

FUTURE STRUCTURE
OF THE
NORTH AMERICAN
RAIL INDUSTRY

JHWinner

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DISCLAIMER

In the interests of full-disclosure, the author, Mr John H Winner, has worked in the transportation industry for 30 years. Much of that work has been in the rail industry. He worked in the rail industry for the Louisville & Nashville Railroad, one of CSXT's predecessors, for eleven years. While working for the L&N, Mr Winner studied many merger possibilities and conducted the operating studies that supported the merger of the Seaboard and Chessie Systems.

He worked for Booz, Allen & Hamilton, Inc for twelve years. At Booz, Allen, Mr Winner supported several railroad mergers and developed operating savings estimates for the merger of ATSF and Southern Pacific. As a part of that work, he appeared as an expert witness on operating issues before the ICC. This merger was denied by the ICC.

As a vice president of Mercer Management Consulting, Mr Winner conducted several extensive studies for CSX Transportation. As President of JHWinner, Inc, he worked with CSX in the preparation of its STB application to acquire Conrail. In his 18 year consulting career, Mr Winner has worked for railroads and governments in the United States, Canada, Mexico and in some fifteen other countries around the world. He has worked with many transportation industry companies including shippers, transport providers from all modes, and industry suppliers. He is a contributing editor to Progressive Railroad magazine where he writes a regular column called "Smart Managing". In March 1998, Mr Winner joined with four other transportation industry consultants to form a new firm, Harral, Winner, Thompson, Sharp & Lawrence, Inc. Other than these two management consulting firms, Mr Winner is not currently serving as a director or corporate officer of any transportation industry firm (June, 1998).

ACKNOWLEDGEMENTS

This white paper is a critical review of the evolving structure of the North American rail industry. It has been sponsored (but not endorsed) by the Office of the Secretary, US Department of Transportation and the Federal Railroad Administration. The paper was begun after CSX and Norfolk Southern filed with the STB for acquisition of Conrail but before the worst of Union Pacific's difficulties in completing its consolidation of Southern Pacific Lines and the CN merger with the IC. The purpose of this paper is to speculate about how the rail industry will evolve over time and to consider the implications of different structural and regulatory models.

During the course of preparing this paper, I have consulted with a number of people in the industry in the United States, Canada, Mexico and several countries with different rail access regulatory regimes. These have included regulators, industry executives, law firms, lobbyists, consultants and shippers. The footnotes document attribution where it is possible and fair to those I have consulted. Mr Raphael Kedar and Ms Jane Bachner, both Deputy Associate Administrators of Policy at the Federal Railroad Administration, have provided important guidance for this effort and have helped me over some inexperience in regulatory affairs and the recent changes in the make-up and function of the Surface Transportation Board.

Where opinions and conclusions have no attribution, they are most likely mine, especially if they seem to be expressed with little or no evidence. Errors of fact and omission are mine alone.

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EXECUTIVE SUMMARY

This report reviews the history of the North American rail industry to identify the forces that have shaped the structure of the industry over time. Historically, the most significant factors that have shaped the structure of the industry are economics and regulation. A review of historical changes in regulation and financial performance shows a close inverse relationship between regulation and financial performance.

Economic drivers of industry structure have been very compelling in the past. The most powerful economic forces have been those of concentration and cost reduction. Economic forces in the future will be of a different nature but are likely to be just as compelling as those in the past. Trends in revenue market share and the increased market reach of new mega-carriers generate compelling economic and financial incentives for further consolidation.

The real value of a railroad network is where it goes—North American rail systems interconnect with each other, permitting traffic to move from one system to another all over the country. Whether that movement is simple and easy, or not, significantly affects the quality and value of service railroads can deliver. Historically, interchanges have *not* been simple *or* easy, but significant causes of delay, service unreliability, and cost for North American railroads. Railroad consolidations have eliminated a large number of interchanges, internalizing routes, improving railroad service capabilities greatly, and significantly reducing operating costs.

When the eastern consolidations are complete, the number of interchanges between railroads will be reduced from some 10 million cars interchanged in the early 1990s to about 5.4 million. Transcontinental consolidations would reduce the number of interchanges further. This paper analyzes railroad interchanges, their characteristics, and how they have changed and are likely to change in the future. Industry consolidation is now forming four or five relatively balanced Class I mega-carriers in North America. While interchanges have been a powerful determinant of consolidation partners in the past, interchange volumes will be less determinative in the future—all the likely partners in a transcontinental merger have almost the same amount of east-west interchanges. Even so, reduced interchanges will help generate the improved service reliability that will propel future consolidations. Formation of transcontinental railroads will have a significant impact on major interchange cities like Chicago, Kansas City and St Louis.

Major forces will act *against* further consolidations in the industry. Those forces include major shippers and congressional officials, whose concerns about the effect of further industry consolidation on transport competition could result in significant pressure to re-regulate industry activities. These concerns are most actively expressed by large “captive” shippers who have little alternative to rail transport. Transcontinental consolidations are unlikely to have traditional adverse competitive impacts since they are end-to-end consolidations.

Other constituents are concerned that mega-carriers could be too big to fail and could hold the economy captive to inefficiency or abuse. Some industry observers think that mega-carriers could be unmanageable. Forces countering further consolidation are much stronger now that two major consolidations in the west have both resulted in significant service failures, at least initially. Forces against further consolidation are compelling, at least in the near term (next five years).

This report analyses likely future structural scenarios including: No Further Consolidation; NAFTA Consolidation; Two Transcontinental Railroads; Intermediate Consolidations; New Business Structures. The largest structural change in the industry would be the consolidation of an eastern railroad with one in the west to form a transcontinental system. It is unlikely that only one such consolidation would occur. The first would throw the remaining two mega-carriers into each other’s arms. A transcontinental consolidation would, in fact, become two transcontinental consolidations. While the forces acting on such consolidations are fairly balanced between those for and against, at least in the short term, financial incentives for further consolidation are likely to be strong—mostly from traffic growth. Several forces act against such mega-consolidations—shipper opposition and the balance of traffic between the railroads. These factors, coupled with mild governmental opposition make conventional consolidation of eastern and western railroads more difficult. Potential intermediate structural changes might occur, including extensive negotiated access between transcontinental carriers and unconventional forms including nationwide service companies operating over multiple rail networks. Some of these forms may permit the formation of major nationwide rail carriers despite the difficulties.

The report concludes that further structural changes in North American railroads are likely. Important economic and political forces are driving structural change. Some forms include regional consolidations with limited competitive impact (potential consolidations include CN/IC¹, CN/IC/KCS/FNE, KCS/IC, UP/KCS/FNE) that could proceed with some competitive access adjustments. Other forms of structural change are likely in the longer term. These include the formation of transcontinental carriers each with access to portions of the other’s lines and the potential for the formation of national specialized carriers—service operators or providers. Such structural changes could preserve competition and permit participants to provide expanded “single-line” service while limiting cherry-picking competition. Both of these latter structures are complex and will require evolution of legal structures, a maturation of management thinking and significant risk taking by very large organizations. These types of consolidations will require a great deal of time to take place.

¹ This consolidation was announced after this paper was written.

I INTRODUCTION

This Chapter reviews the history of the rail industry to discover forces that have been driving the structure of the industry over time. The review shows that the most significant factors driving industry structures are economics and regulation. The review of historical changes in industry structure also shows a close inverse relationship between regulation and financial performance.

The history of the North American rail industry is the history of a changing nation. Economics and regulation have been the major drivers of change in the rail industry since its birth. Arguably, economics have greater influence on rail industry structure than most other industries because railroads require vast amounts of capital, large inputs of labor and have required significant financial creativity throughout their history. Even more important, unlike many other segments of the transportation industry, for the most part, railroads in America have been and remain privately owned and financed. Frank Wilner, a noted railway historian and former Chief of Staff of the Vice Chairman of the Surface Transportation Board (STB), observes:

The history of America's improved airports, air-traffic control systems, harbors, highways and inland waterways is one of public subsidy. But the history of America's railroads is one primarily of private construction.²

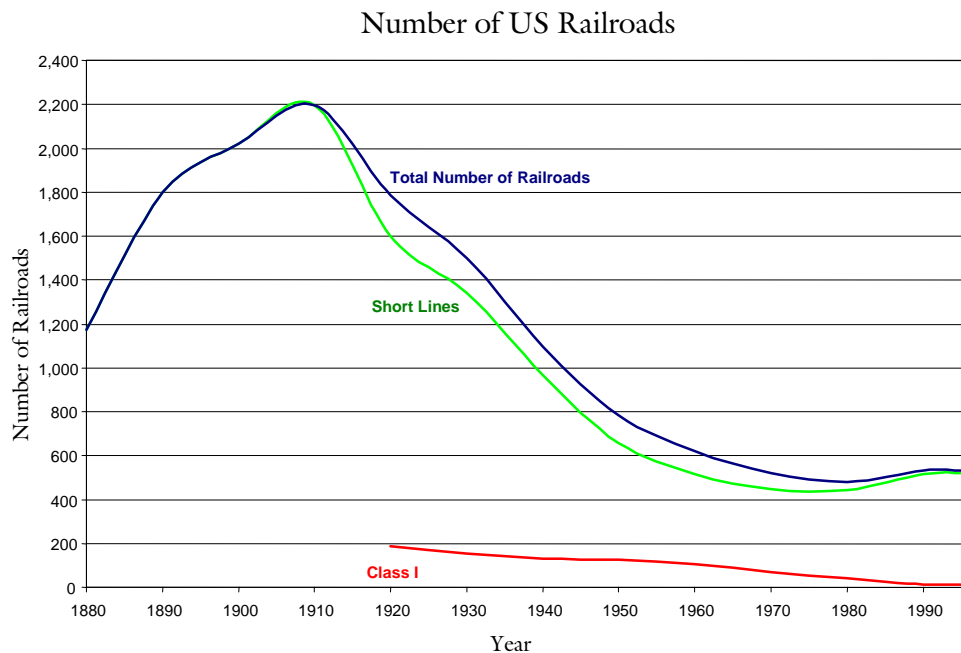
As with all commercial endeavors, the structure of the rail industry has been framed by economic considerations. From the booming construction age through the long period of consolidation that has characterized the industry in the 20th century, powerful economic forces have driven the structure of North American surface transportation. Those forces have included the evolving economic geography of the country, growing sophistication of the financial markets and the increasing concentration of industrial development.

In the past, railroad economics have been greatly influenced by scale. Because of their high fixed-costs and low cost-variability, traffic density, and therefore geographic and economic scale, help determine what financial success was possible in a competitive environment. In what was probably the first rigorous analysis of railway economics, Dionysius Lardner set forth the basic principles of railroad economics. His first principle was: "Railroad expenses

² Frank N Wilner, *Railroad Mergers: History, Analysis, Insight* (Omaha, NE: Simmons-Boardman Books, 1997), p 3.

do not vary in proportion to the volume of business handled.”³ He was referring to economics of scale and density. Economists distinguish between economies of scale and density.⁴ Most rail industry consolidation attacks both economies of scale (*i.e.*, the benefits of being big—purchasing economies and the like) and economies of density (*i.e.*, concentrating traffic on existing lines). Scale and density economics have driven rail industry structure for nearly 100 years in a constant struggle between consolidation and economic regulation. Since the formation of the Interstate Commerce Commission in 1887, regulation has been used to modify and control the struggle to achieve such economies.⁵ The desire to increase densities and to achieve a cost structure with lower fixed costs and greater cost variability has continued to drive railway consolidations; it is likely to continue to be a major factor into the future.

Recent studies have brought into question the degree of scale economics once traffic densities rise above a certain level.⁶ These studies have shown that when railroad traffic density rises above this level,⁷ costs become increasingly variable. The rail industry began to achieve those densities in an intense series of consolidations taking place in the thirty years between 1950 and 1980. The number of Class I railroads declined from 127 in 1950 to 39 in 1980. Most of these were parallel consolidations.



By 1970, all of the largest railroads in the country had been involved in a merger or consolidation. During the period between 1957 and 1970, nearly 60 merger applications

³ Dionysius Lardner, *Railway Economy: A Treatise on the New Art of Transport, Its Management, Prospects and Regulations* (1850), as cited in Stewart Dagget, *Principles of Inland Transportation* (Harper, 1928).

⁴ Ms Martha B Lawrence of Transport & Management Consultants, Inc. Arlington, VA.

⁵ Theodore E Keeler, *Railroads, Freight, and Public Policy: Studies in the Regulation of Economic Activity* (Brookings Institution, 1983), Chapter 3.

⁶ Ann Friedlaender and Richard Spady, *Freight Transport Regulation: Equity, Efficiency and Competition in the Rail and Trucking Industries* (MIT Press, 1981), p. 147.

⁷ The papers cited above found costs variable above system-densities of about 10 mgt.

involving Class I railroads were filed, and the government approved all but six of them.⁸ This was the era of sick railroads and a time when parallel mergers were thought to be able to help the industry increase traffic density and thereby improve financial performance. They served to consolidate traffic and eliminate duplicative facilities. During the 1960s and 1970s, rail management worked to try to reduce costs by consolidating facilities, building scale and density. The consolidation of the Pennsylvania and New York Central Railroads to form the Penn Central Transportation Company in early 1968 was the largest to have occurred up to that time. Even such a major consolidation was not sufficient to save the Penn Central, which went bankrupt a few years after the merger was approved. After the Penn Central debacle, railroads began to favor end-to-end consolidations. Consolidations that increase haul length and give the consolidated railroad greater geographic reach have been the principal feature of rail structural change over the past 25 years.

And, the structure of the North American rail industry has changed a great deal over the past quarter century. In fact, while the industry still relies on rail, crossties and locomotives, little else remains unchanged: competitive environment, technology, company structure, staffing and financial performance. Even the foundation technologies of rail, crossties and locomotives have evolved several times and current versions of each are very different from their predecessors. Over the past 25 years, the major factor changing the economic environment of the rail industry has been deregulation of surface transportation.

It is difficult now to remember the malaise that lay over the industry in the 1970s. Eleven major railroads had gone bankrupt, the government had taken ownership of most rail service in the northeast. Many thought the industry was in a financial spiral to its doom, destined for the technological rubbish heap, along with buggy whips and the Pony Express. There was justification: Rail industry traffic and revenues were declining just as the oil embargo shook the rest of the economy. The 1970s saw the invention of the term, the “rustbelt” referring to the industrial northeast and north-central parts of the country where most US rail traffic originated. Many businesses were declining, moving or going out of business. Interest rates of 15 to 20% drove down spending by capital-intensive railroads. Rapid inflation and slow regulation left railroad prices lagging costs. It truly was a dark and mournful period for railroads. Rail executives devised strategies to shrink their rail business as profitability declined. Many in the industry expected that railroads of the future would consist only of a few lines serving coal-mines, utilities and other bulk shippers and consumers. The regulatory environment that had shaped the industry for the past 50 years was unable to cope with the structural changes taking place in the economy. In this environment, the US Congress struggled to deregulate the rail business before the government became responsible for more of it.

The key piece of legislation was the Staggers Rail Act of 1980. The Staggers Rail Act and the 4-R Act, passed a few years before, ushered in a new era of free-market railroading. The acts permitted confidential contracts between shippers and railroads, allowed the free-market pricing of rail services for most shipments and eased the regulations related to exiting markets. Railroads, freed of much over-regulation, now had prosperity in their own hands and were free to restructure themselves as the economy restructured.

⁸ Wilner, *op. cit.*, p. 93.

Deregulation has been an unqualified success. It has resulted in greater competition and the US economy has enjoyed the benefits associated with deregulated, competitive markets: declining prices, lower costs, improved productivity, better customer service, and more product offerings. Deregulation and the wave of reform and restructuring it unleashed has made the US transport market much more vibrant and financially sound. Productivity improvements made since 1980 have been staggering, increasing more than 300% over the period. Rail traffic growth accelerated and rail industry market share increased for the first time in decades. The elimination of regulations requiring non-discriminatory pricing has allowed railroads to implement differential-pricing practices which have been responsible for generating traffic growth and generally declining prices.

The rail industry has come through a long period of restructuring to emerge in much different form than it had at the beginning. The thousands of individual rail carriers at the turn of the century have become a few mega-carriers and hundreds of independent short-lines. Deregulation has brought greater freedom to adjust transport networks to meet marketplace needs. This increased freedom has allowed rail industry consolidation to proceed relatively unfettered. The ability to merge, sell, or abandon portions of the network is one of the factors that has allowed the rail industry to make significant improvements in financial performance.

Railroads have recovered and prospered under their own power with few, some would argue no government subsidies.⁹ And, the movement to consolidate continues to drive the number of railroads down. In the past few years the number of Class I railroads has been cut in half as C&NW, Union Pacific, Santa Fe, Burlington Northern, and Southern Pacific consolidated into two mega-railroads in the west. Early next year, Norfolk Southern and CSX Transportation are likely to be successful in their effort to buy and divide Conrail. This will leave two mega-railroads in the east. It is natural to anticipate that a set of further consolidations will occur so that the United States would be left with two transcontinental railroads.

Many argue, however, that further consolidation will result in an unfavorable concentration of market power. That market power could significantly reduce competitive pressures and lead to a reduction in overall efficiency in transport markets and harm industries dependent upon rail movement of goods.

This paper reviews historical factors driving industry consolidation and surveys the evolving structure of the surface transportation industry and the role of railroads in that industry. The likelihood and potential impact of such further consolidation in the rail industry are discussed.

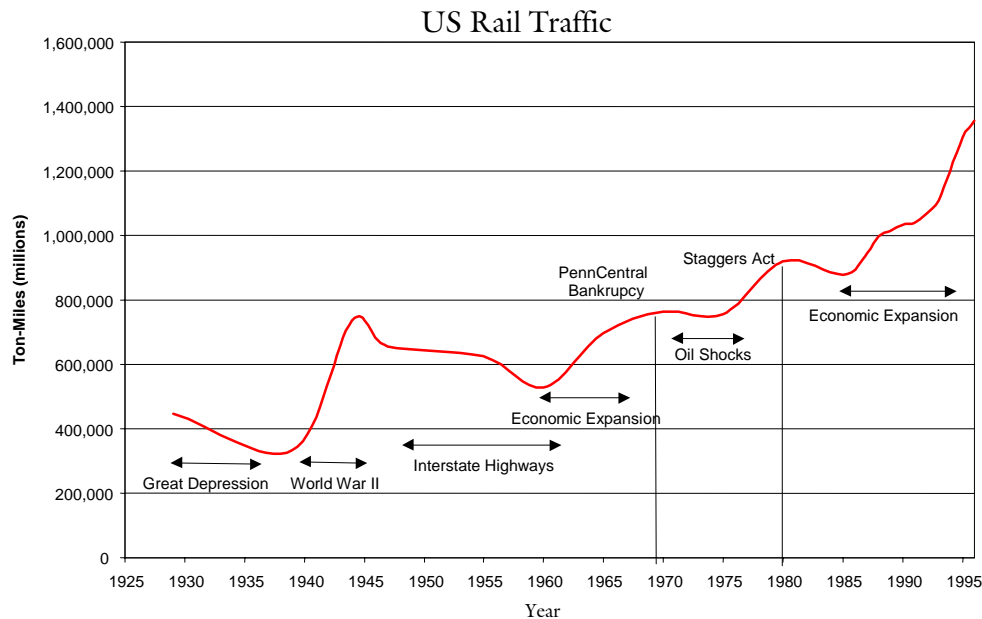
⁹ Government partial payments for road crossing protection cannot be considered a subsidy since in most cases, the railroads were there first. Government payments for Amtrak are a purchased service. Railroad retirement funding is partial payment for a heavily regulated employment system (how many other industries must pay employees six years wages after a consolidation?).

II DRIVERS OF CONSOLIDATION

In this chapter, economic drivers of industry structure are reviewed to determine whether such forces are likely to be powerful enough to drive additional consolidation in the future. This review finds that economic factors — especially forces driving cost reduction — have been the most compelling forces in the past. It also finds that economic forces in the future will be of a different nature but will be even more compelling than in the past. Trends in revenue market share and the increased market reach of new mega-carriers generate compelling financial incentives for further consolidation.

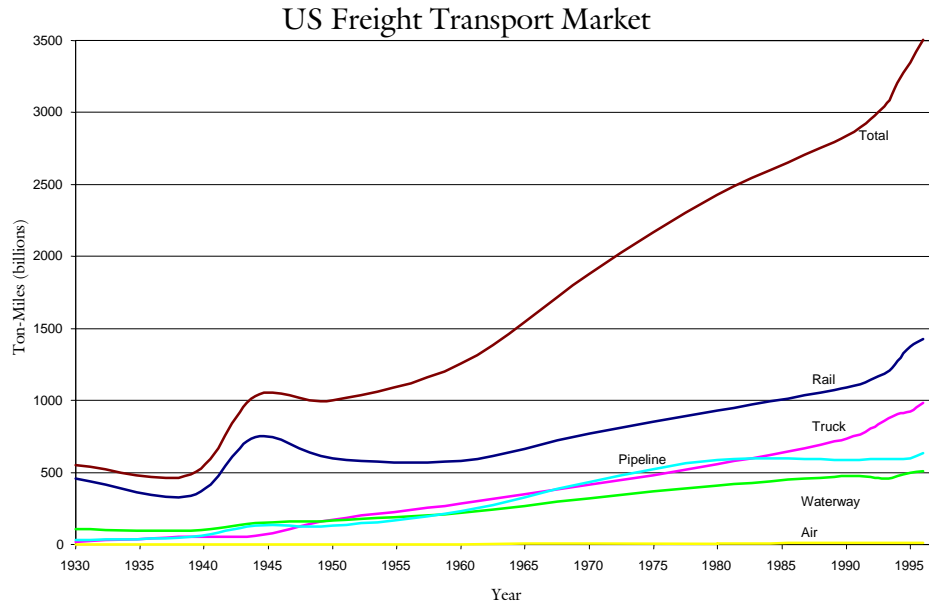
2.1 TRAFFIC GROWTH AND MARKET SHARE

US rail freight traffic has grown more rapidly in the past decade than at any time since World War II. Rail freight traffic has been affected by many factors. It is difficult to separate impacts of the regulatory environment and the continuous

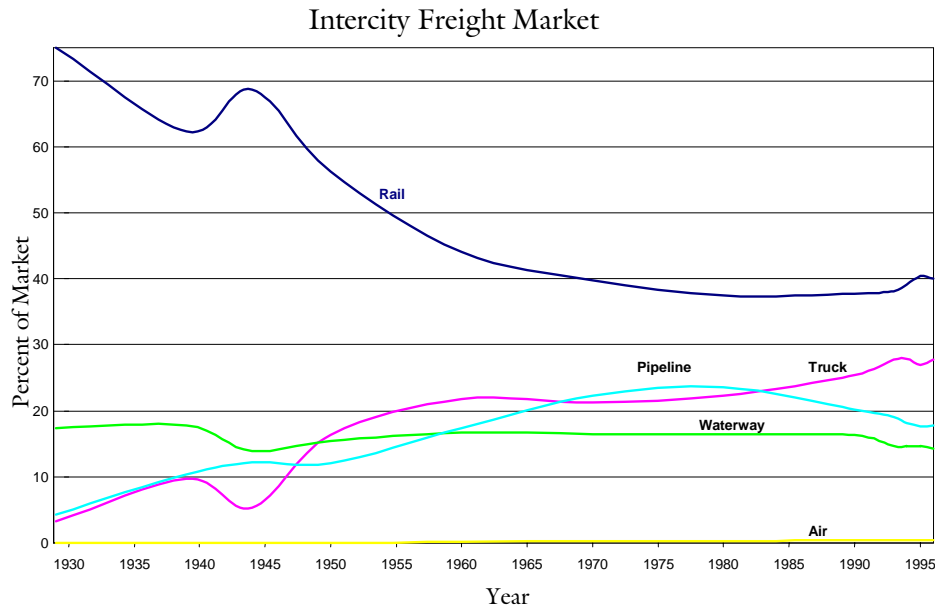


history of consolidations within the industry from the forces affecting the US economy at large. However, the period during the late 1940s to the early 1960s, a period of relative calm and growth in the economy as a whole, shows declining rail traffic. The construction of the interstate highway system, tight constraints on rail industry prices, costs, and service characterized this period. While rail freight transport declined in the period immediately

after World War II, freight traffic in other modes, especially highway, continued growing.¹⁰ The chart below shows the evolving US freight market by mode.¹¹



Close regulation of prices, rates and of access to markets drove the values in the regulated trucking industry higher and rails lower. Rail market share, even on a ton-mile basis,



has fallen continuously during the post-war period. Rail market share ticked up in recent years, driven partly by the consolidation in the industry and the improved service delivery. These charts show market share trends based on ton-miles; revenue based market share data show even larger market share shifts: from rail, water and pipeline to truck. In 1996, rail industry revenue-share of the intercity freight market was only about 13%.

¹⁰ Waterway traffic includes Great Lakes and inland waterway traffic. Great Lake's traffic declined slightly between 1945 and 1950; freight on the inland waterways increased during the period. In contrast, rail freight traffic declined 20% during the period.

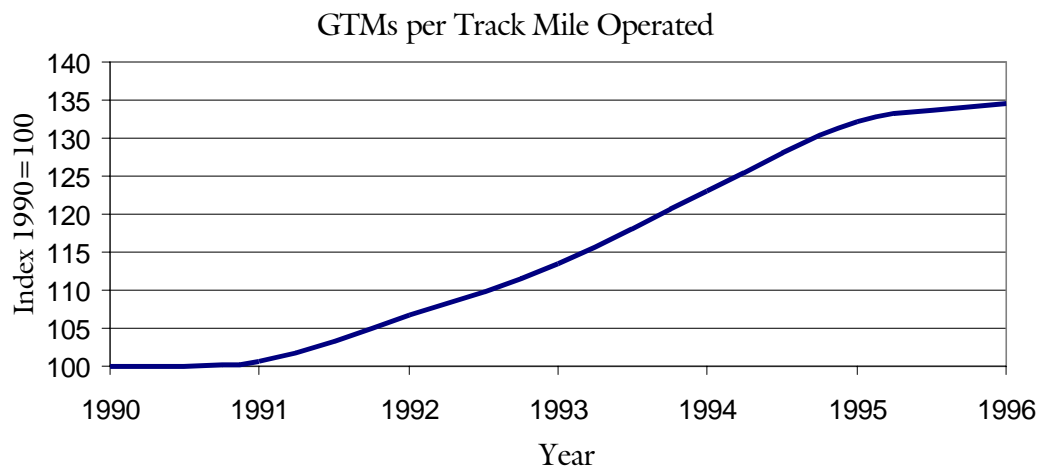
¹¹ Eno Foundation for Transportation, Inc., *Annual Reports*, 1997

Over the past 10 years, railroad market share, as measured by ton-miles, has increased steadily. Partly this is due to increases in western coal loadings and longer hauls for that coal as environmental considerations drive more utilities to use more low-sulfur coal. However, the most rapidly growing segment of rail business has been intermodal shipments. While intermodal traffic has caused some disintermediation from other types of rail traffic, intermodal growth has driven net industry volumes upwards.

Consolidation has allowed major railroads to reduce light density lines, consolidate traffic into fewer main lines, close terminals and yards and to improve the utilization of equipment. More importantly, end-to-end consolidations have extended the service reach of individual rail carriers. While many deride “single-line” service as a reason for continuing consolidation, the evidence shows that consolidations that expand single-line service have permitted the industry to lower costs, reduce investment intensity and improve customer service.

2.2 EFFICIENCY AND COST REDUCTION

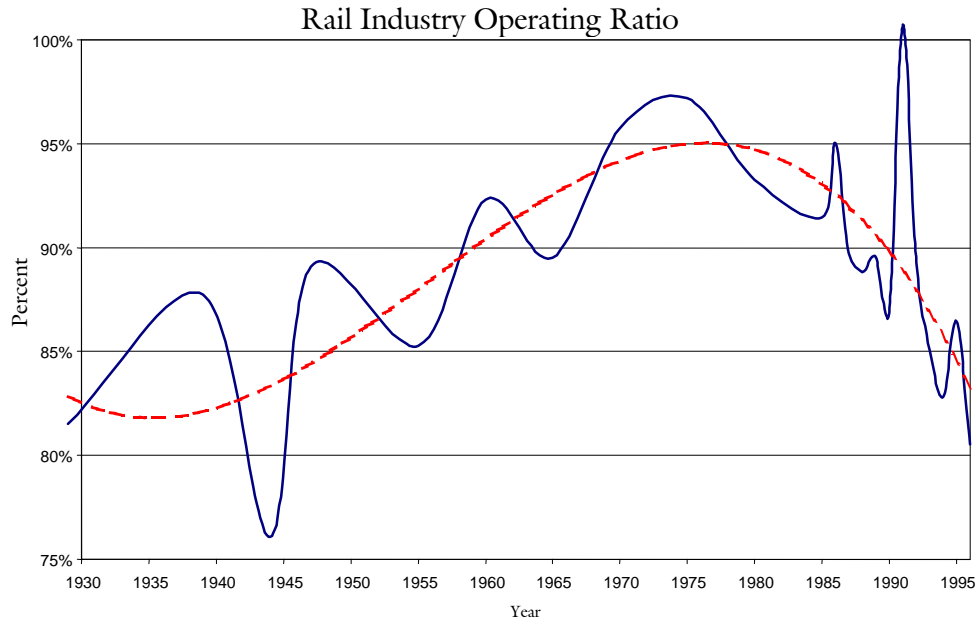
US railroads have taken advantage of the deregulated environment to continue consolidation and to extend their service reach. This has increased traffic densities and improved industry profitability. The chart below graphically shows the increased concentration. Between 1990 and 1996 average track density increased by 35%.¹² Of the 35% increase in traffic density, about 31% is a function of traffic growth, the remainder a function of reduction in track miles. The 31% increase in rail ton-miles since 1990 occurred while trucking volumes



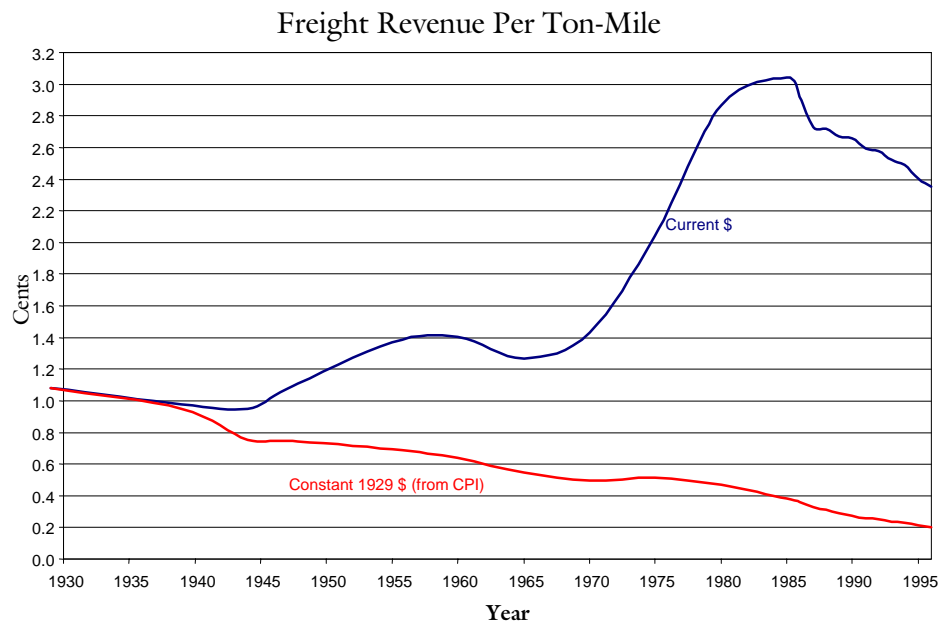
increased some 34%. Overall, US freight transport during the period increased by some 23%, so rail and highway market shares increased at the expense pipeline and waterway traffic, which grew much more slowly. Rail traffic increases are the result of the increased market reach afforded the newly integrated rail carriers, service improvements, reduced costs, and continuing structural shifts in the economy.

¹² Association of American Railroads, *Railroad Ten Year Trends*, 1996.

Deregulation also permitted railroads to reduce light density lines and exit unprofitable businesses. Railroads used these new freedoms to become more efficient and “downsize” physical plant and workforce to more efficient levels.



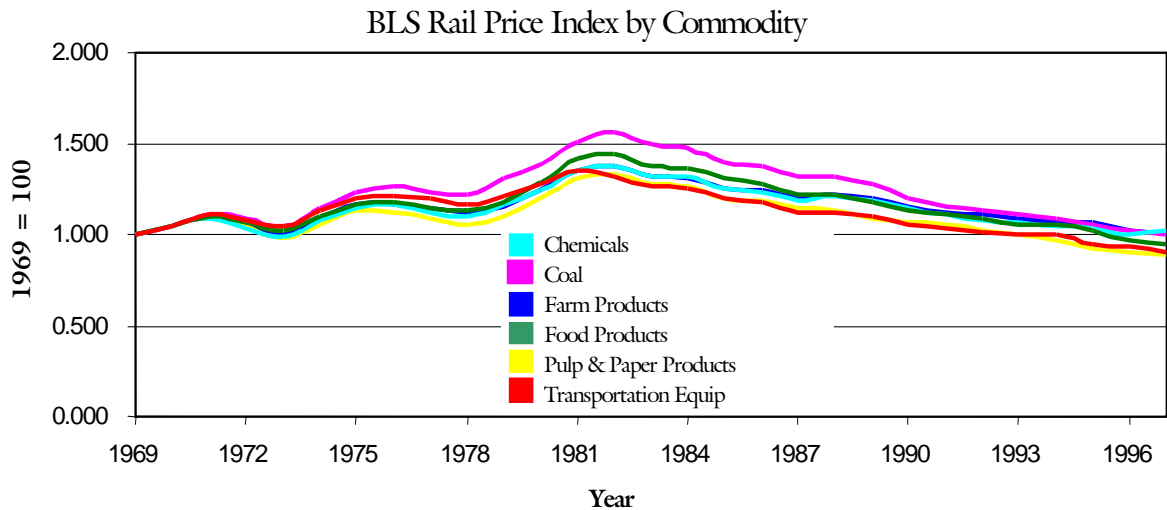
Railroad operating ratios improved as a result of the efficiency and traffic gains. Operating ratios could be improved by increases in unit revenues (rates) as well as through cost



reductions. However, the evidence shows that unit-revenue on railroads has declined consistently since 1929, and more rapidly since 1980. The chart above shows current- and constant-dollar unit-freight-revenue since 1929.¹³ The period between 1970 and 1980 was one of high inflation and low rail industry earnings. Current-dollar rail prices increased,

¹³ Association of American Railroads, *Railroad Facts, 1997 Edition*, at 30, 31. Prices adjusted by the CPI from 1929 to 1996, CPI data from the Federal Reserve System.

driven by rapid inflation and rail industry effort to drop low margin traffic. Since 1984, unit-freight-revenue has declined very rapidly. Mix changes explain some of this recent decline. The increased long-haul movement of coal from the Powder River Basin into the east reduces average revenue-per-ton-mile. Another major factor is the significant increase in container movements, especially doublestack movements, which have low unit-prices.



The table above shows selected series from the Bureau of Labor Statistics producer data on line-haul rail prices. This BLS series begin in 1969 and the data have been price adjusted by the consumer price index from the Federal Reserve. For each series, the BLS data has an end-1984 as a base period (*i.e.*, the data are indexed so that the end of 1984 is 100). They have been restated here to show 1969 as 1.0 for each series.¹⁴

While there was some divergence in pricing up to the early 1980s, since the Staggers Act and the most recent period of consolidation, rail prices for all commodities have declined significantly. Rail prices are now below their 1969 level. The BLS series are significant since they show prices producers actually pay; the series inherently adjusts for contract rates, (permitted in the Staggers Act), volume discounts and other factors. The data show that for all commodities, prices fell from the early 1980s onward.

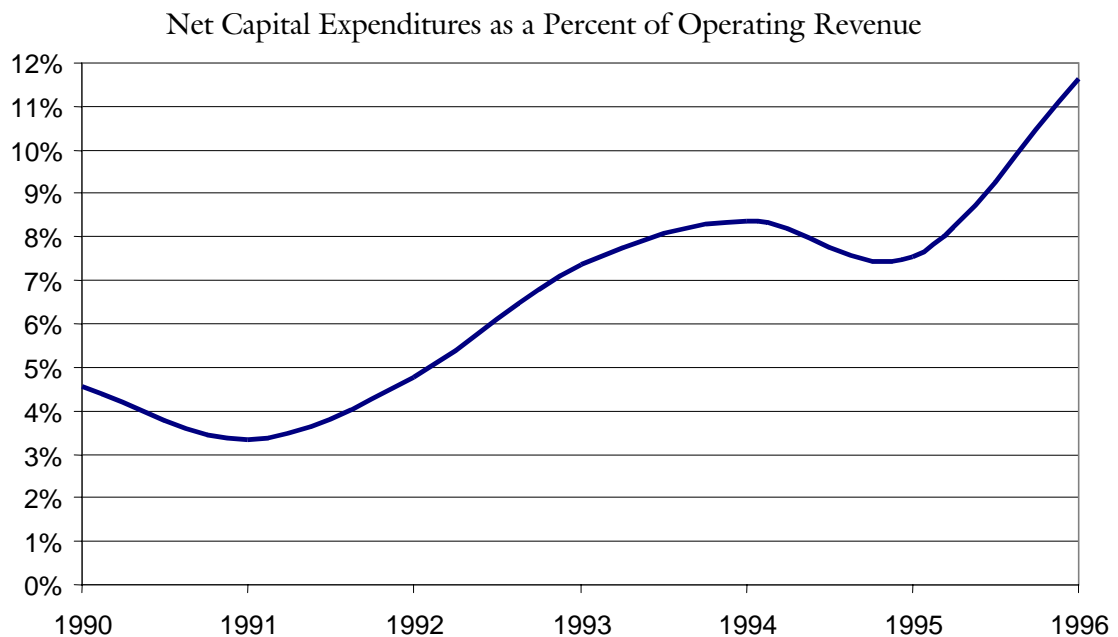
Price declines since the mid-1980s were made possible by industry action to reduce costs, and improve productivity. Industry consolidation has been an important part of the industry's efficiency gains. The industry's undeniable efforts to reduce costs translated into price declines because of the presence of competition. Prices have been under pressure

¹⁴ This does not mean that all shippers paid the same price in 1969 or that prices for long-haul transport were the same across commodities. The data have been indexed to show price behavior for each commodity over the period 1969 to 1997. Some data series are not complete for the year 1997, these have been estimated based upon available monthly data. BLS Data can be accessed from the internet. The series identifiers for the data shown above are: Chemicals-PCU4011#A08; Coal-PCU4011#A03; Pulp & Paper Products-PCU4011#A07; Farm Products-PCU4011#A01; Food Products-PCU4011#A05; Transportation Equipment-PCU4011#B03

because of end-market competition for shippers (end-market competition sends price pressure signals down the entire supply chain), pressure from alternative supply sources and from alternative suppliers of transport.

2.3 THE NEED FOR CAPITAL

Rail industry deregulation has had excellent economic results. Costs have declined, rail industry financial performance has improved significantly, arguably competition has increased,¹⁵ driving down prices. Major railroads have been investing heavily in renewing assets, improving line capacities, realigning yards and terminals for new traffic flows and replacing worn and outmoded equipment.



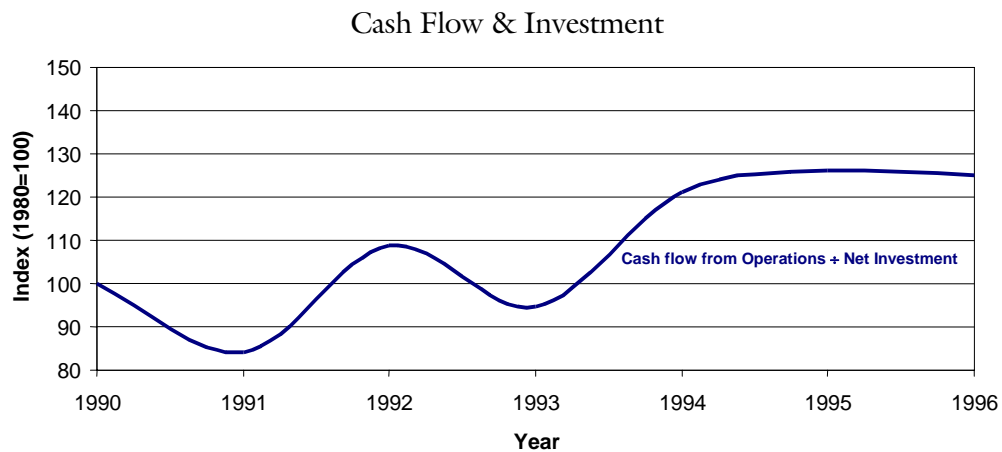
The capital requirements associated with restructuring and traffic growth are significant and have driven capital spending much higher over the past five years. There is much debate in the transport community about whether major US railroads are making adequate earnings to support continued investment in plant and rollingstock. By Surface Transportation Board (STB) measures, few Class I railroads earn their cost of capital.¹⁶

Capital availability is an important issue for the industry. Industry executives claim that if they are not able to earn their cost of capital, they will not be able to continue to invest in railroad assets. The industry has been re-investing; the chart above shows that the

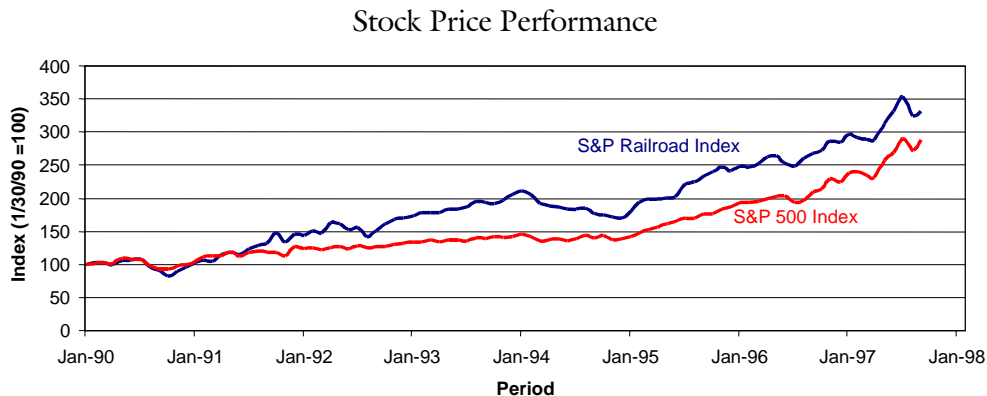
¹⁵ Even within the rail industry, major enterprises are financially more healthy than they have been in decades. Healthy enterprises can compete better than sick ones.

¹⁶ The STB determines rail industry “regulatory” cost of capital each year. The measure is used in some rate proceedings. The regulatory cost of capital for the industry for 1996 is 11.7%.

percentage of revenue committed to investment has been climbing steadily since 1990. The chart below shows the ration of cash flow to net investment, values greater than 1.0 cash-flows greater than investment needs.



Critics argue that the industry is certainly generating sufficient earnings since the stock market has bid-up the price of rail stocks over the past 5 years.¹⁷ The chart below shows that Class I railroad stocks out-performed broad stock market indexes since 1990.



(Class I stock prices have under-performed the market over the past few months.) This suggests that investors expect railroad stocks to continue to have high earnings prospects well into the future. It is difficult to read investor expectations about future industry structure into recent stock market performance, but it is clear that investors expect future earnings gains for the industry.

And well they might. Every large Class I railroad is involved in a merger or consolidation. Investors expect the benefits from these consolidations to continue build earnings growth well into the future. Each major railway consolidation (UP/CNW, BN/ATSF, UP/SP, KCS/FCN, UP/FCN, the pending purchase and dismemberment of Conrail by CSX and

¹⁷ Jerome E Hass, "An Evaluation of the Measurement and Use of the STB's Annual Railroad Revenue Adequacy Determination" National Economic Research Association, in a study prepared for rail industry union representatives, (February, 1997).

NS, and now the CN acquisition of IC) has been prefaced by and supported before the ICC or STB with forecasts of significant cost reductions and improved utilization of assets.

Each recent merger has also claimed significant benefits in service delivery. Improved service quality, lower costs, and better use of assets generate a compelling outcome when considered alone. The service improvement potential generates an expectation of increased market share. While increased market share may require substantial investment in capacity, additional traffic promises significant upside potential for railroad financial performance, especially given the industry's small share of intercity transportation revenue.¹⁸ CSX and NS have claimed that much of the value in their Conrail acquisition is in the additional traffic that will be attracted to rail. The executives of these companies believe that increased competition in key eastern markets and the development of new rail service routes between the Northeast and South will generate significant new traffic.

2.4 SUMMARY

It appears that investors, at least, believe cost-reduction forecasts associated with consolidations, and also expect market share gains to boost railroad financial performance significantly. Investors are betting on growth in the industry. Growth is likely to require further consolidation, the evolution of some new form of cooperation within the industry, or new industry structures, methods or technologies that enhance service delivery and improve quality. Consolidation is the path of least resistance to service enhancement and can strengthen and secure market share at the same time. Pressures to continue consolidating will be large.

Rail industry management have several decades of performance improvement and at least 15 years of falling prices to show for their arguments to continue consolidation. The industry will be able to make a compelling case that a new rail transportation industry is evolving, that railroads in the 21st Century can be as strikingly different as the current mega-carriers are from their predecessors.

¹⁸ Estimated at about 13% by the Eno Foundation Transportation Survey in 1996.

III RAILROAD INTERCHANGES

The real value of a railroad network is where it goes. North American rail systems interconnect with each other, permitting traffic to be interchanged from one system to another. Whether that movement is simple and easy or not significantly affects the quality of service railroads can deliver. Interchanges have not been simple or easy and are often a significant cause of delay, service unreliability and cost for North American railroads. Railroad consolidations have eliminated a large number of interchanges, internalizing routes and improving railroad service capabilities greatly. Once the eastern consolidations are completed, the number of interchanges between railroads will be reduced from some 10 million cars interchanged in the early 1990s to about 5.4 million. Transcontinental consolidations would reduce the number of interchanges further. This chapter analyzes railroad interchanges, their characteristics, how they have changed and are likely to change in the future. Consolidation is now forming five relatively balanced Class I mega-carriers. While interchanges have been a powerful determinant of consolidation partners in the past, in the future, they will be much less important in determining who merges with whom. But, reduced interchanges will help generate the improved service reliability that will propel future consolidations. Formation of transcontinental railroads will have a significant impact on major interchange cities like Chicago, Kansas City and St Louis.

3.1 SERVICE IMPROVEMENT AND INTERCHANGES

A major benefit of the consolidations occurring over the last decade has been the elimination of interchanges between carriers. Reduced interchanges are a proxy for simplified operations, lower costs and improved service quality. The power of consolidation is the ability of the consolidated carriers to offer improved customer service and higher service quality. Robert D Krebs, Chairman of BNSF said in an interview with the Wall Street Journal:

You can have agreements with other railroads. But there is nothing that is a substitute for one philosophy of management, one agenda, one operating plan and a single implementation effort.¹⁹

And, indeed, consolidations have resulted in fewer rail carriers and a reduced number of interchanges. Service improvements have resulted from the consolidations. Eliminating interchanges eliminates time and uncertainty in rail movements. It is estimated that every interchange adds at least a day to transit time; much more in complex terminal areas such as Chicago.

¹⁹ Daniel Machalaba, "Railroads Merging to Give Trucks a Run for the Money," *Wall Street Journal*, August 11, 1994.

The MIT studies stretching for more than two decades²⁰ show that railroad terminals and interchanges are the primary source of unreliability in rail movements. As railroads eliminate the need to interchange traffic between carriers, they reduce the number of terminals involved in through movements. Eliminating terminals reduces transit time and improves reliability. This is the claim railroads make when they talk about “single-line service.”

Indeed, single-line service has allowed railroads to create and offer more competitive service. Most railroads offer highly reliable dedicated train services. For example, dedicated auto unit trains, with turn-around times measured in hours or days, are common in the industry. Service contracts include volume and schedule commitments with tight tolerances. Many railroads report running dedicated intermodal and automobile trains with on-time performance measured in the high 90% range. The ability to control a movement from beginning to end has allowed many carriers to enter into contracts guaranteeing service delivery characteristics for many customers. This has permitted railroads to recapture some market share over the past twenty-five years.

The evidence in improving equipment utilization and greater line densities is clear. The North American freight car fleet has been reduced by more than 30% over the past 25 years; that of the Class I railroads by nearly 60%. The North American locomotive fleet has also been reduced by more than 30%. Ton-miles have nearly doubled while track-miles have declined by 45%.²¹

While freight cars have grown larger (by about 30%), equipment utilization increased significantly for large portions of the freight car fleet. For example, coal car utilization used to be measured in weeks between loadings, now it is measured in days. Industry consolidation has reduced the number of interchanges and increased the velocity of equipment. The increased single-line service made possible by industry consolidation improved service reliability and improved equipment utilization. The use of dedicated and unit trains made shipper owned equipment financially possible.²² Dedicated train operations and high utilization were made possible in part by the formation of larger carriers serving both origin and destination.

²⁰ MIT's Transportation Research Center has done pioneering work since the early 1980s on the causes of rail service unreliability. The work has been reported in a series of papers covering many aspects of railroad operations. According to the research, railroad terminals are the primary source of rail caused service breakdowns. Recent studies on several Class I railroads confirm that more than 90 percent of service unreliability can be attributed to events taking place at railroad terminals, including interchanges. This is one reason that dedicated unit trains, run-through trains and trains moving between dedicated terminals (such as intermodal and auto loading and unloading facilities) have much higher service reliability.

²¹ Association of American Railroads, “Railroad Facts, 1997 Edition” Washington, DC (September 1997)

²² Dedicated trains and high equipment utilization allows shippers to weight the cost of financing dedicated rolling stock against freight rates. Railroads benefit in that they have a long-term client who is putting up part of the capital necessary for rail service.

3.2 RAIL TRAFFIC INTERCHANGES AND CONSOLIDATION

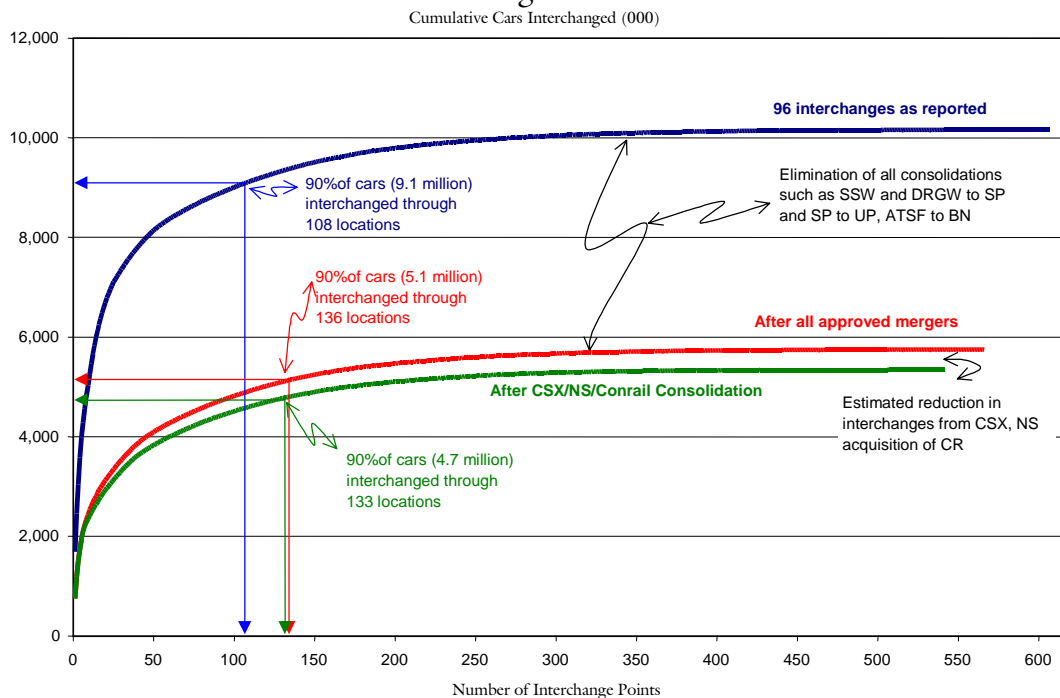
Recent industry consolidations have resulted in a significant reduction in the number of cars that must be interchanged between railroads to reach their final destination. An analysis of the 1995 Waybill Sample shows the magnitude of the reductions. In 1995, the industry reported loading 23.7 million cars. The 1995 Waybill Sample shows a total of 10.2 million carloads interchanged between all rail carriers, or 43 percent of all rail traffic. Several railroads have estimated the average cost of an interchange at about \$100 per car. All interchanges, then, cost the industry and shippers over \$1 billion a year.

Number of Cars Interchanged
1995 Waybill Sample

Analysis Steps	Cars (millions)	Tons (billions)	Interchanges Eliminated	% of Cars 1995 Sample
1 '95 Raw data	10.2	738.8		100.0
2 1 + CN-CP-WC Adjustments	9.9	714.2	0.3	97.1
3 2 + BNSF Consolidations	9.7	694.1	0.2	95.1
4 3 + UP/SP Consolidations	5.8	421.7	3.9	56.9
5 3 + CSX/NS/CR Consolidations	5.4	390.0	0.4	52.9
Total Interchange Reduction	4.8	340.8		47.1

The waybill sample records as interchanges traffic that has different railroad reporting marks in the origin and destination railroad fields. Many of the reported interchanges in this sample are between railroads that have already consolidated. Western consolidations eliminated many major interchanges. Some of the largest interchanges found in the waybill data go away because of consolidations approved years earlier. Elimination of corporate

Interchange Volumes



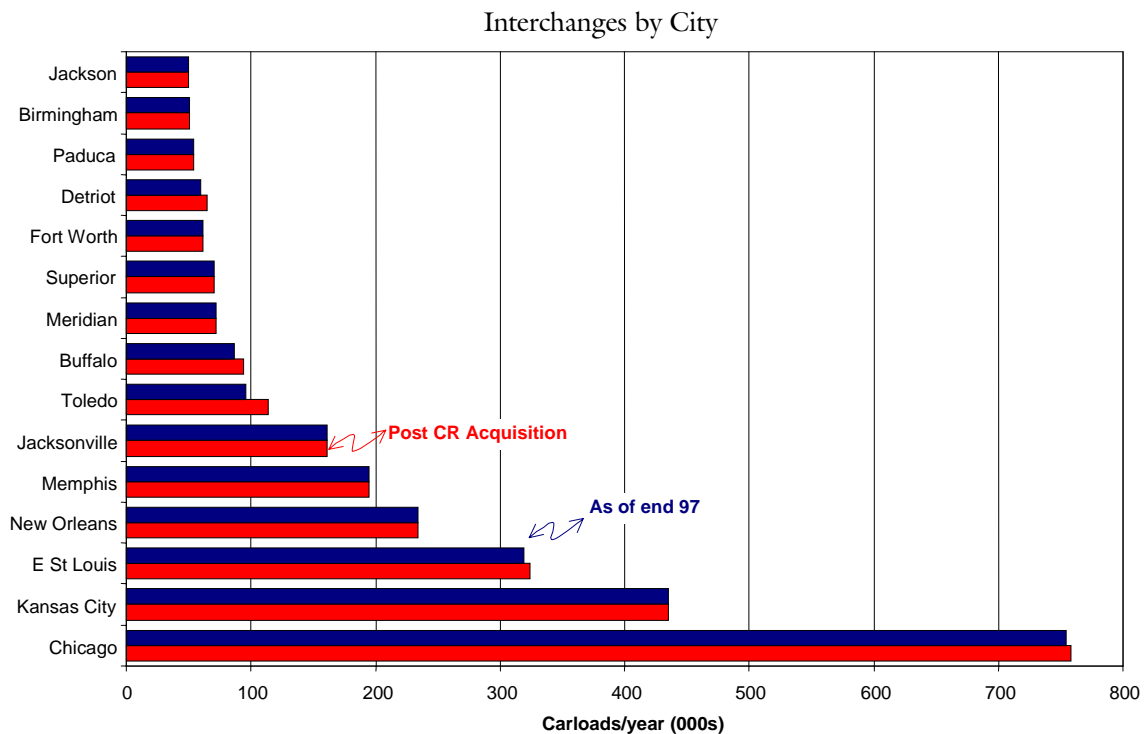
interchanges (*e.g.*, between WRPI and UP) further reduces the number of cars interchanged. Finally, recent western mergers eliminate a significant number of interchanges.

Overall, western consolidations eliminate some of the largest interchanges shown in the 1995 Waybill sample. (The consolidations eliminated interchanges at South Morril, Santa Rosa, Council Bluffs, Herington, Corsicana and Ogden, the 3rd, 5th, 6th, 7th, 8th and 10th largest interchanges reported in the waybill data, among others.) When all approved consolidations are taken into account, the number of cars that must be interchanged between independent carriers declines by more than 4.4 million (resulting in a cost savings of about \$440 million).

Once the CSX/NS/Conrail consolidations have occurred, estimated interchange volumes are only about 53 percent of the interchanges reported in the 1995 Waybill Sample. That is, of the 10.2 million cars reported interchanged in 1995, only 5.4 million would be interchanged between independent carriers after all consolidations are taken into account (about 23 percent of all carloadings). The chart above shows the reductions incrementally. The footnotes describe the reporting mark interchanges eliminated in each step.

3.3 GEOGRAPHIC IMPACTS OF CONSOLIDATION

As railroads become larger, there are fewer interchanges. One would expect that fewer interchange locations would represent a larger percentage of the remaining interchange traffic. This is not the case. The graph below shows the change in the concentration of interchange traffic. As the graph shows, in the raw data, 90 percent of the traffic moved through about 100 different interchange locations. As the number of railroads decreases, the volume of interchange traffic decreases and remaining interchange volumes become more geographically dispersed.



This should not be a surprise. The consolidations occurring over the last decade have eliminated a large number of interchanges between carriers. The theoretical service

improvement available from single-line service is only available where interchanges are eliminated.

Analysis of the 1995 Waybill Sample indicates that the key interchange locations remain Chicago, Kansas City, East St Louis, New Orleans, and Memphis.²³ The chart above shows the top 15 interchanges after the acquisition of Conrail by CSX and NS and compares the car volume at each with the volume before their consolidation. The top seven interchanges are the same before and after the consolidation. The eastern consolidations will result in the elimination of major interchanges at Cincinnati, Hagerstown and Potomac Yard (8th, 9th and 11th largest interchanges before consolidation). These 15 interchange points represent about 50 percent of all remaining interchange traffic. The top five interchanges occur at the boundaries between eastern and western mega-carriers and represent one of the potential gains from transcontinental consolidations. The total volume of interchange traffic represented by these top five is about 2 million carloads or 37 percent of remaining interchange volume.

Transcontinental consolidations (between the eastern and western mega-carriers) would eliminate many of these interchanges (about 570,000 interchanges in total²⁴, see table below). Most eliminated interchanges would be at these border points. However, since traffic would continue to flow between transcontinental carriers, Chicago, Kansas City, St Louis, New Orleans and Memphis would continue to be largest interchanges, though volumes would drop.

For example, if two transcontinental consolidations are assumed (either BNSF + NS and UP + CSX or vice versa), Chicago remains the largest interchange point but interchange volumes fall to about 580,000 carloads (from some 760,000 interchanges). Transcontinental consolidations would substantially change the character of rail operations in Chicago (and, by extension, in Kansas City, St Louis, and other major border interchange points).

Chicago is one of the most congested rail interchange points in the country and cars interchanged there commonly spend more than 3 days in transit.²⁵ It is likely that transcontinental carriers would work to optimize service performance and the volumes of cars moving through choke points such as Chicago would be substantially reduced.

Similarly, costs associated with delays at the real work associated with the physical interchange of rail-traffic would also be reduced. Traffic would likely flow much more smoothly through the Chicago area with little need for road movement of trailers and

²³ Major interchange locations eliminated in consolidations up to 1996 included South Morril, Sana Rosa, Council Bluffs, Herington, Corsicana and Ogden. Many of these involved coal movements.

²⁴ This figure is based upon a simple "static" analysis of the 1995 Waybill Sample. In reality, rail freight flows are dynamic and the number of interchanges would tend to reduce further as each transcontinental carrier offered improved service reliability through new single line service offerings and elimination of intermediate handlings.

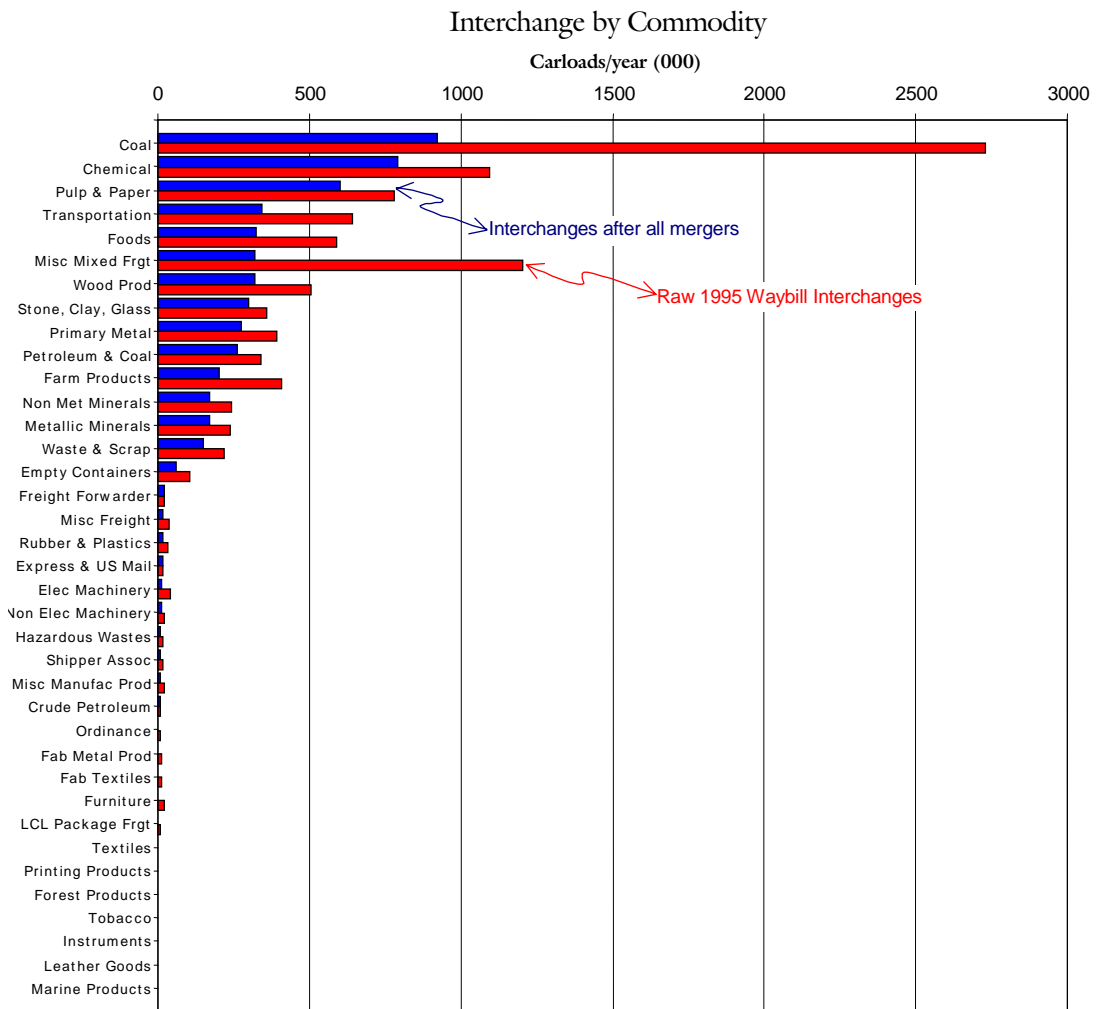
²⁵ Based upon conversations with several major railroads, cars transiting Chicago commonly spend 24 hours in each carriers terminals and often spend another 24 hours at an intermediate carrier. Rail interchanges are difficult enough that many container and trailer loads are unloaded from rail cars, trucked to the intermodal yard of the interchange carrier over the highway and reloaded on rail cars.

containers. When rail traffic is no longer delayed, terminal capacity is released. Many Chicago terminals could be closed and the land developed for higher and better uses. Economic benefits to local communities could be significant (reduced highway congestion, reduced need for highway construction, increased property tax revenues from development, etc.). Other major interchange points would be similarly affected.

It is reasonable to assert that the interchanges eliminated in transcontinental consolidations will significantly change rail transport. Terminal areas that are now sensitive indicators of rail industry health could become way-points on a nationwide interstate railway system. However, terminal areas such as Cincinnati, Little Rock, Houston, Nashville, and Omaha, internal to transcontinental rail systems, could become new sensitive touch-points for the rail network.

3.4 INTERCHANGE TRAFFIC BY COMMODITY

Analyzing interchanges by commodity is also revealing. Prior to the consolidations of the 1990s the largest interchanges involved coal traffic. The Waybill data contains significant



coal interchanges between consolidated western carriers. When these are removed a substantial volume of coal continues to be interchanged, in fact, coal is the largest

commodity interchanged. It should be noted that the 1995 waybill data contains a large volume of coal interchange moves that were interchanged between subsidiaries of the same corporate parent, not different rail systems. So, the reduction in coal interchange volume is not as significant as it appears on the chart above, although the figures are correct (that's because much of the reduction from the raw 1995 data is the elimination of intra-company interchanges). After the consolidation of eastern railroads, major interchanged commodities continue to include coal, chemicals, pulp and paper, and automobile traffic.

Since these are the largest commodities carried by railroads, their dominance in interchange volumes is not surprising. There is a significant reduction in Miscellaneous Mixed Freight, mostly containerized freight movements. Trailer and container traffic generally moves between major terminals and the western mergers, especially those between SP and SSW and D&RGW resulted in a significant reduction in containerized freight interchanges. Since this traffic is most service sensitive and fastest growing, it may not be surprising that recent consolidations have involved streamlining movement of such traffic.

After all consolidations, most interchange traffic continues to involve coal, chemicals, pulp and paper traffic and transportation equipment. Production of these commodities involves relatively large fixed facilities at one or both ends of the transport cycle and rail is the primary transport mode. Note that groups of shippers of these commodities (especially coal and chemical shippers) are among the most vocal in opposition to consolidations.

3.5 INTERCHANGE AFFINITIES

If interchange volume is an important factor driving consolidations, then a consolidation between BNSF and UP should be considered the most likely. The largest interchange volume is between BNSF and UPSP (541 thousand carloads, worth some \$54 million just for the elimination of the interchanges). While a large part of this volume (about 1/3rd) is coal traffic shipping out of the Powder River, most is mixed traffic through a number of interchange locations including such commodities as automobiles, chemicals and intermodal traffic. Even so, a western consolidation is very unlikely as it would involve serious competitive issues and engender severe political difficulties.

Estimated Interchanges by Major Railroad
1995 Waybill Sample, After All Existing Consolidations (million carloads)

	UP	BNSF	CSXT	NS	CN	CP	IC	KCS	WC	Other
UP	-	221.9	251.0	267.0	11.7	33.3	58.4	45.4	26.5	141.0
BNSF	318.9	-	93.5	92.0	3.0	37.2	28.3	169.9	10.5	59.2
CSXT	111.6	85.6	-	72.7	46.6	18.7	15.1	13.3	12.3	276.1
NS	124.5	107.1	83.9	-	33.1	27.9	18.4	47.2	12.9	144.4
CN	64.8	40.2	67.3	89.5	-	10.2	5.8	-	22.5	31.4
CP	64.3	56.8	65.4	83.5	2.8	-	11.7	8.1	29.6	58.1
IC	28.8	13.1	41.8	57.9	2.4	2.1	-	25.4	3.7	67.0
KCS	28.1	48.7	37.6	56.1	-	9.8	34.6	-	-	19.2
WC	60.2	10.7	25.2	15.2	0.3	6.5	4.7	-	-	14.6
Other	210.6	70.3	132.8	147.6	24.1	87.5	35.1	21.7	70.7	106.2
Total	1,011.9	654.4	798.6	881.3	123.9	233.1	212.1	331.0	188.7	917.2

Transcontinental interchange volumes are of the same magnitude for the primary potential combinations. The interchanges between UP and NS (totaling 391.5 thousand carloads) are

about 10 percent larger than UP - CSXT interchanges (which total 362.5 thousand carloads). Based on the \$100 estimated cost of an interchange, only \$3 million separates the value of a NS and CSXT consolidation with the UP.

Interchanges between BNSF and both eastern railroads are substantially smaller than those with UP. Again, NS interchanges with BNSF are again about 10 percent larger than CSXT interchanges with BNSF (BNSF - NS interchanges total 199.1 thousand carloads; BNSF - CSXT interchanges total 179.2 thousand carloads), implying a separation of only \$2 million.

Considering multiple combinations, an NS-UP and BNSF-CSX consolidation would eliminate about 571 thousand interchanges, about 9,000 more than the opposite consolidation (CSX-UP and BNSF-NS). Because of this balance, interchange volume is not likely to be a significant factor in determining which transcontinental consolidations are likely to occur.

A consolidation between east and west mega-carriers will be complex and driven by many factors, including reductions in interchanges. But, at the end of the day, interchange volumes do not favor one combination over another.

3.6 THE IMPACT OF RAILROAD INTERCHANGES ON FUTURE CONSOLIDATIONS

Traditional analysis of rail traffic diversions considers how a combination between two different railroads affects how existing rail shippers will route traffic over the changed network. While a number of factors are normally taken into account, road of origin and destination is the most important. With only two major railroads in the east and west, the control of one end or the other of a movement should not have much impact on how the major players pair-up.

There are likely to be few diversions from one carrier to another based just on the transcontinental consolidation. This may partly explain why many railroads have considered, then discarded the possibility of a transcontinental consolidation. The greatest impact will come from the diversion of freight from highway to railroads, a much harder issue to analyze because of the limited data sources available and more complex decision processes involved.

Ultimately, the ability to create new service products with varying levels of quality and price and to enter contractual agreements with service penalties is where recent rail industry consolidations will create the greatest value. For freight moving between eastern and western regions of the United States, transcontinental consolidations can greatly reduce the number of interchanges and terminal handlings.

However, traffic moving between east and west represents only about 6% of existing rail traffic. It is also a small portion of the overall national freight transport market. By pursuing transcontinental consolidations, railroads could increase market share and lower the cost of providing such transport and in so doing, enlarge the overall market for inter-regional traffic flows.

A transcontinental consolidation coupled with greater access to more local markets in the east and west could generate significant benefits in lower costs, improved service reliability, and increased competition. The pending CSX-NS acquisition of Conrail is an example of a consolidation with greater access to local markets owing to the common service areas in large markets in New York, New Jersey, Detroit and eastern coal-fields. Despite the consolidation, shippers will have more choice and two mega-carriers will face head-to-head competition in markets now served by only one carrier.

Railroads have shown that they can design an operating plan that reduces the number of times freight cars must enter terminals for classification and switching, further enhancing the opportunity to improve service reliability²⁶. As Robert Krebs has observed:

The Railroad industry has an opportunity of a lifetime to bring freight off the highways and back to rail. But, we have to have truck-like service and be 95% on-time, and we can't do that by trying to string together a number of different assembly lines ... there is nothing that is a substitute for one philosophy of management, one agenda, one operating plan and a single implementation effort.²⁷

Transcontinental consolidations can significantly change how railroads design and deliver transportation services, eliminating interchanges, bypassing congested terminals, reducing terminal handlings and enhanced opportunities for dedicated trains. Transcontinental consolidations can transform the industry yet again; with the scale to create a new service-responsive, time-critical, customized transportation service.

²⁶ Improved operating plans and with reduced car handlings are a part of every merger. Conversations with many railroaders and consultants involved in developing such operating plans indicate that the reduction in handlings can be as much as 40%. Average handlings-per-freight-car were reduced from more than 6 to about 3 during the consolidation of railroads forming Conrail (as reported in the Final System Plan).

²⁷ Daniel Machalaba, "Railroads Merging to Give Trucks a Run for the Money," *Wall Street Journal*, August 11, 1994.

IV CONSOLIDATION CONCERNS AND ISSUES

This chapter reviews the major forces acting against further consolidations in the industry. Those forces include the concerns of major shippers and government officials about the effect of further consolidation in the industry on transport competition. Those concerns primarily involve reduction in competition and are most actively expressed by large “captive” shippers who have little alternatives to rail transport. However, many shippers raised the issue of whether mega-railroads were too big to manage. These concerns proved prescient as first the BNSF and then the UP were hobbled by serious management problems. Other rail industry constituents are concerned that mega-carriers could be too big to fail and could hold the economy captive to inefficiency or abuse. Some industry observers think that mega-carriers could be unmanageable. Forces countering further consolidation are much stronger now that two major consolidations in the west have both resulted in significant service failures, at least initially. Forces against further consolidation are compelling, at least in the near term (next five years).

4.1 CONCERNS ABOUT COMPETITION AND INDUSTRY CONCENTRATION

Many observers are concerned that rail industry consolidations are significantly reducing competition. They fear that reduced competition will give remaining rail carriers too much market power. Many rail customers believe that this power will inevitably be abused and that it is they who will be abused.

These fears have prompted railroads to make special efforts to ameliorate reductions in competitive rail service in recent consolidations. These efforts include extensive trackage rights agreements, and special agreements with shippers and connecting railroads on joint rates and access rights and charges. Many shippers believe that such commercially negotiated provisions may not be sufficient. During consolidation approval proceedings, shippers often file supplemental claims with regulatory agencies²⁸ to protect service options and ensure continuing rights to connect to multiple carriers. The STB has responded to some shipper concerns by requiring one railroad to allow a competing railroad to operate over its network to reach certain rail customers.

The North American rail network is subject to commercially negotiated access rights and to access rights directed by regulators. Recently, many shippers have begun to urge legislative

²⁸ Shippers have had standing before the Interstate Commerce Committee and have used this forum to attach special conditions on railroad consolidations to protect their rights and service options. The ICC was replaced in 1995 with the Surface Transportation Board, a regulatory oversight body with somewhat less sweeping powers than the original ICC. Shippers commonly participate in consolidation proceedings before the STB. The STB, however, can impose conditions only when it finds a reduction in competition, *not* when an increase in industry concentration has less precise effects.

bodies to strengthen regulations concerning rail competition and concentration and to open access to privately owned rail networks and facilities to more parties. Both industry negotiated agreements protecting competitive access, STB imposed conditions and shipping industry actions against major consolidations have increased the cost of consolidation.

The STB, and before it, the ICC, have imposed labor protection conditions on major industry consolidations. The cost of protecting existing employees can significantly increase the cost of consolidations. Major industry consolidations are difficult to manage. UP's recent difficulties in consolidating the SP into its operations are a rather extreme example of these difficulties.

All these factors could have a significant impact on further consolidation in the industry.

4.2 INCREASING COST OF CONSOLIDATION

While consolidation could continue if there is sufficient financial incentive for it to occur, financial incentives have been reduced from earlier expectations. UP's consolidation problems have increased the apparent cost of additional mergers (and reduced the anticipated benefits, at least in the short term). Those increased costs are composed of two parts. One is the real cost associated with merging major business enterprises. The second is the cost associated with satisfying government and shipper objections and the potential for increasing regulation. These costs are often seen as reductions in the benefits that can be generated in a consolidation.

4.2.1 *Cost of Merging*

The costs associated with merging major businesses are substantial and the rail industry is not unique in experiencing problems in completing a major consolidation. In 1995, Copeland, Koller and Murrin studied 97 major acquisitions through the 1980s and found that the great majority destroyed value for the buyer.²⁹ Many studies have shown that acquisitions are easy to arrange but hard to make work. Recent work by Mercer Management Consulting shows that success is often determined after the deal has been completed.³⁰

The ability to manage post-merger integration may be the core competency of successful acquirers. In many cases, the principal difficulties are in combining corporate cultures and in quickly making the transition to consolidated operations. Financial institutions and stockholders who would otherwise be wary of major consolidations may look more favorably on rail industry consolidations if such skills can be demonstrated. Mergers within

²⁹ Tom Copeland, Tim Kroller and Jack Murrin, *Valuation*, (New York, Columbia University Press, 1993)

³⁰ Kenneth Smith and James A Quella, "Growth Through Acquisition: The Keys to Capturing Value After the Deal," *Mercer Management Journal*, 1st Quarter, 1995. Smith and Quella point out that more than half of the major acquisitions of the 1980s were economic failures, costing shareholders more than they were worth. Mergers within the same industry had the greatest success rate.

an industry are more successful than out-of-industry combinations and the rail industry has had, until recently, a good history of successful combinations.

However, many industry observers believe that railroads are more difficult to manage than other businesses, owing to their geographic diversity, overall size and the difficulty inherent in optimizing a complex, capital-intensive, network business involved in shuttling multi-ton items around. Many of these observers believe that mega-railroads might just be too big to manage.³¹ When the ability of the industry to manage post-merger integration is brought into question, the value of the consolidation to stockholders and financial backers is reduced. It also worries shippers and government officials and tends to increase the cost of merger proceedings.

Merger difficulties tend to reduce the ultimate value of consolidations. Increased investment needs associated with traffic growth both increase the initial cost of consolidation and can reduce the ultimate economic benefits. A longer implementation time also reduces the present value of merger benefits. Earlier this year many expected substantial merger benefits to be lifting the stock value of both BNSF and UP. Now, the expectation is that major benefits will require more time. Industry executives expect it to take five years to realize all the benefits from current and proposed consolidations.³²

4.2.2 Current and Potential Future Regulatory Costs

Mounting a major consolidation in the rail industry is made more expensive by the relatively lengthy regulatory process involved.³³ The current process requires large legal and consulting expenses. Such expenses, which declined as the regulatory process was simplified after the Staggers Act, are climbing again as the size of the consolidations increase. The costs are now large enough to materially lower the earnings of consolidating railroads during the approval process.

In addition to the rising costs associated with the complexity of consolidation deal, the cost of achieving buy-in from shippers and competitors is increasing. As rail industry consolidations increase in size and complexity, they have required more attention to market competition issues.

Recent consolidations have involved increasingly extensive trackage rights concessions for competitors. Shippers are becoming more upset about the pace of rail industry consolidation and concentration and have been taking a more active role in opposing mergers. Ed Emmit,

³¹ Stock analysts, news reporters who cover the rail industry, and rail industry executives, made this observation. It may be an over-reaction to problems experienced in several recent mergers. But, current mega-railroads are proving surprisingly difficult to successfully optimize and improve. Rail management's have been successful in reducing costs, but significant improvements in service quality are more difficult to achieve.

³² This projection is from conversations with UP, NS, CSX and Conrail management.

³³ It should be noted that rail industry mergers are taking place with much greater speed than in the past, the process is still more lengthy than mergers or acquisitions in other industries. Given the involvement of government entities and an approval process that invites public comment, rail consolidations are also more subject to political pressures than most other consolidations.

President of the National Industrial Transportation League (NIT League), says that shippers...

...are getting more and more upset over [rail industry] mergers and acquisitions...the real problem is shippers feel helpless. Shippers feel their relationship with railroads is so unequal. They don't think anybody's listening.³⁴

The result has been formation of a number of groups like the Alliance for Rail Competition (ARC), a shipper group, to lobby for legislation to improve rail access to captive shippers. To the extent such groups are successful or mount a creditable threat for re-regulation of the industry, further consolidations may become very expensive and could be stopped in its tracks, whatever the economic merits. If railroads and shippers can reach compromise positions and enter into voluntary agreements that provide sufficient access, further consolidation could be encouraged.

4.2.3 Political Complications

Railroad consolidations necessarily affect some of the largest most capital-intensive industries in the economy. Those most affected are often themselves regulated (*e.g.*, utilities). Politics is easily injected into the railway consolidation process. Recent changes in the regulation of the rail industry have increased the potential for political influence on railway consolidations. The Surface Transportation Board, the agency primarily responsible for surface transportation industry oversight, must be periodically re-authorized by the US Congress.

The STB must be re-authorized in 1998. The service difficulties associated with the UP acquisition of SP have sharpened the focus on rail consolidations and STB re-authorization is likely to be affected by the debate on this issue. Should further industry consolidations occur simultaneously with a future STB re-authorization process, the consolidation case would likely become a much more political debate, rather than an economic one.

This reduces the probability of success and increases the probability for dramatic changes in rail industry regulation. Increasing politicization of the process also adds strength to the industrial groups seeking special exemptions and protection. The groups most likely to seek such protection and regulatory changes are economically and politically powerful.

Such considerations will have a significant impact on whether further consolidations will take place. A safe bet would be that rail industry executives would not bring a manor transcontinental consolidation case during the STB re-authorization process.³⁵

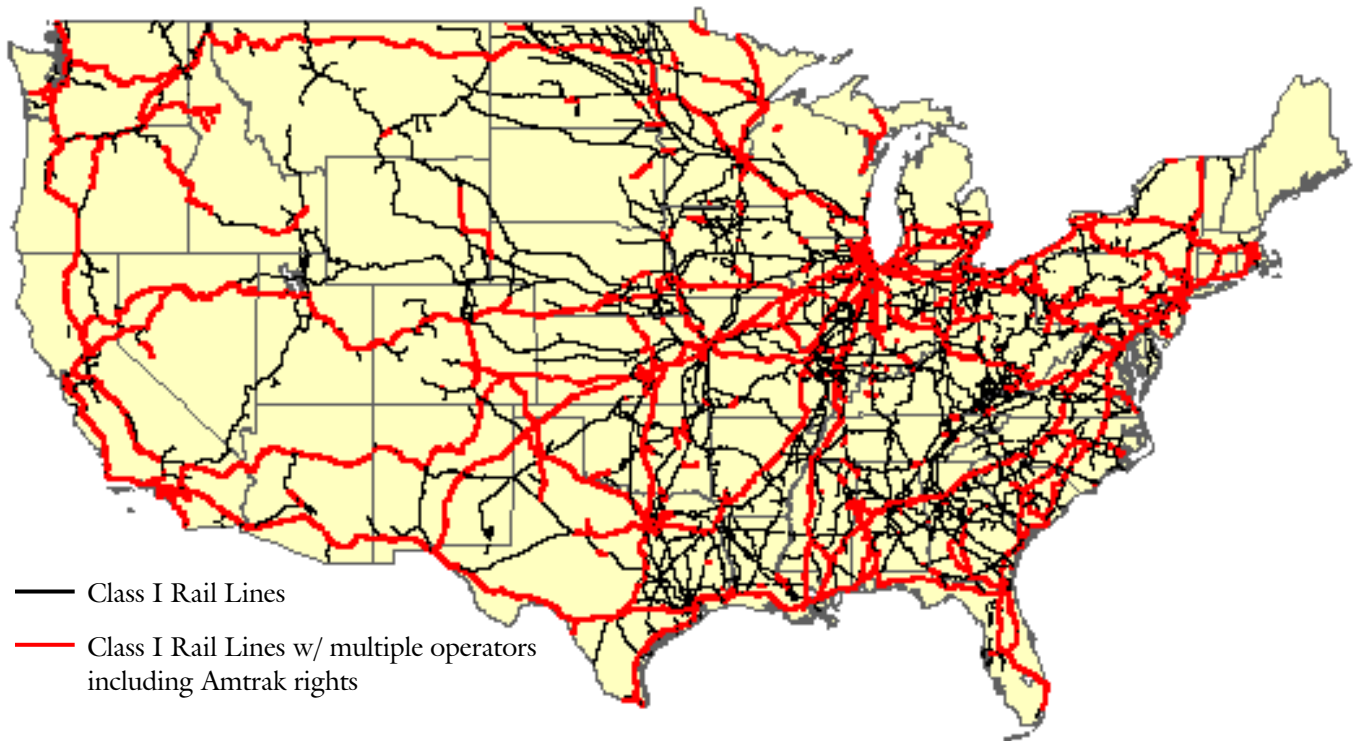
³⁴ As quoted in "Outlook '98", *Progressive Railroading*, December 1997 (p 18-20)

³⁵ While this observation seems only logical, the UP proceeded with its consolidation with the SP during the transition from the ICC to the STB, a particularly politically sensitive time. And CN has just proposed a merger with the IC, in the middle of the re-authorization process.

4.3 SHARED ACCESS SOLUTIONS

Consolidation has been compelling enough for each recent merger to include a significant amount of agreed access for competing carriers over the consolidated carrier. In fact, negotiated track access is a characteristic of the US rail system. The major Class I railroads operate more than 104,000 route-miles of network³⁶. Of this amount, some 37,000 route-miles (more than 35 percent of the Class I rail network) are accessible by more than one rail operator (including Amtrak), either through negotiated trackage rights, joint ownership, or where access has been compelled by the ICC or STB (see map below). If Amtrak access rights are excluded, Class I railroads share rail routes with other rail operators on more than 23,000 route-miles (about 22 percent of their network). Most of route-miles are shared under commercially negotiated agreements between railroads. That's a lot of access.

Class I Rail Lines with Multiple Operating Rights (including Amtrak Rights)³⁷



Major railroads have been willing to provide controlled competition over owned assets, if necessary to permit a merger with large financial benefits to proceed. The amount of access rights granted to competing carriers has increased dramatically in recent consolidations. This is because the carriers are larger and the need to address two-to-one rail-service-provider situations (where shippers who had the choice of two or more rail carriers before the consolidation will have only one afterwards) is greater. As the value to be realized from the

³⁶ This data from the FRA line segment database. It counts each Class I route-mile only once, though it may be operated by several railroads.

³⁷ Map prepared by FRA and includes rights granted and negotiated in the UP/SP consolidation. The first map includes Amtrak rights. Total Class I route miles from the FRA database is 105,000 miles, some 25,570 route miles have multiple operators.

consolidations has increased, railroads have offered competitors not only trackage-rights but also service and rate-making rights.

CSX and NS have developed a unique shared asset concept to overcome competitive concerns while allowing a consolidation to take place. Shared access to major US shipping areas³⁸ will increase competition while allowing each carrier access to new customers and increase the ability of each carrier to create competitive single-line service routes. While many competing rail carriers are not entirely happy with the arrangements, the shared access areas appear to have satisfied the majority of shippers and promise competitive services in many areas now served by only one major rail carrier. Similar arrangements could be made in other areas with competitive issues including the Texas-Gulf area, and Chicago.

Class I Rail Lines with Multiple Operating Rights (excluding Amtrak Rights)³⁹



Prompted by shipper lobbying groups such as the NIT League⁴⁰ and ARC⁴¹, the US Congress has been considering forms of re-regulation that would theoretically boost competition in an increasingly concentrated rail industry. The most prominent proposed solutions involve some form of mandated competitive access to private rail lines. Some proposals have called for “open access” wherein any qualified railroad could provide

³⁸ CSX and NS have agreed to jointly operate former Conrail service areas in New York City, New Jersey and Detroit. Both carriers will have equal access to shippers in these regions and local service will be operated by a jointly owned subsidiary.

³⁹ Map prepared by FRA and excludes lines where Amtrak is the sole other operator. Total multiple use route-miles are 17,245, about 15% of total Class I route miles.

⁴⁰ National Industrial Transportation League

⁴¹ Alliance for Rail Competition

transport services after paying a track access fee determined by the entity owning the infrastructure and regulated by the government.

4.3.1 Forms of Network Access

Some industry observers believe that increased access to the rail network would solve many competitive problems. North American railroads already operate in a regulated access regime. The STB can require that a network owner provide access to its network to serve a market under certain conditions. The STB has required, as a condition of consolidation, that a railroad provide access to a competitor to preserve competition for a particular shipper. Railroads have long provided each other access to their networks on a negotiated basis.

Railroads fear that increased access will allow competitors to “cherry pick,” their best or most profitable business while leaving the underlying network-owning railroad with low margin traffic. There is some concern that increased access may not enhance economic welfare of railroads or shippers but, rather, result in competition among customers to make someone else pay the fixed costs of the network. Such outcomes would decrease economic efficiency rather than increase it.⁴²

The issue is a difficult one for railroads since, like many other network businesses, they practice differential pricing for services over their network. Easy access to their most valuable customers would result in reduced margins and ultimately a smaller network. Differential pricing is an approximation of Ramsey pricing where the products and services are priced based upon the value to the purchaser rather than the marginal cost of production of the supplier. In the airline industry, this kind of pricing takes the form of yield management systems wherein the airline tries to fill as many seats as possible at whatever prices the marketplace is willing to pay. The result is a larger more robust network but very different prices for essentially the same services.

To understand differential pricing, consider the simple case of a train carrying goods for two customers. The train costs \$1,000 to run. One customer can afford to pay \$400 to have his freight hauled on the train, another can afford to pay \$700 for his. If the railroad prices the service at \$400, it will collect only \$800 and will not be able to run the train. If service is priced at \$700, only one customer will be able to afford the service and the train will not run. If the railroad can collect \$400 from one customer and \$700 from the other, the train will run and the railroad will make \$100. By pricing differentially, railroads can support more trains services and a larger network than would be possible if everyone paid the same price.

However, customers paying \$700 for the “same service” for which others are paying \$400 may feel they are being taken advantage of and seek relief from government authorities either through price caps or through encouraging increased competition for transport services. That increased competition in many cases would operate over railroad rights-of-way by providing competitors increased access to the rail network.

⁴² William B Tye, *The Transition to Deregulation: Developing Economic Standards for Public Policies* (Quorum Books, New York, 1991), p400.

Increased access can have a wide range of meanings. The most extreme form of access is probably where above-rail operations are separated from the track structure, called infrastructure separation. Many proponents of an “interstate” rail system promote this form of open network access, most often with government ownership of and responsibility for the infrastructure. Less extreme forms involve private ownership of infrastructure with open access, wherein any competing railroad, a shipper or other “licensed” operator can run over any rail segment to serve a customer.⁴³ Other forms of access involve more limited conditions, *i.e.*, the network owner would be required to allow other qualified rail-service-providers access to customers with only one rail-service-provider.⁴⁴

Many network based businesses are being deregulated and much of the deregulation process focuses on who owns and maintains the network and how access to the network is controlled. Each major network based business is evolving different forms of ownership and access arrangements. For example, deregulation of the electrical power industry is just beginning and the ultimate form and structure of the deregulated industry is still in question. The major issues in the electrical power industry involve access to the various elements of the electric-power network. It appears that the industry will be structured as power generators, power marketers, long-distance transmission line operators and local distributors. These entities may be combined in many ways (e.g., power marketers and local distribution, power generators and long-distance transmission operators, etc).

Ultimately, through network interconnections, access and network billing systems, power will be able to flow over the network from virtually any producer to virtually any consumer. It will be a number of years before the ultimate structure of the industry stabilizes again but a period of transition and change is anticipated. Price increases for the hardest to serve consumers and decreases for the largest consumers are anticipated. A reduction in industry margins is widely anticipated and the debate is raging over who will pay for sunk costs and what happens to “stranded costs.”⁴⁵

There are significant differences between the distribution of electrical energy and railroads. Energy can be distributed without regard to who gets which electron, allowing each segment of the supply chain to be optimized with little attention to developments and structures in other segments. Pricing can be similarly disaggregated, although many disputes about who pays for sunk costs have already arisen.

⁴³ Some would authorize a government entity to license “approved” operators much as the ICC approved trucking operators. Approval could require meeting safety and training standards, operation of “approved” equipment types and achieving financial standards.

⁴⁴ Some would limit access to alternative rail-service-providers within some radius of customer facilities, say 20 miles. Others would limit the definition of rail-service-provider to a network owning railroad.

⁴⁵ Stranded costs are the costs left in the network when prices are readjusted reflecting changed competitive environment and some parts of the network or system are not needed any more. In the power industry, stranded costs typically include the cost for the most inefficient generation sources which will be closed as deregulation proceeds. Many of these are nuclear power plants built in anticipation of lower production costs and rising demand for electricity.

Railroads, on the other hand, must pay attention to each “electron,” making sure it gets to its proper assigned destination. Integration of the supply chain is much more important and the ability to optimize the network, integrating many facilities, functions and services is much more critical to creating economic value in transport.

The issue of access to private rail networks is difficult to resolve since most industry analysts and participants understand the need for differentially pricing transport services but also understand the desire of customers to ensure that they are not paying too much. Each customer’s understanding of “too-much” will depend upon its understanding of the outcomes of various regulatory actions as well as its own economic situation. The ability of governments to establish regulatory mechanisms to make sure prices are “fair” is always in question. Most economists agree that the best way to provide fair pricing is to ensure competitive markets. Since railroads generally own and maintain their own infrastructure, the question of whether, when and how to provide access to that infrastructure to competitors or customers is most significant.

Governments and railroads in many countries have tried different approaches to managing railroad access, competition and pricing fairness issues. It is instructive to review these different approaches. In most countries, the railroad network and operator have been government enterprises. Solutions in these cases are likely to be considerably different than in North America where rail networks are and have been largely privately owned and privately financed. Lessons from other countries are summarized below.

4.3.2 Canadian Access Provisions

There are many forms of access regulation currently being tested in several parts of the world. According to the participants in it, one of the most successful forms of access regulation is that currently used in Canada. Canada has three different kinds of access regulation: imposed running rights, statutory inter-switching, and competitive line rates. The Canadian Transportation Agency can, under certain conditions, impose running rights⁴⁶ and prescribe the rate to be paid. While this provision of Canada’s transport regulations *has never been used*, shippers think it is a considerable deterrent to the exercise of monopoly power by railroads. Canadian Railroads don’t think the provision is likely to be used because of the onerous conditions required to bring a case before the CTA.

A second provision, covering bottleneck cases,⁴⁷ involves statutory inter-switching or reciprocal switching. Statutory reciprocal switching provides shippers access to other railroads whose interchanges are within approximately 19 miles of their facilities (30 kilometers). Rates for switching services are prescribed by CTA and currently range up to about C\$350/car. To preserve railroad incentives to invest in new facilities, terminals such as bulk-transfer operations, auto-ramps and other specialized facilities are exempt from this act.

⁴⁶ Running rights are trackage rights or the right for one railway to operate over the lines of another.

⁴⁷ Bottleneck cases occur where a customer can be accessed only from one railroad, the bottleneck railroad.

Finally, the third form of competitive access is a provision known as Competitive Line Rates (or CLRs). A shipper deemed to be captive to one railway at origin or destination can ask the CTA to require the monopoly railway to short-haul the traffic between his facilities and the nearest competitive interchange. The agency also prescribes the rate charged for the access. Since 1987 only three shippers have applied for CLRs. The provision of competitive line rates are the most contentious part of Canada's competitive access provisions.

Canada's *National Transportation Act* was subjected to review by a special Commission in 1992. That Commission said of the competitive access provisions:

The provisions are a paradox. They offer intrusive regulatory devices in legislation indented to reduce regulatory burdens...Only three shippers have applied for CLRs since 1987, and no party appearing before us could demonstrate that the provisions had a clear economic effect. Yet many shippers said that CLRs were the most important feature of the Act...[and] while both railways called for changes to weaken these provisions, they too failed to prove that the provisions had significant economic effects.⁴⁸

One reason that CLRs are rarely invoked is that disputes in rates, access and other economic provisions must ultimately be handled by arbitration. Canada uses a form of "baseball arbitration" rules. Under these rules, each party comes to the arbitrator with his best offer and the arbitrator is limited to selecting one of those offered. This requires realism on the part of contending parties since the most realistic offer wins the arbitration (or the most unreasonable is rejected). Apparently, once forced to be reasonable, most parties settle before arbitration.

4.3.4 Railroad Access in The United Kingdom and Europe

The United Kingdom has radically restructured its former government-owned railway enterprise, British Rail. British Rail was a vertically integrated enterprise, providing its own equipment, engineering and design services, infrastructure and operations. Prices were regulated by government and the railroad was encouraged to cross-subsidize passenger and provincial services with high prices on freight traffic. Over time, BR lost most of its freight business to evolving highway transport, much as happened in the US in the 1950s and 1960s.⁴⁹

Reform started with the separation and privatization of equipment manufacturing, design services and ancillary functions. The UK government then proceeded to set-up an infrastructure company, initially government-owned, to build, renew and maintain the rail network. Rail operations were privatized in a series of 50-year franchises. In all, several hundred private operations were formed from corpus of British Rail. The infrastructure company was privatized in 1995 as RailTrack. The government established a regulatory oversight group as well as a franchise oversight group. As a part of the restructuring process, some common equipment was sold to equipment finance and rental companies (ROSCos).

⁴⁸ National Transportation Act Review Commission, *Competition in Transportation Policy and Legislation Review*. 1993, Volume 1, page 130

⁴⁹ For an interesting summary of the evolution of access in the UK, see: "The Story of the Life of George Stephenson, Railway Engineer" Samuel Smiles, London, John Murray, 1859. p141.

Most operating franchises are for passenger operations, three freight franchises were bought by a group backed by Wisconsin Central. Each franchise operator obtained an exclusive right to operate the purchased services for a 7 year period. Many services use the same portions of the network. The infrastructure company, RailTrack is responsible for managing the infrastructure, providing dispatching services and coordinating the operation of individual franchise operators.

In one sense, the infrastructure is open access since it is or was available to whomever won the right to provide services. In a larger sense, however, access is not open since each franchise operator owns the exclusive right to operate over the infrastructure to provide the services specified in its franchise agreement. Rail operators contracted with RailTrack for access, ROSCOs for equipment and receive safety and financial oversight from governmental agencies. So far, the process has involved an incredible amount of litigation, a bewildering array of contracts and agreements between numerous parties, and a large amount of consulting and engineering services for required certifications and start-up. Throughout the complex process, trains continued running, operating companies have sought and received financing for new equipment and the infrastructure is being maintained and expanded. However, government subsidy payments have not declined significantly, though they are projected to decline over the next few years.

It is too early to tell whether the process is effective in bringing freight traffic back to the rail network and reducing government subsidies. The UK, however, has a single rail freight operator.

At the same time, the European Union has been promulgating rules designed to bring competition to railway operations. Since Europe's railways are all state-owned, the challenge for the EU has been how to inject competition and outside finance into a complex, multi-country rail system. Europe's railways primarily provide passenger transport; railway transport of freight amounts to less than 10% of all freight transport. The structure of rail systems (country based, government-owned) and their physical differences has limited the amount of inter-line traffic carried between systems. The EU has required that all state-owned rail systems develop separate and independent accounting for infrastructure and dispatching services. So far, most countries have restructured their railways to form separate infrastructure and operating companies. Eventually, the hope is that European-wide rail service operators will begin to offer unsubsidized freight services over the network without regard to country boundaries. This will allow the operator to generate freight services with longer hauls and allow them to compete with highway transport. One such company has been established, NDX, a consortium of the German Federal Railway (DB), the Dutch national railway (NS) and CSX. NDX offers limited container services on routes across the Dutch and German border and plans to offer service from Rotterdam to northern Italy in the near future. Each national rail carrier runs the trains, NDX markets services and operates terminal facilities. The infrastructure companies, still part of the national railway structures, approve schedules, dispatch trains and provide the rail network.

In related developments, Sweden separated the operating and infrastructure portions of its state-owned railway and developed an access regime in the late 1980s. Both operator and infrastructure company remain government-owned. Since reforms started, the infrastructure

company has increased investment four-fold. While infrastructure pricing is not based upon investment or cost recovery, infrastructure charges have increased considerably. The operating company has objected and a series of disputes has ensued. A few local communities have established rail service operators to operate commuter services but no other large scale operators have yet evolved to provide competitive rail services. The government plans to encourage private freight operations in the future.

Restructuring in Europe is in its infancy and it is not possible at this date to estimate how well the European definition of “open access” will work. EU rules will eventually require that national rail-infrastructure companies provide access to approved rail operators from other countries. Currently, the only approved rail operators are other national railways. Each national infrastructure company will remain in control of safety standards and must approve the equipment operating on its infrastructure. Little is known yet about how infrastructure access will be priced. The task for the EU will be to put together a system which allows development of integrated rail services, a situation that was nearly impossible with state-owned railway enterprises.

4.3.5 Australian Access Regimes

Most of Australia’s railroads are owned by state-governments.⁵⁰ Reform and restructuring of these railways has been underway since the late 1980s. A recent federal law, the Competition Act, requires open access to essential government owned facilities (either state or federal ownership). State railways have begun to restructure themselves to permit such access. Farthest along is the State of New South Wales. The NSW government restructured the State Railway Authority and formed an infrastructure company (RailAccess Corp), an urban passenger company (CityRail), a provincial passenger operation (CountryLink), a rail freight company (Freight Corp), and a maintenance services company (Rail Services Corp). Each remains state-owned. Only CityRail remains an integrated service provider, responsible for its own infrastructure investment, maintenance and for train dispatching as well as operations.

Several states and the federal government jointed together in 1992 to form National Rail Corporation (NRC), an entity developed to take over marketing and operation of all interstate freight services—mostly container movements. NRC operates its own trains and freight terminals and negotiates for track access with the various state railways. The government plans to privatize NRC over the next year or so.

Recently, the federal government sold its interest in Australian National Railway in a complex series of transactions. The mainline infrastructure remains in government hands. Operators pay access fees for the right to operate over former AN mainline track. A private operator now provides integrated rail services on Tasmania. Other state governments are in the process of restructuring their state railways. In each case, mainline infrastructure is likely

⁵⁰ Australia has several privately built railroads serving mineral deposits. Other railroads are owned and operated by individual states. Australian National Railway was an exception. AN, formerly a state rail system, was taken over by the Federal Government in the 1970s. AN operated as a Federal railway until 1997 when it was privatized. AN’s mainline infrastructure is still owned and operated by the federal government.

to remain in state hands. Private operators will provide services over that infrastructure and may own light-density lines.

So far the fears of the “cherry pickers” have been borne out in Australian rail markets. The only independent rail operations compete with National Rail Corporation in providing across-Australia freight services, the only profitable market open to competition until recently. One of those operators is TNT, formerly the largest interstate freight customers of the railways. TNT operates its own terminals in each key city and contracts for the operation of its trains from the individual state railways.⁵¹ Other lucrative freight markets, primarily coal transport, concentrated in specific geographic areas, are not yet open to competition since this was the traffic that cross-subsidized all other rail services.

Experience in Australia is instructive in many ways. Rail Access Corp in NSW is the most advanced infrastructure operator. It has pursued a value-pricing strategy that effectively extracts most rail service profits, leaving operators with little remaining margin. As a result, the few existing operators (in particular, government-owned NRC) have brought suit (in an arbitration process) to reduce their access fees and have been largely successful. However, the protracted access negotiation process, high access fees and difficult licensing rules have effectively kept out all operators.

Most energy in the Australian rail industry has gone into the restructuring process and legal wrangling between existing state-owned rail entities, little has gone into developing new freight markets. Rail share of intercity freight traffic continues to decline in Australia. There is hope that with the privatization process now underway (completed in South Australia, about to start in Victoria, planned for National Rail Corporation), focus will begin to shift to shippers. If so, railways may begin to recapture market share from highway transport operators in Australia. The largest rail “cherries,” coal markets in NSW and Queensland, will soon be subject to competitive services. One expectation is that once private operators begin to compete for coal transport, many portions of the Australian rail network will be closed unless state subsidies increase. This is because freight railroads in Australia have used differential pricing to maintain a large network. Government’s encouraged railroads to subsidize service on light density branch lines by high prices for coal transport. Once competition begins in coal transport, margins will be reduced and railroads will not be able to afford to keep loss-making light density lines.

4.4 TOO BIG TO FAIL ?

A free-market economy is constantly renewing itself. Competition forces companies to devote resources, both intellectual and financial, to survival. Some companies don’t and cannot compete. Or, they make a strategic mistake, invest in the wrong technology, or promote the wrong executives, pursue the wrong strategy or price improperly. Companies that make too many strategic mistakes or don’t keep up with the evolving market place are driven out of business. The names of the companies driven out of business are legion, in fact, they are more prevalent than those who have been consistently successful over decades.

⁵¹ Until recently, only state railways were authorized to run trains on state infrastructure.

Many large and successful companies have made mistakes that nearly cost them their existence (US Steel, IBM, Apple, General Motors).

Sometimes companies are considered too big to fail. In such cases, governments have a long history of stepping in to save them. Chrysler, Lockheed and Penn Central come to mind in the United States. These were companies whose failure would cause (or was thought to cause) irreparable harm to the economy. UP's service failures over the past few months have emphasized the importance of rail transport and point up the difficulty that could be inflicted by an ailing, mismanaged or simply unfortunate transcontinental mega-carrier.

Are existing mega-carriers or a new transcontinental mega-carrier too big to fail? The mega-railroads are certainly big. Currently they are financially healthy as well. The chart below summarizes the current financial status of the North American rail industry.⁵² Debt of CSX and NS already reflects financing for the acquisition of Conrail. The amount paid for Conrail, considered by some to be excessive, is not far out of line with what others have paid. (Conrail drew a price of about 9.7 times forward EBITD⁵³ while the western carriers paid about 7.2 time forward EBITD.) Existing mega-carriers are financially sound.⁵⁴

Financial Indicators of North American Railroads

	CSX	UP	BNSF	NS	WC	IC	CP	CN
Revenue	10,536	8,786	8,187	4,770	262	658	6,337	4,159
Net Income	855	904	889	770	50	136	605	124
Assets	19,528	28,666	20,981	17,509	878	1,949	11,374	na
Long Term Debt	6,443	8,185	5,146	7,460	261	573	2,259	na
Debt to Equity	1.18	0.96	0.78	1.41	0.74	0.93	0.44	na
D:E vs Industry	120%	98%	80%	144%	76%	95%	46%	na
Return on Equity	15%	10%	14%	13%	22%	23%	17%	na
ROE vs Industry	117%	73%	105%	101%	166%	178%	119%	na

Would financial failure of one of these railways cause irreparable harm to the economy? It depends upon how its assets were distributed in a bankruptcy, the powers of governmental institutions at the time of failure, and the speed with which they could be deployed. The STB has the authority to provide directed service. The bankruptcy courts have shown an ability to act promptly to ensure essential services. A railroad bankruptcy would not mean that the track would suddenly go up in smoke or disappear into strip-malls. On the contrary, railroad assets are among the longest-lived industrial assets in the current economy. So catastrophic failure is not likely. Disaster would probably be avoided.

Recently, after trying to kill Amtrak for a number of years, the Administration rushed to "save it" during a relatively simple labor conflict. Experience with the reorganization of Conrail 25 years ago shows that the process can take an excruciatingly long time, be expensive and politically difficult. Given the huge potential for politics to play a role, the financial costs likely to be involved and the importance of the industry to the economy,

⁵² All dollar figures in millions. Data is for 12/31/97.

⁵³ EBITDA is earnings before income taxes, depreciation and amortization

⁵⁴ The figures are consolidated for all units. CP and CSX, in particular, have extensive non-rail holdings.

some precautionary steps would be appropriate. Bankruptcy trustees currently have broad powers to operate failed rail properties while they are being reorganized. The process has worked well in the past and provides substantial protection to the public from an abrupt financial failure. This coupled with the STBs power to provide directed service provides adequate protection from sudden catastrophic failure. Legislation to provide special rules for the governance of critical industries might be appropriate. Such rules might prescribe the make-up of the board of directors (inside versus outside, selection process and minimum qualifications, etc.) and minimum financial structures for mega-carriers (much as the Federal Reserve determines bank reserve requirements).

Would greater regulation of access spur the growth of a more competitive industry where the issue of failure was not a significant concern? This requires that two other questions be answered. First, are transcontinental rail carriers a natural monopoly immune to market forces? Second, will state intervention or regulation create effective and beneficial competition?

It is hard to imagine rail systems as monopolies these days—they have only 13% of transportation market revenues. It is, however, possible to define some shippers who could be placed at a competitive disadvantage by a new series of rail consolidations. Transcontinental consolidations, essentially end-to-end mergers, are unlikely to substantially change the competitive situation of many shippers. Some regulatory remedies may be necessary to protect such industries. Experience shows, however, that government regulation has been harmful in the past, and most transportation professionals and shippers in North America believe in limited regulation. The industry should have a wide degree of freedom to operate and price its services. Regulation might be limited to arbitration for dispute settlement.

Would government intervention in the rail markets create effective and beneficial competition? It is possible but evidence indicates that state intervention is cumbersome and tends to deaden competition rather than enhance it. However, anti-trust is a critical role of government and government intervention to prohibit anti-competitive mergers and takeovers has a long history. Government intervention to regulate access on a broad scale (as in open access) could be harmful. No country has yet successfully implemented broad-scale open access to railway lines. Commercially driven, competitive, lightly regulated transcontinental railroads would seem to be less risky than broad-scale, government regulated open access. More limited access provisions, similar to those in Canada, may enhance competition and political acceptability.

V FUTURE STRUCTURES

This chapter summarizes the status of forces driving industry structure. Next, likely structural scenarios are considered. The most prominent include: No Further Consolidation; NAFTA Consolidation; Two Transcontinental Railroads; Intermediate Consolidations; New Business Structures. The largest structural change in the industry would be the consolidation of the two railroads in the east with those in the west to form two competing transcontinental systems. The natural forces acting on such a consolidation are fairly balanced between those for and against. The financial incentives for further consolidation are strong — mostly from traffic growth. Several forces act against such a mega-consolidation — shipper opposition and the balance of traffic between the railroads. These factors, coupled with mild governmental opposition make a conventional consolidation of eastern and western railroads unlikely, at least in the short-term. Potential intermediate structural changes that might occur and unconventional forms of consolidation that may permit the formation of two major nationwide rail carriers are discussed.

5.1 A BALANCE OF FORCES

The financial performance of the rail industry has improved substantially as a result of the consolidations that have occurred in the past. The industry has the opportunity to continue to generate significant revenue and margin growth by increasing its share of the surface freight transportation market. To do so will require substantial improvements in service quality and the introduction of new transportation service products. Further consolidation of the industry could propel these improvements in service quality. The evidence suggests that service quality improvements could be substantial. Evidence also suggests that further consolidation will result in significant improvements in the utilization of rollingstock and fixed assets and contribute to further (though probably modest) reductions in operating costs. Rail prices could continue to decline over the long-term. The table below summarizes the major drivers acting to propel or delay consolidation.⁵⁵

Forces Favoring Consolidation		Forces Against Consolidation	
Economic:		Economic:	
Cost reductions	5	Cost of consolidation	3
Revenue growth	5	Capital requirements	2
Asset utilization	4	Operating cost control	2
Service Quality	5	Negotiated Access	4
Single-Line Service	5	Shipper Opposition	5
Market Share Growth	5	Interchange Balance	2
Operating Control	4	Management Complexity	4
Private Network, low access	4	Potential for new Regulation	
Simplify business processes	5	Competitive access	4
Bragging rights	4	Forced access	5
		Price oversight	4

The relative equivalence of interchanges between major eastern and western carriers indicates that there is not a compelling competitive reason for consolidation. The likely

⁵⁵ Scored on a 1-5 scale, authors judgement of the strength of the forces, 5 is strong, 1 weak. Green is pro-consolidation; red, anti-consolidation; yellow, could have positive or negative impacts.

opposition of shippers could drive increased government intervention and re-regulation. The potential harm government intervention could cause is likely to give railroads pause in their desire to consolidate.

The uncertainty associated with the form and substance of any new regulatory legislation certainly dampens enthusiasm for further consolidation. There is a lot of concern about whether larger railroads can be managed properly. This concern is likely to delay further consolidation, though not rule it out. There is an expectation that the industry will get the current set of consolidations right and begin to reap expected benefits within the next few years.

Continuing change in the North American economy will keep pressure on railroad management to improve service, lower costs, and price competitively. The need to grow will also keep the pressure for additional consolidations. What might the consolidations look like and what are the pros and cons for different structural options?

5.2 NO FURTHER CONSOLIDATION

A compelling case can be made that no further consolidations will occur; that the balance of forces for and against the formation of mega-railroads in North America is too strongly against consolidation. Those forces are summarized in the tables on page 37. In addition to the increasingly difficult economic and management problems posed by the formation of mega-railroads, shipper opposition and that of public officials raises rail industry concerns about re-regulation.

5.2.1 *Re-Regulation*

Many groups have formed to prevent what they see as increased concentration in the industry. The most prominent of these include Consumers United for Rail Equity (CURE) and the Alliance for Rail Competition (ARC). CURE, a group with a large utility and coal industry membership, was formed several years ago to lobby for the reform of the Staggers Rail Act of 1980 to provide more protection to “captive shippers.”⁵⁶ ARC, formed in March 1997 is a group lobbying for open access and rail pricing restraint.⁵⁷ ARC’s membership includes businesses and trade associations involved in agriculture, manufacturing, petrochemicals, natural resource development and other bulk shippers. Both groups are large and well financed. They are concentrating on bringing the concerns of their members to the attention of the US Congress, the prospect of which concerns railroads greatly.⁵⁸

Absent further consolidations or major difficulties from existing ones, it would be difficult for ARC, CURE or others to make a serious case for re-regulation of the industry.

⁵⁶ Robert Ekelund, Jr and Robert F Hebert, “Railroad Reregulation: Is the C.U.R.E. worse than the Disease?” *Policy Analysis No 98*, (CATO Press, January 1988).

⁵⁷ Presentation by Michael F Morrone, “1997 Forecast of Legislative Initiatives on the Transportation Horizon” before the Council of Logistics Management’s Regional Roundtable (Bethesda, May 1997)

⁵⁸ Richard Davidson, president of UP, has noted that the CSX/NS/Conrail consolidation may be the catalyst that will activate shipper efforts for legislative railroad regulatory changes. These comments were made before UP’s own consolidation difficulties.

However, the difficulties both UP and BNSF have had in completing their operating consolidations have reinforced the arguments of ARC, CURE and others that rail industry mergers are bad for shippers and the public. UP's extreme service difficulties have raised shipper concerns and increased the visibility of the industry and revealed again the importance of the rail industry to the economy.

5.2.2 Other Complications

An important difficulty associated with a consolidation forming a transcontinental railroad is that it would almost necessarily require a responsive consolidation from other industry players. That is to say, it could not occur in isolation or alone. The first consolidation would require significant coordination between the participants and other railroads and major shippers, as has been the case in previous consolidations. That coordination would invariably involve a dialogue between major industry railroads about competitive issues and the participants would seek to negotiate access and rights issues that would satisfy railroad opponents. In a conventional consolidation, these arrangements carry significant economic costs since they tend to reduce the value of the consolidation and increase its costs. To the extent that such arrangements must also satisfy the concerns of major shippers, transaction costs could increase further.

The balance of interchange traffic between the major US railroads can also be an impediment to consolidation. The tables in Chapter 2 show that each of the major carriers in the east and west will have important interchanges with the others. The ability to offer unique "single-line" service benefits will be limited to customers who ship on the consolidating railroads, a decidedly small portion of all shippers, rail movements and even of all transport movements.⁵⁹

Freight activity in the United States is highly concentrated geographically. Two thirds of all freight shipments at the national level travel fewer than 100 miles. There is limited interstate movement of freight. A recent analysis of US freight traffic movements by DRI/McGraw Hill reveals that most interstate freight traffic moves between contiguous states. An analysis of the largest interstate movements shows that only two of the largest interstate movements involve traffic between non-neighboring states (Wyoming-to-Texas coal shipments and Illinois-to-Louisiana food-products shipments). The local nature of the vast bulk of the freight market is one of the reasons that many rail industry participants have rejected transcontinental consolidations in the past.⁶⁰

5.2.3 Implications: Likely Structure of the Industry

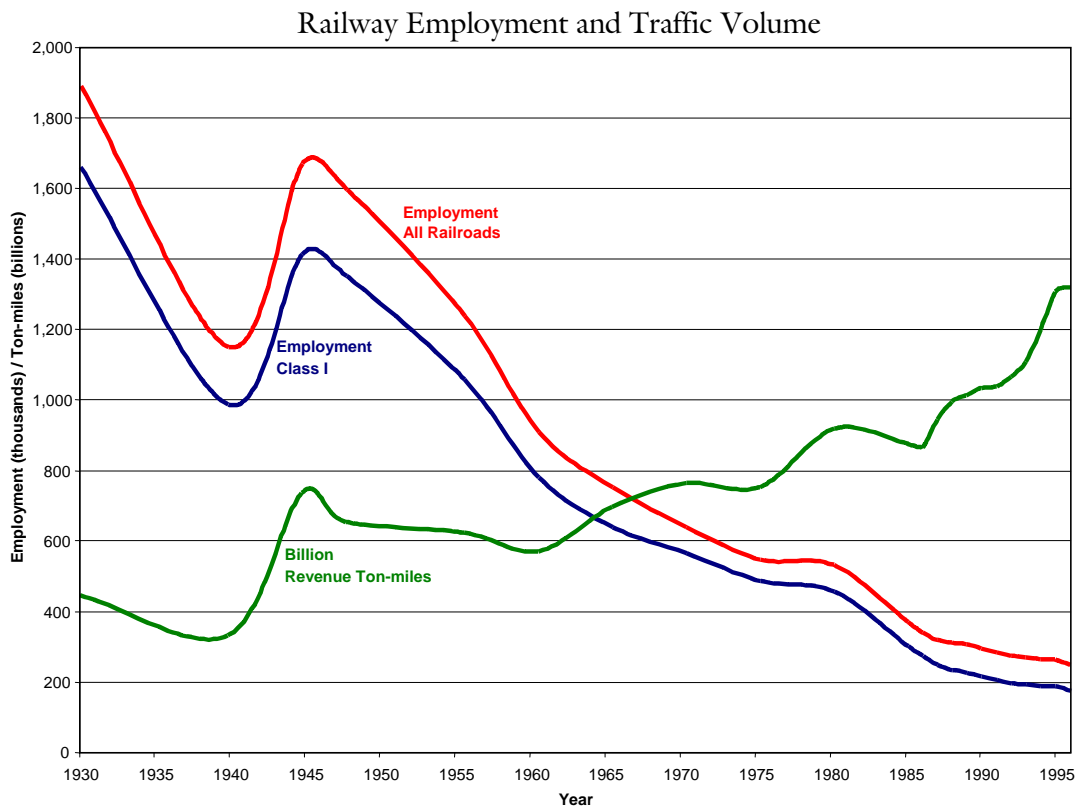
Given the pressures against consolidation, it is easy to argue that significant additional consolidation will not occur. What would the rail industry look like in an era when opportunity for consolidation ceases? It would look different.

It is clear that the massive productivity improvements the industry achieved over the past quarter century are not likely to continue at the same rate. Rail industry labor-productivity

⁵⁹ "Transportation Review: Supplement" a publication of the *Trade and Transportation Service* (DRI/McGraw-Hill, 1996)

⁶⁰ Private conversations with railroad executives involved in considering prior consolidations.

(measured by ton-miles) increased more than 300% during the period.⁶¹ As many industry observers are aware, the productivity improvements have not been easy to achieve. Rail industry employment was reduced from more than 1.6 million in 1920 to less than 260 million in 1995, an 85% decline (see chart below⁶²). Class I employment declined by nearly



seventy percent in the last quarter century (to less than 180,000 by 1996). It would be difficult for the industry to achieve a similar decline in employment over the next 25 years (industry employment would have to decline to less than 57,000 employees). Traffic volumes would have to increase by another 75%.

It is unlikely that competitive pressures on the industry will decrease. Utility deregulation is already making significant changes in the coal business and is likely to increase pressures on rail prices for coal transport. Trucking productivity is increasing and the industry will continue to pressure state and national legislators for increases in truck size and weight (recent rail service problems helping their argument). The North American economy continues to evolve into a service economy, with less GDP being spent on production requiring transport. It will be difficult for railroads to increase prices in this environment. For railroads to continue generating earnings growth, productivity must continue to increase and railroads must capture new traffic now moving on highways.

These pressures will cause a sea change in the structure of the rail industry. The consolidations now underway will propel continued cost reductions for several years. The

⁶¹ Ton-miles per employee went from 1.75 million in 1980 to more than 5.2 million in 1995.

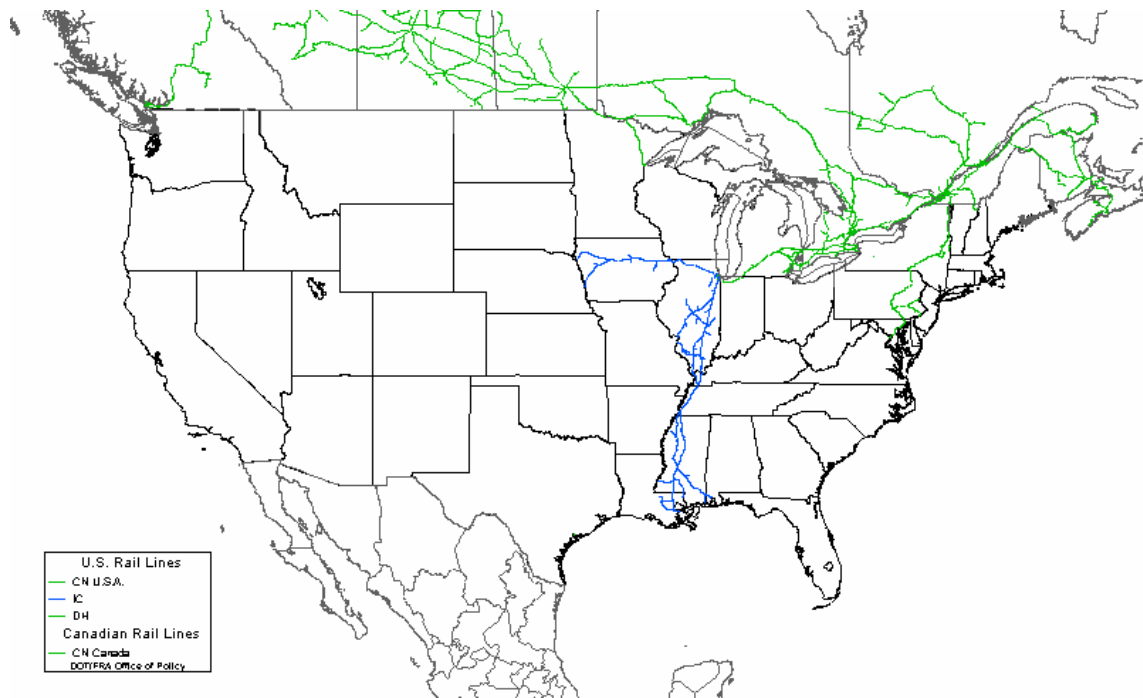
⁶² Railroad Facts, AAR

CSX/NS acquisition of Conrail will open new markets to rail transport.⁶³ After these benefits are assimilated, the industry must continue to restructure to generate earnings and the investment necessary to expand capacity. To do so, railroads must continue to work to reduce costs and improve asset utilization. Railroads will outsource more work, shed marginal trackage to lower cost shortlines and increase the use of right-of-way and other assets. Over time, the industry will slim further and work to maximize the use of assets. It will also have to create new higher-value transport services that compete with highway transport for quality and price. Improved service quality (higher speed, short more frequent trains) generally requires greater capacity. This could generate a new surge of capital investment and the application of new technologies.

Continuing competitive and financial pressures will increase forces for some new form of industry structure short of consolidation. Section 5.5 below discusses conditions in which unconventional transcontinental consolidation might emerge.

5.3 NAFTA CONSOLIDATIONS

The balance of interchanges and struggle for supremacy in the United States is driving North-South consolidations involving the smaller Class I carriers in the United States and Canada. The map below shows the proposed CN/IC combination.



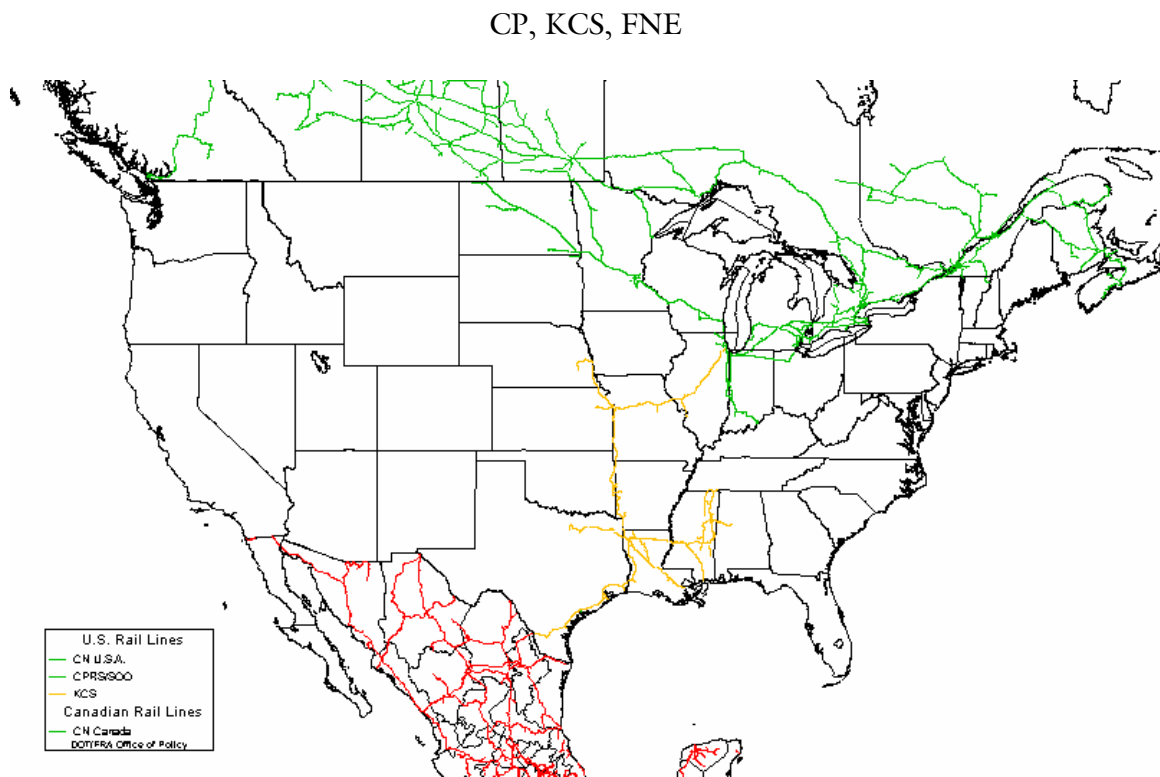
This consolidation will build a strong north-south mega-carrier which will compete with other mega-railroads for north-south business. By constructing a high capacity link between

⁶³ Rail pricing structures and revenue division rules have discouraged rail transport of goods from the major markets in the northeast (New York, New Jersey, Philadelphia) because Conrail and its predecessors received only a short-haul and small revenue division for movements to the south and southwest. Most freight moving in these corridors moves via truck.

Canada and the United States, this railroad could funnel traffic from throughout Canada to the mid-western part of the United States and eventually to Mexico. CN has built a number of alliances with intermediate carriers including Wisconsin Central, strengthening CN's access to Chicago, and with KCS and its Mexican partner, FNE. CN has entered into long term haulage and joint marketing agreements with these railroads that will build on a growing NAFTA market. Currently, there is relatively little rail traffic from Canada to Mexico but traffic builds at each end. Rail traffic between the US and Canada has been increasing, particularly intermodal traffic through Chicago. Rail traffic between the US and Mexico has been growing rapidly, particularly through the Laredo gateway. As the economies of these three North American countries become more integrated, traffic will continue to increase and this combination could bring more traffic to rail, benefiting all connecting carriers.

5.3.1 Complexities

The most likely consolidation involves the already announced Canadian National (CN), Illinois Central (IC) in a merger, and Kansas City Southern (KCS) and Wisconsin Central (WC) in long term haulage agreements.



An alternative consolidation could involve KCS, CP and FNE. It assumes that the combined carrier can coordinate KCS's 49% interest in the Texas Mexican Railroad (TM) and its 37% interest in Ferrocarril del Noreste (FNE). Interestingly, KCS's holding company, KCS Industries, has recently made the railroad a more attractive merger partner by separating its mutual fund and back office automation businesses from its rail business. Some have speculated that because UP dominates the Laredo interchange with FNE, it may be interested in acquiring KCS and, thereby, its interest in the FNE. A consolidation could give UP more control over FNE, perhaps at a lower cost than KCS itself paid.

Canadian and Mexican railroads are in the process of restructuring. The proposed marketing and haulage agreements between CN and KCS don't appear to rule out a consolidation with CP but the possibility seems more remote at the moment. More likely is a further consolidation of CN/IC and the KCS family of railways.

5.3.2 Potential Outcomes

North / South combinations between Canadian and smaller US railroads are not likely to bring opposition from shippers but could bring opposition from UP, whose interchange with FNE at Laredo is the largest US interchange with any of the Mexican railroads. UP would be looking for some concessions to improve its ability to operate through the Laredo gateway. Any consolidation that involves more than two carriers is difficult to carry out. For that reason, the KCS/CP consolidation, depending upon coordination of KCS's interests in FNE and TM, would be fairly difficult to complete. It is made more complex by the international nature of the transaction, requiring approval from multiple governments. To the extent that additional consolidations are required to tie the systems together (as with IC or the WC) the deal would be too complex to complete without complete agreement between key partners. As a result, this combination would likely be a negotiated exchange of stock between the participants and would be signaled in advance by the participants seeking review by governments and major stockholders.

5.3.3 Implications

It is hard to judge the value of a NAFTA consolidation. Railroad traffic, like politics, is mostly a local affair and the amount of international rail traffic is not great in the overall scheme of things. However, there is not an easy "single-line-service" rail route connecting Canada, the United States and Mexico. This creates a barrier to rail traffic similar to the short-haul, poor-divisions barrier that will benefit the CSX / NS / Conrail consolidation. Traffic that moves along the corridor now moves mostly by truck. Trade patterns have not developed partly because logistics costs have been too high.

Freight traffic to and from Mexico is growing rapidly; Canada is the United States largest trading partner; Mexico is the second largest. To the extent that a north / south merger facilitates international trade, and lowers logistics costs, a rail consolidation may affect the pattern of industrial development across the entire continent. Surely, it would drive development further into Mexico, rather than concentrating it along the borders as it is now. Surely, it will take traffic from the highway and may reduce the highway investment burden in the border region and deep into Mexico.

Given the uncertainties in economics, value, and competitive impacts, policy prescriptions are hard to determine. The opening of such a route would enhance competition and could enhance development all along the new international corridor.

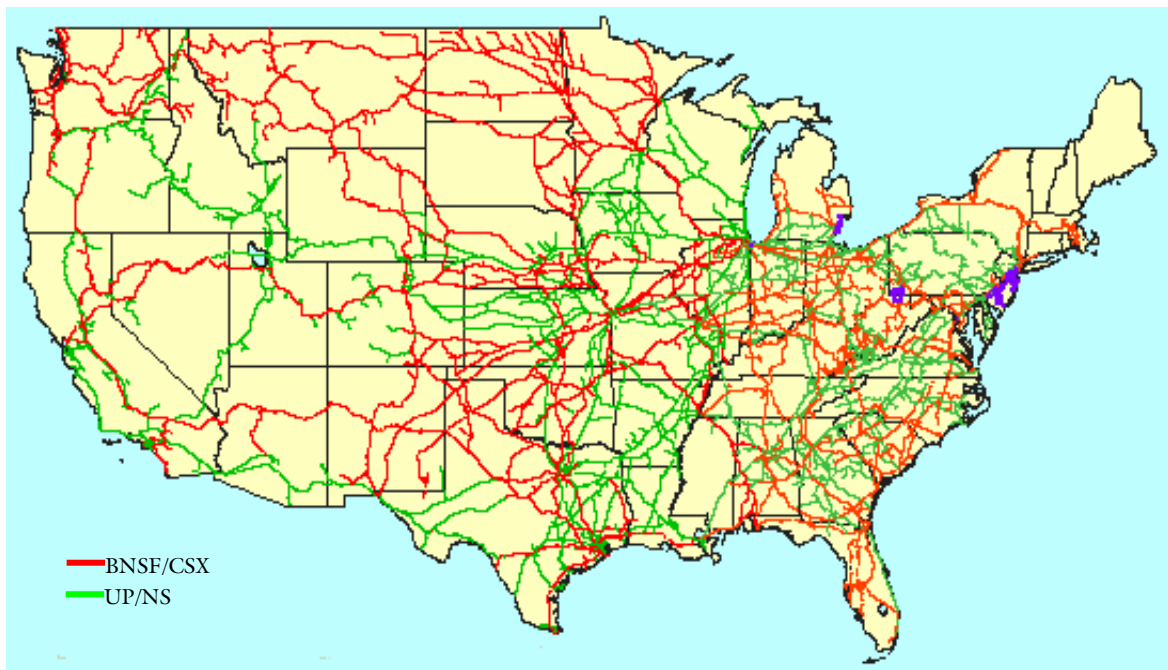
5.4 TRANSCONTINENTAL CONSOLIDATIONS

The most interesting consolidations and those that most would affect the structure of North American rail industry involve the formation of transcontinental railroads. The key players in these consolidations are the four soon to be mega-carriers: BNSF, UP, NS and CSX. The two maps below show the potential consolidations.

The most likely combinations, based upon interchange affinities as discussed in Chapter III, are BNSF with CSX⁶⁴ and NS with UP. However, the consolidation is likely to be driven by a wide combination of factors, beyond interchange affinities. These will include financial strength, shape of the deal, views of major shippers, the mix of corporate cultures, and, importantly, personality of the chairmen, chief executives and board members. NS has been considered the financially stronger of the eastern railroads and this will still be true after the Conrail acquisition. UP had been considered the financially stronger of the western railroads and the most politically astute though that image is now tarnished. That implies an NS / UP consolidation, if the strongest partners merge.

However, in a transcontinental consolidation with these relatively equal railroads, personalities, personal ambition, vision and the ability to sell that vision are likely to be more important than financial and interchange volume considerations. And, so is speed.

BNSF / CSX and NS / UP Systems



In large part, personality and vision will drive transcontinental consolidations between the four remaining mega-carriers. If this is so, then the vision of Robert Krebs, Chairman and CEO of BNSF will be a powerful driver of the first transcontinental consolidation.

⁶⁴ Listed in alphabetical order where possible.

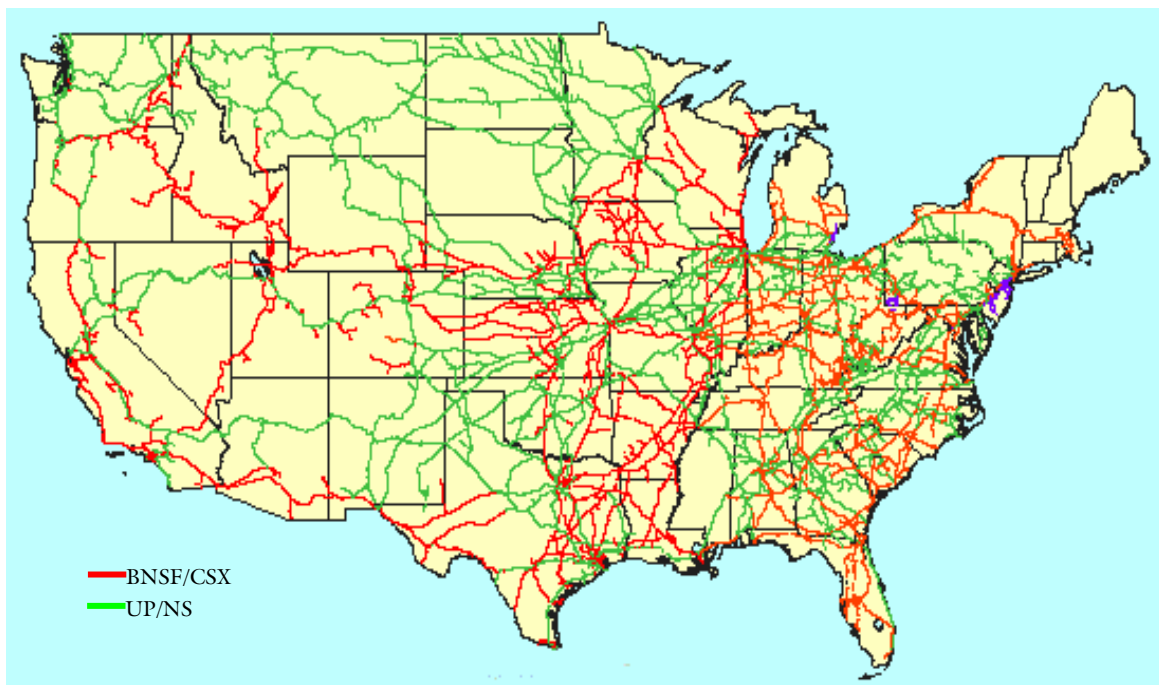
According to many in the industry, Krebs has the vision and the desire to run the first US transcontinental railroad.

Many speculate that he is mostly likely to move first to propose a transcontinental consolidation. If so, it is natural that BNSF would seek to consolidate with the financially strongest railroad in the east and with one whose culture and philosophy more closely aligned with its own. In this case, a BNSF / NS consolidation is in the most likely. Krebs is reported to have made preliminary overtures to NS prior to the Conrail acquisition.⁶⁵ CSX's consolidation with UP, a defensive move, would quickly follow a BNSF / NS consolidation.

5.4.1 Complications

A stumbling block for both consolidations will be succession issues. Railroads on this scale have powerful and determined senior executives. Failure to sort out succession issues has scuttled mergers in the past and will have an important influence on the shape of a transcontinental consolidation.⁶⁶ Do the leaders share the same vision? Can they find a way to cooperate in making a deal? Will they see the opportunities and the best compromises similarly? The complications experienced in recent consolidations have introduced some humility into what had been overconfident and contumelious executive suites. A deal may be possible.

BNSF / NS and CSX / UP Systems



A factor that complicates a transcontinental consolidation is that industry competitive pressures would almost require that two consolidations occur at the same time, or nearly so.

⁶⁵ Daniel Machalaba, "Railroads Merging to Give Trucks a Run for the Money," *The wall Street Journal*, August 11, 1994

⁶⁶ Management ego's and fights over whom would end up in charge have scuttled many rail mergers in the past (including early attempts at a ATSF / SP consolidation, a KCS / IC merger and, reportedly, an attempted CSX / SP consolidation).

But, given the pressures from shippers and legislators against increased concentration in the rail industry, it would be difficult to sell a set of mega-consolidations at the same time. The merging railroads will have to solve concentration issue by granting more extensive trackage and access rights to each other on a scale that would anticipate and satisfy most shipper or legislative objections to industry concentration. This is likely to be a relatively large-scale issue. Its solution could result in a significantly different rail industry structure.

Should the internally-generated competitive solutions be insufficient and players such as ARC and CURE be able to make a case for legislating additional access provisions, or in convincing the STB to impose such conditions, transcontinental deals will not be done. The prospect of increased regulation resulting in higher costs or lower revenue will terminate the transactions or even prevent them from rising at all. Prospects of added regulatory costs have terminated announced deals in other industries. For example, the recently proposed merger of Baltimore Gas & Electric and Potomac Electric was scuttled by the prospect of increased regulation and higher operating costs and governmental oversight.

The rail industry has shown that it can reach complex commercially based agreements that protect and enhance competition. BNSF was able to come to agreement with UP, other railroads and most shippers on how to solve competitive problems created by its formation. UP was able to satisfy most shippers and the STB with its arrangements with BNSF for access to shippers who would have fewer rail shipping choices available after its merger.⁶⁷ Similarly, though the results are not yet in, the creation of territory to be shared by NS and CSX has satisfied most that competition will be enhanced by this consolidation. While complex, the need to address competitive issues will not necessarily stop transcontinental consolidations.

It is likely that railroads would attempt to form transcontinental operations by privately negotiating access arrangements with a limited number of competitors. A consolidation could also involve line sales between parties to the agreements, competitors and to third parties who might be harmed. Shared areas could also be a significant element of a further consolidation. Chicago, Kansas City, LA, Powder River, and the Texas-Gulf Coast would make important shared areas.

Many industry observers point to the current difficulties in the UP consolidation and observe that mega-railroads may have become too larger to manage. While railroads are difficult to manage, there is little doubt among management specialists that transcontinental railroad management structures will evolve rapidly. Many organizations are larger than railroads; some of them operate worldwide with a mix of different languages and cultures. Airlines and package express services manage to have geographically diverse operations and can often produce high quality service.

It might be argued that existing railroad executives do not have the ability to manage mega-rail networks and that may well be. The job that must be done to build a new kind of rail service is much different than the management tasks of the past twenty-five years. In the past, railroads may have needed a “Chain-Saw-AI” type management for cost cutting and

⁶⁷ Although the STB did introduce some 35 additional conditions to increase competition, many of these were extensions of agreements already reached between BNSF and UP.

restructuring. In the future, they will need product designers, service quality specialists, marketers, and a raft of new skills, even in the operating department.⁶⁸ The new management tasks are not intrinsically impossible, however. Railroad boards-of-directors will have to take responsibility for the ability of senior management, just as in any industry. Evidence is that the boards of major railroad have, in the past, been too passive and should become much more active in their oversight role. The majority of major railroad board members are external, a change from the past. The increasing concentration of investment companies and pension funds among railroad stockholders indicates that they will be having a greater influence and producing more active boards with more intense oversight. This process should provide improved executive management, if required.

5.4.2 Value

The transcontinental railroads formed by the consolidations shown above would not create significant areas of competitive concern since they are, for the most part, end-to-end consolidations. Key cities (*e.g.*, Chicago, and Kansas City) could be treated as shared areas for the two remaining carriers. Operations in those areas could be consolidated to generate region-wide management structures that would improve the movement of rail traffic between all railroads and through the terminal area. Many railroads and shippers see that as a significant benefit of a transcontinental consolidation. The complex Chicago terminal operations area is the locus of one of the most persistent and difficult impediments to service improvement the industry has faced.

If there are to be transcontinental consolidations, they must create visible value for railroads, shippers and the public. Lower costs and improved efficiency can generate some of that value, but the end-to-end nature of these mergers will limit efficiency claims. The justification for transcontinental mergers will truly rest in service improvements and new service products that shippers want and for which public benefits are clearly defined. The CSX / NS / Conrail consolidation is expected to generate significant new traffic for the combined railroads. This is traffic that is taken from already congested highways in the east, not traffic from competing rail carriers. The fact that competition will be enhanced in most large markets helps limit competitive concerns and sell the merger.

Transcontinental consolidations must generate similar benefits. The merging railroads must create innovative new service products that can exist only as a result of a transcontinental consolidation. A new era of low-cost, fast, high-quality rail service must be the most important part of proposed transcontinental consolidations. The design of these kinds of new rail services will require time, effort and some experimentation to attract shippers and assuage critics. Because of the scale of the railroads involved in these consolidations, this would necessarily require a nationwide effort. Major national shippers will have to be attracted to the new services to be offered. Shippers most likely to be attracted include UPS, FedEx, and nationwide durable goods manufacturers and retailers such as General Electric and Sears, Roebuck, automobile manufacturers, and container shipping companies.

⁶⁸ Gerry Nichols, Carl Taylor and John Winner, "Can Railroad Operating Departments Provide Better Service" *Progressive Railroading*, August, 1996.

The most difficult group to convince will be utilities, chemical manufacturers, grain shippers and other “captive shippers.” For this, the consolidating carriers must address each major movement resulting in less competition (two-to-one points) and provide a competitive alternative for the shippers involved. With new entrants moving into the Powder River Basin and new competitive services offered in the Texas-Gulf coast area (as a result of the STB conditions in the UP/SP case), competitive accommodation arrangements should be possible.

5.4.3 Implications

A pair of transcontinental consolidations could generate significant new value if they went about creating services to capture traffic from highways. These new enterprises can affect the very structure and international competitiveness of the US economy.

5.5 ALTERNATIVE STRUCTURES

Transcontinental railroads can generate incredible new value for the US economy and for their shareholders. They are likely to be more efficient and could provide a new low cost, high quality transport service that has not yet been seen on the North American continent. The task of constructing such will be difficult and may require the evolution of new rail industry business structures if the dangers of monopoly railroads are to be avoided.

These dangers of a single country rail system can be seen in many countries. Europe’s railroads, while providing modern and sleek passenger services, provide almost insignificant freight services and cost their governments and taxpayers large amounts of money. The prior history of the United States reveals the dangers of over regulated railroads. Other forms are possible and have been evolving in other countries.

5.5.1 National Service Carriers

In Australia, either state or federal governments own the rail systems. About five years ago, several states and the federal government combined their interests to form National Rail Corporation (NRC). NRC provides interstate freight services across all rail systems in Australia. NRC owns terminals, rollingstock, information systems, and related facilities but no track. It employs its own on-board staff and management, takes care of rolling stock maintenance and all marketing and communications functions. It pays for track access and dispatching. It can participate in capacity improvement investments. National Rail Corporation is set to be privatized within the next 18 months, ending government ownership of the operation (though not of the track structure).

North America already has a few somewhat similar structures (*e.g.*, NS’s roadrailer-based Thoroughbred Service; CSX’s CSX Intermodal operations, and APL’s double-stack trains). Of course, Amtrak operates a specialized network of passenger services across many railroads, paying a trackage-rights fee and incentives for higher quality services. While an independent company could enter the business, it would take a great deal of negotiating and capital to start such a business. In addition, railroads have been sensitive to the loss of control of and contact with their customers through freight forwarders or other final service businesses. Rail carriers could join together to form provide specialized network

independent services companies. These companies could cater to customers with specialized high quality service needs such as automotive customers, specialized parcel services (*e.g.*, for UPS, FedEx and other services), and trucking companies. The danger in setting up such businesses is that railroads will invariably compete with them internally, perhaps using control over service and pricing to keep them weak. So far, nearly all such structures in the United States (all except Amtrak) have used railroad operating personnel, locomotives and facilities to provide these services. Under these conditions, it is difficult to develop a differentiated product and guaranteed level of service.

This structure could evolve if political forces promise to increase regulation or require greater access. Too much success would encourage railroads to operate competing services and it is unclear how profitable this kind of operation could become. NS and Conrail had developed a jointly owned RoadRailer service that operated over their combined network and was marketed and managed separately. NS retained total control of this company through the Conrail breakup and the company retains the right to operate over the entire Conrail / NS network. This company could provide a vehicle for increasing cooperation with one of the western carriers.

5.5.2 Infrastructure Companies

Governments in Europe have been working on the formation of a new kind of rail system, one where transport infrastructure is owned by one entity (or the government) and operated over by another (or many others). Many economists feel that this arrangement could offer railroads a level playing field with highway competitors. Of course, that would require that government own, maintain, improve and invest in rail lines (or at least provide the money for it through general tax revenues, as they do for highway design, construction and maintenance). Government ownership of railroad rights-of-way in North America is an unlikely outcome. In fact, privately financed toll roads are a new trend in highway construction in many parts of the world. They relieve the government of the need to raise and manage the capital necessary for basic transport infrastructure.

In the United Kingdom a separate, private, infrastructure company and many different operating companies have been established in the breakup of British Rail. The outcome is still evolving but some things have become apparent. One is that the arrangement requires an extensive set of contracts and contract oversight agreements between multiple parties (infrastructure provider, dispatching provider, locomotive provider, equipment provider, marketer and operator). The cost of providing these contracts and litigation associated with disputes arising from disagreements between parties is proving to be quite high. Some operators⁶⁹ complain that it is difficult to get capacity, speed capabilities, and dispatching investments needed to provide competitive services. The complex arrangements make it difficult to enter into final contracts with customers (because each must contain fault-finding language to determine who is at fault under what conditions and who is responsible for paying what penalties).

⁶⁹ Including Ed Burkhart, Chairman of Wisconsin Central, operator of three freight “franchises” in the UK.

A somewhat similar arrangement is being tried in Australia where a law requiring competitive access strategic infrastructure and facilities has encouraged most state railroads to set up an independent (government owned) infrastructure company. Operators who wish to provide services across several such infrastructures find that pricing is inconsistent between them and dispatching is not coordinated. While it is somewhat early to finally judge the outcome of these experiments, rail freight traffic is losing market share to highway transport. A similar experiment in Sweden where a government owned infrastructure company and independent government owned operating company have frequent disputes over investment requirements, safety standards and infrastructure quality. Infrastructure investment by the government has increased considerably, beyond what is required for operations, according to the operating company.

Some analysts have advocated that major railroads become infrastructure companies, granting other companies operating rights over their networks.⁷⁰ A form of “unbundling”, railroads could transform themselves into infrastructure companies without major legislation. Coupled with national specialized network operating companies, such moves could provide integrated North America wide transport services which could compete and cooperate with other transport modes to provide lowest cost logistics services to a wide variety of customers. Commercial agreements between independent companies are fundamentally different from government mandated infrastructure. It is possible that such unbundling could occur in North America but it would have to be driven by fundamental changes in legislation in each country. Such change would result in significant litigation before the differences between government, shippers and railroad owners could be worked out (similar to the legislation and subsequent litigation surrounding telecommunications markets).

A specific consideration the rail industry is that railroads have been designed as a whole system and separating the infrastructure from above rail operations distances infrastructure investment decisions from shippers and customers. Railroad infrastructure is designed and built with close attention to how operations will be conducted. So, distances between sidings, the length of passing sidings, signal block lengths and stopping distances are all closely related to how long trains will be and how many locomotives will be required. These are related to coupler and drawbar strength and the pulling power of locomotives. Type of rail is closely related to axle-loadings. Innovation in the industry has almost always related to integrated changes in operations and infrastructure. Longer-trains, larger cars, faster train speeds, clearances for double-stack movements all involve a delicate balance between above rail cost savings and below rail investment. To the extent that communications between infrastructure engineers and above-rail operations is disrupted or less effective, costs will rise and network economics suffer. Also, to the extent that differential pricing signals are distorted by an infrastructure company once-removed from customers, the ability to price to generate the greatest value will be muted or lost and the economics of the whole network will suffer.

⁷⁰ See for example, the remarks of William Rennie at the 1997 International Railroad Conference in San Diego.

5.5.3 Other Structural Options

Less drastic legislative changes could create new structural options in the United States. Canadian transport legislation contains a limited form of competitive access to protect shippers from abuse (the 30-kilometer rule, discussed previously, wherein a shipper can obtain a competitive rate for service to another carrier accessible within 30-kilometers from his existing facility). While this capability has rarely been invoked, shippers believe that the existence of the rule brings “contestability” into the market and the threat of competition, if not actual competition, keeps price and service offerings in line.

Finally, new technology could spur the development of new transport companies. While the Iron Highway experiment has not proven successful, NS has had some success with its RoadRailer™ service. A company could develop a network of terminals and offer such service nationwide, purchasing crews and other services from existing railroads.

VI CONCLUSIONS

This chapter concludes that further structural changes in North American Railroads are likely. Important economic and political forces are driving structural change. Some forms include regional consolidations with limited competitive impacts (potential consolidations include CN/IC, CP/KCS, or UP/KCS/FNE) that could proceed with some competitive access adjustments. Other forms of structural change are more likely. These include the formation of transcontinental carriers each with access to portions of the other's lines and the potential for the formation of national specialized carriers. Such structural changes could preserve competition and permit participants to provide expanded "single-line" service while limiting cherry-picking competition. Both of these latter structures is complex and will require evolution of legal structures, a maturation of management thinking and significant risk taking by very large organizations. These types of consolidations will require a great deal of time to take place.

6.1 TRANSCONTINENTAL CONSOLIDATION LIKELY

The economic forces favoring continuing consolidation in the industry are quite strong and are likely to become stronger over time. Trucking competition is strengthening and legislation relaxing existing size and weight limits on truck operations is likely in the future. The North American economy will continue its transformation away from production and towards services. Goods transport markets will continue to migrate towards higher service levels. This will put immense pressure on the rail industry to provide better-integrated, more reliable transport services to stay financially viable. The industry can continue to cut costs internally for some time but with less effectiveness than in the past since the easiest cuts have been made. Absent further consolidation, it is unlikely that the industry can continue to reduce costs at the same pace it has in the past.

Consolidations can continue to provide a basis for reducing costs. Importantly, consolidation can provide the basis for significant improvements in asset utilization not available within a competitive industry by other means. Transcontinental consolidations or wide scale integrated service providers offer the promise of transforming the industries service capabilities. If railroads are to continue to grow and provide new service products shippers want, a transcontinental consolidation is likely. The economic power of further consolidation will be compelling in the long run.

6.2 DIFFICULTIES AND CONSTRAINTS

Continuing consolidation in the rail industry will find many foes because it will increase rail industry concentration. Foes will also perceive anti-competitive impacts. However, transcontinental consolidations represent an almost pure form of end-to-end consolidation and will raise few traditional loss-of-competitive-service issues. They will increase

concentration in the industry significantly. Transcontinental consolidations will touch-off a political battle between railroads and other transport modes and major shippers. Some re-regulation of prices and services will likely result. Alternatively, and perhaps contemporaneously, the industry is likely to negotiate reciprocal access rights with other rail carriers to extensive portions of the rail network.

Given the nature of the industry after acquisition of Conrail by CSX and NS (resulting in two well matched railroads in the east, and two in the west), a single consolidation is not likely. Once a group pairs-off to consolidate, the other group will follow shortly thereafter. The need for two consolidations to proceed almost simultaneously will raise the political stakes and make the political struggle more complex and more difficult. Railroads appear to be able to conduct the kind of negotiations between themselves that will be required to allow such consolidations to occur. Solving the complex political, operating and market issues that simultaneous transcontinental consolidations will raise will be difficult and time consuming.

The smaller Class I railroads will object to transcontinental consolidations and can be expected to vigorously participate in the political debate. Negotiated access provisions may be able to satisfy their concerns. Some consolidations do not raise concentration concerns and can help build a more stable, financially healthy industry. A NAFTA merger is of this type. Examples include KCS/CN/FNE and CP/IC/FNE.

6.3 FUTURE STRUCTURES

All major North American railroads are currently digesting consolidations (US railroads) or trying to restructure operations after significant changes in national transport laws (Canada and Mexico). The difficulties associated with these tasks preclude a major transcontinental consolidation for some time. The degree of difficulty experienced in recent mergers suggests that a transcontinental consolidation will not occur within the next five years, probably not in the next decade. But, unless inter-network enterprises are formed, eventually, further consolidations are likely

Current doubts about the ability of existing rail industry management to put together and properly manage a transcontinental rail system coupled with shipper and governmental concerns about fairness and equity make a consolidation within the next few years unlikely. There is a significant possibility that continuing service difficulties on existing or upcoming industry consolidations will prompt legislation re-regulating the industry or providing some increased form of access to private rail networks by non-owning operators.

Once rail carriers have assimilated existing and planned consolidations, they will be under increasing economic pressure to build revenue, continue to cut costs and provide new service products. In fact, the greatest revenue source available for rail carriers is from capturing traffic now moving on highways and by providing new services not now offered in the marketplace. This will require substantial improvements in service reliability and the ability of the industry to offer differential services at different price points. This will prompt railroads to consider major consolidations again. The result will be the formation of two

major service carriers in the United States. Within North America, three major carriers are likely. Two would be formed from the four major railroads that will remain after the current round of consolidations; the third will either be a combined Canadian carrier or a NAFTA carrier involving one of the Canadian railroads.

If shipper and governmental pressure against such consolidations remains high, they will be accomplished by negotiating access arrangements between the major carriers to solve competitive issues but allowing the consolidations to take place.

The result will be a continuing fall in logistics costs, lower freight rates, a shift of traffic from highway to railway (perhaps spurred by US efforts to reduce CO₂ emissions) and a boom in investment on railway technology. Freight transport safety performance will achieve new records as traffic moves from highway to new reliable and safe rail networks. The process will just take time.