety, efficiency, and intermodal freight movement are targeted.
- **Freight Rail Preservation Program**—This grant program provides funds to public and private entities to preserve or rehabilitate rail lines. Both acquisition and rehabilitation can be funded with grant proceeds.
- **Rail Capital Improvement Bonding Authority**—This program oversees bonding authority for passenger rail projects. Past uses of bonds have included the purchase of train sets and the purchase and rehabilitation of station facilities.
- **State Rail Station Capital Assistance Program**—Although this program currently is not funded, it was created by the state legislature to work with local agencies and the private sector to build and upgrade stations, promote compliance with the Americans with Disabilities Act, and encourage connections to other modes, including air, transit, and taxi.
- **Fixed-Guideway Capital and Operating Assistance Program**—This program provides matching funds for transit system development. This program is currently unfunded.

Chapter 8 Plan Summary

This Plan has been prepared to provide a framework for future freight and passenger rail planning in Colorado. It also has been prepared to be in compliance with the requirements of the PRIIA. Through the development of this Plan, considerable work has been completed to form a comprehensive understanding of the current characteristics of the state rail system and to establish a thorough list of improvement needs as recognized by CDOT, the railroads, industry groups, local governmental entities, and other interested stakeholders throughout Colorado. The planning process also produced a series of non-project specific policy recommendations, which are provided later in this chapter, to guide and enhance future rail planning in Colorado.

Although complete, this Plan is not meant to be the culmination of rail planning; it is meant to be the beginning. The Plan will be incorporated into the Statewide Long Range Transportation Plan and will be updated regularly to reflect current information.

Short-range Investment Program

As outlined in Chapter 6, a substantial list of system improvement needs has been identified. Those projects that are either programmed through public or private sector sources or that could be implemented within five years, depending on funding availability, have been included in the Short-Range Investment Program. Furthermore, a relative priority rating has been established for many of these projects. Although all of the short-range projects are not listed again here, the short-range program generally includes the following elements:

Freight Rail

- Numerous railroad/public safety projects aimed at safety improvements at railroad/highway at-grade crossings
- Many railroad overpass/underpass projects at locations where a new grade separation is needed or where an existing grade separation needs rehabilitation or reconstruction
- A number of short-line improvement projects necessary to allow smaller railroads to effectively work with Class I railroads and to better support local and state economic development. These projects mostly improve tracks and structures to support standard 286,000-pound rail cars or to allow higher operating speeds.
- A wide range of Class I railroad capital projects, which will be implemented by the railroads

Passenger Rail

- Several projects directed at enhancing existing Amtrak services and stations in the state
- Support for completion of the Commuter Rail portions of the Regional Transportation District's FasTracks program and for further development of commuter or intercity rail service from the Denver metropolitan area to Fort Collins

Long-range Investment Program

The Long-Range Investment Program includes those major projects, both freight and passenger, that have not been studied beyond the level of feasibility or are not anticipated to be initiated within the next five years. These include the following:

Freight Rail

- Relocation of the BNSF and UP intermodal facilities
- Added rail capacity to accommodate future freight demand and Front Range passenger rail

Passenger Rail

- Extension of intercity or commuter rail service from Denver to Colorado Springs and on to Pueblo
- A number of projects extending intercity rail service throughout the state and as far as Cheyenne, Wyoming and El Paso, Texas
- High-speed rail projects extending north, south, east, and west of Denver, with the highest priority on the line from the Denver metropolitan area to the Eagle County Airport, pending the outcome of the upcoming Advanced Guideway System (AGS) study.
- A series of rail station-related projects that will be dependent on the development of new passenger rail service lines

Rail Plan Policy Recommendations

The following is a list of policy recommendations suggested to enhance rail planning and to improve the rail system in Colorado.

Position Colorado for future federal funding for freight and passenger-related infrastructure improvements

One of the requirements of PRIIA is that states considering applying for future passenger rail funding from the federal government must have a state rail plan approved by the FRA. The

intent of this Plan is to provide a framework for future direction for improving and expanding freight and passenger rail services in Colorado. The purpose of developing a strong rail transportation stakeholder base is to gain support for pursuit of future state and federal funding initiatives that may develop. The public/private partnerships that may present themselves in regard to either passenger or freight rail projects are expected to require broad support in current and future economic circumstances.

Explore new state and local funding sources for rail-related programs, infrastructure, and services

This Plan contains recommendations for many new programs, such as the Short Line Railroad Assistance Program and the numerous passenger services and other projects that have been identified in the Short and Long Range Investment Programs. Many of these programs and projects are currently unfunded, so it will be important to actively pursue alternative strategies for securing additional funding.

Facilitate improved communication between communities and railroads

Considerable discussion occurred at the six workshops and open houses held around the state about issues relating to a lack of adequate and effective communications between communities/shippers and the railroads. It was suggested that CDOT facilitate a forum where organizations such as the Colorado Municipal League and the Class l and short line railroads could discuss ways to further improve communications related to such issues as vegetation control, grade-crossing maintenance, demurrage (a charge assessed by railroads for the extended use of rail cars by shippers or receivers of freight beyond a specified free time), and land use planning guidelines. CDOT is currently developing a "Railroad Communication Guide."

Coordinate to ensure integration and connectivity with other existing and planned transportation system improvements

An efficient transportation system that integrates all modes and provides connectivity for passengers, goods, and services plays an important role in ensuring Colorado's economic success. A multimodal system requires that connections between modes of transportation be fully integrated to increase system efficiency and operations, ultimately saving time and costs. Understanding the system needs and evaluating them in a system-wide perspective are key to creating a multimodal transportation system for all users. CDOT has an Interregional Connectivity Study underway to address passenger rail in this regard.

Embrace a performance based evaluation process to coordinate rail alternatives into transportation corridor planning when appropriate

This process should address the transportation service, environmental, economic and safety values included in the *Colorado Rail Vision*. The results of the process should be used to inform decision makers as they allocate resources and to educate the public regarding travel choices.

Develop and explore implementation options for a regional commuter rail system

At the workshops and open houses, a high level of support was expressed by many communities throughout Colorado for implementing a passenger rail system. CDOT has completed environmental documents in the form of the North I-25 EIS and I-70 Mountain PEIS studies. The next phases of those efforts include an Interregional Connectivity Study and the Advanced Guideway System (AGS) Study. The Interregional Connectivity Study will evaluate future north-south commuter rail passenger connections to and through the Denver metropolitan area. The Advanced Guideway System Study will define the technology and alignment of future AGS along the I-70 corridor. Regional Long Range Transportation Plans and other independent studies provide additional supporting information. CDOT should work with MPO's along I-25 and with mountain Transportation Planning Regions along I-70 to identify reasonable funding strategies and financing mechanisms for the furtherance of the North I-25 EIS and I-70 Mountain PEIS commitments, respectively.

Maximize use of existing infrastructure and monitor significant rail corridor infrastructure to ensure future corridor preservation and expansion

With limited funding, state departments of transportation are looking for ways to use existing transportation systems in more efficient and economical ways. A need exists not only to make the best use of what they have, but to preserve the system for future use. The Colorado Transportation Commission passed Policy Directive #1607.0 in July 2000. This policy describes a framework for identifying and preserving rail corridors for future use and to supplement the highway system, among other things.

The Tennessee Pass line is owned by the UP and has been in "out of service status" since late 1996. While UP does not have any plans to abandon this route, the state should continue to monitor this line due to its critical nature in being one of two east-west rail lines through Colorado. The critical nature of the Moffat Tunnel and the capacity issues facing UP on that route make the Tennessee Pass route a corridor of significance for the state.

Another corridor to monitor is the Towner Line in southeastern Colorado. It was owned by the state from 1998 to October 4, 2011. On that date, the Victoria and Southern Railroad (V&S) completed its purchase of the 122-mile-long railroad. In December 2011, the V&S

notified CDOT of its intent to abandon the line from North Avondale Junction, Colorado, to Eads, Colorado.

While the above two lines appear to have the most potential for future preservation, other light density lines in the state also should be monitored as part of the Division of Transit and Rail's future rail planning activities and efforts.

Facilitate meetings among the Colorado Office of Economic Development, the Class I and short line railroads, regional economic development agencies, and representatives of various economic sectors, such as agriculture, defense, tourism, and energy, to explore win/win opportunities to grow the Colorado and local/regional economies

Economic development was a key theme at each of the workshops and open houses. Access to rail transportation is crucial for many businesses and industries looking to locate or relocate in Colorado's cities and communities. These meetings could initiate discussions and develop relationships that would improve business for the railroads, enhance economic development in Colorado's communities, and address issues pertaining to railroad abandonment. CDOT and its partners should seek to maximize the participation of the private sector in rail improvement projects and establish responsibilities and performance standards for the railroads in return for public participation. Recognizing that business conditions tend to change more rapidly than public needs, both sides need to be assured of long-term success and sustainability.

Develop and implement a Short Line Railroad Assistance Program

These programs have been implemented successfully in Kansas and other states. Short line railroads are a critical component of the rail industry and benefit shippers and local communities trying to support economic development to many industries**.** The Plan's investment program contains numerous projects provided by the state's short line railroads that would enhance the ability of the short line railroads in the state to more efficiently handle originating and terminating traffic. Most short line railroads today have been created to pick up service that was previously vacated or suffered from deferred maintenance by previous owners. These short line railroads have customers that rely on these railroads to either get their products to market or receive inputs critical to their businesses.

Colorado does not currently have a program to provide assistance to short line railroads for improving their infrastructure. Several states (e.g., Kansas, Iowa, North Carolina, and Pennsylvania) do have short line assistance programs (low interest revolving loans and grants) that Colorado should explore as to their adequacy for the conditions and requirements of the short lines that are key economic drivers in many regions of the state. CDOT also should support efforts to modernize the rail system to accommodate 286,000-pound railcars and increase allowable speeds on short line railroads. The Short Line Railroad Assistance Program

would be expected to benefit agricultural and other industries, promote economic development in rural Colorado, and save tax payer monies from excess highway truck usage.

Support linking of Colorado's passenger rail systems to the developing national intercity and high-speed rail networks

A very strong level of support existed at the workshops and open houses for rail passenger service in the state, both existing long distance Amtrak services and new proposed regional commuter rail, intercity rail, and high-speed rail services.

CDOT has completed an environmental document for the I-70 mountain corridor in the form of the I-70 Mountain PEIS study. The next phase of that effort will be the AGS Feasibility Study. The AGS study will define the technology and alignment of future AGS along the I-70 corridor. CDOT should work with the mountain Transportation Planning regions along I-70 to identify reasonable funding strategies and financing mechanisms for the I-70 PEIS commitments.

The state should consider supporting the retention of all Amtrak services in Colorado. Numerous discussions have occurred regarding the potential re-routing of Amtrak's Southwest Chief service off the Raton Pass line and onto the BNSF's transcontinental line. The potential re-route would benefit Amtrak by adding service to two major population centers, Wichita and Amarillo, while reducing the cost for service by eliminating operations over Raton Pass. However, the rerouting would terminate service to Lamar, La Junta and Trinidad. Considerable support was provided at the workshops and open houses for maintaining the current route through Colorado. CDOT should work with the New Mexico and Kansas Departments of Transportation to determine if a strategy can be developed and presented to Amtrak and BNSF to maintain the existing route.

Use the Stakeholder Group convened for this Plan as a resource for the upcoming Interregional Connectivity and Advanced Guideway System studies and to advise on future updates to the Plan

The Outreach Plan developed for the Rail Plan called for the creation of a Stakeholder Group that would include any individual who expressed an interest in contributing to the development of the Plan. At the outset of the development of the Plan, the Stakeholder Group consisted of approximately 70 individuals. The Stakeholder Group list at the conclusion of the development of the Plan is expected to approach 400 individuals who expressed interest in state rail planning activities.

CDOT should consider using appropriate rail stakeholders from this list for public involvement activities as it moves forward with the ICS and AGS studies. In addition, when CDOT initiates its first update of this Plan, which is expected to occur no later than five years

following its completion, the importance of including the strong base of rail transportation supporters should be used to the fullest.

Integration into Statewide Transportation Plan

The Statewide Transportation Plan is a corridor-based plan that integrates all modes of transportation into a vision for the transportation system of Colorado. As such, the *State Freight and Passenger Rail Plan*, along with other modal plans, will serve as an important component of the next update to the *Statewide Transportation Plan*. Similarly, it will serve as a vital document helping to inform the Regional Transportation Plans (RTPs) that comprise the Statewide Plan.

The foundation of these plans has been visions for the primary transportation corridors in the state. The corridors are multi-modal and consider the movement of both people and goods. To fully and effectively integrate this Rail Plan into the next update of the RTPs and Statewide Plan, each Metropolitan Planning Organization (MPO) and Transportation Planning Region should reconsider the definition of the corridors in light of the information provided in this Plan, and the needs assessment in this Plan should be used to help define the overall corridor goals and strategies.

The Statewide Plan is typically updated every 4 years to coincide with the RTP update cycle for MPOs in air quality non-attainment areas. Hence, the Rail Plan will also be updated every 4 years, in advance of the Statewide Plan, so that critical elements of the Rail Plan can be appropriately reflected in each update of the Regional and Statewide Transportation Plans. Updates to the Rail Plan should focus on changes that have occurred since the last plan, such as the following:

- Major upgrades to rail lines
- Rail line expansions
- Rail lines taken out of service
- New passenger rail service
- Public- and privately funded rail improvement projects
- New rail-related federal and state legislation
- New rail-related programs, policies, or initiatives

Rail Plan updates should also provide updated operating statistics, such as commodity flow patterns, tonnage of freight, and passenger rail ridership, for historic comparative purposes.

The Transit and Rail Advisory Committee (TRAC) is tasked with “developing, advising, and promoting the [Transit & Rail] Division’s vision, policies, and priorities.” To fully integrate transit and rail planning into the statewide transportation planning process, the TRAC should

serve a role in the process, providing input to the STAC and the Transit and Intermodal Committee of the Transportation Commission, as applicable.

Through all of these efforts, planning for freight and passenger rail will play an appropriate role in planning for and providing an excellent transportation system to the residents, businesses, and visitors of Colorado.

Summary

This Plan is not the culmination of rail planning in Colorado; it is the beginning! With input from an extensive stakeholder outreach program, the Plan establishes a framework for effective freight and passenger rail planning within the state.

CDOT and its broad array of rail stakeholders are committed to increasing the focus on improving freight and passenger rail transportation in the State and integrating rail planning efforts with those of other transportation modes. CDOT will also coordinate with other states to identify regional freight and passenger corridor needs and will work with the FRA and neighboring states to develop a Final National Rail Plan that it is consistent with this Plan.

The ultimate objective will be to improve the mobility of passengers and freight within Colorado while enhancing the state's economy.

Appendix A—Public Involvement (see specific documents on enclosed CD)

Appendix B—Colorado Rail Planning Related Studies

A preliminary task in the Consultant's Scope of Work was to prepare summaries of the following:

- Colorado Rail Plans/Updates
- Other Rail Related Studies
- Significant State Rail Legislation and Policy Initiatives Since 1990
- Key Rail Related Programs Managed by the Colorado Department of Transportation (CDOT)
- Key Rail Related Studies Relevant to CDOT
- Rail Related Programs Managed by Other State Agencies
- Financial Support Programs for Colorado Rail Activities

The product of that task is included below.

This *State Freight and Passenger Rail Plan* is the first comprehensive rail planning effort in Colorado in the past 20 years. It is therefore appropriate to provide not only a brief overview of previous rail planning efforts and rail related studies, but also perspective on the importance of railroads in the development of the state of Colorado.

A Summary of Colorado Rail Plans/Updates

Colorado State Rail Plan—1979 (Colorado's first state rail planning effort)

The initial state rail planning effort in Colorado was completed by the Colorado Department of Highways in 1979. The Federal Railroad Administration (FRA) provided states with $100,000 rail planning grants for the purposes of developing a state rail plan. Since this was Colorado's first state rail planning effort, more details are provided for the 1979 State Rail Plan than for subsequent plans. Major tasks included documentation of:

- Existing Colorado rail system
- Light density branch lines subject to abandonment
- Rail passenger service evaluation
- Rail related impacts of energy development
- Transportation safety at rail—highway crossings

The Railroad Revitalization and Regulatory Reform Act of 1976 required the first two elements in the list above be included in any state rail plan. The additional three items were

included in the Colorado State Rail Plan in response to legislative, regional and community concerns.

The Colorado State Rail Plan included the following findings and recommendations related to each of the tasks listed above:

Existing Colorado Rail System

Review of the existing rail system prompted the following recommendations:

- The existing framework of the Colorado Revised Statutes is adequate to carry out the recommendations of the state rail plan.
- An Office of State Rail Planning and Project Implementation (OSRPPI) should be designated within the Colorado Department of Highways. This office would carry out all responsibilities not currently assigned to the Colorado Public Utilities Commission (PUC).
- The PUC should continue its responsibilities, with support from OSRPPI.
- Recommendations in the state rail plan should be reviewed and amended on an annual basis. The first update should review any new proposed branch line abandonments; it should include a study of agricultural railroad rates in the state; and it should include feasibility study of possible rail bypass routes in the eastern plains, to remove coal train traffic from the Front Range corridor.

Light Density Branch Lines Subject to Abandonment

- The state's role in branch line abandonment issues should be to assist in retaining lines that are in the best interests of the community.
- Rail planning should not be fragmented from other modal planning activities. If a Department of Transportation is NOT recommended by the 1979 Colorado General Assembly, the Colorado Department of Highways should be designated as the state's rail planning and implementation agency.
- Federal funding available to Colorado ($593,580) should focus on two branch lines in the Arkansas Valley, subsidizing operations from Swink to Cheraw and rehabilitating Hartman to McClave. Non-federal shares must come from private sources.

Rail Passenger Service Evaluation

- Each state rail plan update should assess the assumptions in this plan, to permit timely action on any passenger rail service options.
- Due to strong public support, the DRGW railroad should continue to operate the Winter Park Ski Train and the Rio Grande Zephyr. The OSRPPI should mediate between

the DRGW and affected communities, to reach agreements on service and compensation that are fair to both sides and the state.

Rail-related Impacts of Energy Development

A Coal Train Assessment Study, (CDOT, 1976) was updated in this section of the state rail plan. The following recommendations were made:

- Any increase in coal train traffic along the Colorado and Southern (C&S) main line through Ft. Collins, Longmont, Boulder and Broomfield would adversely affect these communities. (The C&S and BN announced in late 1976 that this route would not be considered for coal train routing.)
- BN's Sterling, Brush, Denver coal routing should be continued.
- South of Denver, increased coal traffic will require additional sidings, restoration of double track from Palmer Lake to south of Colorado Springs, or a rail bypass of the Front Range.
- Tennessee Pass should continue to serve as a coal route from Utah and west central Colorado to Pueblo and points east. Northwest Colorado coal should use the Moffat Tunnel.
- State and local governments should take steps to ensure that development adjacent to rail lines is compatible with rail use.
- Whenever feasible, railroads should refrain from freight movements blocking rail-highway crossings during rush hours.
- Coal train movements and their associated community impacts are a national issue. Future rail plan updates should continue to evaluate possible solutions in Colorado. A study should be completed with the objective of determining cost effective ways to reduce impacts along the Front Range by relocating coal train movements outside of intensely developed urban areas.

Transportation Safety at Rail-highway Crossings

This element of the state rail plan evaluated existing rail-highway crossings, examining their potential need for a grade separation structure (overpass or underpass). The key data element used to develop these prioritized lists was the "exposure factor" (number of trains per day multiplied by the number of vehicles per day using the crossing). Fourteen crossings were recommended for grade separation structures, and another eleven crossings were recommended for further study.

Colorado State Rail Plan—1980 Update

The 1980 update to the Colorado State Rail Plan included the following:

- Response to FRA comments on the initial 1979 State Rail Plan.
- Updated description of the state's railroads and the state rail network.
- Discussion of light density lines in the state.
- Discussion of Local Rail Freight Assistance Program (LRFA)—Colorado received $805,000 in LRFA funding in 1980, and the following projects were conducted:
  - ✓ Rehabilitation of a unit train grain loading facility in Hugo, Colorado.
  - ✓ Construction of a unit grain loading facility in Cheyenne Wells, Colorado.

Colorado State Rail Plan—1981 Update

The 1981 Colorado State Rail Plan Update consisted of three volumes. Volume I was primarily an update of the 1980 update, and it responded to FRA comments on that update. Specific elements addressed in Volume I were:

- Updated description of the state's rail system.
- Responses to FRA's comments concerning the 1980 Update.
- Discussion of the state's past and proposed Local Rail Service Assistance (LRSA) projects. Proposed LRSA projects were:
  - ✓ Rehabilitation of the former Rock Island Railroad between Limon and Flagler ($607,143 FRA funds; Mid-State Port Authority share $260,214).
  - ✓ Rehabilitation of the San Luis Central (SLC) Railroad from Monte Vista to Center, Colorado (FRA share of $101,776; SLC share $43,618).
- Discussion of the potential for additional rail passenger service to Colorado's western slope.
- Study of the feasibility of rail relocation in Walsenburg. (Two alignments were determined to be feasible from an engineering standpoint. Additional meetings and studies were proposed between the community, state and railroads.)
- Narrative regarding the state's grade crossing protection programs, and update of grade crossing analysis related to grade separation prioritization.
- Market analysis of a proposed auto-ferry service from the Chicago area to Denver. (The analysis indicated that ridership would be only about 1/3 of the ridership on the Virginia to Florida auto ferry service.)

- Discussion of light density rail lines, including the Rock Island Railroad. (This section of the update discussed activities related to the sale of the Rock Island Railroad to the Mid-State Port Authority, from Limon east to north central Kansas, for a total of $19.5 million.)
- Summaries of public meetings and A-95 reviews ('A-95' was a federally mandated process in the 1970s/1980s documenting public input on projects proposed to receive any federal funding).

Two supplemental documents became Volumes II and III of the 1981 Update:

- Volume II—Options for Rail Service along the Rock Island Railroad in Colorado. This study determined the economic feasibility of a short line railroad or branch line operation, focusing on the probable profit or loss of a carrier providing rail service. This effort led to the Kyle Railroad's eventual operation of the line from Limon into north central Kansas, which continues to this day.
- Volume III—Meeker-Piceance Basin Rail Feasibility Study. This study determined that it would be feasible to construct a new rail line into the Piceance Creek basin area (an area of proposed oil shale development approximately 30 miles northwest of Rifle, CO). The study evaluated several possible alignments and determined preliminary cost estimates as well as potential impacts related to the proposed routes.

Colorado State Rail Plan—1984 Update

The 1984 Colorado State Rail Plan Update included the following:

- Response to FRA comments on earlier updates.
- Updated description of the state's railroads and the state rail network.
- Discussion of light density lines in the state.
- Discussion of the Local Rail Freight Assistance Program (LRFA). The program continued to be reduced at the national level, due to federal budget deficits. Colorado was eligible for $805,000 in LRFA funding in 1980; the appropriation for Colorado in 1983 was only $87,000 for light density rail line assistance.

Colorado State Rail Plan—1985 Update

The 1985 Colorado State Rail Plan Update included the following:

- Response to FRA comments on the 1984 update.
- Updated description of the state's railroads and the state rail network.
- Discussion of light density lines in the state.

- Discussion of proposed ATSF/Southern Pacific merger on Colorado railroad operations.
- Fort Collins Rail Bypass Study—This study evaluated several alternative scenarios for re-locating the BNSF rail freight mainline out of downtown Fort Collins. The study evaluated the costs and impacts of various alignments, including possible relocation of UP and Great Western Railway rail operations in the area.

Colorado State Rail Plan—1991 Update

The 1991 Colorado State Rail Plan Update was the first state rail plan update to be completed by CDOT. The previous plans were completed by CDOT's predecessor, the Colorado Department of Highways (CDOH). CDOT was created by legislation passed by the Colorado General Assembly in 1991.

The 1991 update included the following:

- Response to FRA comments on the 1985 update.
- Updated description of the state's railroads and the state rail network.
- Discussion/description of light density rail lines in the state.
- Summary of rail passenger services in the state.
- State policy revisions affecting rail planning in Colorado.
- Grade crossing studies in La Salle and Denver.
- Kyle rail yard rehabilitation project.
- Status of railroad mergers—The UP merged with the Missouri Pacific. The Missouri Pacific line between Pueblo and the Kansas state line became part of the UP system. The DRGW in 1984 became a part of Rio Grande Industries, which also included the Southern Pacific and Cotton Belt railroads. All of these railroads then operated under the name Southern Pacific Lines.

A Summary of Other Rail-related Studies

Colorado State Rail Plan—Rail Bypass Feasibility Study—1979

The *Rail Bypass Feasibility Study, (CDOH, 1979)* addressed the issue of increasing unit coal train traffic moving through the state, from the Powder River Basin in northeast Wyoming to Texas electric utilities. It focused on north/south coal movements and projected coal traffic to the year 2000. The study was completed with the assistance of an advisory committee that included the seven Class I railroads operating in the state at that time.

The following is an overview of the study recommendations. The key factor in the recommendations was the total number of unit coal trains along the route.

- If there were fewer than 20 coal trains per day, the study recommended moving forward with the "Urban" alternative. This essentially meant constructing grade separation structures at numerous key locations and leaving the railroad network and operating arrangements unaltered.
- If coal trains were likely to be in the 20—30 per day range, construction of the Brush to Limon segment of the "Sterling—Rock" alternative was to begin. (The "Sterling—Rock" alternative would also have used the Rock Island railroad between Limon and a point near Colorado Springs where new construction was to occur, linking the line to the joint line north of Pueblo.) This scenario would also have built some key grade separation structures along the existing route.
- If coal trains were likely to approach 35 per day, steps were to be taken to initiate the "All New" alternative, new construction between Brush and Las Animas.

Due to the complexities of this public/private project, involving broad community issues, the study recommended a "phased" approach. This would "help minimize potential impacts from increased coal movements and simultaneously provide an opportunity to reassess and re-evaluate project investment risk prior to large-scale commitment of public funds." The study recommended the following sequence of steps, to "minimize risk and maximize benefits":

- Step 1—Discuss recommendations in a public forum within the legislative process to see if a commitment to proceed existed.
- Step 2.—Develop and construct key grade separation structures to eliminate most significant rail/highway conflicts. Begin rehabilitation of the Rock Island alignment with FRA light density line rehabilitation funds available to CDOH.
- Step 3.—Continue to monitor growth in coal train volume. The study considered the value of beginning an Environmental Impact Statement (EIS) for new construction of Sterling to Brush alignment. Simultaneously, begin negotiations with railroads, state and other parties to refine details of this alternative essential to implementation.
- Step 4.—Continue monitoring coal train growth to see if the "All New" alternative was justified. This again, was dependent on future coal train volumes reaching 35 trains per day.

Analysis of Proposed Amtrak Service among the States of New Mexico, Colorado, and Texas Providing Rail Passenger Service for Selected Communities (1994)

This study conducted by the New Mexico Department of Transportation, evaluated the feasibility of new Amtrak service between El Paso, Texas, and Denver, Colorado through Albuquerque, New Mexico. The El Paso to Denver service would take approximately 17 hours and 45 minutes. It was estimated that the proposed service would generate $7.817 million in revenues but would have a net operating loss of $3.245 million per year excluding equipment costs. Before beginning operations, an estimated $79.3 million in rail infrastructure improvements would be required. Of this investment, $57.6 million would be required between Denver and Pueblo.

The study noted that further analysis would be required to:

- Develop detailed railroad operations simulation modeling. Results from this modeling would provide more specifics in terms of operating schedules and costs, due to its ability to determine conflicts with other trains.
- Finalize a detailed cost estimate.
- Cross check ridership estimates with Amtrak's estimate of ridership.
- Explore equipment procurement options. Obtain optimum equipment arrangements for both locomotives and passenger cars, whether by purchase or lease.
- Examine commissary and maintenance facilities costs. Maintenance would include both heavy equipment maintenance costs as well as cleaning the train at its origin stations.
- Evaluate whether an EIS is necessary and if construction of additional railroad infrastructure is required at some locations.
- Identify station facilities costs that were not included in initial cost estimates. Also, all stations must be Americans with Disabilities Act (ADA)-accessible and include those costs.

Additionally, other issues were identified that could impact the feasibility of the proposed service:

- Proposed ATSF/BN merger—Rail traffic along the route could be affected by such a merger.
- Dissolution of the Interstate Commerce Commission (ICC)—This could impact the level of train traffic on the corridor as well, depending on what agency takes on the ICC's responsibilities.

- Amtrak's existing contract with the Class I railroads expired in 1996. Future contracts could change Amtrak's cost structure

Colorado Passenger Rail Study (1997)

in February of 1995, CDOT published its 20-year multi-modal transportation plan, based on 15 regional plans compiled around the state. The 20-year plan concluded passenger rail service was lacking in the state. Nine corridors were identified as potential candidates for passenger rail service (at a CDOT-developed capital cost estimate of $757 million), and two projects were identified that would enhance existing Amtrak service (at a cost of $72.1 million). The plan stated that five corridors were considered "high priority" for passenger rail service:

- Denver—Colorado Springs
- Leadville—Avon
- Craig—Steamboat Springs
- Glenwood Springs—Avon
- Fort Collins/Greeley—Denver

Very little quantitative data on ridership, costs, and other impacts were available during the development of the regional plans. Many of the high-priority corridors were identified based on stakeholder input.

As a result, CDOT moved forward with a statewide study to determine the feasibility of implementing passenger rail service in selected corridors. The screening process utilized in the *Colorado Passenger Rail Study* identified the following 'high priority' passenger rail corridors, and recommended further analysis:

- Denver—Fort Collins
- Denver—Colorado Springs
- Leadville—Vail—Glenwood Springs—Aspen
- Steamboat Springs—Vail—Aspen

The following 'medium priority' corridors were found to have some potential for passenger rail service and were recommended for further study:

- Winter Park—Steamboat Springs
- Golden—Black Hawk/Central City
- Fort Collins—Cheyenne

Study recommendations were offered in three steps:

- Long range vision, which would take well over 30 years to develop
- Core system plan, which would take at least 20 years to develop
- Immediate action plan; which outlined recommended 'next steps'

Three segments of the core system plan were recommended for immediate advancement:

- Denver—Fort Collins
- Glenwood Springs—Aspen
- Steamboat Springs—Hayden/Yampa Valley Regional Airport

Statewide Rail Needs Study (1999)

The *Statewide Rail Needs Study, (CDOT, 1999)*, was similar to the rail plan updates in the 1980s and in 1991. The study addressed the following topics:

- Class I and short line system overview and individual analysis of each railroad
- Discussion of potential branch line abandonments
- Rail-highway grade crossings
- Passenger rail needs
- Overall rail transportation needs
- Rail funding opportunities
- Analysis of current rail planning in Colorado
- Assessment of successful rail planning programs in other states

The following summary highlights study recommendations:

- Tennessee Pass is the only corridor considered "high priority" as a possible abandonment candidate. Since the line is currently "out of service", CDOT should continue to monitor the corridor and should take action if the line is scheduled for abandonment.
- CDOT should review the formula used to recommend grade crossings for improvement. The 25 highest priority crossings in the state have been recommended for upgrades totaling $25.75 million. A systematic inventory of all rail-highway crossings (public and private) should be established.
- A "crossing closure" study should be undertaken by CDOT to see if any crossings might be closed.

- The North Front Range planning process should continue to evaluate whether rail is the most cost-effective transportation solution for the Ft. Collins/Greeley/Denver corridor.
- CDOT should consider approaching UP and BNSF to see if opportunities exist for partnering in the joint line corridor from Denver to Pueblo.
- CDOT should explore possible new Amtrak stops at Wray and Kremmling, and possible improvements to other existing stations.
- CDOT should create a formal mechanism for communicating with railroad operators in Colorado.
- CDOT should consider establishing a state rail assistance program.
- Elements of the Rail Vision should be evaluated to see if there are elements that can be undertaken immediately.
- Overall state rail needs are estimated at $2.74 billion, with 90% of the total for passenger needs.

Rail Oriented Development: Strategies and Tools to Support Passenger Rail Handbook—CDOT Research Branch (2002)

Rail-Oriented Development: Strategies and Tools to Support Passenger Rail Handbook (CDOT, 2002), (known as 'the Handbook,') is the final product associated with the *Land Use and Transportation System Components to Support Passenger Rail Study (the 'Study'*), sponsored by CDOT in 2001. The 9-month study was initiated to research and define land uses, land development patterns and transportation system characteristics that support passenger rail. The Study's findings are presented in the Handbook, which was designed to provide practical answers to questions regarding passenger rail planning. The Handbook lists factors to be considered by local decision makers when developing a community's policies regarding land use decisions that support rail. The Colorado Department of Transportation does not endorse these factors or present them as recommended policies.

The Handbook was based on extensive research into the land use/rail transit relationship, and on an evaluation of existing North American rail transit systems and their urban environments. The Handbook described land uses and development patterns that would support rail transit in Colorado. It is worth noting that the land uses, development patterns and transportation system characteristics described in the Handbook are applicable outside of Colorado. Communities across the state and country could find that these strategies and tools also achieve a variety of common community goals, including:

- A mix of land uses and design treatments, which can help to create vibrant activity centers and contribute to a sense of place
- Creation of a balanced transportation system
- A land use pattern that can easily be served by any type of transit
- Preservation of open space by encouraging infill development

2002 High Speed Rail Application

in February 2002, CDOT applied to the FRA for the designation of a High Speed Rail (HSR) Corridor in Colorado, called the Colorado Corridor. The proposed corridor was comprised of two separate segments. The first segment was along the Front Range of Colorado, running in a north-south alignment, from Pueblo north to Fort Collins. This Front Range line would connect 85 percent of the state's population in the urbanized areas of Pueblo, Colorado Springs, Denver, Boulder, Longmont, Loveland, Fort Collins and Greeley. The 180-mile corridor would consist of a southern and northern portion.

The southern portion (between Denver and Pueblo) would likely be located within the rail right-of-way jointly owned and operated by BNSF and UP. The northern portion would likely consist of some combination of existing UP and BNSF lines, as well as some new construction. A recently completed North Front Range Transportation Alternatives Feasibility Study (TAFS)—(2000) identified a preferred new fixed guide way alignment along I-25, but a subsequent North I-25 Draft EIS is examining other alignments, including existing tracks. One extension of this Front Range segment was commonly referred to as the 'Air Train.' Planned as a commuter rail line between downtown Denver and Denver International Airport (DIA), this 23-mile leg was viewed as a functionally significant connection for the Front Range HSR line.

The second segment of the Colorado Corridor was identified as HSR service running east-west along I-70 from DIA to Vail and the Eagle County Airport. This segment would also incorporate the above-mentioned Air Train segment to DIA. Considerable local planning has taken place along this corridor and passenger rail service has been chosen as the preferred alternative in a Draft I 70 Mountain Corridor Programmatic Environmental Impact Statement (PEIS)—(2002). However, many issues of technology choice, compatibility, and system integration remain. Given steep grades, engineering difficulties, and power requirements, this 160-mile line was anticipated to cost more than $4 billion in 2002.

The Colorado Department of Transportation sought FRA approval in granting designation status for the Colorado Corridor. CDOT urged the designation of both the Front Range and the I-70/Mountain lines as one "corridor," although the Front Range line was the top priority.

FRA did not take any action to designate this corridor.

Eastern Colorado Mobility Study (2002)

The *Eastern Colorado Mobility Study, (CDOT, 2002)* was undertaken to assist the Colorado Transportation Commission in making investment decisions regarding infrastructure improvements to enhance freight mobility within a study area that included all of eastern Colorado, extending to the I-25 corridor on the west and Colorado's borders on the north, east and south. The study purpose was defined as: "To evaluate the feasibility of improving existing and/or construction of future transportation corridors and intermodal facilities to enhance the mobility of freight services within and through eastern Colorado." The study's recommendations are summarized as follows:

- SH 71 from the Colorado/Nebraska state line to Brush and on to Limon, as well as I-76 from Brush to Denver, was officially designated by the Colorado Transportation Commission as the "Heartland Expressway"; one of the Federal "High Priority Corridors" on the National Highway System (NHS).
- Additional site-specific highway improvements were also recommended.
- Relocation of existing intermodal facilities to new sites was recommended, in order to provide additional land for future expansion of the facilities.

Rail Project recommendations were as follows:

- Class I Railroad Projects—focused on increasing capacity by constructing new lines, second main tracks or siding tracks.
- Short Line Railroad Projects—focused on upgrading existing track structure and roadbed materials to accommodate heavier car loadings.
- Highway/Railroad At-Grade Crossing Improvements—focused on Class I rail lines by improving safety by constructing grade separation structure or closing crossings.

CDOT Public Benefits and Costs Study (2005)

CDOT and the two Class I railroads operating in Colorado, the BNSF and the UP (hereafter jointly referred to as the Railroads), completed several reviews and studies since 1979, investigating the potential for public-private partnerships that would culminate in the relocation of a significant portion of through freight rail traffic, away from the congested Front Range onto a bypass route in the Eastern Plains of Colorado.

in 2003, CDOT, in cooperation with the Railroads, initiated the *Public Benefits and Costs Study* (Public Benefits Study). It measured the benefits and economic impacts of the proposed projects, estimated construction costs, and assessed broad funding and financing options. The study focused on two options for through freight rail: No-Build and Build.

The No-Build Option

This option established a baseline against which to evaluate the proposed project. The No-Build Option was a scenario in which the proposed bypass project is not built. Significant improvements to the existing freight railroad infrastructure would still be needed. Capital investments and ongoing operating and maintenance (O&M) costs would continue to accrue to the railroads even if the project is not built. For example, some track improvements to handle increased traffic along the Front Range would be required under the No-Build Option, but not with the Build Option.

The Build Option

The Build Option involved the various costs of a major relocation of through-freight train traffic east of the Front Range urban corridor, plus additional infrastructure improvements and/or relocations of rail yards and intermodal facilities. There were also benefits associated with each of these undertakings. Public benefits associated with the Build Option included:

- Reduced auto, truck, and emergency vehicle delays at grade crossings.
- Improved air quality and reduced noise and vibration in built-up metro areas. Less populated areas may experience reduced air quality and more noise and vibration.
- Statewide economic development, jobs creation, and urban redevelopment opportunities.
- Reduced train-vehicle incidents.
- Alternate routing to reduce terrorist and hazardous materials risk and system-wide delays.
- Future passenger rail facilitation.

The Public Benefits Study concluded that the citizens of Colorado would accrue more than sufficient benefits to warrant the investment of public dollars in the proposed relocation project.

CDOT Rail Governance Study (2008)

The need for this study stemmed from the fact that no government entity had the funding mechanism or the statutory authority to operate a coordinated system of interregional or statewide transit service in Colorado. CDOT conducted the *Rail Governance Study* to examine options that could be used to plan, fund, implement, operate and maintain interregional or statewide transit service. Developing passenger rail governance options was the initial direction of the study. However, based on input from the Technical Advisory Committee (TAC), it was agreed that interregional transit via *any* technology would have the same issues as passenger rail. CDOT has the statutory authority to plan and develop multimodal

transportation projects, including transit. CDOT also has clear statutory authority to construct and maintain the state highway system and provide funding to support transit services provided by others (Senate Bill 1 and FTA transit grants). There was no clear authority allowing CDOT to implement and operate transit service, nor was there a long-term reliable source of funding necessary for an interregional or statewide transit system. There are some private sector providers such as Greyhound, and TNM&O Coaches and government-owned Amtrak. These service providers have limited routes, frequency, and hours of operation which, while valuable, could not be interpreted as an integrated statewide or regional transit service.

CDOT formed a TAC to assist with the Rail Governance Study. The TAC identified three basic governance types: Special statutory districts; Regional Transportation Authorities (RTAs); and Colorado DOT-based structures. The three options considered most viable by the TAC were:

- **Enhanced CDOT structure**: This would create a program within CDOT with decision-making and fiduciary responsibility. The program would include an advisory committee or board with community members. Final decisions would rest with the Colorado Transportation Commission. This model would require statutory action with a mandate and authority for CDOT to implement statewide or interregional transit services.
- **Autonomous structure housed within CDOT**: This would be an entity within CDOT but with a separate, autonomous board, similar to the CDOT Aeronautics Division, with powers and funding set by statute. The current Aeronautics Board is appointed by the governor, but other options for a transit division could include an elected board or a board made up of local jurisdictional representatives.
- **Statewide or interregional transit/rail district**: This public entity would be formed under the state's Special Statutory District provisions, similar to that used by the Regional Transportation District (RTD), with powers established by statute. It would be an entity unto itself, apart from CDOT. It would have its own fiduciary responsibility, which would require creation of a new organization and administrative structure.

All three options focus on having a governance structure that is capable of providing interregional or statewide transit services.

The TAC reached consensus that the use of a statewide/interregional (and not regional) model is important, given the concept and scale of a statewide, integrated transit system. The TAC recognized CDOT's unique position and potential for intermodal planning, interregional coordination, and more direct access to federal funding, and institutional capability in

developing large-scale projects. Use of a CDOT-based model requires an increased focus on transit and new statutory authority. At the same time, a separate district governance model was viewed as potentially more focused on a specific mission or project.

The TAC recommended that the state should take a leading role in setting overall policy, providing planning and project guidance, securing financing, and ensuring meaningful input from local entities as to policy, service delivery, and station design and development.

CDOT Rail Relocation Implementation Study (2009)

This study was also referred to as R2C2 (Rail Relocation for Colorado Communities). The purposes of the study were to:

- Determine steps that must be taken to form a public-private partnership.
- Better define and finalize the scope and costs of potential projects.
- Determine how costs should be shared, based on both public and private benefits and related factors.
- Identify sources of funding.
- Determine how to finance a project.
- Develop strategies for carrying out the necessary environmental requirements.
- Make recommendations for 'next steps'.

The final report listed the numerous assumptions and methodologies that were used in the R2C2 study, which would need to be reviewed and updated to provide a current analysis as future steps are taken. The following is a list of recommendations for CDOT's further consideration:

- Create a citizens advisory group to provide a basis for citizen involvement with CDOT, relating to potential relocation of through rail freight to eastern Colorado.
- Provide a detailed evaluation of the benefits and impacts of a potential new eastern Colorado rail bypass line to the agriculture industry and communities of eastern Colorado.
- At the completion of the R2C2 and Rocky Mountain Rail Authority (RMRA) studies, combine the results of R2C2 and portions of the RMRA's I-25 corridor passenger rail feasibility study to determine the consolidated benefits and costs to the state of both freight and passenger operations. Continue to identify funding sources to combine the findings of the R2C2 and RMRA studies.

- Continue conversations with the Railroads and the public to explore options that might lead to implementation of a bypass under a public-private partnership. Utilizing the results of the cost and rail operations analysis of study alignments A and B, pursue with both Railroads options that might lead to the future implementation of a bypass. Such options could include either of the study alignments A or B, combinations of those two alignments, or different alignments that might emerge in ongoing discussions.
- Continue to support federal and state initiatives that might provide funding and financing programs that could be utilized in the implementation of a new rail bypass. Take steps necessary to keep possible partners in a public-private partnership well positioned to take advantage of future funding sources.
- Provide R2C2 study results to other private parties that have expressed interest in participating in a partnership that might lead to the potential implementation of a through rail freight bypass in eastern Colorado.

Rocky Mountain Rail Authority High Speed Rail Feasibility Study (2010)

The Rocky Mountain Rail Authority (RMRA) was formed in 2008 as a multi-jurisdictional government body of more than 50 Colorado cities, towns, counties, and transit authorities, for the purpose of conducting the *RMRA High Speed Rail Feasibility Study*. The study evaluated the I-70 corridor from Denver International Airport (DIA) to Grand Junction and the I-25 Corridor from Cheyenne, to Trinidad. The 18-month study focused on determining whether options exist that are capable of meeting FRA technical, financial and economic criteria for high-speed rail feasibility.

Combinations of technologies/routes/stations were analyzed with a focus on technical and economic feasibility. Additionally, a steering committee of stakeholders met monthly to provide input to the project team.

Rail routes were organized into three categories:

- Existing rail—Using either the tracks or right-of-way of an existing rail corridor
- Constrained/highway right-of-way—Solely within, or contiguous to the I-70 and I-25 highway rights-of-way
- Unconstrained/Greenfield—A new route outside the rights of way of the I-70 and I-25 corridors

The study evaluated six types of proven vehicle technologies. It determined that multiple feasible options exist, but the RMRA selected one option for further refinement and analysis to use as the test case for the development of an implementation plan. This option, known as the 'FRA Developed Option,' uses a very high speed electric train (average speeds of 120 to 200

mph and a maximum speed of 220 mph in the I-70 highway right-of-way and I-25 unconstrained routes.)

The study divided the project development into four phases, which included building and clearing the proposed routes in segments. It recommended the following 'next steps':

- Develop a Colorado state rail plan
- Develop an interregional connectivity study
- Coordinate with the freight railroads
- Request HSR Corridor designation
- Expand the coalition of supporters

A Summary of Significant State Rail Legislation and Policy Initiatives Since 1990

Rail Line Acquisition Report (1997—2010)

The purpose of the Rail Line Acquisition Report is to provide the Transportation Legislative Review Committee (TLRC) with the Colorado Department of Transportation's report on rail abandonments and recommendations relative to possible rail line acquisitions. Legislation passed in 1997 called for this report to be submitted annually by the Executive Director of CDOT to the TLRC, pursuant to 43-1-1303 (3) C.R.S.

The structure of this annual report is described below. The specific elements identified and recommendations that follow are from the 13th version of the CDOT report, provided to the Legislature in September, 2010.

Part I—Background information

Part II—New initiative and activities

Part III—Recommendations

There were no abandoned major rail lines in Colorado, nor were there any lines which were considered to be at high risk for abandonment. Consequently, the Department is not recommending to the TLRC that any railroad rights-of-way or rail lines be acquired by the state. However, the Department is recommending the following actions:

- Continue to monitor the Towner Line
- Complete the State Rail Plan
- Continue to monitor the status of the Tennessee Pass line
- Continue to monitor the status of the Fort Collins Branch line

Towner Line Acquisition Legislation (1998)

The Colorado Legislature passed House Bill 1395 on April 22, 1998 which authorized CDOT to acquire a 121.9-mile-long rail line in eastern Colorado known as the "Towner Line". This legislation was amended in 1999 by HB 99-1382 which extended the length of time by 18 months (to December 31, 2001) for CDOT to sell or lease the line to a financially responsible railroad operator. (The results of this legislation are discussed in more detail in the "Towner Line Acquisition and Lease" portion of this document.)

Rail Corridor Preservation Policy (2000)

in June of 2000, the Colorado Transportation Commission passed Policy Directive #1607.0, adopting policy related to railroad corridors of state interest. The directive's purpose was to provide a framework for determining the conditions CDOT would consider for defining and preserving rail corridors.

The policy stated that state transportation interests may be served by participating in rail transportation for the following reasons:

- Preserving rail corridors for future use may save money since the cost to preserve a corridor for future transportation is often far less than having to purchase an equivalent corridor in the future.
- Rail transportation may be needed in certain corridors to supplement the highway system and to provide adequate mobility and travel capacity.
- Rail transportation can be a cost effective and environmentally preferable mode of transportation in certain situations.
- Preserving existing freight rail service by preventing a railroad from being abandoned can reduce the maintenance costs on state highways, since the transportation of displaced rail freight will increase deterioration of the state highway system.
- Freight rail service can serve as a lifeline for the economic health of a community when there are no other modes that adequately and economically serve the community's needs.

The policy selected the following criteria for identifying State Significant Rail Corridors:

- Magnitude of negative impacts upon adjacent highways
- Immediacy of possible abandonment
- Immediacy of actions that may jeopardize an existing or future rail corridor

- Estimated cost of acquiring the corridor
- Public-private partnership potential for the corridor

The policy stated that CDOT will identify State Significant Rail Corridors in the statewide plan. Also, the policy noted that if a corridor is identified as a State Significant Rail Corridor, CDOT may engage in, but is not restricted to, certain methods of participation in either passenger or freight rail transportation. Lastly, the policy described the appropriate activities for CDOT if the rail corridor has not been identified as a State Significant Rail Corridor but has been identified in a Regional Transportation Plan.

Creation of Division of Transit and Rail (2009)

in 2009, the Colorado Legislature passed Senate Bill 94, creating the Division of Transit and Rail (DTR), a new division within the Colorado Department of Transportation. The new Division is authorized to promote, plan, design, finance, maintain and contract transit and rail services such as passenger rail, advanced guideway systems, and buses. In May 2010, the Colorado Transportation Commission approved the 2010/2011 budget for the new division which included eight new employees (including a director), in addition to the existing seven Transit Unit employees transferring to DTR from CDOT's Division of Transportation Development.

A Summary of Key Rail-related Programs Managed by CDOT

Rail Crossing Safety Program

The Railroad Crossing Safety Program, within CDOT's Safety and Traffic Engineering Branch, has the following responsibilities and work products:

1. Manage the Federal Section 130 program which includes:
   - Fund installation of warning devices at highway-rail grade crossings.
   - Fund elimination of at-grade crossings by closure or by construction of grade separation structures.
   - Coordinate work by railroad forces on CDOT construction projects.
   - Evaluate and prioritize candidate projects for Section 130 grade crossing warning device projects.
   - Coordinate between the railroads and region designers on CDOT construction projects that involve construction on or near railroad rights-of-way, such as highway bridges over a railroad. Ensure that the needs of both parties are met as much as possible.
   - Prepare and coordinate the execution of contracts among CDOT and the involved railroads and/or local agencies.

- Prepare (or coordinate preparation of, if on local streets or roads) applications to Public Utilities Commission (PUC) covering proposed changes to the existing grade crossing.
- Schedule and conduct periodic coordination meetings among CDOT staff, Class 1 railroads, Federal Highway Administration, and FRA.
- Prepare/coordinate issuance of plans for Section 130 grade crossing device projects.
- Monitor grade crossing project construction and coordinate change order activities.
- Advise CDOT engineering staff on the nature of hazards to highway users posed by railroad operations.

2. in coordination with the railroads, maintain the statewide crossing database and ensure that the FRA database corresponds with the latest state information.
3. in coordination with the CDOT Safety and Traffic Engineering Branch and other state and local agencies, investigate and evaluate train-vehicle incidents to determine what safety measures were in place and what additional measures should be applied, if any.
4. Coordinate railroad planning activities such as mobility studies, abandonment/corridor acquisition, intermodal connections, and passenger rail, with Rail Planning Unit of CDOT's Division of Transit and Rail.
5. Maintain a record of all hazardous materials incidents. In the past 35 years, there have been almost three hundred such incidents, which resulted in 12 actual spills of hazardous material.
6. Ensure that the highway-rail component of the annual Highway Safety Improvement Plan complies with the mandates of that program.

Federal Section 130 Funds

Highway-rail crossing safety work may occur on any CDOT transportation improvement project. In addition, the Federal Section 130 program (in existence since 1974) earmarks funds (approximately $2 million annually) for individual grade crossing safety projects on Colorado streets, roads and highways. Each year, the FHWA apportions funds to help improve roadway-rail safety, pursuant to 23 U.S.C. §130 and related federal law. These funds must be applied toward projects that eliminate hazards at highway-rail crossings, including the separation or installation of warning devices at at-grade crossings, and the relocation of highways to eliminate grade crossings. Section 130 projects are identified and prioritized based on an accident prediction analysis. The CDOT Safety and Traffic Engineering Branch, Railroad Crossing Safety Program, administers the Section 130 program and is the point of contact with the railroads, the PUC, and/or local agencies on all CDOT/railroad contracts.

Colorado's annual Section 130 program funds total approximately $2 million, of which at least half must be available for the installation of warning devices at rail/highway at-grade crossings. The balance of funds may be applied, at CDOT's discretion, toward at-grade crossing protective devices or a grade-separation project.

CDOT is capable of constructing three to six grade crossing upgrades (e.g., installation of flashing lights, gates, and bells) each year. A typical project will cost, on average, about $350,000. Such projects often consist of the installation of active warning devices at locations that only have passive warning devices or inadequate active warning devices. Most of these projects are on local roads and streets, as most state highway rail crossings have already been sufficiently upgraded.

Due to the high cost of a typical grade separation structure ($12+ million), it is impractical for CDOT to apply the remaining $1 million annual apportionment to a new grade separation project each year. Instead, CDOT will occasionally allow three to four years' worth of apportionment to "pool," until a meaningful amount ($3—$4 million) is available for such a project.

Solicitation of Candidate Projects

The passage of SAFETEA-LU in 2005 changed the underlying basis of the Section 130 program, to create a data-driven process that emphasizes accident prediction through modeling. The legislation allows states to develop the specifics of their models. To carry out this new requirement, CDOT has begun to emphasize the use of accident prediction modeling as a primary factor in project selection.

Ranking, Selection and Prioritization of Projects

A statewide priority list of grade crossing improvement projects is developed every year, based on the accident prediction number generated by the data in the FRA database, called Web Based Accident Prediction System (WBAPS).

On-site Diagnostic Review Meeting

on-site 'diagnostic review' is conducted by a team that includes representatives from the Railroad Crossing Safety Program, the appropriate CDOT region, the railroad company, the local governmental agency, and the PUC. This group investigates and evaluates various aspects of the identified crossing and makes a recommendation to the PUC. The PUC then determines what safety improvements are required at the crossing.

Rail Crossing Inventory

The FRA, in cooperation with the Association of American Railroads (AAR), has developed the Rail-Highway Crossing inventory. Updating the information on the crossing inventory,

previously the sole responsibility of the railroads is now the responsibility of the state. The inventory at each crossing (at-grade and above grade) contains the following data:

- Location of the crossing
- Train traffic volume and type
- Existing traffic control devices
- Topographic features of the crossing

CDOT has recently undertaken a comprehensive survey of the state's rail-highway crossings to gather current information to make informed decisions regarding the use of funds allocated under the Section 130 program. That survey was completed in 2010 and the results were provided to the FRA. CDOT's Railroad Program in the Safety and Traffic Engineering Branch is responsible for the ongoing maintenance of the crossing inventory.

Towner Line Acquisition and Lease

The Colorado Legislature passed HB 1395 on April 22, 1998 which authorized CDOT to acquire a 121.9-mile-long rail line in eastern Colorado, known as the "Towner Line". This rail line was a former Missouri Pacific Railroad line which extended from NA Jct. (east of Pueblo) to Towner, Colorado near the Kansas state line. The line had been "out of service" since UP proposed the line for abandonment in late 1996. The acquisition price from the UP was $10.2 million. SB 1395 also required CDOT to arrange for the sale or lease of the line by June 30, 2000 to a financially responsible railroad operator who would use the line to provide rail service. HB 1395 also required CDOT to receive at least the purchase price paid to UP by CDOT, plus interest, as a result of any sale or lease/sale of the line.

on July 29, 1999 CDOT issued a Request for Proposals for the purchase (or lease-purchase) of the Towner Line. Following a review of the proposals submitted, the Colorado Kansas and Pacific (CKP) Railway Company was selected to negotiate an agreement with CDOT for the lease and/or sale and continued operation of the line. A lease purchase agreement was executed by CDOT and CKP on December 9, 1999.

CKP began operating the line by moving a limited number of loaded grain cars at Haswell, Eads and Towner, as well as storing a significant number of empty intermodal cars for the TTX Company.

on March 27, 2003 a derailment occurred on the line east of Arlington, Colorado. This derailment of 44 empty intermodal cars resulted in significant damage to the track and a concrete box culvert, which took the line out of service for several months.

in late 2003, Watco Companies began negotiations with CKP to acquire the CKP through a stock transfer in order to take over operation of the lease with CDOT and reinstate service

over the line. On February 13, 2004, CDOT ordered CKP to cease operations on the line, due to CKP's failure to keep its required insurance on the line. The Watco/CKP negotiations were terminated in April 2004, when Watco determined it would be a better business decision to compete for the line in the event CDOT issued another Request for Proposals for a purchase or lease purchase of the line.

on August 20, 2004, a Net Liquidation Value (NLV) assessment was completed for CDOT which estimated the value of the line at that time to be $7,166,869. This value, considerably lower than the $10.2 million that CDOT paid for the line in 1998, was due to the very 'deflated" price of steel. NLV is the liquidation value minus the costs associated with the removal of track, ties, ballast and bridges.

on February 8, 2005, CDOT issued another Request for Proposals for the sale or lease of the Towner Line and re-commencement of operation of the line. Following a review of the proposals submitted, the Victoria and Southern Railway, Inc. (V&S) was selected to negotiate an agreement with CDOT for the lease and/or sale and continued operation of the line. A Lease Purchase Agreement was executed by CDOT and V&S on December 1, 2005.

The V&S agreed to operate the line for a three-year period, known as the initial operating period. Also, for the following three years, V&S agreed not to abandon the line at any time before December 1, 2011. CDOT did retain the right of first refusal to purchase the line and associated rights-of-way in the event the V&S intended to dispose of the line. CDOT would be required to pay the lesser amount of:

- The purchase price paid by V&S plus documented capital improvements made by V&S to the line, plus 8% interest, compounded annually; or
- The net salvage of the line at the time CDOT intends to sell all or any part of the line.

in January 2006, the V&S (aka VST) began rehabilitation and improvements of the line, including track repair, track replacement, repair of active crossing equipment, and returning the track to Class II operating standards. The first grain train returning the line to service was moved in September 2006. On April 15, 2008, a massive prairie fire destroyed two wooden bridges in the vicinity of Ordway. Both bridges were replaced with culverts and the line was restored to full service within months.

During most of 2009 and 2010, the line was used to store UP cars east of the Crowley County line to about 8 miles west of Arlington. In 2010, the VST reached an agreement with Watco to operate necessary rail service for movements of grain over the line. In October, 2011, VST purchased the line from the state and in December notified CDOT of their intent to abandon the line from North Avondale Junction, CO to Eads, CO.

A Summary of Key Rail Related Studies Relevant to CDOT

Eagle County/Tennessee Pass Route Rail-related Studies (1995—2003)

A series of studies were conducted between 1995 and 2003 focusing on the possible re-opening of the out-of-service Tennessee Pass line currently owned by UP. These studies were developed by the Intermountain Partnership, comprised of local governments and key companies in the private sector. The studies were provided to CDOT with a request that the agency consider partnering with the Intermountain Partnership in realizing the transportation vision within the Eagle River Valley. The following is a summary, in chronological order, of the study efforts.

*A 1995 property valuation was conducted on the Tennessee Pass route, at that time owned by the Southern Pacific Railroad***.** The section of railroad appraised was 64 miles between Gypsum and Leadville; 109 miles between Leadville and Canon City; and 4.7 miles of the Leadville Branch. Net liquidation value (NLV) was determined to be $6.23 million. NLV is the liquidation value minus the costs associated with removal of track, ties, ballast and bridges.

A study, called *Rails and Trails to Link the Communities of the Vail and Eagle Valleys (Intermountain Partnership, 1998)* was completed and presented to CDOT in 1998. The study described the concept of acquiring the out-of-service railroad in the Eagle Valley from the UP for the purposes of initiating rail passenger service in the valley and also creating a corridor of trails on railroad elements not used for passenger service.

The recommended 'next steps' were:

- Commence negotiations for the Tennessee Pass Railroad Corridor.
- Create a public/private partnership with the Eagle County Regional Transportation Authority.
- Allocate funding for continued planning and design of the start-up phase.
- Develop criteria for and implement a public involvement process.
- Allocate funding for the construction of the start-up phase.

The start-up activities would include the following planning and engineering work:

- Existing conditions report, ridership forecasting, environmental documentation, capital cost estimation, and operations and maintenance cost estimation.

Systems phasing and implementation would include:

- Track design and grade work, right-of-way and utilities, station and park and ride facilities preliminary design, crossings and signalization, trail design, ticketing and fare structure, and construction scheduling.

The study, *A Vision for Rails and Trails to Link the Communities of the Vail and Eagle Valleys*, (*Intermountain Partnership, 1998),* was submitted to CDOT in September 1998. This document described the vision for transportation in the Eagle Valley. It also provided specific details of a proposed partnership between the Intermountain Partnership, a consortium of Eagle County communities, authorities, and businesses, with CDOT to create the Intermountain Connection which would utilize the Tennessee Pass rail route to connect Gypsum and the Eagle County Airport to Avon and Leadville.

The Intermountain Connection Feasibility Study, Eagle County Airport to Avon, *(Intermountain Partnership, 2003),* was developed to provide additional detail on operational characteristics, stations, and preliminary cost estimates for the construction of the Intermountain Connection. The report concluded that the connection could be in service in 4—5 years.

It was suggested that the first three steps (environmental clearance, right-of-way negotiations, and the creation of a public/private partnership) could occur concurrently over a two year period. Design was expected to take less than a year. Equipment procurement could begin early in the design phase and would take about 2 years. Following design, track improvements, maintenance facility construction and station development would take 2—3 years to complete.

Connectivity Concepts—Intermountain Connection, (Kracum Resources for J. F. Sato & Associates, 2003), was completed as a response to a Colorado Transportation Commission resolution "to explore options to preserve rail service in the Eagle Valley corridor." The report updated ridership estimates and other data elements from previous Intermountain Connection-related studies and also included public railroad crossing and track improvement evaluations.

These 'next steps' were identified:

- Develop a Memorandum of Understanding with Eagle County, Vail Associates, and local communities
- Obtain right-of-way appraisal
- Negotiate cost sharing with Eagle County, local governments, and Vail Associates
- Negotiate purchase of rail line with the UP

Castle Rock Railroad Relocation Feasibility Evaluation—2001

The *Castle Rock Railroad Relocation Feasibility Study (2001)* evaluated the technical feasibility of relocating the UP tracks currently moving trains primarily northbound through Castle Rock, to another alignment west of I-25. Both the UP and BNSF were involved in the development of the design criteria and the evaluation of three identified alignment alternatives:

- Alternative 1 would require approximately 18 miles of track to be relocated from Larkspur to Sedalia. It would eliminate 13 public and 12 private at-grade crossings and would cost an estimated $62.9 million.
- Alternative 2 would require approximately 14 miles of track to be relocated to the west side of I-25, and would eliminate 12 public and four private at-grade crossings. It would cost an estimated $52.8 million. The project would extend from Larkspur to Meadows Parkway.
- Alternative 3 would require approximately 7.5 miles of track to be relocated. It would require the construction of two major bridges that the other alternatives would avoid. It would eliminate eight public and two private at-grade crossings and would cost an estimated $45.4 million. The project would extend from Bell Mountain Road to Meadows Parkway.

It was projected that the selected alignment, alternative 1, might be completed in a four year period.

The proposed project represented an important opportunity for the town of Castle Rock and Douglas County to revitalize the town's Central Business District (CBD). It would also improve the safety of the traveling public, and remove obstacles to the efficient movement of goods and services within the community. The study identified a process which would establish specific technical elements of the project and mitigate known impacts, secure necessary funds to implement the project and move the project forward through construction. In addition, CDOT would see future savings related to planned improvements to both I-25 and US 85 if the proposed rail relocation were to be completed. This project was never implemented due to lack of available funding.

Denver Union Station Redevelopment Study (2004)

in 2001, the Denver Union Station (DUS) Executive Oversight Committee was formed through an intergovernmental agreement between four partnering agencies: CDOT, the Regional Transportation District (RTD), the City and County of Denver (CCD), and the Denver Regional Council of Governments (DRCOG), to pursue redevelopment of DUS. After the purchase of DUS by RTD and partner agencies in 2001, an EIS and master planning process were initiated. After careful consideration by the agencies and a 93-member public advisory committee, the Master Plan was adopted in 2004 with a supplement published in 2008. The Final EIS and Record of Decision were signed in 2008. The selected build alternative accommodates all public transit operations needed to efficiently implement all RTD's new FasTracks services, and to maintain existing Amtrak service.

The arrangement of the new facilities includes:

- Two tracks for light rail parallel to the Consolidated Mainline, perpendicular to 17th Street
- Twenty-two bays for RTD's Regional Buses, Downtown Circulator and some commercial bus use below-grade under 17th Street
- Eight tracks in a stub-end passenger rail facility at-grade adjacent to the historic station building
- Street enhancements for the 16th Street Mall Shuttle, bicycles, pedestrians, taxis, and passenger loading

The funding for the $485 million project is a compilation of RTD FasTracks funds, Senate Bill 1 Transit and FASTER funds from CDOT, Railroad Rehabilitation and Improvement Financing (RIFF), and Transportation Infrastructure Finance and Innovation Act (TIFIA) loans. These are to be repaid by a newly formed metro district in the area immediately surrounding the station. As of summer 2011, the project was approximately 35% complete with an anticipated opening date in 2014.

Wyoming Commuter Rail Study—2008

The *Wyoming Commuter Rail Study*, *(Wyoming DOT, 2008)*, examined the feasibility of commuter rail service between Fort Collins and Casper. The proposed service would essentially use the existing BNSF tracks currently used for freight rail service. The momentum for this study began in 2004 with the Front Range Commuter Rail advocacy group meeting with Wyoming officials. The study acknowledges that Wyoming's access to quality regional passenger rail service is tied to the success of Front Range initiatives.

The study evaluated the physical rail inventory features of the following segments:

- Fort Collins—Cheyenne
- Cheyenne—Wendover
- Wendover—Bridger Jct.
- Bridger Jct.—Casper

The analysis suggested that track upgrades in the $1.0—$1.5 million/mile range would be required to accommodate the proposed services.

The study suggested that a next step would be to further refine the capital and operating cost estimates, in addition to better describing the service features which might be available to Wyoming residents. It was also suggested that this study be coordinated with the Rocky

Mountain Rail Authority (RMRA) study, when results from that study become available. (No formal coordination of this study with the RMRA study has occurred at this time.)

Amtrak Pioneer Feasibility Study (2009)

This study examined the feasibility of reinstating Amtrak's *Pioneer* route, which operated from 1977 to 1997 between Chicago, Illinois and Seattle, Washington via Denver, Colorado and Salt Lake City/Ogden, Utah. Amtrak was directed to perform this study by the Passenger Rail Investment and Improvement Act of 2008 (PRIIA) (Public Law 110-432), which reauthorized Amtrak and tasked Amtrak, the federal government, states, and other rail stakeholders to improve intercity passenger rail service.

Amtrak evaluated seven options along four routes, with schedule-based variations. On the basis of total potential ridership, annual operating costs, net operating impact, and fare box recovery, the highest ranking options per route were presented in this study. Options 1 and 3 served Colorado via the Rio Grande Route; Denver to Salt Lake City through Glenwood Springs and Grand Junction over the old DRGW route. Options 2 and 4 connected Denver to Ogden Utah via the Overland Route; the Union Pacific Railroad route from Denver to Cheyenne through Greeley and across Southern Wyoming to Ogden, Utah.

Financial Performance

Projected direct operating costs are:

- Option 1 (Salt Lake City—Seattle): $36.6 million
- Option 2 (Denver—Seattle): $46.2 million
- Option 3 (Salt Lake City—Portland): $35.9 million
- Option 4 (Denver—Portland): $44.7 million

These expenses are comprised primarily of labor costs for train and engine crews and on-board service employees, fuel, and mechanical costs.

The projected direct operating loss (revenue minus direct operating costs) is:

- Option 1 (Salt Lake City—Seattle): $25.0 million
- Option 2 (Denver—Seattle): $33.1 million
- Option 3 (Salt Lake City—Portland): $28.3 million
- Option 4 (Denver—Portland): $35.5 million

Capital and Mobilizations costs

Capital and mobilization costs are as follows:

- Option 1 (Salt Lake City—Seattle): $382 million
- Option 2 (Denver—Seattle): $478 million
- Option 3 (Salt Lake City—Portland): $379 million
- Option 4 (Denver—Portland): $493 million

The study indicated that the actual capital costs of service restoration are subject to significant uncertainty.

Conclusions and 'Next Steps'

The addition of the *Pioneer* and other long distance routes to the Amtrak national network could produce numerous public benefits, at a cost. While PRIIA recognizes the importance of Amtrak's existing long distance routes, it does not provide capital or operating funding for expansion of service beyond current levels. Therefore, additional federal and/or state funding would be required for any service expansion.

Eight billion dollars in intercity passenger/high speed rail capital funding was made available in 2008 by the American Recovery and Reinvestment Act (ARRA). This represents a significant source of funding for capital costs associated with the expansion of intercity passenger rail service. Since the *Pioneer* route is not a federally designated high speed rail corridor, one or more states along the route would have to be an applicant or co-applicant for ARRA funding. Funding for the cost of operating the service would have to be obtained from other federal and/or state sources, since ARRA funding cannot be used for that purpose.

Amtrak recommends that federal and state policymakers determine if passenger rail service should be reintroduced along the former *Pioneer* route, and if so, they should identify the preferred option for service restoration as well as provide the required levels of capital and operating funding to Amtrak. Upon such a decision, Amtrak will work aggressively with federal and state partners to restore the *Pioneer* service.

A Summary of Rail-related Programs Managed by Other State Agencies

Public Utilities Commission Rail-related Program Responsibilities

The Colorado PUC has responsibility for and jurisdiction over the following railroad related programs within the state of Colorado:

- **Rail Safety**—The state's jurisdiction over railroad safety has been pre-empted in recent years by the creation of the Surface Transportation Board (STB). The PUC has retained primary jurisdiction over all public highway-rail crossings, including

openings, closings, upgrading, overpasses/underpasses, and the allocation of costs for such projects.

- **Rail Transit Safety**—The PUC also has responsibility for the oversight of the safety and security of rail fixed guideway systems within Colorado. This applies to any rail fixed guideway, whether or not it has received federal funding that meets the requirements outlined in 49 CFR Part 659 (Rail Fixed Guideway Systems; State Safety Oversight).

Specifics related to the PUC's authority are in Title 40 (Utilities) of the Colorado Revised Statutes and also in Rules (Part 7—Rules regulating railroads, rail fixed guideways, transportation by rail, and rail crossings).

Key features of the PUC's jurisdiction cover the following areas/activities:

- Operating authority
- Crossings and warning devices
- Safety
  - ✓ Railroad clearances
  - ✓ System safety program standard for rail fixed guideway systems
- Employment of Class I railroad peace officers

Colorado PUC Highway/Rail Signalization Fund

The purpose of this fund is to promote public safety and pay the costs of installing, reconstructing, and improving safety appliance signals or devices at highway-rail crossings that do not receive federal funding. The statute states that funding for these purposes shall occur "if appropriated". However, the Colorado Legislature has not made an appropriation to this fund since 2002.

Moffat Tunnel Improvement District

The Moffat Tunnel Improvement District was originally formed to facilitate transportation and communication between eastern and western Colorado, through the efficient operation and maintenance of the existing Moffat Tunnel underneath the Continental Divide. After the Moffat Tunnel Commission successfully accomplished the construction of the tunnel and the retirement of bonds issued to finance the construction, the Colorado General Assembly in 1996 passed legislation transferring control of the District from the Commission to the Colorado Department of Local Affairs (DOLA). DOLA has served as the custodian of the leases related to the tunnel since the Moffat Tunnel Commission ceased to exist in 1998. DOLA continues to be responsible for managing the existing leases of the Moffat Tunnel with both

UP and Qwest. Today this effort essentially consists of receiving the annual lease payments and up-to-date insurance certificates from both UP and Qwest.

A Summary of Financial Support Programs for Colorado Rail Activities

State Funding and Financing Programs

State Rail Bank Fund

Pursuant to S.B. 97-037, the General Assembly may from time to time allocate revenues to the State Rail Bank Fund. Appropriations for moneys in the State Rail Bank Fund may be requested and used for the acquisition, maintenance, improvement, or disposal of rail lines, railroad right-of-way or any other purpose necessary to carry out the implementation of Part 13 of S.B. 97-037, which created a new section of statute related to the acquisition of abandoned railroad rights of way.

General Fund Transfers

These General Fund (GF) transfer funds must be used in the implementation of the strategic transportation project investment program. No more than ninety percent of these funds may be used on reconstruction, repair, maintenance, and capital expansion projects for highway-related capital improvements, including, but not limited to, high occupancy vehicle lanes, park-and-ride facilities and transportation management systems. At least ten percent of the funds must be used for transit purposes or for transit-related capital improvements. The designation of ten percent of the S.B. 97-001 transfer of general fund revenues for transit remains in place for any general fund transfers to CDOT that they may receive from the new transfer mechanism created in S.B. 09-228.

FASTER Safety Revenue

S.B. 09-108 (FASTER) revenue must be used by CDOT for road safety projects only. Except that CDOT must set aside $10 million annually of its allocation from the highway safety surcharge distributed to the Department through the Highway User Tax Fund's (HUTF) 3rd stream revenue formula. These revenues may be used for planning, designing, engineering, acquisition, installation, construction, repair, reconstruction, maintenance, operation, or administration of transit-related projects, including, but not limited to, designated bicycle or pedestrian lanes of highway and infrastructure needed to integrate different transportation modes within a multimodal transportation system, which enhance the safety of state highways for transit users.

Another $5 million of S.B. 09-108 (FASTER) revenue is deducted from the HUTF's 3rd stream revenue formula distributions to local governments and transferred to CDOT. The Division of Transit and Rail redistributes these funds as transit grants to local governments.

Colorado State Infrastructure Bank

The Colorado State Infrastructure Bank (COSIB) is, in fact, not a bank but a revolving fund created by the state legislature that is authorized to make loans to public and private entities, to facilitate the financing of public transportation projects within the state. The COSIB operates four distinct programs: One for highways, another for transit, a third for aviation, and finally one for rail. The overall objective of the COSIB is to seek loan applications for transportation projects that can both benefit from COSIB assistance, and meet the terms for loan repayments. The proposed project must ultimately have revenue sources available to it to repay the loan.

Historically, the COSIB program's primary use is within the aviation community. While all elements of the state's transportation system have projects that merit assistance, aviation is unique in its capacity to generate steady revenues that meet or exceed the cost of operating its facilities over time and is willing to ultimately pay for the full cost of its infrastructure improvements. These two factors make the program particularly useful for aviation.

Federal Funding Programs

Passenger Rail Improvement and Investment Act of 2008 (PRIIA)

PRIIA was enacted in October 2008 and provided for the reauthorization of the National Railroad Passenger Corporation (Amtrak) and tasked Amtrak, the U.S. Department of Transportation (US DOT), the Federal Railroad Administration (FRA), States and other stakeholders with improving operations, facilities, and service. PRIIA authorized over $13 billion between 2009 and 2013 and promotes the development of new and improved intercity passenger rail services, state-sponsored corridors throughout the U.S., as well as the development of high speed rail corridors.

PRIIA established three new competitive grant programs for funding high-speed intercity passenger rail improvements. Each of the three programs provides 80 percent federal funding with a required 20 percent non-federal match. The three grant programs established by PRIIA are described below.

Intercity Passenger Rail Service Corridor Capital Assistance Program

Under PRIIA, an intercity passenger rail capital grant program for states was established requiring states to identify passenger rail corridor improvement projects in their State Rail Plan and is intended to create the framework for a new intercity passenger rail service corridor capital assistance program. The High-Speed Intercity Passenger Rail (HSIPR) Program provides funding assistance to states, groups of states, interstate compacts, public agencies, and Amtrak (both alone and in cooperation with states). These funds can be utilized for service development programs, planning projects, financing the costs of facilities,

infrastructure, and equipment necessary to provide or improve intercity passenger rail transportation. Existing or proposed intercity passenger services are eligible under this program.

High Speed Rail Corridor Development Program

PRIIA also authorized $1.5 billion annually to establish and implement a high-speed rail corridor development program. Funding is currently restricted to projects intended to develop the ten federally-designated high-speed corridors for intercity passenger rail services that may reasonably be expected to reach speeds of at least 110 miles per hour.

Congestion Grants

PRIIA authorizes $325 million annually for grants to states, or to Amtrak in cooperation with states, for financing the capital costs of facilities, infrastructure, and equipment for high-priority rail corridor projects necessary to reduce congestion or facilitate intercity passenger rail ridership growth.

As noted, funding for these authorized programs associated with PRIIA must be appropriated annually.

SAFETEA-LU Programs

The Safe, Accountable, Efficient Transportation Equity Act—a Legacy for Users (SAFETEA-LU), the current authorization bill for the nation's surface transportation program, was scheduled to expire on October 1, 2009; however, temporary extensions for SAFETEA-LU have been passed through March 2012 or until a new transportation authorization bill is approved.

The SAFETEA-LU bill contains a number of program provisions with specific eligibility for rail. These include both funding and financing programs, which are described below.

Section 130 Highway-Rail Grade Crossing Program

As discussed in more depth above, this program provides federal support in an effort to reduce the incidence of accidents, injuries, and fatalities at public rail-highway crossings. States may utilize funds to improve railroad crossings, including the installation or upgrading of warning devices, the elimination of at-grade crossings through grade separation, or the consolidation or closing of crossings. The federal share for these funds is 90 percent.

Rail Line Relocation and Improvement Capital Grant Program

Section 9002 of SAFETEA-LU authorizes funding for the purpose of providing financial assistance for local rail line and improvement projects. Any construction project that improves the route or structure of a rail line and 1) involves a lateral or vertical relocation of any portion of the rail line, or 2) is carried out for the purpose of mitigating the adverse effects of rail traffic on safety, motor vehicle traffic flow, community quality of life, or economic

development, is eligible. The federal share for these funds is 90 percent, not to exceed $20 million.

Successful grant applicants will meet cost-benefit requirements; specifically that the project benefits (for the period of the estimated economic life of the improvements) exceed the costs of the project for the same time period.

Congestion Mitigation and Air Quality (CMAQ) Improvement Program

This program funds transportation projects and programs that improve air quality by reducing transportation-related emissions in non-attainment and maintenance areas for ozone, carbon monoxide, and particulate matter. Examples of CMAQ-funded rail projects include the construction of intermodal facilities, rail track rehabilitation, diesel engine retrofits and idle-reduction projects in rail yards, and new rail sidings.

Funding is available for areas that do not meet the National Ambient Air Quality Standards (nonattainment areas) as well as former nonattainment areas that are now in compliance (maintenance areas). Funds are distributed based on a formula considering an area's population by county and the severity of its ozone and carbon monoxide problems.

The SAFETEA-LU requires States and MPOs to give priority in distributing CMAQ funds to diesel engine retrofits, and other cost-effective emission reduction and congestion mitigation activities. SAFETEA-LU also requires the Secretary of Transportation to evaluate and assess the effectiveness of a representative sample of CMAQ projects to determine the direct and indirect impact of the projects on air quality and congestion levels, as well as ensure the effective implementation of the program.

Freight initiatives may be eligible under the 1999 CMAQ guidance. Although freight is not mentioned specifically, the provision for public-private partnerships—strengthened considerably with TEA-21 to allow public (CMAQ) funds to be used for privately owned and operated services—represents another avenue of support for freight and intermodal projects that generate an air quality benefit. Emissions reductions can be generated directly by projects focusing on the vehicles themselves, through treatment of tailpipe exhaust or application of advanced engine technologies and may thus qualify for CMAQ funding (assuming all other requirements are met).

State Departments of Transportation and Metropolitan Planning Organizations select and approve projects for funding. The federal matching share for these funds is 80 percent.

Surface Transportation Program (STP)

The Surface Transportation Program is a general grant program available for improvements on any Federal-Aid highway, bridge, or transit capital project. The program is meant to provide flexible funding that may be used by States and localities. Eligible applications include

highways, bridge projects on any public road, transit capital projects, and intracity and intercity bus terminals and facilities.

Eligible rail improvements include lengthening or increasing vertical clearance of bridges, crossing eliminations, and improving intermodal connectors.

State Departments of Transportation and Metropolitan Planning Organizations select and approve projects for funding under this program. The federal matching share for these funds is 80 percent.

Rail and Fixed Guideway Modernization

The Transit Capital Investment Program (49 U.S.C. 5309) provides capital assistance for new rail systems (New Starts/Small Starts program), bus systems (Bus and Bus Related Equipment and Facilities Program), and modernization of existing rail systems (Fixed Guideway Modernization Program). Funding can be used for a variety of projects, including purchase and rehabilitation of rolling stock, track, line equipment, structures, signals and communications, power equipment and substations, passenger stations and terminals, security equipment and systems, maintenance facilities and equipment, operational support equipment including computer hardware and software, system extensions, and preventive maintenance.

Eligible recipients for funding are public entities and agencies (transit authorities and other state/local public bodies and agencies) including states, municipalities, other political subdivisions of states; public agencies and instrumentalities of one or more states; and certain public corporations, boards, and commissions established under state law. Modes eligible for funding include heavy rail, commuter rail, and a number of other transit modes.

Transportation and Community and System Preservation (TCSP) Pilot Program

The Transportation, Community, and System Preservation (TCSP) Program provides funding for initiatives including planning and implementing grants; performing research to investigate and address the relationships between transportation, community, and system preservation; and identifying private sector-based initiatives.

Funds are available to States, metropolitan planning organizations, local governments, and tribal governments. The law requires equitable distribution of funds to a diversity of populations and geographic locations. For discretionary funding, an interagency team evaluates applications for competitive TCSP Program grants. TCSP Program grants can also be designated by Congress.

SAFETEA-LU authorized TCSP funding though Program funding levels can vary based on Congress' annual appropriations. Congressional support for the project is suggested as a large amount of available funds are usually earmarked prior to distribution.

Transportation Enhancement Program

These funds are available to strengthen the cultural, aesthetic, and environmental aspects of the Nation's intermodal transportation system. Eligible projects include the rehabilitation of historic transportation buildings or facilities and the preservation of abandoned rail corridors, though a number of environmental preservation, scenic beautification, and historic preservation projects would qualify. Projects are usually chosen at the local government level. The federal share of project costs is 80 percent.

Federal Financing Programs

Private Activity Bonds

SAFETEA-LU established a new financial assistance program that allows the issuance of up to $15 billion in private activity bonds for transportation infrastructure projects. States and local governments are allowed to issue tax-exempt bonds to finance projects sponsored by the private sector subject to rules set forth by the Internal Revenue Service.

Eligible projects include privately owned-or-operated highway and rail-truck transfer facilities, including any surface transportation project receiving Title 23 assistance. This provision therefore extends eligibility to TIFIA-assisted public transportation, intercity bus or rail facilities and vehicles, including vehicles and facilities owned by Amtrak, public freight rail facilities or private facilities providing public benefit for highway users, and intermodal freight transfer facilities.

Transportation Infrastructure Finance and Innovation Act

The Transportation Infrastructure Finance and Innovation Act (TIFIA) program provides credit assistance for qualified projects of regional and national significance. Many large-scale surface transportation projects—highway, transit, railroad, intermodal freight, and port access—are eligible for assistance. Eligible applicants include state and local governments, transit agencies, railroad companies, special authorities, special districts, and private entities.

TIFIA offers three distinct types of financial assistance, designed to address the varying requirements of projects throughout their life cycles: Secured (direct) loans, loan guarantees, and standby lines of credit. The amount of federal credit assistance may not exceed 33 percent of total reasonably anticipated eligible project costs. The exact terms for each loan are negotiated between the U.S. Department of Transportation (USDOT) and the borrower, based on the project economics, the cost and revenue profile of the project, and any other relevant factors. TIFIA interest rates are equivalent to Treasury rates. Depending on market conditions, these rates are often lower than what most borrowers can obtain in the private markets. Unlike private commercial loans with variable rate debt, TIFIA interest rates are fixed. Overall, borrowers benefit from improved access to capital markets and potentially

achieve earlier completion of large-scale, capital intensive projects that otherwise might be delayed or not built at all because of their size and complexity and the market's uncertainty over the timing of revenues.

Any type of project that is eligible for federal assistance through existing surface transportation programs (highway projects and transit capital projects) is eligible for the TIFIA credit program,

The following types of projects are eligible:

- International bridges and tunnels
- Intercity passenger bus and rail facilities and vehicles
- Publicly owned freight rail facilities
- Private facilities providing public benefit for highway users
- Intermodal freight transfer facilities and projects that provide access to such facilities
- Service improvements on or adjacent to the National Highway System
- Projects located within the boundary of a port terminal under certain conditions

An eligible project must be included in the applicable state transportation improvement program. Major requirements include a capital cost of at least $50 million (or 33.3 percent of a state's annual apportionment of federal-aid funds, whichever is less) or $15 million in the case of Intelligent Transportation Systems (ITS). TIFIA credit assistance is limited to a maximum of 33 percent of the total eligible project costs. Senior debt must be rated investment grade. The project also must be supported in whole or in part from user charges or other non-federal dedicated funding sources and be included in the state's transportation plan. Applicable federal requirements include, but are not limited to Titles 23 and 49 of the U.S. Code, NEPA, Buy America provisions, and the Civil Rights and Uniform Relocation Acts.

Railroad Rehabilitation and Improvement Financing

The Railroad Rehabilitation and Improvement Financing (RRIF) Program provides direct federal loans and loan guarantees to finance development of railroad infrastructure. The RRIF program was established by the Transportation Equity Act for the 21st Century (TEA-21) and amended by the SAFETEA-LU. Under this program the FRA Administrator is authorized to provide direct loans and loan guarantees of up to $35.0 billion. Up to $7.0 billion is reserved for projects benefiting freight railroads other than Class I carriers.

The funding may be used to: acquire, improve, or rehabilitate intermodal or rail equipment or facilities, including track, components of track, bridges, yards, buildings and shops; refinance outstanding debt incurred for the purposes listed above; and develop or establish new

intermodal or railroad facilities. Eligible borrowers include railroads, state and local governments, government-sponsored authorities and corporations, joint ventures that include at least one railroad and limited option freight shippers who intend to construct a new rail connection.

Direct loans can fund up to 100% of a railroad project with repayment periods of up to 35 years and interest rates equal to the cost of borrowing to the government. All federal financial assistance programs must pay for the cost to the government of providing that financial assistance. In most cases this is done with appropriations from Congress. Since the RRIF Program does not currently have an appropriation, this cost must be borne by the applicant, or another entity on behalf of the applicant, through the payment of the Credit Risk Premium. The FRA Administrator will calculate the amount of the Credit Risk Premium that must be paid for each loan before it can be disbursed. In addition to the Credit Risk Premium, which is paid only if a loan is approved, each applicant must pay an Investigation Fee regardless of whether the loan is approved. The Investigation Fee defrays costs the FRA incurs in evaluating RRIF loan applications. The Investigation Fee may not exceed one half of one percent of the requested loan amount, but it is often substantially less.

Appendix C—State Rail Planning Best Practices

A preliminary task in the Consultant's Scope of Work was the identification and review of best practices in state rail planning. The product of that task is included below as Appendix C.

Summary of Best State Rail Planning Practices

in discussing the best state rail planning practices, as background for *Colorado's State Freight and Passenger Rail Plan*, it is appropriate to provide perspective on the history of state rail planning in the United States.

State rail planning has been in existence since the 1970s. The focus of initial state rail planning efforts was to support rail freight service on lines subject to abandonment. This program was known as the Local Rail Service Assistance (LRSA) program. The Federal Railroad Administration (FRA) provided planning grants to states to develop their initial state rail plans and updates to those plans, and it also provided some funding for rehabilitation of light density rail lines that may have been subject to abandonment without certain infrastructure improvements. In the 1980s and early 1990s, this program continued with the same light density line focus, but was referred to as the Local Rail Freight Assistance program (LRFA).

in the mid-1990s through 2008, the focus of state rail planning efforts began to change. The states began to identify both passenger and freight rail investments in their rail plan updates, as part of multi-modal planning efforts. These efforts were called for in multi-year pieces of federal surface transportation funding authorization bills: The 1991 Intermodal Surface Transportation Efficiency Act (ISTEA), the 1998 Transportation Efficiency Act for the 21st Century (TEA-21) and the 2005 Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU).

in 2008, the Passenger Rail Investment and Improvement Act (PRIIA) was passed by the U.S. Congress. This legislation authorized increased federal funding for intercity rail passenger service and high-speed rail development. It also mandated the creation of state rail plans, or updates to existing plans, as a requirement for states to be eligible for future federal rail project funding.

The American Recovery and Reinvestment Act of 2009 (ARRA) created a program titled Transportation Investment Generating Economic Recovery (TIGER). This program funded $1.5 billion of infrastructure projects around the country. Freight and passenger rail projects were eligible, along with highways, bridges, ports, and public transit projects. The 2009 ARRA also provided $8.0 billion for capital projects related to intercity and high-speed rail corridors. These funds could be utilized for acquisition, construction, or improvement of track, rolling stock, and other rail facilities.

A Congressional appropriation in 2010 of $50 million for rail planning grants was aimed at helping to establish a pipeline of future high-speed and intercity passenger rail projects and corridor development programs, by advancing planning activities for corridors that were at an early stage of development. The grants are to be used for completion of state rail plans. These funds require a 50% state match and are the impetus for numerous state rail planning initiatives, as shown in Figure C-1.

Figure C-1. Map Showing Status of State Rail Plans by State

PRIIA indicated that a state rail plan must be "PRIIA compliant" in order to be approved by FRA. The plans must therefore address the following general minimum requirements:

- Inventory of rail system, services and facilities
- Evaluation of rail lines including high-speed rail and abandonments
- Review of intermodal connections
- Review of existing publicly funded rail projects
- General transportation, economic and environmental impacts of rail service
- Passenger rail service objectives

- Rail infrastructure needs assessment based on stakeholder input
- Performance evaluation of existing passenger services
- High speed rail corridor development plan
- Long-range service and investment program; project lists
- Determination of public and private benefits
- Financing alternatives

FRA has yet to develop final rules and regulations related to the determination of "PRIIA compliant."

Another requirement of FRA in PRIIA was the development of a National Rail Plan. FRA, in compliance with a PRIIA requirement, developed a *Preliminary National Rail Plan* (October 2009). That document addresses state rail planning practices, and suggests that the final National Rail Plan must ultimately reflect the issues and priorities addressed in various state rail plans.

The following are key elements of state rail planning activities, as described in the American Association of State Highway and Transportation Officials (AASHTO) *State Rail Planning Best Practices,* completed in November 2009.

Rail Advisory Body

A key element of every state rail planning effort is the organization and maintenance of an "external" rail advisory body. These groups are made up differently in states but the crucial members are the state's operating railroads, the owners of the rail assets, and a well-diversified group of other key stakeholders. Balancing the focus between freight and passenger rail is beneficial. The sizes of these organizations vary greatly. Oregon DOT has 15 members on its Rail Advisory Committee, while Tennessee DOT has 55 members of its Rail System Plan Advisory Committee. Smaller-sized committees tend to be more efficient, but larger groups are sometimes required due to the local political climate.

Outreach Activities

PRIIA requires that states "provide adequate and reasonable notice and opportunity for comment and other input to the public, rail carriers, commuter and transit authorities operating in, or affected by, rail operators within the state, units of local government and other interested parties in the preparation and review of its state rail plan."

Much of this interaction would take place within the rail advisory body mentioned above, but states also benefit from additional interaction with the public and rail stakeholders. Interviews, surveys and public meetings are the most common and effective method of

outreach. Recent technological advances allow electronic and social media to be utilized effectively.

Public meetings are still the most common way to provide the public and other stakeholders with direct interactions with the state's department of transportation or equivalent agency, and freight and passenger rail operators, as well as a broad cross section of other rail stakeholders. For example, Minnesota DOT conducted 15 open house meetings attended by 900 individuals as a key element of its public outreach. They conducted an additional 34 stakeholder meetings with groups and associations interested in providing input to the DOT on its state rail plan.

The important point to note is that there is no uniform "best practice" in gaining public input to the state rail plan. The method(s) that best suit the agency and its stakeholders in acquiring critical input should be utilized. Emphasizing stakeholder groups tends to result in more focused, technical input, whereas public meetings or open houses tend to generate comments on a broader spectrum of issues.

Rail Vision

A state's Rail Vision is crucial to helping the state's primary rail organizations (normally departments of transportation) determine where the agency wants to go in regard to freight and passenger rail, and the most appropriate paths to get there.

Most Rail Visions accomplish the following:

- Describe the future role of rail transportation in the state
- Recognize not only the opportunities, but also the challenges
- Suggest a "picture" of rail's future in the state
- Communicate the wishes of rail stakeholders and the public
- Allow for the setting of more specific goals and objectives related to rail activities

There are two types of visions: Short and concise vs. longer and more detailed, as illustrated by these two examples:

- *Iowa*—"The vision will create a passenger rail network that connects Iowans to each other and the country, and makes Iowa a more attractive place to live, work and visit."
- *Arizona*—"A safe, secure, efficient and cost-effective passenger and freight rail network forms an integral part of Arizona's multimodal transportation system. Arizona railroads promote economic opportunities and environmental sustainability that reflect the high value Arizonans place on their unique southwestern lifestyle.

Intercity passenger rail, a new and reliable mode for Arizonans, is well connected to commuter rail and local transit systems. Through coordinated land use decisions and wise investments in multimodal facilities, passenger rail has competitive travel times and is the preferred option for many trips. The State has a freight rail system that carries long-distance cargo in an energy-efficient manner, with intermodal connections that permit seamless distribution of local deliveries."

Rail System Inventory

The rail system description is handled quite differently in various states. However, there are basic components to any rail plan that is PRIAA compliant. The ability of states to utilize Geographic Information System (GIS) technology to include more complicated data sets (major commodity flows, clearances, tonnages, intermodal facilities) on maps within rail plans has proven beneficial in recent rail planning efforts. States such as New York, Montana, Georgia and Ohio are good examples.

System description

The physical description of the assets that make up the state rail network comprises this element of the rail system inventory. Much of these data are being effectively communicated in a GIS-based format in a great majority of state rail plans. A state rail plan is a document for an entire state; therefore statewide summaries for key railroad statistics are appropriate. The Association of American Railroads (AAR) is a common source for much of the data. An understanding of the ownership of various rail assets, whether Class I, Class II, or Class III, is a key element of a rail plan. These privately held companies own the assets that will be the focus of the state's rail planning effort. GIS-based mapping readily depicts the state's key railroad partners in a very usable manner.

Rail operations and rail capacity

Rail operations and capacity issues are also key components of the rail system inventory. The ability of one railroad to operate on another railroad's lines is known as trackage rights, and is easily shown on maps depicting trackage rights, railroad densities (millions of gross tons) and trains per day. Figure C-2 shows a Georgia State Rail Plan GIS depiction of rail tonnages.

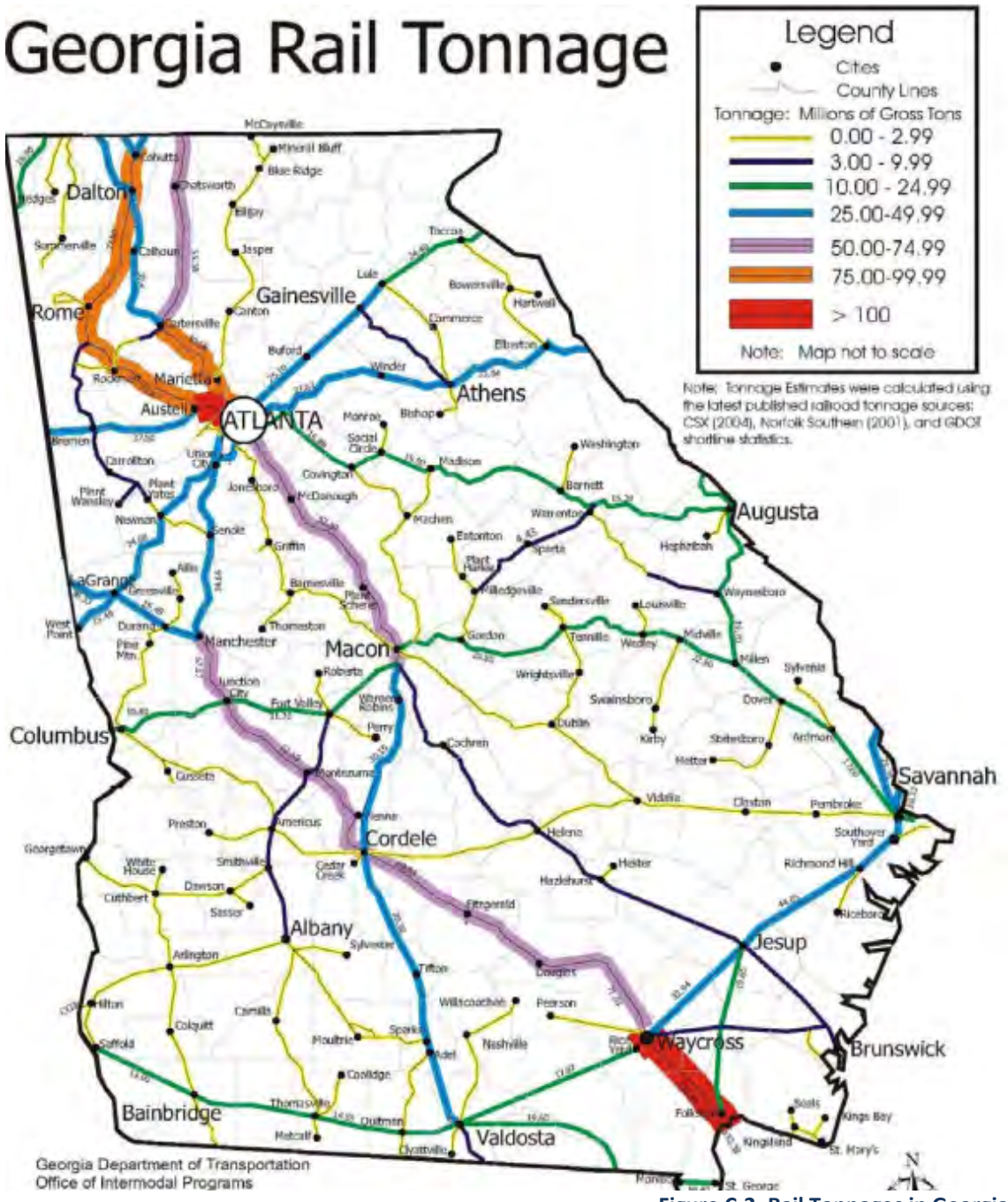


Figure C-2. Rail Tonnages in Georgia

Rail capacity related issues (passing capacity, weight limits, and double-stack clearance) are also crucial information for a rail planning agency. These variables affect the overall speed and passing capabilities for both freight and passenger rail services; they impact a rail carrier's ability to haul heavy goods due to weight restrictions on track and bridges; and they

identify the potential for double-stack capability, which increases a freight railroad's throughput and efficiency.

This information is typically depicted as a narrative, or in a combination of maps and tables. It is dependent upon the quality of information gathered from the railroads and other sources. It is suggested that maps, in combination with tables, be used wherever possible to convey this information. This allows geographic context, and makes the plan more user-friendly for the public and the DOT.

Rail Carrier Profiles

The profiling of each rail operator in the state is an important element of the state rail plan. Each owner/operator should have a current description of not only the specifics of that carrier's infrastructure and traffic, but also its employment, and other economic factors which benefit the state and local communities in which the railroads operate. Each rail carrier profile should be depicted graphically in a GIS-based format, which provides the state and stakeholders with an understandable view of that railroad and its operations.

States that have combined maps with rail carrier profiles include Kansas, Georgia, Arizona, and Minnesota. The maps typically depict a carrier's network and primary lines. Statistics, such as number of employees, wages/benefits and capital spending by carrier, are usually conveyed in accompanying tables. Maps of economic statistics are not typically included. For the Colorado SFPRP, Colorado's rail carrier profiles will follow this same format. Data requests made to the railroads have been as condensed as possible, and the requested statistics are not specific to individual rail lines.

Commodity Flows

The Surface Transportation Board's (STB) Carload Waybill Sample and other data can be utilized to depict the various commodities that have an economic impact on the state, based on the origination or termination of that commodity within the state. This is very important data for state economic development organizations, and for communities to attract rail-served businesses. The commodity flow data also describes those commodities that flow "through" the state, neither originating nor terminating within the state. These flows are important because they use up critical rail capacity within the state without having the direct economic benefits of originating and/or terminating rail traffic. Such data are also readily communicated on maps within the rail plans in GIS formats.

Generally, states convey commodity flow information in statistical tables rather than maps. It is suggested that commodity flows can be conveyed by maps, but must be somewhat generalized to be easily understood. It is also suggested that only the top five commodity flows by value/weight be mapped. One way this can be achieved is through the use of the

Freight Analysis Framework (FAF3) along with statistics from the 2007 Economic Census Commodity Flow Survey and the Surface Transportation Board's Waybill Sample.

National "spider" maps are constructed depicting top destinations for Colorado commodities and origins into the state by FAF3 zones. The maps depict the general flow of commodities to and from other states, without depicting the specific rail route used to move the commodities. This could be constructed for value and weight of commodities.

This provides the reader with a general sense of where important commodities are moving to/from and provides context of the dominant movements. An additional benefit of using the FAF3 network is the inclusion of projected commodity flows for 2010—2035 in five year increments.

Passenger Rail Data

The ridership data on rail passenger services within the state are readily available from the passenger rail service operators (Amtrak). These can be quantified by the various passenger station locations, and can be graphically plotted to identify trends in the demand for various passenger services. Due to the high costs of developing and maintaining their own individual state rail passenger demand models, many states choose to utilize commercially available passenger demand models to project future passenger demand. The state of Georgia has initiated development of its own model, and California is in a 5-year process of developing a passenger travel demand model which will incorporate rail, highway and aviation modes. Figure C-3 shows an Arizona State Rail Plan GIS depiction of commuter and intercity rail corridors, while Figure C-4 shows the recommended Minnesota regional passenger rail system.

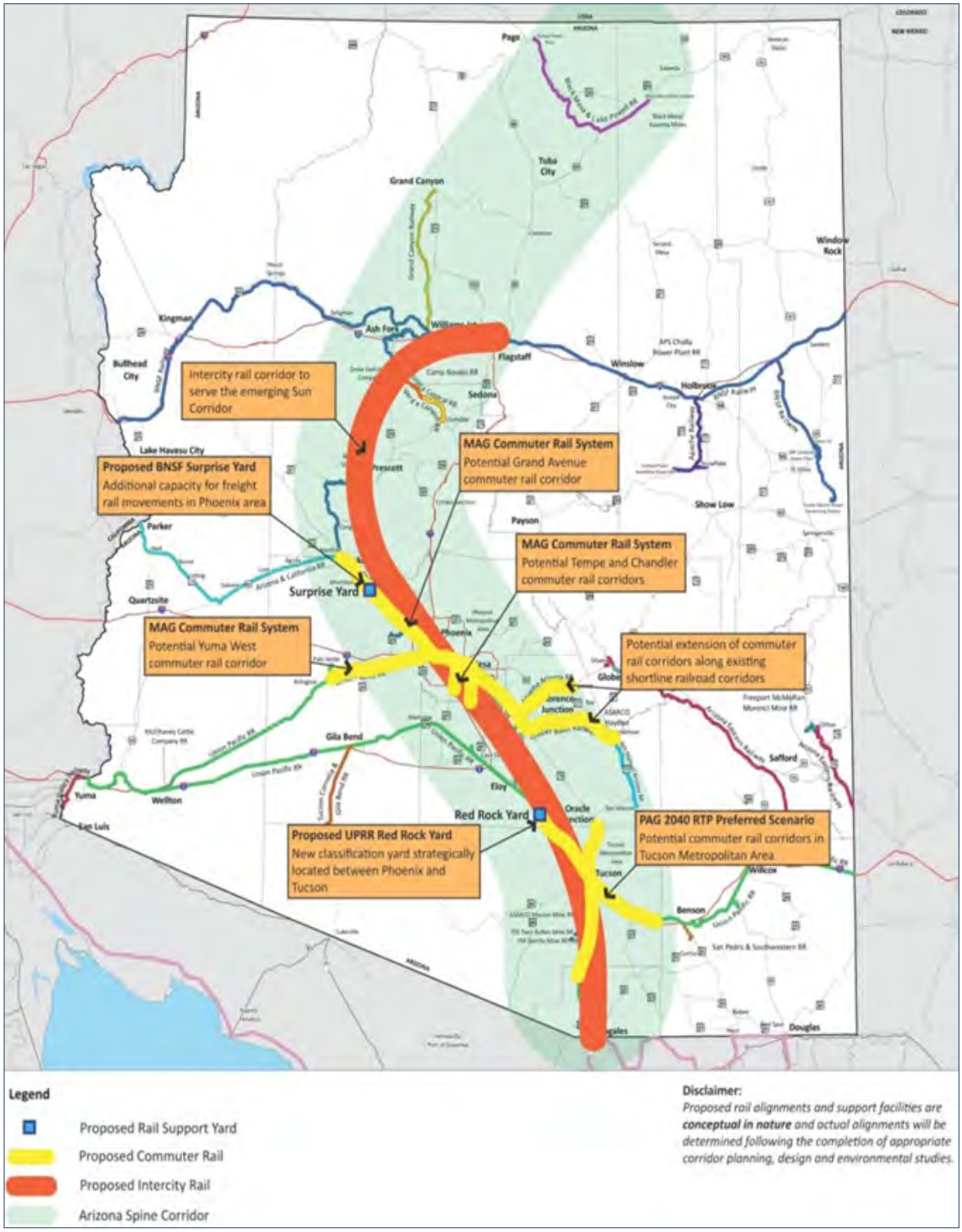


Figure C-3. Arizona State Rail Plan—Commuter and Intercity Rail Corridors

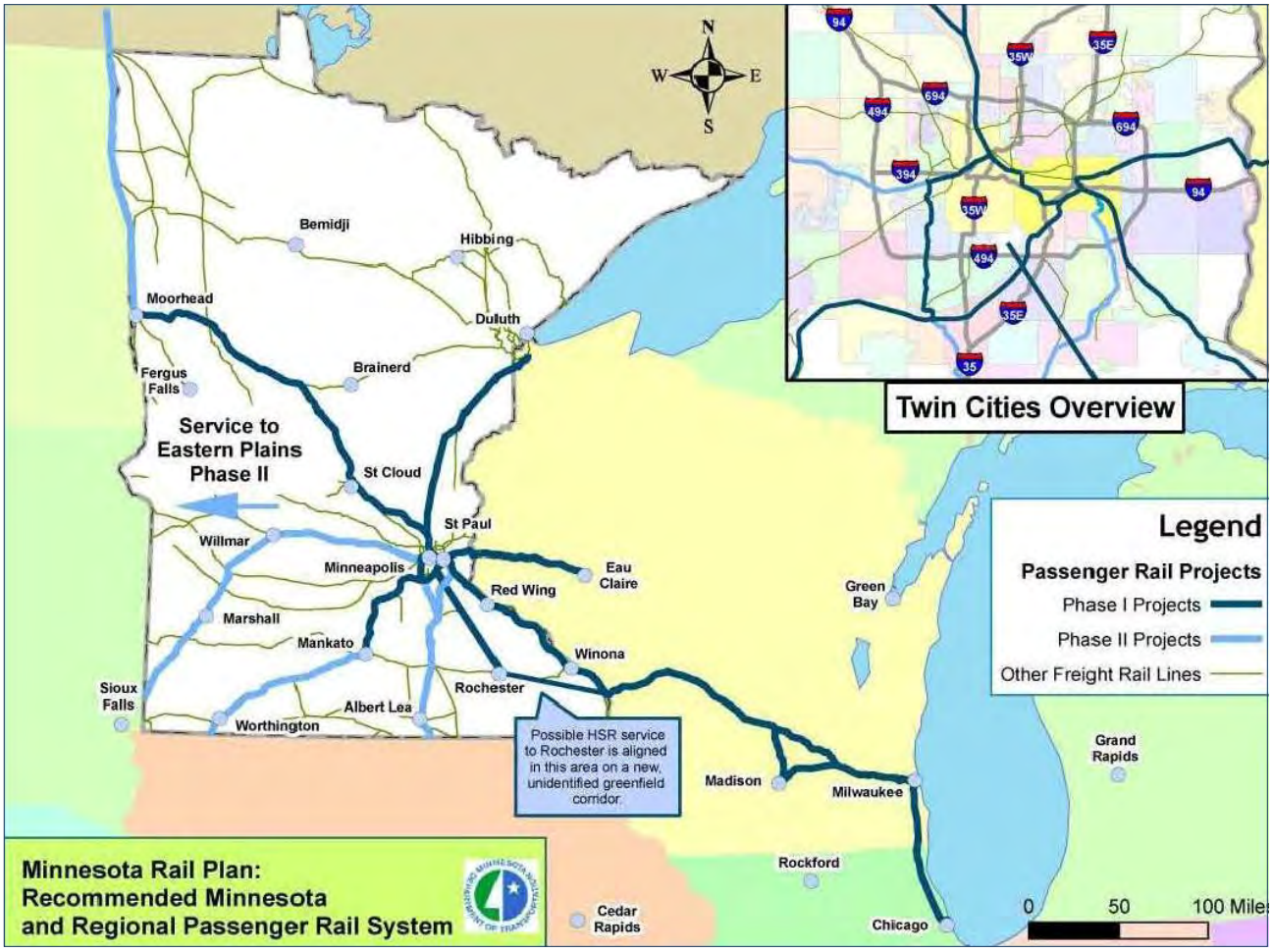


Figure C-4. Recommended Minnesota Regional Passenger Rail System

The usefulness of GIS is shown as a tool in depicting future rail corridors on the maps above for proposed passenger rail services in the Arizona and Minnesota State Rail Plans.

Rail Issues and Opportunities

The PRIIA compliant state rail plan will be expected to include a discussion of the freight and passenger railroad industry's impacts on the environment, state and regional economies and transportation safety.

Climate Change and Air Quality

Both freight and passenger services offer advantages over their rubber-tired competitors, such as trucks and automobiles. The state rail plan should highlight these advantages in terms of climate change and reduced energy consumption. The Kansas State Rail Plan calculated that if the 344 million tons of freight moving by rail in the state were transferred to highways and moved by trucks, an additional 294 million gallons of diesel fuel would be consumed. This

would cost nearly $1.1 billion. It would generate an additional 34,000 tons of pollutants, at a cost of $108 million. Examining the environmental impacts of rail provides the DOT with a tool to use in prioritizing rail investments.

Economic Development

Rail-served industry is a great economic driver at the state and local levels. The state's ability to compete in the emerging global economy, utilizing the more efficient mode of freight and passenger rail transportation, should be analyzed in the state rail plan.

The rail industry is a key economic driver in state economies, as identified below in the Kansas and Minnesota State Rail Plans.

Table C-1. Economic Impact of Rail Industry—2008

State	Rail Employees	Average Salary	State Payroll Tax	Property Tax
Kansas	5,800	$73,746	$28,000,000.00	$36,000,000.00
Minnesota	4,500	$71,400	$15,000,000.00	$20,700,000.00

in addition to these direct benefits, both states also identified substantial *indirect* financial benefits to the states related to rail-related industries. DOTs utilize these quantified financial benefits to further assist in the project prioritization process.

Passenger rail also generates positive economic impact. The value of goods and services purchased by rail passengers (intercity, light rail and tourist railroads in the state) can be significant. Also, the economic contribution from the value of commercial development/redevelopment surrounding passenger station locations should be noted.

Congestion Mitigation/Modal Shifts

Both freight and passenger rail have the opportunity to reduce highway congestion. By increasing investment in the rail mode, state and local transportation agencies may reduce financial demands related to highway capital and maintenance budgets. For example, the Arizona State Rail Plan (2011) identifies the importance of its rail network in relation to highway congestion. Arizona's major interstate highways, that are adjacent to the state's major rail lines, would be impacted by 23,000 additional trucks trips per day if the freight being carried on the rail lines were transferred to the interstate highways. Arizona is an excellent example of providing this level of detail. Some state rail plans make assessments that are much more qualitative, which don't allow them to offer this depth of analysis.

Community Impacts

State rail plans should promote coordinated land-use planning which will allow land-use decisions made at the local or county levels to improve the livability of communities. Future freight rail investments should be effectively integrated into supporting land uses. Also, proper and efficient access to highway networks from intermodal facilities can greatly reduce impacts of rail operations on communities.

As additional rail passenger service is created across the country, transit-oriented development has an opportunity to impact urban settings. The Arizona State Rail Plan addresses 'Livable Communities' with the following statements:

> *Passenger rail meets several of the livability principles defined by the US Department of Housing and Urban Development (HUD), the US Department of Transportation (DOT) and the US Environmental Protection Agency (EPA) Partnership for Sustainable Communities, by offering an alternative transportation option. It also helps to focus growth by encouraging infill and focused new development around station locations, thereby increasing mobility and lowering the combined cost of housing and transportation for residents. It also enhances the economic competitiveness of the region through reliable and timely access to such locations as employment centers and educational campuses. Planning for intercity passenger rail systems, in concert with planning for sustainable land use, presents the opportunity to secure additional funding through federal programs which will have an emphasis on supporting livable communities.*
>
> *Each Intercity rail station can be an important node on a statewide system, which if properly designed will add to Arizona's already rich and diverse spectrum of cities. Examples from other cities throughout Europe and Japan have demonstrated how intercity rail stations can be a catalyst for improved communities, both in the form of great architecture for the stations and through well designed new development in the surrounding area.*

While this example supports the use of transit oriented development (TOD), it is suggested that information or references to studies that quantify benefits of TOD be included in the rail plan to be most effective.

The Ohio Rail Plan (2010) suggests that rail service in the state improves the quality of life in various ways. It removes trucks from already congested roadways, reduces the freight carbon footprint to the state, and provides businesses and industries with alternative and often less expensive options for moving materials and goods. Use of rail service reduces production and distribution costs, making Ohio businesses more competitive. As an example, the Norfolk Southern Railroad (NS) serves two mines in eastern Ohio, moving over 10 million gross tons of coal to a river barge facility less than 20 miles away. This "short-haul" rail initiative removes approximately 400,000 fully loaded coal trucks from the state's highway system.

The Ohio example is much more specific and allows for a quantitative analysis of the reduction of impacts to communities through the use of rail. Generally speaking, quantitative assessments aid in project prioritization better than qualitative assessments.

Safety/Security

Key elements of this state rail plan section emerged from recent events. Positive Train Control (PTC), a radio-based system that communicates between trains, the engineer, and dispatchers, is a relatively new technology that has been mandated by Congress to attempt to reduce train-to-train collisions, speeding, and incursions into work areas. PTC will be required by 2015 on all rail lines carrying passengers and also on all lines carrying dangerous chemicals.

Also, since 9/11 events, there is much more urgency about safety and security, related to rail transportation of both hazardous materials and passengers. The responsibility for rail security is primarily a federal matter, led by the Department of Homeland Security in cooperation with the FRA. Day-to-day actions to keep the railroad industry secure are the responsibility of railroad police officers. State rail plans should identify the state and local agencies that coordinate with the federal and railroad security forces. Another important element of this section of the state rail plan is the identification of the Strategic Rail Network (STRACNET) within the state. As was done in the Kansas State Rail Plan (2011), this could be a map identifying the portion of the state's rail network that is most critical to the national defense.

The value of preventing injuries and deaths related to highway accidents due to the presence of both freight and passenger rail should also be generally identified in the state rail plan.

Needs Identification

This element of the state rail plan is critical to the eventual development of a long-range investment plan. The effort basically consists of the compilation of identified "projects" for both freight and passenger rail.

Needs should be identified through the following sources:

- Short and long range needs identified by the state
- Physical and operational needs identified by the Class I and short line railroads
- User needs—Both freight rail shippers and rail passengers are users of railroad services. A series of interviews can be an effective means of identifying their needs. For the Kansas State Rail Plan, 40 interviews conducted with rail stakeholders (Class I and short line railroads, manufacturers, shippers, metropolitan planning organizations (MPOs) and local economic development agencies) provided meaningful input. Meaningful input led to the following conclusions:

- ✓ Bottlenecks are negatively impacting efficient freight service.
- ✓ 286,000 pound rail cars on short lines are creating additional track rehabilitation needs.
- ✓ Rail service should facilitate emerging alternative energy sources such as wind and bio-energy.

- ➢ Communities with key freight and passenger rail facilities will also provide crucial input into the rail-related needs of communities. A combination of "expert sessions" and open houses are an effective way to achieve outreach. The expert sessions can be invitation-only meetings of railroads, shippers, local elected officials and economic development staff. These sessions provide conclusive identification of specific projects and policy direction that may require further analysis. These meetings may also clarify particular data elements (i.e., track deficiencies at specific mileposts). The open house format, which would follow the invitation-only sessions, gives other interested citizens and individuals an opportunity to present broader issues, such as a general support for more passenger rail service.

All of the identified needs are then sorted into freight and passenger categories, and are compiled into an overall Master List of proposed projects. These should be evaluated in more detail and prioritized in subsequent tasks of the state rail plan. (See below for example criteria that can be used in project evaluation)

Project Evaluation

Numerous criteria must be considered by the department of transportation and rail advisory body in order to prioritize projects proposed for inclusion in the Fiscally-constrained Plan (program of projects linked to a specific budget amount) and Vision Plans. Among them are the following:

- ➢ Economic Competitiveness
- ➢ Improved Assets
- ➢ Cost Reductions
- ➢ Service Improvements
- ➢ Enhanced Mobility; Goods and People
- ➢ Enhanced Environment
- ➢ Congestion Mitigation
- ➢ Enhanced Economic Development

- Improved Air Quality
- Improved Land Use
- Enhanced Public Safety
- Enhanced Public Security
- Reduced Public Expenditures
- Community Effects

Many types of weighting schemes can be applied to these criteria, to assist in the benefit/cost analyses that will be conducted in the development of project priorities. Public and private benefits should be considered, because both public and private partners will be analyzed for project funding. There are several examples of successful Public/Private Partnerships (PPP) around the country which focus on improved efficiency of rail services. While these projects (Alameda Corridor—Los Angeles; Crescent Corridor—Louisiana to New Jersey; CREATE—Chicago area) were implemented years before PRIIA compliant rail plans were developed, they were identified and prioritized in earlier state rail plans. It is expected that future successful PPP projects will stem from the benefit/cost analysis and project evaluations conducted in the current generation of state rail plans.

Final prioritization, while not required in PRIIA, is a natural outgrowth of the project evaluation process and is a critical step in developing a fiscally constrained list of projects. There are different methods that states use to prioritize projects. Some use categories (i.e. high, medium, or low) and others prioritize numerically (1 to 75). In most instances, the use of high, medium and low categories is a better way to prioritize, due to the qualitative nature of many of the criteria used in the prioritization of projects.

Funding for Project Implementation

The last step in the state rail plan prior to the development of the short and long term investments plan is to identify funding sources that might be utilized to implement the proposed projects.

This effort should be begin with identification of funding sources historically and currently used to fund rail-related projects at the federal, state and local levels. Once again, these sources should include both public and private sources, including public/private partnerships.

Potential funding programs that have been utilized in other states or communities should also be considered. An example of a successful program would be Kansas' State Rail Service Improvement Fund (SRSIF) which provides loans and grants to short line railroads in Kansas for rehabilitating track and bridge structures.

Appendix D—Colorado Railroading History

Following the introduction of railroad technology to land transportation in the 1820s, and the successful application of steam locomotives for motive power (replacing horses) in 1830, rapid improvements in railroad equipment and operations led to exploding railroad growth across the eastern United States in the 1840s and 1850s. By the 1850s, population in the mid-western territories was growing rapidly and territories were clamoring for statehood. Texas was annexed in 1845; Oregon in 1846; and in 1861, Congress created the Colorado Territory. Gold was discovered in California in 1848, triggering the great Gold Rush. Gold was also discovered at Cherry Creek, Denver in 1858; Pikes Peak in 1859; and Cripple Creek in 1891. These Colorado discoveries attracted thousands of prospectors and settlers to the territory, bringing with them demand for improved transportation facilities.

The Mexican War of 1846-1848, which added vast territories to the United States including California, coincided with tensions with Great Britain over territories in the Pacific Northwest. There was a need for improved transportation across the vast North American continent and there was public and political pressure to build a railroad connecting the east and west in furtherance of national policy to secure these territories to the Union. In pre-Civil War America, there were a number of railroad route surveys performed by the Federal Government to determine the best routes for transcontinental railroads. However, which railroad would be built first, in the north, central or south part of the nation, became caught up in tensions which exploded into the Civil War in 1861.

With the Civil War going on and southern interests absent from Congress, in 1862 and 1864, President Abraham Lincoln signed legislation chartering two transcontinental railroad routes: the Union Pacific/Central Pacific Route, between Omaha, Nebraska and Sacramento, California; and the Northern Pacific Route, just south of the Canadian border, connecting the Great Lakes to Puget Sound. Congress, beginning with the Pacific Railway Act in 1862 authorized Federal land grants of alternate sections of land directly to railroads in areas where states had not been organized. This aided the financing of Western railroad construction in advance of development and to meet national goals of land settlement; more efficient transportation of Federal military, mail and other traffic; and extension of Federal control to lands occupied by Native Americans. This legislation also required reduced rates on Federal rail traffic. Reduced rates for Federal movements were finally ended by Congress in the early 1940s. With the Federal Government retaining ownership of alternate sections of land, the market value and price of public lands following railroad construction increased, as did the land's taxable value. On May 10, 1869, at Promontory Summit in the Utah Territory, the first of the transcontinental railroads was completed by the Union Pacific (UP) and Central Pacific (CP) railroads. The east and the west were finally linked by rail.

The city of Denver was founded as a mining town in 1858, during the Pike's Peak gold rush. By the 1860s, it seemed poised to benefit from a premier position on the transcontinental railroad route, as government surveys for the central corridor had passed through the Denver area. Nestled at the foot of the Colorado Front Range, Denver is where the Great Plains meets the Rocky Mountains and would be a logical place for a railroad to start its climb. The people of Denver were dismayed by UP's decision to run their line through the barren High Plains of Wyoming, 106 miles north of the city. Denver continued to seek a position on a railroad mainline.

Denver Pacific Railway & Telegraph Company was incorporated by Colorado territorial governor John Evans along with Denver government and business leaders on November 19, 1867. They were all concerned that Denver had been bypassed by the first transcontinental railroad through Cheyenne (UP) as well as formation of a competing railroad to link Golden through Loveland to Cheyenne. Prior to formation of the Denver Pacific, the Leavenworth, Pawnee & Western Railroad, which began in 1855, had been reorganized in 1863 as the Union Pacific Eastern Division to build a second transcontinental railroad from Kansas City through Fort Riley to join the UP at Fort Kearney, and had received alternating section land grants from the Pacific Railway Act. As a result of lobbying efforts by the citizens of Denver, in 1868, Congress authorized a second-phase extension of the UP Eastern Division through Denver and the Rockies to the Pacific, to compete with the Union Pacific main line. Denver Pacific obtained a Federal alternating section land grant based on a condition it would link with the UP Eastern Division to form a through route to Cheyenne. Denver Pacific construction began on May 18, 1868 near where the Denver Coliseum now stands, and began service to Cheyenne on June 24, 1870. Meanwhile, the UP Eastern Division's name was changed in March 1869 through an act of Congress to Kansas Pacific Railway and, with $6 million in backing from German investors, established through service to Denver in August 1870.

These two railroads were the only Colorado railroads to receive Federal land grants. Following Kansas Pacific control of Denver Pacific in the 1870s', both were merged into the Union Pacific Railway on January 24, 1880.

With the arrival of the Kansas Pacific (KP) from the east came a dynamic engineer and skilled railroad promoter, General Jackson Palmer. Palmer envisioned a network linking Denver with Mexico City. In 1870, Palmer resigned from KP and formed his own railroad company, the Denver and Rio Grande (D&RG). Palmer also took the opportunity to learn about narrow gauge railroads. These railroads, with tracks set three feet apart instead of the standard 4 feet, 8½ inches, were a popular innovation and soon spread around the world, where some networks remain in use today. Narrow gauge offered a variety of advantages in mountain terrain, including use of smaller locomotives and rolling stock, and lower construction and

operating costs. A narrow gauge line could be built on a path of steeper grades and sharper curves, through deep canyons and over high passes, thus needing less earthwork and little or no tunneling—advantageous for building railroads through Colorado's rugged mountains. Palmer wasted no time in getting the D&RG underway. Construction began southward from Denver to Colorado Springs on July 28, 1871, and regularly scheduled passenger service to Colorado Springs began in 1872.

Although Mexico was viewed as the southern terminus, the lure of Colorado mineral traffic was also an important part of Palmer's scheme. Before going south, the D&RG extended a line over La Vetá Pass to reach the fertile San Luis Valley, and pushed another branch westward from Pueblo to Cañon City, then through the Royal Gorge of the Arkansas River, a gateway to new mining camps deep in the Colorado Rockies.

Palmer's progress was stifled due to inadequate financing during the Panic of 1873. He also faced competition from the Atchison, Topeka, and Santa Fe Railroad (ATSF), pushing its way west into the Colorado Territory, with many of the same goals as D&RG. The ATSF reached the Kansas/Colorado Border in December of 1872, and in 1878 became the first railroad to occupy Raton Pass, effectively blocking the Palmer route from reaching south. As a result of clashes with the ATSF, the D&RG refocused its efforts entirely on the Rocky Mountain region of central Colorado, Utah, and northern New Mexico.

By the 1880s, the D&RG had expanded beyond the San Luis Valley, to western Colorado mining communities, through construction of the San Juan Extension. This line ran over Cumbres Pass and then crossed the Continental Divide to reach Durango in 1881. A key branch ran northward from Durango up the Animas River to Silverton. After settling territorial differences with the ATSF, the D&RG built west from Cañon City, reaching Salida by 1880 and Leadville by 1881. The D&RG also extended a branch beyond Leadville over the 10,000 foot summit at Tennessee Pass, reaching Montrose and Grand Junction in 1881. By 1883 the D&RG had a narrow gauge line reaching Salt Lake City and beyond, reaching the CP/UP at Ogden, Utah, where it tapped into transcontinental business.

By the middle 1880s', Colorado's railroad map had a "line of demarcation" following the Front Range. East of the line, railroads were built to the national "standard" gauge. West of the line, narrow gauge railroads prevailed across the state. As long as rail movements were between mining areas and distribution centers for local traffic, the two gauge system worked well. But as passengers and freight moved longer and longer distances, the local and regional nature of Colorado's narrow gauge system became more economically disadvantaged as traffic had to be transferred to and from the nation's standard gauge rail network. First standard gauge railroad to be built into the Rockies and across the Continental Divide was the Colorado Midland Railway (1884), planned by James J. Hagerman. In 1886, this route connected

Colorado Springs, Leadville, Glenwood Springs and New Castle. Most of this route was dismantled in 1921.

After nearly two decades of promoting narrow gauge railroads, the D&RG changed direction and in the late 1880's built its own standard gauge route between Denver and the Great Salt Lake. Instead of re-gauging the existing route, D&RG constructed a new mainline on the Tennessee Pass, continuing west through Glenwood Canyon on a new alignment to ease grades and curves. Colorado's narrow gauge network declined and was removed with increasing rapidity, particularly after highways spread into mountain communities and the mining industry declined. The last non-tourist operation, Rio Grande's route from Alamosa into southwestern Colorado and northern New Mexico, was abandoned in the late 1960's.

Many Colorado towns became railroad centers. Denver and Pueblo the busiest, others included Colorado Springs, Salida, Alamosa, Grand Junction, and the mining centers of Cripple Creek, Leadville, and Durango.

The railroad affair with gold and silver mining was short-lived. New industries were growing in Colorado, such as tourism, manufacturing and agriculture, and there was a need to move commodities; which became the new focus of railroads. In 1882, the Chicago, Burlington and Quincy Railroad (CB&Q) (also known by the subsidiary Burlington & Colorado), completed its line from Nebraska to Denver. Denver was now connected to Chicago over a single railroad. The ATSF eventually built north from Pueblo to Denver, paralleling the D&RG, combining to form a double track line in 1918.

John Evans, territorial governor of Colorado appointed by President Abraham Lincoln and earlier involved in the Denver Pacific and Kansas Pacific, continued to push for railroad development in Colorado. He believed in an alternate rail outlet to eastern markets, from Colorado south to the Gulf of Mexico. He envisioned a line connecting Denver and Pueblo to the Gulf of Mexico, where steam ships would connect and move traffic to the Atlantic Seaboard. In 1881, Governor Evans incorporated the Denver & New Orleans Railroad (D&NO). In the face of opposition from the D&RG, ATSF, and UP railroads, Evans began building the D&NO south from Denver to Colorado Springs and Pueblo on a reconfigured route. The D&NO was never built south of Pueblo. Under the guidance of Gov. Evans and General Grenville Dodge from the UP, a new company was formed in 1887. It operated from Pueblo to the Texas/New Mexico border and acquired control of both the Fort Worth and Denver Railway (FW&D) and the Denver, Texas and Fort Worth Railroad (later known as the Colorado & Southern Railway or C&S). On March 14, 1888 the FW&D connected with the Denver, Texas & Fort Worth Railroad in Folsom, New Mexico. In 1908 both the C&S and the FW&D became part of the CB&Q system.

More than a decade after the Rio Grande standard gauge line connected Denver and Salt Lake via Tennessee Pass, Denver-based railway promoter David H. Moffat envisioned a more direct route over the Front Range from Denver. In 1902 he founded the Denver Northwestern & Pacific Railway, which climbed over Rollins Pass at 11,660-feet. Known as the Giants Ladder, the highest mainline crossing in North America, it was only intended as a temporary route, since Moffat planned to tunnel under the Rockies once funds were available. Moffat ran out of money in 1911, and died shortly thereafter. Others picked up where he left off and in 1922 public funds were made available. In February of 1928, the first train passed through the 6.2-mile-long Moffat Tunnel at an elevation of 9,198-feet. Ultimately the D&RG assumed operation of the Moffat Route and connected it to its own mainline to form a through route in 1934 which survives today as a transcontinental route.

This history is the basis and background for many of the developments that occurred later in the 20th century, and made Colorado of great railroad importance, especially in handling coal, iron and steel, agricultural and food products, and intermodal traffic. Key events in later years include:

- **1956**—Federal-Aid Highway Act of 1956 signed into law on June 29 for the construction of 41,000 miles of interstate highways over a 20-year period. This national highway network had immense economic consequences for the nation's railroads.
- **1968**—in January, the nation's two largest railroads blanketing the Northeast and Midwest, the Pennsylvania and New York Central, merged to become Penn Central Transportation Company.
- **1970**—CB&Q, Northern Pacific, Great Northern, and Spokane Portland & Seattle Railroads merged, to form the Burlington Northern (BN) Railroad in March. In June, Penn Central (PC) tumbled into bankruptcy—the largest business failure in the United States up until that time. By 1976, PC was one of seven major Northeast and Midwest railroads in bankruptcy.
- **1971**—on May 1, Amtrak (the National Rail Passenger Corporation) took over operation of most intercity passenger trains from the freight railroads in a stopgap to keep trains running across Penn Central and other bankrupt carriers until the service could be ended or sold. A few railroads kept running their passenger trains rather than join Amtrak, including the Denver & Rio Grande, which continued its Denver-Salt Lake City service into the 1980's.

- **1974-80**—Development of the Powder River Basin (PRB) in northeastern Wyoming into the largest coal mining region in the US, resulting in heavy coal movement through Colorado to Texas by BN.
- **1975**—Bankruptcies in the major railroads reached Colorado with the Chicago, Rock Island & Pacific (CRIP) Railroad's falling into bankruptcy in February. Rock Island served Colorado on a route across the eastern plains to Limon, then splitting to serve Denver (over UP) and Colorado Springs. Failure of the nation's major railroads went transcontinental when the Chicago, Milwaukee, St. Paul & Pacific Railroad (CMStP&P or The Milwaukee Road/MILW) fell into bankruptcy in December 1977.
- **1980**—Rock Island shut down at the end of March, and was later liquidated. Freight service on the previous Rock Island route connecting Chicago to Colorado Springs, was re-instated from Limon to the Kansas State Line when Kyle Railroad began operations over this segment. The Limon to Colorado Springs line was abandoned.

  The Staggers Rail Act of 1980, signed into law by President Jimmy Carter on October 14, deregulated the American railroad industry (to a significant extent) and replaced the regulatory structure that existed since the 1887 Interstate Commerce Act. The Act was named for Congressman Harley Staggers (D-WV), who chaired the House Interstate and Foreign Commerce Committee. The Staggers Act was one of three major Acts passed in a two year period, as the cumulative result of efforts to reform transport regulation begun in 1971, during the Nixon Administration. The other two Acts were the Airline Deregulation Act (1978) and the Motor Carrier Regulatory Reform and Modernization Act (1980). It was meant to restore the nation's freight rail network to economic health following the wave of industry bankruptcies in the 1960ss and 1970s which touched Colorado.
- **1982**—Missouri Pacific Railroad (MP) and Western Pacific Railroad are merged into the Union Pacific. Legal merger of MP into UP was delayed until 1997 due to outstanding MP bonds.
- **1980s**—Coal development in Western Colorado resulted in UP coal traffic on the Moffat Line to Denver and east. Both BN & UP increased development of intermodal yards.
- **1984**—Philip Anschutz purchased the Denver and Rio Grande Western (DRGW) Railroad.
- **1988**—Philip Anschutz purchased the Southern Pacific (SP), and merged it with the DRGW.

- **1995**—BN and ATSF merged into the Burlington Northern Santa Fe (BNSF) Railway Co.
- **1996**—UP and SP/DRGW merged, which shifted much of SP's overland traffic to the UP's main line across Wyoming, redirected flows on the Moffat Tunnel route and caused the UP to place the Tennessee Pass route into an "out of service" category. This was the stimulus for Colorado acquiring the "Towner Line" from the UP in 1998, to continue freight service to the eastern plains communities of Colorado. This was the former Missouri Pacific line in southeastern Colorado between North Avondale (just east of Pueblo) and Towner, Colorado (just west of the Kansas State line) which had been used by SP as a main line between Pueblo and Kansas City.

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