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RAILROAD REGULATION

Changes in Railroad Rates and Service Quality Since 1990





**United States
General Accounting Office
Washington, D.C. 20548**

**Resources, Community, and
Economic Development Division**

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April 16, 1999

The Honorable Conrad Burns
The Honorable Byron L. Dorgan
The Honorable Pat Roberts
The Honorable John D. Rockefeller, IV
United States Senate

In response to your request, this report discusses how rates and service quality for freight rail transportation have changed since 1990 and actions being taken by the Surface Transportation Board and others to address service quality issues. We previously transmitted a companion report to you entitled Railroad Regulation: Current Issues Associated With the Rate Relief Process (GAO/RCED-99-46, Feb. 26, 1999).

Unless you publicly announce its contents earlier, we plan no further distribution of this report until 14 days after the date of this letter. At that time, we will send copies of the report to interested congressional committees with responsibilities for transportation and regulatory issues; the Honorable Rodney E. Slater, Secretary of Transportation; the Honorable Linda J. Morgan, Chairman of the Surface Transportation Board; and other interested parties. We will also make copies available to others upon request. Please call me at (202) 512-3650 if you have any questions about the report. Major contributors to the report are listed in appendix IV.

A handwritten signature in cursive script that reads 'Phyllis F. Scheinberg'.

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Executive Summary

Purpose

The Railroad Revitalization and Regulatory Reform Act of 1976 and the Staggers Rail Act of 1980 gave freight railroads increased freedom to price their services according to market conditions. In response to this freedom and to recent consolidations within the rail industry, some shippers have raised concerns that freight railroads have abused their market power in setting rates for those shippers with fewer alternatives to rail transportation while at the same time providing poor service.

Concerned about the potential abuse of market power by freight railroads in setting rates and a deterioration of service quality in recent years, Senators Conrad Burns; Byron L. Dorgan; Pat Roberts; and John D. Rockefeller, IV, asked GAO to examine issues related to railroad rates and service. In particular, this report provides information on (1) the environment within which railroad rates have been set since 1990, (2) how railroad rates have changed since 1990, (3) how railroad service quality has changed since 1990, and (4) actions taken by the Surface Transportation Board and others to address railroad service quality problems.

Background

By the 1970s, many of the nation's largest freight railroads (called Class I railroads) were in poor financial health. With passage of the Railroad Revitalization and Regulatory Reform Act and the Staggers Rail Act, the Congress sought to improve the financial health of the rail industry by reducing economic regulation of freight railroads and providing railroads more freedom to price their services according to market demand. In particular, the Staggers Rail Act made it federal policy for railroads to rely, where possible, on competition and the demand for service to establish reasonable rates. Under this policy, shippers with less effective transportation alternatives pay a higher proportion of a railroad's fixed costs than those with more effective competitive alternatives (this is called "differential pricing"). The Interstate Commerce Commission (ICC) continued to regulate rates where there was an absence of effective competition. During the 1980s, railroads used the increased freedoms to improve their financial health and competitiveness.

The ICC Termination Act of 1995 abolished the ICC and created the Surface Transportation Board (the Board), a bipartisan, independent adjudicatory agency administratively housed within the U.S. Department of Transportation. The Board has continued many of ICC's rail regulatory functions, including regulating rail rates where there is an absence of effective competition and adjudicating disputes about service.

As part of its review, GAO received survey responses from about 700 shippers on how the quality of service they have received from Class I railroads has changed since 1990. GAO surveyed the major associations of grain, coal, chemicals, and plastics industries—industries whose freight constitutes the largest portion of rail shipments. GAO’s survey used a statistical sample; as a result, when GAO reports survey results, they represent estimates, based on the views and experiences of these groups.

Results in Brief

The environment in which railroads set their rates has been influenced by ongoing industry consolidation, competitive conditions, and railroads’ financial health. As a result of mergers, bankruptcies, and the redefinition of what constitutes a major railroad, the number of independent Class I railroad systems has been reduced from 30 in 1976 to 9 in early 1999, with the 5 largest Class I railroads accounting for 94 percent of industry operating revenue. This increased concentration has raised concerns about potential abuse of market power in some areas due to railroads’ use of market-based pricing. Under market-based pricing, rail rates in markets with less effective competition may be higher than in markets that have greater competition from railroads or other modes of transportation. Railroads’ financial health has also improved since 1990. However, despite these improvements, the Board has determined that most Class I railroads are “revenue inadequate” because they do not generate enough revenue to cover the industry’s cost of capital. Although such determinations are sometimes controversial, revenue inadequacy affects the ability of a railroad to attract and/or retain capital and remain financially viable.

Railroad rates have generally decreased since 1990. However, the decrease has not been uniform, and in some cases, rail rates have stayed the same as, or are higher than, they were in 1990. This was particularly true on selected long distance (greater than 1,000 miles) rail shipments of wheat from northern plains states like Montana and North Dakota to west coast destinations. In general, rail routes with effective competitive alternatives—either from railroads or from trucks and barges—experienced greater decreases in rail rates.

As the rail industry has consolidated, shippers have complained that service quality has deteriorated. Shippers’ complaints have included a lack of railcars when and where they were needed and inconsistent pickup and delivery of cars. Roughly 60 percent of the coal, grain, chemicals, and plastics shippers responding to GAO’s survey (representing 329 shippers) said that their service was somewhat or much worse in 1997 than it was in

1990. In general, railroads believe the service they provide is adequate but agree improvements can be made. According to railroads, service problems have been caused by such things as capacity constraints and industry downsizing. At the current time, the overall quality of rail service cannot be measured. There are few industrywide measures of service, and service measures recently developed are not comparable from one railroad to another, nor do they fully address service quality.

Federal agencies and railroads have taken a number of actions to address rail service problems. These include an October 1997 emergency service order issued by the Board to facilitate the resolution of service problems in the West that originated in the Houston/Gulf Coast area; the creation of a government task force to disseminate information that can help railroads and shippers to anticipate changes in transportation demand and supply; and the Board's adoption in December 1998 of procedures for expediting relief from inadequate rail service. Although these actions are expected to yield benefits, they do not address some shippers' belief that greater competition in the rail industry is needed to improve service. If it decides to address this issue, the Congress will need to weigh the potential benefits of increased competition with the potential financial and other effects on the railroad industry.

Principal Findings

Rate Setting Influenced by Numerous Factors

Since 1990, the environment within which railroads set their rates has been influenced by a number of factors. One is continued consolidation within the rail industry. While there were 30 independent Class I railroad systems in 1976, by early 1999 the number had been reduced to 9, with half of that reduction due to consolidations.¹ Although consolidations and mergers were expected to yield cost efficiencies and improve service, they have also concentrated the industry into fewer and larger railroads. The five largest railroads accounted for about 94 percent of industry operating revenue in 1997 (the latest year for which data are available). Rail shippers and others have raised the issue of potential abuse of market power by these larger railroads.

Differential pricing has also played a role. Under differential pricing, shippers with less effective transportation alternatives generally pay

¹Conrail is expected to be formally absorbed by CSX Transportation and Norfolk Southern in 1999. This will reduce the number of Class I railroads to eight.

proportionately greater shares of a railroad's fixed costs than shippers with more effective transportation alternatives. This allows railroads to price their services more aggressively in areas where shippers have more transportation alternatives. The effect of differential pricing can be seen when railroad revenues from shipments are compared to railroad variable costs (costs that vary according to the quantity shipped). In general, railroads can obtain more revenue in relation to variable costs from shippers with less effective transportation alternatives than from those shippers with better alternatives—even though both groups of shippers may share similar cost characteristics, such as the number of railcars to be shipped or lengths of haul to destination.

The percent of rail industry revenue from shipments transported at rates generating revenues exceeding 180 percent of variable costs (the current threshold for the Surface Transportation Board's jurisdiction over rail rate complaints) has generally declined from about 33 percent in 1990 to 29 percent in 1996. However, the ratio of revenue to variable costs varied widely by commodity.

Railroads' financial health has also improved since 1990. From 1990 through 1996, railroads' return on investment and return on equity (both measures of profitability) averaged about 8.5 and 11 percent, respectively—about 60 percent and 24 percent higher, respectively, than railroads' returns on investment and equity during the 1980s. Although financial health has improved, the Board has found most Class I railroads to be revenue inadequate, a condition that may induce investors to place their money elsewhere and affect a railroad's financial viability. Revenue adequacy determinations for the railroad industry have been controversial. In recent years, shippers and others have questioned the meaningfulness of the current method of determining revenue adequacy, particularly when railroads that are designated revenue inadequate are able to attract capital to acquire other railroads.

Rail Rates Have Fallen, but Not All Shippers Have Benefited

The reduction in railroad regulation that began in the 1970s continues to yield benefits for shippers. According to the Board, from 1982 through 1996, average real (inflation-adjusted) rail rates for Class I railroads had fallen about 46 percent. However, rates had not necessarily decreased proportionally for all shippers. GAO's analysis of real rail rates since 1990 for coal, grain (corn and wheat), certain chemicals, and transportation equipment (finished motor vehicles and parts) in selected transportation corridors found that rates had generally fallen. However, for some

long-distance shipments of wheat from northern plains states such as Montana and North Dakota, rates had stayed the same as, or were higher than, they were in 1990. Rail rates were also sensitive to competition, and GAO found that rates in some markets/corridors that are considered to have less effective competition, such as the northern plains states, were generally higher than rates where there may be more effective competitive options, such as barges or other railroads.

Ratios of revenue to variable costs (RVC) are often used as indicators of railroads' dominance of markets—by statute, a railroad does not dominate a market if its revenue is less than 180 percent of its variable costs for transporting the shipper's commodities. GAO's analysis of RVC ratios suggests that competition plays a role in ratios for specific commodities and markets. In general, GAO found that RVC ratios exceeded 180 percent on some short-distance (500 miles or less) movements of coal and long-distance movements of wheat—movements for which there may be less effective competition. In contrast, RVC ratios were 180 percent or less on some long-distance movements of coal where there may be more competition. Although RVC ratios are used as proxies for railroad market dominance, such ratios can be increasing at the same time rates are decreasing and, conversely, decreasing at the same time rates are increasing.

Quality of Service Cannot Currently Be Measured

In recent years, shippers have increasingly criticized railroads for providing poor service. These complaints include such things as a lack of railcars when and where needed and inconsistent pickup and delivery of cars. GAO's survey of approximately 700 coal, grain, chemicals, and plastics shippers found that roughly 60 percent believed their rail service in 1997 was somewhat or far worse than it was in 1990. Shippers and shipper associations have attributed poor service, at least in part, to railroad mergers and consolidations. Some shippers told us that they are dependent on railroads to meet their transportation needs and that they believe such dependence has reduced railroads' incentives to provide good service. In general, Class I railroad officials believe their railroads provide adequate service and that rail service in 1997 was at least as good as it was in 1990. However, the officials acknowledge that problems exist and that improvements can be made. Among the reasons cited for service problems were increased rail traffic and industry downsizing, which have created capacity constraints in the rail system.

The quality of rail service cannot be measured currently. There are few industrywide service measures, and service information from individual railroads is either not available, inconsistently defined across and within railroads, or not available going back in time. The rail industry has recently developed quantitative measures of performance, such as average train speed. Although these measures may be helpful in assessing some aspects of service, they are more an evaluation of railroad operating efficiency rather than quality of service.

Actions Taken to Resolve Service Issues, but Some Concerns of Shippers Not Addressed

Actions have been taken by both federal agencies and railroads to address service issues. These include the issuance of an emergency service order by the Board to facilitate the resolution of recent service problems in the West that originated in the Houston/Gulf Coast area and the creation of a joint Board-U.S. Department of Agriculture Grain Logistics Task Force to disseminate information on anticipated changes in transportation demand and supply. In December 1998, the Board also adopted new procedures allowing shippers to receive expedited temporary relief from inadequate rail service through access to an alternative carrier. Unlike the procedures for obtaining more permanent relief, the new procedures do not require a shipper to show that a railroad has engaged in anticompetitive conduct.

All the actions taken are expected to yield benefits in addressing service problems. However, the actions do not address some shippers' belief that increased competition in the rail industry is needed to improve service. Because of the divergent views of railroads and shippers on this issue, resolving service and competition issues will be difficult and may require congressional action. If it decides to address this issue, the Congress will need to weigh the potential benefits of increased competition against the potential financial and other effects on the railroad industry.

Recommendations

This report makes no recommendations.

Agency Comments and GAO's Evaluation

GAO provided a draft of this report to the Surface Transportation Board and to the Department of Transportation for review and comment. GAO met with a number of Board and Department officials, including the Board's Deputy General Counsel and the Director of the Office of Intermodal Planning and Economics of the Federal Railroad Administration. The Board agreed that the draft report was a fair representation of the issues covered. The Department of Transportation

made no substantive comments on the draft report. Among the specific comments made by the Board were that GAO should better depict that (1) competition is better measured by the effectiveness of transportation alternatives rather than the number of competitors; (2) the Board, in its decisions on mergers, has taken actions to ensure that no shipper has become captive to a single railroad; (3) controversy over revenue adequacy issues is not new and that these issues were addressed at length by the Board's predecessor; (4) 1997 was not a typical year in terms of the quality of railroad service due to the unusual, severe congestion that occurred in the West; (5) the Board has an informal mechanism to handle railroad service complaints through which many problems with service are resolved; (6) as noted in its December 1998 report to Members of Congress, providing open access (where one railroad is required to make its tracks and facilities available to other railroads for a fee), or otherwise dramatically modifying the current regulatory scheme, could have far-reaching impacts for shippers and railroads; and (7) service problems in the Houston/Gulf Coast area during 1997 were not caused by the Union Pacific/Southern Pacific merger and that the merger's implementation helped resolve the problems. The Board also suggested that recently developed performance measures by the railroad industry could be of some usefulness in determining service quality.

GAO added information, or modified and/or clarified wording, in this report to address each of these issues and to recognize the Board's concerns and/or position. For example, GAO modified the report's language to better recognize the importance of effective competition rather than the number of competitors. Board and/or Department officials also made other technical comments, which GAO incorporated where appropriate. The Board's comments and GAO's responses are discussed in greater detail at the end of chapters 1 through 5.

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Abbreviations

4RAct	Railroad Revitalization and Regulatory Reform Act
AAR	Association of American Railroads
CONRAIL	Consolidated Rail Corporation
DOT	U.S. Department of Transportation
GAO	General Accounting Office
ICC	Interstate Commerce Commission
RVC	revenue to variable cost
URCS	Uniform Railroad Costing System
USDA	U.S. Department of Agriculture

Introduction

Throughout this century, railroads have been a primary mode of transportation for many products, especially for such bulk commodities as coal and grain. Yet, by the 1970s American freight railroads were in a serious financial decline. The Congress responded by passing landmark legislation in 1976 and 1980 that reduced rail regulation and encouraged a greater reliance on competition to set rates. Railroads also continued a series of combinations to reduce costs, increase efficiencies, and improve their financial health.² In 1995, the Congress abolished the Interstate Commerce Commission (ICC)—the federal agency responsible for overseeing rates, competition, and service in the rail industry—and replaced it with the Surface Transportation Board (the Board).

Rail shippers and others have expressed concern about the lack of competition in the railroad industry, the extent to which railroads are using their market power to set rates, and the quality of service provided, especially for those shippers with fewer alternatives to rail transportation to move their goods to market. They have also questioned whether the Board is adequately protecting shippers against unreasonable rates and service.

Reduced Regulation of the Railroad Industry

By the 1970s, America's railroads were in serious financial trouble. In a 1978 report to the Congress, the U.S. Department of Transportation (DOT) indicated that in 1976, 11 of 36 Class I railroads studied were earning negative rates of return on investment, and at least 3 railroads were in reorganization under the bankruptcy laws.³ Some of the railroads' problems were due to federal regulation of rates that reduced management control and the flexibility railroads needed to react to changing market conditions.⁴ Prior to 1976, almost all rail rates were subject to ICC oversight to ensure they were reasonable. The Congress sought to improve the financial health of the rail industry by reducing railroad rate regulation and encouraging a greater reliance on competition to set reasonable rail rates. The Congress did so by passing two landmark pieces of legislation—the Railroad Revitalization and Regulatory Reform Act of 1976 (4R Act) and the Staggers Rail Act of 1980.

²Combinations include mergers, purchases, changes in control, acquisitions, and other forms of consolidations among railroads.

³Class I railroads are the nation's largest railroads as measured by revenue. In 1997, Class I railroads were those railroads with operating revenues of \$256 million or more. Return on investment measures the profit made on assets used to provide transportation services.

⁴Railroad Regulation: Economic and Financial Impacts of the Staggers Rail Act of 1980 (GAO/RCED-90-80, May 16, 1990).

The 4R Act limited the ICC's authority to regulate rates to those instances where there was an absence of effective competition—that is, where a railroad is “market dominant.” Furthermore, the Staggers Rail Act made it federal policy to rely, where possible, on competition and the demand for rail services (called differential pricing)⁵ to establish reasonable rates. Among other things, this act also allowed railroads to market their services more effectively by negotiating transportation contracts (generally offering reduced rates in return for guaranteed volumes) containing confidential terms and conditions; limited collective rate setting to those railroads actually involved in a joint movement of goods; and permitted railroads to change their rates without challenge in accordance with a rail cost adjustment factor. Furthermore, both the 4R Act and the Staggers Rail Act required the ICC (now the Board) to exempt certain railroad transportation from economic regulation. The Staggers Rail Act required ICC to exempt railroad transportation from regulation upon finding that the regulation was not necessary to carry out the rail transportation policy and either (1) the transaction was of limited scope or (2) regulation was not needed to protect shippers from an abuse of market power. During the 1980s, railroads used their increased freedoms to improve their financial health and competitiveness.

Consolidation Within the Railroad Industry

The railroad industry has continued to consolidate in the last 2 decades, a condition that has been occurring since the 19th century. In 1976, there were 30 independent Class I railroad systems (comprised of 63 Class I railroads); by early 1999, there were 9 railroad systems (comprised of 9 Class I railroads) and half of that reduction was due to consolidations.⁶ (See fig. 1.1.) The nine remaining Class I railroad systems are the Burlington Northern and Santa Fe Railway Co.; Consolidated Rail Corporation (Conrail); CSX Transportation, Inc.; Grand Trunk Western Railroad, Inc.; Illinois Central Railroad Co.; Kansas City Southern Railway Co.; Norfolk Southern Railroad Co.; Soo Line Railroad Co., and Union Pacific Railroad Co. In 1998, the Board approved the division of Conrail's

⁵Inherent in the rail industry cost structure are joint and common costs that cannot be attributed to particular traffic. Under demand-based differential pricing, railroads recover a greater proportion of these unattributable fixed costs from rates charged to those with a greater dependency on rail transportation.

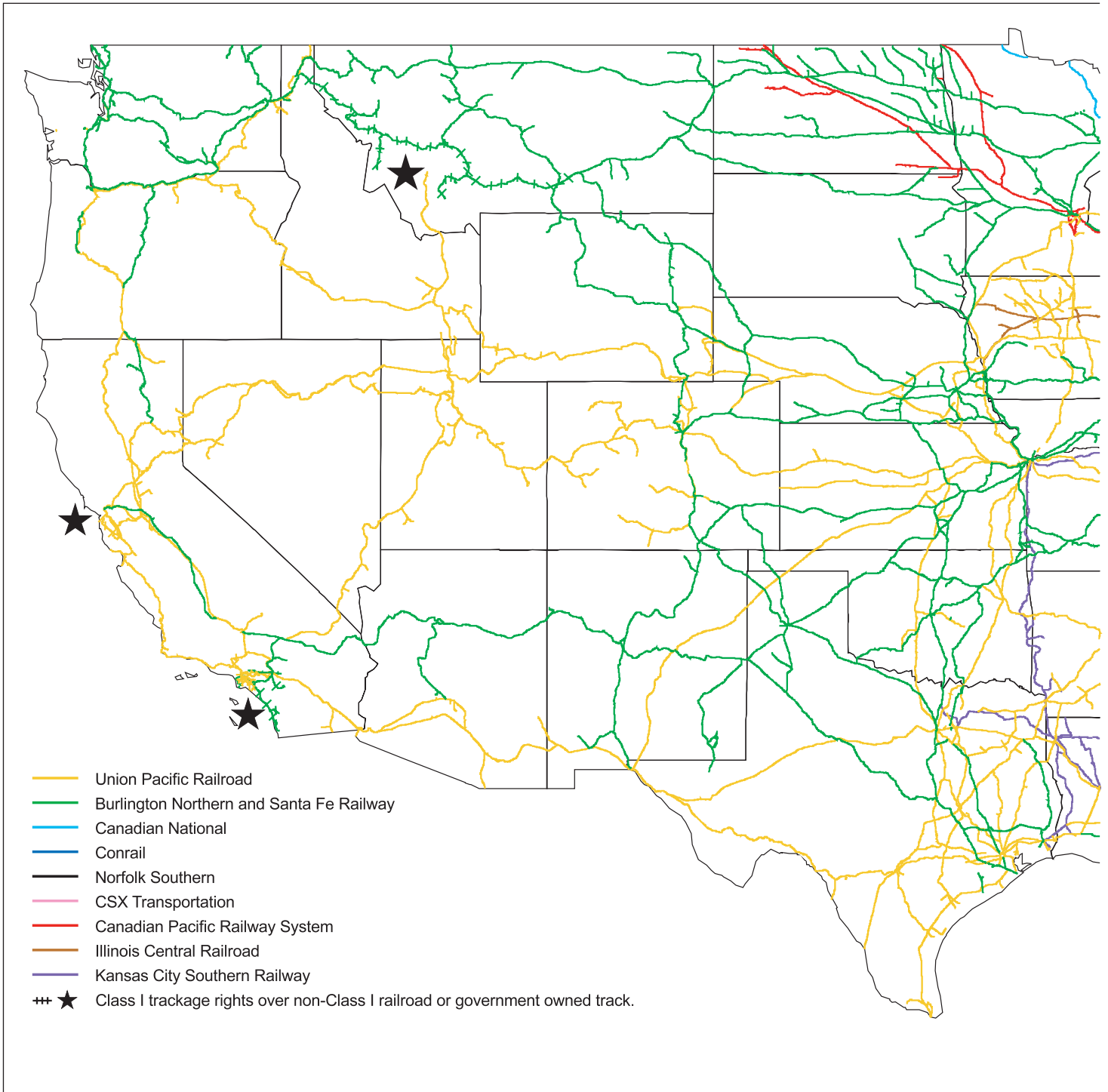
⁶In addition to consolidation, other reasons for the reduction in the number of Class I railroads were carrier bankruptcies and a 1992 ICC change in the threshold for qualifying as a Class I railroad (from \$50 million to \$250 million). Bankruptcies eliminated 2 of the 30 Class I railroad systems, while changes in the Class I standard moved 9 systems out of Class I status.

Chapter 1
Introduction

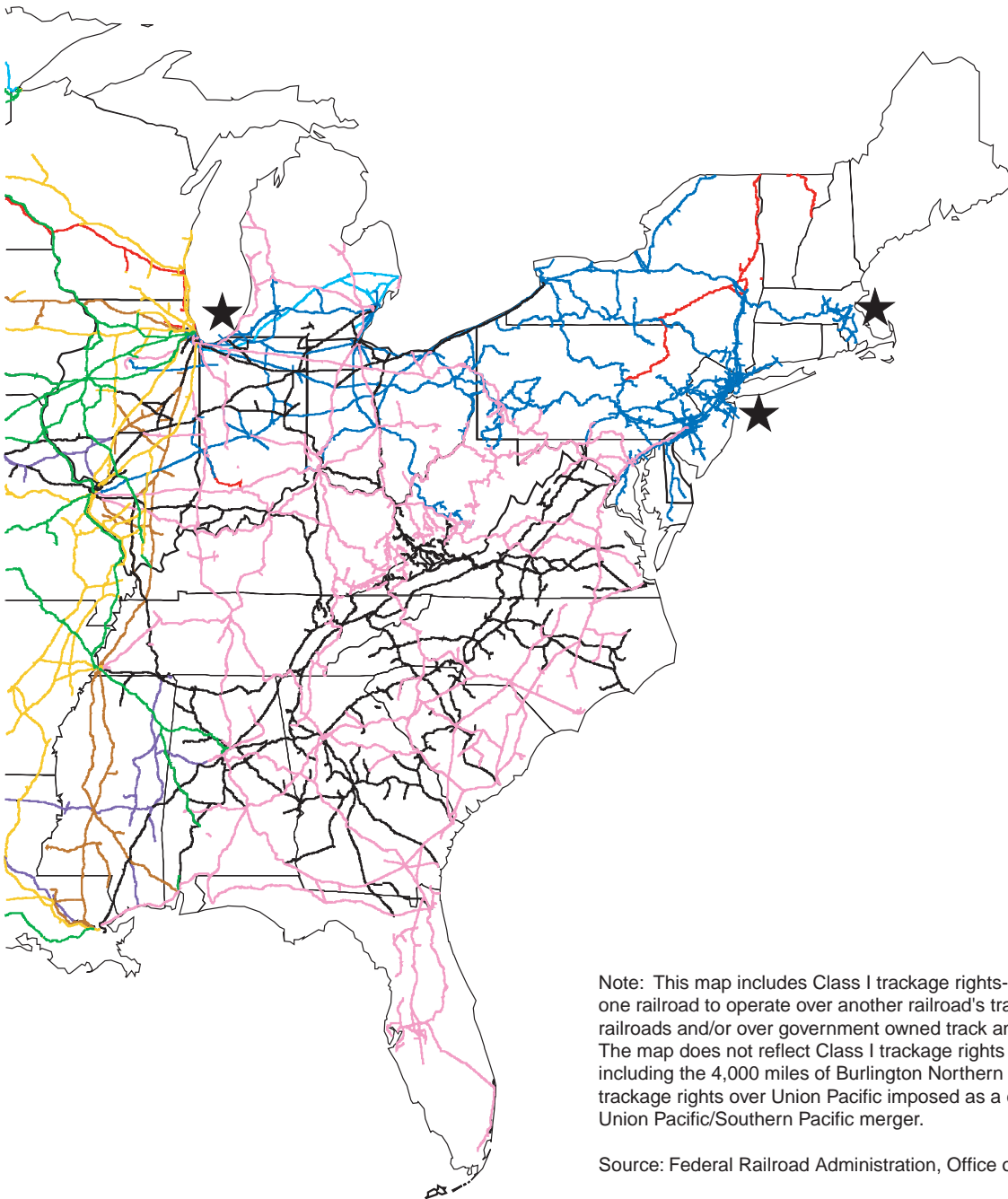
assets between CSX Transportation, Inc., and Norfolk Southern Corporation. Conrail is expected to be formally absorbed by CSX Transportation and Norfolk Southern in 1999, leaving a total of eight Class I railroad systems.

Chapter 1
Introduction

Figure 1.1: Class I Freight Railroads in the United States, 1997



Chapter 1
Introduction

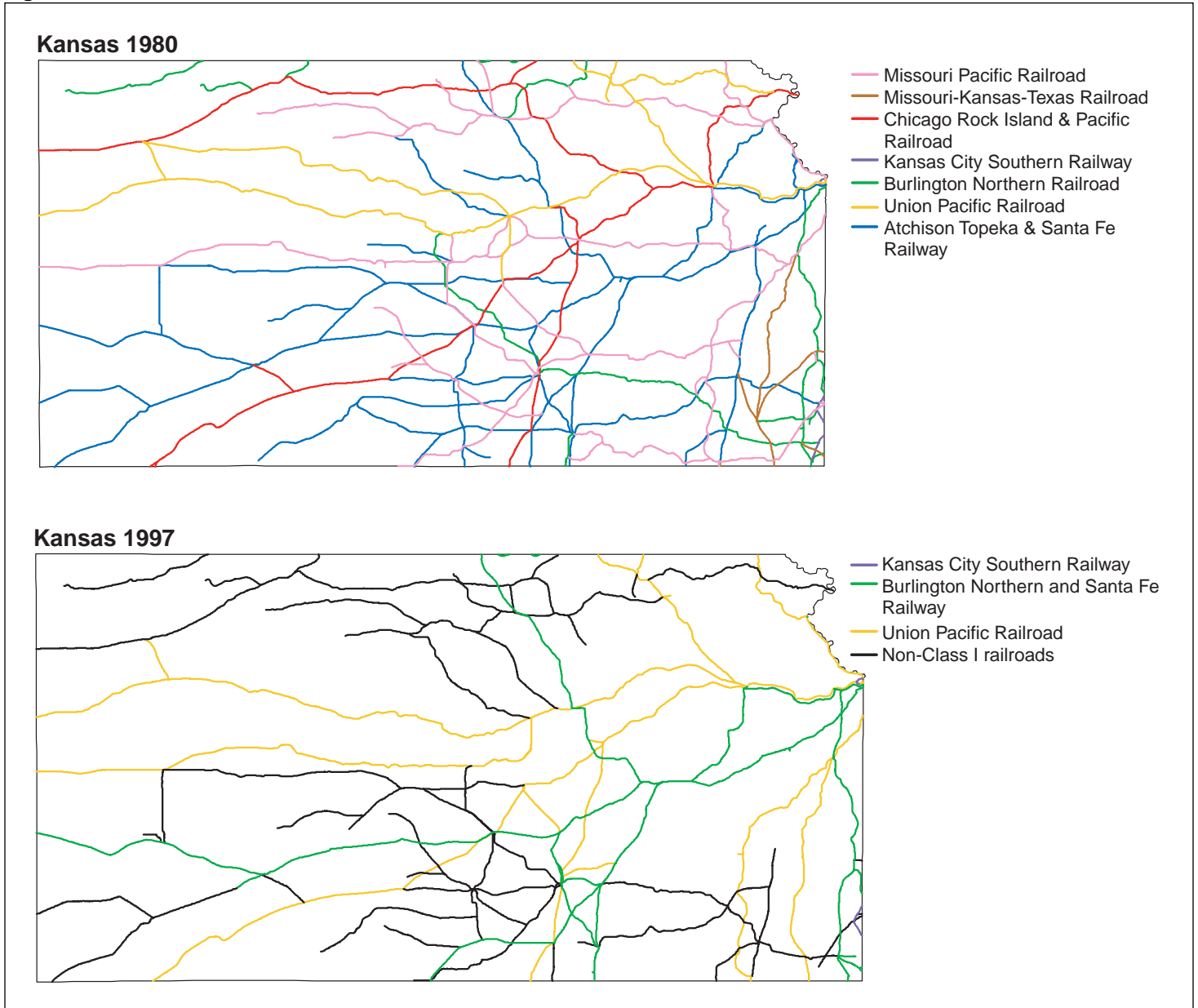


Note: This map includes Class I trackage rights--that is, the authority of one railroad to operate over another railroad's track--over non-Class I railroads and/or over government owned track and joint ownership of track. The map does not reflect Class I trackage rights over other Class I railroads, including the 4,000 miles of Burlington Northern and Santa Fe Railway trackage rights over Union Pacific imposed as a condition in the Union Pacific/Southern Pacific merger.

Source: Federal Railroad Administration, Office of Policy.

Railroads consolidated to reduce costs and increase efficiencies, making them more competitive. For example, one of the justifications for the 1995 Burlington Northern-Santa Fe merger was to provide shippers with more efficient and cost-effective “single line” service. Both the Board and the railroads involved expected reduced costs and improved transit times because the railroad on which a shipment originated would no longer have to transfer the shipment to another railroad for routing to its final destination. Cost reductions and increased efficiencies were also expected from, among other things, rerouting of traffic over shorter routes, more efficient use of equipment, and increased traffic densities. Consolidations were also justified as providing competitive benefits—both within the rail industry and between railroads and other transportation modes. For example, the Board in its 1996 approval of the Union Pacific/Southern Pacific merger expected the merger would intensify rail competition in the West between Burlington Northern and Santa Fe Railway and the combined Union Pacific/Southern Pacific. The acquisition of Conrail by Norfolk Southern and CSX Transportation is expected to yield benefits—both by diverting substantial amounts of highway freight traffic to railroads and by introducing new railroad-to-railroad competition in those areas previously served only by Conrail.

Figure 1.2: Class I Railroads in Kansas, 1980 and 1997



Source: Federal Railroad Administration, Office of Policy.

As Class I railroads consolidated, non-Class I railroads increased their importance in providing service. For example, in 1980, Kansas was served by seven Class I railroads (see fig. 1.2); in 1997, this number was three. Between 1991 and 1996, Class I railroads reduced their mileage operated in the state by about 1,400 miles while non-Class I carriers increased their mileage by about 1,700 miles (175 percent greater than in 1991). (App. I shows how Class I and non-Class I rail mileage changed in Montana, North Dakota, and West Virginia from 1980 to 1997.)

The Surface Transportation Board Replaces the ICC

In 1995, the Congress passed the ICC Termination Act of 1995, which abolished the ICC. The act transferred many of ICC's core rail functions and certain nonrail functions to the Board, a decisionally independent adjudicatory agency that is administratively housed in DOT. Among other things, the Board approves market entry and exit of railroads; approves railroad mergers and consolidations; determines the adequacy of a railroad's revenues on an annual basis; adjudicates complaints concerning rail rates on traffic over which a railroad has market dominance;⁷ adjudicates complaints alleging that carriers have failed to provide service upon reasonable request; and exempts railroad transportation from economic regulation under certain circumstances. The ICC Termination Act made several significant changes to railroad regulation. For example, the act eliminated the requirement for railroad tariff filings.⁸ However, the act did not alter railroads' authority to engage in demand-based differential pricing or to negotiate transportation service contracts containing confidential terms and conditions that are beyond the Board's authority while in effect.

Several of the Board's functions are particularly relevant to this report: the (1) responsibility for determining the adequacy of a railroad's revenues, (2) jurisdiction over rail rate complaints, and (3) jurisdiction over complaints alleging that carriers have failed to provide service upon reasonable request. First, the Board is required to determine the adequacy of railroad revenues on an annual basis. In addition, the Board is required to make an adequate and continuing effort to assist railroads in attaining

⁷The Board's market dominance analysis contains both quantitative and qualitative components. Quantitatively, the Board first determines if the revenue produced by the traffic transported is less than 180 percent of the railroad's variable cost of providing the service. By statute, a railroad is not considered to dominate the market for traffic that is priced below the 180-percent revenue-to-variable cost (RVC) level. Variable costs are those costs that change according to the quantities shipped (e.g., fuel and labor). If the revenue produced by the traffic exceeds the statutory threshold, the Board conducts a qualitative analysis of any intramodal or intermodal competition.

⁸A tariff is a schedule of rates and general terms and conditions under which a product or service is supplied.

adequate revenues—that is, revenues that under honest, economical, and efficient management cover total operating expenses plus a reasonable and economic profit on capital employed in the business.

Second, the Board is also responsible for protecting shippers without feasible transportation alternatives from unreasonably high rail rates. Where the Board concludes that a challenged rate is unreasonable, it may order the railroad to pay reparations on past shipments and prescribe maximum rates for future shipments. The Board does not have authority over rail rates for car movements made under contracts or for movements that it has exempted from economic regulation.⁹ Only about 18 percent of the tonnage moved in 1997 was subject to rate reasonableness regulation by the Board. The remainder was either moved under contract (70 percent), according to the Association of American Railroads (AAR),¹⁰ or was exempt from economic regulation (12 percent).¹¹ Furthermore, rates on rail traffic priced below the 180-percent revenue-to-variable cost threshold are not subject to regulation by the Board. According to the Board, over 70 percent of all rail traffic in 1997 was priced below this threshold.

Third, the Board has the authority to adjudicate service complaints filed by shippers. The Board's process for handling formal service complaints, like its rate complaint process, is an administrative litigation process, in which parties to the dispute file pleadings, disclose and receive information from each other, and present evidence.¹² If the Board decides a case in favor of the complainant, it can require the carrier to provide the shipper with monetary compensation or to adopt or stop a practice. Moreover, the Board is authorized to impose "competitive access" remedies, under which shippers can obtain access to an alternative carrier.¹³ However, to obtain permanent relief, the complaining shipper

⁹The Board may revoke exemptions from economic regulation when it determines that such regulation is necessary to carry out the rail transportation policy.

¹⁰AAR is a railroad trade association.

¹¹Examples of commodities and services that have been exempted from economic regulation include farm products (except grain, soybeans, and sunflower seeds), fresh fruits and vegetables, boxcar traffic, and new highway trailers or containers.

¹²The Board also has a process for handling service complaints informally, and, according to Board officials, many service complaints are handled this way quickly and inexpensively.

¹³Three kinds of competitive access remedies are available: (1) alternative through routes, under which railroads are required to interline traffic with other railroads and provide through routes and through rates for that traffic; (2) reciprocal switching, under which a carrier must transport the railcars of a competing carrier for a fee; or (3) terminal trackage rights, under which a carrier must permit another carrier to use its lines in or near a terminal area for a fee.

must demonstrate that the rail carrier currently providing the service (called the incumbent carrier) has engaged in anticompetitive conduct—that is, the carrier has used its market power to extract unreasonable terms or, because of its monopoly position, has disregarded the shipper’s needs by not providing adequate service. As discussed in chapter 5, the Board also has other procedures for providing temporary relief from service inadequacies without a showing of anticompetitive conduct where the carrier is not providing adequate service.

The Board may also address service deficiencies through emergency service orders. The Board may issue an emergency service order if it determines that a failure of traffic movement has created an emergency situation that has a substantial impact on shippers or railroad service in a region or that a railroad cannot transport traffic in a manner that properly serves the public. Through emergency service orders, the Board may, among other things, permit the operation of one rail carrier over another carrier’s line to improve the flow of traffic. The Board may also direct a rail carrier to operate the lines of a carrier that has ceased operations. These arrangements may not exceed 270 days. Since 1990, the ICC and the Board have issued eight emergency service orders; prior to its termination, the ICC, in five of these instances, directed a carrier to operate the lines of another railroad.

Objectives, Scope, and Methodology

Senators Conrad Burns, Byron Dorgan, Pat Roberts, and John D. Rockefeller, IV, expressed concern that the continued consolidation within the rail industry has allowed railroads to charge unreasonably high rates and provide poor service. The Senators asked us to report on (1) how the environment within which rail rates are set has changed since 1990; (2) how rates for users of rail transportation have changed since 1990; (3) how railroad service quality has changed since 1990; and (4) what actions, if any, the Board and others have taken (or propose to take) to address rail rate and service quality issues. The requesters also asked us to identify difficulties and barriers for shippers, including small shippers, in obtaining relief from unreasonable rates from the Board. We addressed this latter topic and actions that the Board and others have taken to address rail rate issues in our companion report on issues associated with the Board’s rate relief process.¹⁴

¹⁴Railroad Regulation: Current Issues Associated With the Rate Relief Process (GAO/RCED-99-46, Feb. 26, 1999).

To identify how the environment within which rail rates have been set has changed since 1990, we reviewed (1) legislation regarding the economic regulation of railroads, (2) regulations and decisions issued by ICC or the Board regarding rail rate and service issues, and (3) literature available in professional journals and trade publications. We also used reports we have issued on various aspects of the railroad industry and the Staggers Rail Act of 1980 and reviewed selected position papers prepared by railroad and shipper trade associations. To identify the economic and financial status of railroads in the 1990s, we collected information available from various AAR surveys of Class I railroads on the percent of railroad tonnage moved under contract and collected financial information from ICC's Transport Statistics in the United States, the Board's Statistics of Class I Freight Railroads in the United States, and AAR's Railroad Facts. We also obtained information on the amount of intercity freight tonnage transported in the United States annually by transportation mode from Transportation In America, published by the Eno Transportation Foundation, Inc. To identify structural changes in the railroad industry since 1990, we reviewed information from AAR on Class I status, information on railroad industry combinations, and reviewed ICC's and the Board's decisions in selected railroad merger cases.

To identify how railroad rates have changed since 1990, we obtained data from the Board's Carload Waybill Sample for the years 1990 through 1996 (latest data available at the time of our review). The Carload Waybill Sample is a sample of railroad waybills (in general, documents prepared from bills of lading authorizing railroads to move shipments and collect freight charges) submitted by railroads annually. We used these data to obtain information on rail rates for specific commodities in specific markets by shipment size and length of haul. According to Board officials, revenues derived from the Carload Waybill Sample are not adjusted for such things as year-end rebates and refunds that may be provided by railroads to shippers that exceed certain volume commitments.

Some railroad movements contained in the Carload Waybill Sample are governed by contracts between shippers and railroads. To avoid disclosure of confidential business information, the Board disguises the revenues associated with these movements prior to making this information available to the public. Using our statutory authority to obtain agency records, we obtained a version of the Carload Waybill Sample that did not disguise revenues associated with railroad movements made under contract. Therefore, the rate analysis presented in this report presents a

truer picture of rail rate trends than analyses that may be based solely on publicly available information.

The specific commodities selected for analysis were coal, grain (wheat and corn), chemicals (potassium and sodium compounds and plastic materials or synthetic fibers, resins, and rubber), and transportation equipment (finished motor vehicles and motor vehicle parts and accessories). These commodities represented about 45 percent of total industry revenue in 1996 and, in some cases, had a significant portion of their rail traffic transported where the ratio of revenue to variable costs equaled or exceeded 180 percent. Since much of the information contained in the Carload Waybill Sample is confidential, rail rates and other data contained in this report that were derived from this data base have been aggregated at a level sufficient to protect this confidentiality.

We used rate indexes and average rates on selected corridors to measure rate changes over time. A rate index attempts to measure price changes over time by holding constant the underlying collection of items that are consumed (in the context of this report items shipped). This approach differs from comparing average rates in each year because over time higher- or lower-priced items can constitute different shares of the items consumed. Comparing average rates can confuse changes in prices with changes in the composition of the goods consumed. In the context of railroad transportation, rail rates and revenues per ton-mile are influenced, among other things, by average length of haul. Therefore, comparing average rates over time can be influenced by changes in the mix of long-haul and short-haul traffic. Our rate indexes attempted to control for the distance factor by defining the underlying traffic collection to be commodity flows occurring in 1996 between pairs of Census regions.

To examine the rate trends on specific traffic corridors, we first chose a level of geographic aggregation for corridor endpoints. For grain, chemical, and transportation equipment traffic, we defined endpoints to be regional economic areas defined by the Department of Commerce's Bureau of Economic Analysis. For coal traffic, we used economic areas to define destinations and used coal supply regions—developed by the Bureau of Mines and used by the Department of Energy—to define origins. An economic area is a collection of counties in and about a metropolitan area (or other center of economic activity); there are 172 economic areas in the United States and each of the 3,141 counties in the country is contained in an economic area. For each selected commodity and each corridor, we determined the average shipment distance over the 1990

through 1996 time period. We placed each corridor in one of three distance-related categories: 0-500 miles, 501-1,000 miles, and more than 1,000 miles. We then determined, for each selected commodity, the aggregate tonnage over the 1990 through 1996 time period and selected the top five corridors (based on tons shipped) within each distance category for further examination, including changes in revenues and variable costs per ton-mile over the time period.

To assess how railroad service quality has changed since 1990, we (1) reviewed literature on how railroad service is (or can be) measured; (2) reviewed railroad and shipper statements on the quality of rail service in recent years; and (3) interviewed Class I railroads, shipper associations, and several individual shippers. To obtain a wider perspective on shippers' views about the quality of service they have received and how it might be improved, we sent a questionnaire to members of 11 commodity associations that ship using rail in the United States and to those shippers that had filed rate complaints before the Board. The member organizations represent shippers of the four commodities that comprised the largest volume of rail shipments—coal, chemicals, plastics, and bulk grain.¹⁵ For coal, chemicals, and plastics, we surveyed all members of the associations, and this report provides the views of the 87 coal shippers and 99 chemicals and plastics shippers that responded to our survey.

Because we used statistical sampling techniques to obtain the views of members of one grain association, the National Grain and Feed Association, the statistics we provide relating to the views of grain shippers and of all shippers responding to our survey are presented as estimates. The report provides estimates of the views of 523 grain shippers. In all cases, these estimated 709 coal, chemicals, plastics, and grain shippers indicated that they had shipped goods by rail in at least 1 year since 1990. Some estimates presented in this report do not represent the views of 709 shippers because some shippers did not answer all the questions. For more information on how we conducted our survey, as well as responses to individual questions, see our companion report on current issues associated with the Board's rate relief process (GAO/RCED-99-46).

We also determined the number of formal service complaints that were being adjudicated by ICC on January 1, 1990, and the number that have been filed with the ICC/Board from January 1, 1990, through December 31, 1998. To do this, we asked the Board to identify all formal service

¹⁵Corn, wheat, sorghum grains, barley, rye, and oats represented nearly all grain shipments by rail in the United States in 1996.

complaints between these two dates. In order to test the completeness of the Board's identification of service complaints, we reviewed selected cases that the Board did not consider to be service-related. We found one service complaint not contained on the Board's original list of complaints. We discussed this complaint with Board officials, who agreed that it should be considered a formal service complaint. We did not review the merits, or appropriateness, of any ICC/Board decisions associated with these complaints.

To determine actions the Board and others have taken or have proposed to take to address service issues, we interviewed officials from the Board, DOT, and U.S. Department of Agriculture (USDA); industry association officials; and officials from Class I railroads and reviewed the documents that they provided. We also reviewed statutes and regulations pertaining to service issues, recent Board decisions on service issues, and emergency and directed service orders issued by the ICC or the Board since 1990. We interviewed officials from the Board, DOT, and USDA about their recent and planned efforts to address the needs of agricultural shippers and obtained and reviewed relevant agency agreements and reports. We interviewed Class I railroad and AAR executives about, and obtained and reviewed documentation on, their 1998 meetings with shippers; efforts to develop and disseminate measures of service; agreements with grain and feed shippers and small railroads; and efforts to improve customer service. We also attended the railroad/shipper meetings held in Chicago in August 1998 and in Atlanta in October 1998.

The organizations we contacted during our review are listed in appendix III. Our work was conducted from June 1998 through March 1999 in accordance with generally accepted government auditing standards.

Agency Comments and Our Evaluation

In commenting on a draft of this report, the Board noted that our map of Class I freight railroads in the United States in 1997 (fig. 1.1) did not include trackage rights of Class I railroads over other Class I railroads, including about 4,000 miles of Burlington Northern and Santa Fe trackage rights over Union Pacific. The Board also noted that it has an informal process for handling railroad service complaints and that this process can be used to resolve service problems quickly and inexpensively. In response to these issues, we modified the note to figure 1.1 to indicate that Class I trackage rights over other Class I railroads is not shown on the map, including the 4,000 miles of Burlington Northern and Santa Fe

Chapter 1
Introduction

trackage rights over Union Pacific. We also added language better recognizing the Board's informal service complaint process.

Industry and Other Factors Have Influenced the Rate-Setting Environment Since 1990

Railroads' rate setting since 1990 has increasingly been influenced by ongoing industry and economic changes such as continued rail industry consolidation, which has concentrated the industry into fewer and bigger railroads, and the need for investment capital to address infrastructure constraints. Rail rates are also a function of market competition. Using differential pricing, railroads continued to set rates in the 1990s according to the demand for their services. Overall railroad financial health has improved during the 1990s, and railroads increased their share of the freight transportation market. However, many Class I railroads continued to earn less than what it costs them to raise capital (called the revenue adequacy standard).

Ongoing Industry and Economic Changes Influence Rate Setting

Ongoing industry and economic changes have influenced how railroads have set their rates. Since 1990, there has been considerable change in the rail industry and the economic environment in which it operates. Not only has the rail industry continued to consolidate, potentially increasing market control by the largest firms, but capacity constraints have led to an increased need for capital; industry growth has raised the specter that productivity gains may moderate; and domestic and worldwide economic changes have caused fluctuations in the demand for rail transportation. Many of these changes are expected to continue into the future. Other actions are also expected to influence the rate-setting environment, including ongoing actions to deregulate the electricity generating industry.

Continued Railroad Industry Consolidation Has Potentially Increased Railroads' Control Over Industry Revenues and Rail Markets

The 1990s have seen significant consolidation within the railroad industry. For the most part, this consolidation has concentrated the rail industry in fewer and larger companies and potentially increased market control by these firms. The number of independent Class I railroad systems has decreased from 13 in 1990 to 9 in early 1999.¹⁶ These firms control a significant portion of industry revenues as well as traffic. In 1990, the five largest railroads accounted for about 74 percent of total rail industry operating revenue.¹⁷ In 1997, this percentage had increased to about 94 percent.¹⁸ In fact, the two largest Class I railroads (Union Pacific and

¹⁶This includes one railroad (the Florida East Coast Railway) that was reclassified from Class I to Class II in 1992.

¹⁷The five largest railroads in terms of operating revenues were Burlington Northern; Conrail; CSX Transportation; Norfolk Southern; and Union Pacific. The analysis excluded the Florida East Coast Railroad because it was reclassified to Class II in 1992.

¹⁸In terms of total operating revenues for 1997, these railroads were Burlington Northern and Santa Fe Railway, Conrail, CSX Transportation, Norfolk Southern, and Union Pacific.

Burlington Northern and Santa Fe Railway) accounted for about 55 percent of total industry operating revenue. An analysis of ton-miles of revenue freight transported shows similar results. In 1990, the five largest railroads accounted for about three-fourths of total revenue ton-miles transported by the railroad industry. In 1997, the five largest railroads accounted for about 95 percent of revenue ton-miles transported. Again, the two largest Class I railroads accounted for just under two-thirds of all revenue ton-miles transported in 1997.

Some shipper groups and others have expressed concerns about industry consolidation. For example, the Railroad-Shipper Transportation Advisory Council, created by the ICC Termination Act, reported in 1998 that, because of rail industry consolidation, some shippers have developed fears that the railroad that serves them not only dictates the terms of their relationship but also whether they remain economically viable. The Consumers United For Rail Equity, representing various shipper and industry trade associations, has also expressed concerns that dwindling competitive rail options resulting from industry consolidation have increased the number of shippers that consider themselves captive to railroads. Finally, the Alliance for Rail Competition, also representing various shipper and industry trade associations, has expressed concern that deteriorating rail service and the potential for monopoly rate abuse by railroads have resulted from the creation of fewer and bigger railroads. This organization believes increased competition in the railroad industry, rather than regulation, would better protect shippers against abuses.

The Board plays a role in rail industry consolidation. Not only does the Board approve proposed mergers and acquisitions when it finds them in the public interest, but monitors them once they have been approved.¹⁹ As part of the review and approval process, the Board has the authority to attach conditions to a merger or acquisition. In general, these conditions are designed to protect the public against any harm that might otherwise be experienced as the result of one railroad taking over another and to protect against the potential loss of competition or protect affected shippers from the loss by another rail carrier of the ability to provide essential service. According to the Board, merger conditions are routinely imposed to ensure that any shipper that was capable of being served by more than one railroad before a merger will continue to have more than one railroad available after the merger. These conditions typically involve

¹⁹During a proceeding involving two or more Class I railroads, the Board considers, among other things, how the transaction will affect competition among railroads (in the affected region or in the national transportation system), railroad employees, and the adequacy of transportation provided to the public.

granting another railroad either rights to operate on the combining railroads' track or some form of switching rights to gain access to affected customers of the combining railroads. These conditions have been imposed in all large mergers occurring during the 1990s. Board officials have acknowledged, however, that due to staff and resource limitations they must by necessity be less proactive in monitoring mergers to ensure that conditions imposed are working properly to preserve pre-merger competition.

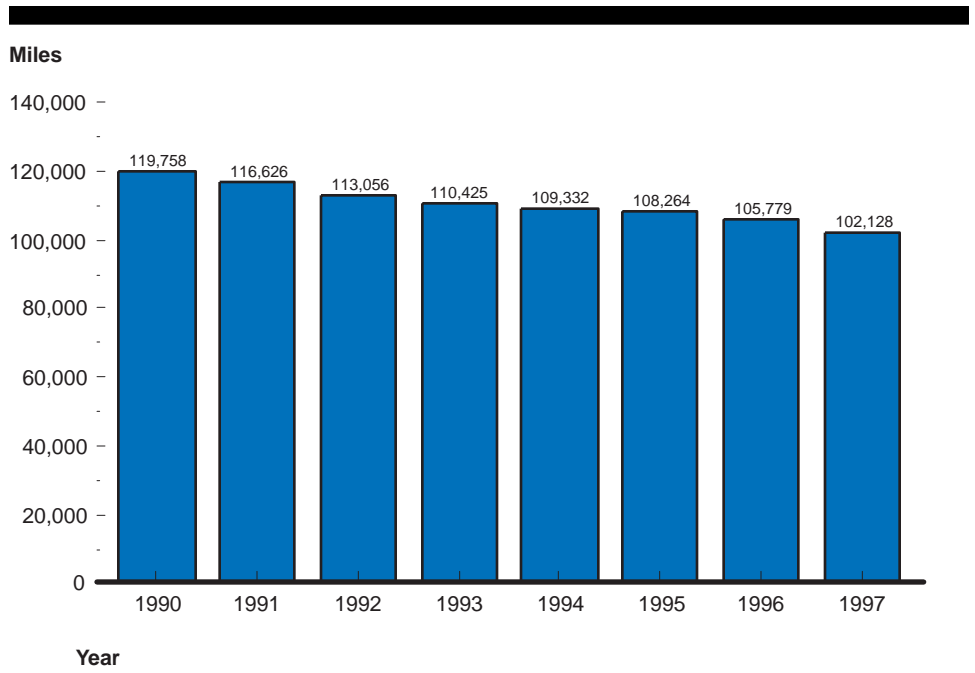
**Capacity Constraints and
Moderation of Productivity
Gains May Slow Railroad
Cost Reduction**

The rate-setting environment has also been increasingly affected by railroads' infrastructure needs. Railroads have increased their market share and the amount of tonnage they carry each year. However, even with the increased demand for rail transportation, real rail rates have declined, necessitating that railroads seek ways to continue to reduce costs. Two ways such costs have been cut are reductions in miles of road operated and employment levels.²⁰ (See figs. 2.1 and 2.2.) From 1990 to 1997, the miles of road operated by Class I railroads decreased about 15 percent (from about 119,800 miles to about 102,000 miles), and Class I employment decreased by about 18 percent (from 216,000 employees to 178,000 employees).

²⁰A mile of road operated represents the aggregate length of roadway, excluding yard tracks, sidings, and parallel lines. Some of the reductions in miles of road operated resulted from lines sold to non-Class I railroads, while in other cases, lines were abandoned.

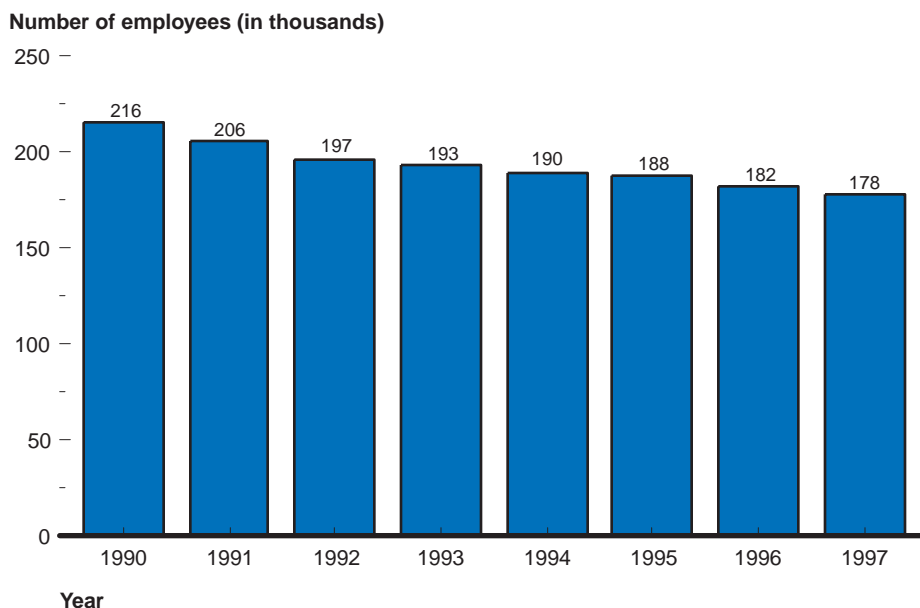
Chapter 2
Industry and Other Factors Have Influenced
the Rate-Setting Environment Since 1990

Figure 2.1: Miles of Road Owned by Class I Railroads, 1990 Through 1997



Source: AAR.

Figure 2.2: Class I Railroad
Employment, 1990 Through 1997



Source: AAR.

Although reductions in miles of road operated and employment have helped to reduce costs, they have also created capacity constraints and a need for investment capital to address these constraints as the rail market has grown in recent years. Obtaining this capital has become a concern of the rail industry, particularly given falling rates and revenue trends. Some of the railroad officials we spoke with acknowledged this concern and were unsure about how this problem would be addressed. For example, officials of one Class I railroad told us that, in the future, their company would have a difficult time meeting increased market demand because of a lack of equipment and inadequate track and rail facility infrastructure. The officials suggested that additional capital investment would be needed to address choke points—that is, sections of track and facilities that have more traffic than they can handle. However, making such investments would be difficult given falling rail rates. Officials at two other Class I railroads also expressed concern about market growth and capacity constraints and said that additional investment would be needed. The officials also agreed that this would be difficult, at best, given rail rate trends and the need to price their services to be competitive.

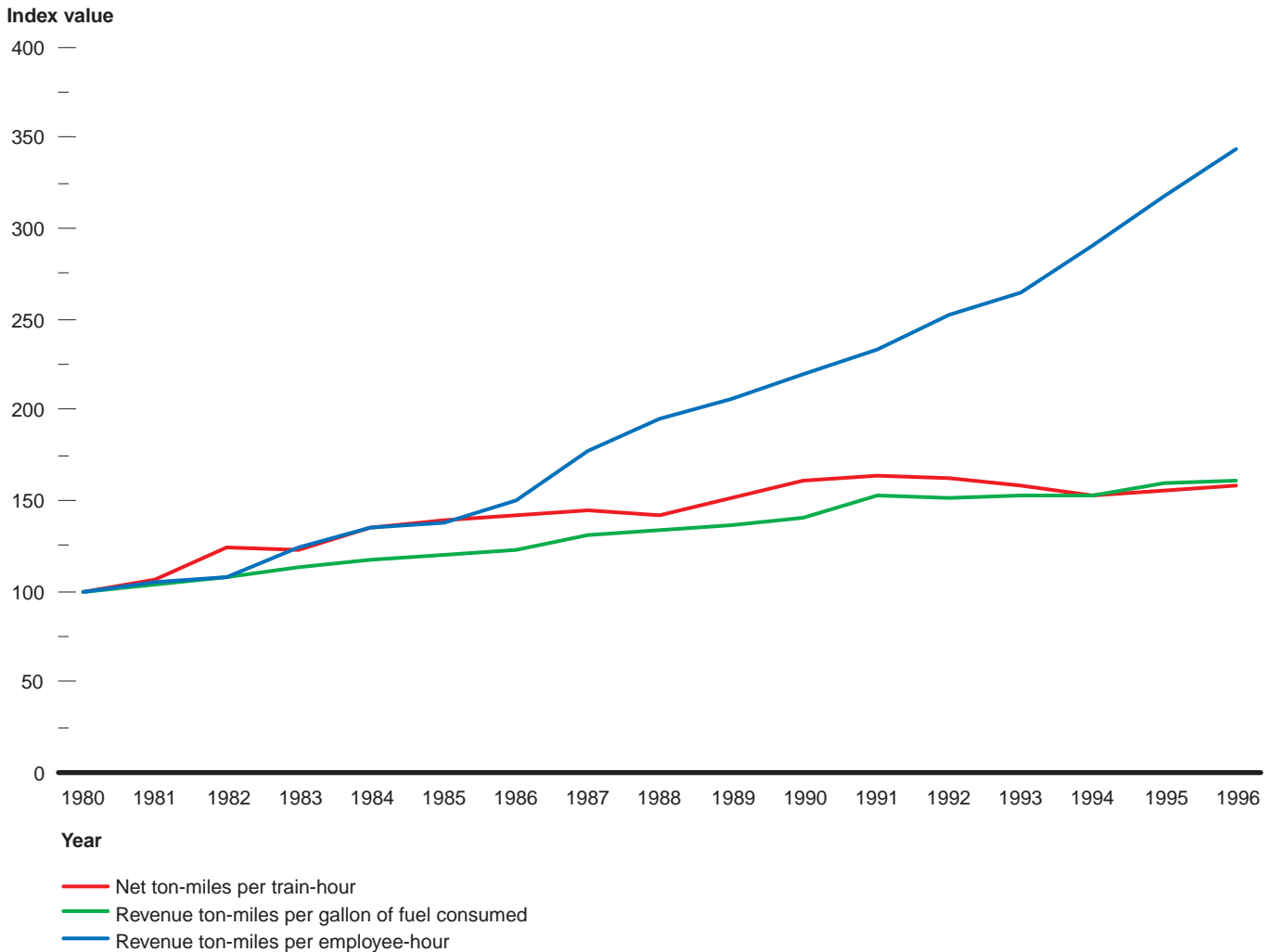
The rate-setting environment has also been influenced by productivity gains. In particular, productivity gains have helped railroads reduce costs, which in turn has allowed railroads to reduce rates in order to be competitive.²¹ The productivity gains achieved in the 1980s have largely continued into the 1990s. (See fig. 2.3.) We looked at three measures of productivity—net ton-miles per train hour,²² revenue ton-miles per gallon of fuel consumed, and revenue ton-miles per employee-hour worked. In general, each of these measures, except net ton-miles per train-hour, increased since 1990. Net ton-miles per train-hour has fluctuated since 1990, and in 1996, was about 2 percent lower than it was in 1990. Revenue ton-miles per employee-hour worked, in particular, has shown dramatic increases since the late 1980s. Using an index based on 1980 (1980 equals 100), revenue ton-miles per employee-hour worked more than doubled from 1986 through 1996—rising from an index value of 151 to an index value of 344.

²¹For more information see GAO/RCED-90-80.

²²A net ton-mile is the movement of one ton of revenue or nonrevenue freight, or both, a distance of 1 mile.

Chapter 2
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Figure 2.3: Class I Railroad Productivity, 1980 Through 1996



Source: GAO's analysis of AAR's data.

According to railroad officials, most of the productivity gains achieved have been shared with customers through rate reductions. Although productivity gains have played a significant role in past rate making, there is some question as to whether these gains can continue to be achieved.

One recent study suggests that the prospects for continued productivity improvements may be diminishing.²³ This was attributed to the expectation that, because industry consolidation has permitted significant reduction in miles of road operated and employment levels, the next round of industry consolidation and mergers (network rationalization) might yield only modest productivity benefits. If so, then there may be fewer opportunities for the rail industry to rely on productivity gains to achieve cost reductions and therefore rate reductions. In fact, future productivity gains may be reduced because what was once redundant track and facilities (and therefore eliminated to reduce costs) might have to be brought back into service to meet market growth. Doing so could minimize productivity improvement.

Economic and Regulatory Changes Have and Will Continue to Affect Rail Markets

The rate-setting environment has been affected by domestic and world economic changes. This is especially true for rail commodities that are exported. For railroads, volatility in world grain markets can affect the volume of grain transported by rail. Over the last 10 years, the volume of export grain transported by rail has ranged from a low of about 28 million tons in 1994 to a high of about 56 million tons in 1988. Other rail commodities can also show fluctuations over time. From 1992 through 1996, the nation's coal exports ranged from a low of about 71 million tons in 1994 to a high of about 103 million tons in 1992. The volatility in commodity markets can affect railroad rates because it affects the demand for rail transportation. As demand changes, railroads adjust rates to attract or retain business. For example, officials at one Class I railroad told us that it has a wide range of pricing policies for chemicals that allow it to react to changes in world chemicals markets. Officials from the same railroad said that export demand can play a particularly strong role for grain. Although grain rates can be affected by decreases in demand, there is more of an impact when exports are strong and their railroad is trying to keep business away from a competitor.

The rate-setting environment has also been affected by legislative and/or regulatory actions. In 1990, the Clean Air Act was amended to, among other things, reduce sulfur dioxide emissions by electric generating plants. The act spurred the demand for low sulfur coal for use in generating electricity. This increased the demand for western coal, especially from the Powder River Basin area of Wyoming and Montana, which is known for its low sulfur content. In 1996, Wyoming produced more coal than any

²³Sources of Financial Improvement In the U.S. Rail Industry, 1966-1995, Carl D. Martland, Massachusetts Institute of Technology, as presented in the Proceedings of the Transportation Research Forum, 39th Annual Meeting (1997).

other state in the nation (about 278 million tons or about 63 percent more than the next highest state, West Virginia). About 85 percent of this coal moved by rail. Although demand for Powder River Basin coal has increased substantially, our analysis shows that inflation-adjusted Powder River Basin rail rates on both long (over 1,000 miles) and medium distance (over 500 miles) routes have generally decreased since 1990.

Ongoing efforts to deregulate the electricity generation industry can be expected to affect future rail rates. Electricity generation is heavily dependent on coal as a fuel source. A recent Energy Information Administration study found that over 87 percent of all coal consumed in the United States was for electricity generation by utilities.²⁴ Moreover, railroads are the largest carrier of coal, and transportation is a major component of the price of coal delivered to electric power generators. The study suggested that as the electricity generating industry becomes more competitive there will be pressure for the industry to reduce its costs, including the price it pays for coal and the transportation of coal. These cost reductions may have significant impacts on the railroad industry and future rail rates.

Using Differential Pricing, Railroads Set Rates According to Competitive Conditions

In reducing the economic regulation of railroads through the 4R Act and Staggers Rail Act, the Congress expected that rates determined by market competition would, in general, benefit both railroads and shippers. In many instances, railroads faced competition from other railroads or modes of transportation, and the new congressionally set rail transportation policy recognized the broader nature of this competition by permitting railroads the flexibility to set their rates in response to rates and services available to shippers from other transportation options. In particular, railroad rates set in response to truck, barge, or railroad competition would typically be different (lower) than rates based primarily on a railroad's full cost to provide service. Differential pricing then is a means by which railroads set rates reflecting the demand characteristics of shippers, with the result that shippers with similar cost characteristics (such as the number of railcars to be shipped or lengths of haul to destination) can pay quite different rates.

Although rail rates set using demand-based differential pricing reflect the demand characteristics of shippers and market competition, such rates are also linked to railroad costs. Generally, the nature of a railroad's fixed

²⁴Challenges of Electric Power Industry Restructuring for Fuel Suppliers, Energy Information Administration (Sept. 1998).

costs (e.g., physical plant such as rail, bridges, and signalling) is such that the costs of providing it are (1) incurred before any traffic moves and (2) insensitive to the level of rail traffic. Fixed costs are also largely unattributable to any particular shipper. For a railroad to be profitable, it must recover all of its costs—fixed as well as variable costs. Differential pricing is a pricing mechanism in which a railroad's fixed costs can be recovered collectively from all shippers but not necessarily proportionately from each shipper. Under differential pricing, shippers without effective alternatives to a railroad's transportation generally pay proportionately greater shares of the railroad's fixed costs, while shippers with more alternatives pay proportionately less.

Differential pricing was envisioned as benefitting both railroads and shippers. Railroads were expected to benefit from gaining the pricing flexibility to retain or attract shippers that would otherwise choose other transportation modes. In this way, railroads were expected to benefit from a larger and more diversified traffic base than under the previous regulatory scheme. Those shippers with competitive alternatives were expected to benefit from lower rail rates. Shippers without competitive alternatives were also expected to benefit. In theory, these shippers would pay less than if competitive traffic were diverted to an alternative transportation mode, thus leaving those shippers without alternatives to bear the unattributable costs previously assigned to the diverted traffic.²⁵

The Congress expected that the transition to differential pricing and a more market-oriented system would not affect all shippers equally because, in general, transportation characteristics and market conditions vary among commodities.²⁶ In practice, these expectations have been met. Data from the Board show that in 1990 about one-third of all rail traffic (as measured by revenues) was transported at rates generating revenues exceeding 180 percent of variable costs. By 1996, this percentage had decreased to 29 percent.²⁷ That means that about 70 percent was transported at rates generating revenues that were less than 180 percent of variable costs. In addition, in 1996, the percent of commodity revenue for shipments transported at rates generating revenues exceeding 180 percent of variable costs fluctuated widely by commodity—ranging from a low of near 0 percent for fresh fish and tobacco products to a high of about

²⁵Railroad Regulation: Shipper Experiences and Current Issues in ICC Regulation of Rail Rates (GAO/RCED-87-119, Sept. 9, 1987).

²⁶See GAO/RCED-90-80.

²⁷According to the Board, this decrease was remarkable since the level of rates needed to reach 180 percent of variable costs fell as rail productivity gains reduced Board-measured variable costs.

73 percent for crude petroleum and gasoline.²⁸ Among the commodities included in our analysis of rail rates (coal, grain, chemicals, and transportation equipment), the percent of commodity revenue for shipments transported at rates generating revenues exceeding 180 percent of variable costs ranged from about 23 percent for farm products (grain) to about 54 percent for chemicals.

Railroad Financial Health Has Improved, but Most Railroads Do Not Earn the Industry Cost of Capital

One important factor that has played a role in how railroads set their rates has been the financial health of the railroad industry. During the 1990s, railroad financial health generally improved compared with the 1980s. Not only were returns on investment and equity higher, but railroads were able to increase their market share. However, most railroads have been determined by the Board to be “revenue inadequate”—that is, their earnings were less than the railroad industry’s cost of capital. Revenue adequacy determinations have been controversial, and some shippers have questioned the meaningfulness of the current method of determining revenue adequacy. Not being able to earn the cost of capital can affect a railroad’s ability to attract and/or retain capital and remain financially viable.

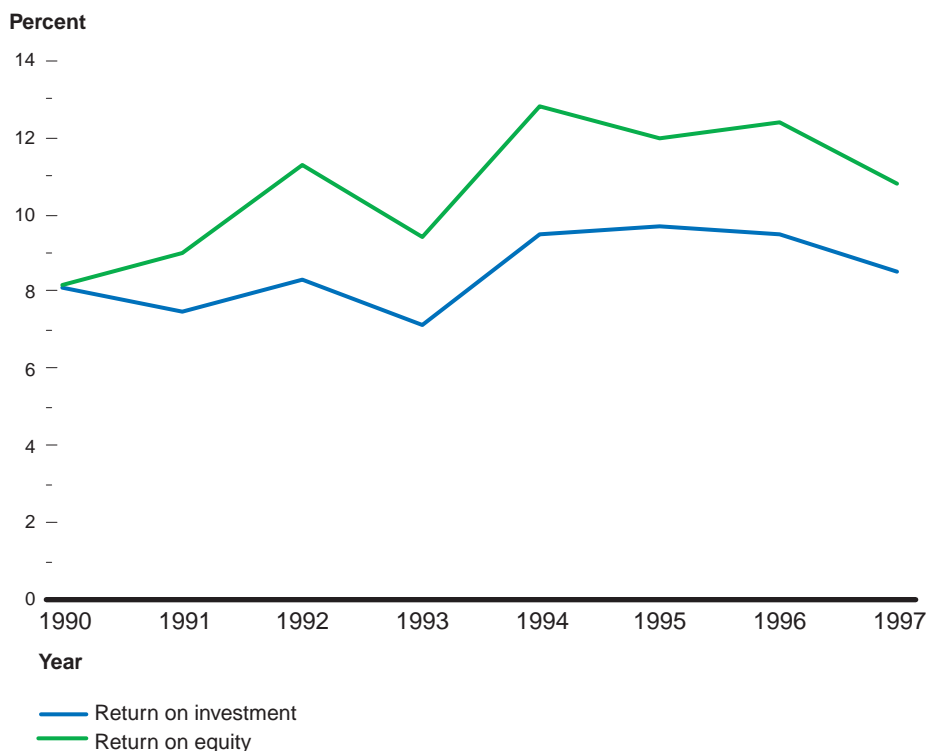
Railroad Financial Health Has Improved, and Market Share Has Increased

In general, railroad financial health improved in the 1990s. For example, railroad returns on investment and returns on equity—both measures of profitability²⁹—were higher during the 1990s than they were in the 1980s. From 1990 through 1997, returns on investment averaged 8.5 percent per year while returns on equity averaged 10.7 percent per year. (See fig. 2.4.) This was about 61 percent and 24 percent greater, respectively, than the 5.3 percent and 8.7 percent returns on investment and equity achieved during the 1980s. The operating ratio, which shows how much of a railroad’s operating revenues are taken up by operating expenses, also showed improvement. From 1990 through 1997, railroad operating expenses accounted for, on average, about 87 percent of operating revenues annually—about 1 percentage point less than the average from 1980 through 1988. According to a Board official, every 1-percentage point change in the operating ratio can be significant to the railroad industry.

²⁸The commodity groups in this example accounted for less than one-tenth of 1 percent of total industry revenue.

²⁹Return on investment measures the profit made on assets used to provide transportation services. Return on equity measures the profit made on funds provided by stockholders.

Figure 2.4: Railroad Industry Returns on Investment and Equity, 1990 Through 1997



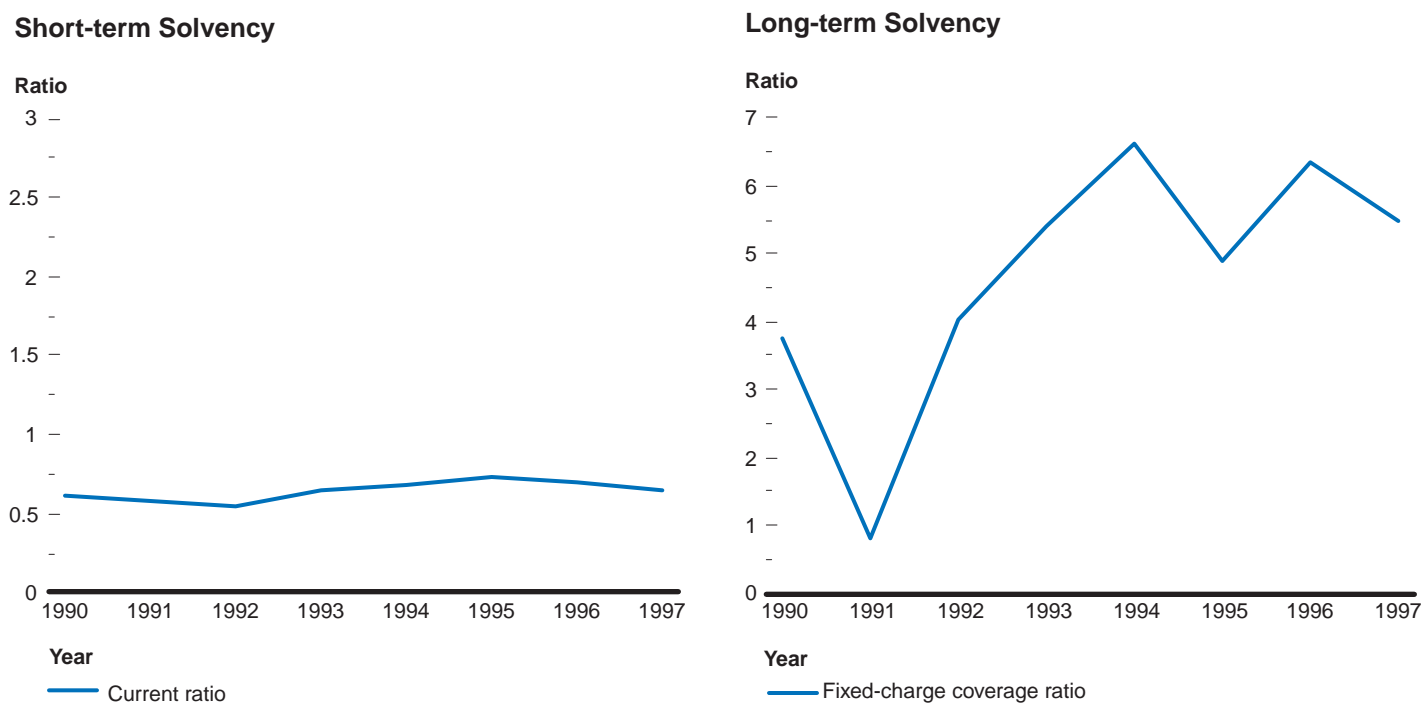
Note: Excludes special charges taken by railroads.

Source: AAR.

However, not all aspects of financial health improved. For example, railroads' ability to meet their short-term and long-term obligations were either about the same as, or worse than, during the 1980s. The current ratio, which compares the dollar value of current assets (such as cash) to the dollar value of current liabilities (such as short-term debt), averaged about 64 percent from 1990 through 1997. (See fig. 2.5.) In contrast, this ratio averaged about 113 percent from 1980 through 1988. Maintaining a current ratio of less than 100 percent may jeopardize a firm's ability to pay its short-term debts when they come due. A firm's ability to pay its long-term debt is generally measured by the fixed charge coverage ratio, which compares the income available to pay fixed charges with the interest expense that must be paid on debt outstanding. Since 1990, the

fixed charge coverage ratio for the railroad industry was only marginally better than it was during the 1980s. From 1990 through 1997, the fixed charge coverage ratio averaged about 4.7—that is, the income available to pay fixed charges was about 4.7 times the interest to be paid. From 1980 through 1988, the ratio averaged about 4.6.

Figure 2.5: Short- and Long-term Solvency of Class I Railroads, 1990 Through 1997



Source: GAO's analysis of the Board's data.

Railroads have also increased their market share during the 1990s. (See fig. 2.6.) In 1990, railroads transported almost 38 percent of intercity revenue freight ton-miles.³⁰ By 1997, the market share had increased to 39 percent. This increase came despite a general slowdown in the growth of intercity freight traffic handled by railroads in this decade. From 1990 through 1997, the amount of intercity freight tonnage handled by railroads

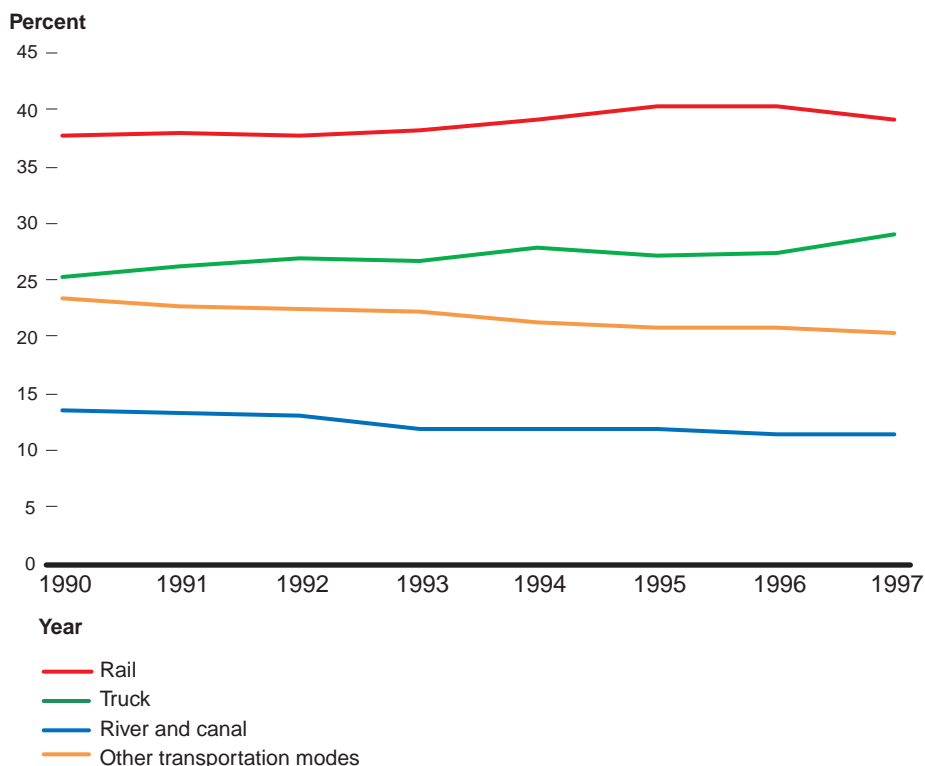
³⁰A revenue ton-mile is 1 ton of freight carried 1 mile for revenue.

grew, on average, about 2 percent annually. This compares with about a 3-percent average annual growth in the 1982 through 1989 period.³¹ The market share change may be a reflection of railroads' increased use of contracts to tailor their rates and service to meet customer needs. According to AAR, in 1997 about 70 percent of all railroad tonnage moved under contract—up 10 percentage points from 1988. However, contracts are more prevalent for the shipment of some commodities than others. AAR statistics show that, in 1997, over 90 percent of all coal tonnage, but only about 26 percent of grain tonnage, moved under contract. In fact, the percentage of grain tonnage moved under contract has decreased over time. In 1994, about 50 percent of grain tonnage moved under contract compared with 26 percent in 1997. According to an AAR official, this decrease was primarily attributable to (1) an increased use by railroads of noncontract car reservation/guarantee programs to supply grain cars to shippers and (2) a 1988 regulatory change that increased the amount of public information about grain contracts.³² Under car reservation/guarantee programs, for a fee, shippers can obtain a set number of railcars for delivery at a future date(s).

³¹The reduced growth in tonnage for railroads and for all modes in the 1990s probably reflects slower economic growth during the period. Real gross domestic product grew, on average, 2.4 percent annually from 1990 through 1997—about half the 4-percent annual growth rate, on average, from 1982 through 1989.

³²In February 1988, ICC issued final rules implementing the Conrail Privatization Act. In general, the act required that, for the shipment of agricultural commodities, such information as the identities of the shipper parties to a contract and actual volume requirements, if any, be disclosed in contract summaries filed with ICC. While the ICC Termination Act eliminated the general requirement to file contract summaries, it retained the requirement to file summaries of agricultural contracts.

Figure 2.6: Railroad Market Share, 1990 Through 1997



Note: The 1997 figures are preliminary.

Source: GAO's analysis of Transportation In America data, Eno Foundation for Transportation, Inc., (1998).

Most Railroads Do Not Meet Revenue Adequacy Criterion

Although railroad financial health has improved, most Class I railroads are still not earning revenues adequate to meet the industry cost of capital. From 1990 through 1997, in any one year no more than three of nine Class I railroads were determined by the ICC/Board to be revenue adequate. From 1990 through 1994, in any one year no more than 2 of 12 Class I railroads were determined to be revenue adequate.³³ The returns on investment of the remaining railroads have been below the railroad industry's cost of capital. The degree that Class I railroads did not earn the industry's cost of capital has fluctuated since 1990. (See table 2.1.) This appears to reflect fluctuations in average return on investment more than a change in the cost of capital. The cost of capital has generally remained

³³Excludes the Florida East Coast Railway Co., which was reclassified as a Class II carrier in 1992.

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between 11.4 percent and 12.2 percent from 1990 through 1997. In contrast, return on investment has ranged from just over 1 percent to just under 9.5 percent. As we reported in 1990, revenue inadequacy affects the ability of a railroad to attract and/or retain capital.³⁴ Insufficient profit not only makes it difficult for railroads to cover costs, maintain operations, and remain financially viable, but may also induce investors to place their funds elsewhere.

Table 2.1: Revenue Adequacy of Class I Railroads, 1990 Through 1997

In percents			
Year	Return on investment	Cost of capital	Degree of revenue inadequacy
1990	8.1	11.8	-3.7
1991	1.3	11.6	-10.3
1992	6.3	11.4	-5.1
1993	7.1	11.4	-4.3
1994	9.4	12.2	-2.8
1995	6.9	11.7	-4.8
1996	9.4	11.9	-2.5
1997	7.6	11.8	-4.2

Note: Return on investment is based on the Board's methodology for determining revenue adequacy. These returns may not be the same as returns on investment calculated for nonregulatory purposes.

Source: GAO's analysis of the Board's data.

Revenue adequacy determinations for the railroad industry have been controversial. According to Board officials, controversy over revenue adequacy determinations is not new and that these issues have been addressed at length by the Board's predecessor. However, in recent years, shippers and others have again questioned the meaningfulness of the current method of determining revenue adequacy, particularly railroads' ability to attract capital for mergers and acquisitions. For example, in 1996, Union Pacific was expected to spend about \$1.6 billion to acquire Southern Pacific Railroad. Nevertheless, in this same year, the Board determined Union Pacific to be revenue-inadequate. Similarly, in 1998, CSX Transportation estimated that it would incur over \$4 billion in acquisition costs in the joint CSX Transportation/Norfolk Southern

³⁴Railroad Regulation: Economic and Financial Impacts of the Staggers Rail Act of 1980 (GAO/RCED-90-80, May 16, 1990).

acquisition of Conrail.³⁵ In 1997, CSX Transportation was determined by the Board to be revenue-inadequate.

In April 1998, the Board began a proceeding to address issues related to railroad access and competition. As part of this proceeding, the Board called upon both railroads and shippers to mutually agree on an independent panel of disinterested experts to review how revenue adequacy is determined and to develop recommendations as to how, if at all, this determination should be changed. According to the Board, as of February 1999, although railroad representatives were satisfied with the neutral panel approach, shipper representatives opposed it and suggested instead that the Board initiate a rulemaking proceeding to address revenue adequacy issues.

Agency Comments and Our Evaluation

In commenting on a draft of this report, Board officials said that we should better explain that the Board, in its merger decisions, has taken actions to ensure that no shipper has become captive to a single railroad. The Board also said we should better recognize that controversy over revenue adequacy determinations is not new and that these issues have been addressed at length by the Board's predecessor. To address these concerns, we have modified the report to acknowledge that the Board imposes merger conditions to ensure that any shipper that was capable of being served by more than one railroad before a merger would continue to have more than one railroad available after the merger. We also added language to better recognize that revenue adequacy determinations have been controversial for some time and that these issues had been dealt with by the Board's predecessor.

³⁵This amount excludes Conrail's current and long-term liabilities to be assumed by CSX Transportation.

Rail Rates Have Fallen Since 1990, but Not All Shippers Have Benefitted

Since 1990, railroad rates have generally fallen both overall as well as for specific commodities. However, rail rates have not decreased proportionately for all shippers and users of rail transportation. Some shippers, like those transporting coal, have experienced larger rate decreases than other shippers. In addition, in other cases, such as long-distance wheat shipments from Montana and North Dakota to west coast destinations for export, real rail rates have stayed about the same as, or were slightly higher than, they were in 1990.³⁶ We also found that revenues were 180 percent or more of variable costs for a number of routes, including short-distance movements of coal and long-distance movements of wheat from northern plains states such as Montana and North Dakota. The degree of competition on a route may have played a role in both how rates changed and/or how high or low a revenue to variable cost ratio may be for a specific commodity or route. While the revenue to variable cost ratio is often used as a proxy for market dominance, use of the ratio for this purpose may lead to misinterpretations. For example, even when railroads pass all cost reductions along to shippers in terms of reduced rates, the ratio can increase. Conversely, the ratio can decrease if railroads pass all cost increases along to shippers in the form of higher rates.

Rail Rates Have Generally Decreased Since 1990

In general, real (inflation-adjusted) rail rates have decreased since 1990. In fact, real rail rates have been falling since the early 1980s. In February 1998, the Board found that the average, inflation-adjusted Class I railroad rate had decreased by about 46 percent from 1982 through 1996.³⁷ The Board found that rates in all major commodity groups decreased, including coal and farm products, which, as bulk commodities, have historically been shipped by rail. However, the decreases were not uniform. (See table 3.1.) Also, in general, the average annual rate of decrease in rail rates was somewhat lower in the 1990s (about 4 percent annually) compared with what it was from 1982 through 1989 (4.6 percent annually). The average annual rate of decrease in rail rates for farm products (which include grains such as corn and wheat) was about 7 percent in the 1980s, compared with only about 1 percent in the 1990s. In contrast, the average annual rate of decrease for coal was just over 3 percent in the 1980s, compared with almost 8 percent in the 1990s.

³⁶Unless noted otherwise, all rates discussed in this chapter are cents per ton-mile stated in 1996 dollars. Also, the analysis was based on the following distance categories: long, medium, and short. Long is over 1,000 miles from origin to destination, medium is between 501 and 1,000 miles, and short is 500 miles or less.

³⁷The inflation-adjusted railroad rate is gross revenue produced per ton-mile of freight originated, in 1982 dollars.

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Table 3.1: Average Annual Change in Real Rail Rates for Selected Commodities, 1982 Through 1996

Category	Average annual change in real rail rates	
	1982-89	1990-96
Farm products	-6.7	-1.1
Metallic ores	-5.2	-5.2
Coal	-3.3	-7.9
Food and kindred products	-6.9	-3.7
Lumber and wood	-6.2	-4.0
Chemicals	-3.9	-2.4
Petroleum and coal products	-5.6	-3.0
Stone, clay, glass, and concrete	-5.5	-0.5
Transportation equipment	-2.4	-2.5
Intermodal	-5.8	-2.9
Average annual rate change (all commodities)	-4.6	-4.1

Source: GAO's analysis of the Board's data.

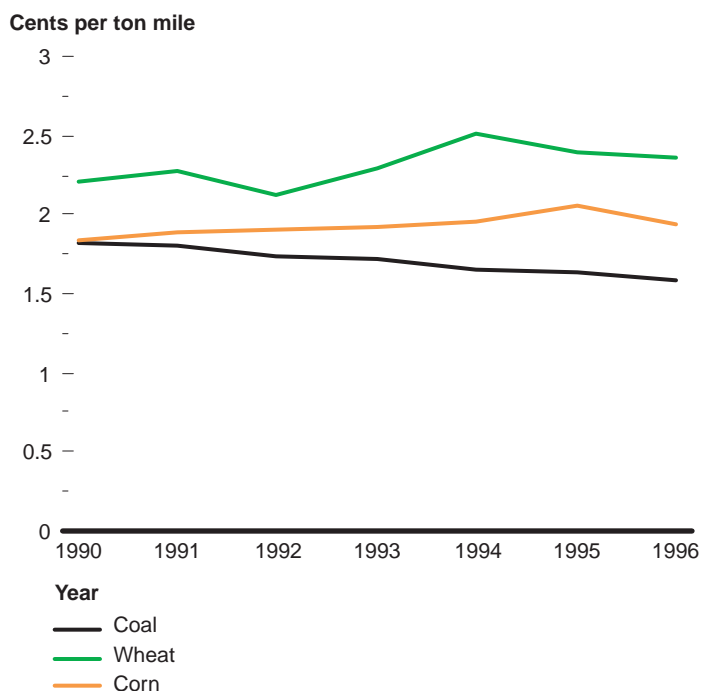
Our analysis of overall real rail rates showed similar results, with certain exceptions. Using the Board's Carload Waybill Sample—a data base of actual rail rates provided to the Board annually by individual railroads—we constructed rate indexes³⁸ for coal, grain, certain chemicals, and transportation equipment for the period from 1990 through 1996. (See fig. 3.1.) As the figure illustrates, in general, rail rates for most of these commodities decreased over time. The exceptions were wheat, corn, and chemicals (potassium and sodium; plastics and resins). Wheat in particular showed general rate increases from 1992 through 1994—from about 2.1 cents per ton-mile to about 2.5 cents per ton-mile—before falling back to about 2.4 cents per ton-mile in 1996. Corn also showed increases from 1990 through 1995—from about 1.8 cents per ton-mile to just under 2.1 cents per ton-mile—before decreasing in 1996 to about 1.9 cents per ton-mile.

³⁸A rate index attempts to measure price changes over time by holding constant the underlying collection of items that are consumed. This differs from comparing average rates in each year because over time higher- or lower-priced items can constitute different shares of the items consumed. Although an index is a pure number in which each year's value is expressed relative to a common base year, because we wanted to maintain a sense of the magnitude of the revenues per ton-mile of the various commodities, we did not express each year's value relative to a base year (that is, we did not divide each year's value by the value in 1996). We did not adjust for general effects of inflation. The specific commodities we reviewed were coal (bituminous); wheat; corn; potassium or sodium compounds; plastic materials or synthetic fibers, resins, or rubbers; motor vehicles; and motor vehicle parts or accessories.

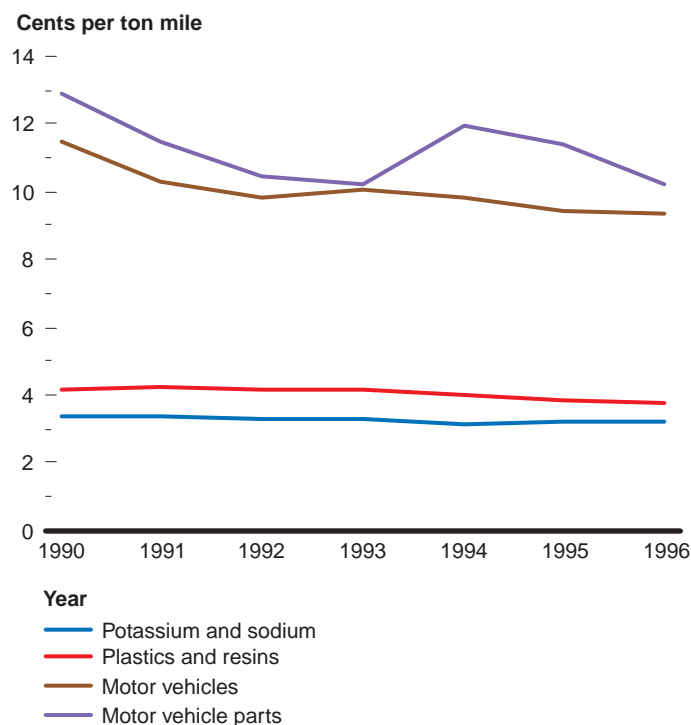
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Figure 3.1: Rail Rate Index for the Transportation of Selected Products, 1990 Through 1996

Rail Rate Index for Transportation of Coal, Wheat, and Corn, 1990-96



Rail Rate Index for Transportation of Potassium/Sodium, Plastics/Resins, Motor Vehicles, and Motor Vehicle Parts, 1990-96



Source: GAO's analysis of the Board's data.

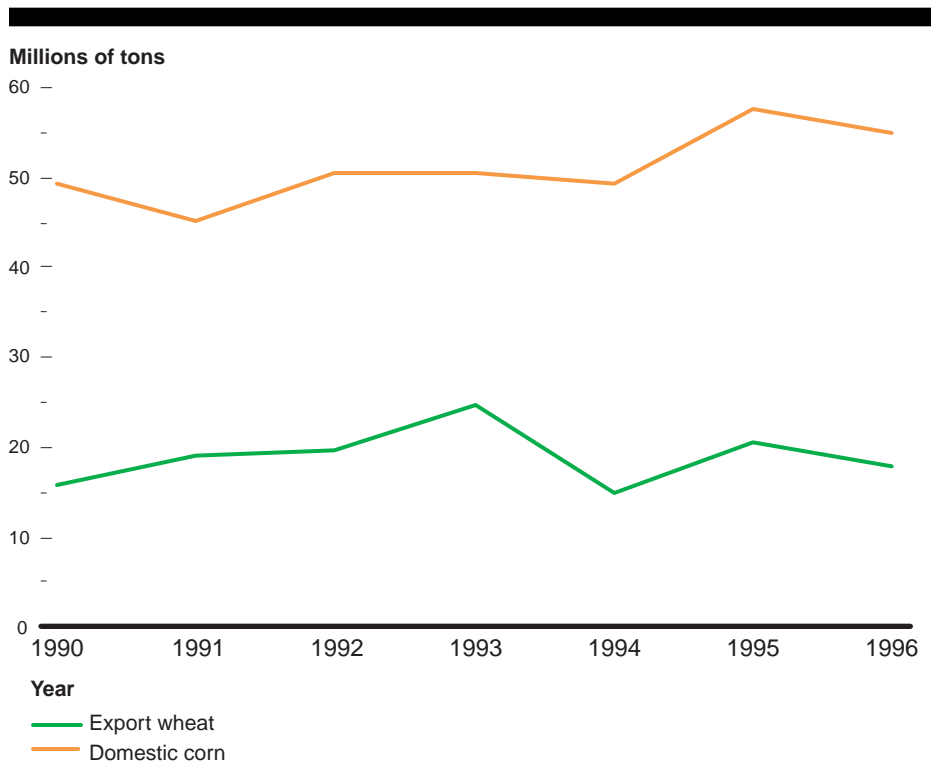
There may be a variety of reasons behind the rate changes shown in figure 3.1. As we reported in 1990, to become more competitive railroads reduced rates. In addition, railroads have made extensive use of contracts to do business. Finally, rail rates reflect the specific characteristics of each commodity and the demand for rail transportation. According to USDA, transportation of wheat is dominated by railroads—in 1996 railroads transported about 57 percent of all wheat in the nation—and exports greatly affect the demand for rail transportation.³⁹ Since 1990, the demand

³⁹See Transportation of U.S. Grains: A Modal Share Analysis, 1978-95, U.S. Department of Agriculture, Agriculture Marketing Service, Transportation and Marketing, Marketing and Transportation Analysis Program (Mar. 1998).

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for rail transportation of wheat for export has fluctuated from a high of about 25 million tons in 1993 to a low of about 15 million tons in 1994. (See fig. 3.2.) In contrast, transportation of corn is more dependent on trucks—in 1996, trucks transported about 41 percent of corn production compared with about 38 percent for rail—and corn is primarily used for domestic poultry and cattle feed, domestic processing into ethanol alcohol, and other purposes. Also, significant amounts of corn are grown in areas accessible to navigable waterways, and much of the corn exported is transported by barge to such ports as New Orleans. As shown in figure 3.2, since 1990 the rail transportation of domestic corn has fluctuated from about 58 million tons in 1995 to about 45 million tons in 1991. These commodity characteristics may at least partially account for the overall difference in prices between wheat and corn—2 to 2.5 cents per ton-mile for wheat and less than 2 cents per ton-mile for corn.

Figure 3.2: Rail Transportation of Export Wheat and Domestic Corn, 1990 Through 1996



Source: USDA.

Rail Rates in Some Markets Have Not Fallen

Our analysis of rail rates since 1990 for coal, grain (corn and wheat), chemicals, and transportation equipment in selected transportation markets/corridors generally showed that real rail rates have fallen.⁴⁰ However, not all rates have fallen, and rail rates were sensitive to competition—both intermodal (competition between railroads, trucks, and other transportation modes) and intramodal (rail to rail). For example, we found that real rail rates for corn shipments from the Midwest, where there is barge competition, to the Gulf Coast were significantly less than rail rates for corn shipments on similar distance routes that appeared to offer little nonrailroad competition. We also found that rates in markets/corridors that are considered to have less railroad-to-railroad competition, such as the plains states of North Dakota and Montana, were generally higher than rail rates on similar distance corridors that might offer more railroad options. Finally, we found that the relationship of shipment size (number of railcars) to rates varied by commodity. Typically, as shipment size increases, rates charged per ton decrease, reflecting increased efficiencies in train operations. For coal and some other commodities we reviewed, we generally found that the size of shipments remained relatively constant from 1990 through 1996. However, at the same time rates were generally falling. This implies that factors other than shipment size accounted for the rate decreases. We also found that on at least one northern plains wheat corridor we reviewed, railroad rates generally did not decrease even as average shipment size increased.

Rail Rates for Coal Have Generally Decreased Since 1990

In general, real rail rates for coal shipments have fallen since 1990. This was true for overall rates and for the specific long-, medium-, and short-distance transportation corridors/markets. The rates on medium-distance routes (between 501 and 1,000 miles) provide a good illustration of the changes we found in coal rates.⁴¹ (See fig. 3.3.) As figure 3.3 shows, real rail rates for both the eastern (Central Appalachia) and

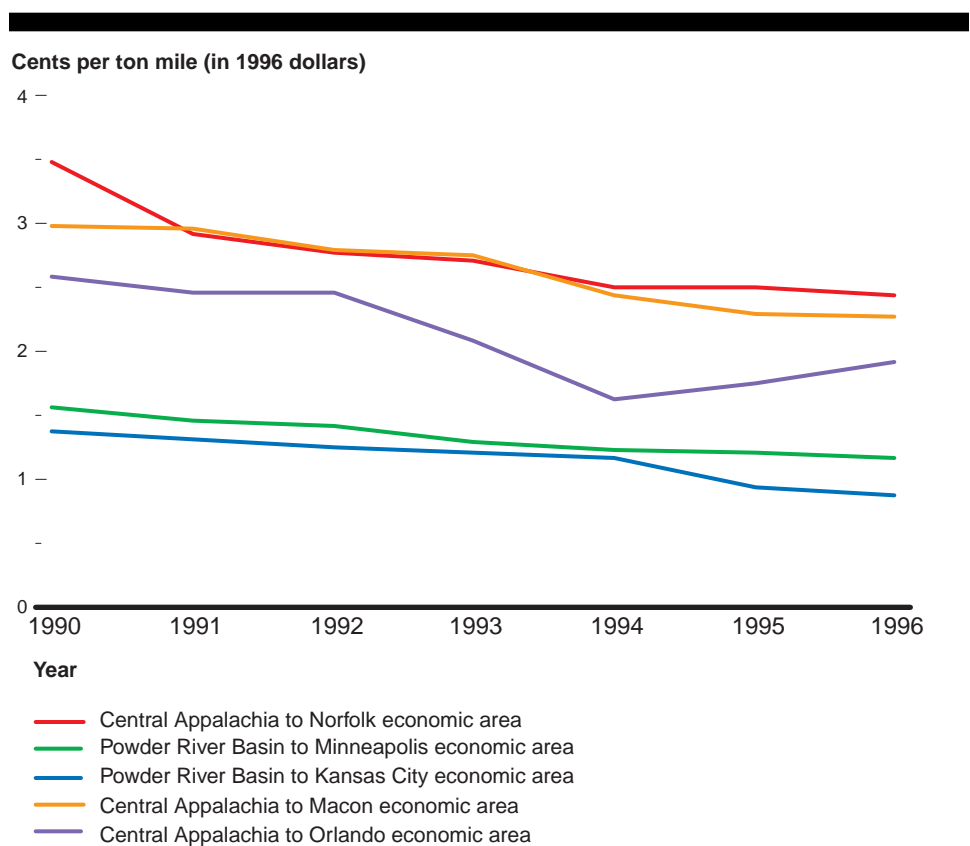
⁴⁰The markets/corridors selected for this analysis are those with the highest average annual tonnage (over the 1990-96 period) within each of the distance categories we used. Except for coal and Canadian origins, these markets/corridors represent Bureau of Economic Analysis economic areas. Unless there are problems of data confidentiality, we present information on the leading five corridors for each commodity group and distance category. Where confidentiality problems preclude reporting on a corridor, we substituted the corridor with the next highest tonnage. Even though these corridors are the highest-volume corridors for the particular commodities—the 10 highest-volume short-, medium- and long-distance routes accounted for over 50 percent of tons and over 60 percent of ton-miles of coal, and over 40 percent of tons and ton-miles of wheat—those selected do not represent a statistical sample drawn from the population of all corridors. Thus it is not appropriate to generalize our findings to a population larger than the corridors we analyzed. See chapter 1 for how we selected specific corridors.

⁴¹See app. II for illustrations of real rail rates for coal shipments in the long- and short-distance categories.

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western (Powder River Basin) coal routes that we looked at generally decreased since 1990.⁴² On the eastern medium-distance coal routes, rates generally decreased one-half to 1 cent per ton-mile. On the western medium-distance coal routes, rates generally decreased between two-thirds of a cent and one cent per ton-mile. The only real exception to the rate decreases was a slight increase in real rail rates from 1994 through 1996 on a route from Central Appalachia to Orlando. However, the rate in 1996 was still about seven-tenths of a cent less than the rate in 1990.

Figure 3.3: Real Rail Rates for Coal, Selected Medium-Distance Routes, 1990 Through 1996



Source: GAO's analysis of the Board's data.

⁴²The Central Appalachia Coal Supply Region includes eastern Kentucky, Virginia, and southern West Virginia. The Powder River Basin Coal Supply Region includes Montana and Wyoming.

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There may be a number of reasons why rail rates for the transportation of coal have fallen. Although changes in shipment size may affect rail rates, in general we did not find any significant changes in shipment sizes from the 1990 through 1996 period for the routes/corridors we reviewed. On the medium-distance routes, shipment size for the eastern coal routes generally remained between 80 and 90 railcars over the entire period, except for the Central Appalachia to Norfolk, Virginia, route where shipment size generally stayed between 40 and 50 railcars.⁴³ Shipment size on the medium-distance western coal routes generally remained between 100 and 115 railcars. Shipment size on western long-distance routes (over 1,000 miles) also generally remained in the 100 to 120 railcar range, while shipment size on the shorter distance coal routes (500 miles or less) generally remained in the 70 to 90 car range. One exception was a short-distance route between Central Appalachia and Charleston, West Virginia. On this route, the average shipment size increased from about 70 railcars in 1990 to about 100 cars in 1996. Over the same time period, the rail rate decreased about 30 percent—from about 6.5 cents per ton-mile in 1990 to about 4.5 cents per ton-mile in 1996.

The coal rates we examined may have been affected by rail competition. Currently, two Class I railroads serve the Powder River Basin—the Burlington Northern and Santa Fe Railway and Union Pacific Railroad—and three Class I's serve the Central Appalachia region—Conrail, CSX Transportation, and Norfolk Southern. Whether these or other railroads have the market power to extract higher rates from coal shippers is unclear. On the one hand, data from the Board show that from 1990 through 1996 the percent of coal shipments transported where revenues exceeded 180 percent of variable costs averaged about 53 percent. However, in 1996, 47 percent of the coal shipments were transported at rates where revenue exceeded 180 percent of variable costs. This was the lowest percentage since 1987. On the other hand, if the number of rate complaints filed with ICC or the Board is indicative of shippers' views of market power wielded by railroads, about half of the approximately 40 rate complaints filed since January 1, 1990 (or were pending on that date), involved coal rates.⁴⁴

⁴³Board officials indicated that the comparatively small average shipment size found on this route reflects the waybill creation and reporting practices that a particular railroad uses for its export coal traffic. Although the waybill indicates shipments of only one or small groups of cars, Board officials believe the railroad in question gathers these cars into one or more larger shipments for transport to destination.

⁴⁴See GAO/RCED-99-46.

Rail Rates for Some Grain Shipments Have Remained Flat or Increased Since 1990

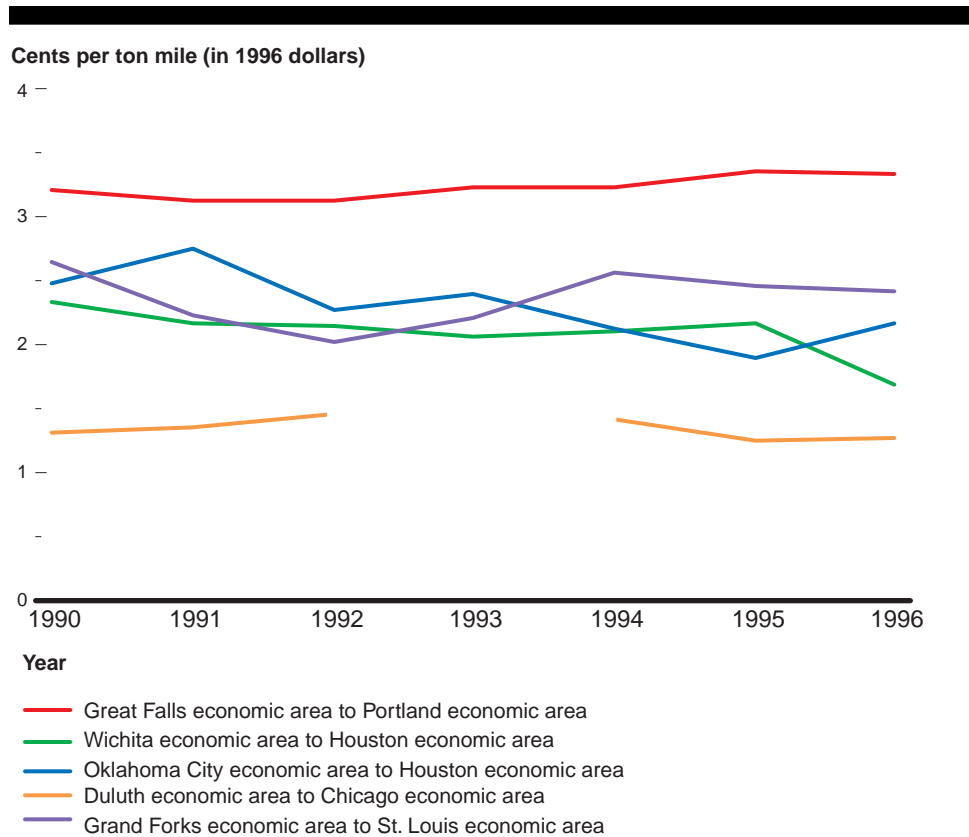
As discussed earlier, rail rates for transporting grain such as wheat and corn have generally stayed the same or increased since 1990.⁴⁵ However, rail rates for medium-distance routes (501 to 1,000 miles), such as from central plains origins around Oklahoma City and Wichita to Houston, showed some decreases.⁴⁶ (See fig. 3.4.) On the other hand, rail rates from Great Falls, Montana, to Portland, Oregon, stayed about the same or increased slightly between 1990 and 1996. We found similar trends in other distance categories, particularly long-distance (greater than 1,000 miles) wheat routes. The rail rates on long-distance wheat routes from Billings, Montana, and Minot, North Dakota, to Portland both stayed relatively constant, at about 3 cents per ton-mile over the entire 7-year period. Rate trends for corn shipments were similar to those of wheat. Again, the variety of rate trends we found for shipments of corn can be seen on the rates for medium-distance routes. (See fig. 3.5.) Although the rates on some of the routes, most notably those routes from the midwest to Atlanta, showed decreases, rates for corn shipments from selected origins in Illinois to New Orleans showed some increases. As with wheat, rail rates for long-distance corn shipments on the routes we reviewed generally varied little, remaining in the 1.4 to 1.6 cents per ton-mile range from 1990 through 1996.

⁴⁵In 1996, of grain transported by rail, corn represented about 49 percent of total rail industry revenue, with wheat an additional 40 percent. According to USDA, in 1997 the top three corn producing states in the United States were Iowa, Illinois, and Nebraska, while the top three wheat producing states were Kansas, North Dakota, and Montana.

⁴⁶App. II contains illustrations of the real rail rates on selected long- and short-distance wheat and corn routes.

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Figure 3.4: Real Rail Rates for Wheat, Selected Medium-Distance Routes, 1990 Through 1996

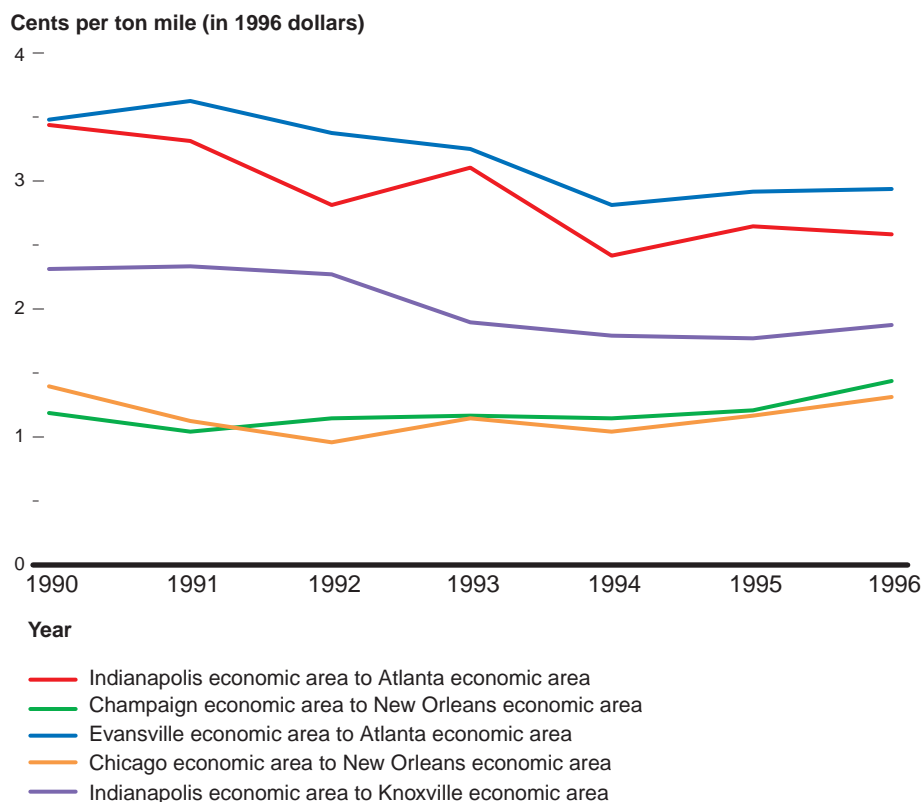


Note: Due to confidentiality, data point for Duluth economic area to Chicago economic area for 1993 was excluded.

Source: GAO's analysis of the Board's data.

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Figure 3.5: Real Rail Rates for Corn, Selected Medium-Distance Routes, 1990 Through 1996



Source: GAO's analysis of the Board's data.

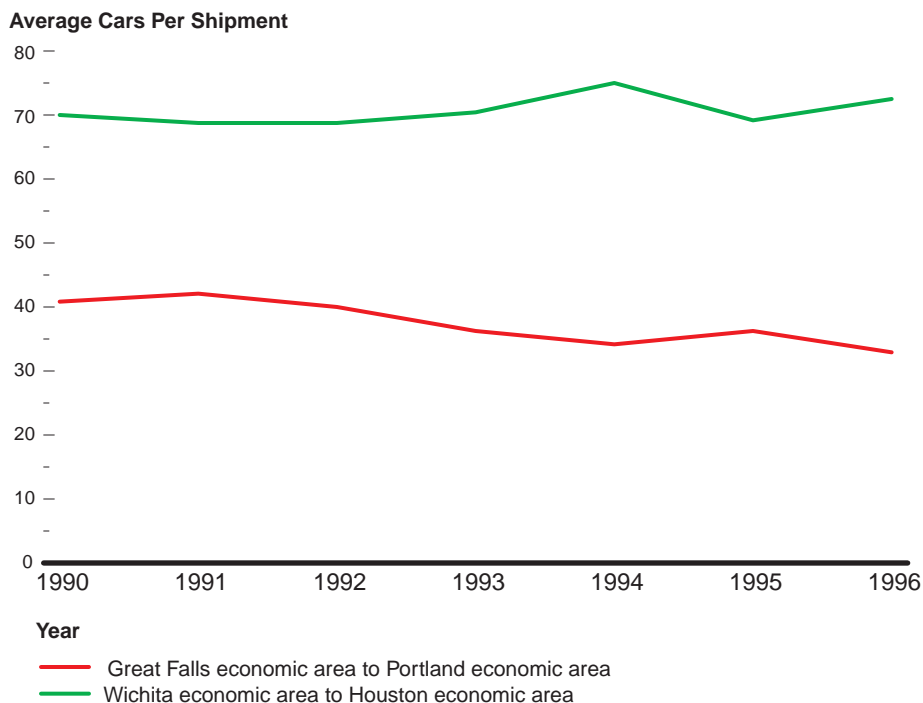
We also found that rail rates for wheat and corn shipments appeared to be sensitive to both inter- and intramodal competition. For example, as shown in figure 3.4, rail rates for shipments of wheat from Duluth, Minnesota, to Chicago, Illinois—a route that is potentially competitive with Great Lakes water transportation—were significantly less—generally between 0.75 to almost 2 cents less per ton-mile—than rail rates on other medium-distance wheat routes. This includes rail rates for shipments from Great Falls, Montana, to Portland, Oregon, which some consider to lack effective transportation alternatives to rail. The same was true for corn shipments. The rail rates for corn shipments from Chicago and Champaign, Illinois, to New Orleans—routes which are barge competitive—were substantially less (in some years over 2 cents per

ton-mile less) than rail rates on the other medium distance corn routes. (See fig. 3.5.) The sensitivity to intramodal competition is best seen by comparing rail rates for wheat shipments originating in the central plains states with the rail rates for shipments originating in the northern plains states. As figure 3.4 illustrates, rail rates for wheat shipments originating in Oklahoma City and Wichita were generally about 1 cent per ton-mile less than rates on the Great Falls, Montana, to Portland, Oregon, route which originated in the northern plains. Northern plains states, such as Montana and North Dakota, generally have fewer Class I railroad alternatives than the central plains states, such as Kansas. (See fig. 1.1.)

Shipment size is an important factor influencing railroad costs and hence rates, particularly for agricultural commodities. Loading more cars at one time increases railroad efficiency and reduces a railroad's costs. We found that the average shipment size of wheat originating in the northern plains was typically smaller than for wheat shipments originating in the central plains. For example, average shipment size on the Great Falls, Montana, to Portland, Oregon, route was about half that of shipments going from Wichita to Houston—about 40 railcars from Great Falls compared with about 70 railcars from Wichita. (See fig. 3.6.) This may partially explain why rail rates and costs for wheat shipments are higher in the northern plains than in the central and southern plains.

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Figure 3.6: Average Shipment Size, Selected Wheat Routes, 1990 Through 1996



Source: GAO's analysis of the Board's data.

To investigate further the effects of shipment size on railroad rates and variable costs, we developed regression equations using waybill data in which annual average revenues per ton-mile and average variable costs per ton-mile were calculated for export wheat corridors and shipment size categories, and then regressed on distance, a time trend, and indicators of the shipment size category. For a set of northern plains export corridors, the effects of increased shipment size on revenues were modest compared with the effects of shipment size on variable costs per ton-mile on these routes, and compared with the effects of shipment size on both revenues and variable costs for a set of central and southern plains export corridors. Specifically, revenues per ton-mile for the northern plains corridors were estimated to be 0.2 of a cent less on shipments between 5 and 50 cars than for shipments of fewer than 5 cars, while revenues per ton-mile for the

central and southern plains corridors were estimated to be 0.6 of a cent less for a similar shipment size increase.⁴⁷ Additionally, revenue per ton-mile in the central and southern plains for shipments exceeding 50 cars were estimated to decrease an additional 0.3 of a cent, while in the northern plains, the estimated reduction in revenue per ton-mile for this increase in shipment size was not statistically significant. For variable costs per ton-mile, there was more similarity between northern plains and central and southern plains states. For example, estimated cost reductions were statistically significant for all shipment size categories, although the magnitudes were greater in the central and southern plains case.

Rail Rate Changes for Chemical and Transportation Equipment Shipments Were Similar to Coal and Grain

For comparison purposes, we also reviewed rail rates for certain chemicals and transportation equipment.⁴⁸ In general, we found that real rail rates for chemical shipments exhibited many of the characteristics of coal and grain discussed previously—that is, many of the rail rates on various routes fell, but rates did not fall on all routes. An illustration of these trends can be seen for shipments of potassium/sodium on medium distance routes.⁴⁹ (See fig. 3.7.) As figure 3.7 shows, rail rates from Canadian origins to Minneapolis, Minnesota, decreased about one-third over the 7-year period—from about 5.4 cents per ton-mile to about 3.7 cents per ton-mile. However, rates from Casper, Wyoming, to Portland, Oregon, remained relatively stable at 3.4 cents per ton-mile. One of the largest rate changes was a decrease in rail rates for transportation of plastics and resins within the New Orleans, Louisiana, economic area (a short-distance route). On this route, rail rates decreased about 70 percent from 1990 through 1996—from about 47 cents per ton-mile to about 14 cents per ton-mile. (See app. II.) According to the Chemical Manufacturers Association, nearly two-thirds of the tonnage of chemicals and allied products shipped are transported less than 250 miles. At these distances, trucks are a competitive option for chemical shippers, and in 1996, about

⁴⁷In the northern plains sample—Great Falls and Billings, Montana, and Minot, Bismarck, and Grand Forks, North Dakota, to Portland—average revenue per ton-mile was 2.99 cents, and average variable cost per ton-mile was 1.55 cents. In the central and southern plains sample—Wichita and Topeka, Kansas; Oklahoma City, Oklahoma; Dallas-Ft. Worth and Amarillo, Texas; and Denver, Colorado, to Houston as well as Denver to Beaumont, Texas—average revenue per ton-mile was 2.41 cents, and average variable cost per ton-mile was 1.75 cents.

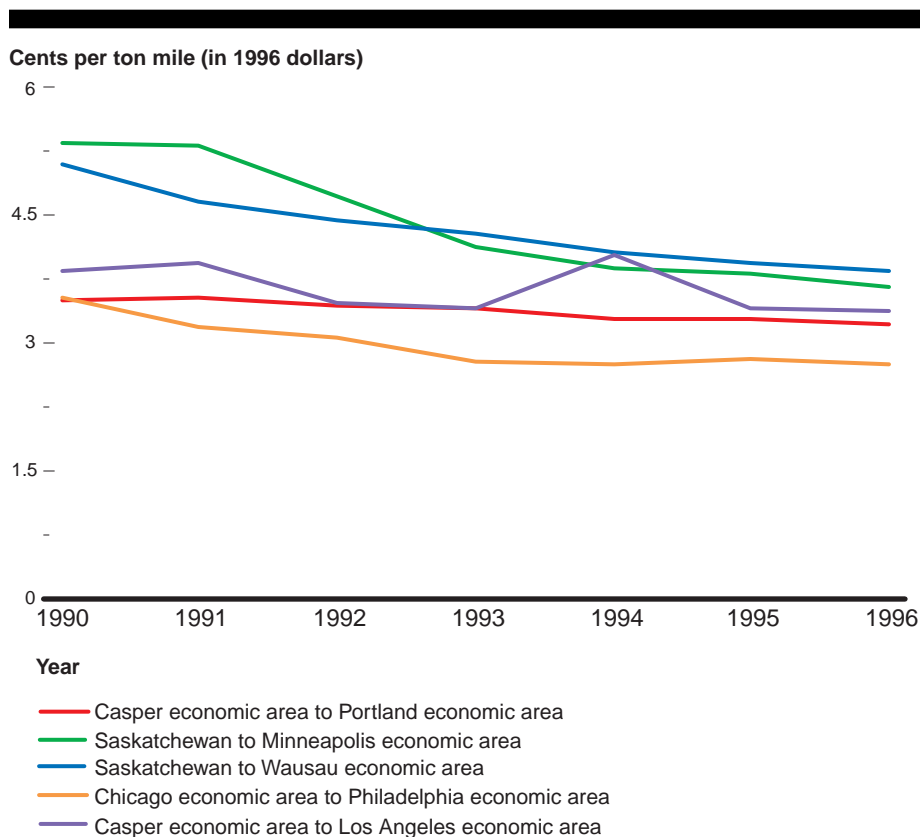
⁴⁸The chemicals we included (potassium and sodium compounds and plastic materials or synthetic fibers, resins, rubbers) and the transportation equipment categories we included (motor vehicles and motor vehicle parts or accessories) accounted for about 49 percent and 97 percent, respectively, of total rail industry revenue for these commodities in 1996.

⁴⁹See app. II for illustrations of rail rates for chemicals and transportation equipment shipments in other distance categories.

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52 percent of the tonnage of all chemicals and allied products shipped were by truck, with railroads only accounting for 21 percent.

Figure 3.7: Real Rail Rates for Potassium/Sodium Shipments, Selected Routes, 1990 Through 1996



Source: GAO's analysis of the Board's data.

Rail rates for shipments of finished motor vehicles and motor vehicle parts and accessories also showed a variety of patterns. One of the most dramatic rate changes was a decrease in rail rates for the transportation of finished motor vehicles from Ontario, Canada, to Chicago, Illinois. On this route, rates fell about 40 percent—from 19.5 cents per ton-mile to 11.7 cents per ton-mile. In general, most rail traffic in motor vehicles and motor vehicle parts or accessories is under contract or has been exempt from economic regulation. According to AAR surveys, the percent of motor

vehicle traffic that moved under contract increased from 55 percent in 1994 to 81 percent in 1997. Whether railroads have the market power to charge high rates is unclear. Officials from Norfolk Southern told us that automotive shippers “pay a premium rate for premium service.” This suggests that rates may be related to factors other than market power. In addition, officials from Union Pacific said their company has offered shippers reduced rates in return for guaranteed high volumes of shipments, again suggesting that rates are related to factors other than market power.

Revenue to Variable Cost Ratios Reflect Differential Pricing, but With Some Caveats

Revenue to variable cost ratios are often used as indicators of shipper captivity to railroads. If used in this way, the higher the RVC ratio the more likely it is that the shipper has used only rail to meet its transportation needs and the more likely it is that the railroad can use its market power to set rates that extract revenues much greater than its variable costs. Since 1990, about one-third of all railroad revenue has come from shipments transported at rates that generate revenues exceeding 180 percent of variable costs. However, the percentage varies by commodity and has changed over time. Our analysis suggests that competition can influence specific RVC ratios for specific routes and commodities. In general, we found that RVC ratios exceeded 180 percent on short-distance movements of coal and long-distance movements of wheat from northern plains states—movements where there may be less competition for the railroad. In contrast, RVC ratios were consistently 180 percent or less on a wide variety of routes, including long-distance movements of coal. While RVC ratios are often used as proxies for market dominance, use of such ratios for this purpose may lead to misinterpretations because RVC ratios can increase as rail rates go down and, conversely, can decrease as rail rates go up.

RVC Ratios Reflect Differential Pricing

Overall, the percent of railroad revenue from shipments transported at rates generating revenues exceeding 180 percent of variable costs differs by commodity. (See table 3.2.) As table 3.2 shows, from 1990 through 1996, for all commodities, about one-third of all revenues generated by railroads came from movements transported at rates generating revenues exceeding 180 percent of variable costs. However, several commodities, such as coal, chemicals, and transportation equipment, had higher percentages of revenue from shipments at rates generating revenues exceeding 180 percent of variable costs. Farm products (which include grain shipments) had a lesser percentage. As table 3.2 shows, these percentages

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Rail Rates Have Fallen Since 1990, but Not
All Shippers Have Benefitted

can change over time. For example, for coal and transportation equipment, in 1996, the percentage of revenue generated from shipments at rates generating revenues exceeding 180 percent of variable costs were the lowest they had been since 1990. By contrast, for chemicals, in 1996, the percentage of revenue generated from shipments at rates generating revenues exceeding 180 percent of variable costs was the highest it had been since 1990.

Table 3.2: Percent of Rail Industry Revenue Exceeding 180 Percent R/VC for Selected Commodities, 1990 Through 1996

Year	Percent of revenue exceeding 180 percent R/VC				
	All commodities	Coal	Farm products	Chemicals	Transportation equipment
1990	34	55	22	44	66
1991	29	54	22	45	48
1992	30	55	21	46	48
1993	32	54	26	48	53
1994	34	54	32	50	59
1995	32	54	26	46	54
1996	29	47	23	54	33

Source: GAO's analysis of the Board's data.

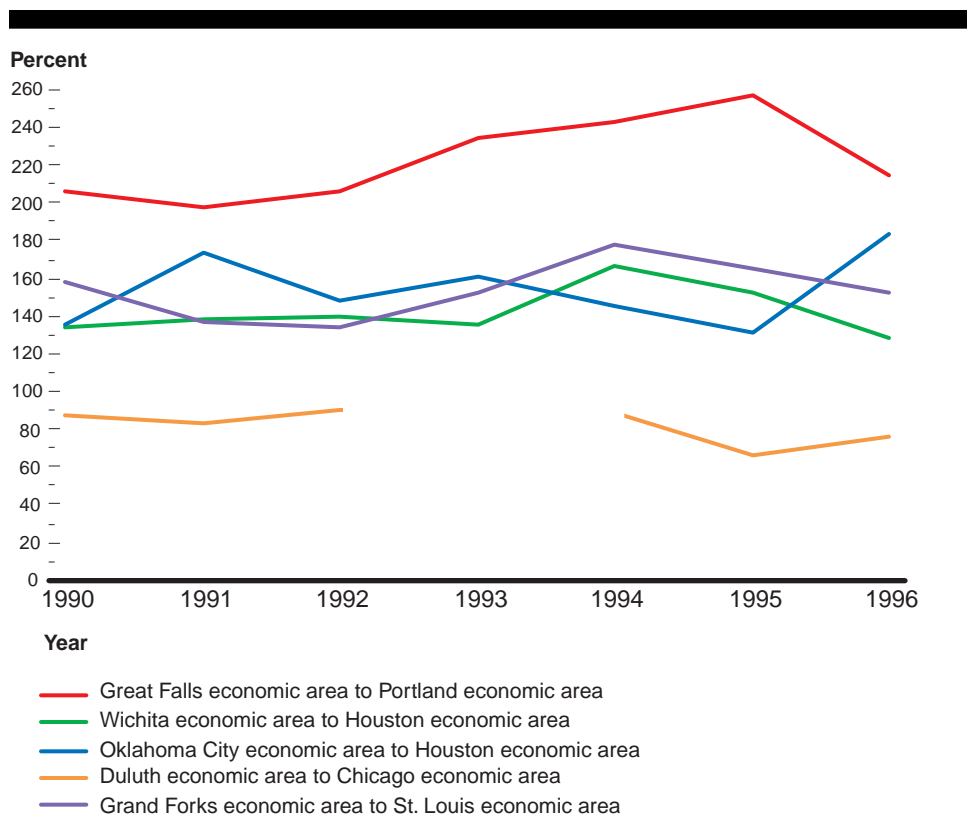
We found a wide variety of R/VC results for the specific commodities and routes that we looked at. In general, R/VC ratios were consistently above 180 percent on short-distance movements of coal (such as from Central Appalachia) and certain long-distance movements of wheat. The R/VC ratios were consistently below 180 percent on long-distance movements of corn and of coal from the Powder River Basin and on medium-distance movements of corn and wheat. The ratios for the other commodities and routes that we reviewed showed no consistent pattern.

The ratio results suggest that demand-based differential pricing may have played a role in how railroads set their rates. The fact that R/VC ratios were typically higher for short-distance movements of coal than for medium- and long-distance movements reflects the possibility that, as shipping distance increases, the shipper or receiver is better able to substitute other sources of coal. This same distance-related pattern of R/VC ratios was found for corn, illustrating both the nature of domestic corn markets as well as geographic considerations that favor barge options for the transportation of corn. In both the coal and corn cases, various competitive pressures may constrain the rates that railroads were able to

charge for longer-distance movements, and this resulted in lower RVC ratios.

Long-distance movements of wheat often occurred at much higher RVC ratios than were typically found for corn and coal. For example, the RVC ratios for long-distance wheat movements originating in Montana and North Dakota were consistently at 180 percent or higher from 1990 through 1996. In contrast, the RVC ratios on a Minneapolis, Minnesota, to New Orleans, Louisiana, route—where barges offer competition—were always below 100 percent. We also found differences in the ratio between northern and central plains routes for the medium-distance shipments of wheat. (See fig. 3.8.) The northern plains states are considered by some to have fewer rail alternatives than the central plains states. As figure 3.8 shows, the RVC ratios for those wheat shipments originating in Wichita and Oklahoma City were consistently below 180 percent from 1990 through 1996. On the other hand, the RVC ratio for wheat shipments originating in Great Falls, Montana, were consistently above 180 percent over the entire period.

Figure 3.8: R/VC Ratios for Medium-Distance Rail Shipments of Wheat, 1990 Through 1996



Note: Due to confidentiality, data point for Duluth economic area to Chicago economic area for 1993 was excluded.

Source: GAO's analysis of the Board's data.

R/VC Ratios Are Subject to Limitations

R/VC ratios have their limitations. One of these is how variable costs are determined. According to the Board, variable costs are developed in accordance with the Uniform Railroad Costing System (URCS). URCS is a general purpose costing system used by the Board for jurisdictional threshold determinations and other purposes. By necessity, URCS incorporates a number of assumptions and generalizations about railroad operations to determine variable costs. Because of these assumptions and generalizations, the variable costs developed under URCS may not necessarily represent the actual costs attributable to the particular shipment involved. The revenues used to calculate R/VC ratios may also not be actual. Board officials told us that revenues shown in the Carload Waybill Sample are not adjusted for such things as the year-end rebates

and refunds often provided to shippers exceeding minimum volume commitments. As a result of these limitations, it is possible that some of the RVC ratios used in our analysis would be different if actual revenues and variable costs were known.

Perhaps a more serious limitation is possible misinterpretations of RVC ratios. Because an RVC ratio is a simple division of revenues by variable costs, it is possible an RVC ratio could be increasing at the same time revenues and variable costs are both decreasing. For example, if rail revenues are \$2 and variable costs are \$1, the RVC ratio would be 200. However, if revenues decrease to \$1.50 and variable costs decrease to \$0.50, the ratio becomes 300. Under this scenario, although railroads have passed all cost reductions along to shippers in terms of lower rates, the increased RVC ratio makes it appear as though the shipper is worse off. On the other hand, RVC ratios could be decreasing at the same time revenues and variable costs are increasing. For example, using the example above (\$2 in revenues and \$1 in variable costs with a ratio of 200), if revenues increase to \$2.50 and variable costs increase to \$1.50, the ratio becomes 167.

Agency Comments and Our Evaluation

In commenting on a draft of this report, the Board noted that competition is better measured by the effectiveness of transportation alternatives rather than the number of competitors. In response to this issue, we modified report language to better recognize the importance of effective competition in measuring the effects of competition on rail rates.

Widespread Concerns About Rail Service, but Overall Quality of Service Cannot Be Assessed

In recent years, shippers have increasingly criticized Class I railroads for providing poor service. Rail service disruptions in the western United States in the summer and fall of 1997 brought national attention to these concerns. Among the problems cited by shippers were an insufficient supply of railcars when and where needed, inconsistent pickup and delivery of cars, and longer than necessary transit times to a destination. In general, railroad officials believe the railroads provide adequate service. However, they agree that service is not what it could be and that the industry has failed to meet shipper expectations.

The quality of railroad service, over time for individual rail carriers or between specific railroads, cannot be measured currently. The Board determines whether service is reasonable on a case-by-case basis. In addition, the railroad industry has been reluctant to develop specific service measures for fear they could be misinterpreted or misused by the public or might reveal business-sensitive information. In reaction to widespread criticism of rail service, however, railroads have developed four performance indicators. Although these indicators may be helpful in assessing certain aspects of service, they are more an evaluation of operating efficiency than of quality of service.

Shippers Believe Railroad Service Has Been Poor

In recent years, railroad shippers, shipper associations, and local communities have complained in various forums about poor railroad service. Complaints have been particularly strong from agricultural shippers and communities in the West and Midwest. Union Pacific Railroad's merger with the Southern Pacific Railroad in 1996 and the subsequent widespread delays in delivering railcars to destinations brought national attention to the seriousness of railroad service problems. Shippers attribute many of the problems they experience to a decrease in competitive transportation options as a result of railroad mergers. In addition, some shippers believe railroads must improve the consistency of their operations and increase the number of available railcars, among other things, in order to improve service levels.⁵⁰

⁵⁰The subsequent discussion includes references to the year 1997. In responding to a draft of this report, Board officials noted that, in its opinion, 1997 was an atypical year in terms of quality of rail service. They cited the Board's emergency service order in the Houston/Gulf Coast service breakdown as reflecting this aberration and pointed out that service problems in this area of the country began before the Union Pacific/Southern Pacific merger had been fully implemented. They also said that rail service has improved since 1997.

**Shippers Believe the
Quality of Rail Service Has
Deteriorated in Recent
Years**

Many rail shippers believe service has been poor. Events in recent years may have exacerbated the problems. For example, in the summer of 1997, during implementation of the Union Pacific/Southern Pacific merger, rail lines in the Houston/Gulf Coast area became severely congested, and freight shipments in some areas came to a complete halt. As the problem spread, many grain shippers experienced delays in railcar deliveries of 30 days or more, while some grain shippers in Texas did not receive railcars for up to 3 months. Transit times for movements of wheat from Kansas to the Gulf of Mexico in some cases exceeded 30 days—four to five times longer than normal. In late 1997, the Board determined that the service breakdown, which had a broad impact throughout the western United States, constituted an emergency and, among other things, ordered Union Pacific to temporarily release its Houston area shippers from their service contracts so that they could use other railroads serving Houston, and to cooperate with other carriers in the region that could accept Union Pacific traffic for movement, to help ease the gridlock.

The lack of predictable, reliable rail service has been a common complaint among some shippers. For example, during public hearings conducted by USDA in 1997, over 400 grain shippers and rural residents from Iowa, Kansas, Minnesota, Montana, and North Dakota expressed their concerns about cars not being delivered; little, or no, notification when railcars would be delivered; little or no success in trying to reach appropriate railroad officials for information on car deliveries; and the general lack of available cars when and where needed. These same types of problems were identified by shippers and shipper associations during additional hearings in Montana and North Dakota conducted in December 1997 by a Senate Subcommittee and in April 1998 by the Board during hearings on railroad access and competition issues.

**Survey Results Also
Indicate Shipper
Dissatisfaction With Rail
Service**

Our survey responses from about 700 bulk grain, coal, chemicals, and plastics shippers conducted in the fall of 1998 also reflect concerns about railroad service.⁵¹ An estimated 63 percent of the shippers responding to our survey (329 of 525 shippers that answered this question) said that the overall quality of their rail service was somewhat or far worse in 1997 than it was in 1990. Chemicals and plastics shippers were among the most dissatisfied with the overall quality of their rail service—approximately 80 percent of these shippers indicated that the overall quality of rail service they received in 1997 was somewhat or much worse than in 1990. About 71 percent of coal shippers indicated that the overall service levels

⁵¹See chapter 1 for details on how we conducted our survey.

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provided by the railroads serving them were somewhat or much worse. Finally, echoing the complaints expressed during congressional hearings, an estimated 57 percent of grain shippers responding to our survey indicated their overall quality of rail service was somewhat or much worse in 1997 than it was in 1990.⁵²

On the basis of our survey results, the types of problems experienced since 1990 have varied by commodity. (See table 4.1.) About 66 percent of coal shippers responding to our survey indicated that they experienced somewhat or much worse service in terms of car cycle time—that is, the amount of time it takes to deliver a commodity to its destination and return—in 1997 compared with 1990. Chemicals and plastics shippers identified problems with the consistency of on-time delivery as most problematic; about 84 percent of the shippers responding to our survey identified this problem as worse in 1997 compared with 1990. Grain shippers identified railcar availability as their most troublesome problem. An estimated 67 percent of grain shippers indicated that railcar availability during peak periods was somewhat or much worse in 1997 than it was in 1990. Railcar availability, in general, was rated as worse by an estimated 63 percent of the grain shippers.

Table 4.1: Percent of Shippers Responding to Our Survey Experiencing Somewhat or Much Worse Service in 1997 Compared With 1990, by Commodity Type

Aspect of service	Grain shippers	Coal shippers	Chemicals/ plastics shippers
Car transit time	41	65	78
Car availability during peak periods	67	65	73
Car cycle time	47	66	78
Car availability in general	63	61	69
Consistency of on-time pick up	48	58	46
Consistency of on-time delivery	53	57	84

Note: Not every shipper provided a response for each aspect of service. Between 138 and 261 grain shippers, between 34 and 47 coal shippers, and between 24 and 69 chemicals/plastics shippers provided responses to each aspect of service.

Shippers responding to our survey also indicated that the quality of service provided by the railroads has decreased relative to the amount paid for

⁵²Surveys inherently have sampling errors. Sampling errors define the upper and lower bounds of the estimates made for our survey results and were calculated at the 95-percent confidence level. This means that 19 out of 20 times, the sampling procedures used would produce a range that includes the true value. For the information in this report, all sampling errors were less than 5 percent. The specific sampling errors are included in our companion report (GAO/RCED-99-46).

that service. This was particularly true in 1997 compared with 1990. An estimated 43 percent of those shippers (247 of 570 shippers) indicated that the quality of service provided by railroads in 1990 was somewhat or far less relative to the amount paid in 1990. In contrast, the percent of shippers indicating that the quality of service they received from railroads in 1997 was either somewhat or far less relative to the amount paid for that service had increased to an estimated 71 percent of those responding to our survey. Coal shippers and chemicals and plastics shippers were the most dissatisfied—about 80 percent and 88 percent, respectively, were dissatisfied with the value of their service. An estimated 66 percent of grain shippers responding to our survey said the quality of rail service was somewhat or far less relative to the amount that they paid for such service in 1997.

Relatively Few Shippers Have Filed Formal Service Complaints Before the Board

The widespread dissatisfaction with railroad service has not necessarily resulted in many formal service complaints being filed with the ICC or the Board. Only 25 formal service-related complaints were pending with the ICC as of January 1, 1990, or were subsequently filed with the ICC or the Board.⁵³ These complaints involved a wide range of alleged service problems, including failure to provide a sufficient supply of railcars; late inbound and outbound deliveries; and other kinds of inconsistent service. Of the seven cases that had completed the adjudicatory process as of February 1999, five were decided in favor of railroads and two in favor of shippers. Thirteen cases did not result in a decision because ICC/the Board did not have jurisdiction over the matter or the shipper withdrew the complaint. Five formal service complaints were pending as of February 1999.

Typically, no more than two or three complaints were filed each year, except in 1995, when seven complaints were filed. Most of the complaints were filed against Class I railroads (68 percent), with the rest filed against smaller railroads (32 percent). Of the Class I railroads involved in these complaints, Burlington Northern had the greatest number of complaints filed against it (six) followed by Conrail (five) and CSX Transportation (three). On a commodity basis, customers who shipped grain products represented the largest proportion of complaints (20 percent), followed by customers who shipped steel and railcars (12 percent each).

⁵³There were also four petitions for declaratory orders relating to service matters. The statutory authority for declaratory orders and associated relief differ from those of formal complaints. However, the petitions for declaratory orders reflect the petitioners' attempts to use a formal mechanism to resolve service problems.

**Many Shippers Believe
Railroad Mergers and Lack
of Competitive Alternatives
Have Contributed to Poor
Service Performance**

Many shippers and their associations have attributed service problems, at least in part, to railroad mergers or consolidations. When asked in our survey the extent to which mergers or consolidations since 1990 (excluding the Union Pacific merger with Southern Pacific) have affected the quality of rail service they received, an estimated 50 percent of the shippers (268 of 536 shippers responding) indicated that service levels were somewhat or much worse as a result of mergers or consolidations. When asked specifically about the effects of the Union Pacific merger with Southern Pacific on service levels, an estimated 84 percent of the shippers (371 shippers) indicated that the quality of rail service they received was either somewhat or much worse since the merger. Chemicals and plastics shippers indicated they were most affected by the Union Pacific/Southern Pacific merger—about 97 percent indicated that the rail service their companies received was somewhat or much worse. Similarly, about 94 percent of the coal shippers indicated that the Union Pacific merger had resulted in worse rail service. An estimated 77 percent of the grain shippers indicated they received somewhat or much worse rail service after the merger than before the merger.⁵⁴

Shippers have also attributed service problems to a lack of competitive alternatives to rail transportation. Some shippers who told us that historically they have only been served by a single railroad or have no access to other transportation modes maintain that the rail service they receive is poor. For example, some North Dakota grain shippers told us that they are heavily dependent upon railroads to transport their grain because shipping grain by truck (the only other major mode of freight transportation available in the state) over long distances to mills, processors, and export markets is not economically feasible. As a result of this dependence, they claim there is little incentive or reason for the one railroad that serves them to provide quality service. These shippers told us that not only have railroads become more arrogant and stopped providing good service to those shippers for which they no longer face rail competition, but also railroads have tended to serve those customers with competitive alternatives first—leaving those shippers without competitive alternatives to receive the last and worst service.

Shippers responding to our survey identified several changes that they believe railroads should make to increase rail service quality. Although grain shippers cited the lack of available cars as the aspect of service that

⁵⁴These percentages represent results from 87 of 90 chemical/plastics, 51 of 54 coal, and an estimated 175 of 227 grain shippers. The remaining respondents did not answer this series of questions; indicated they did not know; or it was not applicable to them because they indicated that they were not served by the Union Pacific/Southern Pacific Railroad.

has caused them the most problems, an estimated 68 percent of the grain shippers (331 of 485 shippers responding) indicated that they would like to see the consistency of on-time delivery of cars improved. An estimated 51 percent of the grain shippers (246 of 485 shippers responding) believe the number of available cars should be increased, and an estimated 33 percent (162 of 484 shippers responding) want to see the consistency of on-time pick up of cars improved. While both coal shippers and chemicals and plastics shippers identified consistency of on-time delivery as among the three most important changes needed to improve service, they identified improving transit times as among the most important changes that should be made by the railroads—about 75 percent of the coal shippers (62 of 83 shippers responding) and about 84 percent of the chemicals and plastics shippers surveyed (81 of 97 shippers responding) expressed the need for improved transit times.

Railroads Believe That Service Is Adequate, but Improvements Are Needed to Meet Shipper Expectations

In general, rail industry officials believe the service they provide to their customers is adequate. In fact, railroads have made capital expenditures in recent years to improve system capacity and service levels. However, railroad officials recognize that railcar availability and the timeliness of rail shipments, among other things, do not always meet shipper expectations. Some industry officials believe capacity constraints, industry downsizing, and an inadequate railcar supply are among the factors that have contributed to the difficulties in meeting shipper service expectations. In addition, some railroad officials agree that rail mergers and consolidations, in particular the Union Pacific merger with Southern Pacific, have exacerbated service problems. Addressing service problems can be a challenge; railroad officials told us that they often face the difficult task of balancing the service needs of customers with the financial viability of the railroads.

Railroads Believe Service Is Generally Adequate

In general, railroad officials believe that current service is adequate. This is particularly true when compared with 1990. With the exception of service problems associated with the Union Pacific/Southern Pacific service crisis, officials from the four largest Class I railroads we spoke with about service said overall service in 1997 was at least as good as it was in 1990. They provided a number of illustrations for why service was as good as or better than in 1990. For example, Norfolk Southern officials said that their railroad and other railroads have made significant investments in cars, locomotives, and people to improve service. Officials from CSX Transportation said that investments in such things as the

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installation of continuously welded rail throughout the network, purchase of new cars and locomotives, and the development of better information technology to respond to customer problems have all contributed to improved service. There was also general agreement that rail industry consolidation, including the Union Pacific merger with Southern Pacific, has benefitted shippers by creating more single-line service that reduces the number of trains that must handle goods enroute, thereby reducing costs and transit times.

However, many railroad officials also agree that service is not what it should be and may not have met shipper expectations for various reasons. For example, some railroad officials told us that delays on rail systems have been primarily caused by capacity constraints. As railroad traffic has been growing in recent years, and as railroads have been scaling back operations in order to cut costs, system capacity has become inadequate. In addition, to cut costs, railroads have reduced employment levels. Now, given the growth in railroad traffic, railroads have had insufficient people or crews available to provide the required service. For example, train delay data we obtained from one Class I railroad indicated that both a shortage of locomotives and crews were major causes of train delays from 1992 through 1996. Finally, an inadequate supply of railcars, especially for grain shippers, has contributed to shipper dissatisfaction. As one railroad official told us, railcar availability will always be a point of contention between railroads and shippers, and some railroads are reluctant to invest in the number of cars needed to handle peak demand if those cars might sit idle for a significant portion of the year.

**Railroads Acknowledge
the Union Pacific/Southern
Pacific Merger Contributed
to Problems**

Some rail industry officials we spoke with, including those at the Union Pacific Railroad, acknowledged that the Union Pacific merger with Southern Pacific contributed to the service crisis which began in the late summer of 1997 in and around Houston, Texas. According to Union Pacific officials, Southern Pacific had more problems than Union Pacific officials expected, especially a substantial amount of deferred track maintenance. In general, these officials said that Southern Pacific had made a lot of operating decisions based on short-term cash flow considerations rather than long-term financial health. As a result, Union Pacific's high traffic levels and a series of external stresses overwhelmed a weak Southern Pacific infrastructure. Union Pacific officials expect that as the railroad recovers from its difficulties, service levels will return to their pre-merger levels—which in their opinion, had improved since 1990.

The difficulties experienced by Union Pacific affected other railroads as well. For example, officials at Norfolk Southern told us that because Norfolk Southern receives cars from Union Pacific Railroad for shipment to ultimate destinations and sends other cars to destinations that are on Union Pacific's tracks, the Union Pacific's problems adversely affected Norfolk Southern's customer commitments. Officials at Burlington Northern and Santa Fe Railway told us that it took on a significant amount of additional business during the service crisis that would usually have been carried on Union Pacific, which resulted in a trade-off: railroad officials decided it was better to serve more shippers with a lower level of service rather than a more limited number of customers at a higher level of service. Officials from CSX Transportation also said the Union Pacific/Southern Pacific failures were a "wake up call" to the railroad industry to do a better job of serving its shippers.

**Providing High-Quality
Service Involves
Trade-Offs Between
Investment and Service**

In providing high-quality service, railroad management faces the difficult task of balancing the needs of shippers with the financial viability of the railroad. In discussing service adequacy and shipper dissatisfaction, railroad officials made clear the role financial tradeoffs play in service decisions. Officials from CSX Transportation told us that their company could hire more crews and invest in assets to address capacity problems. However, in their opinion, the competitive nature of today's railroad business precludes these extra costs from being passed on to shippers. Officials from other railroads agreed, saying that railroads need to add capacity—which will require a significant capital investment. In considering this investment, their companies will have to weigh issues such as the potential for future traffic growth; cost of adding capacity; and effects on rates and service. Tradeoffs will also be a part of the decision making process regarding railcars. Some railroad officials noted that shippers and railroads historically have disagreed on the adequacy of the supply of railcars, but actual investment in such cars involves a tradeoff between the investment in railcars and the return on that investment. Often, the return on investment is not sufficient to justify the investment cost.

Management discretion that is inherent in railroad operations can also influence the quality of rail service. The logistics of moving different kinds of freight to a myriad of markets in different geographical locations can be a difficult task. Management decision making may play a larger role than technology in influencing service levels. This was the conclusion of a 1993 study conducted by the Massachusetts Institute of Technology, Center for

Transportation Studies, on freight railroad reliability.⁵⁵ This study concluded that decisions regarding power management (availability and positioning of locomotives), train operations (which trains to run, with what cars, and at what time), and the management of railroad terminals all had important consequences on railroad reliability. Some railroad officials we spoke with agreed that management decision making plays a significant role in the quality of service. For example, officials at Norfolk Southern told us that, although it has taken actions to minimize management decisions in providing service, there is still a fairly high degree of management discretion in service decisions. Officials at CSX Transportation told us that 85 to 90 percent of service performance involves management decision making about capital expenditures and operating expenses. In their opinion, at the local level, service decisions are very much influenced by budget and financial decisions, and insufficient funding could lead to reductions in such things as train service.

**Quality of Rail Service
Cannot Be
Determined Since
Industrywide
Measures Do Not
Exist**

Currently, the overall quality of railroad service provided by railroads cannot be measured. While the legislation governing railroad service requires that railroads provide service upon reasonable request, the Board and federal courts determine what constitutes reasonable service and whether a railroad has satisfied its service obligations in the context of deciding specific complaints. Industrywide measures of rail service for the most part do not exist. In general, the very limited industrywide measures we were able to obtain suggest some improvement in these measures in recent years. However, these measures are not enough to conclude that service has improved overall. Railroad officials told us they have been reluctant to develop service measures, fearing they could be misinterpreted or misused by customers and/or the public or that they may reveal business-sensitive information. According to AAR, individual rail carriers have developed measures of service over time that, while addressing carrier and/or customer specific service performance, are not necessarily consistent or continuous measures of service either between carriers or over time for individual carriers.

⁵⁵Causes of Unreliable Service in North American Railroads, Little, P., Martland, C.D., Proceedings of the 35th Annual Meeting, Transportation Research Forum (1993).

Governing Legislation
Does Not Prescribe
Specific Service Levels

Railroads are required by statute to provide service upon reasonable request; furnish safe and adequate car service; and establish, observe, and enforce reasonable rules and practices on car service.⁵⁶ The Board (and its predecessor, ICC) and federal courts determine what constitutes reasonable service and whether a railroad has satisfied its service obligations in the context of deciding specific complaints. For example, in a 1992 case, the ICC addressed the issue of railcar supply in connection with a complaint challenging the legality of Burlington Northern Railroad's Certificate of Transportation Program. The ICC held that Burlington Northern had not violated its statutory obligations and observed that the common carrier obligation requires that a railroad maintain a fleet sufficient to meet average—not peak—demand for service. According to the ICC, a requirement for a fleet sufficient to meet peak demand would result in a wasteful surplus of equipment detracting from a railroad's long-term financial health.⁵⁷ Other cases have involved such matters as whether a railroad was justified in refusing a shipper's request to restore service on an embargoed line. However, ICC and the Board's decisions are situation-specific and do not easily lend themselves to developing a single set of measures that would allow an assessment of a railroad's—or the industry's—quality of service in all circumstances.

Few Industrywide
Performance Measures
Exist

For the most part, industrywide measures of service performance do not exist. For example, according to AAR, there is no standard railroad industry definition of transit time and no central clearinghouse to collect industry service performance data. As a result, the types of service measurements maintained can vary from one railroad to another. The officials told us that trying to understand and develop industrywide service measures has been an important issue in the rail industry but “the least fertile area for information.” In addition, officials said that some industrywide service data that used to be collected have been discontinued. For example, AAR used to prepare reports on car cycle times, the percent of the railcar fleet that was out-of-service, and car shortages. These reports are no longer prepared because of data quality problems.

⁵⁶These statutory requirements, found in sections 11101(a) and 11121(a)(1) of title 49, United States Code, are collectively referred to as the common carrier obligation.

⁵⁷*National Grain and Feed Association v. Burlington Northern Railroad Co.*, 8 I.C.C.2d 421, 427 (1992). The United States Court of Appeals for the Eighth Circuit subsequently reversed ICC's decision and remanded the case to ICC for a further examination of whether the Certificate of Transportation program was consistent with the common carrier obligation. However, the court specifically held that ICC's ruling regarding fleet size was permissible. *National Grain and Feed Association v. United States*, 5 F.3d 306, 311 (8th Cir. 1993). At the National Grain and Feed Association's request, the ICC proceeding was ultimately dismissed.

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A factor complicating the collection of industrywide service measures is that individual railroads have been reluctant to make such information public. According to AAR and officials at some Class I railroads we spoke with, this reluctance is based on concerns that service information could be misinterpreted or misused by the public, customers, or others or that the information may be proprietary. For example, AAR noted that providing information such as railcar transit and cycle times can be misleading because (1) cycle times are typically increased when additional railcars are added to the fleet (because it may take longer to load and unload trains with additional cars), (2) cycle times should be compared with target performance levels or standards which reflect seasonal fluctuations, (3) an increase in long-haul business may lead to a lengthening of cycle and transit times, and (4) a railroad cannot control what happens to a car once it leaves its tracks for movement to a final destination via another railroad. Regarding the latter, AAR said meaningful data on interline traffic (traffic which interchanges from one railroad to another), which represents roughly one-third of all rail freight revenue, are generally not maintained by individual railroads and would, therefore, not be captured in measuring railroad performance. As officials from one Class I railroad told us, just getting raw service data may not indicate the root cause of problems.

Despite these limitations, two measures of industrywide service offer a narrow view of how service has changed since 1990. One is cycle time for freight railcars, which shows a slight improvement. (See table 4.2.) (In general, the faster the cycle time the more readily cars are available for additional trips.) In 1990, the average cycle time for all railcars was just under 18 days. In 1995 (the last year data were available), the average cycle time was just under 17 days. However, as table 4.2 shows, cycle time can fluctuate over time and, as AAR has pointed out, cycle time may be influenced by several factors, such as change in trip length.

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**Table 4.2: Average Railcar Cycle Time,
Selected Car Types, 1990 Through
1995**

Year	Car cycle time			
	All cars	Covered hoppers	Open top hoppers	Tank cars
1990	17.8	27.0	10.8	42.9
1991	18.9	28.5	12.1	44.5
1992	18.0	27.0	11.6	42.4
1993	17.6	27.4	11.3	42.4
1994	16.4	27.0	10.1	41.0
1995	16.7	26.8	10.0	41.0

Notes: Covered hoppers are typically used to transport grain; open top hoppers to transport coal; and tank cars to transport chemicals and plastics.

Cycle time was calculated by dividing 365 by the average number of revenue trips per year by car type. Industrywide information on car cycle times was discontinued in 1995.

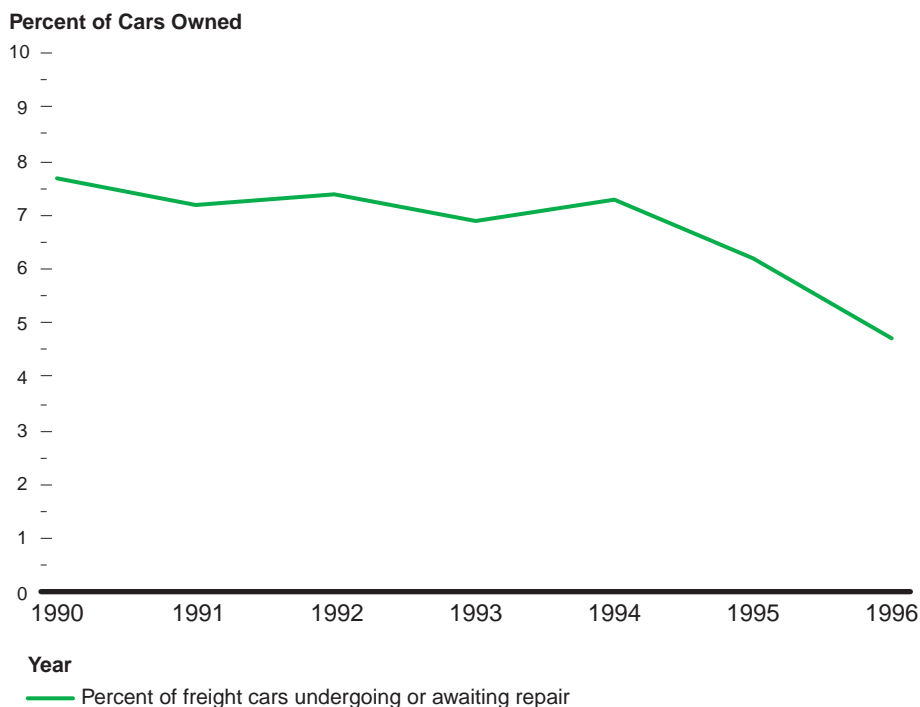
Source: GAO's analysis of AAR's data.

Another measure, the number of revenue freight cars undergoing or awaiting repairs (and, therefore, not available for active revenue service), also dropped slightly since 1990.⁵⁸ (See fig. 4.1.) In 1990, about 52,000 of 677,800 cars (about 8 percent of railcars owned) were undergoing or awaiting repairs. In 1996 (the last year data were available), about 27,000 of 576,800 cars (about 5 percent of railcars owned) were in this category. However, this measure does not shed any light on how efficiently these cars were deployed or whether an adequate supply existed.

⁵⁸Revenue freight cars provide revenue to railroads by carrying goods. Railroads also operate nonrevenue freight cars, such as those used to maintain roadbed and track.

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Figure 4.1: Railroad-Owned Revenue Freight Cars Undergoing or Awaiting Repair, 1990 Through 1996



Note: As of June 1 each year (except as of Jan. 1 in 1992).

Source: AAR.

Information From Individual Railroads Has Limitations

Measuring service performance of the rail industry is further complicated by the fact that individual railroads do not maintain measures of service performance that are continuous or consistent across the industry. For example, we asked for, but generally did not obtain, information from individual Class I railroads about their service performance since 1990 in the following areas: (1) average car transit time—the amount of time from the departure of a shipment from an origin to delivery to a destination; (2) average car cycle time for unit trains;⁵⁹ (3) car availability, during both peak and nonpeak periods—this would include the identification of car surpluses and shortages at each period; (4) on-time pickup of shipments; (5) on-time delivery of shipments; and (6) train delay summaries, including causes of train delays. Although some of the railroads we contacted maintained some of this information, including on-time pick up and

⁵⁹In general, unit trains are a dedicated set of cars and locomotives that run in a continuous cycle from an origin to a destination and return.

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delivery of cars and causes of train delays, most of this information was either not available going back to 1990 or was only used for specific analyses.

In general, railroad representatives told us that railroads develop and maintain their own unique set of service performance measures that are tailored to their needs and their customers' needs. Because no two rail customers may have identical service demands, and what is acceptable service to one shipper might not be acceptable to another, most railroads have developed service measures that meet the needs of their specific customers' situations. The type and level of service can also be commodity-specific. For example, officials from CSX Transportation told us that shippers of different types of commodities demand different levels of service. For some commodities (such as intermodal containers and auto parts), on-time pick up and delivery are very important. For other commodities (such as coal and grain), through-put (total amount of tonnage) may be more important than timeliness. Finally, officials from Norfolk Southern also pointed out that differences exist between eastern and western railroads in terms of the types of service measures a railroad might keep, because eastern railroads carry, for example, more coal and western railroads carry more grain. As a result, eastern railcar delivery delays are generally measured in hours, not days as they might be in the west.

Railroad mergers have also influenced the availability and consistency of service measures. As an illustration, Burlington Northern and Santa Fe Railway officials noted that, prior to the Burlington Northern merger with Santa Fe in 1995, each railroad collected its own unique service data. Because of this, data for the pre-merger period may not be available in all cases or may be inconsistent in what it measured. In addition, officials from Union Pacific Railroad told us they had concerns about providing us with service data because the type of measures collected had changed over the last 10 years—Union Pacific Railroad today is the product of mergers of several railroads, each of which had maintained unique data systems. Union Pacific officials also noted that computer technology advances have allowed Union Pacific to generate new types of data that were previously impossible to generate and that are not comparable with any data from pre-merger periods.

Railroad Industry Is Developing Limited Measures of Performance

In part due to the widespread criticism of the industry over the quality of its service, railroads are developing industrywide performance measures. As part of its overall review of railroad access and competition issues, the Board directed railroads to establish a more formal dialogue with shippers for this purpose. In response, from August to November 1998, AAR held a series of meetings across the country between Class I railroad executives and shippers to discuss service issues. As a result of these meetings, the Class I railroads decided to make available, through the Internet, actual data (not an index) on four measures of performance directed at providing shippers and others with a means to evaluate how well traffic moves over railroad systems. These measures, which the railroads began reporting in January 1999, include (1) total railcars, by type, currently on the rail system; (2) average train speed by type of service; (3) average time railcars spend in major terminals; and (4) timeliness of bills-of-lading (a receipt listing goods shipped). These measures are updated weekly and broken out by individual railroad. According to AAR, these measures are informational in nature, but consideration is being given to establishing standards and goals in these four areas.

According to AAR, it is expected that rail customers will be able to use the data to determine what is happening in terms of performance on each railroad. However, according to AAR, these measures are not uniformly calculated across the industry and may be influenced by operating differences among railroads, including traffic mix, weather conditions, and terrain. Therefore, AAR cautions that this information should not be used to compare one railroad against another.

Although these measures may be helpful in assessing certain aspects of service, they are more an evaluation of railroad operating efficiency rather than of quality of service. They also may not resolve more fundamental concerns about service. For example, in a November 1998 letter to the Board, several shipper associations and shippers expressed their concern that better information alone will not solve the service problems resulting from railroad consolidations and enhanced market power.

Agency Comments and Our Evaluation

In commenting on a draft of this report, the Board indicated that 1997 was not a typical year in terms of the quality of railroad service due to the unusual, severe congestion that occurred in the West. The Board also suggested that performance measures recently developed by the railroad industry can be helpful in measuring some aspects of service quality. In response to these comments, we added material to the report

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reflecting the Board's assessment that railroad service in 1997 was atypical and that service has improved since that time. We also revised the report to better recognize that recently developed performance measures may be helpful in measuring some aspects of service quality. However, we continue to believe that these measures are more an evaluation of railroad operating efficiency than of quality of service.

Despite Recent Actions to Address Service Issues, Concerns Continue

Federal agencies and railroads have taken a number of actions to address the service problems that originated in the Houston/Gulf Coast area in 1997 during the implementation of the Union Pacific/Southern Pacific merger as well as service issues that are more longstanding and widespread. These actions have led to some progress, particularly the dissemination of new information regarding rail service and additional options for shippers and carriers to resolve disputes. However, in spite of the various actions to address service issues, shippers remain concerned about a lack of access of many shippers to competitive rail alternatives and the effect of this lack of competition on service levels. Shippers and railroads hold widely differing views on this key issue. The Board has tried, without success, to get the two sides to reach some agreement on this issue and has suggested that these issues are more appropriately resolved by the Congress. If the Congress decides to address this issue, it will need to weigh the potential of increased competition to improve service against the potential financial and other effects on the railroad industry.

Union Pacific and the Board Address Service Problems Beginning in Late 1997

The Union Pacific/Southern Pacific system started experiencing serious service problems in July 1997 during the process of implementing the merger of the two railroads. Congestion on this system spread to the Burlington Northern and Santa Fe Railway system, affecting rail service throughout the western United States. Serious rail service disruptions and lengthy shipment delays continued throughout the last half of 1997, particularly in the Houston area. To address service problems on the Union Pacific/Southern Pacific system, Union Pacific adopted a Service Recovery Plan in September 1997. Under this plan, the railroad, among other things, took actions to reduce train movements on the Union Pacific/Southern Pacific system and manage traffic flows into congested areas, acquired additional locomotives, and hired additional train and engine crew employees.

In response to growing concerns about the deteriorating quality of rail service in the West, the Board issued an emergency service order in October 1997. This order, and subsequent amendments to it, directed a number of actions aimed at resolving service problems in the Houston area, the source of the crisis. In particular, the order directed temporary changes in the way rail service was provided in and around the Houston area to provide additional options for shippers and carriers and required weekly reporting by Union Pacific on a variety of service measurements, such as system train speed and locomotive fleet size. In December 1997,

the service order was expanded to require grain loading and cycle time information to be submitted by Burlington Northern and Santa Fe Railway. In August 1998, the order expired and the Board decided not to issue another emergency service order, finding that there was no longer any basis for such an order given the significant improvements in Houston area rail service. However, the Board noted that service was still not at uniformly improved levels, as reflected by congestion in Southern California. Accordingly, the Board ordered Union Pacific/Southern Pacific and Burlington Northern and Santa Fe Railway to continue the required reporting on a biweekly basis so that it could continue to monitor service levels. In December 1998, the Board discontinued this requirement, citing further service improvements and the intention of all of the Class I railroads to start issuing weekly performance reports in January 1999.

As part of its oversight of the Union Pacific/Southern Pacific merger, the Board has considered requests by various parties for additional merger conditions that would modify the way in which rail service is provided in the Houston area. In its December 1998 decision, the Board announced several changes in response to these requests in order to enhance the efficiency of freight movements in the area. Most significantly, the Board authorized the joint Union Pacific/Burlington Northern and Santa Fe Railway dispatching center at Spring, Texas, to route traffic through the Houston terminal over any available route, even a route over which the owner of the train does not have operating authority. However, the Board declined to adopt a plan sponsored by a group of shippers, two affiliated railroads, and the Railroad Commission of Texas that would have displaced the current Union Pacific operations in the Houston terminal area by establishing neutral switching and dispatching operations by a third party, the Port Terminal Railroad Association, in order to increase competition in the area. According to the Board, implementing this plan would have required Union Pacific to give trackage rights to this association and all other railroads serving Houston.

In making its decision not to adopt the plan, the Board concluded that the service crisis in Houston did not stem from any competitive failure of the Union Pacific/Southern Pacific merger. The Board further concluded that the plan was not necessary to remedy any merger-related harm because it would add new competitors for many shippers in the Houston area that were served by only one carrier prior to the merger and, therefore, had not experienced a decrease in competition as a result of the merger. According to the Board, absent merger-related competitive harm, such an arrangement would thus constitute “open access”—an idea that shippers

should, wherever possible, be served by more than one railroad, even if, in order to produce such a system, railroads that own a majority of an area's rail infrastructure would be required to share their property with others that do not—an action which Board officials said the law does not provide for at this time.

Union Pacific has recently taken further actions aimed at improving its service levels. These actions have included decentralizing railroad operations and implementing capital and maintenance projects, such as projects to improve, expand, and maintain its railroad track. Also, in August 1998, the railroad created a new internal organization, called Network Design and Integration, which will be responsible for identifying the services most needed by shippers and developing plans for delivering them. This organization is expected to serve as a link between the marketing and operating departments, to ensure that service commitments to shippers match the railroad's capacity to deliver these services. In December 1998, Union Pacific reported to the Board that its operations had returned to normal levels, citing its average system train speed that had risen above 17 miles per hour for the first time since July 1997, when its service crisis began. The railroad acknowledged that its service levels still needed improvement but maintained that its latest service measures demonstrated a recovery from its prior serious service problems.

Government Agencies and Railroads Take Some Actions to Address Broader Service Issues

Federal agencies as well as railroads have recently taken a number of actions aimed at addressing freight rail service issues of a broader nature than the recent service crisis in the West. These issues include the need to foresee and prevent service problems and expeditiously resolve them when they do arise and the need to expand the capacity of the railroad system to provide service. Among the actions by federal agencies are efforts by the USDA and the Board to disseminate information that can help railroads, shippers, and receivers anticipate changes in transportation demand and supply and the adoption by the Board of new procedures allowing it to authorize temporary alternative rail service more quickly for shippers affected by serious service disruptions. In addition, individual railroads have recently made efforts to improve service through changes in their customer service organizations and increased investments in infrastructure. Finally, partly at the urging of the Board, the railroad industry has acted to address some service issues. Actions include a commitment by the Class I railroads to issue weekly measures of their service performance, an agreement between Class I railroads and grain and feed shippers to resolve some service-related disputes through binding

arbitration, and an agreement between Class I and smaller railroads aimed at allowing smaller railroads to play a greater role in providing service to shippers.

The Board and USDA Take the Initiative in Addressing Service Issues

The rail congestion that occurred during the 1997 rail crisis in the West severely affected the movement of grain to market. This situation illustrated the need to better monitor production levels, the transportation needs of grain shippers, and the capacity of the railroads to meet those needs, so that shippers and railroads could anticipate changes in transportation demand and supply and make adjustments that could lessen the severity of such changes. To meet this need, the Board and USDA signed an agreement in May 1998 to create a Grain Logistics Task Force. This task force, made up of Board and USDA officials, was tasked with identifying and disseminating information on grain production and consumption and transportation requirements. The task force began issuing reports in August 1998 and expects to issue them five times a year. These reports contain information on such things as expected production levels of various grains (by state), grain supplies and storage capacity, and railcar loadings and the demand for rail transportation.

To address long-term transportation issues facing the nation's agriculture sector in the 21st century, USDA also held a National Agricultural Transportation Summit in Kansas City in July 1998. This meeting provided a forum for agricultural shippers and others to express their concerns about grain marketing and demand, and railroad service quality issues. A significant outcome of this summit was an agreement between USDA and DOT to create a Rural Transportation Advisory Task Force. The objectives of this task force include undertaking joint outreach to users and providers of agricultural and rural transportation services to further identify transportation challenges and ways in which these challenges can be met and considering joint research efforts and policy initiatives to address these challenges. While the scope of the task force's responsibilities will be broad, freight rail service to the nation's agricultural community will be a key component of its work.

At hearings held by the Board in April 1998 to review issues concerning rail access and competition, shippers complained about a number of service problems, including the difficulties in seeking relief from serious service disruptions through the Board's existing procedures.⁶⁰ In response,

⁶⁰See Surface Transportation Board, Ex Parte No. 575, Review of Rail Access and Competition Issues (Apr. 17, 1998).

the Board adopted new procedures in December 1998 providing temporary relief from serious service problems, through service from an alternative rail carrier, more quickly.⁶¹ Shippers and smaller railroads can seek temporary alternative service in two ways: (1) through an 8-day evidentiary process for requesting short-term emergency relief for up to 270 days or (2) through a 45-day evidentiary process for requesting longer-term relief for serious, though not emergency, service inadequacies. Prior to obtaining either type of relief, the petitioning shipper or railroad must discuss the service issues with the incumbent rail carrier and obtain the commitment from another rail carrier to meet the identified service needs. These expedited procedures do not require a showing that the rail carrier has engaged in anticompetitive conduct. Rather, the petitioning shipper or railroad must show a substantial, measurable deterioration or other demonstrated inadequacy in rail service over an identified period of time.

Individual Railroads Attempt to Improve Service

In order to be better able to resolve service problems brought to their attention by customers, individual Class I railroads have recently taken a number of actions to improve their customer service organizations. For example, some railroads have removed their local customer service personnel from field offices and replaced them with centralized customer service centers. At these service centers, service representatives either route the customer to the appropriate department at the railroad for problem resolution or handle the calls directly. As noted previously, Union Pacific Railroad expects to improve its ability to meet its customers' service expectations through the creation of its new organization that will serve as a link between its marketing and operating departments. In its attempts to improve customer service, Norfolk Southern has added yard operations, billing, and freight claim settlement to the responsibilities of its customer service center. Finally, Burlington Northern and Santa Fe Railway has instituted a Grain Operations Desk that serves as a point of contact for grain shippers throughout its rail system for obtaining information on the arrival of empty grain cars, improving the spotting of loaded cars, and improving overall communications between the railroad and its customers.

The Class I railroads have also been attempting to improve service through capital investments to improve their infrastructure and expand their capacity to provide service. Class I railroad capital expenditures in 1997

⁶¹See Surface Transportation Board, Ex Parte 628, Expedited Relief for Service Inadequacies (Dec. 21, 1998).

were about 31 percent higher (in constant dollars) than they were in 1990. Rail industry officials told us that these investments are important because they help relieve capacity constraints caused by restructuring of railroad operations and the growth of traffic in recent years. Investments have included new rail yards and terminals, additional sidings and track, and additional cars and locomotives. However, these railroad representatives believe that further capital investments are needed to address service problems. Railroad officials also told us that hiring new employees is important to increase the number of train crews available.

Railroad Industry and Shippers Address Some Service Issues, With the Board's Encouragement

In April 1998, following its hearings on rail access and competition issues, the Board issued a decision that called on railroads and shippers to discuss and identify solutions to a number of service-related problems. One problem that the Board noted was the need for greater communications between railroads and their customers and the need for railroads to find a more systematic way of addressing customer concerns. Accordingly, the agency directed the railroads to establish formal dialogue with shippers. In response, from August through November 1998 the AAR held five meetings across the country, attended by the Board's chairman, between Class I railroad executives and their customers to discuss service issues. At these meetings, the railroads introduced four proposed measures of railroad service predictability and asked for feedback on their usefulness.⁶² The industry had developed these measures in July 1998 in response to customer suggestions that such measures were needed. The industry maintains that these indicators will reflect the general health of each railroad and will provide an early warning of developing operational problems. The Class I railroads began making these measures available on the Internet in January 1999; they plan to update the measures weekly.

In addition, AAR held a "customer service symposium" in March 1999 in order to facilitate further dialogue with shippers on aspects of service such as shipment tracking and problem resolution. Although many shippers have welcomed these efforts, some have expressed skepticism about their impact on broader transportation issues. For example, in November 1998, 27 shipper associations sent a letter to the Board noting that, while they welcomed the railroads' efforts to improve service predictability, the meetings have not addressed shipper concerns regarding systemic issues such as the lack of competitive rail alternatives and the effectiveness of available regulatory remedies.

⁶²The proposed measures were total cars on-line, average train speed, average terminal dwell time (average time a railcar is at a specified terminal), and timeliness of bills-of-lading.

Shippers with specific complaints regarding rail service may seek a resolution of the problem through the Board's formal complaint adjudication process. However, in order to establish an alternative private sector process for resolving disputes between agricultural shippers and rail carriers, the National Grain and Feed Association reached an agreement with Class I railroads and the AAR in August 1998 that provides for compulsory, binding arbitration—as well as nonbinding mediation—to resolve specific types of disputes.⁶³ Although this initiative was not specifically called for by the Board, the Board noted that it is consistent with its preference that private parties resolve disputes without Board involvement and the litigation that it involves. The agreement covers a wide range of grain and feed products and covers such disputes as the misrouting of loaded railcars, disputes arising from contracts, and disputes involving the application of rules governing car guarantee programs. Those parties agreeing to use this arbitration process are not obligated to arbitrate claims that exceed \$200,000. Officials from one Class I railroad we spoke with said this agreement is like a small claims court for handling small rate and service problems. The agreement is not designed to handle multimillion dollar cases.

The role of non-Class I railroads in providing freight service has been another issue of concern. These railroads, as well as shippers, have expressed concerns regarding obstacles, such as inadequate railcar supply and lack of alternative routings, that prevent small railroads from expanding their business and providing increased service options to their customers. In its April 1998 decision, the Board directed short line and regional railroads (collectively called small railroads) and Class I railroads to complete discussions they had begun on these problems. In September 1998, the American Short Line and Regional Railroad Association and the AAR announced that they had reached agreement on provisions aimed at giving short line and regional railroads access to new routing arrangements to develop new business. The agreement also contains guidelines for how certain fees and rates charged by Class I railroads to provide service to small railroads will be set and how revenue would be divided between Class I and smaller railroads.⁶⁴ As part of the

⁶³The Board also has a voluntary binding arbitration process that offers parties involved in a service dispute a means of informally resolving their differences through arbitration, with limited Board involvement. The Board adopted rules for this process in August 1997 to promote private sector dispute resolution and reduce the litigation burdens—particularly to smaller entities—associated with the Board's formal complaint process. As of February 1999, this process had not yet been used.

⁶⁴A division of revenue involves an agreement between railroads on how to allocate revenue when a car travels over two or more railroads' track. The rate-related aspects of the agreement were subject to Board approval, which was granted on an interim basis on September 22, 1998, and on a final basis on December 11, 1998.

agreement, the railroads agreed to submit disputes regarding these provisions to binding arbitration. The president of the American Short Line and Regional Railroad Association described the agreement as a “framework of partnership and growth for years to come.” In a survey conducted by the association at the end of 1998, executives of small railroads were also optimistic but cautioned that the implementation of the agreement depended on cooperation by Class I railroads.

Railroads and Shippers Remain Far Apart on the Key Issue of Competition

While the actions described above have addressed some service-related issues, some shippers remain concerned regarding the systemic issue of increasing consolidation within the railroad industry. They complain that this consolidation has reduced competition within the railroad industry, leading to a situation in which many shippers are without competitive rail alternatives and must pay higher rates for inadequate service.⁶⁵ The divergent views held by railroads and shippers on this issue make it much more difficult to address than the issues described previously.

The Board is authorized to impose remedies giving shippers access to more routing options—alternative through routes, reciprocal switching, and terminal trackage rights—on a permanent basis. However, under its competitive access regulations, the shipper must demonstrate that its incumbent rail carrier has engaged in anticompetitive conduct.⁶⁶ Specifically, the shipper must show that the carrier has used its market power to extract unreasonable terms or, because of its monopoly position, has disregarded the shipper’s needs by providing inadequate service.⁶⁷ Some shippers have complained that this requirement is too difficult to meet, and as a result, the Board has not imposed competitive routing options where shippers believe such options are needed. Some shippers consider the requirement to demonstrate anticompetitive conduct to be the most problematic aspect of the Board’s interpretation of its statutory authority on this issue. The shippers believe that the elimination of this requirement is essential. However, the railroads believe that the demonstration of anticompetitive conduct is a necessary prerequisite to the imposition of a competitive routing option. Railroads cite concerns

⁶⁵Regarding this concern, Board officials have noted that, while mergers have changed the way the rail system looks, the mergers that have been approved have had conditions placed upon them to ensure that no facility served by more than one railroad before the merger would be limited to service by only one railroad afterwards.

⁶⁶49 C.F.R. § 1144.5 (1998).

⁶⁷*Midtec Paper Corp. v. Chicago and N.W. Transp. Co.*, 3 I.C.C.2d 171 (1986), *aff’d sub nom. Midtec Paper Corp. v. United States*, 857 F.2d 1487 (D.C. Cir. 1988).

that increased competition imposed through regulation would undermine the industry's ability to cover their high fixed costs and earn adequate returns.

In its April 1998 decision regarding rail access and competition issues, the Board stated that it would consider whether to revise its competitive access rules. However, the Board directed that, first, railroads should arrange meetings with a broad range of shipper interests under the supervision of an administrative law judge to examine the issue. In these meetings, shippers and railroads were to try to mutually identify appropriate changes to the Board's rules that would facilitate greater access to competitive rail alternatives where needed. In response, shippers and railroads held discussions in May and June 1998 on proposed revisions to these rules but, due to widely divergent views on the topic, could not come to any agreement.

In its December 1998 report to Members of Congress on rail access and competition issues, the Board declined to initiate further action on this issue, pointing to its adoption of new rules, described previously, that allow shippers temporary access to alternative routing options during periods of poor service. In response to the impasse between the representatives of railroads and shippers, the Board observed that the competitive access issue raises basic policy questions that are more appropriately resolved by the Congress.⁶⁸ These questions include the appropriate role of competition, differential pricing, and how railroads earn revenues and structure their services. The Board noted that this issue is complex, and it is unclear how changes in its rules pertaining to competitive routing options would affect the nation's rail system and the level of service provided by this system. In its December 1998 decision in the Houston/Gulf Coast oversight proceeding, the Board recognized the possibility that opening up access could fundamentally change the nation's rail system, possibly benefitting some shippers with high-volume traffic while reducing investment elsewhere in the system and ultimately reducing or eliminating service for small, lower-volume shippers in rural areas. Board officials noted that many small, low-volume shippers have already lost service options as larger railroads shed their low-density and otherwise unprofitable lines.

⁶⁸Similarly, as previously explained, the Board recently declined to provide for an open access arrangement in the Houston area in response to requests from area shippers and others. The Board explained that the proposed arrangement was not tailored to any demonstrated merger-related harm and, therefore, was not within the scope of its statutory authority.

Fundamental differences exist between shippers and railroads on the issue of mandating additional competition in the railroad industry. If it decides to address this issue, the Congress will need to weigh the potential benefits of increased competition with the potential financial and other effects on the railroad industry. In deliberating this issue, the Congress will need to consider such things as the potential impacts of proposed changes on shipper routing options and railroad service levels as well as the rail system as a whole, including railroad revenues, infrastructure investment, capacity, and operations.

Agency Comments and Our Evaluation

In commenting on a draft of this report, the Board suggested that we modify our characterization of the 1997 service problems in the West to make clear that these problems were not the result of the Union Pacific/Southern Pacific merger and that implementation of this merger helped solve the problems. In addition, the Board suggested changes to present a more complete and precise portrayal of both its October 1997 emergency service order in response to these service problems and its December 1998 decision in the Houston/Gulf Coast oversight proceeding. Finally, the Board suggested we expand our discussion of the Board's assessment of the possible impacts of providing "open access" throughout the nation's rail system. In response to these comments, we revised our description of the service problems in the West to eliminate the impression that these problems were caused by the Union Pacific/Southern Pacific merger; we revised the report to provide a more complete discussion of the Board's emergency service order and decision in the Houston/Gulf Coast oversight proceeding; and we added material to the report discussing the Board's views on the potential impacts of implementing railroad open access.

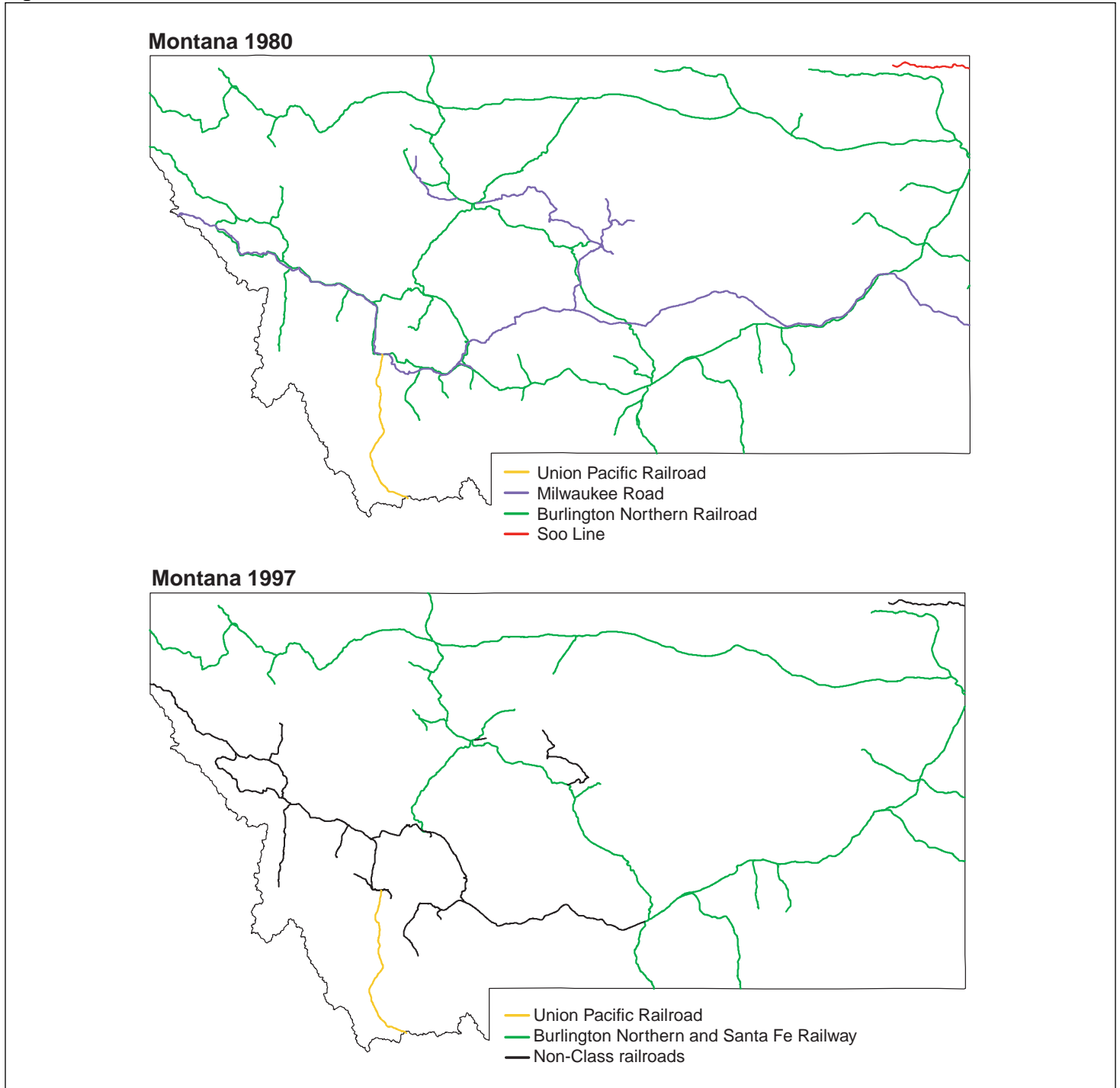
Class I Railroads in Selected States, 1980 and 1997

The maps in this appendix show how the number of Class I railroads has decreased between 1980 and 1997 in Montana, North Dakota, and West Virginia. Although the number of Class I railroads operating in each state decreased markedly, a substantial portion of the track that is no longer owned by Class I railroads has been acquired and is operated by smaller, non-Class I railroads. While non-Class I railroads can compete with Class I railroads to provide better service, some are restricted from offering better rates and service than the neighboring Class I railroad.

Four Class I railroads operated in Montana in 1980; in 1997 there were two. (See fig. I.1)

Appendix I
Class I Railroads in Selected States, 1980
and 1997

Figure I.1: Class I Railroads in Montana, 1980 and 1997



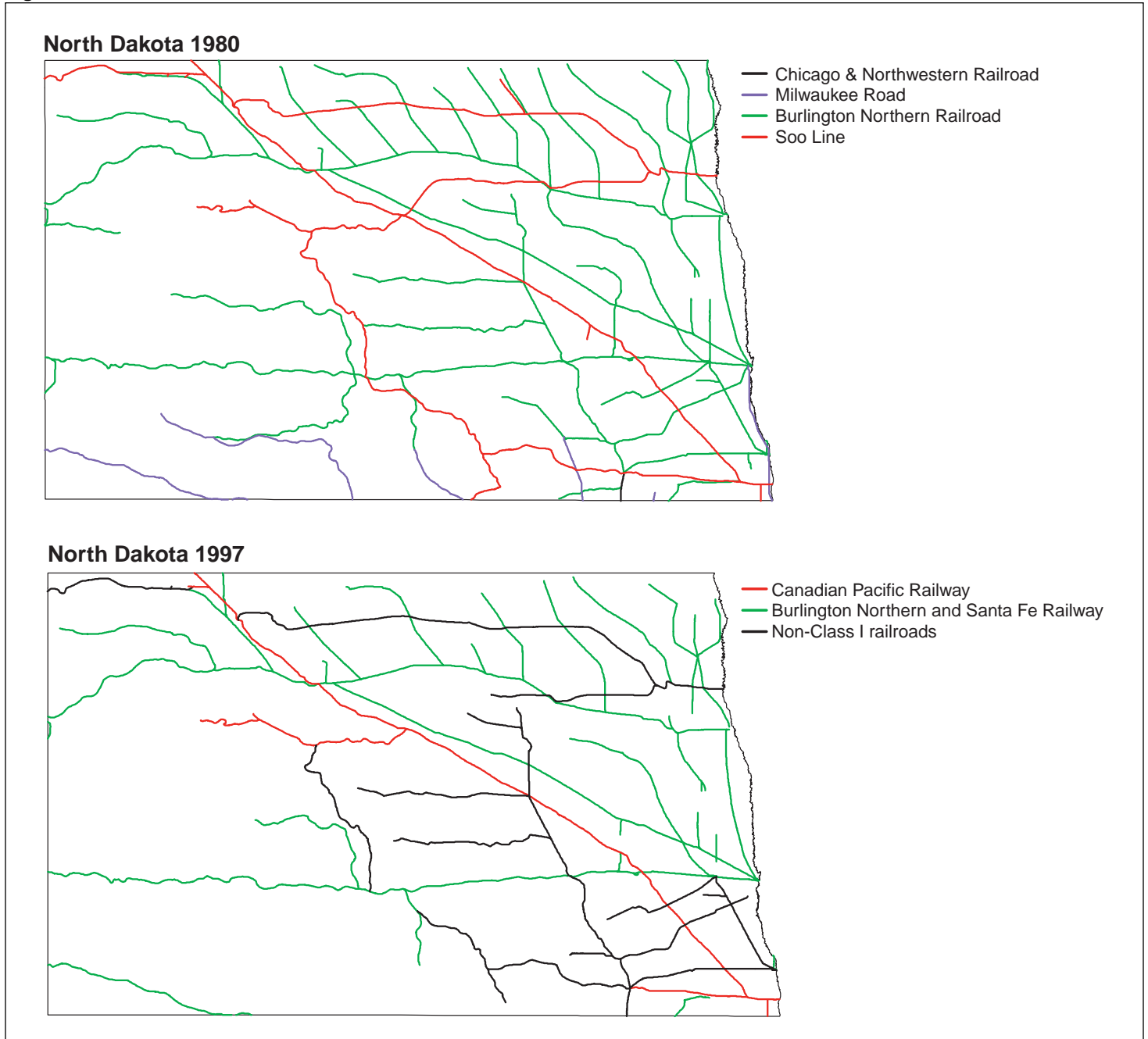
Source: Federal Railroad Administration, Office of Policy.

Appendix I
Class I Railroads in Selected States, 1980
and 1997

The number of Class I railroads in North Dakota decreased from four to two between 1980 and 1997. (See fig. I.2.)

Appendix I
Class I Railroads in Selected States, 1980
and 1997

Figure I.2: Class I Railroads in North Dakota, 1980 and 1997



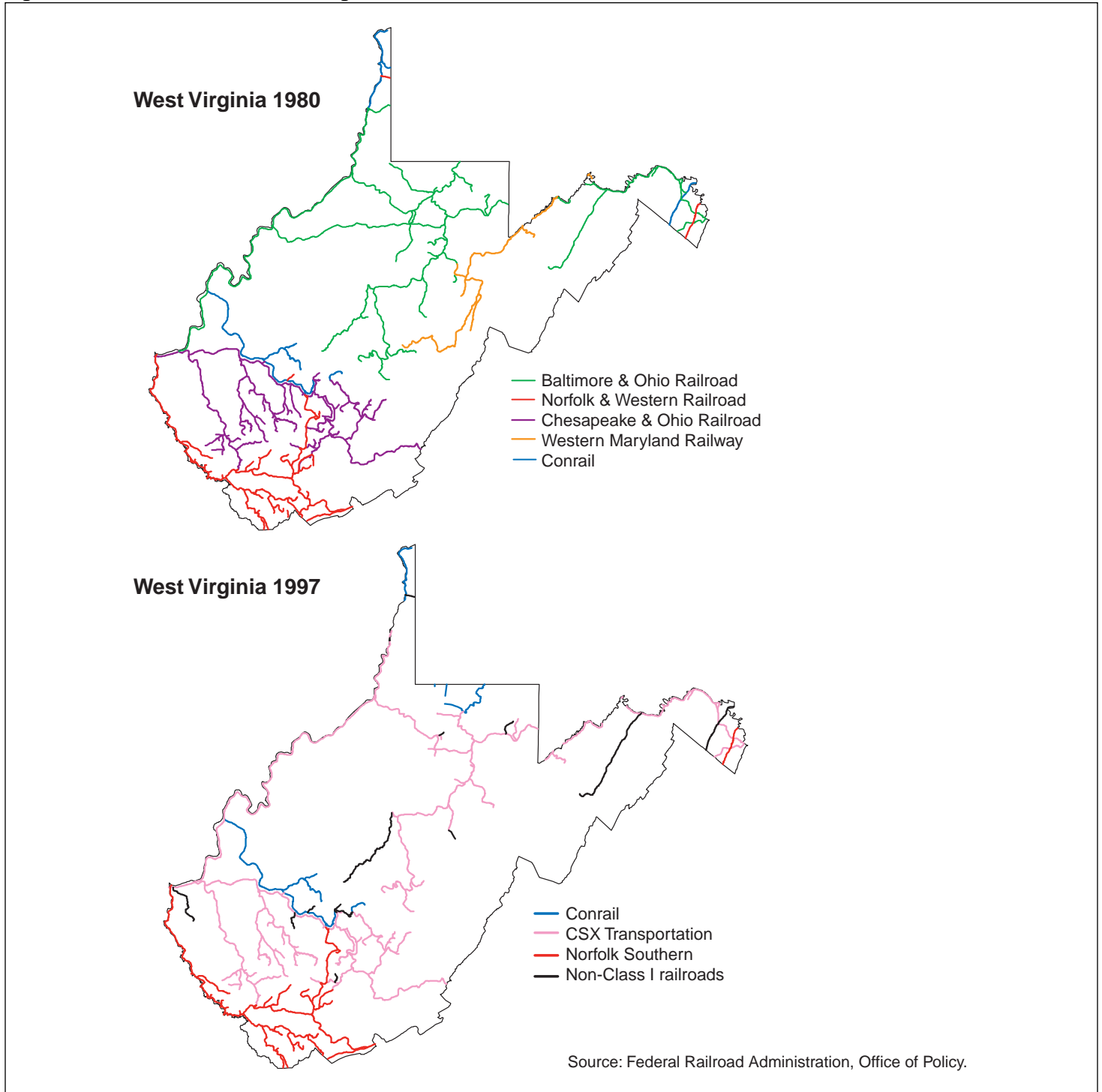
Source: Federal Railroad Administration, Office of Policy.

Appendix I
Class I Railroads in Selected States, 1980
and 1997

Five Class I railroads operated in West Virginia in 1980; in 1997 the number had been reduced to three. (See fig. I.3.)

Appendix I
Class I Railroads in Selected States, 1980
and 1997

Figure I.3: Class I Railroads in West Virginia, 1980 and 1997



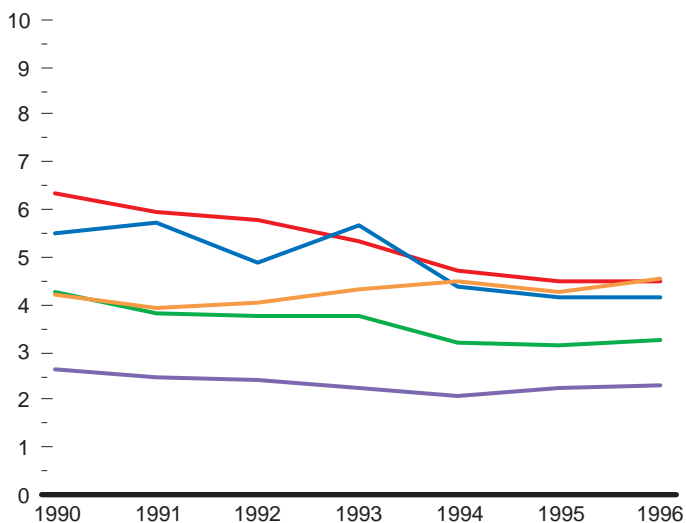
Real Rail Rates for Selected Commodities Transported by Rail

The following are real (inflation-adjusted) rail rates for selected commodities and markets/corridors that we reviewed in various distance categories. The selection of the commodities and routes is discussed in chapter 1 of this report. The distance categories are as follows: short is 0 to 500 miles; medium is 501 to 1,000 miles; and long is over 1,000 miles.

Figure II.1: Real Rail Rates for Coal, Selected Short- and Long-Distance Routes, 1990 Through 1996

Selected Short Routes, 1990-96

Cents per ton mile (in 1996 dollars)

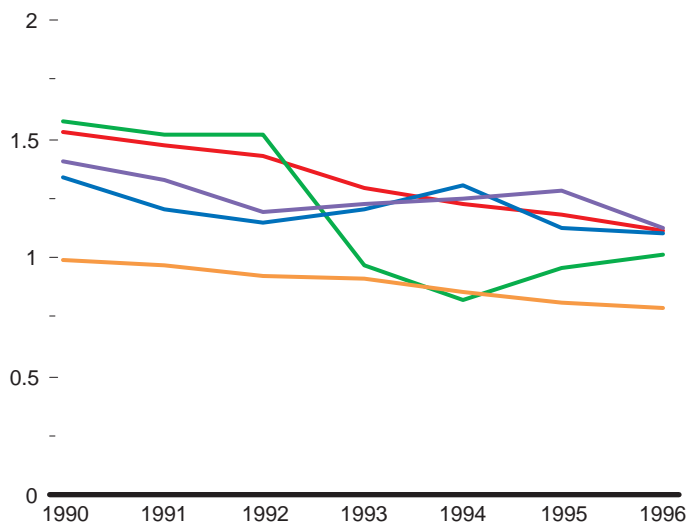


Year

- Central Appalachia to Charleston economic area
- Northern Appalachia to Washington, D.C./Baltimore economic area
- Illinois Basin to Evansville economic area
- Illinois Basin to St. Louis economic area
- Central Appalachia to Atlanta economic area

Selected Long Routes, 1990-96

Cents per ton mile (in 1996 dollars)



Year

- Powder River Basin to Duluth economic area
- Powder River Basin to Chicago economic area
- Powder River Basin to St. Louis economic area
- Powder River Basin to Paducah economic area
- Powder River Basin to Tulsa economic area

Note: The Northern Appalachia Coal Supply Region includes Maryland, Ohio, Pennsylvania, and northern West Virginia. The Illinois Basin Coal Supply Region includes western Kentucky, Illinois, and Indiana.

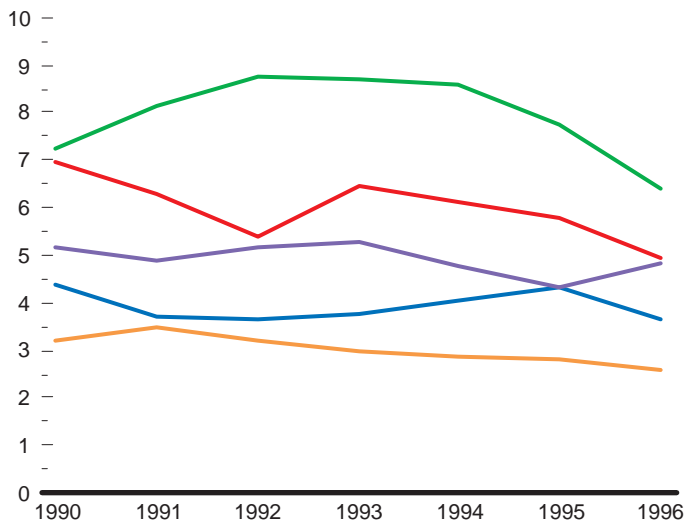
Source: GAO's analysis of the Board's data.

**Appendix II
Real Rail Rates for Selected Commodities
Transported by Rail**

Figure II.2: Real Rail Rates for Wheat, Selected Short- and Long-Distance Routes, 1990 Through 1996

Selected Short Routes, 1990-96

Cents per ton mile (in 1996 dollars)

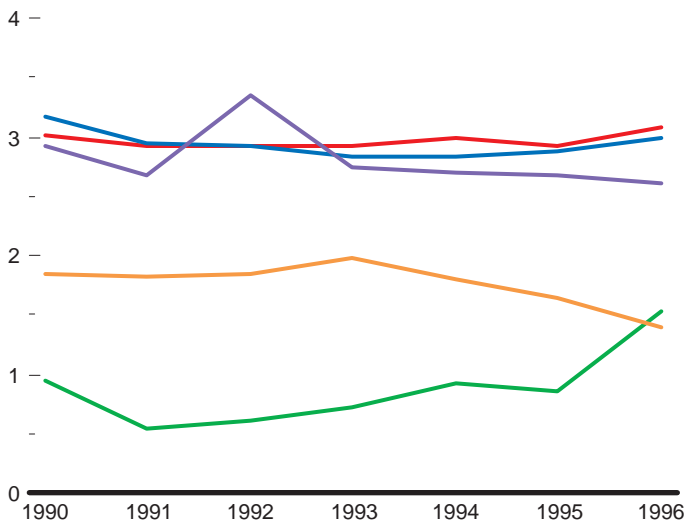


Year

- Wichita economic area to Wichita economic area
- Fargo economic area to Minneapolis economic area
- Wichita economic area to Kansas City economic area
- Dallas economic area to Houston economic area
- Grand Forks economic area to Duluth economic area

Selected Long Routes, 1990-96

Cents per ton mile (in 1996 dollars)



Year

- Billings economic area to Portland economic area
- Minneapolis economic area to New Orleans economic area
- Minot economic area to Portland economic area
- Denver economic area to Houston economic area
- Grand Forks economic area to Portland economic area

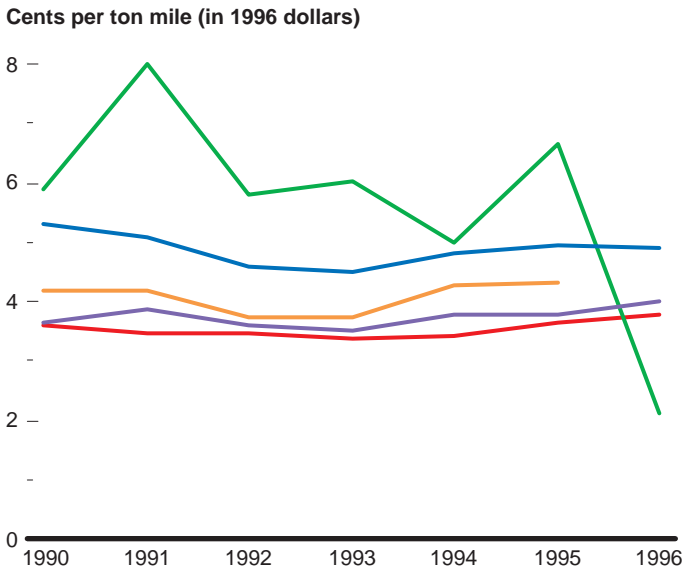
Note: Origins and destinations with the same label (e.g., Wichita to Wichita) may cover a large area. Routes were not further identified to preserve confidentiality.

Source: GAO's analysis of the Board's data.

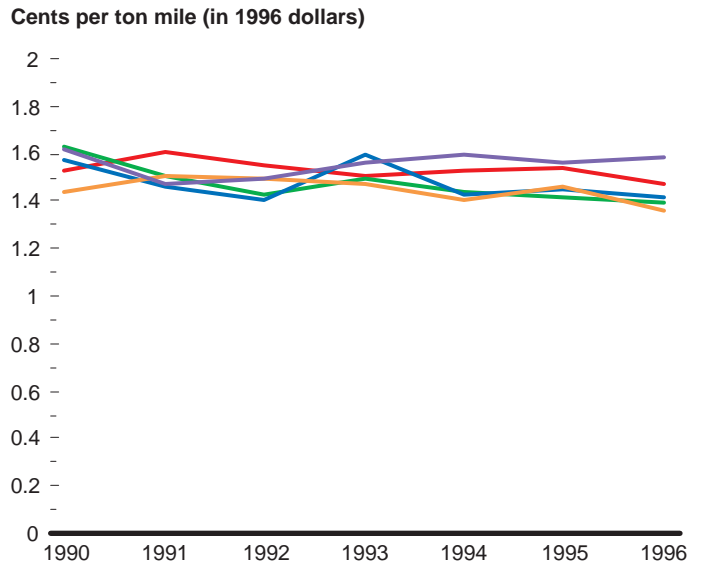
**Appendix II
Real Rail Rates for Selected Commodities
Transported by Rail**

Figure II.3: Real Rail Rates for Corn, Selected Short- and Long-Distance Routes, 1990 Through 1996

Selected Short Routes, 1990-96



Selected Long Routes, 1990-96



- Des Moines economic area to Davenport economic area
- Champaign economic area to Champaign economic area
- Minneapolis economic area to Minneapolis economic area
- Des Moines economic area to Des Moines economic area
- Des Moines economic area to Madison economic area

- Grand Island economic area to Portland economic area
- Minneapolis economic area to Seattle economic area
- Sioux Falls economic area to Seattle economic area
- Omaha economic area to Portland economic area
- Sioux Falls economic area to Portland economic area

Note: Origins and destinations with the same label (e.g., Des Moines to Des Moines) may cover a large area. Routes were not further identified to preserve confidentiality. Also, due to confidentiality, the data point for 1996 on shipments within the Des Moines economic area was excluded.

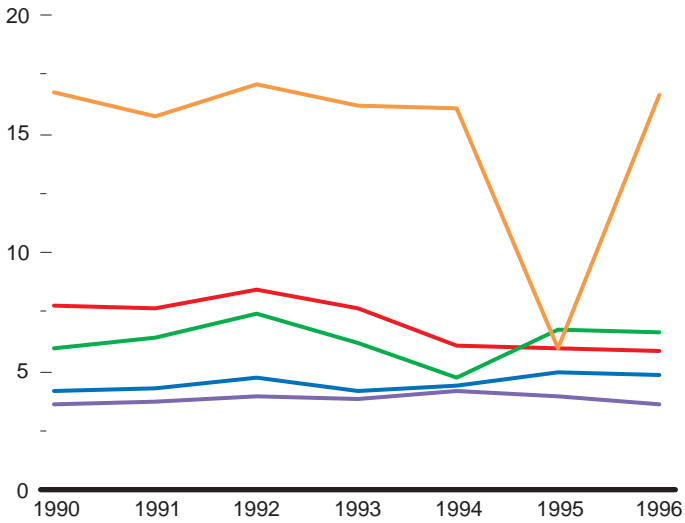
Source: GAO's analysis of the Board's data.

**Appendix II
Real Rail Rates for Selected Commodities
Transported by Rail**

Figure II.4: Real Rail Rates for Potassium/Sodium Compounds, Selected Short- and Long-Distance Routes, 1990 Through 1996

Selected Short Routes, 1990-96

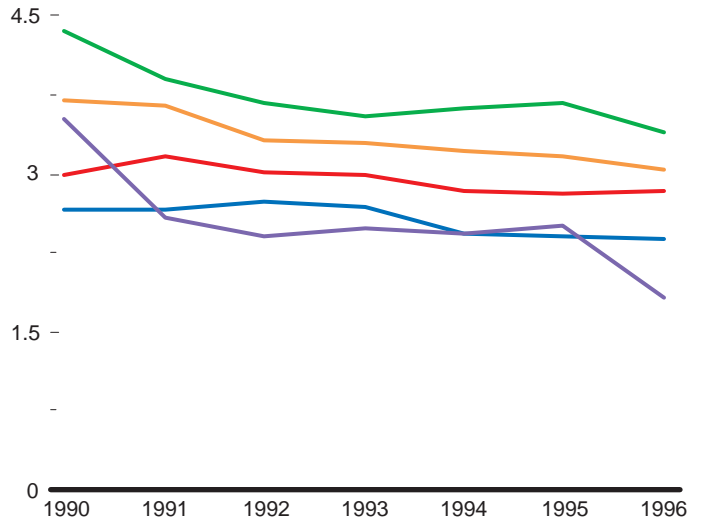
Cents per ton mile (in 1996 dollars)



- Los Angeles economic area to Los Angeles economic area
- Minneapolis economic area to Minneapolis economic area
- Chicago economic area to Indianapolis economic area
- New Orleans economic area to Baton Rouge economic area
- Minneapolis economic area to Des Moines economic area

Selected Long Routes, 1990-96

Cents per ton mile (in 1996 dollars)



- Casper economic area to Chicago economic area
- Saskatchewan to Chicago economic area
- Casper economic area to Beaumont economic area
- Casper economic area to St. Louis economic area
- Saskatchewan to Huntsville economic area

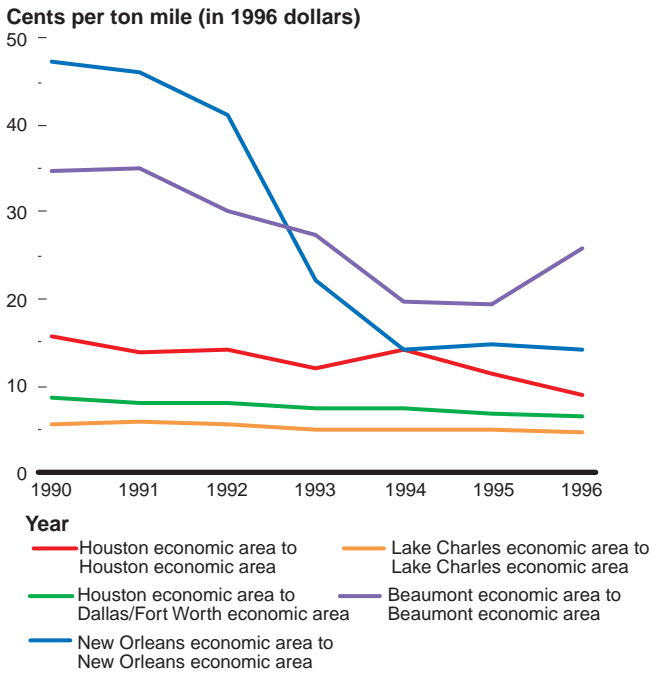
Note: Origins and destinations with the same label (e.g., Los Angeles to Los Angeles) may cover a large area. Routes were not further identified to preserve confidentiality.

Source: GAO's analysis of the Board's data.

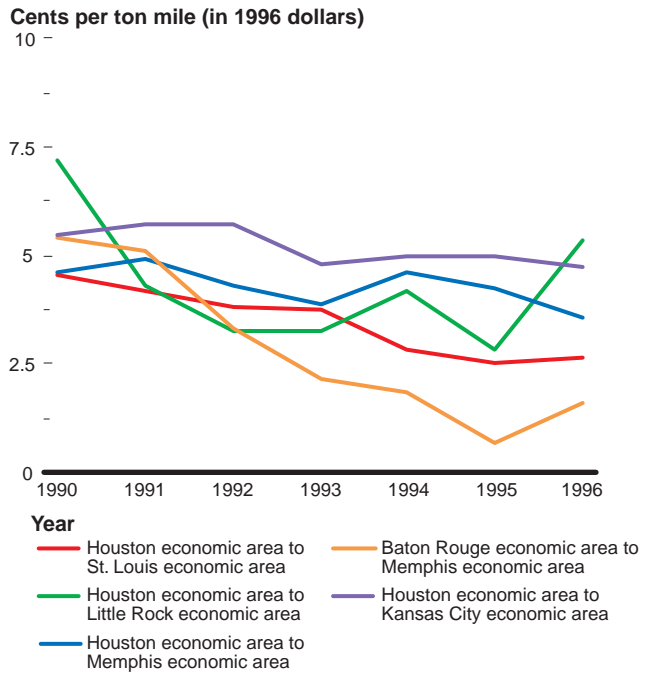
**Appendix II
Real Rail Rates for Selected Commodities
Transported by Rail**

Figure II.5: Real Rail Rates for Plastic Materials or Synthetic Fibers, Resins, or Rubbers, Selected Short-, Medium-, and Long-Distance Routes, 1990 Through 1996

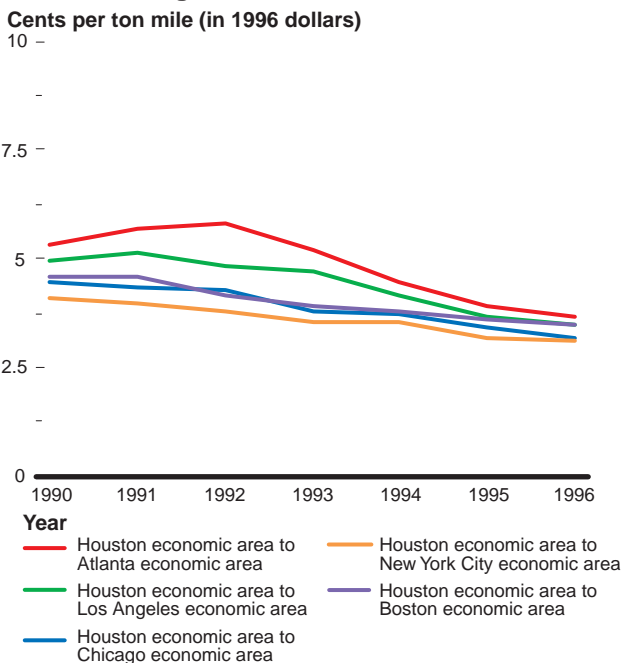
Selected Short Routes, 1990-96



Selected Medium Routes, 1990-96



Selected Long Routes, 1990-96



Note: Origins and destinations with the same label (e.g., Houston to Houston) may cover a large area. Routes were not further identified to preserve confidentiality.

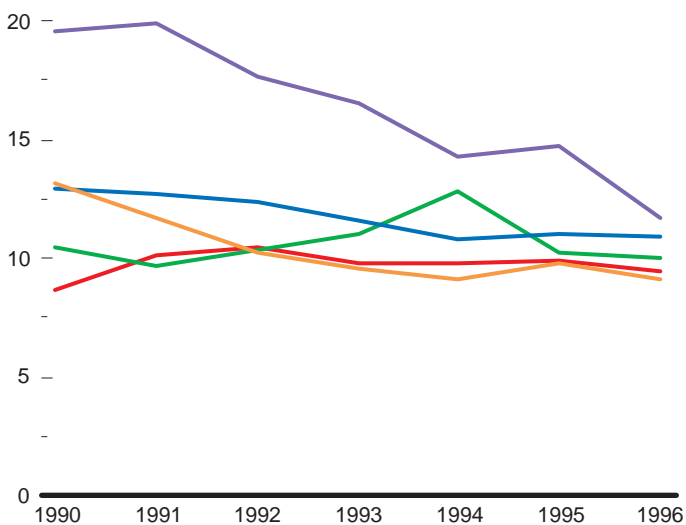
Source: GAO's analysis of the Board's data.

**Appendix II
Real Rail Rates for Selected Commodities
Transported by Rail**

Figure II.6: Real Rail Rates for Motor Vehicles, Selected Medium- and Long-Distance Routes, 1990 Through 1996

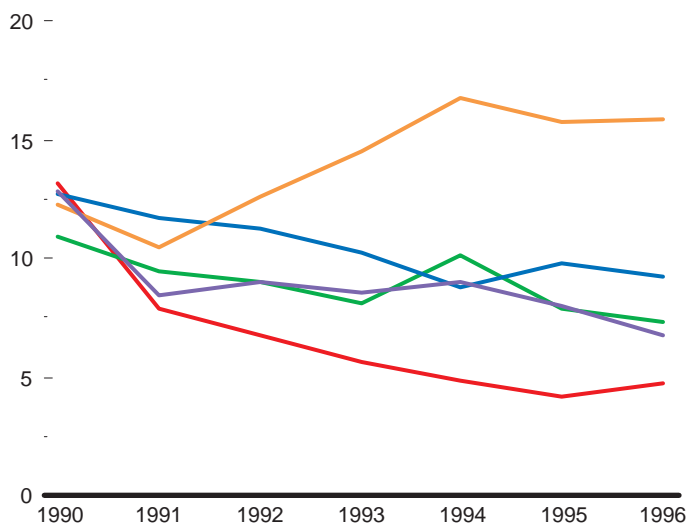
Selected Medium Routes, 1990-96

Cents per ton mile (in 1996 dollars)



Selected Long Routes, 1990-96

Cents per ton mile (in 1996 dollars)



- Year**
- Detroit economic area to Philadelphia economic area
 - Chicago economic area to Kansas City economic area
 - Detroit economic area to Washington, D.C./Baltimore economic area
 - Detroit economic area to Kansas City economic area
 - Ontario (Canada) to Chicago economic area

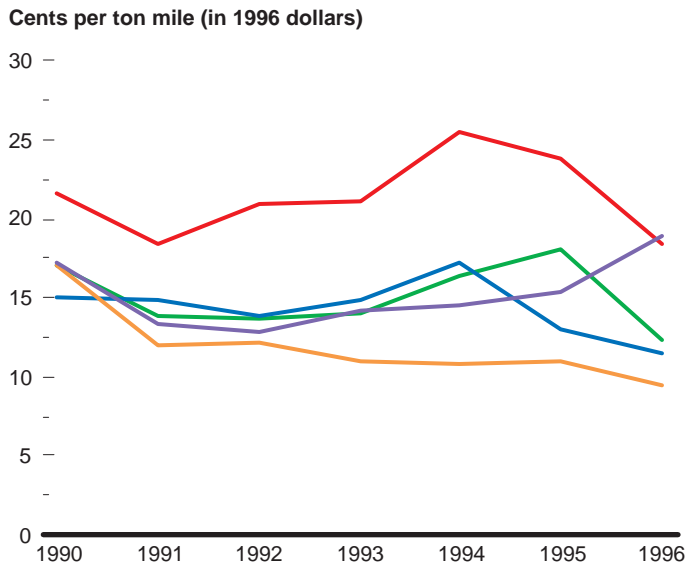
- Year**
- Chicago economic area to Los Angeles economic area
 - Kansas City economic area to Los Angeles economic area
 - Detroit economic area to Jacksonville economic area
 - Chicago economic area to Dallas/Fort Worth economic area
 - Kansas City economic area to San Francisco economic area

Source: GAO's analysis of the Board's data.

**Appendix II
Real Rail Rates for Selected Commodities
Transported by Rail**

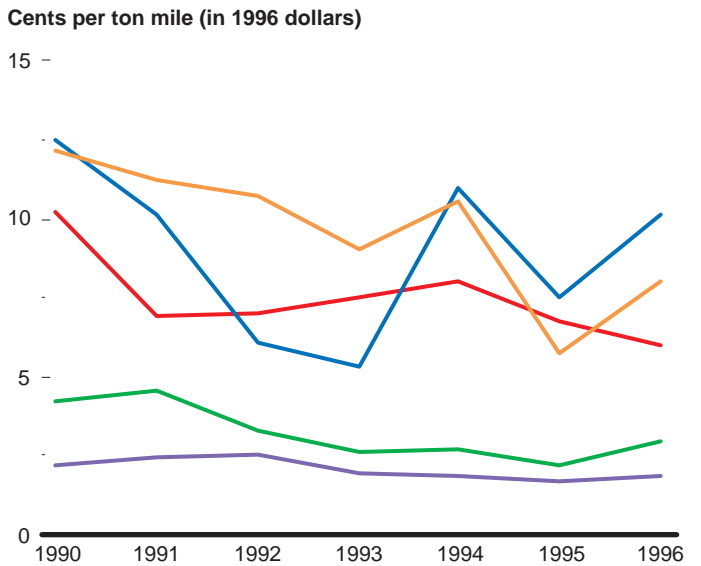
Figure II.7: Real Rail Rates for Motor Vehicle Parts or Accessories, Selected Medium- and Long-Distance Routes, 1990 Through 1996

Selected Medium Routes, 1990-96



- Detroit economic area to St. Louis economic area
- Detroit economic area to Kansas City economic area
- Detroit economic area to Atlanta economic area
- Detroit economic area to Norfolk economic area
- Detroit economic area to New York economic area

Selected Long Routes, 1990-96



- Chicago economic area to San Antonio economic area
- Chicago economic area to San Francisco economic area
- Detroit economic area to Dallas/Fort Worth economic area
- Detroit economic area to San Antonio economic area
- Los Angeles economic area to Chicago economic area

Source: GAO's analysis of the Board's data.

Organizations Contacted

Federal Agencies

Department of Agriculture
 Department of Energy
 Department of Transportation
 Surface Transportation Board

Railroad Associations

American Short Line and Regional Railroad Association
 Association of American Railroads

Class I Railroads

Burlington Northern and Santa Fe Railway Company
 Canadian National Railway
 Consolidated Rail Corporation
 CSX Transportation
 Illinois Central Railroad Company
 Kansas City Southern Railway Company
 Norfolk Southern Corporation
 Union Pacific Railroad Company

Other Than Class I Railroads

Red River Valley and Western Railroad Company
 San Joaquin Valley Railroad Company

Railroad Shipper Associations

Alliance for Rail Competition
 American Automobile Manufacturers Association
 National Association of Wheat Growers
 National Automobile Transporters Association
 National Industrial Transportation League
 North American Millers Association
 North Dakota Grain Dealers Association
 Pacific Northwest Grain and Feed Association

Shippers

Agri Sales, Inc. (North Dakota)
 Berthold Farmers Elevator Company (North Dakota)
 BTR Farmers Co-op (North Dakota)
 Columbia Grain Company (Montana)
 Crete Grain Company (North Dakota)
 Enderlin Farmers Elevator (North Dakota)
 Farmers Union Grain (North Dakota)
 Harvest States (North Dakota)

**Appendix III
Organizations Contacted**

Hunter Grain Company (North Dakota)
Kindred Farmers Elevator (North Dakota)
Marion Equity Elevator (North Dakota)
Mayport Farmers Co-op (North Dakota)
Northwest Equity Elevator (North Dakota)
Otter Tail Power Company (Minnesota)
Wyndmere Farmers Elevator (North Dakota)

Others

Fieldston Company, Inc.
GW Fauth & Associates
LeBoeuf, Lamb, Green & McRae
L.E. Peabody & Associates
Massachusetts Institute of Technology, Center for
Transportation Studies
North Dakota Public Service Commission
North Dakota Wheat Commission
Upper Great Plains Transportation Institute

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