

Louisiana Statewide Rail System Plan

prepared for



Louisiana
Department of Transportation
and Development

May 2003

prepared by



ENGINEERS
PLANNERS
ECONOMISTS

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July 10, 2003

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Dear Ms. Parsons:

Please find enclosed one copy of the document: "Louisiana Statewide Rail System Plan", May 2003. This plan was developed as part of the update of the Louisiana Statewide Transportation Plan. Thank you for your participation in this work effort as a member of the Freight Rail Advisory Council. If you need any additional information, please contact me or Dan Broussard at (225) 379-1924.

Sincerely,

A handwritten signature in blue ink, appearing to read "Eric Kalivoda".

Eric Kalivoda
Deputy Assistant Secretary
Office of Planning and Programming

Enclosure
pc: Mr. Kenneth A. Perret

Louisiana Statewide Rail System Plan
May 2003

Prepared by the Staff of the Louisiana Department of Transportation and Development
with assistance from
Wilbur Smith Associates



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LOUISIANA STATEWIDE RAIL SYSTEM PLAN

INTRODUCTION

Louisiana's Rail System Summary

Louisiana has an extensive railroad network consisting of 2,699 route miles of track in freight service. Seventeen freight railroads are presently operating lines in the state. Including trackage rights that allow one railroad to run trains on the tracks of another, these railroads operate 3,187 total route miles.

The National Railroad Passenger Corporation (Amtrak) provides intercity passenger services in the state over the lines of the Burlington Northern and Santa Fe Railway, Union Pacific Railroad, Canadian National Railway, CSX Transportation, and the Norfolk Southern Railway. Except for about six miles of New Orleans Union Station trackage, Amtrak has no track of its own in the state.

The current railroad network in Louisiana is shown in **Figure 1**. Louisiana, like many other states, has been losing rail mileage. Between 1985 and 1995, 618 miles of track were abandoned¹. Since then, another 118 miles of railroad have been taken out of service. In most cases, the right-of-way for these facilities has been lost as well, thereby effectively preventing rail service from ever being reestablished for all practical purposes.

There are approximately 6,700 highway-rail at-grade crossings in Louisiana, of which approximately 3,100 are public. Only about 1,400 of the public grade crossings have active warning devices. Current annual funding to improve grade crossings is \$8 million, of which 80 percent is from federal sources.

Objectives of the State Rail Plan

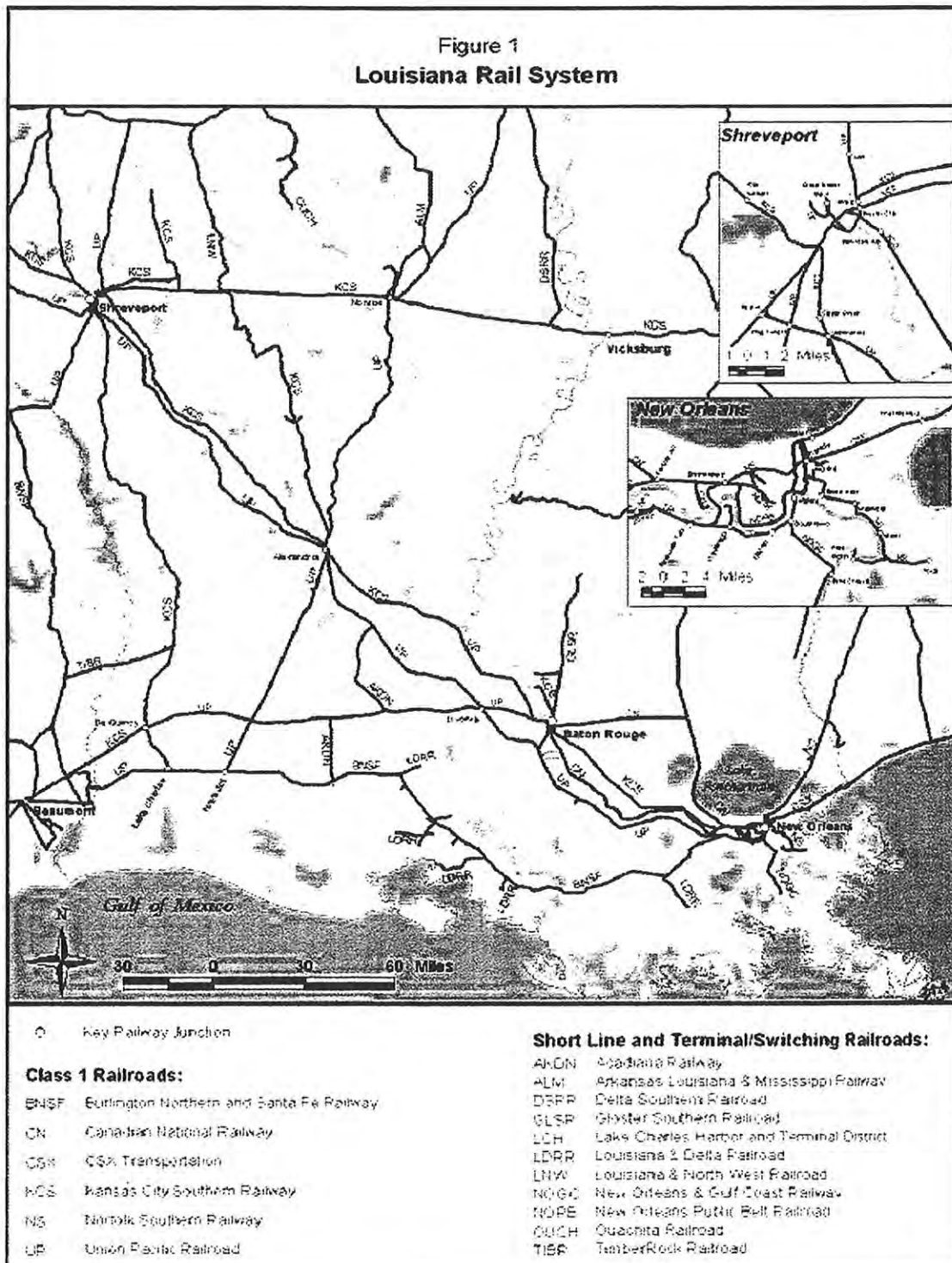
Periodically, DOTD formally reviews the state of the Louisiana rail system. DOTD last did so in 1996, as part of the *Statewide Intermodal Transportation Plan*. Prior to that, DOTD produced the *Louisiana State Rail Plan Update* in 1990. In the past, rail planning efforts had two general objectives. The first was to inventory the state rail system. The second was to identify funding needs of light density lines, which could be candidates for federal assistance.

This plan encompasses these two objectives, but includes several others. These are to:

- Describe the state's freight rail system – the carriers and their physical plants.
- Describe the use of that system – the commodities shipped and the primary rail traffic flows.
- Describe the state's Rail Program – its mission and specific tasks.
- Identify the major rail issues in the state – those that confront both rail shippers and carriers.

¹ *Louisiana Statewide Intermodal Transportation Plan*, National Ports and Waterways Institute, 1995.

Figure 1
Louisiana Rail System



- Discuss the economic role and sustainability of small railroads – reasons that continue to justify state-sponsored support for small railroads.
- Determine the unmet capital needs of state’s small railroads – the short lines and terminal/switching railroads – and obtain an assessment of the performance of their larger railroad partners
- Identify funding sources – those that could fulfill the small railroad unmet capital needs.
- Describe various state sponsored freight rail programs – those that have proven successful in helping light density lines find the funds for capital improvements.
- Determine the rail service issues of the state’s rail shippers – those located on large systems as well as others served by small railroads – and obtain their thoughts on an appropriate role for DOTD regarding rail service in Louisiana.
- Describe the state’s passenger rail system – the services that are offered now by Amtrak, the national intercity passenger rail carrier.
- Identify potential new passenger services – services that would tap into and compliment known travel markets.
- Inventory passenger rail stations.
- Suggest appropriate state activities and policies with respect to passenger rail service.
- Describe the state’s Rail Safety Program – an effort focused on railroad-highway at-grade crossing safety.
- Recommend next steps for DOTD’s Rail Program – enhancements to efforts currently underway to improve both freight and passenger rail services.

SECTION 1: FREIGHT ELEMENT

CURRENT FREIGHT SERVICE

Louisiana’s railroads can be classified into three main categories. These are Class 1 railroads, short line railroads, and switching and terminal railroads. As defined by the U.S. Surface Transportation Board (STB), the federal agency charged with regulatory oversight of railroads, a Class 1 railroad has operating revenues of at least \$260 million per year².

² According to the U.S. Surface Transportation Board, Class 1 railroads have annual gross revenues of \$260 million or more. Class 2 railroads have annual gross revenues of \$20 million to \$260 million, while Class 3 carriers have annual gross revenues below \$20 million. These limits are updated annually to reflect inflation.

Two industry interest groups, the American Association of Railroads (AAR) and the American Short Line and Regional Railroad Association (ASLRRRA), define short lines as small non-Class 1 railroads, operating on less than 350 miles of track and with less than \$40 million in annual revenues. Switching and terminal railroads are also non-Class 1 railroads engaged primarily in switching and terminal service for other railroads. The state's freight railroads, along with their route miles³ and trackage rights⁴, appear in **Table 1**. Included below is the Lake Charles Harbor and Terminal District, state agency and track owner, which contracts with UP for service over its lines.

Table 1
Miles of Freight Railroad in Louisiana
Including Trackage Rights

Freight Railroad Company	Route Miles Owned/Leased	Route Miles of Trackage Rights	Total Route Miles
Acadiana Railway (AKDN)	63	21	84
Arkansas Louisiana & Mississippi Railway (ALM)	45	0	45
Burlington Northern and Santa Fe Railway (BNSF)	192	80	272
Canadian National Railway (CN)	257	0	257
CSX Transportation (CSXT)	35	0	35
Delta Southern Railroad (DSRR)	66	0	66
Gloster Southern Railroad (GLSR)	21	0	21
Kansas City Southern Railway (KCS)	901	0	901
Lake Charles Harbor and Terminal District (LCH)	13	0	13
Louisiana & Delta Railroad (LDRR)	120	195	315
Louisiana & North West Railroad (LNW)	38	0	38
New Orleans & Gulf Coast Railway (NOGC)	24	0	24
New Orleans Public Belt Railroad (NOPB)	25	0	25
Norfolk Southern Railway (NS)	80	0	80
Ouachita Railroad (OUCH)	8	0	8
TimberRock Railroad (TIBR)	22	0	22
Union Pacific Railroad (UP)	789	192	981
TOTAL MILES	2,699	488	3,187

Sources: *Railroad and States, 1999*, published by the American Association of Railroads (AAR); "Trains" magazine issue of July 2001; DOTD's 1995 *Statewide Intermodal Transportation Plan*; and *Professional Railroad Atlas of North America* by Railroad Information Services, 1998. The 1999 AAR data actually showed 2,747 route miles in the state. Mileage of Acadiana Railway was increased and that of UP decreased from the totals identified in the aforesaid sources, per a statement of Acadiana that it presently lease 5 miles of track from UP.

³ Route miles measure the length of a rail route between stations or on-line points. Total miles of track – due to double track, sidings, spurs, and yards – are greater than total route miles.

⁴ Trackage rights are granted by one railroad to another. By virtue of these rights, the grantee may traverse the granting railroad's line between specific points (overhead trackage rights), or may be able to gather and distribute traffic at points on the granting railroad's line. Trackage rights may be purchased, or they may be mandated by the U.S. Surface Transportation Board.

Class 1 Railroads

There are six Class 1 railroads serving Louisiana, operating over 2,526 miles of railroad, including trackage rights. Brief descriptions of these railroads appear below.⁵ New Orleans is a major interchange point or gateway for western railroads UP and BNSF and eastern railroads CSXT and NS. All of the Class 1 railroads connect in New Orleans, either individually or through the switching services of the New Orleans Public Belt Railroad. Likewise, they all serve the Port of New Orleans.

The traffic densities on these lines, shown in ranges of millions of gross ton-miles per mile (MGTM/M) for the most recent year available, appear in **Figure 2**. MGTM/M is the common railroad measure of traffic activity on specific line segments. Lines handling more than 40 MGTM/M can be considered very busy lines. On the other hand, those handling less than 5 MGTM/M are known as light density lines, according to the Federal Railroad Administration (FRA).

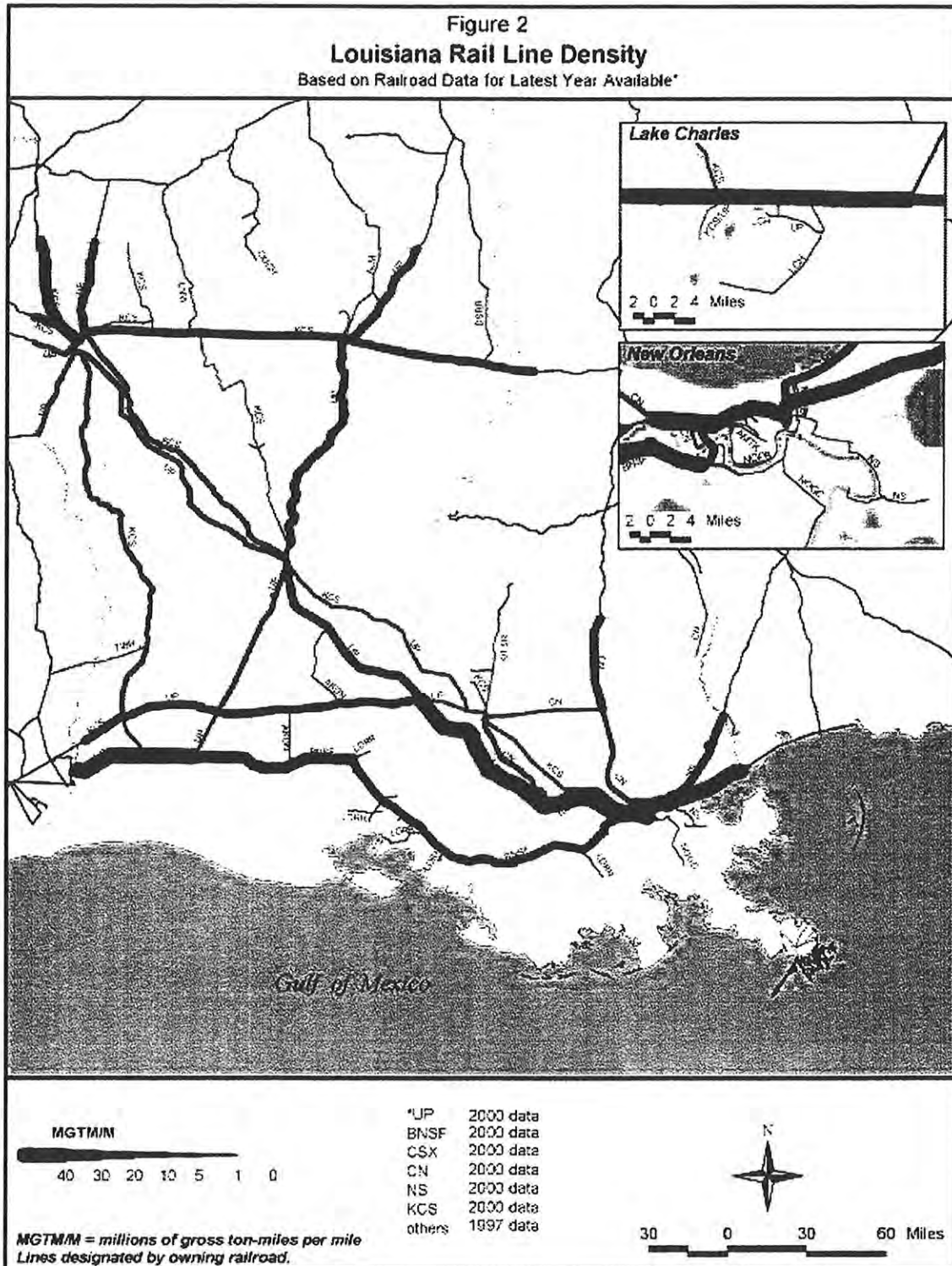
Union Pacific Railroad

Operating on 981 route miles, the Union Pacific Railroad (UP) is the largest railroad in Louisiana. Its system is the product of various mergers including the Missouri Pacific, the Texas and Pacific, the Chicago and North Western, and the Southern Pacific railroads over the past 20 years. Today, the system operates over six main line segments running east-west and north-south through Louisiana. These are:

- An east-west line from New Orleans via Lafayette and Iowa Junction to Beaumont, Houston, continuing to the West Coast. The portion of the former Southern Pacific between Avondale and Iowa Junction was sold to the Burlington Northern and Santa Fe Railway as a condition of the UP's acquisition of SP in 1996, with UP retaining trackage rights.
- An east-west line from Baton Rouge via Livonia, Kinder, and De Quincy to Beaumont and Houston, continuing to the West Coast. This route uses trackage rights on Kansas City Southern between De Quincy and Beaumont.
- An east-west route from New Orleans via Livonia and Alexandria to Shreveport and Dallas, continuing to the West Coast.
- A north-south line from Iowa Junction via Alexandria and Monroe to Pine Bluff, continuing to St. Louis and Chicago.
- A north-south line running through Shreveport that connects Texas locations with Pine Bluff, St. Louis, and Chicago.

Subsequent negotiations between UPRR & BNSF have now converted the entire Lafayette Subdivision between New Orleans and Houston to joint ownership. The portion between New Orleans and Iowa Jct. is maintained by BNSF and the portion between Iowa Jct. & Houston is maintained by UPRR. The entire subdivision is jointly dispatched.

⁵ Descriptions of the Class 1 railroads were compiled from information provided by the railroads, from the railroad Websites, and from information included in various publications including The Professional Railway Atlas of North America, published by Railroad Information Services, Inc., 1998; Comprehensive Railroad Atlas of North America, published by SPV, 2001; U.S. Railroad Traffic Atlas, published by Ladd Publications, 1997; Railroad and States, American Association of Railroads, 1999; and The Official Railway Guide, published by Commonwealth Business Media.



Other UP main and branch lines are located between:

- Baton Rouge and Addis.
- Baton Rouge and Lettsworth, also used by KCS under trackage rights.
- Collinston and Bastrop, and a connection with Arkansas, Louisiana & Mississippi Railway.
- Geary and Napoleonville.

Major Louisiana customers of UP include chemical and petrochemical shippers, lumber and paper manufacturers, and auto makers. UP serves the Ports of New Orleans, Baton Rouge, and Lake Charles. Its primary Class 1 connections are at:

- New Orleans: BNSF, NS, CSXT, KCS, and CN
- Iowa Junction: BNSF
- De Quincy: KCS
- Baton Rouge: KCS and CN
- Shreveport: KCS
- Lake Charles: KCS and BNSF

UP's Louisiana short line and switching railroad connections are at:

- New Orleans: NOPB and NOGC
- Sunset Route (Avondale to Iowa Junction): LDRR
- Crowley: AKDN
- Opelousas: AKDN
- Monroe: ALM and DSRR
- Bastrop: ALM
- Bunkie: AKDN
- El Dorado, Arkansas: OUCH

UP's Louisiana intermodal facilities are in New Orleans. UP general yard facilities are in:

- Shreveport (Hollywood, Reisor and Riverfront Yards)
- Alexandria
- Baton Rouge (Addis and Anchorage Yards)
- Lake Charles (Lake Charles Yard and Lake Charles Shops)
- Lafayette
- New Orleans (Avondale and Gouldsboro)



- Monroe
- Livonia

Burlington Northern and Santa Fe Railway

Burlington Northern and Santa Fe Railway (BNSF) was formed by the combination of the former Burlington Northern and the former Atchison, Topeka and Santa Fe Railway in 1995. BNSF operates on 272 route miles of railroad in Louisiana. The majority of BNSF tonnage runs on trackage rights on UP between the Texas border east of Beaumont, and on its own track between Iowa Junction and Avondale where it connects with the New Orleans Public Belt. BNSF acquired the Iowa Junction-Avondale trackage from UP as a condition of the 1996 UP/SP merger. At Beaumont, BNSF traffic can travel on BNSF lines north to Dallas and the Midwest, and west to Houston, various Mexican gateways, and eventually the West Coast. At New Orleans, BNSF traffic can interchange with CSX Transportation or Norfolk Southern Railway for furtherance to southern and eastern destinations.

BNSF has trackage rights on UP's north-south line through Keatchie, Shreveport, and Plain Dealing.

Major customers include grain and intermodal shippers. BNSF serves the Port of New Orleans. Its Class 1 connections are located at the following junctions:

- New Orleans: UP, NS, CSXT, CN, and KCS
- Iowa Junction: UP
- Lake Charles: US and KCS

BNSF's Louisiana short line and switching railroad connections are at:

- New Orleans: NOPB
- Sunset Route: LDRR
- Crowley: AKDN
- Kirbyville, Texas: TIBR

In the New Orleans area, BNSF has an intermodal facility in Westwego. Its general yard facilities are nearby in Avondale. BNSF also offers off-line intermodal services (North America Container System) at Shreveport.

Canadian National

Canadian National Railway (CN) operates on 257 route miles of Illinois Central Railroad (hereafter CN) tracks in Louisiana. CN merged with the Illinois Central in 1999. CN's principal routes include:

- A south-north line running from New Orleans via Hammond and Kentwood to western Mississippi and ultimately the Midwest.
- An east-west line from New Orleans to Baton Rouge.
- An east-west line from Hammond to Baton Rouge.

Branch lines include:

- Baton Rouge north to Slaughter.
- Slaughter west to Zee.
- Brookhaven, Mississippi to Bogalusa.

CN serves the Ports of New Orleans and Baton Rouge. Its Class 1 connections are at:

- New Orleans: UP, BNSF, CSXT, KCS, and NS
- Baton Rouge: UP and KCS

CN's Louisiana short line and switching railroad connections are at:

- New Orleans: NOPB
- Slaughter: GLSR

CN operates an intermodal facility in New Orleans. Its general yards are at:

- New Orleans (Mays Yard)
- Baton Rouge
- Hammond

In January 2002, the STB authorized CN to construct and operate a 3.2-mile line of railroad in East Baton Rouge Parish. The line would connect CN's Maryland Industrial Lead with the Baton Rouge Polyolefins plant of ExxonMobile Chemical Company. The proposed line would allow a second railroad to provide service to the plant. Construction is subject to specific environmental impact mitigation measures.

Kansas City Southern

Kansas City Southern Railway (KCS) operates 901 route miles of railroad in Louisiana, including about 40 miles of trackage rights on UP between Baton Rouge and Lettsworth. Principal main routes include:

- A north-south line from Lake Charles via De Quincy to Shreveport.



- An east-west line from New Orleans via Baton Rouge and UP trackage rights to Lettsworth and its own track to Pineville, Shreveport, and north to Kansas City.
- An east-west line from the Meridian and Vicksburg, Mississippi, crossing Louisiana via Monroe and Shreveport, and continuing west to Dallas.
- An east-west line from De Quincy to Beaumont and Port Arthur, Texas. Beaumont is part of a KCS routing to the Mexican gateway at Laredo, using both UP trackage rights to Robstown, and the Texas Mexican Railway (TexMex) to Laredo.

Other KCS lines include:

- A south-north line running from Pineville to Gibsland on the Vicksburg-Shreveport east-west line.
- Sibley on the Vicksburg-Shreveport line to Minden.
- Minden to Springhill on the Arkansas state line.
- Minden west to Shreveport.
- Baton Rouge to Port Gardner.

KCS serves the Ports of New Orleans, Lake Charles, and Baton Rouge. Its Class 1 connections are at:

- New Orleans: UP, BNSF, CN, CSXT and NS
- Shreveport: UP
- Baton Rouge: UP and CN
- Lake Charles: UP and BNSF

KCS's Louisiana short line and switching connections are at:

- New Orleans: NOPB
- Tallulah: DSRR
- Monroe: DSRR and ALM
- Gibsland: LNW
- De Ridder: TIBR

It has intermodal facilities in New Orleans, Baton Rouge, Alexandria, and Shreveport. Its general yards are at:

- New Orleans (Shrewsbury Yard)
- Shreveport (Deramus, Harriet Street, and Forbing Yards)

- Baton Rouge
- Lake Charles (Mossville and Maplewood Yards)
- Monroe

CSX Transportation

CSX Transportation (CSXT) operates 35 route miles in Louisiana between New Orleans and the Mississippi state line on the Gulf Coast. The route eastward links New Orleans with Mobile, Atlanta, Jacksonville, and East Coast markets.

CSXT serves the Port of New Orleans. It connects with all other Class 1s in New Orleans. Its switching railroad connection is with NOPB. Its intermodal and general yard facilities are at Gently Yard in New Orleans.

Norfolk Southern

Norfolk Southern Railway (NS) operates on 80 route miles of railroad in Louisiana. This total consists of main line trackage from New Orleans to the Mississippi state line at Nicholson, and the trackage of the former New Orleans Terminal Railroad into lower St. Bernard Parish. NS has haulage rights on KCS from Meridian to Dallas, running through northern Louisiana from the Mississippi state line west of Vicksburg to the Texas state line west of Shreveport.⁶

NS serves the Port of New Orleans. It connects with all Class 1 railroads in New Orleans. Its switching railroad connection is with NOPB. Its major intermodal and general yard facilities are at Oliver Yard in New Orleans. It also operates Chalmette Yard on the former New Orleans Terminal Railroad.

Short Line Railroads

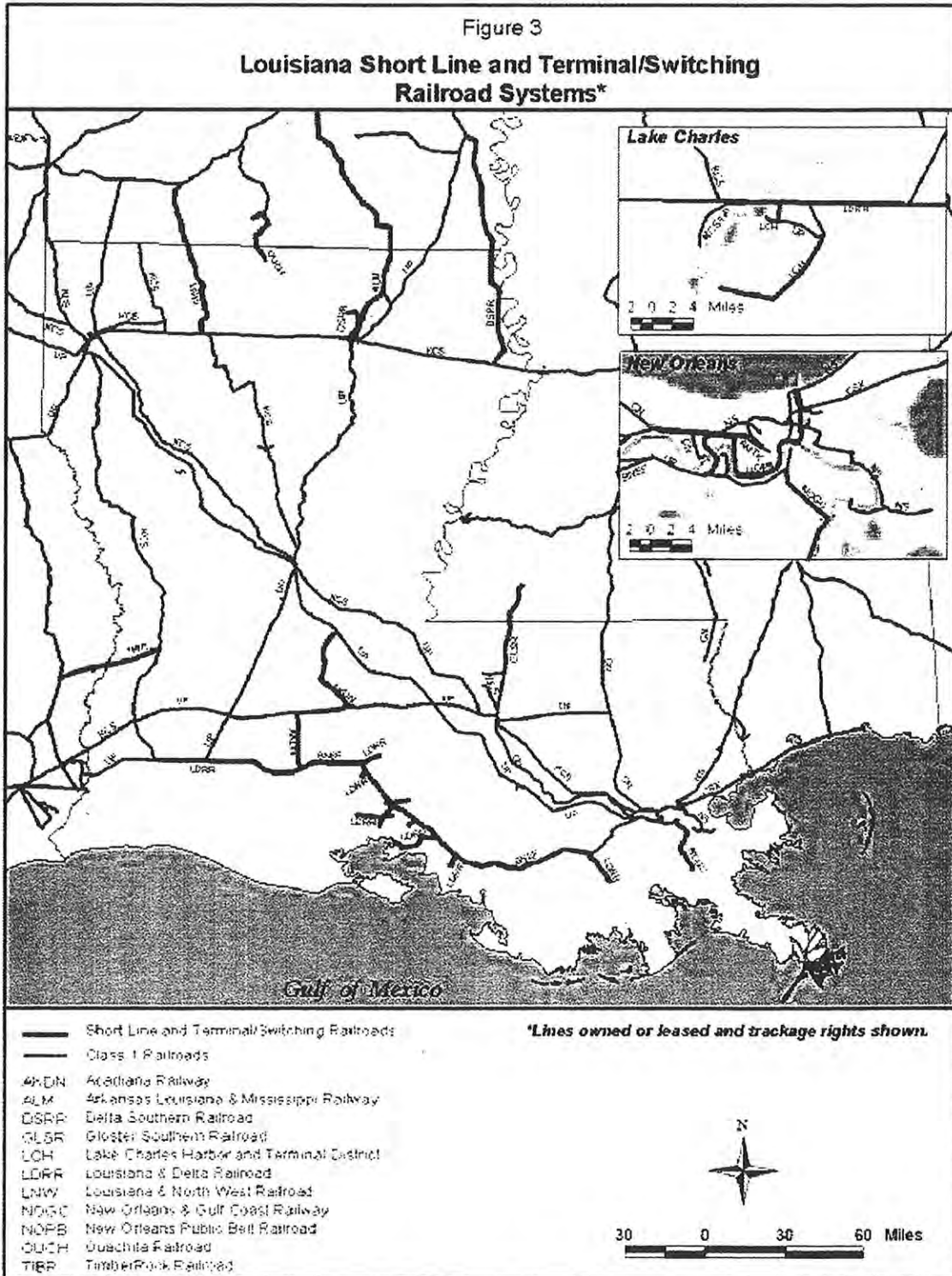
There are nine local or short line railroads in Louisiana, operating 623 miles of railroad, including trackage rights. Short lines are illustrated in **Figure 3**. Brief descriptions are presented below.⁷

Acadiana Railway

The Acadiana Railway (AKDN) operates from Bunkie south to Opelousas (former Texas & Pacific Railroad line) and from Eunice south to Crowley (former Missouri Pacific Railroad Crowley Branch). These two lines are connected by trackage rights over UP from Eunice to Opelousas. AKDN connects with UP at Bunkie, Opelousas, Eunice, and Crowley. It connects with BNSF at Crowley. It operates on 84 route miles. It is owned by Trac-Work Company.

⁶ Haulage rights are granted by one railroad to another. By virtue of these rights, the grantee's traffic can traverse the granting railroad's line between specific points (overhead haulage rights). They may also allow the grantee to gather and distribute traffic at points on the granting railroad's line; the granting railroad then hauls the grantee's carloads to and from its connection with grantee railroad. Haulage rights may be purchased, or they may be mandated by the U.S. Surface Transportation Board. They differ from trackage rights, whereby in this case the grantee is able to operate trains on the granting railroad.

⁷ Descriptions of the short line railroads were compiled from information provided by the railroads, from the railroad Websites, and from information included in various publications including The Professional Railway Atlas of North America, published by Railroad Information Services, Inc., 1998; Comprehensive Railroad Atlas of North America, published by SPV, 2001; U.S. Railroad Traffic Atlas, published by Ladd Publications, 1997; Railroad and States, American Association of Railroads, 1999; the July 2001 issue of "Trains" magazine; and The Official Railway Guide.



Arkansas Louisiana & Mississippi Railway

The Arkansas Louisiana & Mississippi Railway (ALM) operates 53 miles of track from Monroe north through Bastrop to Crossett, Arkansas. There are 45 route miles of the railroad within Louisiana. ALM interchanges with UP at Bastrop and Monroe, and with KCS at Monroe. The carrier, owned by Georgia Pacific, has been an independent short line for many years.

Delta Southern Railroad

The Delta Southern Railroad (DSRR) operates a former Missouri Pacific Railroad route from Tallulah north through Lake Providence to Eudora and McGhee, Arkansas. Approximately 51 miles of this line are in Louisiana. The railroad also operates 15 miles of trackage between Monroe and Sterlington. This segment was a former Missouri Pacific Railroad branch line. In

all, DSRR operates on 66 route miles of railroad in Louisiana. It is owned by National Railroad Equipment Company.

Gloster Southern Railroad

The Gloster Southern Railroad (GLSR) operates a 36-mile route from Slaughter north through Norwood to Gloster, Mississippi, over former Illinois Central Railroad trackage. About 21 miles of the line are in Louisiana. The railroad connects with CN in Slaughter. It is owned by Georgia Pacific Corporation.

Louisiana & Delta Railroad

The Louisiana & Delta Railroad (LDRR) operates a series of former Southern Pacific Railroad branch lines on the Sunset Route across the Mississippi Delta. The lines are tied together by trackage rights over UP and BNSF between Lake Charles and Raceland Junction. Total route mileage of the branches is 120, and the trackage rights extend 195 miles across the state, mostly within the delta. The railroad is part of the Genesee & Wyoming short line family. The branches serve:

- Lafayette to Breaux Bridge
- New Iberia to Abbeville and Avery
- Jeanerette to Patoutville
- Baldwin to Cypremont
- Bayou Sale to North Bend
- Raceland Junction to Jay

The railroad connects with UP and BNSF on the Sunset Route.

Louisiana & North West Railroad

The Louisiana and North West Railroad Company (LNW) connects with the Union Pacific Railroad at McNeil, Arkansas, and extends 62 miles south to Gibsland, Louisiana where it connects with the Kansas City Southern Railway. About 38 miles are located in the State of Louisiana, with general offices in Homer, Louisiana. Established in 1888, Robert N. Iwamoto, Jr. owns this short line railroad. Major shippers of LNW are: Albemarle Corporation, Weyerhaeuser Company, SMI Steel, Ludlow Plastics and Quail Piping.



New Orleans & Gulf Coast Railway

Formerly known as the New Orleans & Lower Coast Railroad, the New Orleans and Gulf Coast Railroad (NOGC) operates along 24 route miles of the former UP branch between Gouldsboro Yard and Myrtle Grove. Major shippers include Chevron Chemical, Harvest States, and British Petroleum. It connects with UP at UP's Gouldsboro Yard and is owned by Rio Grande Pacific Corporation.

Ouachita Railroad

The Ouachita Railroad (OUCH) operates a 25-mile short line from El Dorado, Arkansas south to Lillie. There are only about eight route miles of track in Louisiana. Its sole connection is with the UP in El Dorado. The railroad is part of a former Chicago, Rock Island & Pacific branch line. It is part of the Arkansas Shortline family of railroads.

TimberRock Railroad

The TimberRock Railroad (TIBR) operates over 40 route miles of a former BNSF branch line from De Ridder west through Merryville to Kirbyville, Texas and a connection with BNSF. About 22 route miles of the line are in Louisiana. The railroad is owned by Watco Companies. Its Louisiana connection is with KCS in De Ridder.

Switching and Terminal Railroads

There are two switching and terminal railroads in Louisiana, operating a total of 38 route miles of railroad. They are illustrated also in Figure 3, and are described briefly below.⁸

Lake Charles Harbor and Terminal District

The Lake Charles Harbor and Terminal District (LCH), a state agency, owns 13 route miles serving facilities at Lake Charles. Service is operated by UP under contract.

New Orleans Public Belt

The New Orleans Public Belt Railroad (NOPB) operates 25 route miles of switching trackage along the Mississippi River and the Industrial Canal. The railroad serves the Port of New Orleans. It interchanges with all Class 1s serving New Orleans and operates its riverfront Tchoupitoulas Street Yard. It is owned by the Public Belt Railroad Commission.

FREIGHT RAIL SYSTEM USE

The Louisiana rail system described earlier is used for the movement of both freight and passengers. The system has undergone a number of changes since the 1995 *Statewide Intermodal Transportation Plan*, as discussed earlier, and freight traffic patterns have also changed. Louisiana rail freight traffic changes are discussed with a review of total freight movement to, from, within, and through the state, and an analysis of commodities originating and terminating in Louisiana.

⁸ Descriptions of the switching railroads were compiled from information provided by the railroads, the NOGC Website, and from information included in various publications including *The Professional Railway Atlas of North America*, published by Railroad Information Services, Inc., 1998; *Comprehensive Railroad Atlas of North America*, published by SPV, 2001; and *U.S. Railroad Traffic Atlas*, published by Ladd Publications, 1997.

While the discussion that follows portrays traffic on the system, it is worth mentioning that much of this traffic relies on modal connections leading to the rail origin point or away from the rail termination point. For example, a portion of the lumber and wood products harvested in Louisiana bound for inland markets by rail is handled by truck to rail reload facilities. Grain, sugarcane, and container shipments, on other hand, move by rail to the Ports of New Orleans and Lake Charles for export by ship.

The attributes of rail service can illustrate why certain commodities are drawn to rail versus truck movement. A strength of rail transport is that it can move high volumes over longer distances at a lower cost relative to truck. For this reason, less time-sensitive bulk commodities traveling several hundred miles or more generally go by rail. Also, mixed commodities shipped in trailers and containers between New Orleans and California often go by rail, as intermodal trains (trailer and container unit trains) are expedited and are therefore competitive with truck both in terms of cost and transit time. Conversely, time-sensitive cargo going shorter distances tends to move by truck.

Freight Traffic

Total rail freight traffic in Louisiana in 1999 was comprised of 119.4 million tons as shown in Table 2. Out of the total, 37.1 million tons originated in the state with destinations outside of the state, and 31.5 million tons terminated in the state from origins outside of the state. There were 4.9 million tons which originated and terminated within Louisiana; that is, freight traffic that remains within the state (intrastate traffic). Through traffic (traffic passing through without an origin or destination in Louisiana) accounted for 45.9 million tons. Together, the commodities shown in the table below account for almost 98 percent of all rail shipments to, from, within and through the state.

Table 2
Louisiana Freight Traffic
1999

STCC ⁹	Commodity Description	Tonnage					% Total
		Originat'g	Terminat'g	Intrastate	Through	Total	
28	Chemicals or allied products	10,957,661	2,542,499	1,990,783	13,802,101	29,293,044	24.5%
49	Hazardous materials	8,841,553	1,695,154	1,231,861	9,080,788	20,849,356	17.5%
01	Farm products	476,869	6,585,678	8,630	2,124,069	9,195,246	7.7%
46	Miscellaneous mixed shpmts.	4,072,584	3,738,181	640	1,326,799	9,138,203	7.7%
11	Coal		4,242,394		4,739,836	8,982,230	7.5%
26	Pulp, paper, or allied products	4,340,667	525,566	305,167	2,923,821	8,095,221	6.8%
20	Food or kindred products	1,580,049	2,354,773	110,679	2,286,834	6,332,336	5.3%
29	Petroleum or coal products	2,015,218	737,325	679,706	2,184,621	5,616,869	4.7%
14	Non metallic minerals	97,805	4,020,622	7,920	503,674	4,630,022	3.9%
24	Lumber or wood products	1,777,220	953,384	272,867	1,022,015	4,025,486	3.4%
33	Primary metal products	794,816	358,637	15,332	2,338,365	3,507,150	2.9%
32	Clay, concrete, glass, stone prod.	478,615	1,040,913	14,683	1,457,819	2,992,029	2.5%
37	Transportation equipment	708,941	1,407,319	142,545	376,628	2,635,434	2.2%
40	Waste or scrap materials	298,016	568,760	29,762	601,334	1,497,872	1.3%
	All others	647,675	681,719	132,648	1,109,264	2,571,306	2.2%
	Total	37,087,690	31,452,924	4,943,223	45,877,968	119,361,805	100.0%

Source: STB Waybill Sample compiled by Wilbur Smith Associates.

⁹ Standard Transportation Commodity Code (STCC), originally a commodity designation system developed by the American Association of Railroads (AAR) and since adopted by the Interstate Commerce Commission (ICC) and subsequently by the Surface Transportation Board.

Commodities and Flows

In the aggregate (all movement types), chemicals or allied products comprise the largest commodity moving by rail (24.5 percent) in or through Louisiana. Hazardous materials are second at 17.5 percent (probably chemicals in large part). Three commodity types – farm products (grains including wheat, corn, and soybeans), mixed shipments (intermodal trailers and containers), and coal – each account for about 8 percent of rail totals. Pulp, paper, and allied products make up 6.8 percent of Louisiana rail traffic.

The significance of each commodity varies, however, by movement type. The following paragraphs elaborate on the differences.

Originating Traffic

The 37.1 million tons of commodities originating by rail in Louisiana, and terminating outside the state, are comprised principally by four groups:

- Chemicals or allied products (29.5 percent)
- Hazardous materials (23.8 percent)
- Pulp, paper, or allied products (11.7 percent)
- Miscellaneous mixed shipments (11.0 percent).

Together the commodity shipments above embrace more than three-fourths of originating totals. Other significant totals include petroleum or coal products at 5.4 percent, food or kindred products (e.g., frozen foods, beer, etc.) at 4.3 percent, and lumber and wood products at 4.8 percent.

Rail freight originating in Louisiana predominantly terminates in Texas, as shown in **Figure 4**. The next largest areas are California, Illinois, Georgia and Florida. Combined, these states account for 18.1 million tons or 48.7 percent of originating Louisiana volumes. The shipments to California are largely intermodal, chemicals and pulp/paper products. Traffic to Florida is mostly intermodal and hazardous material, as are the largest shipments to Illinois and Texas.

Terminating Traffic

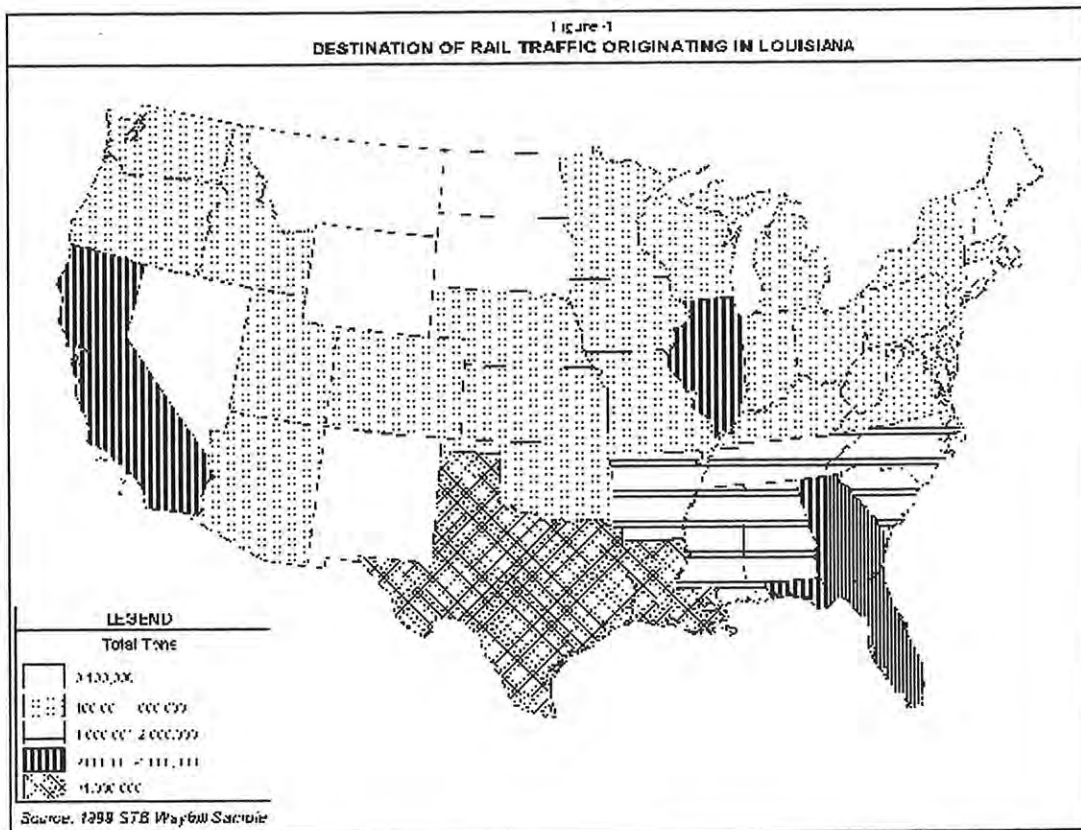
Nine commodity types dominate tonnage terminating by rail in Louisiana and originating by rail outside the state. They are a diverse group, comprised of the following, which account for almost 88 percent of total terminating shipments.

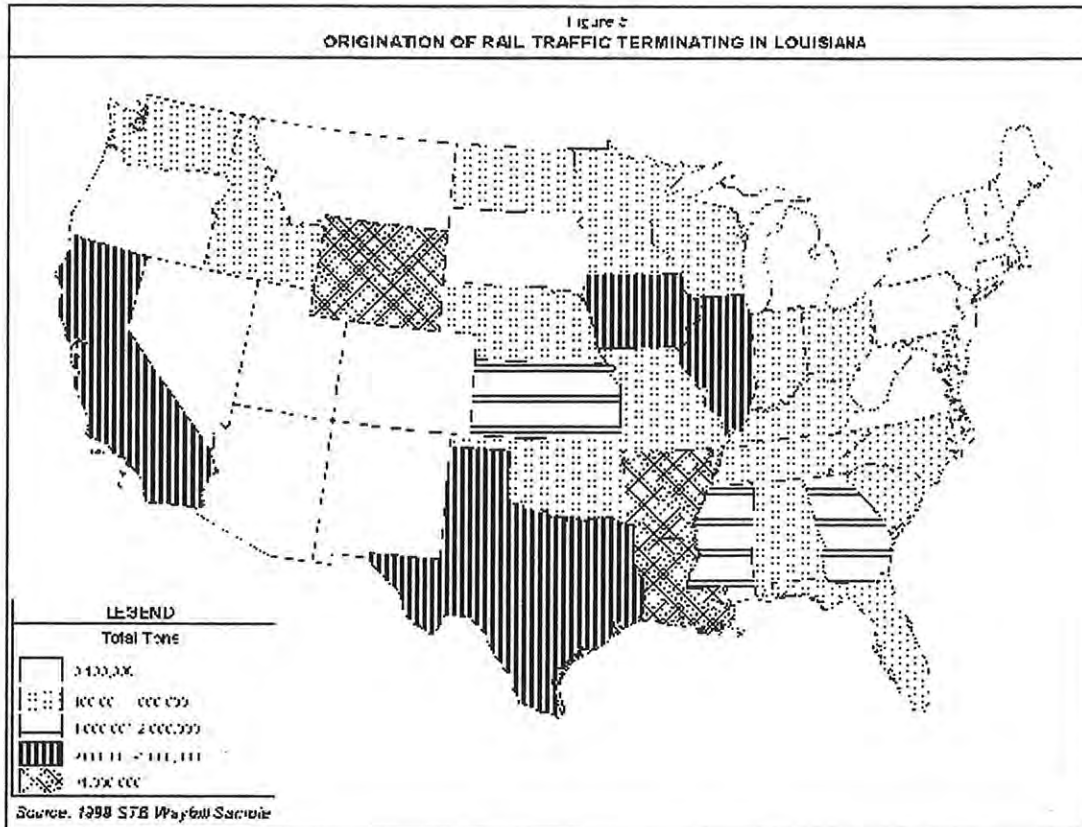
- Farm products at 20.9 percent
- Coal at 13.5 percent
- Non metallic minerals at 12.8 percent
- Miscellaneous mixed shipments (intermodal containers and trailers) at 11.9 percent
- Chemicals or allied products at 8.0 percent
- Food or kindred products at 7.5 percent
- Hazardous materials at 5.4 percent

- Transportation equipment at 4.5 percent
- Clay, concrete, glass or stone products at 3.3 percent

The leading exporters to Louisiana are Wyoming, Mississippi, and Arkansas, as shown in **Figure 5**. California, Texas, Iowa and Illinois follow them. Combined, these states account for 20.8 million tons or 66.1 percent of terminating Louisiana shipments.

Shipments from Arkansas are predominantly non-metallic minerals (ballast and gravel); from California, intermodal; from Iowa, farm products; and from Wyoming, coal. Shipments from Texas are more varied than from these other states, but over half are chemicals and hazardous materials.





Intrastate Traffic

Louisiana intrastate traffic – traffic that both originated and terminated in Louisiana – totaled 4.9 million tons in 1999. This sum is small compared to the other types of movements. The principal intrastate commodities are as follows, and comprise more than 90 percent of intrastate traffic.

- Chemicals or allied products at 40.3 percent
- Hazardous materials at 24.9 percent
- Petroleum or coal products at 13.7 percent
- Pulp, paper, or allied products at 6.1 percent
- Lumber or wood products at 5.5 percent

Through Commodities

Rail traffic passing through Louisiana from origins outside of the state and destined for delivery in states other than Louisiana comprise the largest rail traffic movement at 45.9 million tons. Eight major commodity groups' account for 86 percent of through rail shipments.

- Chemicals or allied products at 30.1 percent
- Hazardous materials at 19.8 percent

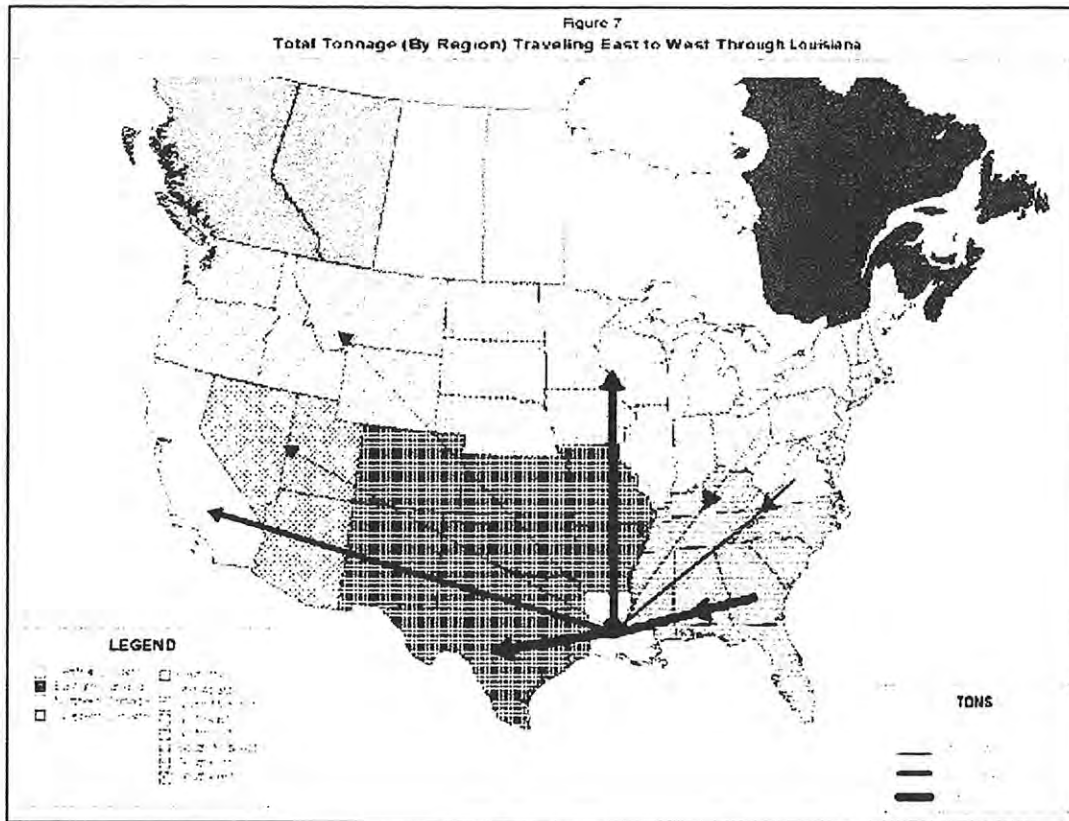
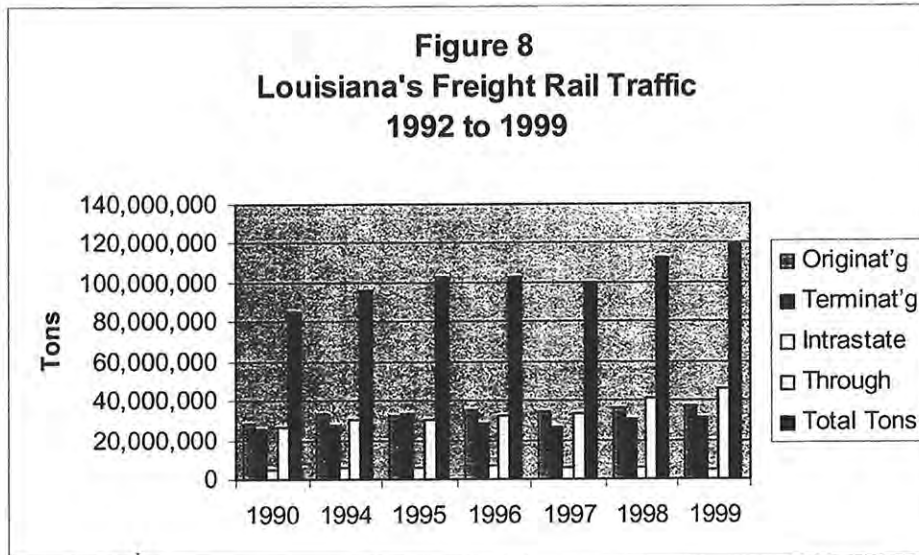


Table 3
Louisiana Freight Rail Traffic 1990 to 1999

Year	Originat'g	Terminat'g	Intrastate	Through	Total Tons
1990	28,698,102	25,600,780	5,200,617	26,047,465	85,546,964
1994	33,379,832	27,449,085	5,423,256	29,964,371	96,216,544
1995	31,926,571	33,569,583	6,201,176	30,672,013	102,369,343
1996	34,922,164	28,689,631	6,778,745	32,557,439	102,947,979
1997	34,130,895	26,862,252	6,156,688	32,981,224	100,131,059
1998	35,750,535	30,230,735	5,492,639	41,422,303	112,896,212
1999	37,087,690	31,452,924	4,943,223	45,877,968	119,361,804

Source: STB Waybill Sample data compiled by Wilbur Smith Associates



Appendix A contains spreadsheets for originating, terminating, intrastate and through traffic flows for the seven years shown in Table 3. The spreadsheets indicate carloads and tons per commodity and type of traffic flow for each of the seven years. Commodities are identified by Standard Transportation Commodity Codes (STCC). A key listing these codes and the corresponding commodity types also appears in Appendix A.

STATE RAIL PROGRAM

The purpose of the Rail Program is to monitor rail service in the State of Louisiana, and help facilitate ways whereby rail contributes to economic development. Specific tasks include:

- Ensure that Louisiana is taking advantage of federal programs (please see funding sources identified below), as they become available, in order to improve the state's railroad infrastructure.
- Work with local jurisdictions (cities, parishes, and metropolitan planning organizations) to identify issues and needs relative to freight and passenger rail service.
- Develop the Louisiana Rail Plan and its periodic updates. Among other things, the plan describes the existing rail system, identifies the leading rail issues, and makes recommendations for improving the state's rail system.

MAJOR RAIL ISSUES

The rail planning effort identified five major issues confronting the state's rail system. Each of these issues is discussed briefly below.



Rail Traffic through New Orleans

An ongoing study, the New Orleans Rail Gateway and Regional Rail Study, seeks to identify ways to improve the efficiency of rail movements through the New Orleans region. DOTD and the New Orleans Regional Planning Commission are co-sponsors of the study. The Class 1 and small railroads serving the area are participating. Key tasks include:

- A site inspection of the study area and a review of past studies.
- An examination of the impacts of past rail mergers.
- Rail traffic forecasts for 2005, 2010 and 2020.
- Passenger rail forecasts.
- Port cargo forecasts.
- Identification of existing rail operational deficiencies and alternative solutions.
- Simulation modeling for evaluating alternatives.
- Identification of cost, funding, and environmental issues, and evaluation of new technology applications for freight and passenger services.
- Stakeholder input throughout the study process.

At this point, the study has modeled the entire rail infrastructure of the region and the movements of trains through the rail network. It has identified bottlenecks and potential solutions. A key finding was that a major constraint in efficient train movements was poor communication among the railroads involved. The solution identified was to build a joint dispatching center that would manage train movements through the network on an impartial basis. Findings indicate that with improved coordination, a joint dispatching center would alleviate the need for another rail crossing over the Mississippi River. The solution would cost approximately \$10 million, with funding shared on a "50/50" basis between the federal government and the freight railroads.

Millennium Port Project

The Millennium Port Authority (MPA) has initiated consideration of four major projects to facilitate the planning and development of increased container handling capacity and related transportation infrastructure within Louisiana. The initiatives are in response to the projected increase in container traffic to and from the Gulf of Mexico. The goal of these projects is to develop sufficient capacity in Louisiana, allowing the state to become the "port of choice" for service to mid-America.

The four major projects, which the MPA is considering, are:

1. **Lower Mississippi River** – Coordination and advance planning for the potential location of port facilities and appropriate transportation infrastructure along the Mississippi River (Miles 42 to 60) that might be available to resolve near and long-term capacity needs.
2. **Coastal Port Development** – Coordination and advance planning to determine the feasibility of establishing deep draft port facilities and supporting transportation infrastructure along the Louisiana Gulf Coast to satisfy long-term capacity demands.

3. **Sea Point** – Acceleration of the market and technical testing of the Sea Point concept, a barge-to-ship container transfer facility, near the mouth of the Mississippi River 20 miles from the Gulf of Mexico.
4. **Collateral Projects** – Coordination with various port and political jurisdictions to determine economic development opportunities related to the Millennium Port concept.

The MPA is also evaluating the availability of railroad infrastructure to effectively and efficiently serve potential waterside port facilities.

Spurring the MPA's action was the *Millennium Port – Comprehensive Feasibility Study*, completed in November 1999 under the direction of the Board of Commissioners of the Port of New Orleans. The study determined that, as a result of the projected increase in hemispheric trade (north-south), Gulf-oriented maritime container traffic would increase significantly over the next decade. In addition to identifying the potential markets, the study determined that the requirements to capture the trade's market share were:

- A reliable deep draft navigation channel to serve shipping interests. The Mississippi River Gulf Outlet (MRGO), currently providing access to container port facilities, was not considered reliable.
- Given the state's abundance of potential port sites, its access to multiple Interstate Highway systems, and the six class one railways terminating in New Orleans, Louisiana is geographically well located to serve as a hub for north-south container flow.
- A regional planning approach is required to make the most efficient use of existing and potential port and related transportation infrastructure to support future traffic demands.
- Immediate action is required.

Based on the study, the Board of Commissioners of the Port of New Orleans took immediate steps to rehabilitate the Napoleon Avenue Wharf, on the Mississippi River, so that the facility could accommodate container operations. The improvement will reduce reliance on the MRGO.

Also based on the study, the State Legislature (1999 session) created the MPA to ensure that a regional planning process was implemented.

Railroad Mergers

Since 1995, there have been four major rail mergers affecting rail services. These were:

- Burlington Northern Railroad and Atchison, Topeka and Santa Fe Railway in 1995, creating the Burlington Northern and Santa Fe Railway.
- Union Pacific Railroad and the Southern Pacific Transportation Company in 1996. The combined system carries the UP name.
- The Canadian National Railway and Illinois Central Railroad in 1999. The combined system carries the CN name.
- The acquisition of Consolidated Rail Corporation (Conrail) by Norfolk Southern Railway and CSX Transportation in 1998.



During this period as well, the Kansas City Southern Railway formed a joint venture with the Mexican ocean and logistics company, Transportacion Maritima Mexicana (TMM), to purchase from the Mexican Government its line running south from Ciudad Juarez (south of Laredo, Texas) to Mexico City. It also purchased from TMM a 49 percent interest in the Texas Mexican Railway (Tex Mex) running between Laredo and Corpus Christi, Texas. In 1997, it was granted trackage rights on UP from Beaumont Texas to Corpus Christi (a STB condition for the UP/SP merger approval). Earlier in 1995, it purchased the Gateway Western Railway, with which it connected in Kansas City and which owned haulage rights on UP to Chicago. More recently, it has created a marketing agreement with CN. Through its combination of lines and marketing alliance with CN, KCS has constructed what it calls the "NAFTA Railroad"¹⁰ running from Canada and the Midwest to Central Mexico. The NAFTA Railroad runs through most of western Louisiana.

These combinations of rail lines, commonly reported as "rail mergers", transformed the rail map of the United States. The Class 1 railroads mentioned above were reduced to six, all of which serve Louisiana: BNSF, UP, CN, KCS, CSXT and NS. In implementing their post-merger plans, the railroads sought to organize themselves to maximize the potential of their expanded networks. However, there were problems.

The most widely reported were the service problems associated with UP's acquisition of SP, and the NS and CSXT acquisition of Conrail. However, there were also merger-related service difficulties experienced on the new BNSF system. Typically reported by shippers were extensive and costly delays in shipments during the period following the acquisitions and system combinations. The impacts from these service problems are reflected in comments received through a survey of Louisiana rail shippers and reported below.

The potential service problems arising from mergers of major rail systems was in large part responsible for new rules being established by the STB regarding rail mergers. The new merger rules, issued on June 11, 2001 and which became effective on July 11, 2001, impose a heavier burden on future applicants to show that a major rail combination is consistent with the public interest. Among other things, the new rules place greater emphasis on evaluating whether proposed mergers would enhance (not just preserve) competition, and whether applicants have fully addressed the impact of such transactions on service, including plans for service reliability.¹¹

Arguably, both generalized shipper concern over merger related shipper problems and the new STB rule making caused the BSNF and CN to withdraw their proposal merger. This combination would have created the largest North American railroad, reaching from the Atlantic to the Pacific, and from Canada to Mexico.

While merger activity has continued¹², a new trend, which has for the moment replaced the Class 1 railroads' desire to merge, has been the formation of "strategic alliances" among and between carriers. These are varied both in nature and scope. For example, UP and the Canadian Pacific Railway (CP) have become mutually preferred carriers (where possible) for cross border shipments. Also, UP and NS have teamed up to offer a new Los Angeles-Atlanta "Blue Streak" intermodal service. Through a marketing alliance with Canadian National, the KCS network also

¹⁰ NAFTA is the acronym for the North American Free Trade Agreement signed by the United States, Canada and Mexico in the early 1990s.

¹¹ See Surface Transportation Board "News" Release No. 01-24, issued on June 11, 2000.

¹² In 2001, CN acquired the Wisconsin Central Transportation Corporation, a Midwestern regional rail carrier. Because this combination was termed a "minor" transaction, it was exempt from the more onerous requirements specified in the STB new merger rules.

extends into Canada. According to KCS, shippers using this expanded NAFTA Railroad can secure one rate and access a single rail network to move shipments throughout North America.

This trend can be expected to continue. Undoubtedly, the trend will please many shippers, who may see it as a means by which the major carriers can focus on improving their respective systems, without the distraction of merging.

Small Railroad Needs

A survey of Louisiana's short line and terminal/switching railroads, which is the subject of the following section, was conducted in response to this issue. The survey found \$102.6 million of unfunded needs indicated by these small railroads. Thirty-nine percent of the needs specifically related to upgrading lines in order to handle heavier rail cars that are preferred by the Class 1 railroads and by shippers for their increased capacity and operating cost efficiency. While Class 1s are capable of funding the improvements required to handle heavier cars on their lines, the small railroads in most cases are not. The inability of the small railroads to fund these improvements poses a challenge for rail shippers located along these lines. That is, their alternative would be to ship by truck at a higher cost.

Track Inspections

Two major train derailments occurred in southwestern Louisiana in May 2000. These were in Eunice and New Iberia. Both resulted in spills of hazardous materials and evacuations of nearby residents. The Eunice derailment and spill, which triggered the evacuation of 2,500 residents, occurred on the UP's east-west main line. The National Transportation Safety Board (NTSB) identified the probable cause as joint bars which had broken before the arrival of the accident train and which allowed the rail to become misaligned¹³. The NTSB said that the joint bars had remained in service with undetected and uncorrected defects because of the UP's ineffective track inspection procedures and inadequate management oversight. The New Iberia derailment and spill, which triggered the evacuation for 24 hours of an 11-block area, occurred on the BNSF east-west main line.

These two accidents have prompted questions within DOTD of whether or not state-sponsored support of track inspection activities might be merited. The Federal Railroad Administration (FRA) is the federal agency charged with oversight for rail safety. States can participate in track inspections through the Federal Safety Program, a partnership with the FRA. The state inspectors could supplement FRA inspections. Alternatively, the state could monitor federal inspections, and thus ensure the inspections are completed as prescribed. The state could review all safety inspection reports, coordinate with railroads to ensure all safety discrepancies are addressed, and when appropriate, develop funding strategies with railroads to facilitate the necessary capital improvements/maintenance to provide for safe rail operations.

SMALL RAILROAD SURVEY

Of the 17 railroads serving Louisiana, 11 are small railroads. Nine are short line railroads, and two are terminal and switching railroads. In all, these 11 small railroads own or lease over 16 percent of the state's route-mile trackage (the percentage excludes trackage rights). A key issue

¹³ NTSB Public Meeting, April 2, 2002, Derailment of Union Pacific Railroad Train, Eunice, Louisiana, May 27, 2000, NTSB Synopsis RAR-02-03.



facing these small railroads is funding. While Class 1 railroads generally can fund ample capital budgets, often reaching the hundreds of millions (if not billions) of dollars a year, small railroads are hard pressed to do the same. Still, their needs remain, and are becoming even more acute with the advent of ever greater loaded car weights.

Obtaining funding from the private sector has proved problematic for many short lines. As a result, they increasingly have turned to the public sector. To help short lines meet their funding needs, several states have reasonably well funded programs which provide loans or outright grants. By contrast, Louisiana budgets no funding for short line assistance. At the present time, DOTD's focus is on assessing the needs of the short lines through the development of this State Rail Plan.

As part of the *Louisiana State Rail Plan*, all of Louisiana's short line and terminal/switching railroads were surveyed to determine future unfunded capital needs. The survey also sought to capture what short line and terminal/switching railroad operators' thought of the overall service provided by their Class 1 connections, and to uncover their chief concerns. DOTD conducted the survey by mail. Follow-up efforts were made by telephone to encourage responses. DOTD received responses from all inquiries.

Unmet Capital Needs

Expressed needs consisted principally of rehabilitation of track and bridges. Much of the rehabilitation need was related to 286,000-pound cars. Total loaded car weights of 286,000 pounds represent about a 10 percent increase over previous maximum car weights. These cars are popular with shippers and Class 1 railroads as they represent opportunities to maximize loads and minimize operating costs. However, many short lines do not have the underlying track and structures capable of supporting these heavier cars.

One short line, Ouchita Railroad, cited \$13 million needed to restore service to Bernice and Ruston. The line is a former Chicago Rock Island & Pacific Railroad line, and its southern extension from Lillie was abandoned several years ago. Ouchita related that resumption of service to these points would provide a rail alternative to shippers in Bernice, and a competitive alternative to the KCS for shippers in Ruston.

In contrast with the short lines, the switching and terminal railroads, the Lake Charles Harbor and Terminal District and the New Orleans Public Belt Railroad, cited comparatively few needs that were related directly to upgrades for handling 286,000-pound cars. LCHTD's needs pertained mostly to relieving congestion and handling increasing traffic. NOPB's largest projects are for a new rail deck on the Huey P. Long Bridge and upgrading switch and signal operations – neither of which is exclusively related to heavier cars. In all, short line and terminal/switching unfunded capital needs total \$102.6 million, as shown in **Table 4**.

Table 4
Survey Results – Immediate Unfunded Capital Needs of Small Railroads

Short Line Railroad	Project Description	Purpose	Estimated Cost	Total Need
Acadiana Railway	Tie installation	Upgrade for 286,000-pound cars	3,750,000	
	Bridge upgrade	Upgrade for 286,000-pound cars	1,750,000	
	New rail	Upgrade for 286,000-pound cars	2,100,000	
	New ballast	Upgrade for 286,000-pound cars	1,100,000	8,700,000
Arkansas, Louisiana & Mississippi Railway	Bridge upgrade	Upgrade for 286,000-pound cars	1,000,000	1,000,000
Delta Southern	General rehabilitation of facilities	Upgrade for 286,000-pound cars	15,000,000	15,000,000
Gloster Southern Railroad	Bridge maintenance	Remove decay	200,000	200,000
Louisiana and Delta Railroad	Trackwork upgrade	Not reported	3,467,480	
	Locomotive upgrade	Not reported	175,000	
	Other equipment and maintenance items	Not reported	114,000	3,756,480
Louisiana & North West Railroad	New rail	Upgrade for 286,000-pound cars	7,500,000	7,500,000
New Orleans & Gulf Coast Railway	Track upgrade, Madison Street	Improve residential street on which railroad runs	700,000	
	Bridge repair, Belle Chase Lift Bridge	Repair bridge over Intracoastal Waterway Canal	200,000	
	Highway-rail crossing improvements	Improve crossings	250,000	
	Tie installation	Improve track	400,000	1,550,000
Ouchita Railroad	Bernice Extension	Restore track for rail service to Bernice, LA	3,000,000	
	Ruston Extension	Restore track for rail service to Ruston, LA	10,000,000	13,000,000
Timber Rock Railroad	New rail	Upgrade for 286,000-pound cars	7,000,000	7,000,000
New Orleans Public Belt Railroad	Paint removal, Huey P. Long Bridge	Remove lead base paint	500,000	
	Ballasted deck, Huey P. Long Bridge	Eliminate renewing of 35,000 timber bridge ties	12,000,000	
	Upgrades, East Bridge and West Bridge Jct.	Upgrade interlocking plants; consolidate towers	6,000,000	
	Continuous welded rail, Huey P. Long Bridge	Replace curve worn track	16,000	
	Main track improvement	Renew and upgrade 11.5 miles of main track	1,250,000	

Short Line Railroad	Project Description	Purpose	Estimated Cost	Total Need
New Orleans Public Belt Railroad (cont'd)	Rail yard tie replacements	Replace 21,000 ties for 286,000-pound cars	650,000	
	Rail yard lead switch replacement	Renew 35 yard lead switches	1,750,000	
	Bulk Yard Terminal near-term improvements	Replace ties, switches; return tracks to service	1,100,000	
	Bulk Yard Terminal long-term improvements	Add tracks for a new classification yard	5,500,000	
	France Yard long-term improvements	Increase capacity	1,000,000	
	New Alvar Yard	Build a new classification and intermodal yard	4,000,000	33,766,000
Terminal/Switching Railroads				
Lake Charles Harbor & Terminal District	New storage yard	Decrease congestion in existing yards	3,800,000	
	Track rehabilitation, Industrial Canal lead	Accommodate sugarcane shipments	3,400,000	
	Track rehabilitation, Bulk Terminal No. 1	Accommodate customer shipments	1,400,000	
	Track rehabilitation, City Docks	Accommodate increasing rail traffic	2,500,000	11,100,000
TOTAL			102,572,480	102,572,480

Notes:

Class 1 railroads were not surveyed to assess their needs.
This list of unfunded needs will be updated periodically.

Small Railroad's Assessment of Class 1 Railroads

Short lines and terminal/switching railroads depend on Class 1 railroads to pick up and deliver rail traffic from their interchange points. For example, a short line will be responsible for the actual pick up and delivery of carloads from a shipper, and then interchange these carloads to a Class 1 railroad for a long haul trip. For this local service, the short line is typically paid a fee or a portion of the long haul rate. How expeditiously the Class 1 handles that interchange traffic is important to the small railroad, since it directly affects the quality of service provided to the shipper. Delays at interchange mean delays in overall transit time, which can cause shippers to look for transportation alternatives and thus undercut the short line's business base.

As part of this rail plan, the state's 11 short lines and the terminal/switching railroads were surveyed for their opinions on the overall service provided by their Class 1 connections. Specifically, they were asked to rate their Class 1 service quality from 1 (poor) to 5 (excellent). The responses from the railroads were then averaged. The results showed that, on average, the small railroads rate the service provided by the Class 1s as 3 (acceptable). The results appear in **Table 5**.

**Table 5
Class 1 Service Quality Ratings
By Small Railroads**

Number of Small Railroads	Class 1 Service Rating	Service Quality Description
0	1	Poor
2	2	
6	3	Acceptable
2	4	
1	5	Excellent

Small Railroad Concerns

The 11 short line and terminal/switching railroads were also asked about their chief concerns. Their responses are summarized as follows:

- Three short lines expressed concerns over the *condition of track and bridges* on their systems. Two specifically mentioned the effect that 286,000-pound cars have on their physical plant.
- Two railroads cited *competitive access concerns*. Each of the railroads connects with a single Class 1 railroad. Both indicated that access to more than one would be desirable. The hope is that such access would encourage competition between the Class 1s, resulting in lower prices and better service.
- Two railroads cited concerns for *public safety and liability*, as they either run through highly populated areas or have numerous railroad-highway crossings.
- Two railroads cited a general concern over *the cost of doing business*. One specifically mentioned a concern due to the recession, presumably resulting in a decline in its traffic.
- One railroad cited a concern over *obtaining funding* for major capital projects.
- One railroad noted that its *Class 1 interchange service was unreliable*.

ECONOMIC ROLE AND SUSTAINABILITY OF SMALL RAILROADS

As noted, Louisiana rail shippers are served by 11 short line and terminal/switching railroads. For many shippers, these rail lines are their only link to the national freight rail system. At the same time, these railroads have reported large unmet capital needs. Both the economic role which small railroads play and the certainty of funding needs have been justifications behind state-sponsored rail programs, several of which are outlined in a subsequent section. Both of these justifications are discussed broadly below.

Economic Role

A generic description of a short line or a terminal/switching railroad is that it is a small railroad in comparison with Class 1 carriers, both in terms of revenues and route miles. There are about 500 short lines and regional railroads in North America. Though their individual roles may vary, they typically feed traffic to the high volume main line rail routes owned by the Class 1s. Regional



railroads are also small systems compared to Class 1 railroads. They may operate in several states, and are generally larger than either short lines or terminal/switching railroads in terms of revenues and route miles. A typical regional railroad is the Wisconsin Central Railway, recently acquired by Canadian National. There are no regional railroads operating in Louisiana, however.

Short line, regional and terminal/switching railroads own, maintain and operate 29 percent of U.S. rail mileage, totaling almost 50,000 track miles – a total that exceeds the mileage of the Interstate Highway System¹⁴; they account for 9 percent of the rail industry's freight revenue and 11 percent of railroad employment¹⁵. Though any one short line has a comparatively small track mileage and revenue profile, its role is important: for many rail shippers, it is the link to the national railroad network.

The total number of short lines and regional railroads has been growing. In 1980, there were about 220 companies. As noted before, there are more than twice this many today. Driving this growth has been the rationalization efforts of Class 1 railroads, spinning off numerous light density branch lines in an effort to pare costs. The Class 1s either sold many lines outright or leased operations on these lines to private operators¹⁶.

Switching and terminal companies – some of which have been in operation for decades – play an important role in the efficient, timely interchange of traffic among major railroads and through busy terminal areas.

Perhaps the easiest way to appreciate the role that short lines play would be to recognize that, should these railroads no longer exist, the burden of handling their current traffic would shift to local roads. In rural areas, the shift may cause pavement damage with lightly designed roadway pavement. The shift will typically cause few, if any, congestion problems, since sufficient capacity typically exists on rural roadways to absorb these shifts. The same may not be true in more urban areas, where the shift in volumes onto urban roadways would serve to exacerbate often congested conditions. Also, a closure of a light density line would represent a reduction of modal options for shippers along using that line: they would now have to shift to truck from origin to destination or by truck to the nearest rail intermodal facility. With less routing options, the surrounding area would predictably become less attractive to shippers. Thus potential closure would work against the economic development potential of areas served by the line.

Indeed, Congress recognized the importance of short lines in the 1970s with the passage of legislation aimed at support of rail operations on lines belonging to various bankrupt Northeastern and Midwestern railroads. Since that time, however, the Congress has tended to view support for short lines as a local issue, with the responsibility for support for infrastructure needs resting appropriately (in its view) with the states. As described below, many states have instituted programs to support the infrastructure requirements of short lines. Presumably, concerns over impacts on local roads, as well as concerns over economic development impacts of light density line closures, drove the states' interest in supporting light density lines.

¹⁴ Interstate highways totaled 46,427 miles in 2000, according to Federal Highway Administration data.

¹⁵ *North America's Short Line and Regional Railroads...Working for You*, American Short Line and Regional Railroad Association.

¹⁶ Class 1 route miles declined from more than 200,000 in 1970 to less than 120,000 in 1995. Over the same period, route mileage of Class 2 and 3 railroads increased from less than 15,000 to over 45,000 in 1995.

From time to time, infrastructure funding support for short lines has been included in special, one-time federal appropriations. These have included congressional support for short lines that sustained severe flood damage in 1997 and again in 1998.

Sustainability of Small Railroads

As noted, short lines and some terminal/switching railroads typically earn a fee for handling individual cars. As an example, a Class 1 carrier pays a short line \$300 to move a loaded car from a shipper's loading dock located on the short line to a connection with the Class 1 carrier. For a sustainable operation, fee-generated revenues must be sufficient to cover both operating costs and capital costs. Operating costs include such items as labor and fuel. Capital costs, for example, include improvements to track and bridges. Often revenues have proven inadequate to cover both operating and capital costs of short lines, and public funding sources have been needed to sustain the lines.

Exacerbating this issue is the so-called "286 problem," mentioned previously. According to the American Short Line and Regional Railroad Association (ASLRRA), 286,000-pound equipment is rapidly becoming the norm for commodities that are the bread-and-butter for many small railroads – grain, lumber and paper products. As noted, many short lines today can handle 286,000-pound cars only with difficulty (and at slow speeds), or not at all¹⁷. To do so would require "heavier rail"¹⁸, and upgrading costs are significant¹⁹.

Also, heavier cars mean fewer cars are needed to move the same amount of a commodity. As short lines earn less revenue for fewer cars, they are even less capable of covering the capital requirements that the heavier equipment triggers.

Though this is not the case for all short lines²⁰, those independently owned and/or operated short line railroads serving rural areas are particularly vulnerable to this problem. Many of these are "captive" to the Class 1s that spun them off, and therefore lack leverage to negotiate higher revenue levels from the Class 1s that would support higher capital investments.

According to the ASLRRA, these short lines must quickly find funds for massive capital spending to upgrade track and bridges to handle larger, heavier freight cars that shippers and larger railroads are bringing on line in record numbers. The American Association of State Highway and Transportation Officials (AASHTO) estimated that total 10-year infrastructure needs for American short lines and regional railroads total between \$7.9 and \$11.8 billion, of

¹⁷ According to a survey of short line and regional railroads in the U.S. conducted in 1999 by the American Association of State Highway and Transportation Officials, 41 percent of respondents can currently accommodate these cars on their existing facilities. However, 87 percent of respondents noted that their facilities will have to be capable of accommodating this carload.

¹⁸ "Heavier rail" would indicate more massive track having a high pound weight per linear yard. Much branch line track is less than 100 pounds per yard. Upgrades for 286-pound cars would call for track in excess of 100 pounds; 112-pound rail would be typical of an upgrade.

¹⁹ In its 1998 *286,000# Upgrading Study Report*, the Iowa Department of Transportation estimated the cost of upgrading a typical branch line to a level capable of handling 286,000 pound cars totaled \$170,000 per mile. This figure did not include any costs for bridges. In its May 2000 study entitled *An Estimation of the Investment in Track and Structures Needed to Handle 286,000 lb. Rail Cars*, the American Short Line and Regional Railroad Association (ASLRRA) estimated the cost per mile for a rehabilitation of small railroad trackage capable of handling 286,000 pound cars at \$137,000; this figure included repairs to bridges.

²⁰ As noted before, some short lines that are owned and operated by Class 1s would have their capital needs funded by the Class 1. Also, terminal railways, which typically interline traffic to competing Class 1 railroads, are in a strong position to negotiate fees adequate both operating and capital costs or even to allocate capital improvement expenses directly to the Class 1s.



which only 19 to 23 percent can be funded by the railroads themselves²¹. As previously noted, the alternative has been the public financing, i.e., programs put in place by the federal and numerous state governments, as discussed in the following section.

Another factor driving the need for public financing is that many short lines and regional railroads may find obtaining funds for major infrastructure improvements from the private sector difficult or financially prohibitive. Firstly, given the substantial sums that rehabilitation may require, small railroads may not have the revenue stream needed to repay private sector loans. Secondly, even if they do, favorable interest rates are typically available on short-term loans. However, the railroads need long term loans for track and structure upgrades that will have a useful life of 20 to 30 years. Given the greater risk of longer term repayments, these loans would come predictably at higher interest rates.

FUNDING SOURCES FOR SHORT LINES

Federal Rail Program History

The federal freight program had its origins in the railroad bankruptcies in the Northeast and Midwest (1970s).

LRSA/LRFA

The federal rail service assistance program was established by the Federal Railroad Revitalization and Regulatory Reform Act of 1976 (4R Act), and was amended by the Local Rail Service Assistance (LRSA) Act of 1978, and the Omnibus Budget Reconciliation Act of 1981. The LRSA program provided funding on a federal/local matching share basis for four types of projects: rehabilitation, new construction, substitute service, and acquisition. The LRSA Program permitted states to provide funds on a grant or loan basis.

In 1990, the Local Rail Service Reauthorization Act and the name of the program were changed to Local Rail Freight Assistance (LRFA). The criteria for lines eligible to receive assistance also were revised. Funds for the program were dramatically reduced in the 1990s, and congressional appropriations ceased in 1995. Over \$544 million in federal funds were expended between 1976 and 1985.

TEA-21 Rail Funding

The reauthorization of the Intermodal Surface Transportation Efficiency Act (ISTEA), the Transportation Equity Act for the 21st Century (TEA-21), contains several provisions for rail assistance project funding. Two of these, Section 7302, Light Density Line Pilot Programs which is intended to replace LRFA, and Section 7203, Rail Rehabilitation and Improvement Financing (RRIF), are specifically designated for rail lines. Others are not, but can be used in an overall program.

²¹ *The Ten-Year Needs of Short Line and Regional Railroads*, AASHTO Standing Committee on Rail Transportation, December 1999. This effort surveyed short line and regional railroads regarding their capital needs. The responses indicated that the railroads have needs totaling at about \$92,000 per mile for track, excluding signal and bridge improvements. This figure is significantly less than the \$170,000 per mile estimated by the Iowa Department of Transportation as the cost of upgrading a branch line to handle 286,000-pound cars and the \$137,000 per mile estimated by ASLRRRA. At least in part, the difference appears to lie in the fact that not all railroads responding to the AASHTO survey reported a need to upgrade track for 286,000 cars. The AASHTO needs calculation also included \$1.7 billion for equipment, including cars and locomotives.

Rail initiatives are concentrated in seven sections. They are listed below and discussed in the following paragraphs.

- Light Density Line Pilot Program;
- Rail Rehabilitation and Improvement Financing (RRIF);
- Congestion Mitigation and Air Quality Improvement Program (CMAQ);
- Coordinated Border Infrastructure and Safety Programs;
- Transportation and Community and System Preservation Pilot Program (TCSP);
- Highway Rail Grade Crossing Program/Operation Lifesaver; and
- Rail and Intermodal Project Earmarks.

§ 7202: Light Density Line Pilot Program – The purpose of this section is to fund capital improvements and rehabilitation for publicly and privately owned light density lines (LDLs). An annual total of \$17.5 million was authorized for the life of TEA-21, but funds have yet to be appropriated.

§ 7203: Rail Rehabilitation and Improvement Financing (RRIF) – This section provides loans/loan guarantees for acquisition, development, improvement, or rehabilitation of intermodal²² or rail equipment or facilities. It permits an aggregate unpaid balance of \$3.5 billion over the life of TEA-21 with \$1 billion to be designated for non-Class 1 carriers. As insurance against default, a risk-factor premium will be required. The factor will be computed by the U.S. Department of Transportation and must be funded from non-federal sources. Priority is to be given for projects which:

- Enhance safety;
- Enhance the environment;
- Promote economic development;
- Included in state transportation plans;
- Promote U. S. competitiveness; and
- Preserve/enhance service to small communities.

Proposed rules for use of the program were issued and comments submitted, but the rules have yet to be finalized. There are concerns over several stipulations, especially the lender of last resort, set forth in the proposed rules. The ability to repay the loan will be a principal evaluation criterion.

²² Intermodal in this sense refers the movement of freight traffic between modes. For example, an intermodal rail movement would include movement of a truck trailer or marine container on a railroad flatcar.



§ 1110: Congestion Mitigation and Air Quality Improvement Program (CMAQ) – A holdover from ISTEA, this section continues the eligibility of rail projects and expands eligibility to Maintenance Areas as well as Non-Attainment Areas. Total available funding is \$8.1 billion:

Projects to be funded are to improve air quality. CMAQ funding has been used by the Arizona and California Railroad (ARZC), as well as several Class 1 and short line carriers. The ARZC grant (actually, City of Blythe) was for the Blythe Intermodal Facility.

§ 1119: Coordinated Border Infrastructure and Safety Program – Improvement of safety and efficiency at or across U. S. borders is the objective of this section. Funding of \$700 million is to be coordinated with the National Corridor Planning and Development Program. Improvements to existing infrastructure and operations that facilitate international trade are eligible for funding.

§ 7202: Transportation and Community and System Preservation Pilot Program (TCSP) – Allocations of \$25 million annually are available for initiatives regarding relationships between transportation, community and system preservation and private-sector initiatives. States, local governments, and Metropolitan Planning Organizations (MPOs) are eligible for funding to:

- Plan and implement strategies improving transportation efficiency;
- Reduce transportation's environmental impacts;
- Reduce future infrastructure investments;
- Ensure efficiencies and access to jobs, services and trade; and
- Examine related private-sector development and investment patterns.

Funding from this section has been used by a community in Washington State to acquire an abandoned rail line for service resumption purposes.

§ 1108: Highway Rail Grade Crossing Program – Under this section, the §130 Program of ISTEA is continued. It also increased the Surface Transportation Program (STP) Safety Set Aside (\$466 million) with the section 152 Hazard Elimination Program. The minimum funding in each state is tied to FY 1991 levels. However, all of the STP set aside is eligible at the state's option. Further, a state can shift even more funding into grade crossing improvements; Louisiana has selected this course of action.

Also, a number of states, working through their Congressional delegations, secured specific freight rail assistance projects under ISTEA. Examples are repair of the Coos Bay Bridge (\$5.5 million) of the Central Oregon and Pacific, and construction of the San Ysidro Intermodal Yard (\$10 million) on the San Diego and Imperial Valley Railroad (operator of the San Diego and Arizona Eastern Railroad).

Other TEA-21 rail initiatives are also applicable.

- **§1203 – 1204: Streamlined Planning** adds freight shippers to MPO and statewide planning initiatives. For long-term access to TEA-21 funds (and presumably future versions of the federal transportation program), an MPO presence will be imperative.
- **§ 1201 (35): Transportation Enhancements** continues investment options for historic rail facilities. These funds have been used largely for station renovations.

TIFIA Funding

Although not established specifically for rail projects, certain rail projects could be eligible for funding under the Transportation Infrastructure Finance and Innovation Act (TIFIA)²³. Specifically eligible would be improvements to freight facilities on or adjacent to the National Highway System (NHS); theoretically, freight rail facilities on or near the NHS therefore may be eligible for funding. This TEA-21 program provides assistance in the form of credit (direct loans, loan guarantees and standby lines of credit) for major transportation projects of critical national importance. The project must cost at least \$100 million or 50 percent of the state's annual apportionment of federal aid funds, whichever is less. Federal participation is limited to 33 percent of total project costs as the program is designed to fill market gaps and to leverage capital from other sources.

Potential Federal Sources

There are at least three proposals under discussion in Washington, D.C. that, if they were to come to fruition, would provide funding sources for short lines. These are:

H.R. 1020

If enacted, the Railroad Track Modernization Act would permit the Secretary of Transportation to establish a program of capital grants to Class 2 and Class 3 railroads. These grants would be to rehabilitate, preserve or improve railroad track (including roadbed, bridges, and related track structures) used primarily for freight transportation to a standard ensuring that the track can be operated safely and efficiently, particularly when handling 286,000-pound rail cars.

The maximum federal share for carrying out a project under this section would be 80 percent. The non-federal share may be provided by any non-federal source in cash, equipment, supplies, or other in-kind contributions approved by the Secretary.

The legislation proposes authorization of \$350 million to the Secretary for each of the fiscal years 2002 through 2004 for these grants. The bill was introduced by Reps. Bob Clement (D-Tennessee) and Spencer Bachus (R-Alabama).

RAIL-21 (S. 1530) and RIDE-21 (H.R. 2950)

The Railroad Advancement and Infrastructure Law of the 21st Century (RAIL-21) is a Senate bill introduced in October 2001 by Commerce Committee Chairman Ernest Hollings (D-South Carolina). This bill would provide \$35 billion in direct loans and loan guarantees to Amtrak, other passenger and freight railroads. Of this amount, \$7 billion would be set aside for short lines. It also would establish a \$350 million capital grant program for rehabilitating, preserving, or improving railroad track for regional and short line railroads.

The House is considering a similar bill, the Rail Infrastructure Development and Expansion Act for the 21st Century (RIDE-21), introduced in September 2001 by Transportation and Infrastructure Committee Chairman Don Young (R-Alaska). The House bill would expand the existing RRIF program from \$3.5 billion to \$35 billion, as well as eliminate some restrictions in the current program (structure of loan cohorts, collateral requirements, and artificial limits on loan amounts).

²³ TIFIA is part of the overall TEA-21 legislation.



State Programs

Most of the states participated in the federal LRSA/LRFA program in the 1970s and 1980s when it was well funded, although a lot of states, mostly outside of the Northeast and Midwest, were slow to get involved. At that time, most light density lines were owned by the Class 1 railroads. The principal issue was branch line abandonment as the larger carriers sought to rationalize their systems as one strategy in addressing their financial problems. Abandonment cases were common and were fought on both the planning (with assistance funding) and regulatory fronts.

Today the problem is assisting short line operators, who through the spin-off process made possible in deregulation of the railroads, have inherited the vast majority of remaining Class 1 branches. Although abandonment is always the ultimate issue, many short line operators manage to continue service in cases where the Class 1s would have filed for abandonment. Thus, for all practical purposes, the issue is the same, but the sense of urgency has dissipated.

As could be expected, each state responded initially in a different manner to the problem. Many states were confronted with constitutional prohibitions against assisting private enterprise, some even to the extent of having problems passing through federal monies, much less using state funds. In addition, there was and is a wide disparity in need, e.g., the Northeastern and Midwestern states with over-built rail systems and financially troubled carriers, versus the western states with comparatively sparse rail systems and financially healthier railroads.

State Survey

Based on a survey of the states conducted by the AASHTO Standing Committee on Rail Transportation (SCORT), published in early 1997,²⁴ just over \$2 billion was expended on rail assistance projects between 1976 and 1995. The funding was distributed as shown in **Figure 9**. Note that of the total of \$2.1 billion, only 28 percent were derived from federal funds, while 48 percent came from state sources. Matching funds from local and other sources accounted for almost as much (25 percent) as federal sources. The federal program thus served the purpose of providing inducement and seed money for a national effort. The \$2.1 billion funded 3,173 projects.

Based on the survey responses,²⁵ 21 states provided grants and 13 provided loans funded from state resources. One state during this time period provided loans but not grants. Thus, a total of 22 states used state funds for assistance efforts during the 20-year period.²⁶ Appendix B contains a discussion of the rail assistance programs of selected states. The purpose of the presentation is to reveal different approaches and funding sources. Given the lack of federal funds, state programs have taken on more meaning in recent years.

SHIPPER SURVEY

As part of the rail planning process, DOTD surveyed numerous Louisiana rail shippers to ascertain concerns with regard to their rail service, as well as their opinions on the role that DOTD should play with regard to rail service.

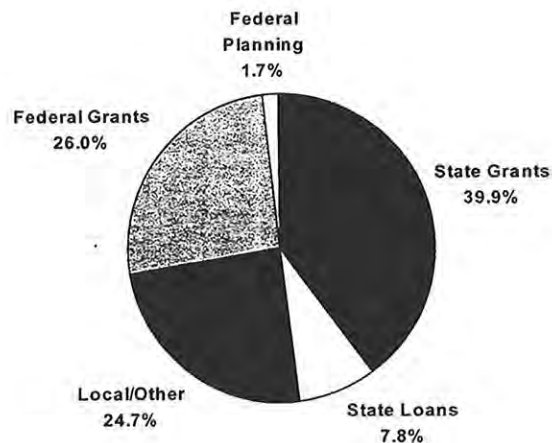
²⁴ *State Programs for Light Density Rail Lines, 1976 - 1995*, a report prepared by the Standing Committee on Rail Transportation of the American Association of State Highway and Transportation Officials, February 1997.

²⁵ Ibid, six states did not respond.

²⁶ Louisiana was successful in getting a \$500,000 LRFA grant to partially rehabilitate the Louisiana and NorthWest Railroad from Gibsland in Bienville Parish through Homer in Clairborne Parish to the Arkansas State Line.

The first challenge was to develop a mailing list of shippers to survey. No such mailing list existed. DOTD consultants created a mailing list from several sources. First, several short lines and terminal/switching railroads provided the names of major shippers on their lines, in response to a question on the Short Line Survey. Second, some chamber of commerce web sites listed the names of major manufacturers in their service area. Third, the consultants used a commercially available Louisiana business and manufacturing directory which lists businesses by size and type of product. The consultants selected from the directory those businesses with 100 or more employees in the product categories most likely to use rail service (chemicals, aggregates, coal, steel pipe, lumber, etc.). Apart from the consultants' efforts, the Louisiana Chemical Association sent the survey on to its membership of more than 70 firms, and requested their participation.

Figure 9
Distribution of Rail Assistance Funding - 1976 – 1995
Total Program = \$2.094 Billion



Source: *State Programs for Light Density Rail Lines, 1976 – 1995*, p.3.

The lists were crosschecked to eliminate redundancies. Finally, during the late summer, DOTD mailed the survey to more than 150 potential shippers in the state.

In soliciting their participation in the survey, DOTD guaranteed the shippers anonymity. No effort was made to call non-respondents to encourage their participation. Seventy-two rail shippers (out of 220 solicited shippers) completed the survey. The profiles of the respondents and specific findings of the survey appear below.



Characteristics of the Respondents

The first part of the survey asked a number of questions meant to identify specifics about the respondents. The answers revealed the following.

Respondents Are Located in All Parts of Louisiana

The 72 survey respondents are located in all parts of the state served by rail. However, 40 shippers are concentrated in southeastern Louisiana. The remaining shippers are spread more or less evenly among the northern, central and southwestern parts of the state.

Most Respondents Are Served by Class 1 Railroads

Sixty-eight shippers reported being served by Class 1 railroads. Most of these are served singly by either UP, CN or KCS. However, several respondents enjoy service from multiple Class 1s. By contrast, only three shippers named short lines as their serving carriers. One shipper reported not having direct rail service. Rather, the shipper makes use of an off-site rail intermodal facility for sending and receiving rail-borne container/trailer loads. The Class 1 carriers, the short lines, and the numbers of survey respondents they serve appear in **Table 6**.

**Table 6
Railroads and Respondents Served**

Class 1s	Respondents Served
UP	24
CN	20
KCS	17
Combination of Carriers	
UP/KCS	3
UP/KCS/BNSF	3
CN/KCS	1
Short Lines	
Delta Southern Railroad	1
Louisiana & Delta Railroad	1
Ouchita Railroad	1
<i>Total Rail-served Shippers</i>	<i>71</i>

Shippers Use Off-site Railroad Facilities

Eighteen shippers, or 25 percent of respondents, reported utilizing off-site rail facilities. Of these, seven shippers reported using reload facilities, i.e., facilities where shippers arrange for transshipment of cargo from truck trailers into rail boxcars or onto flatcars, and vice versa. Four shippers reported utilizing highway-rail intermodal facilities, i.e., facilities where trailers or containers are loaded on and off rail flatcars or double-stack cars, and vice versa. Other off-site facilities reportedly utilized to lesser degrees include team tracks, i.e., common user railcar loading/unloading points, and tracks leased from railroads for car storage.

Most Respondents Use Off-site Facilities Located on Two Class 1 Railroads

Fifteen shippers, or 21 percent of respondents, reported making use of off-site facilities on either UP or CN. Lesser numbers reported using off-site facilities on the other four Class 1s. Only one shipper reported making use of an off-site rail facility accessed by multiple Class 1s, and another reported using an off-site facility on the New Orleans Public Belt Railroad.

Shippers Have Varied Reasons for Making Use of Reload Facilities

The reason more often cited by a respondent for utilizing reload facilities is to obtain a lower transportation cost, presumably by obtaining access to a second Class 1 railroad. Four respondents, all of whom are KCS served, use reload facilities to ship cargo on UP. Other stated reasons for reload facility use include:

- One shipper reported using a reload facility to store inventory.
- Two shippers use reload facilities to break down rail carloads into truckload shipments for delivery to ultimate destination points.

Respondents Report a Variety of Inbound Shipments

Fifty-one respondents reported receiving a variety of commodities by rail. However, of the 51 respondents, 41 reported receiving chemicals. Six shippers receive multiple commodities.

Not all shippers reported volumes. Of the 51 shippers reporting receiving specific types of commodity shipments, only 41 included carload volume information. These 41 generate inbound rail shipments of more than 36,000 carloads per year.

Shippers Use Rail Predominantly for Inbound Shipments

Shippers reported using rail predominantly for inbound shipments. A simple, non-weighted average of 57 shippers' responses indicates that 55 percent of their inbound shipments arrive by rail (53 percent by carload and 2 percent by intermodal), and 43 percent by truck. The remainder receive shipments by ship or barge.

Most Outbound Shipments Are Chemical Products

Sixty-nine respondents reported shipping a variety of commodities by rail. However, of the 69 respondents, 43 reported shipping chemicals. Fourteen ship forest products. Only one ships multiple commodities.

Not all shippers reported volumes. Of the 69 shippers reporting shipping specific types of commodity shipments, only 57 included carload/intermodal volume information. These 58 generate outbound rail shipments of more than 163,000 carloads and 6,000 intermodal container loads per year.

Many Respondents both Ship and Receive Rail-borne Commodities

Included in the tallies above, 46 respondents reported both shipping and receiving commodities by rail. The commodities are predominantly chemicals.

Shippers Use Rail More Than Truck for Outbound Shipments

Shippers reported using rail predominantly for outbound shipments. A simple, non-weighted average of 67 shippers' responses indicates that 58 percent of their outbound shipments depart by

rail (57 percent by carload and 1 percent by intermodal), and 40 percent by truck. The remainder ships by ship or barge.

Most Respondents Are Large Shippers

Of the 63 shippers reporting volumes, 40 shippers reported sending and receiving 1,000 carloads or their equivalents (e.g., two intermodal containers equal one *intermodal* carload; 100 tons of commodity equals one *heavy bulk* carload) per year – an arbitrary threshold for a large shipper (typically, a large shipper generates multiple carloads daily). Twenty-one reported shipping and receiving between 100 and 999 carloads or carload equivalents per year. Only two shippers reported shipping and receiving less than 100 carloads or carload equivalents per year.

Shippers Mostly Control Rail Routing Decisions

Shippers reported that they, for the most part, make the routing decisions. Responses from 70 shippers indicated that the shippers decide which routes shipments will follow between origin and designation 78 percent of the time. Consignees, or receivers, decide the route 15 percent of the time. Third parties, such as commodity brokers or freight forwarders, make the routing decisions 7 percent of the time.

Survey Findings

The second part of the survey asked the respondents what they thought about the current quality of rail service, the major issues they face, and the roles they think are appropriate for DOTD regarding freight rail in Louisiana. The findings are as follows.

Reliable Transit Time Tops List of Rail Service Attributes Important to Respondents

Shippers were asked to rank specific rail service attributes in terms of importance. Rankings were between 1 and 6, with 1 being most important and 6 being least important. Most, but not all, shippers ranked service attributes, and of those that ranked attributes not all ranked every attribute. The rankings were averaged. The results, which appear in **Table 7**, show that reliable transit time is most important among the respondents.

Table 7
Ranking of Rail Service Attributes

Service Attribute	No. of Respondents	Ranking
Reliable transit times	67	1.9
Cost / price	67	2.7
Responsiveness	68	3.3
Car availability	64	3.4
Damage-free service	67	3.8
Other	12	4.2

Only 12 shippers identified specific “other” attributes and ranked them. These were varied and in some cases repetitive of the attributes listed above. Most frequently cited (three times) was knowledge by railroad of shipper operations. Other attributes cited included safety, accurate billing, timely switching of deliveries and pickups, safety, quality equipment (presumably clean and serviceable cars), “trouble free routing”, among others.

Shippers were also asked to rate the quality of the rail service attributes based on their experience. As shown in **Table 8**, most respondents rated railroad transit times as either fair or poor, with only a small minority saying that it is good. The same pattern held true for the cost or price of railroad transportation services. Comparatively few rated railroad responsiveness as good. The railroads earned the best marks from shippers with regard to car availability and damage-free service. However, shippers ranked both car availability and damage-free service as lesser important service attributes (see Table 7). In some cases, shippers rated service attributes without ranking them, and vice versa. As a result, the number of respondents in Tables 7 and 8 differ.

**Table 8
Assessments of
Rail Service Attribute Quality**

Service Attribute	No. of Respondents	Poor	Fair	Good
Reliable transit times	69	29%	59%	8%
Cost / price	68	25%	63%	12%
Responsiveness	68	37%	37%	26%
Car availability	58	7%	47%	47%
Damage free service	69	6%	45%	43%
Other	11	36%	55%	9%

Shippers Feel Rail Quality Has Declined over Time

Shippers were asked whether their rail service had improved, remained the same, or worsened over the last 10 years. Responses from 68 shippers showed that more feel that service has declined rather than improved. Only 18 percent of all these respondents indicated that service has either improved significantly or somewhat; 29 percent indicated that service has remained the same; and 53 percent indicated that it has deteriorated either somewhat or significantly.

Almost Half of Shippers Cite Rail Mergers as a Major Factor on Rail Service Quality

Thirty-two shippers identified the consolidation of Class 1 railroads as a major contributor to the level of rail service that they are experiencing. Only three shippers indicated that the effect was positive, and 28 felt the mergers have had a negative effect. The remaining one shipper offered no comment one way or the other.

Twenty-five shippers identified rail traffic bottlenecks as a major factor on their rail service. The bottleneck locations more frequently cited by shippers are New Orleans, Houston, Shreveport, and Baton Rouge.

Five shippers felt that the creation of short lines over recent years has been a major factor. One felt the new short lines have had a negative impact, while four felt they had a positive impact.

Only three shippers cited inadequate car supplies as a major contributor to their current service quality. Also, four shippers reported that railroad staff reductions have had a negative effect on service quality.

Twelve shippers identified several diverse factors, which either positively or negatively have affected the current quality of rail service. Those having a positive impact include:



- Improved rail facility access.
- More and larger rail cars.
- The establishment of private (shipper-owned and controlled) car fleets.

Those having a negative impact include:

- Untimely and inaccurate (poor car placement) switching.
- Short line service cutbacks.
- Poor customer service generally.
- High costs.

Most Shippers Report Increasing Rail Volumes

Despite the negative factors affecting rail service quality, most respondents voiced a positive trend in Louisiana rail shipments. Forty-three shippers, or 60 percent of all 72 respondents, reported that their rail volumes increased during the last 10 years. For the same period, 21 shippers reported that volumes decreased, and 7 reported that their volumes remained the same.

Most Shippers Identify Further Class 1 Consolidations as a Major Issue

Several rail mergers in the recent past have resulted in major rail service disruptions. In Louisiana, problems were particularly acute following the UP's absorption of the former Southern Pacific Transportation Company in 1996. These problems have since improved, only to be followed by service problems resulting from the division of Consolidated Rail Corporation (Conrail) between Norfolk Southern Railway and CSX Transportation. However, these problems have ameliorated as well. It is hardly surprising, therefore, that 40 shippers, or 56 percent of the 72 respondents, identified additional consolidations among the large rail systems as a major issue that they will face in the future.

Thirty-two shippers, or 44 percent of respondents, identified rail traffic bottlenecks as an other key issue in future rail service. Five shippers indicated that the continuing consolidation of short lines will be a major issue, and one shipper noted that the increasing needs for capital improvements of its serving short line as a major issue.

Twenty shippers cited other issues as major future concerns. Among these, the most frequently cited is a general deterioration in railroad service quality, manifested by poor employee attitudes, staff reductions, and lengthening transit times. Also cited were:

- Capital improvement needs on Class 1 carriers for track condition and capacity.
- Increasing costs.
- Lack of storage tracks on carriers.
- At-grade crossing safety.
- A general lack of customer focus on the part of railroads.
- A trend in railroading to focus on shipments terminal-to-terminal rather than to and from the shipper.

Shippers See a Varied Role for DOTD

Shippers offered comments on roles which DOTD should play relative to their rail service. These were grouped into the five broad categories as shown in **Table 9**. Forty shippers offered comments on specific roles, and some suggested multiple roles. In all, 50 individual suggestions were received. The most commonly suggested role pertained to regulatory oversight on issues relating to service quality, competition, and safety. However, in these matters, DOTD’s authority may be preempted by federal law.

**Table 9
Shipper Suggested Roles
for DOTD**

Shipper Suggested Role for DOTD	Comments
Advocate service improvements and shipper interests	10
Provide regulatory oversight for safety and service	23
Provide funding for improvements	2
Monitor service (current role)	3
Facilitate improved rail service and safety (current role)	10
No clear role	2
Total individual comments received	50

The largest number of shipper comments (23) referred to the provision by DOTD of regulatory oversight for safety and service. Except for grade crossing safety oversight, these functions now are performed by federal agencies²⁷. The state may wish to explore the feasibility of assuming some of regulatory oversight for the railroad operations within the state. This may require new legislation as well as coordination with the federal regulatory authorities.

Ten shippers suggested a role for DOTD as an advocate for rail shippers’ interests. DOTD could assume a role of advocacy regarding shippers’ specific concerns about service quality. DOTD could perform this role without the need of new or expanded legislation. The Oregon Department of Transportation’s (ODOT) Rail Division has performed this very role for many years, often monitoring rail service on an as-needed basis. Also, DOTD could sponsor track safety inspections supplementing federal efforts.

However, at least two shippers did not believe that a pro-active role for DOTD is appropriate. Both commented that DOTD does not have the authority to do much. One specifically noted that rail service pertains to interstate commerce, over which the federal government has sole oversight responsibility.

Two shippers suggested a role for DOTD with regard to supporting rail infrastructure improvements; this role in particular is addressed in the recommendations of this Rail Plan.

²⁷ With the passage of the Staggers Rail Act of 1980, many states relinquished their intrastate regulatory oversight of railroads. In those cases, the states’ rail service oversight responsibilities shifted to the Interstate Commerce Commission (now the U.S. Surface Transportation Board), and their rail safety oversight responsibilities shifted to the Federal Railroad Administration. Prior to 1980, states and the federal government shared oversight responsibilities.

SECTION 2: PASSENGER ELEMENT

HISTORIC RAIL PASSENGER SERVICE PERSPECTIVE

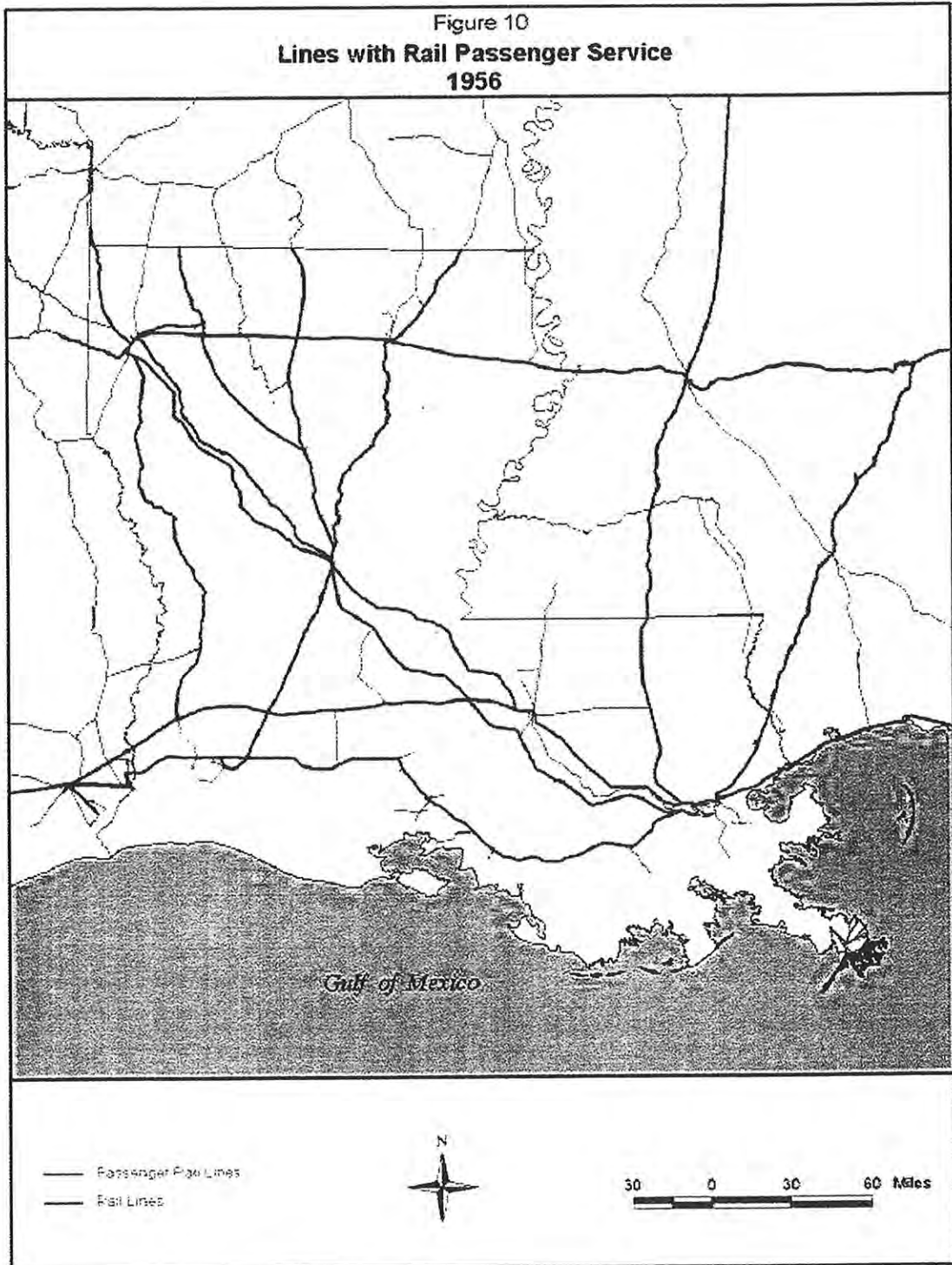
Passenger trains provided significant levels of service, and were an important mode of intercity travel during the first half of the 19th Century. Once the primary mode of travel, the rail share began to decline during the 1920s and 1930s when auto travel became more affordable to more families. However, the rail share remained important through the 1940s and into the early 1950s, and passenger trains served all major urban areas and most of the country's small towns. In addition to transporting passengers, the trains carried mail and express. Railroad depots, usually located close to the center of each community, were activity hubs at train time.

With the construction of the Interstate highway system during the 1950s and 1960s, and the introduction of high capacity jet aircraft that significantly reduced travel times and costs, passenger rail usage declined. Private railroads increasingly were unable to compete with publicly funded highway and airport transportation modes, and a cycle of passenger train discontinuance ensued as the rail industry sought to drop service that had become uneconomical. With each train discontinuance, connections were broken and travel options were reduced, further hastening a cycle of service reductions.

In Louisiana, the level of rail passenger service provided in the mid-1950s reflects the period before the greatest cutbacks occurred. The 1956 service level is illustrated in **Figure 10**. Radiating outward from New Orleans, passenger trains served major cities and small towns throughout the state. Most of these were long distance services, operating several hundred miles into adjoining states. Primary routes within Louisiana included:

- Five daily trains across southern Louisiana, with four of these operating to Houston or beyond to Los Angeles.
- Four daily trains through the heart of the state from New Orleans to Baton Rouge to Shreveport, continuing west to Dallas/Fort Worth or north to Little Rock, Kansas City, or St. Louis.
- Four daily trains north to Memphis and Chicago.
- Two daily trains northeast to Birmingham and beyond.
- Seven daily trains east to Mobile, diverging to Cincinnati, Atlanta, Washington, and Florida.
- Additional trains between Shreveport and Beaumont, Shreveport and Meridian, and Monroe and Lake Charles.

Passenger service was gradually reduced to only a handful of long distance trains by 1971, when Amtrak was created by the Congress to operate a basic national system of passenger trains. Through Louisiana, Amtrak retained service over only three routes radiating from New Orleans. A fourth route was added in 1993, when the Los Angeles-New Orleans Sunset Limited was extended east to Florida.



CURRENT AMTRAK SERVICE

The state is served by three long distance Amtrak trains, centered on New Orleans. There currently is no commuter or intercity corridor service provided in the state, either by Amtrak or by other operators. Amtrak operates entirely over the trackage of Class I freight railroads, except for the trackage at New Orleans Union Passenger Terminal. Amtrak has provided a constant level of service on the long distance trains, with no recent increases in the frequency of service. Additionally, the limited number of cars available nationally restricts the length of the trains, so ridership along with service has reached a relatively flat plateau. Current services appear in **Figure 11**.

Sunset Limited

The Sunset Limited operates on a tri-weekly schedule between Los Angeles and Orlando (2,764 miles), serving major intermediate stations at Tucson, El Paso, San Antonio, Houston, New Orleans, Mobile, and Jacksonville. The train passes through New Orleans eastbound on Sunday, Tuesday, and Friday. Westbound trips pass through New Orleans on Monday, Wednesday, and Friday. East of New Orleans, the train travels overnight between New Orleans and Tallahassee and serves Jacksonville and Orlando during daytime hours. On the west end of the route, the overnight segments are between Houston and West Texas, and again between Tucson and Los Angeles. The Sunset Limited makes connections in Jacksonville with trains along the Eastern seaboard, and in Los Angeles with service along the Pacific Coast. Through cars from Chicago (via St. Louis and Dallas) are switched to and from the train in San Antonio. In addition, passengers can connect with the City of New Orleans and Crescent at New Orleans, although some connections require an overnight stay at New Orleans.

During calendar 2000, the Sunset Limited carried 114,140 passengers across its 8-state route. New Orleans is a major origin/destination for passengers from each end of the route. Louisiana stations served by the Sunset Limited are Lake Charles, Lafayette, New Iberia, Schreiver, and New Orleans.

The Sunset Limited operates with Amtrak Superliner equipment. These cars are bi-level cars with passenger accommodations on two levels. The train carries coaches, sleeping cars, a diner, an observation lounge, and baggage cars.

City of New Orleans

This train operates daily between Chicago, Memphis, and New Orleans – a distance of 926 miles. The schedule provides overnight service between Chicago and Memphis, and daytime service south of Memphis. At Chicago, the train connects with other long distance trains to both East and West Coast locations. In addition to serving passengers with a New Orleans origin/destination, the City of New Orleans provides connections to the Sunset Limited and Crescent.

During 2000, the train's route ridership was 200,400 passengers. Five states are served by the train. In Louisiana, the City of New Orleans serves stations in Hammond and New Orleans. The City of New Orleans operates with Amtrak Superliner equipment. The bi-level cars provide coach seats, sleeping car rooms, dining, and observation lounge space on two levels.



Crescent

Amtrak's long distance Crescent service operates 1,377 miles between New York, Washington, Charlotte, Atlanta, Birmingham, and New Orleans. The overnight portion of the run is between Washington and Atlanta. The Crescent connects with other long distance trains in New York and Washington, and with the Sunset Limited and City of New Orleans in New Orleans.

The train carried 271,200 passengers during calendar 2000. Twelve states and the District of Columbia lie along the route of the train. Louisiana stations served by the Crescent are Slidell and New Orleans.

The Crescent operates with single level equipment, due to limited clearances through tunnels between Washington and New York. The train carries coaches, sleeping cars, a diner, and a lounge car.

Thruway Bus Service

Amtrak provides connecting bus service between rail stations and nearby communities without passenger rail service. In Louisiana, Thruway service is provided between Longview (served by the Chicago-San Antonio Texas Eagle) and Shreveport/Bossier City, and also between New Orleans and Baton Rouge. The Thruway service is marketed as an extension of the rail service, with through tickets and fares.

Freight Operations

Though Amtrak's freight operations are not well known, it is estimated that in 2002, they could provide as much as \$140 million in revenue. Amtrak primarily handles first class mail and airmail for the U.S. Postal Service, as well as time sensitive products that compete with less-than-truck load motor carriers.

PROPOSED SERVICES

Amtrak has evaluated a series of proposals that are designed to increase markets served and to improve the economic performance of its long distance routes. Termed the Network Growth Strategy (NGS), Amtrak has identified two proposals that affect service in Louisiana.

Crescent Star

Amtrak is pursuing plans to establish a new rail link between Meridian and Fort Worth. The service would involve splitting the Crescent at Meridian, and operating a segment of the train from Meridian to Dallas/Fort Worth via Jackson and Shreveport. The remainder of the Crescent would continue to New Orleans, as at present. The proposed schedule would serve most or all Louisiana stations at night, but even with that limitation, it will provide increased travel options for communities across the north part of the state. Interest in a station stop has been expressed by Monroe, Ruston, and Bossier City/Shreveport. Amtrak's policy is that station facilities need to be constructed and maintained by state or local agencies, so the actual determination of train stop locations remains uncertain at this time. There are no state funding sources identified to assist the communities in developing station facilities. Typically, a simple station platform with lighting, shelter, benches, minimal parking, and signage will cost from \$500,000 to \$1 million, depending on local conditions and site availability. It may be possible to make use of former station sites in some communities, or to share use of existing parking lots, in order to reduce station construction costs.

Introduction of the Crescent Star service is dependent upon additional siding capacity on the Kansas City Southern (KCS) trackage. KCS is seeking a RRIF loan of \$44 million from the FRA to finance the necessary track and signal improvements, and is asking the three states involved (Mississippi, Louisiana, and Texas) to provide about \$1.5 million each for loan guarantee insurance (credit risk premiums). KCS indicated the service could start when the loan is assured, even though the improvements will not be completed for some time. The service also is dependent upon Amtrak securing adequate promise of mail and express business over the route, to help support the operating costs of the service. Amtrak continues to explore these markets.

None of the states has yet come forward with necessary loan guarantee insurance, so the extension appears to be on hold. However, it remains a viable addition to Amtrak's national route system that should be pursued, and supported by state policy.

Sunset Limited

A second NGS proposal potentially affecting Louisiana is a plan to reroute the Sunset Limited between Houston and El Paso to operate through Dallas, Fort Worth, Abilene, and Odessa instead of the current route through San Antonio and Alpine. Amtrak studies projected that the greater population on this route would improve the economics of the train. While it would not involve loss of service to any Louisiana station, it could require revising the schedule to operate at significantly different hours, perhaps with an overnight run between Houston and New Orleans rather than daytime service. In addition to concerns regarding loss of service to San Antonio, the proposal would impact current connections with other trains in Los Angeles, Fort Worth, New Orleans, and Jacksonville. It is not likely to be implemented in the near term.

LOUISIANA RAIL PASSENGER STATIONS

Amtrak currently serves seven stations in Louisiana which account for almost 200,000 annual boarding and alighting passengers. Ridership to and from Louisiana stations grew moderately between 1999 and 2000. Recent ridership data are shown in **Table 10**.

Table 10
Annual Amtrak Patronage
for Louisiana Stations

Station	1999	2000
New Orleans	171,298	177,824
Hammond	9,078	11,178
Slidell	4,345	4,483
Lake Charles	2,352	2,320
Lafayette	2,591	2,215
New Iberia	1,062	1,060
Schreiver	480	446

Source: Amtrak Quarterly Station Reports



New Orleans Union Passenger Terminal (NOUPT)

The New Orleans station was constructed in 1954, replacing several separate facilities then operated by railroads providing passenger services. Trackage subsequently was modified to accommodate bus operations, making it one of the first truly intermodal bus/rail stations in the nation. The station provides an enclosed ticketing and waiting room, magazine stand, restaurant, and related passenger facilities for both Amtrak and Greyhound. NOUPT has complete Amtrak station services, including ticketing, baggage and parcel checking, restroom facilities, and a separate Metropolitan Lounge for first class passengers. The station is located centrally in New Orleans.

Amtrak maintains a mechanical staff and facilities at NOUPT for stocking and servicing of trains and maintenance of locomotives and passenger cars. Facilities used essentially were those built as a part of the union station project, upgraded as necessary to meet current standards.

A renovation plan for New Orleans Union Passenger Terminal has been developed by the City, in conjunction with Amtrak and the former railroad owners of the station. The plan will convert the station, now 48 years old, into a contemporary transportation center serving trains, buses, and local transportation. The plan includes upgrading the facility with new mechanical systems and passenger conveniences, and environmental containment removal. The \$6.5 million rehab will be paid with funds from Amtrak and the freight carriers. A new control center will be provided to control RTA, Amtrak, and Greyhound movements as well as the city's traffic signals. Most recently, the City of New Orleans has obtained full control of the assets of NOUPT.

The plan was developed after years of talks between the passenger and freight carriers who have interests in the facility. The upgraded transportation terminal will be managed by a public benefit corporation formed by the City of New Orleans. It may eventually serve as a downtown terminal for an airport light rail line. A new parking garage is planned to serve the terminal.

Hammond

The station is located downtown on Railroad Avenue. It was constructed in 1912 by the former Illinois Central Railroad. It is still in use as the Amtrak passenger station. Amtrak maintains a staffed facility, with waiting room, ticket office, baggage facilities, and restrooms. The building also houses city offices.

Slidell

The brick station building on Front Street was constructed in 1913 by the former Southern Railway. It is currently in use for municipal and railroad offices. The Slidell Station is not staffed by Amtrak. A custodian opens and closes the waiting room before and after train arrivals.

Lake Charles

The station on Ryan Street built by the former T&NO Railroad is still in use as an unstaffed Amtrak facility. A waiting room and restrooms are available to passengers prior to train arrivals.

Lafayette

The brick station building on East Grant Street was built by the former T&NO Railroad. It was destroyed by fire in 1998. Only the brick shell remains. Temporary shelter is being arranged by the City of Lafayette. The station was unstaffed. Recently, the City of Lafayette has begun the development of an Intermodal Transportation Center at the site.

New Iberia

The former T&NO station is on Washington Street. Built about 1900, it currently houses offices for the Louisiana & Delta Railroad, and serves as an unstaffed Amtrak stop. Only minimal shelter is provided on the boarding platform for Amtrak passengers.

Schreiver

The Schreiver station, located at South Route 20 and Route 24, originally was built by the former T&NO Railroad. It continues to serve as an unstaffed Amtrak facility, with a waiting room that is opened and closed before and after train arrivals.

RECENT RAIL STUDIES

The 1998 *Passenger/Commuter Rail Service Master Plan*, Phase I, prepared for the DOTD, determined a preferred rail corridor between New Orleans and Baton Rouge and examined priorities and financial requirements for incremental development of rail service in the corridor. The report evaluated intercity service opportunities, commuter service potential into both New Orleans and Baton Rouge, and shuttle service between New Orleans and New Orleans International Airport (NOIA). It also looked at the potential for service between Baton Rouge and NOIA, and for rail service to Louisiana State University in Baton Rouge.

Ridership projections, operating costs and revenues, and capital costs were developed for alternative service levels that can be implemented sequentially as track and facility upgrades are completed. The preferred route is from New Orleans to Baton Rouge via the KCS line through Gonzales.

The plan projected sufficient patronage to support multiple frequencies over the route, with ridership increasing as additional frequencies are added that make the service more convenient. A Phase II report has yet to be started.

SOUTHERN RAPID RAIL TRANSIT COMMISSION (SRRTC)

Louisiana, Mississippi, and Alabama joined to create the SRRTC for the purpose of studying passenger rail feasibility connecting the three states. The initial impetus was interest in commuter rail service along the Gulf Coast. However, the 1984 Louisiana World Exposition provided an opportunity to start a service, and the SRRTC contracted with Amtrak to provide a day service between Mobile and New Orleans under a shared subsidy operating agreement. The service was well utilized during the fair period, but patronage dropped following the fair. The service subsequently was discontinued when Mississippi withdrew its share of the funding.

The SRRTC was instrumental in encouraging Amtrak to extend the Sunset Limited from New Orleans to Florida, and it was largely responsible for the designation of the Gulf Coast Corridor (Houston to Pensacola, and New Orleans to Atlanta) as one of several national corridors eligible for federal funding for high speed passenger service. Initial corridor planning for the New Orleans-Mobile segment is now underway. At the same time, Mississippi will be evaluating an alternative, more inland alignment for CSX Transportation's main track railroad.



The SRRTC continues to be funded by the three states at a minimal level, maintaining a small staff to seek and administer federal planning grants. Its role will become more important if any of the current proposals for high speed rail funding are approved by the Congress.

HIGH SPEED RAIL CORRIDORS

Congress has provided that the Secretary of Transportation may designate high speed rail corridors throughout the nation, making certain types of improvements in those corridors eligible for federal funding. Funding is essentially limited to planning studies and grade crossing improvements, but the high speed designation opens the door to any further grant or loan programs the Congress may enact. Several funding proposals were introduced during the 2000 and 2001 congressional sessions, but none was enacted. The proposals vary in terms of whether they provide grants, favorable interest loans, or authorization for the sale of bonds by either the federal or state governments, and whether the support is for incremental speed improvements on existing passenger routes or for new, dedicated high speed systems. There also are differences in the level of state vs. federal contributions. Elements of the proposals also were included in recent economic stimulus legislation, but only a \$100 million grant for tunnel safety in the New York area was approved.

High Speed Rail Investment Act

Federal legislation was introduced in Congress in 2000 to enact a High Speed Rail Investment Act (HSRIA). The legislation would allow Amtrak to issue \$10 billion in bonds over 10 years. Interest earned on the bonds would be tax-free. States would be required to provide a 20 percent match to be placed into escrow to pay off the bonds later. Ninety percent of the total would go to corridors designated under ISTEA and TEA-21 for infrastructure development, with no single corridor to get more than 30 percent of the total funding. The HSRIA funding is envisioned as an incentive for state investment (as highways and transit already enjoy) and as a means to encourage serious development of higher speed intercity passenger rail services nationwide. The contemplated funding level would support meaningful infrastructure improvements, far beyond the token grade crossing funding available to date. Minor revisions to the proposal were made in 2001.

RAIL-21

Senator Ernest Hollings, Chairman of the Senate Commerce Committee, introduced the Railroad Advancement and Infrastructure Law (RAIL-21). The legislation would eliminate the current requirement that Amtrak be self-sufficient on an operating basis, would provide \$3.2 billion in emergency funding for security and capacity (including equipment for use outside the Northeast Corridor), authorize \$35 billion in loans and loan guarantees for freight and passenger services, and provide a capital grant program for short line railroads. It also will continue the Swift Rail Development Act, which provides funds for corridor planning.

RIDE-21

Congressman Don Young, Chairman of the House Transportation and Infrastructure Committee, proposed a \$71 billion Railroad Infrastructure Development and Expansion Act (RIDE-21). The legislation would establish \$36 billion of authority for states or interstate compacts to issue federally tax-exempt bonds for high speed passenger development (125 mph design speed). The

legislation also would expand the Swift Rail Development Act to allow acquisition of rolling stock and signal equipment, and would expand the RRIF loan and loan guarantee program to encourage passenger system development.

All of the pending corridor legislation from the 2001 session may be reconsidered in 2002. However, action is likely to be deferred while Congress wrestles with questions of Amtrak reorganization, and whether a major restructuring of rail passenger service and funding mechanism will take place.

The designation of the Gulf Coast Corridor is in general terms, and it does not specify precise routes. In some cases there are few alternatives, but a major issue for Louisiana is whether and how to serve Baton Rouge. The current route used by the Sunset Limited through Lafayette and Lake Charles misses the capitol city, which has considerable potential as a passenger traffic generator. Since many of the high speed proposals involve incremental upgrades on current passenger routes, the state needs to determine how service to Baton Rouge can be reconciled. There appear to be three options:

- Develop the high speed corridor on the current route of the Sunset Limited, and serve Baton Rouge with a connecting service tying into the Gulf Coast Corridor at New Orleans.
- Develop the high speed corridor along KCS and UP trackage via Baton Rouge, and Opelousas, and consider shifting the Sunset Limited to this route when feasible.
- Explore the feasibility of new trackage between Baton Rouge and Lafayette,²⁸ enabling the corridor to serve both Baton Rouge and the existing Sunset route west of Lafayette.

Determination of the preferred routing will result from ongoing work of the SRRTC, which will address the New Orleans to Lafayette Corridor.

POTENTIAL LOUISIANA RAIL CORRIDORS

In order to assess the general viability of passenger rail service in Louisiana, travel patterns were reviewed as reported by the National Travel Survey conducted by the Federal Bureau of Transportation Statistics in 1995. The survey summarized all trips over 100 miles between major metropolitan areas. The survey found the mode split for rail was about the same for shorter and longer trips, so the total travel volumes are representative of volumes that might be expected on any given route. It is important to point out that the NTS reported only trips between major metropolitan areas, which represent only about one-third of all trips over 100 miles. The other two-thirds of intercity travel have one or both trip ends in smaller communities. This assessment was done only to identify the major transportation corridors within and through the state where passenger rail might be sustainable. Obviously, any specific proposal would require a more rigorous analysis to determine potential ridership, operating conditions and schedules, potential connections, capital costs, and operating support needed.

The analysis found the most significant markets were:

- New Orleans to Baton Rouge;

²⁸ A rail line between Lafayette and Baton Rouge was abandoned many years ago.

- Houston through Beaumont to New Orleans; and
- New Orleans to Mobile and Florida.

Other major travel corridors include:

- New Orleans to Birmingham and Atlanta;
- Dallas to Shreveport and New Orleans;
- Dallas to Shreveport, Jackson MS, and Birmingham; and
- New Orleans north to Jackson and Memphis.

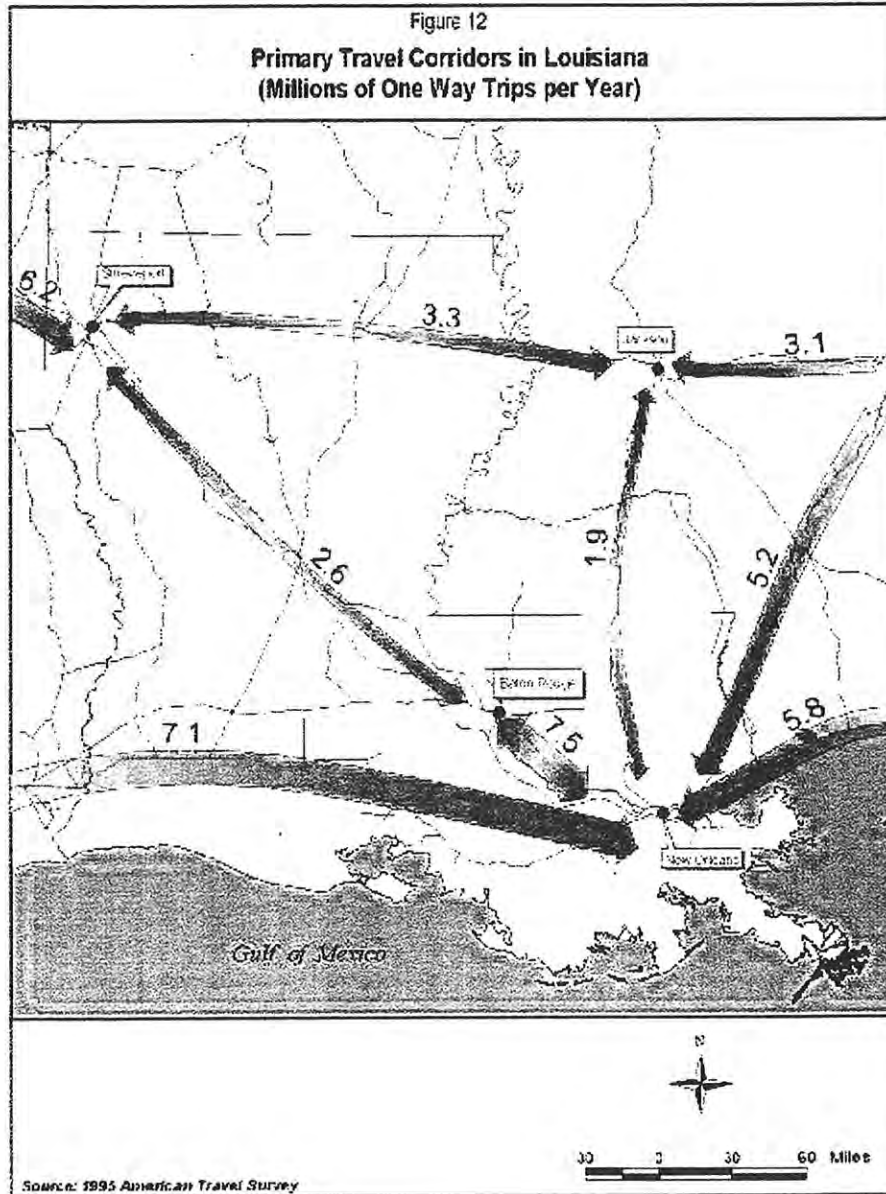
These markets are illustrated in **Figure 12**.

The heavy travel flow across the lower Gulf mirrors the designation of the Gulf Coast Corridor, and the corridor's potential would be strengthened by a routing via Baton Rouge.

FEDERAL RAIL FUNDING

Since 1971, Congress has provided operating and capital funding for Amtrak's nationwide passenger network. Funding has always been tenuous, with a dependence on annual appropriations rather than long-term funding commitments. Passenger service support has often been threatened by budgetary constraints, and by administrations or members of Congress who object to the level of funding being provided on either fiscal or philosophical grounds. Amtrak has survived all of these challenges, but it has never been funded at a level that would permit major infrastructure improvements or significant increases in service. As a result, Amtrak has turned increasingly to states to provide financial support for services that are primarily a state or regional benefit. Where the states have stepped up to the plate – primarily on the West Coast, along several routes radiating from Chicago, and services on or extending from the North East Corridor (Boston-New York-Washington) – significant service improvements have resulted. Amtrak's long distance trains have received little benefit from state funding, because it is difficult for states to agree on a cost-sharing formula for a train passing through a multiplicity of states.

In 1997, Congress directed Amtrak to work toward operating self-sufficiency with the understanding that federal funding would continue to be provided for capital needs. However, the authorized level of capital funding was not provided, and early in 2002 Amtrak stated it would not attain the self-sufficiency goal and would require continuing federal support for regional corridor services and the long distance network. The Congress and the new administration are currently debating the funding issues related to rail passenger service. Without a resolution of these issues, the long distance trains that currently serve Louisiana face a threat of discontinuance before the end of 2002.



STATE POLICY AND INTEREST

Louisiana currently does not have an active passenger rail program, and there has been no commitment of state funding to support passenger rail. However, since legislation may emerge that requires a state matching share to participate in potential federal programs, the state has a need to develop an overall policy toward passenger rail services, and to begin to consider potential sources of local matching funds. Three policies and activities appear to be appropriate



steps for preservation and development of passenger services as an essential element of public transportation mobility.

1. Support National Service

Louisiana should support, on a policy basis, the retention of Amtrak's national system trains that serve Louisiana. Experience has shown that once all passenger service is removed from a route, it becomes increasingly difficult to restore such service in the future. Further, the state should encourage Amtrak to work to provide daily service rather than tri-weekly service by the Sunset Limited. Amtrak's experience with tri-weekly trains has been that ridership levels will increase at a rate greater than the train-miles increase when service is daily. There simply are too many potential trips lost when frequency is less than daily.

2. Encourage Meridian-Dallas Service

Amtrak's proposed Crescent Star service holds promise of being a cost-effective means of travel between the Northeast, Atlanta, Birmingham, Shreveport, and Dallas/Fort Worth. Louisiana should explore means to assist Amtrak in getting this service underway.

3. Evaluate New Service in High Travel Corridors

Louisiana should continue to evaluate, in cooperation with adjoining states, the potential to establish new passenger services, including improvement of major routes for high speed, multiple frequency operation. The key element of this will be to look into optional routes between New Orleans and Texas that could serve Baton Rouge.

PASSENGER RAIL DEVELOPMENT CRITERIA

In planning for both rail (and connecting bus) service expansion, it is necessary to evaluate each service proposal and consider its many implications. A preliminary assessment of each service proposal often will be sufficient to provide a basis for a decision. In some instances, more detailed study will be required to clarify the pros and cons of any specific service proposal. Questions to be answered in the service assessment include:

- Will the service attract sufficient ridership?
- What are the potential costs and revenues?
- What are the economic and social benefits to the state and local communities?
- Can a service be provided at an affordable cost?
- What are the alternatives to providing the service?
- How does the service satisfy the state's transportation goals?
- Will the service contribute positively to other services through connections?

The primary advantage of rail is its ability to move larger numbers of passengers at approximately the same cost as a small number of passengers, and to move them in a

comfortable, time-competitive manner. Because of the high infrastructure cost²⁹, rail works best where passenger volumes are high enough to justify the investment. Generally this means where multiple frequencies can be operated. Rail's advantage declines where the available rail route is not competitive with driving times, either due to a circuitous route or to poor track conditions that limit operating speeds. Nevertheless, there is a general perception that rail service is more reliable, more comfortable, and safer because the vehicles provide more passenger space and travel over a fixed guideway that is not affected by highway congestion.

Patronage, cost recovery, and running time are the key factors which must be evaluated when considering rail service options.

Patronage

To justify rail service, a train should have a minimum average occupancy of about 75 passengers³⁰ per train. Occupancy might be lower at the extreme end of a run, but average occupancy should justify the operation of a train consist with at least 180 seats (typically a three-car train). The economic efficiency of rail is significantly reduced if usage falls below this level, and bus operation often may provide more effective use of transportation dollars.

Cost Recovery

Typical train operating costs are about \$26 per mile. A new rail service should be expected to attain a 30 to 40 percent farebox recovery ratio (the proportion of operating costs covered by fare revenue) to be viable. With a lower cost recovery, the amount of subsidy per passenger becomes excessive and alternative transportation by bus becomes a more attractive option.

Running Time

Rail service has to be reasonably competitive with auto driving times to be successful. While high speed, frequent service in a few corridors may be able to compete with air travel times, in most cases the alternative to rail travel is to drive.

SECTION 3: RAIL SAFETY

RAIL SAFETY PROGRAM

Federal Railroad Safety Program

DOTD administers the Federal Highway Safety Program. To this end, DOTD evaluates its 3,100 public at-grade crossings on an ongoing basis. Of these, DOTD distributes \$8 million of the federal and state safety program funds annually to improvements at 50 grade crossings. Projects are prioritized on the basis of:

- Estimated vehicular and train movements at each crossing.
- The history of incidents of rail and motor vehicle collisions at each crossing.

²⁹ Amtrak payments to a railroad for use of its trackage represent a contribution toward infrastructure cost. In addition, there may be specific improvements required to support passenger services that must be borne fully by the passenger operation.

³⁰ This level is based on typical patronage of state-supported train service in other states, and is not a hard and fast threshold. Below this level, the economics of passenger train operations make service unlikely.

- The existing warning devices at the crossings.
- Input from the public and railroads pertaining to the crossings.
- “Engineering judgement.”

Rail Safety Review of State Highway Projects

Apart from the administration of this program, DOTD, on an ongoing basis, evaluates state highway improvement projects that involve crossing rail lines, and ensures appropriate warning at the highway-rail crossings.

Support of Operation Lifesaver

Operation Lifesaver is a national, non-profit education and awareness program aimed at reducing collisions, fatalities, and injuries at highway-rail at-grade crossings. The organization has coordinators and programs in 49 states nationwide (Hawaii excluded). Louisiana Operation Life Saver (LOL), the state program, is funded jointly by the Louisiana Highway Safety Commission and by contributions from railroads.

LOL promotes education, law enforcement, and engineering solutions aimed at enhancing safety at highway-rail at-grade crossings. While not formally involved in LOL activities, DOTD supports the LOL by attending quarterly meeting, addressing engineering issues when referred by LOL, and informing the LOL coordinator of what DOTD is planning with regard to grade crossing improvements.

Additional Funding Needed

As noted, the Rail Safety Program spends \$8 million per year on improving crossing safety. Of this amount, \$3.2 million comes from the Federal Highway Safety Program. Some of the remainder is from other federal safety improvement funds not specifically earmarked for highways. The Rail Safety Program also uses state funds to improve crossing safety. Another \$1 million is available for engineering. To minimize costs, the Rail Safety Program has aggressively pursued crossing closures and consolidations. As both railroad and highway volumes increase, the conflict potential and delays at major crossings will become intolerable. Consideration should be given to increasing funding to begin grade separation.

Track Inspections

Two major train derailments occurred in southwestern Louisiana in May 2000. These were in Eunice and New Iberia. Both resulted in spills of hazardous materials and evacuations of nearby residents. The Eunice derailment and spill, which triggered the evacuation of 2,500 residents, occurred on the UP’s east-west main line. The National Transportation Safety Board (NTSB) identified the probable cause as joint bars which had broken before the arrival of the accident train and which allowed the rail to become misaligned³¹. The NTSB said that the joint bars had remained in service with undetected and uncorrected defects because of the UP’s ineffective track inspection procedures and inadequate management oversight. The New Iberia derailment and spill, which triggered the evacuation for 24 hours of an 11-block area, occurred on the BNSF east-west main line.

³¹ NTSB Public Meeting, April 2, 2002, Derailment of Union Pacific Railroad Train, Eunice, Louisiana, May 27, 2000, NTSB Synopsis RAR-02-03.

These two accidents have prompted questions within DOTD of whether or not state-sponsored support of track inspection activities might be merited. The Federal Railroad Administration (FRA) is the federal agency charged with oversight for rail safety. States can participate in track inspections through the Federal Safety Program, a partnership with the FRA. The state inspectors could supplement FRA inspections. They could utilize the same database and make the same reports and inspections, while working both independently and jointly with federal inspectors.

SECTION 4: FINDINGS AND RECOMMENDATIONS

FINDINGS AND RECOMMENDATIONS

Key *findings* of this State Rail Plan are as follows.

Freight Rail Findings

- Louisiana has an extensive freight rail network, consisting of six Class 1 railroads, 11 small short line and terminal railroads, and more than 2,700 route miles.
- Louisiana is a major origin and destination for rail traffic. The state also serves as an avenue for through rail traffic, whose tonnage is greater than either originating or terminating tonnages.
- The state's 11 small railroads, which fulfill a fundamental economic role in linking shippers with the national freight rail system, have unmet capital needs totaling \$102.6 million, of which 39 percent related to the "286 problem", i.e., track improvements needed to handle heavier car weights.
- There are numerous examples of successful, state-sponsored rail programs which have helped in providing funding to capital-starved small railroads.
- Legislation pending in Congress may provide funding source opportunities for short lines.
- A survey of 72 Louisiana rail shippers indicated that these shippers believe their overall quality of rail service has declined over the last 10 years, while their overall quantity of rail shipments have increased. That is to say, when demand in recent years has never been higher, service has never been worse.
- The shippers reported rail traffic bottlenecks in New Orleans, Houston, Shreveport, and Baton Rouge that are affecting the quality of their rail service.
- Looking to the future, the shippers voiced a concern over the effects that further major rail system consolidations and continuing bottlenecks may have on the quality of their rail services.
- The state's rail shippers feel there is a role for DOTD to play with regard to advocacy on their behalf with the freight railroads serving them, and with regard to providing regulatory oversight for safety and service.



Passenger Rail Findings

- Existing passenger trains serving Louisiana carry a moderately increasing number of riders, but growth is limited by a lack of passenger cars to increase train length.
- Except for New Orleans, stations serving these trains have only minimal passenger facilities and amenities.
- There is sizable personal travel occurring in several corridors into and across the state. Some of these corridors could become viable passenger rail corridors in the future.

Recommendations

- Educate the state's Congressional delegation on the need for funding a federal rehabilitation grant and loan program benefiting the state's 11 small railroads. H.R. 1020, H.R. 2950 (RIDE-21), and S. 1530 (RAIL-21) would create such a funding program. This could be accomplished without the incursion of additional resources by LDOTD.
- Continue and expand Louisiana's Freight Rail Advisory Council. Oregon DOT's Freight Advisory Committee offers a relevant model. Broadly based, it consists of Class 1 carriers, small railroads, shippers, express companies, and truckers – all of whom either manage or utilize the freight rail system. The purpose of the committee would be to advise and guide state freight rail policy on a recurring basis. Continuation and expansion of the Freight Rail Advisory Council is estimated to cost LDOTD an additional \$10,000/year.
- Support the interests of rail shippers and small railroads on an as-needed basis. A specific responsibility would be to raise shippers' and small railroads' concerns on quality of the rail service that they are experiencing with the major carriers. Again, Oregon DOT's Rail Division provides a relevant example (see Appendix B). At the request of shippers, the Rail Division confers with Class 1 railroads where appropriate in efforts to facilitate improvements in service.
- Help the state's small railroads secure the grants and loans they may need from existing and future federal assistance programs. There are many relevant examples of successful state programs cited in this plan that accomplish this task. LDOTD could assist small railroads in identifying potential funding sources and in qualifying for these sources – conceivably by even helping them fill out required forms. LDOTD also could facilitate meetings between railroads and federal funding agencies.
- Establish state funding for railroads. A level of \$3-5 million per year for railroad assistance is in line with funding levels provided by other states (see Appendix B). This program would allow some funding for projects affecting Class 1 railroads. It is important that these resources be directed towards the planning and implementation of improvements to small railroads. As 39 percent of unfunded capital needs identified by the state's small railroads were specific to the "286 problem", priority should be given to projects enabling small railroads to handle heavier total car weights. Additionally, LDOTD should undertake a study to determine where the track structure is insufficient to handle 286,000-pound cars.

Short line railroad crossing signal circuitry is often old, and frequently causes maintenance difficulties. Some of the state funding for small railroads should be dedicated to the planning and prioritization of improvements that address these and other small railroad infrastructure deficiencies.

Another portion of the state funding for small railroads should be dedicated towards an analysis of the benefits that could be accrued by hauling various agricultural commodities via railcars instead of by truck.

Finally, it is recommended that anything remaining in the small railroads fund be dedicated towards matching any federal passenger rail funds that are available to the state.

- Support improvements to increase ridership and fare box recovery ratios. LDOTD should continue to be an advocate for improving service reliability and providing daily service on existing Amtrak routes. LDOTD also should explore opportunities to secure federal matching funds for existing and potential passenger rail services. These activities could be conducted under the auspices of an expanded Rail Division at LDOTD.
- Continue to study existing and potential passenger rail corridors (e.g. Houston, Baton Rouge, New Orleans, and Atlanta) where ridership levels can be sustained or increased. It is estimated that \$200,000 would be sufficient to provide for one or more of these studies every year.
- Provide an additional \$3-6 million per year for the LDOTD's Highway-Rail At-grade Crossing Improvement Program. LDOTD should begin an evaluation program identifying the most dangerous crossings as candidates for grade separation projects. Crossings identified as warranting less-intensive treatment than grade separation could then qualify for warning alarm / gate treatments. Related to this is the idea that highway-rail at-grade crossings should be evaluated as a routine component of the roadway improvement planning process.
- Monitor, study, and potentially fund ongoing rail-related projects that may be important to the economic competitiveness of Louisiana. These would include the Millennium Port Project, the North Shore Freight Distribution Rail Shuttle, the Louisiana Airport Authority's Cargo Airport Project, and rail connectivity to sugar cane mills.
- Fund a staffing increase of the LDOTD's Rail Section to accomplish the recommendations cited above, as well as its existing responsibilities. The Section currently has one staff member, who is addressing both freight and passenger rail issues in Louisiana.

Rail Section staff should include a Rail Safety and Compliance Officer to monitor the federal track inspection program. This safety officer would not conduct inspections, but rather ensure that federal inspections are completed as prescribed. Additionally, the safety officer would review all safety inspection reports, coordinate with the railroads to ensure all safety discrepancies are addressed, and, when appropriate, develop funding strategies with the railroads to facilitate the necessary capital improvements / maintenance to provide for safe rail operations.

Two other rail program managers would facilitate the flow of safety inspection information between those who collect data on rail system condition and those who prioritize and program improvements for the system. Additionally, they would support rail shippers and small railroads in service issues with Class 1 railroads, as appropriate; assist small railroads in securing federal funds for improvements; administer state funds for small railroads; coordinate the Sugar Cane Train; conduct the continuing Freight Rail Advisory Committee meetings; and conduction studies of future passenger corridors, among other things.

Thus, three new staff members should be sufficient to handle the recommendations cited above. The addition would yield a total of four people in the LDOTD's Rail Division. The cost of this staffing increase is estimated to be approximately \$300,000, including all benefits, or \$100,000 per person.

- Monitor, study and potentially fund ongoing rail-related projects that may be important to the economic competitiveness of Louisiana, including the Millennium Port Project, the North Shore Freight Distribution Rail Shuttle and rail connectivity to the proposed Louisiana Transportation Center.
- Research incentive programs for closures of public and private grade crossings.



APPENDIX A RAIL TRAFFIC FLOWS

This appendix contains spreadsheets for originating, terminating, intrastate, and through rail shipments between 1990 and 1999. The data includes carloads and tons by commodity. The commodities are identified by STCC numbers. A key to the STCC numbers appears below.

Key: STCC Numbers and Corresponding Commodities

01	Farm products
08	Forest products
09	Fresh fish or other marine products
10	Metallic ores
11	Coal
13	Crude petroleum, natural gas, or gasoline
14	Non metallic minerals
19	Ordnance or accessories
20	Food or kindred products
21	Tobacco products
22	Textile mill products
23	apparel, or other finished textiles
24	Lumber or wood products
25	Furniture or fixtures
26	Pulp, paper, or allied products
27	Printed matter
28	Chemicals or allied products
29	Petroleum or coal products
30	Rubber or miscellaneous plastics products
31	Leather or leather products
32	Clay, concrete, glass or stone products
33	Primary metal products
34	Fabricated metal products
35	Machinery
36	Electrical machinery or equipment
37	Transportation equipment
38	Instruments, photographic goods or optical goods
39	Miscellaneous products of manufacturing
40	Waste or scrap materials
41	Miscellaneous freight shipments
42	Containers, carriers or devices
43	Mail and express traffic
44	Freight forwarder traffic
45	Shipper association or similar traffic
46	Miscellaneous mixed shipments
47	Small packaged freight shipments
49	Hazardous materials



APPENDIX B STATE RAIL ASSISTANCE PROGRAMS

This appendix contains a discussion of seven state rail assistance programs that have been successful in helping fund short line needs. The purpose of the presentation is to reveal different assistance program approaches and funding sources.

PENNSYLVANIA

The Penn Central Railroad bankruptcy of 1970¹ and those of other eastern railroads were the beginning of public-sector rail planning. Concerned with the preservation of service, first the federal government and later the states, began addressing the issue. The Regional Rail Reorganization (3R) Act of 1973 established the United States Railway Association (USRA) to manage many of the former Penn Central lines². The 3R Act included temporary support of other lines in the Northeast not managed by the USRA. This legislation was superseded by the Railroad Revitalization and Regulatory Reform (4R) Act of 1976.

Program History

Due to the many Penn Central lines in the state, Pennsylvania was hard hit and the Pennsylvania Department of Transportation (PennDOT) began rail planning activities in 1974. Prior to 1973, the Commonwealth's involvement, like most of the states, was limited to regulatory functions through the Public Utility Commission and grade crossing matters associated with its highways.

The Department's initial activities involved analysis of the economic impacts of abandonments proposed by USRA in its rationalization planning for the Northeastern system. When the USRA's efforts culminated in the formation of Conrail in 1976, the railroad owned 1,400 fewer miles of track in Pennsylvania than did its predecessors. Operations were continued on 430 of those 1,400 miles through the federal program. In addition, 180 miles of line were acquired between 1976 and 1983 (the Commonwealth has since disposed of some of these properties). Between 1976 and 1995, \$190 million were spent on rail preservation and improvement. Of the total, \$126 million came from Commonwealth funds.

Current Program

Pennsylvania ranks first nationwide in the number of railroads in the state, having 70; and fifth in the total number of route miles, having 5,600. The vast majority of the railroads fall into the regional, local and terminal categories. To address problems typically associated with these carriers, the Commonwealth uses its Rail Freight Assistance Program (RFAP). The intent of the program is twofold – 1) preserve essential service where economically feasible, and 2) preserve or stimulate economic development through new or expanded rail freight service.

The Bureau of Rail Freight within PennDOT administers the program. Funding, derived from appropriations from the General Fund, is available on a matching basis for rehabilitation and construction. A rehabilitation project is eligible if it is for a level that is sufficient for safe operation and has a useful life of at least five years. The purchase of land, buildings, or materials

¹ The former New York Central Railroad and Pennsylvania Railroad systems merged in 1968 to create the Penn Central. The combined system slipped into bankruptcy less than two years later due to persistent high costs, diversion of traffic to trucks, and internal management strife.

² The USRA was established by congress to manage the Penn Central and other bankrupt eastern railroad systems. This organization eventually became Consolidated Rail Corporation, also known as Conrail (recently acquired by Norfolk Southern Railway and CSX Transportation).



to construct buildings are not eligible. Participation by the Commonwealth is limited to \$300,000, or 75 percent of the actual cost, whichever is less. Construction follows the same guidelines with the exception of the funding maximum, which is \$100,000, or 50 percent of the total cost, whichever is less. However, projects with costs in excess of \$100,000 may become candidates for state capital budget submission.

Funding levels of \$8-9 million annually are typical for RFAP, as are \$3 to 5 million for capital budget funds. Based on data provided by PennDOT, RFAP funding averaged approximately \$125,000 per project over the last two years, and capital budget projects averaged \$617,000. There is a wide range of expenditures per project, however, especially for capital budget expenditures.

Grade Crossings

Grade crossings are handled by the Public Utility Commission.

OHIO

The Ohio rail program was originally located within the Ohio Department of Transportation (ODOT), but in 1994, the Ohio General Assembly created the Ohio Rail Development Commission (ORDC), with duties to administer the rail transportation network in the state. ORDC's mission statement is to "...plan, promote, (and) implement improved movement of goods and people faster and safer on a rail transport network connecting Ohio to the nation and the world." Through grant and loan programs, ORDC is to partner with public and private agencies to fulfill this mission. Among its specific duties, ORDC is to:

- Facilitate economic development, which includes creating new jobs by improving or rehabilitating existing lines;
- Improve passenger and freight service through an intermodal transportation network; and
- Increase safety at rail grade crossings.

Funding

ORDC's 1998-1999 biennium budget was \$46.2 million. About \$14.2 million of this sum came from the state, mostly from ORDC's 50 percent share of the Corporate Franchise Tax paid by the railroads. Another \$30 million in federal funds was allocated for grade crossing improvements. In addition, ORDC had other funds (\$520,000) available from loan repayments for previously approved projects.

Current Programs

There are two current programs used to fulfill ORDC's mission. Within these programs are specific projects or objectives as shown below.

- Development Program
 - Industrial Development Projects: to promote industry and jobs.
 - Railroad Rehabilitation Projects: to provide safety improvements and greater efficiency.
 - Passenger Station Improvements: to promote passenger rail through construction and rehabilitation.

- Rail Safety Improvements
 - Corridor Improvements: to improve important crossings, and close redundant/dangerous crossings.
 - Grade Crossing Warning Projects: to install/upgrade active warning devices at critical crossings.
 - Grade Crossing Surface Improvement Projects: a trial program to repair or upgrade a limited number of grade crossing surfaces in the state.

1998 Ohio Rail Projects – Utilizing grant and loan mechanisms, ORDC implemented \$4.75 million worth of projects across the state in 1998. As an example of project expenditures, the 1998 expenditures by category and distribution type are shown following.

A. Development Program (Industrial spur/rail construction):

<u>Projects</u>	<u>Grants</u>	<u>Loans</u>
10	\$1,018,750	\$835,000

B. Development Program (Rehabilitation):

<u>Projects</u>	<u>Grants</u>	<u>Loans</u>
4	\$1,970,000	\$900,000

C. Development Program (Other):

<u>Projects</u>	<u>Grants</u>	<u>Loans</u>
2	\$27,500	0

D. Totals

<u>Projects</u>	<u>Grants</u>	<u>Loans</u>
16	\$3,016,250	\$1,735,000

INDIANA

The heart of Indiana's rail corridor preservation and development effort is the Industrial Rail Service Fund. It has been a loan program since the mid 1980s, but lately, some funding has been in the form of grants.

Funding Sources

Monies for the program are derived from the general state sales tax. More specifically, the program is the recipient of 0.04 percent of state receipts. This equates to \$1.3 to \$1.4 million annually. In addition, since the program has been predominately a loan program, repayments constitute another source of funds for new expenditures. Repayments have been averaging \$1.5 million per year.

Project Selection

The project selection process is begun each year by notifying the state's rail carriers (there are 30 short lines in the state) that the process is beginning and that applications should be submitted to



the Railroad Section of the Indiana Department of Transportation. The applications require detailed responses that often comprise 20 pages or more. The applications are scored and prioritized. A benefit-cost analysis is part of the process.

Eligibility

Both public and private operations are eligible for assistance, and for grants as well as loans. In the case of private-sector parties, financial needs are considered. The maximum funding that is provided to any one railroad is \$200,000 to \$250,000. A minimum match of 25 percent is required.

Safety

The grade crossing program, or at least as it concerns those crossings with active warning devices, is shared with the highway side of the Department. Section 130 funds are the funding source. There is a program for passive warning devices that resides in the Railroad Section. Funded with \$500,000, assistance to both railroads and counties is available to help with reflectorized markings and signs, and advanced warnings.

ILLINOIS

Fifty different railroads³ operate over 7,500 route miles in Illinois (second only to Texas). In addition, the state has two of the nation's top east-west gateways – Chicago, the largest in the country, and East St. Louis – and thus experiences large volumes of overhead traffic. The Illinois Department of Transportation's (IDOT) rail freight improvement program focuses on preservation of essential rail service for communities and rail users faced with rail line abandonment.

The Bureau of Railroads within the IDOT administers the Rail Freight Program (RFP) which has existed since the late 1970s. It is a loan program with low interest (3 to 4 percent) and long repayment periods (10-15 years) targeted for rehabilitation and new construction. Both loan repayments and annual appropriations (\$3.5 - \$5 million) fund new projects. Grants are available on occasion, but usually only when working with a public agency and a multitude of jobs are dependent on the availability of rail service.

The Bureau of Railroads becomes involved in grade crossings only when they are incidental to rehabilitation or construction projects. The highway side of IDOT and the Illinois Commerce Commission are the parties with the primary responsibility.

WASHINGTON

Program History

The Washington State Rail Program was based on the federal effort until 1983. In that year, the Washington State Legislature, recognizing the growing concern about rail line abandonment, established the Essential Rail Assistance Account in the state general fund to preserve and maintain essential rail service. The legislation also authorized the formation of county rail districts and directed the Washington State Department of Transportation (WSDOT) to prepare an update of the State Rail Plan. However, funds were not authorized for the account.

In 1985, the State Legislature amended the state statute authorizing "rail banking," the state or local purchase of abandoned railroad rights-of-way.

³ 9 Class 1, 8 regional, 20 short lines, and 13 switching and terminal companies.

In 1989, the Legislature first appropriated funds to the Essential Rail Assistance Account (ERAA) and the newly established Essential Rail Banking Account (ERBA) generated from the sale of state general fund bonds. However, the authorization for administration of these accounts did not pass the Legislature.

Convened in 1987, the State Rail Development Commission (RDC) reviewed the state's rail system and the state's rail program and found that:

- Rail abandonments affect the economic health of Washington's rural communities and state highways and local roads;
- Freight mobility impacts the state's economy;
- There was a need for a coordinated freight rail program; and
- The freight rail program should address coordination, planning, and technical assistance.

The RDC made subsequent recommendations, which were enacted by the State Legislature as part of the 1990 High Capacity Transportation Act and were codified in Revised Code of Washington (RCW) 47.76. The Act included legislative authorization and a policy framework directing the WSDOT to coordinate and implement a Freight Rail Program as part of a balanced multimodal transportation system. In 1993, amendments to the statute clarified and refined elements within the program, established the content of the rail plan, established a technical evaluation process for rail assistance, a rail preservation program, and criteria for identifying the state's essential rail system.

Early in 1994, the WSDOT Rail Branch convened an advisory committee (the Washington State Freight Rail Policy Development Committee) to assist the Department in evaluating the state's freight rail program and policies, and to recommend changes to the Transportation Commission and the Legislature as appropriate. This evaluation was intended to address changing economic and service conditions within the state and the rail industry.

Subsequently in 1995, the Legislature not only reconfirmed its earlier findings, but saw fit to broaden the focus of the WSDOT Freight Rail Program. In recognition of freight mobility needs and links to the state's economic future, RCW 47.76 was revised in 1995 to address additional rail issues related to mainline congestion and port access in addition to light density lines and corridor preservation.

In 1996, under Engrossed Substitute House bill 2832, the Department was further directed to work in partnership with Washington State Parks and Recreation and the Department of Natural Resources to:

- Facilitate the completion of a cross-state trail;
- Maintain ownership of the former Milwaukee Road Corridor between Ellensburg and Lind; and
- Determine the value of the Corridor as a re-instituted rail line.

This was to be done while exploring the possibility of developing a franchise agreement to use this corridor for future rail service.

Current Program

Washington State Freight Rail Program funding is available from the Essential Rail Assistance Account (ERAA). Funds in this account may be distributed to county rail districts, port districts, counties, economic development councils and cities. Funds are provided as low interest loans



wherever practical but can be granted to public entities. In the case of privately owned projects, funds can be provided only as loans. Funds may be used for the following purposes:

- Acquiring, rebuilding, rehabilitating, or improving rail lines;
- Purchasing or rehabilitating railroad equipment necessary to maintain essential rail service;
- Constructing railroad improvements to mitigate port access or mainline congestion;
- Construction of transloading facilities to increase business on light density lines or to mitigate the impacts of abandonment;
- Preservation, including operation, of light density lines, as identified by WSDOT; or
- Preserving rail corridors for future rail purposes by purchase of rights-of-way. Purchase of rights-of-way may include track, bridges, and associated elements, and must meet the following criteria:
 - i. The right-of-way has been identified and evaluated in the state rail plan;
 - ii. The right-of-way may be or has been abandoned; and
 - iii. The right-of-way has potential for future rail service.

State Budget

Since state funds were first authorized in 1991, WSDOT has received \$12.1 million for freight rail planning and project appropriations from the State Legislature are shown in the following table by biennium.

**Table B-1
Washington State Rail Budget**

Biennium	Amount
1991 – 1993	\$1,696,206
1993 – 1995	1,906,305
1995 – 1997	2,440,745
1997 – 1999	1,006,000
1999 – 2000	5,100,000*

* for project funding

Grain Train Program

One of Washington’s projects is unique and is presented here as information. The Grain Train Program was developed in 1994 in response to chronic grain car shortages in the Palouse Region of Eastern Washington. Without an adequate supply of grain cars, 200 miles of light density rail lines were at risk of abandonment. The preservation of service on these lines reduces energy costs and avoids considerable road damage that would occur if the grain was shipped by trucks. Utilizing federal Stripper Well overcharge funds (\$750,000), WSDOT agreed to purchase 29 covered hopper grain cars in return for commitments from four grain co-ops to ship their grain on designated light density rail lines. The Port of Walla Walla manages the fleet on behalf of WSDOT. The program has been self-sustaining from car-hire payments since initial purchase of the equipment.

OREGON

The State of Oregon has funded a variety of state rail projects since 1979 when the Oregon Department of Transportation (ODOT) was given legislative authority to participate in the federal rail program. The State Rehabilitation Fund was established in 1985, and permitted governmental jurisdictions to enter the railroad business for profit.

Federal Fund Use

Federal funds were obtained from the Local Rail Freight Assistance (LRFA) program and its predecessor, the Local Rail Service Assistance Act (LRSA). Between 1980 and 1994, Oregon used \$7.9 million in LRSA/LRFA funds. The funds were used in combination with monies from other sources.

State Funds

The State of Oregon requires the participation of local jurisdictions in funding rail projects. Revenues from ports are also utilized to support rail projects. The two most common state funding sources are:

- **State Rehabilitation Fund** - This fund is supported through the General Fund and administered by ODOT. It can be used for rail line acquisition, rehabilitation, or improvement of rail properties, planning or other methods of reducing costs resulting from loss of rail service. However, this program has never been funded.
- **Economic Development Department Funds** - A portion of the State Lottery (authorized in 1984) proceeds is directed towards Oregon's economic development effort. It has been used to support rail line acquisition and rehabilitation projects. A limited amount has also been used to conduct planning and rail feasibility studies. Grants and loans are used to distribute funds, which are based on availability and a competitive process. About \$4.5 million have been distributed through this program.

Advisory Committees

ODOT receives input on freight rail issues from two advisory committees, which help guide the department's freight policy decisions. These are:

Freight Advisory Committee – This is a broad based, multi-modal committee. Its membership consists of the Class 1 railroads (UP and BNSF), short line and terminal railroads, shippers, express companies, and truckers. Members of the committee are appointed by the Oregon Transportation Commission, which oversees transportation investments in the state. The ODOT Director chairs the meetings. The committee meets monthly when the legislature is in session, and quarterly when it is not. The purpose of the committee is to advise ODOT on key freight issues, and to provide input to ODOT on its ongoing work.

Rail Freight Advisory Committee – This committee is a creation of ODOT. Its purpose is to advise the department current trends and specific freight rail issues. Its membership consist of representatives of the Oregon Short Line Railroad Association, the Class 1 railroads, various specific short lines, rail shippers, a rail served port (usually the Port of Portland, and the Oregon Economic and Community Development organization. The committee meets on an irregular basis. Various members of this committee advise ODOT in the periodic update of the Oregon Rail Plan.



Summary

Even though the ODOT has a wide mandate to address rail-related issues, funds for rail projects have been lacking. The Economic Development Department funds that have been used are not designed to deal specifically with the needs of the rail industry. In some cases, project funds have been so narrowly defined that rail issues are difficult to address. That being said, the department's outreach efforts vis a vis the two advisory committees provide with direct stakeholder input to help guide ODOT efforts to support the state's freight rail service.

Apart from these outreach efforts, ODOT's Rail Division also serves as an advocate for state rail shippers. The ODOT Rail Division has performed this role for many years. At the request of shippers, and where justified, the Rail Division has engaged Class 1 railroads in efforts to facilitate service improvements for shippers.

IOWA

Iowa was an early participant in rail line preservation effort. It has developed a number of state-sponsored rail programs.

Rail Assistance

This program was created in 1974 to assist retention of service on essential rail lines. Over 1,800 miles have been rehabilitated since that time with \$170 million in federal, state, railroad and shipper funds. Currently funding averages \$1.2 million annually, including loans and grants. Annual appropriation is from the General Fund, which is also used to fund economic development and Iowa Railway Finance Authority (IRFA) projects.

Iowa Railway Finance Authority (IRFA)

This authority offers assistance to finance acquisition and improvements, or to refinance essential rail lines. Funding can take the form of loans, grants, limited partnerships or state ownership and operation. Since 1981, the IRFA has financed about \$44.7 million in projects. Current funding is from the General Fund.

Rail Economic Development

As an appropriation from the General Fund (through rail assistance), this program helps to provide and/or maintain rail service to companies that create or retain jobs. The project typically involves rehabilitation or construction of spur tracks to serve new industries or improve service to existing industries.

Federal Aid Rail/Highway Crossing Safety Fund

Typically used to install or upgrade crossing signal devices, this program allocates an average of \$3.4 million is for these purposes from federal highway funds. Other projects that can be implemented using this fund are closing crossings, widening crossings, improving sight distance, etc.

State Grade Crossing Surface Repair Fund

The fund assists railroads and highway jurisdictions to repair or rehabilitate rail-highway grade crossing surfaces. The Road Use Tax Fund is used for these projects (\$900,000 annually).

State Grade Crossing Safety Fund

The purpose of this fund is to assist in the maintenance of crossing signals installed since 1973. An annual sum of \$700,000 is appropriated from the Road Use Tax Fund for this effort.

Rail Revolving Fund

This is a loan program created in 1998 by the Iowa Legislature for a variety of rail-related projects for both branch and main lines. Its initial funding is derived from IRFA and rail assistance loan repayments.



APPENDIX C GLOSSARY OF TERMS

A

3R Act Acronym for the Regional Rail Reorganization Act of 1973.

4R Act Acronym for the Railroad Revitalization and Regulatory Reform Act of 1976.

A-95 Review OMB Circular No. A-95 provides State and local agency evaluation, guidelines for review and coordination of federal assistance programs and projects. Replaced by Executive Order 12372 issued July 14, 1982.

AAR or A.A.R. (Association of American Railroads) An industry association whose responsibilities include safety standards (including design standards and approval), maintenance, operations, service and repair standards car service rules research, etc.

AAR Manual of Standards and Recommended Practices (MSRP) Publication concerning the technical specifications and quality assurance requirements for interchange freight cars and components. Considered mandatory when specifically referenced in MR Interchange Rules.

Abandoned Rail line or rail facility no longer being served by a common carrier railroad (tracks or other rail facilities may still be in place). The ICC has granted the railroad authority to terminate service and remove the track.

Abandonment Line or facility where termination of rail service is being considered. Also, the legal proceeding wherein railroads must formally apply to the ICC, follow federal regulations, and receive authority to abandon service before it can do so.

ABS (Automatic Block Signals) On a specific section or length of track, an arrangement of automatic signals governing each block.

ACI Automatic Car Identification System used to provide for automated identification of cars in a train by owner, number and equipment classification, etc. when read by a wayside scanner. See *AEI*

ADO Acronym for the Alabama Development Office.

Adhesion A measure of the ability of locomotive driving wheels to generate tractive force, usually expressed as a percent of the total weight on the drivers.

AEI (Automatic Equipment Identification) An automatic car scanning system to assist railroads in tracking and tracing cars. The system requires a transponder mounted on diagonally opposite corners of each railcar or other equipment to respond to radio frequency interrogation.

Air Brake The general term used to describe the braking system used on most railways operating in North America.

Alianment (or Alinement) The horizontal location of a railroad as described by curves and tangents.

- Alternating Current** An electric current that serves its direction at regular intervals.
- Alternator** A device that generates alternating current electricity, or, an electrical machine on a locomotive unit and driven by the diesel engine. When rotated, the alternator generates alternating electrical current subsequently adapted for use by the traction motors.
- Ammeter** An instrument for measuring electric current in a circuit.
- Amperage** A unit of measure of electrical current.
- Amtrak** is another name for The National Railroad Passenger Corporation, which was created by an act of Congress effective May 1, 1971, to operate a nationwide passenger service.
- Angle Cock** Manually operated valve at ends of car or locomotive opening or closing air brake train line.
- Anti Creeper** See *RailAnchor*.
- APB (Absolute Permissive Block)** On a specific section or length of track, an arrangement of signals and circuits automatically providing absolute protection from control point to control point against opposing train movements while permitting following movements under block signal protection.
- Approach Locking** A time sensitive electrical locking system to prevent the movement of track switches in a given route after a train is committed to that route, while at the same time protecting that route from opposing or conflicting movements.
- APSC** Acronym for the Alabama Public Service Commission.
- AREA (American Railway Engineering Association)** Professional organization whose membership is comprised of Railroad maintenance-of-way officials. The AREA develops and established material specifications and track construction standards. See AREMA.
- AREMA (American Railway Engineering and Maintenance-of-Way Association)** Organization formed in 1998 encompassing the AREA, Roadmasters and bridge and Building Associations and the MR Communications & Signals Division in establishing and maintaining standards and recommended practices across the board.
- Armature** The rotating part of a direct current motor or generator. It consists of a laminated iron cylinder or core keyed to a shaft, in the slots of which are wound the armature coils of insulated copper wire or bars. In alternating current machinery the armature is frequently the stationary element.
- Articulated Cars.** Two or more car bodies permanently coupled by slackless connections over shared trucks.
- Automatic Block Signals (ABS)** A means of protecting a section or block of track against conflicting usage. ABS utilizes automatic signals that are actuated by a train or other usage of the track.

Automatic Brake The air brake system used on a train. The automatic brake is controlled by a pressurized air pipe or brake pipe which runs the length of the train. A reduction or drop in the pressure in this train line, called a brake pipe reduction (BPR), causes air brakes to apply on each car.

Automatic Coupler *See Coupler.*

Automatic Interlocking *See Interlocking Automatic.*

Automatic Train Control. An electric or mechanically operated device attached to the locomotive and acting in conjunction with current in rail, magnets, ramps or trips attached to the tracks, which permits the control of, or the automatic stopping of trains in case of dangerous speeds or other unsafe operating conditions.

Automatic Train Control System (ATC) 1) A track-side system working in conjunction with equipment installed on the locomotive, so arranged that its operation will automatically result in the application of the air brakes to stop or control a train's speed at designated restrictions, should the engineman not respond. 2) When operating under a speed restriction, an application of the brakes when the speed of the train exceeds the predetermined rate and which will continue until the speed is reduced to that rate. ATC usually works in conjunction with cab signals.

Automatic Train Operation (ATO) A system by which speed and other control signals from the wayside are automatically received and translated into train response, with appropriate ATC supervision to assure operating safety.

Automatic Train Stop System (ATS) A track side system working in conjunction with equipment installed on the locomotive, so arranged that its operation will result in the automatic application of the air brakes should the engineman not acknowledge a restrictive signal within 20 seconds of passing the signal. If the restrictive signal is acknowledged, ATS will be suppressed.

Axle The steel shaft on which the car wheels are mounted. The axle holds the wheels to gauge and transmits the load from the journal bearing to the wheels.

B

"B" End of Car The end on which the hand brake is located. If the car has two hand brakes, the "B" end is the end toward which the body-mounted brake cylinder piston moves in the application of brakes or the end on which the retaining valve is located (if such a valve is used). If none of the above definitions are applicable, the car owner shall arbitrarily designate the "B" end.

"B" Unit A diesel unit without a cab and without complete operating controls. "B" units are usually equipped with hostler controls. "B" units are usually equipped with hostler controls for independent operation at terminals and engine houses.

Back Haul A return trip.



- Bad Order** A car which is in need of mechanical attention.
- Balance Speed** A speed at which the tractive effort of the locomotive exactly balances or equals the sum of all the train, grade and curve drag forces. At this speed, there is neither acceleration nor deceleration.
- Ballast** Heavy material such as slag or crushed stone used to support and hold crossties in alignment and elevation after rails have been spiked to them. Should be a material which is stable, easily tamped, permeable, and resistant to plant growth.
- Ballast Car** A car for carrying and distributing ballast for repair and construction work, usually of either the flat, gondola, or hopper type.
- Ballast Regulator** A track-mounted machine for moving ballast to provide the desired cross-section, usually including brooms to clear ballast from the ties.
- Ballast Undercutter Cleaner** A production machine that removes the ballast from the track, cleans it, and returns it back to the track in one continuous operation.
- Ball of the Rail** This is the top of the rail on which the wheels roll.
- B/C** Acronym for benefit/cost ratio. Calculation of this ratio is made by dividing all quantified benefits by the total cost of a project.
- Bessemer Process** A steel making process whereby liquid pig iron is converted to steel by forcing air at atmospheric temperature through the metallic bath in a converter in which no extraneous fuel is burned, resulting in the oxidation or reduction of the carbon, manganese and silicon to the extent desired and their removal in the form of slag.
- Bill of Lading** A carrier's contract and receipt for goods specifying that the carrier has received certain goods which it agrees to transport from one place to another, and to deliver to a designated person or assignee for such compensation and upon such conditions are specified therein.
- Block** 1) A length of track of defined limits, the use of which by trains is governed by block signals. 2) A group of cars, assembled in the process of classification for movement to a specified common destination.
- Block Signal** A fixed signal at the entrance of a block to govern trains and engines entering and using that block. (Standard Code)
- Block System** A series of consecutive blocks within ABS, ATC, CTC and Interlocking.
- Body Center Plate** A circular cast or forged steel plate on body bolster at the car centerline, the function of which is to mate with the truck center plate and transmit the body bolster load to the truck.
- Body Side Bearing** Flat steel bearing pads fastened to the body bolster, a standard distance outboard from the center pin hole, the function of which is to support the car or the mating

truck side bearing when variations in track cross level or other train dynamics cause the car to rock transversely on the center plates.

Bolster See Container *Bolster*, *Truck Bolster*.

Bolster Anchor Rods One at each end of the bolster of passenger car trucks, the ends of which are mounted in rubber, one on an arm integral with the truck frame and the other on the end of the bolster so as to guide the lateral and vertical movement of the bolster and position that it is always free from contact with the truck transoms.

Bolster Gibs Small projections at each end of a truck bolster that engage the side frame column guides and provide vertical guidance for the bolster and lateral restraint to the side frames when assembled as a truck.

Bolster Pad In a tank car, a plate welded directly to the exterior of the tank at each body bolster location to which the remaining body bolster structure is attached.

Bolster Springing The secondary suspension element in a car truck, supporting the truck bolster, on which the weight of the car rests, on the truck frame or swing hangers.

Boxcar A closed car having a floor, sides, ends and a roof with doors in the sides, or sides and ends. Used for general service and especially for lading which must be protected from the weather, subsequent damage.

Brake Beam The immediate supporting structure for the two brake heads and two brake shoes acting upon any given pair of wheels. In freight service the virtually universal type is of truss construction consisting primarily of tension and compression members fastened at the ends and separated at the middle by a strut or fulcrum to which the truck brake lever is attached. Brake beams are said to be inside hung or outside hung, according to whether they are in the space between the axles or outside the axles.

Brakeman One who brakes a train, keeps a lookout for potential problems on moving trains, and uncouples cars that are to be dropped off between the train's termini.

Brake Pipe A term properly used, applied to describe the continuous line of brake pipe extending from the locomotive to the last car in a train, with all cars and air hoses coupled. It acts as a supply pipe for the reservoirs and also is usually the means by which the car brakes are controlled by the engineman. When a train is made up and all brake pipes on the cars are jointed, the entire pipeline comprises what is commonly called the train line. The term is often used to refer to the brake pipe on a single car.

Brake Pipe Reduction (BPR) A reduction in air pressure in the train brake pipe. This pressure reduction causes air to flow from the air reservoir on each car to the brake cylinder, thus causing the brake to apply and produce a retarding force on the train.

Branch Line A secondary line of a railway, as distinguished from the main line sometimes defined as a line carrying from 1.0 to 5.0 million gross tons per year.

Bridge Plate A hinged device affixed to a TOFC flatcar at the BR and AL corners used to span the gap between coupled cars to enable circus loading of trailers. Flatcars with 15" end of car



cushioning require auxiliary bridge plates at the BL and AR corners to provide the additional spanning length necessary when coupled to standard draft gear cars.

Broad Gauge A rail track gauge that is greater than 1.435 m (4 ft. 8.5 in.).

Buff A term used to describe compressive coupler forces. The opposite of draft.

C

Cab Car A passenger-train car equipped with train-line connected controls such that it can serve as the lead unit in a train being pushed by a locomotive at the rear of the consist.

Caboose A car usually placed at the rear of a train which provides an office and quarters for the conductor and/or trainmen while in transit, and for carrying the various supplies, tools, etc., used in freight train operations: From the caboose, the crew is also able to observe the condition of the train and initiate measures to stop the train if unfavorable conditions arise. Sometimes called "Cabin Car," "Way Car," or "Van."

Cab Signal A signal located in engineman's compartment or cab, indicating a condition affecting the movement of a train or engine and used in conjunction with interlocking signals and in conjunction with or in lieu of block signals.

Cant (of a Rail) A rail's inward inclination effected by using inclined surface tie plates, expressed as a height-to-width ratio: e.g., 1:20.

Capacity Consists of two different types: line (or route) capacity and terminal capacity. Line capacity is a function of: number and condition of tracks; characteristics of grades and curves; and other restrictions. Terminal capacity is a function of: size of facility, (e.g., number and length of tracks); quantity and type of equipment; degree of automation; and other factors.

Car Body The main or principal part in or on which the load is placed.

Car Days An expression referring to the number of days a car owned by one railroad is on the line of another railroad.

Car Float A flat-bottomed craft without power and equipped with tracks upon which cars are run from the land by means of a float bridge, to be transported across water.

Car Mile An operating term defined as one car, moved over one mile of track.

Car Retarder A braking device built into a railway-track to reduce the speed of cars being switched over a hump. Power activated shoes press against the lower portions of the wheels and slow the car to a safe coupling speed.

Car Service A term applicable to the general services of railroads with respect to car supply, distribution and handling; involving such matters as demurrage, interchange, per diem charges and settlements, private car line mileage statements and allowances.

Car Service Rules Rules established by agreement between railroads governing interchange of cars. See Interchange Rules.

Category I Lines Rail lines likely to be the subject of an ICC abandonment or discontinuance application within three years.

Category II Rules Rail lines which are under study and may be the subject of a future ICC abandonment or discontinuance application within 3 to 5 years.

Category III Lines Rail lines for which abandonment or discontinuance of service applications are pending before the ICC.

Category IV Lines All other rail lines, owned and operated.

Category V Lines All other rail lines, owned and operated.

Catenary On electric railroads, the term describing the overhead conductor that is contacted by the pantograph or trolley, and its support structure that supplies electricity to propel railroad trains.

Center Pin The large steel pin which passes through the center of both body and truck center plates and assists in keeping the two plates in proper alignment as the car is being placed on its trucks. In passenger train cars, also locks truck to car.

Center Plate *See Body Center Plate and Truck Center Plate.*

Center Sill The center longitudinal structural member of a car underframe, which forms the backbone of the underframe and transmits most of the buffing shocks from one end of the car to the other.

Centralized Traffic Control (CTC) A method of operation whereby the movement of trains over routes and through blocks on a designated section of track or tracks is directed by signals controlled from a designated point without requirement of train order authority and without regard to superiority of trains.

Centrifugal Force The force which seems to push a rotating object or its parts outward from a pivotal point.

CFR Acronym for Code of Federal Regulation. Contains federal laws and regulations.

Circus Loading A term used to describe an older method of loading highway trailers on TOFC (piggyback) flatcars, whereby a tractor backs the trailer up a ramp placed at one end of a cut of cars, and along the decks of the cars to the point of securement. Circus loading requires bridge plates at each end of all cars to enable the trailer and tractor to pass from car to car. *See Side Loading, Overhead Loading.*

Classification Yard A system of tracks used for storing cars, making up trains and other purposes.

Class I Railroad A railroad whose operating revenues are more than an annually designated amount – in 1998 \$255 million.



Class II Railroad A railroad whose operating revenues are between \$20.4 million and the Class I threshold.

Class III Railroads These have annual operating revenues of less than \$10 million.

Class of Truck FRA has established six categories of track based on specified criteria for maintaining truck. See FRA Track Safety Classification Table at end.

Clearance Diagram An outline or cross section drawing representing the maximum limiting dimensions to which rail equipment can be built. Specific limiting dimensions have been established and are shown on standard clearance diagrams known as "plates."

Clearance Envelope The cross sectional shape required to provide specified horizontal and vertical clearances for rail vehicle in motion.

Clearance Point The point where the minimum distance between converging/diverging tracks is sufficient to meet clearance envelope requirements when vehicles are on both tracks.

COFC An acronym for "Container On Flat Car." A type of rail-freight service involving the movement of closed containers on special flat cars equipped for rapid and positive securement of the containers using special pedestals or bolsters.

COG Acronym for Council of Governments. A consortium of local Government representatives from contiguous committees which make recommendations for solutions to regional problems. COGs may represent either a single county or several counties in a region.

Cog Railroad A tourist railroad climbing steep grades (e.g., 25+%) with the aid of a locomotive cogwheel engaging a rack rail.

Coil Spring A spring made by winding round wire or rods in a helical pattern around a circular core, used extensively in rail car suspension systems.

Coke Rack A slatted frame or box, applied above the sides and ends of gondola or hopper cars, to increase the cubic capacity for the purpose of carrying coke or other freight, the bulk of which is large relative to its weight.

Commodity A general term used to describe the contents of a car. Other terms such as "lading," or "product" mean the same thing and are often used interchangeably.

Common Carrier One who holds himself out to the general public to transport property and passengers in intrastate, interstate or in foreign commerce, for compensation. Common carriers must operate from one point to another over routes or in territory prescribed by the Surface Transportation Board (U.S. interstate) and by a Public Service or Public Utilities Commission (intrastate).

Compromise Joint (Bar) Joint bars designed to connect rails having a different height and cross-section, or rails of the same type but of different joint drilling.

Consist The makeup of a train, i.e., number and type or class of power units.

Container Bolster A container securement device generally used on raised center sill COFC cars. Container bolsters are arranged to mount transversely on a flatcar, and support the container at each end.

Continuous Welded Rail (CWR) Sections of rail welded together to form a single rail which measures up to 1,440 feet. It provides a much smoother ride, with less equipment and track damage, rail wear.

Conventional Rail (CR) Track having bolted joints rather than welded rail joints (as in CWR).

Corridor A major transportation route through a populated area.

Coupler A device located at both ends of all cars and locomotives in a standard location to provide a means for connecting a locomotive units together, for coupling to cars, and for coupling cars together to make up a train. The standard AAR coupler uses a pivoting knuckle and an internal mechanism that automatically locks when the knuckle is pushed closed, either manually or by a mating coupler. A manual operation is necessary to uncouple two cars whose couplers are locked together. *See E Coupler, and Sheriff Coupler Interchange Rule.*

Coupler Shank That part of a coupler behind the head and containing a either a slot or a pinhole at the rear portion for connection to the yoke and draft system.

Coupler Yoke A cast steel component of the draft system that functions as the connecting link between the coupler and the draft gear.

Covered Gondola A gondola car which has been equipped with some form of removable cover which can be placed over the lading to protect it from weather exposure in transit.

Covered Hopper Car A hopper car with a permanent roof, roof hatches and bottom openings for unloading. Used for carrying cement, grain or other bulk commodities requiring protection from weather.

Creep Lengthwise movement of the rail as a result of wheel friction and temperature expansion and contraction.

Creosote Used in wood preserving, creosote is a distillate of coal tar produced by high-temperature carbonization of bituminous coal.

Crib The space between the ties.

Cropped Rail The cutting off of each end of a damaged rail, resulting in a reusable rail with a minimum length of 27 feet.

Cross Bar A bar with locking devices at each end that fit and lock to belt rails in DF (“Damage Free”) boxcars to provide longitudinal restraint for lading.

Crossing In trackwork, an arrangement of four frogs allowing one line to cross another.

Cross Level The distance one rail is above or below the intended level of the other – not to be confused with superelevation on curves.



Crossover A track connection between two adjacent tracks.

Crossover Platform A drop step located on the engine front and rear permitting movement of personnel between units.

Cross Tie Intermediate transverse structural members of a freight car underframe extending from the center sill to the side sill.

Cruise Velocity The forward speed that a vehicle normally maintains when it is not accelerating or decelerating.

CTC (Centralized Traffic Control) A term applied to a system of railroad operation by means of which the movement of trains over routes and through blocks on a designated section of track or tracks is directed by signals controlled from a designated central point. Also called TCS (Traffic Control System).

Curve (of a Railroad Line) IN the United States, it is customary to express track curvature as the number of degrees of central angle subtended by a chord of 100 feet. The degree of curvature is equal to 5,750 divided by the radius in feet.

Cushioning A term referring to the energy-absorbing capabilities of a car underframe or draft system. Although standard draft gears do have energy-absorbing capabilities, the term "cushioning" or hydraulic cushioning" is generally understood to mean systems with a minimum travel of ten inches.

Cushion Underframe A term generally used to describe a freight car designed so that a hydraulically cushioned inner sill, free to slide with respect to a rigid outer sill, isolates the car body from a major portion of the end impact loads experienced in switching. Not to be confused with end-of-car cushioning devices, which are independent long travel units installed in the draft gear pockets behind each coupler.

D

Dampener Any material or device used to reduce vibration by absorbing energy.

Dead Head An operating term used to describe off-duty travel of a train crewmember from some point back to his or her home terminal. Sometimes the term is used to identify any railroad employee traveling on a pass.

Deferred Maintenance The accrued expenses chargeable to current operations for the estimated cost of repairs which cannot be made during the year due to priorities for materials and supplies or shortage of labor.

Demurrage The detention of a freight car beyond the time allocated for loading or unloading. An added charge for the shipper (loader) or receiver (unloader).

Depot A railway station.

Depreciated Value The reproduction value of a freight car adjusted for depreciation up to the date of damage.

Depressed Center Flatcar A flatcar having that portion of the deck between the trucks lower or closer to the rail to accommodate loads with excessive vertical dimensions.

Derail A track safety device designed to guide a rail car off the rails at a selected spot in order to prevent collisions or other accidents; commonly used on spurs or sidings to prevent unattended rolling cars from fouling the main line.

DF A term used to describe an interior lading restraint system for boxcars, using transverse bars (cross bars) engaging special belt rails mounted to the car sides. The initials DF stand for "damage free." *See Cross Bar.*

Diesel An internal combustion engine invented by Dr. Rudolph Diesel differing from other internal combustion engines because its compression is high enough to cause combustion to be spontaneous.

Diesel-Electric Locomotive A locomotive in which power developed by one or more diesel engines is converted to electrical energy and delivered to the traction motors for propulsion.

Diesel-Hydraulic Locomotive A locomotive in which power developed by one or more diesel engines is delivered through a hydraulic transmission to the driving axles by means of shafts and gears. This type of drive is also used for self-propelled cars.

Dispatcher A person who directs the action of trains of a certain division by the use of radio and/or remote controlled switches, and cooperates with other dispatchers in train movements between divisions.

Ditch The part of the right-of-way that is lower than the ballast section which drains the water from the track into a stream or drainage facility.

Double-Slip Switch A combination of a shallow-angle crossing and two other tracks, located within the limits of the crossing, each connecting a right-hand switch from one crossing track and a left-hand switch from the other, to provide routes between the crossing tracks without additional frogs.

Double Track (DT) Two main tracks, on one of which the current traffic is in a specified direction and on the other in the opposite direction.

Draft A term used to describe forces resulting in tension in the coupler shank. The term "draft" means the opposite of the term "buff."

Draft Gear A term used to describe the energy-absorbing component of the draft system. The draft gear is installed in a yoke which is connected to the coupler shank and is fitted with follower blocks which contact the draft lugs on the car center sill. So-called "standard" draft gear use rubber and/or friction components to provide energy absorption, while "hydraulic" draft gear use a closed hydraulic system consisting of small ports and a piston to achieve a greater energy-absorbing capability. Hydraulic draft gear assemblies are generally called "cushioning units." *See Cushioning.*

Draft System The arrangement on a car for transmitting coupler forces to the center sill. On standard draft gear cars, the draft system includes the coupler, yoke, draft gear, follower, draft key, draft lugs and draft sill. On cushioned cars, either hydraulic end-of-car cushion units

and their attachments replace the draft gear and yoke at each end; or a hydraulically controlled sliding center sill is installed as an integral part of the car underframe supplementing the draft gears.

Dragging Equipment Detector (DED) A sensor between and along side the rails to detect dragging equipment.

Drawbar Pull A tensile coupler force. Locomotive pulling power is sometimes expressed in terms of “pounds of drawbar pull.”

Drawbridge Another term to describe a movable bridge.

Draw Head The head of an automatic coupler.

Dump Car A car from which the load is discharged either through doors or by tipping the carbody.

Dynamic Braking A means of braking a locomotive or car having electric motors by using the motors as generators and dissipating this power through resistors. It may be used to control train speed and to brake a train to a low speed after which air brakes bring it to a full stop.

Dynamic Track Stabilizer A track machine that consolidates ballast by subjecting the track to high vibratory forces. A compactor applies forces through the rails themselves, simulating the stabilizing effects of accumulated train traffic and thus reducing or eliminating post-trackwork slow orders.

Dynamometer A device for determining the power of an engine.

Dynamometer Car A car equipped with apparatus for measuring and recording drawbar pull, horsepower, brake pipe pressure, and other data connected with locomotive performance and train haul conditions.

E

“E” Coupler A standard AAR automatic coupler. Type “E” couplers are cast in several grades of steel, and have several shank configurations to meet varying service requirements.

Effective Velocity The speeds that a vehicle travels, including dwell times at stations and acceleration and deceleration. (Calculated by dividing trip distance by total elapsed time to complete trip).

Electronically-Controlled Freight Brake Braking system using the communication capability of digital electronics over a two-wire trainline to provide instantaneous control and monitoring of all air braking functions throughout trains of any length, initially applied in special service pending standardization in the late 1990’s.

Electro-Pneumatic Combination of electrical and compressed air devices and equipment used in controlling and operating such devices as power track switches and car retarders.

Electro-Pneumatic Brake A braking system used multiple-unit (MU) electric passenger trains. Brakes are applied and released on each car through the action of electro-pneumatic values

energized by current taken from contacts on the engineman's brake valve and continuous train wires. Brakes can be applied instantaneously and simultaneously, eliminating undesirable slack action and providing more positive control of train speed.

Elevation (or Superelevation) The vertical distance that the outer rail is above the inner rail in curves.

Elliptic Spring A spring whose shape resembles an ellipse. Made of two sets of parallel steel plates called "leaves," of constantly decreasing length. Because of the damping provided by friction between the leaves, such springs have been widely used for bolster springs for passenger cars.

Embargoed Interruption of rail service for a particular line. Usually a temporary action taken because of the physical condition of a line.

Empties Freight cars not carrying revenue—generating loads.

Empty-and-Load Brake A freight car air brake incorporating gear to increase braking power automatically when the car is loaded.

Empty Weight *See Light Weight*

E.M.U *See Multiple-Unit Cars*

End-of-Train Device Device that monitors air brake system and train integrity on trains being operated without a caboose. Includes flashing marker light (night) and rear-of-train emergency brake application capability.

Energy The ability to do work. *See Work*

Engineer A person trained to operate a locomotive.

Equalizer In six-wheel and some four-wheel truck arrangements, a system of bars, rods, levers and springs that serves to equalize the loads on the axles and provide improved riding qualities for the truck.

Equilibrium Superelevation When the centrifugal (outward) force is totally resisted by the component of the weight of vehicle parallel to the plane of superelevation.

Exclusive Right-of-Way Land area or other space devoted to the exclusive use of a rail system or other transportation system where the right-of-way is not used by more than one mode.

Extra Train A train not represented on and authorized to move by the timetable.

F

Fail Safe A term used to designate a design principle of any system the objective of which is to eliminate the hazardous effects of a failure of the system by having the failure result in nonhazardous consequences.



False Proceed (Railway Signal Indication) A clear or green signal displayed because of a system failure when a more restrictive indication should be displayed. Sometimes called "False Clear."

Fare Box Recovery Ratio Measure of the proportion of operating expenses covered by passenger fares; found by dividing fare box revenue by total operating expenses for each mode and/or systemwide.

FAST An acronym for The Facility for Accelerated Service Testing located at the Transportation Technical Center near Pueblo, Colorado.

Fastenings Joint bars, bolts and spikes.

Feeder Lines Light-density lines, usually branch lines, that connect with and feed traffic onto a higher density of main line. Also, short line railroads that interchange freight with a major railroad.

Field Weld A weld joining two rails together after rails are installed in track.

Flag a Block To go ahead or behind a train to signal a warning for other trains.

Flange Any projecting surface or area, generally small with respect to the main component of which it is a part, included to serve some special purpose.

Flange of a Wheel The vertical projection along the inner rim of a wheel that serves, in conjunction with the flange of the mating wheel, to keep the wheel set on the track, and provides the lateral guidance system for the mounted pair.

Flangeway The open way through a track structure which provides a passageway for wheel flanges.

Flatcar A freight car having a flat floor or deck laid on the underframe, with no sides, ends or roof, designed for handling commodities not requiring protection from weather.

Flat Spot Loss of roundness of the tread of a railroad wheel, caused by wheelaliding. This causes the wheel to bump and must be corrected when the flat spot exceeds a certain size.

Flat Switching Switching movements in a yard where cars are moved by a locomotive on relatively level tracks as opposed to over a hump.

Float Bridge A structure with an adjustable apron to connect tracks on land with those on a car float, thus permitting cars to be transferred between the land and the car float at varying water levels.

Foreign Car Any car not belonging to the particular railway on which it is running.

FRA (Federal Railroad Administration) An agency of the U.S. Department of Transportation with jurisdiction over matters of railroad safety and research.

Freight Car A general term used to designate all kinds of cars which carry goods, merchandise, produce, minerals, etc.

Frog A track structure used at the intersection of two running rails to provide support for wheels and passageways for their flanges, thus permitting wheels on either rail to cross the other.

Frog Number The length in units along the frog point at which it is one unit wide – a measure of the sharpness of its angle.

G

Gallery Car A passenger car normally employed in commuter service which contains a main seating level and an upper deck level with an open aisleway through the center which gives a “gallery” appearance to the car interior.

Gate Sometimes used to describe the bottom door assembly that serves as a discharge opening on covered hopper cars; usually called the “discharge gate.”

Gauge (or Gage) The distance between the gauge line, measured at right angles thereto (the standard is 4 ft., 8-1/2 in.).

Gauge Line 1) The spot on the side of the railhead 5/8 inch below the rail tread, where track gauge is established. Gauge lines other than 5/8 inch are found on light rail transit. 2) The side of the railhead of a third rail where the third rail gauge is measured.

Gibs The vertical ridges on each end of a truck bolster which engage the column guide surfaces of the side frame when the truck is assembled.

Girder Rail A special rail cross-section for use on light-rail trackage in paved streets incorporating an integral flangeway on the gauge side of the railhead.

Gondola Car A freight car with low sides and ends, a solid floor, and no roof. It is used mainly for transportation of coal, iron and steel products and other lading not requiring protection from the weather. Special types of gondola cars are built with high sides (for coal), removable covers, load-scouring devices, drop-ends (for long loads) etc., for specialized service.

Grade The rise or fall in elevation of railroad track. A rise of 1 foot in elevation in 100' of track is a 1% ascending grade. Similarly, a decrease of 0.75' or 9' in elevation in 100' of track is a 0.75% descending grade.

Grade Crossing An intersection of a highway with a railroad at the same level. Also, an intersection of two or more railroad tracks at the same elevation.

Grade Resistance. The resistance to motion of a train on a gradient due to the pull of gravity. Grade resistance is always 20 pounds for each ton of train weight for each percent of grade. Thus, a train on a 0.75 per cent grade (.75 feet or nine inches change in elevation per 100 feet of length of track) would have 15 pounds grade resistance for each ton of train weight. If the track rises, the grade drag is positive; if the track decreases in elevation, the grade drag is negative.

Grain Door A temporary arrangement for sealing the openings around boxcar sliding doors so that the car may be used for bulk handling of grain. One common type consists of heavy reinforced paper nailed to strips of wood which are fastened to the doorposts one either side of the car door opening.

Gravity Switch Move A switching maneuver whereby gravity causes a stationary car to roll when the handbrake is released rather than being propelled by an engine.

Gross Ton Combined weight of the rail vehicle (or train) and its contents expressed in tons (i.e., 2,000 gross pounds equal one gross ton).

Gross Ton Mile A volume measure of rail traffic calculated by multiplying the weight in gross tons times the distance in miles.

Gross Weight The total combined weight of a rail car and its contents. Also, the total combined weight of a train (locomotives, revenue cars, empties and caboose).

Guard Rail 1) A short, heavily braced rail opposite a frog to prevent wheels from striking the frog point or taking the wrong route. 2) Auxiliary rails between the running rails on bridges, in tunnels or near other obstacles or hazards to keep derailed cars from leaving the roadbed before exiting the danger area.

H

Hand Brake 1) A device mounted on railway cars and locomotives to provide a means for applying brakes manually without air pressure. Common types include vertical wheel, horizontal wheel and lever type, so named because of the configuration or orientation of their operating handles. 2) The brake apparatus used to manually apply or release the brakes on a car or locomotive.

Hazardous Material 1) When used with respect to lading in transportation vehicles, a term identifying the lading as subject to specific safety requirements set forth by the Department of Transportation and/or the Interstate Commerce Commission. Examples of hazardous materials are explosives, poisons, flammable liquids, corrosive substances, and oxidizing or radioactive materials. 2) A substance or material which is capable of posing an unreasonable risk to health, safety, and the environment.

Head-End Power (HEP) A system of furnishing electric power for a complete railway train from a single generating plant, located either on the locomotive or on a power car.

Headway Time required for successive vehicles traveling at the same speed and direction to pass the same point.

Heavy Rail Heavyweight transit vehicle using an existing freight line or third rail power source and operating on exclusive right-of-way, usually having high-level platform stations.

Heavy Rail Transit An electric railway constructed on an exclusive right-of-way to transport passengers in an urban environment. Operations generally consist of trains with several

passenger cars coupled together operating on a subway, elevated, or grade-separated surface right-of-way, usually with power via third rail.

Heavy Repairs As reported to the Association of American Railroads, repairs to revenue freight cars requiring over 20 man-hours.

Held for Orders Cars in repair facilities waiting on authorization to proceed with repairs.

Helper A manned locomotive, usually placed toward the rear of a train, to assist in the movement of the train. For instance, a helper may be used on a heavy ascending grade.

Helper Locomotive A locomotive usually placed towards the rear of a train, to assist in the movement of the train over heavy grades. Helper locomotives can be either manned, or remotely controlled from the lead unit in the train.

Highrailer A highway-type vehicle equipped with secondary flanged wheels for running on rails. Usually used as an inspection vehicle.

High Side Gondola Car A gondola car, with sides and ends over 36 inches high, for carrying coal or minerals.

High Speed Rail Passenger rail transportation system in densely-traveled corridor over exclusive right-of-way at speeds of 125 mph (200 Kmph) or greater.

High & Wide A term referring to outside dimensions of a car or open top load that exceed the normal clearances on the route to be traveled.

Horsepower A unit of power equivalent to 33,00 foot-pounds per minute or 746 watts.

Horsepower Limited Speed The maximum speed obtainable from the horsepower developed by the locomotive.

Hotbox An overheated journal caused by excessive friction between bearing and journal, due to lack of lubricant or foreign matter.

Hot Box Detector A heat sensitive device installed along railroad mainline track at strategic locations for measuring the relative temperatures of passing journal bearings. Bearing temperatures may be transmitted to wayside stations and monitored by personnel who can act to stop a train if an overheated journal is discovered. Most detectors report any bearing temperatures above a threshold value by radio directly to the train crew for appropriate action.

Hump Yard A railroad classification yard in which the classification of cars is accomplished by pushing them over a summit, known as a "hump," beyond which they run by gravity into their assigned track.

I

I.C.C. Abbreviation for Interstate Commerce Commission, superseded by the Surface Transportation Board in 1996.

- Idler Car** Usually a flatcar used in the transportation of a long article of shipment, which extends beyond the limits of the car carrying the shipment; the “idler” being a car on which the shipment or article does not rest, but overhangs. Also, a car used to move cars into or out of trackage (e.g., car float) where locomotive may not go.
- IDT** Initials that stand for “In-Date-Test,” periodic test of the air brake equipment on every car to assure its continued proper operation. The month, day and year of the most recent IDT must be stenciled on every car.
- Independent Brake** The air brake control valve on a locomotive unit that controls the brakes on that locomotive (or multiple unit consist) independently from the train brakes.
- Industry Track** A track which services an industry, usually a spur.
- Insulated Joint** A rail joint designed to arrest the flow of electric current from rail to rail by means of insulation so placed as to separate rail ends and other metal parts connecting them.
- Insulated Rail Joint** A joint in which electrical insulation is provided between adjoining rails.
- Interchange** A process by which rolling stock is delivered or received between two separate railroads.
- Interchange Rules** Rules established and maintained by committees made up of representatives of railroad and car owners. If offered in interchange, a car complying with all interchange requirements must be accepted by an operating railroad, to another at a common junction point.
- Interface** Transfer activity and the facilities required for transfers between transportation modes (e.g., bus to rail, etc.).
- Interline** Rail shipment involving at least two different railroads between its origin and destination.
- Interlocking** An arrangement of switch, lock, and signal devices that is located where rail routes cross and that is interconnected in such a way that their movements must succeed each other in a predetermined order, thereby preventing opposing or conflicting train movements.
- Interlocking Automatic** An arrangement of signals, with or without other signal appliances, which functions automatically upon the approach of a train, as distinguished from those functions are controlled manually.
- Intermodal Traffic** Transportation of goods in containers or trailers involving more than one mode-rail, water, highway.
- Intermodal Freight** Goods or materials moving by more than one mode of transportation (e.g., TOFC, COFC).
- Intermodal Freight Facilities** Yard or terminal where freight is transferred from one mode to another using cranes, ramps and other means.

Intermodal Passenger Facilities Station or terminal where several modes meet, allowing direct transfers of passengers from one mode to another.

Invert The inverted arch in the lower portion of the cross-section of a tunnel supporting the track, walls and roof.

J

Joint The junction of members or the edges of members that are to be joined or have been joined.

Journal Bearing The general term used to describe the load bearing arrangement at the ends of each axle of a railcar truck. So called plain journal bearings are blocks of metal, usually brass or bronze, shaped to fit the curved surface of the axle journal, and resting directly upon it with lubrication provided by oil supplied by spring-loaded wick-fed lubricator pads beneath the axle in the journal box. Journal roller bearings are sealed assemblies of rollers, races, cups and cones pressed onto axle journals and generally lubricated with grease. Vertical loads are transferred from the journal bearing to the truck side frame through the journal bearing wedge (in plain bearing designs), or through the roller bearing adapter in roller bearing trucks.

Journal Box The metal housing on a plain bearing truck which enclosed the journal of a car axle, the journal bearing and wedge, and which holds the oil and lubricating device.

K

Kilowatt Hour A unit of energy measured equal to the continuous flow of one kilowatt (1,000 watts) for one hour.

Knuckle 1) The pivoting casting that fits into the head of a coupler to engage a mating coupler.
2) The pivoting hook-like casting that fits into the head of a coupler and rotates about a vertical pin to either the open position (to engage a mating coupler) or to the closed position (when fully engaged). Coupler knuckles must conform to a standard dimensional contour specified by the Association of American Railroads.

L

LCL (Less-Than-Carload) A term applicable to a quantity of freight which is less than the amount necessary to constitute a carload.

Lead (or Ladder) A track which has numerous tracks branching off it.

Leased Line A rail line that is leased to another railroad which operates and maintains said line.

Light Engine A locomotive or locomotive consist running as a train without cars.

Light Rail An urban/suburban passenger system employing manned vehicles ("LRV's" –usually articulated) operating singly or in short trains over routes including some in-street running on overhead catenary or trolley wire power.

Light Weight Empty or tare weight of a railroad car, new or as determined by reweighing after any repairs, stenciled on car in conjunction with the load limit abbreviated LT.WT.

Line Haul The movement over the tracks of a carrier from one city to another, not including switching service.

Link and Pin Coupler An old type of connection between cars employing a single link attached to each drawhead by a vertical pin manually inserted when coupling.

Load Factor Ratio of total passengers to number of seats.

Local Service The service rendered by a train which stops to deliver and receive freight by setting out and picking up cars at intermediate points along its route.

Locomotive A self-propelled vehicle running on rails, and generating or converting energy into motion for the purpose of hauling cars. It has no space for a revenue load.

Locomotive Unit A single carbody with power and transmission equipment, but not necessarily with controls.

LRSA Act Acronym for the Local Rail Service Assistance Act of 1978.

LRV Abbreviation for "Light Rail Vehicle."

L/V Ratio The LV ratio is defined as the ratio of the lateral force to the vertical force of a car or locomotive wheel on a rail. An important factor affecting the tendency of the wheel to overturn or climb the rail it is often a point of discussion in evaluating the cause of a train derailment.

M

Magnetic Field A term applied to the space occupied by electric or magnetic lines of force.

Mainlines The primary tracks of a railroad, those carrying more than 5 million gross ton per year.

Main Track A track extending through yards and between stations upon which trains are operated by timetable obtain order, or both, or the use of which is governed by signal indication.

Manifest A document giving the description of a single shipment or the contents of a car.

Manual Train Control Train movement completely controlled by the operator.

Mechanical Designation An alphabetic code two – to four – letter assigned by the Association of American Railroads to every freight car to designate its general design characteristics and its intended purpose. E.g., XF=food-service boxcar.

Mechanical Refrigerator A term applied to refrigerator cars equipped with a self-contained power plant and mechanical refrigeration equipment including a compressor, condenser, evaporator, and fans for distribution of cold air around the lading.

Mile Post A post indicating the distance in miles from a given point.

Modal Split The division of trips made from the various alternative types of transportation available.

Motive Power A term relating to the self-propelling equipment of a railroad, usually taken to mean locomotives.

MPH Abbreviation for "Miles Per Hour."

Multiple Unit Operation Practice of coupling two or more locomotives or electric passenger cars together with provision made to control the traction motors on all units from a single controller. Sometimes referred to as "MU-ing."

Multiple Unit Train Two or more electrically-operated passenger cars coupled with provision made to control the operation of the cars from a single controller. Sometimes referred to as "EMU."

N

Network The configuration of routes and junctions which constitute the total system.

Nonoperating Income Net income from property or operation not associated with providing transportation or transit service.

Normally Aspirated (Internal Combustion Engine) An engine that uses air at atmospheric pressure for combustion.

O

Open-Top Car Any of a group of cars with or without sides and ends, and with no roof, all being intended for transportation of commodities not requiring protection from the weather, such as steel products, coal or rough forest products. Flat, gondola and hopper cars are all classed as open top cars.

Operating Ratio The ratio of operating costs to gross revenue.

Operating Revenue The gross income from operation of the rail system, including fares, charter income, concessions, advertising, and movement of goods in the case of freight operations. Does not include interest from securities, non-recurring income from sale of capital assets, etc.

Ore Car An open top gondola or hopper car designed specifically to carry iron or some other metallic ore. Because of the high density of most ores, cars, for this service are built with relatively low cubic capacities, and some are equipped with empty-and-load brake equipment.

OSHA Occupational Safety and Health Administration

Overhead Loading A method of loading highway trailers or containers on intermodal cars by the use of an overhead (usually a gantry type) crane.

Overpass (Railroad) Any grade-separated structure where the tracks pass over a street, highway, railroad, etc.

P

Pantograph A device for collecting current from an over headed conductor (catenary) and consisting of a jointed frame operated by springs or compressed air, and having a suitable collector at the tope.

Peak Hour That hour period during which the maximum amount of travel occurs. Generally there is a morning peak and an afternoon peak, especially for commuter operations.

Per Diem The amount or rate paid by one carrier to another or to a private car owner for each calendar day (or each hour) it uses a car belonging to the other.

Pickup A term descriptive of a car or cars added to a train enroute between dispatching and receiving yards: or added at dispatching yard to train operating over two or more divisions on a continuous wheel report.

Piggyback A term referring to the practice of transporting highway trailers on railroad flatcars.
See TOFC.

Piggyback Car Flat cars designed and equipped for the transportation of highway vehicles or containers.

Pilot A qualified employee assigned to a train or other on-track equipment when the engineer, conductor or driver is not qualified on the physical characteristics or rules of the portion of the railroad over which movement is to be made.

Pitch Rise and fall "porpoising" motion about the transverse axis of the vehicle.

Plain Journal Bearings *See Journal Bearing*

Plate B, C, E, F and H An AAR clearance diagram for unlimited interchange. *See Clearance Diagram.*

Platform An intermodal freight car unit capable of carrying 40 ft. container or trailer – term used to clarify situation since platforms permanently connected (by articulation or drawbars) are given a single car number. Also called a "slot."

Plug Door 1) A type of side door used on insulated box and refrigerator cars that fits flush with the interior car side when closed. Plug doors provide a better seal and are, therefore, more desirable than the common sliding door for insulated car applications. 2) A freight car door designed to fit into the door opening rather than sliding across it.

Pneumatic Coupler An automatic connector which links pneumatic trainlines together between rail cars.

Power Work done by a force divided by the time required to do the work. A high power locomotive can do a relatively large amount of work in a short amount of time.

Preventative Maintenance Inspection to discover if something needs repairing before it fails and performing the necessary work in order to stop or slow that failure.

Push-Pull Train Operation Passenger service, typically over commuter or medium-haul routes, with locomotive-powered consists train-line connected for control from either end which shuttle between terminal stations without being turned.

Puzzle Switch *See Double Slip Switch.*

R

Rack Rail A notched rail mounted between the running rails that engages the gears of a locomotive so equipped, for traction ascending and braking descending on a cog railroad.

Rail used in car construction, any horizontal member of a car superstructure. The term is usually used in combination with some additional identifying word such as "belt rail" or "hand rail." As used in track a rolled steel shape, commonly at-section, designed to be laid end to end in two parallel lines on crossties or other suitable support to form the supporting guideway constituting a railroad.

Rail Anchor A device attached to the base of a rail bearing against a crosstie to prevent the rail from moving longitudinally under traffic.

Rail Classification Weight per yard of rail length (e.g., 90-lb. rail).

Rail Creep The occasional lengthwise movement of rails in track. Rail creep is caused by the movement of trains or temperature changes. It is common practice to stop the effect of creeping by the use of rail anchors or resilient fasteners.

Rail Detector Car A small car equipped to test rails for flaws. A less sophisticated track geometry car.

Rail, Head-Hardened A rail with only the railhead heat treated to a higher hardness for reduced wear, longer life on curves.

Rail Section The shape of the end of a rail cut at right angles to its length. The rail mills identify the different shapes and types of rails by code numbers, as for example, 131-28 for the 131 RE rail section.

Rail Tread The top portion of the railhead where rail/wheel tread contact occurs. Also called Running Surface.

Rail Web The vertical member of a rail connecting head and base to form a beam.

Raised-Wheel Seat Axle Current design of axle in which wheels are pressed onto enlarged parallel section of axle eliminating failures caused by stress concentration at the wheel-axle interface.

Rapid Transit Heavy-rail systems for urban/suburban passenger service not directly connected to the lines of commuter or freight railroads.



Rate Bureau The tariff setting and publication agency for all carriers within a certain freight classification territory in the era prior to deregulation.

Rate of Return The ratio of net operating income (also called "net railway operating income" in railway accounting) to the value of the property in common carrier use, including allowance for working capital.

Real Estate Land, including all the natural resources and permanent buildings on it.

Receiving Yard A rail yard used for receiving trains from over-the-road movements in preparation for classification.

Regenerative Braking The retardation system on electric cars or locomotives which can return power developed by traction motors acting as generators to the third rail or catenary for use by other units.

Remote Control A term denoting the control of any apparatus from a location apart from the location of the apparatus.

Repair 1) Reconstruction of a car, or a part or parts of a car to its original design. 2) Physical work performed upon a railcar in order to restore original structure because of damage, decay, injury, deterioration or partial destruction. *See also Preventative Maintenance.*

Resilient Fastener Any of a variety of proprietary designs of rail fastener other than cut spikes that provide a more positive connection between the rail and tie or a track support slab.

Revenue Cars Income-producing rail cars, carrying passengers or freight.

Reverser The handle on a locomotive control stand that selects the direction in which the locomotive will move by reversing the traction motor field connections.

Ribbon Rail *See continuous welded rail (CWR).*

Right-of-Way The land occupied by a railroad, especially the land traversed by the track. Track, yards and terminals are within the operating right-of-way.

Riprap Heavy stones or other durable material used to protect the roadbed from water erosion.

Rip Track A small car repair facility, often simply a single track in a classification yard or terminal. In larger yards, the rip track may be quite extensive with several tracks and shop buildings. Larger car repair facilities are generally known as "car shops." The name "rip track" is derived from the initials RIP which stands for "repair, inspect and paint."

Roadbed The rock or soil surface upon which the ties, rails, and ballast of the railroad track rest.

Rock-and-Roll A slang term for the excessive lateral rocking of cars, usually at low speeds and associated with jointed rail. The speed range through which this cyclic phenomenon occurs is determined by such factors as the wheel base, height of the center of gravity of each individual car, and the spring dampening associated with each vehicle's suspension system.

Roller Bearing The general term applied to journal bearings that employ hardened steel rollers to reduce rotational friction. Roller bearings are sealed assemblies that are mechanically pressed onto an axle, and transfer the wheel loads to the truck side frames through a device known as a roller bearing adapter that fits between the bearing outer ring and the side frame pedestal.

Rolling Stock The vehicles used in a transportation system.

Rotary-Dump Car Open-top car equipped with rotary coupler at one end allowing load to be dumped by overturning without need for uncoupling.

Rotating End-Cap Roller Bearing Modern type of journal roller bearing in which the outer grease seal is between the cartridge-type bearing assembly and a cap attached to the axle.

Roundhouse A storage or maintenance building for locomotives, usually equipped with a turntable.

RSPO Acronym for the Rail Service Planning Office.

Run The train to which an employee is assigned. It is his regular route usually from one division to another.

Running Rail The rails which rolling stock and on-track equipment runs directly on as opposed to guardrail, rack rail or third rail.

Running Surface See RailTread.

Running Time The elapsed travel time between points along a route.

R/W (or ROW) Abbreviation for right-of-way.

S

Schedule That part of a timetable which prescribes class, direction, number and movement for a regular train.

Schnabel Car A specially designed car used for transportation of extremely-large and heavy machinery. The car is constructed with two separate units, capable of empty movement as a single car when bolted together. The load is placed between the two carrying units, and rigidly fastened to them, thus becoming literally part of the carbody.

SDM Acronym for the System Diagram Map. A listing submitted by the railroads indicating location and data for lines placed in category I, II, and III.

Shatter Cracks A rail defect in the form of minute cracks in the interior of rail heads, seldom closer than ½ in. from the surface, and visible only after deep etching or at high magnification. They are caused by rapid (air) cooling, and may be prevented from forming by control cooling the rail.

Shelf Coupler A special coupler, required on some cars designed for transporting hazardous commodities, having top and bottom “shelves” cast integral with the head to prevent vertical

disengagement of mating couplers in the event of an excessive impact as in a derailment. Shelf couplers are fully compatible with other standard A.A. R. couplers.

Shoofly A temporary track (detour) built around an obstacle such as a wreck, construction sites, or a flooded-out place.

Shops Structures which shelter vehicle construction and repair activities.

Short Line Railroads that typically operate between cities, are shorter than major (Class I) railroads and consist of Class II and Class III railroads. They may be either independently owned or a subsidiary of another railroad.

Shoulder That portion of the ballast between the end of the tie and the toe of the ballast slope.

Side Bearing A load bearing component arranged to absorb vertical loads arising from the rocking motion of the car. There are various types of side bearings ranging from simple flat pads to complex devices which maintain constant contact between the truck bolster and carbody. See Body Side Bearing.

Side Frame In the conventional three-piece truck, the heavy cast steel side member which is designed to transmit vertical loads from the wheels through either journal boxes or pedestals to the truck bolster springs.

Side Loading A method of loading or unloading containers or highway trailers on or off flat cars by physically lifting the unit over the side of the car with heavy duty mobile loading equipment.

Siding A track auxiliary to the main track for meeting or passing trains.

Signal Indication The information conveyed by the aspect of a signal relative to speed and conditions on the track ahead.

Single Track A main track on which trains are operated in both directions.

Skate A metal skid or chock (wedge) placed on rail to stop the movement of rolling stock.

Slack Unrestrained free movement between the cars in a train.

Sliding Sill A term used to describe a type of hydraulic cushioning for freight car underframes. IN sliding sill designs, a single hydraulic unit is installed at the center of the car and acts to control longitudinal forces received at either end of an auxiliary center sill, which is free to travel longitudinally within a fixed center sill. *See Cushion Underframes.*

Slug A cables locomotive which has traction motors, but no means of supplying power to them by itself. Power is provided by power cables from an adjacent unit. Used where low speeds and high tractive effort are needed, such as in hump yards.

Snubbers Hydraulic or friction damping devices used in suspension systems of cars to improve lateral stability. Some snubbers are designed to replace one spring in the truck spring group, some are incorporated as part of the truck side frame or bolster design, and others require special

installation. Supplemental hydraulic snubbing is used most often on cars with high centers of gravity such as 100-ton coal hoppers or gondolas and tri-level automobile rack cars.

Solid-State Inverter Used to generate, modify, or alter electrical waveforms and frequencies, an essential component used to generate and regulate alternating-current for the AC induction traction motors of modern locomotives.

Spike Killing The damage and reduction of the holding power of a tie resulting from repetitive removal and installation of spikes in changing or transposing rail.

Spiral When used with respect to track: a form of easement curve in which the change of degree of curve is uniform throughout its length in going from tangent to curve.

Spring A general term referring to a large group of mechanical devices making use of the elastic properties of materials to cushion loads or control motion. See Coil Spring, Elliptic Spring, and Truck Springs.

Spring Group Any combination of standardized coil springs used in each truck side frame, and selected to match car capacities and obtain desired vertical suspension characteristics. Cars are often stenciled to show the number of specific springs of various designations, e.g., 5 D5 outer 3 D5 inner, that make up the spring group standard to the car.

Spur A section of track connected at one end only to a main track.

Stagers Rail Act of 1980 An act of Congress which fundamentally altered the regulatory environment of the railroad industry by reducing regulations including the elimination of antitrust immunity in certain areas of activity.

Stake Pocket A "U"-shaped collar attached to the side or end sill of a flat car to receive the lower end of a stake used for securing open top loads.

Standard Gauge The standard distance between rails of North American railroads, or 1,735 mm, being 4'8 1/2" measured between the inside faces of the rail heads 5/8" below the rail head.

Static Load The load or weight on the roadbed applied by track material or standing rolling stock.

Station A place designated in the timetable by name. An enclosed Building or covered area that acts as a collection and distribution point for passengers.

STCC Acronym for Standard Transportation Commodity Code.

Subballast Any material which is spread on the finished subgrade of the roadbed below the top-ballast to provide better drainage, prevent upheaval by frost, and better distribute the load over the roadbed.

Subgrade (Track) The finished surface of the basement material below the ballast (or subballast if any).

Superelevation The vertical distance the outer rail is raised above the inner rail on curves to resist the centrifugal force of moving trains.



Suspension The system of wheels and axles which supports the vehicle on the track and the springs and dampers which further isolate it from shocks and vibration.

Sway A side-to-side oscillation or fluctuation of a vehicle.

Swing Hanger Bars or links, attached at their upper ends to the frame of a swing motion truck, and carrying the spring plank at their lower ends. Also called "bolster hanger."

Swing-Nose Frogs A frog in a turnout with a movable frog point connected to a switch machine to match the switch position.

Switch A track structure with movable rails to divert rolling stock from one track to another in a turnout. By eliminating the gap across which wheels must pass, the swing nose eliminates impact and also allows the use of frogs longer than No. 24. (e.g., No. 32, allowing 80 mph operation through the diverging route of a turnout.)

Switch and Lock Movement A device, the complete operation of which performs the three functions of unlocking, operating, and locking a switch, movable point frog, or derail.

Switchback A zigzag railroad track built across a hill too steep for direct ascent.

Switching and Terminal Companies Are those that provide railroad switch service for certain towns or other facilities.

System Car A car owned by the subscriber railroad.

System Repair A repair performed by owner of the car.

T

Tangent Straight section of track.

Tariffs A set schedule of rates the railroads can (must) charge shippers. Is seen by a regulatory agency (ICC, PUC, etc.).

Tariff Circulars (I.C.C.) Circulars issued by the Interstate Commerce Commission or its successor containing rules and regulations to be observed by the carriers in the publication, construction and filing of tariffs and other schedules.

Team Track A track which is owned by the railroad, and is used to spot cars for customers who do not have an industry track leading into their plant.

Tee Rail The typical rail shape used in track construction. The tee rail consists of a head, web and base, and is so called because of the inverted "T" shape it assumes.

Terminal An assemblage of facilities provided by a railway at a terminus or at an intermediate point for the handling of passengers or freight and the receiving, classifying, assembling and dispatching of trains.

Third-Rail A current distribution system for electrical railroads consisting of an insulated rail laid parallel to one of the running rails and arranged to provide a continuous supply of power to electric locomotives.

Tie The portion of track structure generally placed perpendicular to the rail to hold track gauge, distribute the weight of the rails and rolling stock, and hold the track in alignment. The majority are made from wood. Other materials used in the manufacture of ties include concrete and steel. Also called Crosstie.

Tie Down Any device for securing a load to the deck of a car. Chain tie downs with ratchets are probably the most common type and are used to secure wheeled vehicles and lumber products on flat cars.

Tie Plate The metal plate which fits between the base of the rail and tie. Modern tie plates have an inside and outside shoulder, and an inclined surface (also see "Cant").

Timetable The authority governing movement of trains subject to the rules. It contains classified schedules of regular trains and special instructions.

Toe (of a Frog) End of a frog nearest the switch.

TOFC An acronym for "trailer on flatcar" intermodal service or equipment.

Track An assembly of fixed location extending over distances to guide rolling stock and accept the imposed dynamic and static loads. See *Track Structure*.

Trackage Lines of railway track. A right to use the tracks of another railroad.

Trackage Rights The privilege of using the tracks of another railroad, for which the owned railroad is duly compensated.

Track Circuit An electrical circuit of which the rails of the track form a part. (I.C.C.)

Track Gauge (Measurement) Measured at right angles, the distance between running rails of a track at the gauge lines.

Track Geometry Car A passenger or self-propelled car equipped with necessary instrumentation to provide quantitative track evaluations.

Track Maintenance The process of repairing a track defect or track condition.

Track Modulus A quantitative measure of the vertical deflection of track under wheel loads (pounds per inch per inch of length) used to assess the suitability of track structure and subgrade for heavy axle-loading traffic.

Track Structure A term relating to the various components that comprise a track, such as tie plates, fasteners, ties, rail anchors, guardrails, etc. See *Track*.

Trackwork The rails, switches, frogs, crossings, fastenings, pads, ties, and ballast or track support slab over which rail cars are operated. Also, maintenance or repair of the above.

Traffic Control Systems A block signal system under which train movements are authorized by block signals whose indications supersede the superiority of trains for both opposing and following movements on the same track. See *CTC*.

Train For dispatching purposes, an engine or more than one engine coupled, with or without cars, displaying markers. (e.g., headlight and rear-end device).

Train Consist The composition of the complete train excluding the locomotive. The cars in a train.

Train Line A term properly applied to describe the continuous line of brake pipe extending from the locomotives to the last car in a train, with all cars and air hoses coupled. The term is often used to refer to the brake pipe on a single car.

Train Resistance A force which resists or opposes movement of a train. Resistance to motion along the track, attributed to bearings, wind and air resistance, flange contact with rail, grade, etc.

Transpose Rail To swap the rails of a track to extend their service life.

Tread The portion of the steel wheel that runs or bears upon the ball of the rail. Also the top surface of the head of a rail which contacts wheels.

Trestle A braced framework of short spans for carrying a train over a depression, chasm, or river.

Trimmer A signal located near the summit in a hump yard, which gives indication concerning movement from the classification tracks toward the summit.

Truck The general term covering the assembly of springs, axles, wheels, etc., comprising the structures which support a car body at each end (or in the case of articulated cars, the joint support of two, abutting rear ends).

Truck Bolster The main transverse member of a truck assembly that transmits car body loads to the side frames through the suspension system. The ends of the bolster fit loosely into the wide openings in the side frames and are retained by the gibs, which contact the side frame column guides. Truck bolster contact with the car body is through the truck center plate, which mates with the body center plate and through the side bearings.

Truck Center Plate The circular area at the center of a truck bolster, designed to accept the protruding body center plate and provide the principal bearing surface, often fitted with a horizontal wear plate and a vertical wear ring to improve wearing characteristic and extend bolster life.

Truck Center Spacing On a single car, the distance between the truck center pins as measured along the center sill from the center line of one body bolster to the center line of the other.

Truck Hunting A lateral instability of a truck, generally occurring at high speed, and characterized by one or both wheelsets shifting from side to side with flanges striking the rail. The resulting motion of the car causes excessive wear in car and truck components, and creates

potentially unsafe operating conditions. For freight vehicles, the phenomenon occurs primarily with empty or lightly loaded cars with worn wheelsets.

Truck Side Bearing A plate, block, roller or elastic unit fastened to the top surface of a truck bolster on both sides of the center plate, and functioning in conjunction with the body side bearing to support the load of a moving car when variations in track cross level cause the car body to rock transversely on the center plates.

Truck Springs A general term used to describe any of the several types of springs used in the suspension of trucks to provide a degree of vertical cushioning to the car and its load.

Turbocharger A centrifugal blower driven by an exhaust gas turbine used to supercharge an engine.

Turn-Around Time The time required to complete the cycle of loading, movement, unloading and placement for reloading of a freight car.

Turnout An arrangement of a switch and a frog with closure rails by means of which rolling stock may be diverted from one track to another. Engineering term for "track switch."

Turntable A rotating platform with a track for redirecting or turning cars and locomotives.

U

UMLER Acronym for Universal Matching Language Equipment Register. A continuously updated computerized file maintained by the Association of American Railroads. UMLER contains specific details on internal and external dimensions capacity and other information affecting the loading and use of freight cars as of UMLER includes data on intermodal (piggyback) trailers and locomotives shown in The Official Railway Equipment Register.

Unbalanced Superelevation The amount (vertical distance) that the actual superelevation is less than that required for equilibrium superelevation for vehicles traveling at maximum authorized speed.

Underpass Any structure, regardless of type, where the tracks pass under a street, highway, railroad, etc.

Unit (locomotive) The least number of wheel bases together with superstructures capable of independent propulsion, but not necessarily equipped with independent control. The term is used in connection with diesel and electric locomotives.

Unit(s) A car, multi-unit car, articulated car, or multi-level superstructure which is identified by a unique reporting mark and number.

Unit Train A train transporting a single commodity from one source (shipper) to one destination (consignee) in accordance with an applicable tariff and with assigned cars.

V

Variable Cost A cost that varies in relation to the level of operational activity.

Voltage A unit of electromotive force which causes electrical current to flow in a conductor. One volt will cause an electrical current of one ampere to flow through a resistance of one ohm.

W

Waybill The primary written documentation of every freight shipment that forms the basis for railroad freight revenue accounts.

Wayside Control A system of electronic or mechanical devices alongside the track for controlling rail vehicles.

Well Car A flatcar with a depression or opening in the center to allow the load to extend below the normal floor level when it could not otherwise come within the overhead clearance limits.

Wheel The specially designed cast or forged steel cylindrical element that rolls on the rail, carries the weight and provides guidance for rail vehicles. Railway wheels are semi-permanently mounted in pairs on steel axle, and are designed with flanges and a tapered tread to provide for operations on track of a specific gage. The wheel also serves as a brake drum on cars with on-tread brakes.

Wheel Flange The tapered projection extending completely around the inner rim of a railway wheel, the function of which, in conjunction with the flange of a mate wheel, is to keep the wheel set on the track by limiting lateral movement of the assembly against the inside surface of either rail.

Wheel Plate The part of a railway wheel between the hub and the rim.

Wheel Report A listing of the cars in a train as it leaves a yard, made from waybills, on which the conductor posts set-offs and pickups.

Wheel Set The term used to describe a pair of wheels mounted on an axle.

Wheel Slip An operating condition where there is driving wheel rotation on its axis with motion of the wheel at the point of contact with the rail. Wheel rotation speed during wheel slip is greater than it is during rolling, to the extent that tractive force is significantly reduced.

Wheel Tread The slightly tapered or sometimes cylindrical circumferential surface of a railway wheel that bears on the rail and serves as a brake drum on cars with conventional truck brake rigging.

Wide Gauge Track defect caused by failure of tie/rail fastening system to withstand lateral wheel forces, leading to derailment when wheel drops off railhead.

Window The time slot between scheduled trains.

Woodchip Hopper Open-top hopper or gondola car of high cubic capacity used to transport woodchips.

Work The force exerted on an object multiplied by the distance the object moved. The work a locomotive does is the tractive effort of the locomotive multiplied by the distance the train moves as a result of the tractive effort.

Wye Tracks forming the letter Y with a connector across the top, used for turning cars and engines where no turntable is available.

X-Y-Z

Yard A system of tracks defined by limits within which movements may be made without schedule, train order of other authority for the purpose of classification, etc.

Yard Engine An engine assigned to yard service and working wholly within yard limits.

Yard Plant Compressed air supply facility allowing charging of train air line and conduct of terminal air brake tests before arrival of road locomotive.

Yaw Veering motion as vehicle heading deviates from track alignment.

Yoke The component in a railroad car draft system that transmits longitudinal coupler forces to the draft gear. See *Coupler Yoke*.