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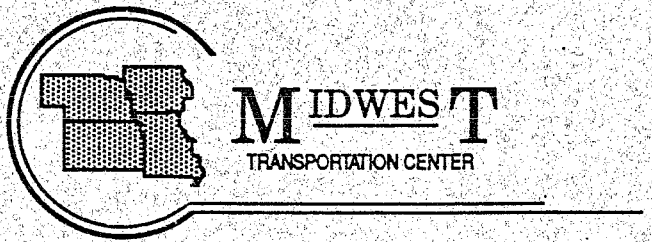
The Changing Role of Freight Transportation Modes and Intermodal Freight

October, 1990



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The Changing Role of Freight Transportation Modes and Intermodal Freight

Final Report
October, 1990

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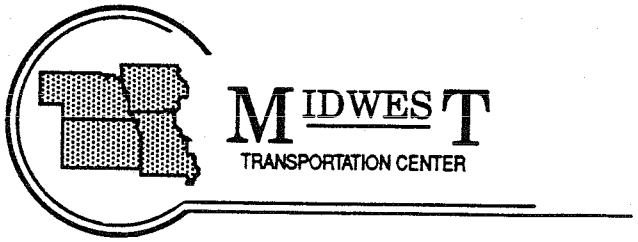

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Regulation and Operations, Iowa Department of Transportation; Virgil Umthun, President and Chief Executive Officer, Umthun Trucking Company.

Executive Summary

Introduction

Freight transportation industries in Federal Region VII (the region includes the states of Iowa, Kansas, Missouri, and Nebraska) are evolving as a result of a number of changes that have occurred during the 1980s, including regulatory policy changes and technological innovation. Significant changes in rail and trucking industry structures and methods of operations have been seen but not clearly documented for this region. For example, one result of regulatory reform, technological innovation, and the increasing role that exports and imports play in the U.S. economy, is the growth of intermodalism, particularly double stack service. In addition to promoting intermodalism, regulatory reform has cause both the motor carrier and railroad industries to become more competitive, which has resulted in greater innovation in service delivery and given shippers more freedom to develop new logistics strategies. The impact of changes of the 1980s on freight transportation services in Federal Region VII have not been well documented.

This is an interim report documenting the first year's findings of a two-year project. The project attempts to provide information that will assist regional authorities in making more effective transportation policy to enhance economic development in the region.

The first year deals with the collection of data to determine the changing transportation patterns and assesses the changes that have occurred in the rail and motor carrier industry in Region VII since the beginning of surface transportation regulatory reform in 1980. As a result, the first-year's effort is largely devoted to data collection, summarization, and reporting. The end of the first year was capped by a workshop attended by representatives of carriers, shippers, and governmental planning and regulatory agencies held on December 12, 1989 in Kansas City, Missouri.[1]

The second year will analyze the economic impact of possible transportation policy, public investment, and further institutional reforms. The second year will be capped by a workshop to be attended by representatives of transportation policy boards, members of state legislatures, federal decision-makers, and business leaders.

The Executive Summary's sections and organization parallels that of the full report. The report's first chapter is the introduction. The second chapter and the second section of the Executive Summary cover business and economic trends of the region. The regional economy is starting to revive from the recession of the early 1980s but has been slower to recover than the rest of the nation. The third section describes the federal regulatory reforms of the 1980s and the nature of state regulation and the reforms that have taken place in the states of Region VII. The fourth section deals with freight traffic patterns, both intra-regional and bridge traffic. The fourth and fifth sections describe the motor carrier and railroad industries in the region, summarize current conditions and changes, and discuss the findings of interviews conducted with the management of selected rail and motor carriers.

Midwest Business and Economic Trends

To develop a basis for understanding and identifying the implications of change in the region, a foundation is developed by examining business and economic trends. To understand business and economic trends, the performance of the region's economy was measured in four areas: population growth, economic product, employment growth, and income trends. The economic performance of the states in Region VII was found to be lagging behind that of the rest of the country.

Regional Population Trends

The region's population trends during the 1980s were similar to other parts of the country that have a larger than average proportion of non-urban based population. Roughly 60 percent of the region's population is located in urban places. Nationally, 74 percent of the population is located in urban places. Population densities in the four states vary from a low of 20.5 persons per square mile in Nebraska to 71.3 in Missouri. The population density for the nation averages 62.6 persons per square mile.

The region has a population base of about 12 million (1988) which accounts for nearly 5 percent of U.S. population. During the 1980s, the states of the region experienced two major population trends:

- **Population growth trends** Between 1980 and 1988 the nation's population increased by roughly 8 percent while the region's population increased at a rate of about 2.5

percent. Kansas and Missouri experienced a population growth of about half the national rate, Nebraska's growth was minimal, and Iowa experienced a net out-migration.

- **Population urbanization** Growth in the region occurred almost exclusively in urban areas. In Iowa, the only county experiencing marked growth was Polk, which includes the Des Moines metropolitan area. The three other states experienced growth in counties which contained metropolitan areas. Lightly populated counties on the fringes of Missouri's two largest metropolitan areas experienced the greatest growth rates as their population growth was leveraged by the spill over from historically urbanized counties.

Regional Economic Product

The importance to each state's economy of agriculture, manufacturing, and service industries tends to vary from state to state within the region. Of the four states, Nebraska's economy is most highly dependent on agriculture, which accounted for $3.6 billion of the gross state product in 1986. Manufacturing and services accounted for $3.5 billion and $6 billion, respectively. By contrast, in 1986 in Missouri manufacturing accounted for $17 billion and services accounted for $21 billion. Agriculture's contribution to the state product was only $2.3 billion. The economies of Iowa and Kansas are significantly less dependent on agriculture than Nebraska but they are not nearly as diversified as Missouri's. Changes in regional product have been affected by the following major trends:

- **Agricultural sector growth** In the nation as a whole, growth in agricultural economic product from year-to-year has tended to be quite volatile. For example, in 1981 agricultural product grew at a rate of 15.5 percent, while in 1983 it declined by 16.8 percent. The region's agricultural product growth rate has been nearly twice as volatile as the nation's. In 1981 the region's agricultural product grew by 39.6 percent and in 1983 it declined by 32.4 percent.

- **Manufacturing sector growth** The regional manufacturing sector has tended to reflect national growth rates. The year of greatest national growth in manufacturing during the 1980s, was 1984. In 1984 manufacturing's product rose by 12.2 percent and the region mirrored the national trend with a 12.3 percent increase. Of the region's manufacturing product, almost 40 percent is a result of manufacturing non-durable goods, which are predominately processed food products.

- **Service sector growth rates** The service sector (including financial services, insurance, and real estate) during the 1980s grew at a rate of 3 to 4 percent per year nationally while the region experienced growth that was slightly more sluggish at 2 to 3 percent per year.

Summary of Business and Economic Trends

The 1980s were a time of economic hardship for much of Region VII. For the most recent year examined (1988), however, the business picture for the states in the region appears to be improving.

Clearly the economy of the region could be further helped by diversification away from agriculture, farm machinery production, and food processing. The region would be better served by finding additional and more reliable sources of economic activity.

More value-added activities involving manufacturing would help the economy of the region to grow. Missouri, which has the most diversified economy, is expected to exceed the other three states in income and employment growth.

Federal and State Regulatory Change in the 1980s

The reforms to economic regulation of transportation services that took place in the late 1970s and 1980s were the most dramatic changes since the regulation of transportation services began. Although federal reforms were instituted broadly across most transportation industries, this document focuses on three federal legislative actions which affected the railroad and trucking industries: the Railroad Revitalization and Regulatory Reform Act of 1976 (4-R Act), the Motor Carrier Act of 1980 (MCA), and the Staggers Rail Act of 1980 (Staggers Act). At the state level, federal legislation has virtually preempted state regulation of the railroad industry. Although the authority of states to regulate motor carriers has not been eroded by federal legislation, states in the region have chosen varied approaches ranging from broad regulatory reforms to maintaining a traditional regulatory system.

Although the federal legislative actions are commonly referred to as acts deregulating transportation services, they, in fact, modified existing economic regulation and eliminated total regulation for only a few commodities or specific services. The regulatory institutions still exist. The involvement of government in the regulation of freight transportation services has been reduced, however.

Regional Employment Trends

Structural changes in the economy during the late 1970s and early 1980s have meant hardship for areas within the region that concentrate in agricultural production and farm machinery manufacturing. For example, during the period between 1978 and 1986, Iowa experienced a slight decline in employment and had the second lowest employment growth rate in the nation. Changes in employment in the region can be summarized by the following trends:

- **Employment growth rates** Although employment growth rates in the region may have been flat during the early 1980s, in the most recent year that data are available (1988), all states in the region saw at least modest growth in employment. Kansas and Iowa experienced just over 2 percent growth during 1988 and Nebraska and Missouri experienced just over 1 percent growth. Employment in manufacturing is experiencing modest growth while construction and mining are experiencing declines in employment.

- **Structural shifts in agribusiness related manufacturing** Declines in farm machinery manufacturing and other agribusiness-related manufacturing have been nearly off-set by increases in grain and meat processing and agricultural chemical manufacturing. The structure of agribusiness has changed but total employment levels have been nearly constant.

- **Small business employment** Just over one-third of the non-farm employment is in small business. Nationally, the rate is only 27 percent.

Regional Income Trends

The region has lagged slightly behind the nation in income increases. Annual income growth rate (in unadjusted dollars) averaged 5.5 percent per year for the region, and 6.5 percent per year for the nation between 1980 and 1988. Average income levels for the region were slightly lower than those for the nation. In 1988, the average per capita personal income in the U.S. was $16,489 per year and for the region it was $15,258 per year. Income per capita during 1988 varied between the states in the region by about $1,000 per year per person. Kansas had the highest per capita income and Iowa the lowest.

Income that is earned by manufacturing workers in the region has grown about 6 percent during 1988. Income earned in the manufacturing sector, as well as by agricultural workers, has experienced healthy increases during 1988 which are expected to continue in 1989.

trailers or containers was made exempt from regulation. The exemption of intermodal traffic was, in part, responsible for the expansion of intermodal traffic.

- **Rates and Rate Making** The Staggers Act built on the concepts of the 4-R Act, made it more difficult for the ICC to find a rate too low or high. For a rate to be too low, it must be found to be less than the variable costs of the service. To be found to be too high, the shipper must first prove market dominance of the rail carrier using ICC established criteria. Once dominance is shown, then the rate must be found to be unreasonably high. Very few rates have been found to be unreasonable.

  The Staggers Act permitted the use of contracts between shippers and carriers. Contract rates are confidential and the contract rate can only be challenged on the grounds that the contract unduly impairs the carriers ability to meet its common carrier obligation.

- **Service Regulation** The Staggers Act allowed carriers participating in joint-line movements to unilaterally increase rates if the carrier was earning less than 110 percent of the variable cost of the service. It also allowed carriers to cancel joint rates and through rates under certain conditions. The Staggers Act also relaxed regulation on reciprocal switching agreements and switching charges. The result has been to decrease the competition among railroads and the ability of the railroads to operate as a system.

- **Merger and acquisition** The 4-R Act contained substantial statutory changes regarding standards and procedures for merger approval. The Staggers Act provided primarily procedural reform. The ICC still retains control over the merger of rail carriers. Corresponding to the regulatory reform environment, many recent applications for mergers have been approved, with the significant exception of the Santa Fe and Southern Pacific Railroads' proposed merger.

  The ICC reversed its pre-1980 policy restricting mergers or acquisitions resulting in one carrier's ownership of a carrier operating a different mode of transportation. Although no reform legislation specifically addressed intermodal mergers and acquisitions, the ICC used the general regulatory reform provisions of the acts passed in 1980 (the Staggers Act and the MCA) to change its long-standing policy with respect to rail ownership of trucklines and bargelines.

Trucking Industry Regulatory Reform

The MCA of 1980 established a separate policy for motor carriers of property and a variety of goals for the trucking industry. The emphasis of these goals is on efficiency and competition. This differs from the Staggers Act which emphasized revenue adequacy. The major changes under the act are:

- **Entry** Prior to the MCA of 1980, to be authorized to provide a regulated service a carrier had to prove financial fitness, and public convenience and necessity. The MCA

There are many parallels between the federal reforms of the trucking industry and the railroad industry. There are three important differences, however, between the two industries with respect to the regulatory reform movement:

- The rail industry was more pervasively regulated before regulatory reform began.
- The rail industry supported the move toward deregulation while the trucking industry did not.
- The basic statutory changes for rail regulation resulted from two pieces of legislative -- the 4-R Act and the Staggers Act, -- with the latter being more important. Regulation reform for the trucking industry resulted from only one piece of legislation, the MCA of 1980.

Economic regulation of transportation services has traditionally covered four business activities: 1) carrier entry and exit, 2) the price (or rate) for services, 3) service quality or adequacy, and 4) merger and acquisition of the same mode carriers and of carriers of other transportation modes.

Rail Industry Regulatory Reform

The 4-R Act explicitly recognized the railroad industry's need for adequate revenues and that railroads do not have monopoly powers in many of the markets they serve. Despite the potential of the 4-R Act for meaningful reform, the legislation lacked the affirmative guidance for the implementation and interpretation of the Act by the Interstate Commerce Commission (ICC). As a result, the 4-R Act did not provide the reform sought by its developers.

The Staggers Act established a separate policy for the rail industry. The purpose of the act was to provide for the restoration, maintenance, and improvement of physical facilities and financial stability of the railroad system. Revenue adequacy for the rail system was clearly the act's primary goal. The primary regulatory reforms that resulted from the Staggers Act are:

- **Exemptions from regulation** Under the 4-R Act, the ICC could exempt from regulation traffic where the regulation served "no useful public purpose." In 1979, rail transportation of fresh fruits and vegetables was deregulated. The Staggers Act allowed the ICC to exempt from regulation traffic where regulation is "not necessary" to carry out the National Transportation Policy. In 1980, several additional agricultural commodities were named exempt from regulation and, in 1981, traffic carried in truck

of 1980 relaxed the requirement so that a carrier seeking authority must only prove that the service provides a useful public purpose, a much less demanding standard. An important procedural change is that the burden of proof now lies with the protesting carrier.

- **Rates and rate making** The MCA of 1980 provided common carriers greater freedom to set rates with ICC regulatory oversight by the zone of rate freedom concept. This concept stated that the ICC could not suspend, investigate, or revoke a rate on the basis that it was too high or too low if it was within plus or minus 10 percent of the existing rate. The ICC has used the rate provisions in the MCA of 1980 to approve about all proposed rate reductions and discount rates.

- **Service Regulation** The 1980 MCA eliminated gateway and circuitous route limitations that had existed since 1935. In particular, the provision compelled the ICC to broaden the categories of goods allowed to be transported by a particular carrier, remove restrictions that were against serving intermediate points, convert all one-way authorities to round-trip authorities, and to eliminate narrow territorial limitations and other restrictions wasteful of fuel, inefficient, or contrary to public interest.

State Regulation of Intrastate Freight Transportation

The role of the state in regulating intrastate rail shipments has been dramatically diminished. First, because most intrastate movements are short and trucking dominates the short haul market, states have a limited quantity of rail traffic within their jurisdiction. Secondly, the Staggers Act required that each state that intends to regulate intrastate rail traffic must submit to the ICC its standards and procedures. If the standards and procedures fail to be in accordance with those of the ICC, the state may not exercise jurisdiction over intrastate rates. In Region VII, Iowa, Kansas, and Missouri are certified under this requirement.

The role of the state in intrastate truck service regulation varies from state to state. Since 1980, six states have either totally or nearly deregulated intrastate trucking (none are in Region VII). None of the federal regulatory reform statutes, however, diminish the jurisdiction of the states in regulating truck service. Changes in truck service regulation in each of Region VII's states are summarized in the following:

- **Iowa** The Iowa Motor Carrier Division of the Iowa Department of Transportation has unique categories for the common carriers it regulates: motor carriers of freight, liquid carriers, and truck operators. To obtain authority to offer a specific service the carrier must show need for that service, proof of financial fitness, an insurance

certificate, and an inspection of safety fitness. The burden of proof of need has been shifted from the applicant to the protestor. Rate making is based on an estimate of the service's operating ratio. A rate may be increased only to a level that yields a 93.25 percent operating ratio.

- **Kansas** The Kansas State Corporation Commission considers only one carrier category, common carriers. In 1982, the requirement that an applicant for authority must prove the proposed transportation services promotes public convenience and necessity was dropped to only proving fitness. Kansas has dramatically relaxed rate regulation and allows tariffs to include shipper-named discounts based on a commodity, volume, or route if such rates are given to similarly situated users.

- **Missouri** The Missouri Department of Economic Development, Division of Transportation, regulates common carriers in two categories: 1) less-than-truckload general and specialized commodities, and bulk non-agricultural products, and 2) truckload general and specialized commodities, and bulk agricultural commodities. In 1986, the entry requirements were relaxed. Entry for the first category of carriers is based on fitness and an easier standard of useful public purpose, while protestors bear the burden of proof. Entry for the second category requires only a fitness test. A maximum level for rates is set for general commodity carriers and both minimum and maximum rates for bulk commodity carriers. Maximum rates for general commodities are based on a fully allocated cost approach. Variable costs are considered to set minimum rate levels for specialized and bulk commodities.

- **Nebraska** The Nebraska Public Service Commission regulates one category of carrier, common carriers of freight. Nebraska maintains traditional requirements for entry that the applicant must prove that it is fit, willing and able and the service will be required by present or future public convenience and necessity. The burden of proof, when an application is protested, rests on the applicant. Rate change applications are based on the ability to cover variable and fixed costs, the service's ability to operate at a profit, and the resulting operating ratio.

Since 1980, the states of Kansas and Missouri formally evaluated the need for continued economic regulation and reached different conclusions. Kansas has moved to reduce regulation in line with ICC changes, while Missouri adopted certain procompetitive features with the overall intention to continue regulation. Iowa and Nebraska have had few substantive statutory changes. Iowa, however, has modified its administrative rules and practices with a net effect of relaxing its regulatory stance, while Nebraska continues its historical and traditional approach to regulation.

- Farm products were the most frequent commodity shipped by rail and food and kindred products were second, with the total of both accounting for 71 percent of all tons shipped. This highlights the importance of food production and food processing to the region's economy. Iowa accounted for the largest proportion of farm products originated with 31 percent of the region's total and Nebraska and Kansas accounted for 28 percent and 26 percent, respectively. In Missouri, the most frequently shipped commodity was food and kindred products, with farm production being second.

- The traffic in each state, except Iowa, was predominately bridge traffic. Eighty-five percent of Nebraska's traffic, measured in tons, was bridge traffic in 1987, and in Missouri and Kansas it was 70 percent and 65 percent, respectively. In Iowa, only 45 percent of all traffic was bridge traffic.

Truck Traffic

Unlike rail traffic where the ICC produces a waybill sample to identify traffic volumes and commodities carried, there are no comparable statistics in the public domain for truck traffic. To obtain an indication of traffic trends, volume and classification counts (which identify the size class of the vehicle) were gathered from state departments of transportation. The counts are used to identify general traffic patterns.

Although the classification counts identify vehicle types, each of the state's vehicle categories vary. All four states, however, separate traffic counts between passenger vehicles and pickups, and trucks. Trucks traffic counts used to assess truck trends include single unit and larger trucks. Identifying any vehicle that is a single unit truck or larger as a truck, the following regional traffic patterns are identified:

- **Primary highways** The truck traffic volumes on 17 primary highways (non-interstate) with truck traffic volume in excess of 500 trucks per day were examined for the years 1980 and 1986 for all states except Missouri, where volumes for 1982 and 1985 were gathered. With only two exceptions, traffic volumes tended to increase very little or decline. Although most primary highways carried relatively minor truck traffic volumes in comparison to more heavily trafficked interstates, the trends indicate a concentration of activity onto major interstate facilities.

- **Interstate highways** Truck traffic volumes on each of the east-west and north-south through interstates were collected. The truck traffic data collection locations selected were distant from urban areas to obtain measures of traffic growth for intercity traffic and not traffic within an urban area. In all cases, the aggregate measures (averages) of truck traffic are greater for east-west interstates by almost 50 percent. Percentage

Freight Traffic Trends

The four-state region acts as a bridge for traffic between east and west, and to a much less extent, links the industrial Midwest with the Southwest. Three east-west interstate highways (I-80, I-70, and I-44) and two north-south interstates (I-35 and I-55) cross the region. All of the western transcontinental rail carriers have main lines across the region connecting with an eastern transcontinental carrier at the Chicago, St. Louis, or Kansas City gateways.

Rail Traffic Trends

Rail traffic trends were ascertained through the use of the ICC waybill sample. Confidential waybill computer tapes were obtained for 1980 and 1987. A comparison of the two years was used to extrapolate trends.

The waybill sample separates intermodal movements in trailers or containers from other rail car movements. The major trends in intermodal movements are:

- During the period from 1980 to 1987, intermodal loadings nationally increased by about 40 percent. Intermodal traffic, either originating or destined to the four-state region, however, increased by 138 percent, rising from 236,250 trailers and containers in 1980 to 562,858 trailers and containers in 1987.

- Although data on traffic through the region (bridge traffic) were unavailable for 1980, the region has clearly become an important bridge for east-west traffic. Roughly 25 percent of all intermodal traffic in the U.S. was bridge traffic through the four-state region. In addition, about 10 percent of all intermodal traffic had an origin or destination within the region.

- The growth in intermodal traffic has largely focused around larger urban areas that contain one or more Class I carriers' intermodal loading hub. The most urban state in the region, Missouri, in 1987 accounted for 58 percent of the total region's origins and destinations, Kansas, Nebraska and Iowa accounted for 30 percent, 6 percent, and 6 percent, respectively.

The rail car traffic in the region also increased during the period, but increases were not nearly as significant as those experienced by intermodal traffic. The major trends were:

- Rail car traffic, expressed in tons originated, decreased nationally by 8 percent during the period between 1980 and 1987. In the region total traffic originated grew by 23 percent. Farm product shipments grew by 25 percent which accounted for 57 percent of the increase.

change (growth) over the period (1980-1986), however, was almost exactly the same in both directions. Both directions, in aggregate, grew by almost 25 percent.

Trends for Motor Carriers and Motor Carrier Shippers

To better understand the motor carrier industry and industry trends, three studies were conducted:

- **Carrier financial performance** A study of changes in the financial performance between 1980 and 1987 of a selected group of common carriers that operate in the Midwest was conducted. The group was selected to be representative of less-than-truckload (LTL) and truckload (TL) common carriers of general freight with financial performance ranging from excellent to default.

- **Motor carrier interviews** Interviews were scheduled with top managers of trucking firms to help interpret the trends observed in the financial performance analysis.

- **Shipper survey** A survey of shipper logistics strategies, trends and preferences was conducted. The purpose of the survey was to identify trends in the number of carriers used by shippers, the importance of electronic data interchange (EDI), and the use of contracts between motor carriers and shippers.

Motor Carrier Performance Analysis

The financial data reported by 18 motor carriers in their annual reports to the ICC were analyzed to determine trends. All the carriers sampled operate in Iowa and carry general freight. The sample included an even mix of LTL and TL carriers. The firms were intended to be representative of financially strong, fair, marginal, and recently bankrupt motor carriers.

Data were extracted from the annual reports from 1980 through 1987 and all dollar figures were adjusted by the GNP deflator to express amounts in 1982 dollars. Admittedly, the annual reports are a snapshot of each firm at the time the report was compiled and may not be totally indicative of the actual annual performance of the firms. The reports tend, however, to indicate general financial performance trends of the firms over the reporting period. The following trends were observed in the financial indicators examined:

- **Debt** Although total debt to assets ratios tended to remain the same, the use of long-term debt decreased while short-term debt increased, particularly in 1986 and 1987. Further, liquidity tended to decline over the entire period. The greater use of short-term financing makes the industry more vulnerable to changes in economic conditions.

- **Productivity** Ratios to measure productivity included revenue per driver, revenue per employee, revenue per tractor, and revenue per trailer. Revenue per employee and per tractor were fairly flat over the period while revenue per driver and per trailer tended to decline. The results tend to reflect the greater temporal flexibility in transportation services demanded by shippers. Previous studies have indicated that motor carriers have expanded trailer fleets to provide temporal flexibility in loading and unloading; presumably, this would also create more slack time for drivers.

- **Profitability** Measures of profitability have tended to remain flat or declined throughout the entire period. The ratio of earnings before interest and taxes to total assets has, on the average, declined steadily throughout the entire period.

- **Overall financial performance** A composite measure of the financial performance of the firm is measured using Altman's Z"-score. A strong financial condition is indicated by a score of 2.6 or more and a financially precarious and weak position is indicated by a score of 1.1 or less. The average Z"-score of the group tended to slide during the period. A high of 3.193 was achieved in 1983 and a low of 1.532 was reached in 1987.

Carrier Case Studies and Interviews

Managers of five trucking firms were interviewed to help the researchers identify trends in the trucking industry. Two TL and three LTL carriers were included in the group. The carriers were both regional and transcontinental carriers. One of the managers interviewed was a previous employee of a recently bankrupt firm. The predominate issues identified were:

- **Drivers** Evidence of the importance of drivers was discovered in the shortage of qualified applicants and high turnover experienced by some firms. Firms that gave drivers higher priority, whether in equipment selection, work assignments, employee benefits or family considerations, had fewer problems. Carriers whose drivers were scheduled for long hours and days away from home experienced high turnovers and driver shortages.

- **Regulation** The effects of regulatory reform provided varying degrees of concern to carriers. All believed that the increased number of carriers brought accelerated competition and was grounds for some concern. Smaller LTL's carriers were concerned about potential predatory practices of larger carriers wishing to capture their market. Conversely, most carriers expressed the concern that financial viability and survival may be predicated on their ability to expand. Carriers operating in more than one state were somewhat frustrated by varying state regulations.

- **Financing** The uniformly high operating ratios reported suggest that trucking is a competitive, low margin business. A high portion of carriers' costs are variable, especially for TL carriers that have fewer terminals than do LTL carriers. With adequate long-term financing, whether debt or equity, these carriers should be able to

weather economic downturns by decreasing operations and hence operating costs. The tendency to use short-term financing, particularly while attempting to expand, however, makes firms particularly vulnerable to financial difficulties.

- **Risk Management** Carriers have increased self insurance and implemented better risk management practices to deal with rising insurance premiums. This has resulted in more risk sensitive hiring practices and more thorough training.

Shipper Survey

The purpose of the questionnaire was to examine some of the logistics opportunities that were previously unavailable to shippers purchasing trucking services. Previous studies have indicated that shippers tend to spread their business across fewer trucking firms and demand more control over their shipments through such strategies as the use of EDI and contracting. The questionnaire attempted to examine these trends nearly a decade after the regulatory reforms of 1980.

Forty-seven percent of the respondents are traffic managers at firms with an excess of $1 billion in sales, and 40 percent have revenues between $100 million and $1 billion. Because the surveyed traffic managers represent rather large firms, the information may be biased. Three important trends were found:

- Shippers are reducing the number of trucking firms they utilize. About 60 percent reported a reduction in the number of motor carriers used between 1984 and 1988. The average number of carriers declined from 214 in 1984, to 150 in 1988.

- Shippers reported both an increase in the use of EDI and a growing tendency towards the use of EDI. Fifty-nine percent reported they used EDI and, of those that already using EDI, almost all anticipated increasing the use of EDI in the next five years. Further, several shippers felt that a lack of carrier expertise in EDI was an impediment to the use of EDI by the trucking industry. On the average, however, shippers felt that about 80 percent of the carriers they deal with would have EDI capabilities within the next five years.

- Shippers are increasing the use of long-term contracting. Only 14 percent of the respondents do not contract. Nearly 45 percent purchase 50 percent or more of their trucking services through contracts. Seventy-eight percent intend to increase contracting in the next five years.

The practices of shippers dealing with fewer trucking firms and more long-term contracting are likely to favor more concentration in the trucking industry. Concentration

could either result from existing carriers specializing in narrower niches, carrier acquisitions or through cooperation between carriers.

Trends For Railroad Companies, Services and Facilities

The regional rail system has seen a good deal of transition in 1980s. The 1980s started with the bankruptcy of the Chicago, Rock Island and Pacific Railroad (Rock Island) and the sale of many of its lines, then the reorganization of the Chicago, Milwaukee, St. Paul and Pacific Railroad (Milwaukee Road) and the acquisition of the reorganized system by the Soo Line Railroad Company (Soo Line). The Illinois Central Railroad Co. (Illinois Central) also sold or abandoned all of its lines in the region. The Staggers Act of 1980 also created new opportunities for Class I carriers to reduce and, hence, to rationalize their rail network.

Changes to the Region's Rail Network

During the 1980s, the region experienced a great deal of reorganization of its rail system through bankruptcies, sales of lines, acquisitions, and mergers. The major changes in the region are:

- **Withdrawal from the region** Three Class I carriers that provided service in 1980 no longer operate in the region. The Rock Island went bankrupt, ceased operation and its lines were sold or abandoned. The Milwaukee Road's system was reorganized after filing for bankruptcy and later the system was sold. The Illinois Central sold all of its lines in the region.

- **Line sales** The sale of the Rock Island lines resulted in the creation of two regional railroads, the Iowa Interstate Railroad Ltd. (Iowa Interstate) and the Kyle Railroad Company. The sale of the Illinois Central lines has also resulted in two regional railroads; the Chicago Central and Pacific Railroad Company, and the Chicago, Missouri and Western Railway; although the Chicago, Missouri and Western Railway recently declared bankruptcy and is being reorganized by a trustee. Other significant purchases of lines include the sale of other Rock Island lines to the Chicago and North Western Transportation Company (Chicago and North Western) and to the Southern Pacific Transportation Company (Southern Pacific).

- **Acquisitions** The Soo Line was permitted to purchase the entire reorganized Milwaukee Road in 1984. The most strategically important line in the region, acquired by the Soo Line was the mainline running northeast from Kansas City, along the Mississippi River and east to Chicago. After operating the Kansas City to Chicago line for five years, the Soo Line offered the line for sale in 1989. The Soo Line reached an agreement with Southern Pacific to purchase the line and the ICC is reviewing the

sale (as of fall, 1989), giving the Southern Pacific lines connecting the West Coast and Chicago.

- **Mergers** During the period there were four mergers involving Class I railroads operating in the region. In 1980, the Burlington Northern Railroad (Burlington Northern) and the St. Louis-San Francisco Railroad merged to form the current Burlington Northern system. In 1982, the Union Pacific Railroad, Missouri Pacific Railroad and Western Pacific Railroad merged to form the present Union Pacific Railroad (Union Pacific), and in 1988 the merger of the Missouri-Kansas-Texas Railroad Co. with the Union Pacific was approved and completed. After a failed merger attempt between the Atchinson, Topeka and Santa Fe Railway Company (Santa Fe) and Southern Pacific, the Southern Pacific successfully merged with the Denver, Rio Grande and Western Railroad in 1988.

The four-state region lost about 5,000 railway miles during the 1980s due to abandonment and reorganization. Currently, Region VII includes about 20,000 railway miles. Iowa was affected by the loss of rail lines more than any other state, losing 31 percent of its rail system during the eighties. Missouri was the next most affected, having lost 23 percent of its system. Kansas and Nebraska have been relatively untouched with 7 and 6 percent reductions in their systems, respectively.

Because Iowa, more than any other of the four states, was more significantly affected by the Rock Island and Milwaukee Road bankruptcies and the Illinois Central sales, Iowa has faced a more serious rail network reorganization problem. In response, Iowa has developed a proactive financial assistance program to assist in the orderly reorganization of the state's rail system. None of the other states in the region have initiated continuing financial assistance programs. In Nebraska, there is even a constitutional prohibition against the use of state funds to provide assistance to foster the orderly reorganization of the rail system.

The Staggers Act and the ICC's interpretation of it greatly reduced the restrictive conditions that have to be met by Class I carriers wishing to sell a line. The Staggers Act gave the ICC the power to approve line sales without extensive regulatory oversight or the automatic imposition of labor protective conditions. The ICC interpreted this to mean that the sale of a line is not a subject that is bargainable with labor.

In response to relief from bargaining requirements of the Railway Labor Act of 1926, the number of line sales throughout the country mushroomed. In 1987, a hiatus in line sales occurred as a result of a federal district court ruling that the ICC's interpretation was incorrect

and that line sales were subject to the labor bargaining conditions defined in the Railway Labor Act of 1926. Ultimately the ruling was appealed to the Supreme Court which, in the summer of 1989, ruled on the side of the ICC by a one-vote margin. The narrow margin provided unclear direction on the future rights of labor to negotiate on line sales matters.

Assuming that line sales procedures continue, based on the Supreme Court's ruling, many of the Class I carriers in the region intend to proceed with selling lines. States without an assistance program cannot proactively participate in the reorganization of its state's rail network.

The number of intermodal loading and unloading facilities throughout the region declined dramatically during the 1980s. This is a result of the Class I carriers consolidating their facilities to intermodal hubs within major metropolitan areas. For example, the Burlington Northern believes it can serve a region that is roughly 250 miles in radius from one hub center.

Carrier Issues and Interviews

To obtain the rail carriers' perspective of the key issues that have resulted from the changes in the 1980s, interviews were scheduled with managers of five rail companies. The companies included one regional railroad (the Iowa Interstate), one medium sized Class I carrier (the Chicago and North Western), three of the four western transcontinental railroads (the Santa Fe, the Burlington Northern and the Union Pacific railroads). The major findings were:

- **Market niches** The smaller the carrier, the more narrowly defined were their specialty market niches. For example, the smallest carrier interviewed, the Iowa Interstate, operates on the previous Rock Island mainline linking Omaha and Chicago. Most of the traffic on the line (about 93 percent) originates or is destined to locations along the line. Just the reverse is true of the parallel Chicago and North Western line where the bulk of traffic is through traffic.

  Larger carriers are more able to diversify. Greater diversification of services helps to buffer larger carriers from downturns in an industry or within a particular region. Specializing leaves smaller carriers more susceptible to economic cycles.

- **Intermodal traffic** Although each carrier believed that the intermodal traffic market is likely to continue to grow, each has different views on the best approach and its role in intermodal transportation. For example, the Union Pacific plans to exit the traditional trailer-on-flat-car market within the next five years and shift all its

intermodal movements to containers. Organization of the container services will be conducted by, and the equipment purchased by, American President Lines Intermodal Division (API), Union Pacific's intermodal partner. The Union Pacific's relationship with API is perhaps the closest relationship between a rail company and a third party. On the other hand, the Santa Fe is going to continue marketing its successful piggyback service. The Santa Fe will also internally market its container double-stack services, and will discourage the use of third parties and steamship lines to market double-stack service.

- **Downsizing and line sales** All four of the Class I carriers indicated that downsizing their networks was a key issue. All expected line sales to continue. The regional operator viewed the continuation of line sales to be an opportunity for expansion.

- **Labor** All four of the Class I carriers indicated that restrictive labor rules and crew size requirements are significant detriments to the efficiency and cost of their operation. All were attempting to reduce their labor cost liability but expected that substantial reductions in labor costs would be difficult to obtain.

When labor was discussed with the regional operator, the comments were in sharp contrast to those of the Class I carriers. The regional operator's labor force has grown and labor has been very cooperative with management.

Endnote

1. "The Changing Role of Freight Transportation Modes and Intermodal Freight: Summary of Workshop," (Kansas City, Missouri, 1989) is available from the Midwest Transportation Center, Iowa State University.

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Chapter I
Introduction

The 1980s began with the most sweeping changes in transportation regulation since its inception. The regulatory reforms of the late 1970s and early 1980s give shippers a freer hand to demand services that meet their requirements. Carriers enjoy more freedom to innovate, develop new service strategies, and the flexibility to integrate transportation modes and provide intermodal services. Increased competition have led to reduced transportation prices and caused carriers to search for additional means of cutting their costs.

Change has resulted in generally more flexible and lower cost transportation services. On the other hand, change and competition has also caused financial difficulties for some carriers, resulting in financial instability and bankruptcy. Change has also concentrated services in dense markets and caused carriers to withdraw services from light density markets.

This is the interim report for the first year of a two-year project. The mission of the first year was to:

> Identify changes that have occurred since 1980 in the surface freight transportation industry in Federal Region VII (Iowa, Kansas, Missouri, and Nebraska). The issues studied are to include the industry structure of the modes, changes to the infrastructure used by each technology, institutional changes at the federal and state levels, changes in the services offered by carriers and their use by shippers, and changes in traffic flows for each of the technologies.

Report Organization

The report contains six chapters. The second chapter discusses business and economic trends of the region during the 1980s. The regional economy is starting to revive from the recession of the early 1980s, but has been slower to recover than the rest of the nation. The third chapter covers the federal and state regulatory reforms and the nature of state regulation in Iowa, Kansas, Missouri, and Nebraska. The fourth chapter uses the Interstate Commerce Commission's waybill sample of rail traffic and truck traffic volume counts and classification

counts, collected by state departments of transportation, to identify traffic trends during the 1980s. Because of the limited truck traffic data, only general trends are identified.

Chapter five examines the motor carrier industry and trends in services provided by motor carriers. The financial performance of several carriers are tracked through the 1980s and general trends are identified. To verify the findings made through the financial analysis, managers of five motor carriers were interviewed and the results are reported. Chapter five ends with the analysis of a survey of shippers used to identify trends in the use of contract agreements, the number of carriers hired, and the use of electronic data interchange.

Chapter six reviews each state's rail system, the evolution of the rail system during the 1980s in each state, and each state's policy on public assistance for railroad preservation. Chapter six ends with the reporting of interviews with the management of five rail carriers to identify key issues and strategies.

Chapter Two
Business and Economic Trends

To develop a basis for identifying and understanding the implications of change in the region, a foundation is developed by examining business and economic trends in the four-state region. Four indicators of economic performance are used to develop a description of business and economic trends of the region: population growth, economic product, employment growth, and income trends. Trends in each of the four indicator areas are discussed in a subsection in this chapter. Unfortunately, the economic performance of the states in Region VII during the 1980s is lagging behind that of the rest of the country.

Population in the Region

Population has traditionally been a basic indicator of a region's economic vitality. Furthermore, an analysis of population is important to determine future levels of transport demand, future levels of production, and the potential tax base from which transport infrastructure improvements may be made. In Region VII, however, population levels may have less significance. This is because much of the freight moving in the region is across the region between the West Coast and the industrial Midwest or East Coast. The volume of traffic with an origin and destination outside of the region ("bridge traffic") is not a function of the population in the region. There are still significant freight movements (e.g., grain) to and from destinations and origins in the region.

Findings by State and Region

Population data for the years following the 1980 census are mid-year population estimates made by the Bureau of the Census and reported by the Department of Commerce, Bureau of Economic Analysis. For the period from 1980 through 1988, population levels in three of the four states, Missouri, Kansas, and Nebraska, have shown either very slight increases, or virtually no change at all. The annual growth rates have ranged from a low of .00081 (eight one-hundredths of one percent) to .00879 (eight tenths of one percent) annual growth.

Iowa experienced a slight population decrease in the same period. Iowa saw a .01042 (approximately one percent) annual decrease from 1985 to 1986. The population projection for 1989 should show a gain of approximate 11,000 persons, which would be an increase of about four-tenths of one percent over 1988.[1] Iowa's population loss seems to have stopped. Near-term population forecast is for constant population levels, or slight population increases.

The population levels are found in Table 2-1.[2] The table illustrates the fact that population levels in the region have shown virtually no change during the study period. Furthermore, the relative population levels of the states have not changed.

Table 2-1 Total Population (In Thousands of Persons)

Year	IA	NE	MO	KS	Region VII	USA
1980	2916	1573	4923	2370	11782	227255
1981	2918	1583	4939	2389	11829	229637
1982	2908	1590	4943	2410	11851	231996
1983	2905	1596	4965	2428	11894	234284
1984	2904	1605	5004	2441	11954	236477
1985	2880	1604	5034	2449	11967	238736
1986	2850	1598	5064	2459	11971	241096
1987	2834	1594	5103	2476	12007	243400
1988	2834	1602	5141	2495	12072	245800

Source: Bureau of Economic Analysis, U.S. Department of Commerce

Urbanization of Population

The urbanization of the population has been occurring in the region for at least four decades. Since 1900, farm population has fallen from 42 percent of the total U.S. population to less than 3 percent in 1986.[3]

Use of aggregate, state-wide, or regional data may mask underlying structural problems in the rural economy. That is, much of this region's income and employment growth, noted later in this chapter, has not been evenly distributed geographically. Rather, it has been concentrated in the urban areas. In Kansas, for instance, the four large, mostly urban counties, Johnson, Sedgwick, Shawnee, and Wyandotte, comprised about 43 percent of the state's population in 1988. They earned 49 percent of the state's total personal income.[4]

In Iowa, the most significant population increases in the 1980s have been almost exclusively in the Des Moines (Polk County) metropolitan area. Additionally, northeast Iowa

has experienced modest growth, particularly in the Cedar Rapids area, and in southeast Iowa, in the Davenport (Quad Cities) area.[5]

Nebraska is characterized by two urban population centers, Omaha and Lincoln. These two cities hold just about half the state's population, earning well over half of the state's income.

In Missouri, three of the counties with the highest growth rates were suburban areas, and two others were fairly small counties. These small counties, while posting impressive growth rates, contribute very little to the overall population growth of the state or region.

The 1987 population for the entire state of Missouri is 5,102,876; just under half the people live in the five largest counties, three in the St. Louis area, one in the Kansas City area, and one in the Springfield area.

How the Region Compares with the Rest of the Country's Characteristics

Region VII's most recent population estimate (1988) stands at 12,072,000 persons. The region comprises 4.9 percent of the total U.S. population, which is estimated at 245,800,000 persons. The largest state in the region, Missouri, has 42.6 percent of the region's people, while the least populous state, Nebraska, has 13.3 percent.

Population levels alone may be misleading, however, if used to estimate transportation demand. This is because this region acts as a "bridge" for rail and highway traffic passing through the region, but does not originate or have a destination in this region. This traffic is much greater than one would expect from the relatively low population levels. Therefore, although the region exhibits a fairly small population, it is relatively transport-intensive region, per unit of population.

Population Density Table 2-2 contains the population densities of each of the four states and the United States' population density. In terms of population density, the states in the region are considerably less dense than most other states. For instance, the population density of Nebraska is one-tenth that of Illinois, and one-fiftieth that of New Jersey. Even Missouri, the most densely-populated state in Region VII, has a population density one-tenth that of Massachusetts.

Table 2-2 Population Density, 1980 Census

State	Per/Sq. Mi.
Missouri	71.3
Iowa	52.1
Kansas	28.9
Nebraska	20.5
U.S	62.6

Source: The 1989 Almanac, (Boston, Houghton Mifflin Co., 1989), 42nd Ed., p. 771.

Population Levels The pace and patterns of urbanization in Region VII do not differ significantly from those found nationwide, however. Only the absolute levels differ, with the states in the region at about 60 percent urban, and the United States as a whole at about 74 percent urban. By comparison, California was the most urbanized, at about 91 percent urban.[6] The Federal Reserve Bank of Kansas City noted that in the period from 1983-1985, about 49 percent of the rural (non-metropolitan) counties in the United States were experiencing declining population.[7] This is not a new trend, as the net out-migration from rural areas has been occurring since the early part of this century. In the period 1950-1960, this trend was most severe, with almost 60 percent of rural counties experiencing net out-migration.

Population Growth Rates The difference in population growth rates between Region VII and the United States as a whole is illustrated in Table 2-3. Data are shown for the four most recent periods for which data were available. The United States has posted a steady growth rate of just under one percent for each period, whereas this region's population growth rates have ranged from almost nil to about one-half of one percent.

Table 2-3 Estimated Population Growth Rates

Period	Region VII	U.S.A.
1984-85	.00109	.00955
1985-86	.00033	.00988
1986-87	.00301	.00956
1987-88	.00541	.00986

Source: Calculations were based on mid-year population estimates of the Bureau of the Census, as reported by the U.S. Department of Commerce.

Production in the Region

Demand for freight transportation is a function of the general level of output in the economy. The level of freight transportation can be derived from the demand for the commodities which are being transported. The relationship between the demand for various commodities and the demand for transportation of those commodities is expected to be significant.

The broad measure of economic output is gross national product (GNP), and for the states, gross state product (GSP). The production data used in this study are expressed in constant 1982 dollars (1982 = $100) so that the effects of price inflation are excluded. Production has been broken down into 10 categories, some with sub-categories, to allow for sectoral analysis. This type of analysis will provide a profile of the changes occurring in various economic sectors of Region VII.

How the Region Compares with the Rest of The Country

Growth in Production The State of Kansas is predicting that growth of its gross state product will be 5.3 percent in 1989. This outstrips the current prediction for GNP growth in the United States, which is 2.4 percent. Kansas has identified some macroeconomic risks to their moderate growth scenario, which run parallel to the risks for any state in the region, and to the United States. These risks include tight fiscal or monetary policies, disruptions in consumer and governmental debt markets, and potential energy price increases.[8]

Transportation services demanded in Region VII have increased during the 1980s (Chapter Four examines traffic patterns and volumes during the 1980s) and are expected to continue in the future. The following subsections examine production growth in three sectors: agriculture, manufacturing, and service sectors.

Agricultural Sector Production Compared to the United States as a whole, however, this region exhibits even greater variability in agricultural output from year to year in agriculture's contribution to GSP, as shown in Table 2-4.

Agricultural production is very variable at the national level. The wide swings in agricultural production injects significant uncertainties into the transportation business in this region. Further, these wide variations in agricultural output may make transportation planning more difficult.

Table 2-4 Agricultural Production - Annual Gross State Product Growth Rates

Period	U.S.	Region VII
1980-81	+15.5%	+39.6%
1981-82	+ 1.8%	- 2.5%
1982-83	-16.8%	-32.4%
1983-84	+10.4%	+24.6%
1984-85	+13.8%	+20.9%
1985-86	+ 7.3%	+11.6%

Source: Bureau of Economic Analysis, U.S. Department of Commerce.

In Iowa, over one-third of the value added by Iowa manufacturers is derived directly from grain and meat processing, agricultural chemicals, and farm machinery production. This is almost 10 times as concentrated as the national average.[9] These industrial sectors are particularly transportation-intensive, all using truck, rail, or barge. These large value-added sectors ship great quantities of bulk commodities, or in the case of machinery and parts, particularly heavy loads. Their transportation needs may be in either bringing goods into the region for processing, or sending goods out of the region, once processed.

Net growth of production in the agricultural bulk commodities sector may be elusive. Consultants have cited the depressed worldwide demand for grains, low prices, and huge quantities in storage. In 1987, they urged the State of Nebraska to plan for shifts in production, and to engage in a greater degree of economic development activity, and to:

> . . . adopt a long-term agenda for economic change and build new economic foundations in order to become more competitive, more diverse -- to become the leading state in a new kind of Great Plains economy.[10]

This agricultural prognosis has a bright side, which is that not all commodities are seen as having slack demand and soft price levels. There is an increasing world demand for meat and poultry (e.g., processed turkey, chilled beef, and pork) products, alternative oilseed crops, and improved demand for a number of specialty agricultural products such as seed corn, popcorn, dry-milled corn, specific pathogen-free eggs and flocks, and purebred breeding stock. There can be growth in agricultural output without the declining price or income features, especially when that growth is characterized by product (crop) diversification, and value-added activities.[11]

Production in the Services Sector A significant change in the economic structure of the nation -- which has been taking place since the end of World War II -- is the transition

from manufacturing and agriculture to a service-based economy. For the purposes of this investigation, the services sector includes the hotel and restaurant industry, repair businesses, data processing services, professional services of accountants and attorneys, medical and dental professions, as well as the financial, insurance, and real estate businesses. The region's annual growth rate in services' contribution to GSP has been about half that in the nation, as shown in Table 2-5.

Table 2-5 Services Sector Output - Annual Gross State Produce Growth Rates

Period	U.S.	Region VII
1980-81	+3.3%	+4.6%
1981-82	+0.2%	-0.8%
1982-83	+3.9%	+1.5%
1983-84	+4.6%	+2.6%
1984-85	+4.3%	+2.2%
1985-86	+4.8%	+3.2%

Source: Bureau of Economic Analysis, U.S. Department of Commerce.

Some analysts believe that the service sector in the Middle West has reached a growth plateau, or saturation. This finding has been confirmed with 1987 and 1988 production data. After sharing in the rapid growth of the nation's service sector, growth in services is expected to remain level.[12] The services sector remains a driving factor, however, especially in the economies of Nebraska and Iowa. This includes the areas of health care, financial and insurance industries, and education.

Manufacturing Sector Production The growth in manufacturing output in this region compares quite favorably with that of the nation. Non-durable goods manufacturing, which includes various aspects of the food processing and packaging industries, has been important in Nebraska and Iowa. Durable goods manufacturing, which includes automobiles, aerospace, and appliance industries, has been important to Missouri and Kansas. Overall manufacturing growth rates, measured by its contribution to GSP, are listed in Table 2-6.

Output in manufacturing has been relatively strong in this region, compared to output in the region's other sectors. The growth has been in the appliance industries, food processing and allied industries, and high technology manufacturing. The durable goods sector showed steadily increasing output over the entire decade, while non-durable goods production has shown the best results in this region over the last three years. In 1986, the region had 39.3

Table 2-6 Manufacturing Sector Production - Annual Gross State Product Growth Rates

Period	U.S.	Region VII
1980-81	+ 1.6%	+ 1.8%
1981-82	- 6.1%	- 6.0%
1982-83	+ 6.4%	+ 7.5%
1983-84	+12.2%	+12.3%
1984-85	+ 4.3%	+ 2.5%
1985-86	+ 2.8%	+ 1.8%

Source: Bureau of Economic Analysis, U.S. Department of Commerce.

billion dollars in gross state product attributable to manufacturing output.

For 1988, Iowa's manufacturing output was up about 7 percent. But Missouri did not participate fully in the revival of manufacturing seen throughout the United States in the late 1980s. Gains in Missouri's export-led manufacturers were offset by reduced output in automobile production and defense-related industries.

Production in Other Sectors Production data for the construction industry in Region VII shows a continued weakness and excess capacity over the last few years. Growth in the construction industry has been basically flat since the early 1980s. The exception was the building "booms" in St. Louis and Kansas City, with many large projects nearing completion in 1986 and 1987. High vacancy rates and the generally sluggish regional economy are expected to keep growth in nonresidential construction fairly flat.

Gross state product from transportation, communication, and public utilities (as grouped by the Department of Commerce) has been somewhat variable in the decade of the eighties. The region has seen an equal number of years with growth as with declines. In terms of the transportation component alone, the region has shown similar variability.

Energy production is significant when looking at economic production in Kansas and, to a lesser extent, Missouri. This is primarily concerned with the production of crude oil (stripper wells at less than 10 barrels/day), natural gas extraction, and coal mining.

Implications for Transportation Demand

The sectors which have the most heavily transport-intensive outputs are mining, agriculture, manufacturing, and construction. Increased output in these sectors will almost certainly lead to increased demand for transportation services. To a lesser extent, production levels in retail and wholesale trade may also lead to increased demand for transportation.

With mining and construction output showing little growth in the region, emphasis should be placed on the agriculture (and food processing) and manufacturing industries. This will be the source of an increasing demand for transportation. Furthermore, it is important to note that much of the transportation demand in this region is not from goods which have an origin or destination in the region. This "external" demand is significant.

Employment in the Region

An analysis of shifting employment patterns is necessary to draw conclusions about the economic stability of a region and identify trends in freight transportation. It is also important to look at employment trends by industrial sector, thereby obtaining a picture of the dynamics of employment growth and change throughout the region.

Wage and salary data from the U.S. Department of Commerce, Bureau of Economic Analysis are used in this analysis. The Department of Commerce considers the most recent two years' of data to be official estimates. As subsequent years are issued, the Department will adjust the employment figures for the previous two years. For purposes of this discussion, the years 1988 and 1987 (and in some cases 1986) should be considered estimates.

These data originated at state-level agencies e.g., the Missouri Division of Employment Security or the Kansas Department of Human Resources. The wage and salary employment data exclude some types of self-employed individuals, such as proprietors and farm proprietors. However, the economic contribution of proprietors may be measured in terms of income. These data may be found in the next section of this chapter.

Wage and salary employment by industrial sector is shown by place of work, rather than by place of residence. For example, those individuals who live in Council Bluffs, Iowa, and work in Omaha, Nebraska, are included in the Nebraska data.

In certain cases, the Department of Commerce omitted data "to avoid disclosure of confidential information." This was especially evident in the mining, transportation, and communications industries for some states. In these instances, only estimates for the U.S. totals were available. The Department of Commerce's practice of omitting data may result in inadequate data when the four states that comprise Region VII are summed.

The employment figures include military employment in the "Government" category.

Findings By State and Region

Employment in the region stood at 5,341,172 persons in 1987, which is about 4.86 percent of total U.S. employment. Employment in 1987 for the states in Region VII is shown in Table 2-7.

Table 2-7 Region VII Employment - 1987

State	Total Employment
Missouri	2,334,663
Iowa	1,166,902
Kansas	1,110,889
Nebraska	728,718

Source: Bureau of Economic Analysis, U.S. Department of Commerce.

Employment Growth and Change For Iowa, structural change in employment has meant economic hardship. Between 1978 and 1986, Iowa experienced the second lowest employment growth (it declined .0042 percent) of all 50 states. Montana, Illinois, Michigan, and West Virginia also posted declines.[13]

One employment study, really a snapshot of short-term changes in a recent period, shows the relative growth patterns of the four states in the region. The total employment one-year growth rates (for August, 1987 - August, 1988) among the region's four states are shown in Table 2-8.

Table 2-8 Total Employment Growth, August, 1987 - August, 1988

State	Percent Growth
Kansas	2.35
Iowa	2.16
Nebraska	1.26
Missouri	1.12

Source: Office of the Governor of the State of Kansas, The State of Kansas Economy, 1988-1989, Topeka, Kansas (1989), p. 4.

Transport-intensive industrial sectors are separately identified in Table 2-9. Those transport-intensive sectors are mining, construction, manufacturing, and agriculture. There is significantly less employment growth in this region for that same time. This type of derived demand logic may significantly understate the demand for transportation coming from the

agricultural sector, since employment there is primarily self-employed proprietors and they are not included in the study referenced.

Table 2-9 Percent Change in Employment for August, 1987 to August, 1988, For Transportation Intensive Industries

State	Mining	Constr.	Manf.	Transp & Utilities
Kansas	(2.54)	(4.16)	2.14	(.49)
Iowa	(4.00)	0	4.57	2.41
Nebraska	0	(1.53)	2.98	2.78
Missouri	0	1.23	(0.05)	0.56

Source: Office of the Governor of the State of Kansas, The State of Kansas Economy, 1988-1989, Topeka, Kansas (1989), p. 4.

Kansas is predicting continued contraction of employment in its transportation sector, at least through 1989. It cites transportation deregulation as the reason.[14] Other reasons for the employment decline in transportation in Kansas, including the changing industrial mix and, potentially, the levels of agricultural output, also exist.

Employment in the durable goods sector seems to be a bright spot, especially in Kansas and Missouri. The notable exception here is the closing of the Leeds General Motors plant near Kansas City in 1988.

Industrial Mix: How the Region Compares with the United States

In the case of Iowa, the collapse of the farm machinery market in the early and mid-1980s brought about structural employment change. Interestingly enough, the employment shifts were not away from agribusiness, but shifts within agribusiness. Employment in that industry dropped sharply, but was offset by an increase in employment in the food-processing sector.

Part of the explanation for the poor employment performance of the region, relative to the United States as a whole, may be the unfavorable mix of industries, heavily concentrated in the agriculture and agribusiness sectors. This would suggest that the region will benefit from efforts at economic diversification.

Slightly over one-third of total non-farm employment in the region is in small businesses. This compares with only 27 percent nationally.

The Bureau of the Census has found that the services-producing sector has been experiencing increasing employment while the goods-producing sector has been experiencing declines in employment. This is true both nationally and in this region. In studies done in 1969, 1978, and 1984, it was noted that the goods-producing sector may have lost as much as one-third of its employment from 1969 to 1984. Furthermore, the services-producing share of total employment in the Plains states was very comparable to that in the United States generally (although the region's growth in the service sector has been more sluggish than the rest of the country).[15]

Income in the Region

There are several measures of national financial well-being that could be used to illustrate economic trends and the concomitant shifts in transportation patterns. For this discussion, disaggregate data on personal income were used. More precisely, data on earnings by place of work were obtained through the Department of Commerce, Bureau of Economic Analysis. The initial source of the department's data was federal tax records. These data were then grouped by industry. The industrial breakdowns are based on the 1972 Standard Industrial Classification (SIC) scheme.

Personal income is shown by place of work, rather than by place of residence.[16] This facilitates the breakdown by industrial groups. Earnings by place of work, however, will not include income from dividends, interest, rent, or government transfer payments. This is acceptable since an appropriate transportation analysis would be primarily concerned with the physical production and distribution of goods.

Only in the cases of per capita income and per capita income growth rates was personal income by place of residence used. This was to ensure that the parallel relationship with population would be maintained. All income data are expressed in current (non-inflation adjusted) dollars.

The farm income category does include the proprietors' net income, which, in some cases, is comprised in part by agricultural subsidy payments. Farm income also includes any cash wages, payment-in-kind, wages of hired farm workers, and salaries of officers of corporate farms.

Some income categories show negative values, especially in the mining categories. This is due to net taxable losses in that industry, due in part to Internal Revenue Service rules on depreciation. For the Region VII summation, losses were subtracted from gains in income to arrive at regional totals.

Findings By State and Region, Sources and Levels of Income

Total personal income in the United States stood at almost 3 trillion dollars in 1988. Region VII earned about 4.5 percent of the total personal income earned in the United States. Table 2-10 indicates the personal income by each state in the region.

Table 2-10 Personal Income, 1988

State	Personal Income
Kansas	$27,356,072,000
Missouri	$58,975,681,000
Nebraska	$17,632,210,000
Iowa	$28,599,701,000
Region	$132,563,000,000

Source: Bureau of Economic Analysis, U.S. Department of Commerce

With its heavy concentration in the agriculture sector, the region's income levels are more sensitive to changes in market demand for, or prices of, a few agricultural commodities. For example, Iowa's 1985 receipts from farm marketing illustrate the heavy concentration in four agricultural products; hogs, corn, cattle, and soybeans. The percentage of total receipts from each of Iowa's farm products are shown in Table 2-11.

Table 2-11 Receipts for 1985 Iowa Farm Products

Product	Percent of Total
Hogs	26%
Corn	25%
Cattle	18%
Soybeans	16%
Other Ag	10%
Dairy	5%

Source: U.S. Department of Agriculture, Iowa Agricultural Statistics, (Washington, D.C., USGPO, 1986).

Fluctuating personal income growth in Kansas in the late 1980s, when analyzed on a county-by-county basis, may be found to be a result of changes in farm incomes. In particular, rural western Kansas exhibited large increases in income in some years, but showed significant declines in other years. This is illustrative of the instability of farm income over the past decade. In contrast, urban areas showed stable income growth throughout the period. Four metropolitan counties, Johnson, Sedgwick, Shawnee, and Wyandotte, had the greatest total personal income in Kansas in 1987.[17]

By 1988, Kansas had the most impressive income gains in the region, almost matching that of the nation. This was due in large measure to the rebounding farm economy. Income in the Kansas manufacturing and aircraft sectors also showed marked improvement. In contrast, income from the auto assembly, energy, and construction sectors posted a slide in 1988.

In Nebraska, agriculture and manufacturing (primarily food processing) continued to post sectoral gains in personal income in 1988, while other sectors failed to show much improvement. In Missouri, significant components of manufacturing income include the appliance, aerospace, and automobile industries. Some of these did not exhibit significant growth in Missouri during the 1980s.

Manufacturing is the most promising sector for income growth in the region. Tables 2-12, 2-13 and 2-14 show levels of income for durable and non-durable goods manufacturing. The most recent three years are shown, as they will most strongly affect future growth.

Table 2-12 Income From Manufacturing Durable Goods (millions $)

Year	Nebraska	Kansas	Iowa	Missouri	Region
1986	1,053	3,065	3,335	7,286	14,739
1987	1,105	3,113	3,690	7,323	15,230
1988	1,208	3,281	3,983	7,740	16,212

Source: Bureau of Economic Analysis, U.S. Department of Commerce.

Table 2-13 Income From Non-Durable Goods Manufacturing (millions $)

Year	Nebraska	Kansas	Iowa	Missouri	Region
1986	1,057	1,796	2,122	4,659	9,633
1987	1,085	1,875	2,299	4,847	10,106
1988	1,183	1,953	2,423	5,161	10,720

Source: Bureau of Economic Analysis, U.S. Department of Commerce.

Table 2-14 Income From All Manufacturing (million $)

Year	Nebraska	Kansas	Iowa	Missouri	Region
1986	2,109	4,861	5,457	11,944	24,372
1987	2,190	4,987	5,989	12,170	25,336
1988	2,391	5,234	6,405	12,901	26,932

Source: Bureau of Economic Analysis, U.S. Department of Commerce.

Metropolitan Area Concentration of Income As with employment, income is concentrated in the urbanized areas of Region VII. The metropolitan areas of the region have shown resiliency and growth in incomes. The rural areas and small towns have experienced declines. The region is seen to be undergoing an "uncoupling" of urban and rural areas. A review of personal income by standard metropolitan statistical areas (SMSA) in Region VII illustrates the pattern of geographic concentration of income. The findings for 1986 can be found in Table 2-15.

Table 2-15 Metropolitan Area Concentration of Personal Income (Thousands of dollars, 1986)

State or SMSA	Total Income
State of Iowa	**$38,113,737**
Des Moines SMSA	$5,802,212
Davenport-Rock Island-Moline SMSA (IA & IL)	$5,048,860
Cedar Rapids SMSA	$2,416,959
Waterloo-Cedar Falls SMSA	$1,860,997
Sioux City SMSA (IA and NE)	$1,492,866
Iowa City SMSA	$1,265,065
Dubuque SMSA	$1,082,993
State of Missouri	**$70,502,935**
St Louis SMSA (MO & IL)	$38,658,169
Kansas City SMSA (MO & KS)	$23,669,911
Springfield SMSA	$2,914,910
Joplin SMSA	$1,491,527
Columbia SMSA	$1,408,607
St Joseph SMSA	$1,107,648
State of Kansas	**$35,646,440**
Wichita SMSA	$7,216,433
Topeka SMSA	$2,455,006
Lawrence SMSA	$855,917
(Note: Kansas City above)	
State of Nebraska	**$21,930,092**
Omaha SMSA (NE & IA)	$8,928,824
Lincoln SMSA	$2,829,419
(Note: Sioux City above)	

Source: U.S. Department of Commerce, Local Area Personal Income, (Washington, D.C., USGPO, July, 1988), Vol. 3, pp. 6-12, 15, 43, 97, and 129.

How the Region Compares with the Rest of the Country

Per Capita Income An analysis of per capita income provides some good comparisons among states and between the region and the nation as a whole. Figure 2-1 shows that there has been a steady increase in per capita personal income levels in this region, which now stands at $15,258 per person.[18] Table 2-16 presents a tabulation of the per capita personal income for each state, the region, and the United States. Income in Region VII was significantly lower than that in the United States in every year, 1980 through 1988.

The ranking of income among the four states has not changed since 1982. For the years 1983 through 1988, Kansas had the highest per capita income, followed by Missouri, Nebraska, and Iowa, in that order. In 1980 and 1981, Iowa's per capita income was significantly higher than that of both Missouri and Nebraska.

Per capita income in the region as a whole stood at $15,258 per person in 1988. The per capita income level for the United States stood at $16,489 in 1988, which was 8.1 percent higher than the regional level.

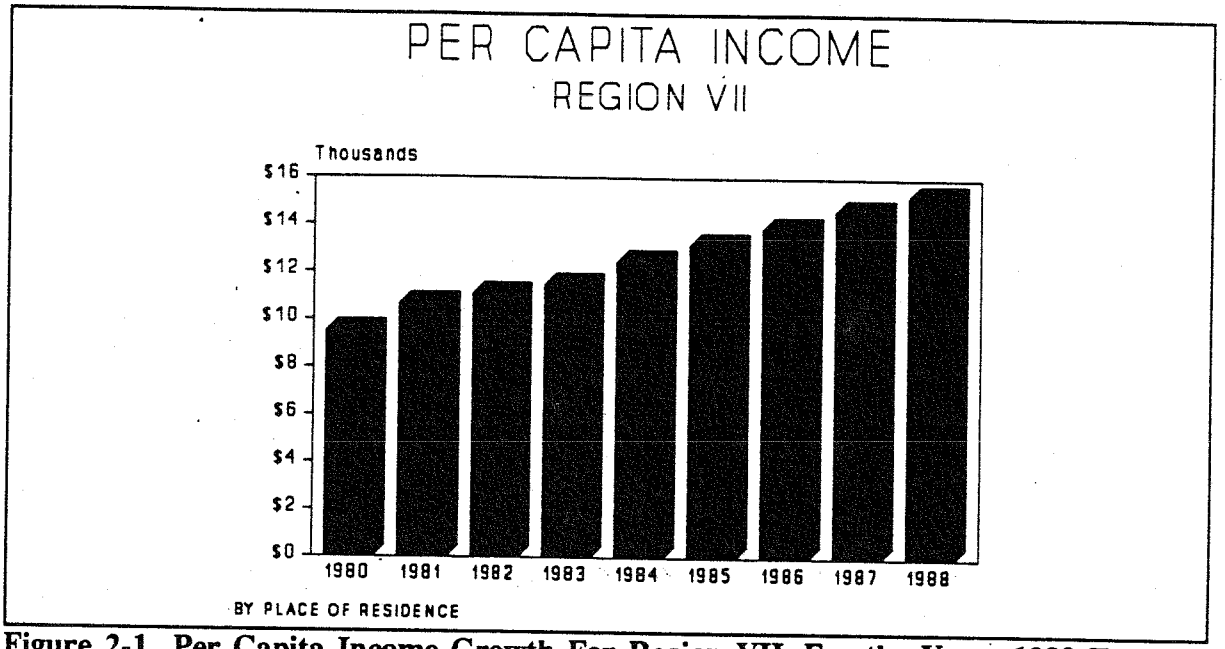


Figure 2-1 Per Capita Income Growth For Region VII, For the Years 1980 Through 1988

Table 2-16 Per Capita Personal Income (by place of residence, in whole dollars)

Year	Iowa	Nebraska	Missouri	Kansas	Region VII*	USA
1980	$ 9,537	$9,274	$9,298	$9,941	$9,484	$9,919
1981	10,812	10,652	10,322	11,190	10,663	10,949
1982	10,857	11,055	10,868	11,811	11,082	11,480
1983	10,945	11,266	11,500	12,137	11,463	12,098
1984	11,972	12,323	12,494	13,022	12,452	13,114
1985	12,606	12,967	13,250	13,813	13,171	13,896
1986	13,288	13,509	13,914	14,476	13,864	14,596
1987	14,028	14,100	14,630	15,089	14,624	15,472
1988	14,662	14,774	15,452	15,759	15,258	16,489

* Per capita income for the region is not to be derived from the individual per capita figures above. Rather, it is derived by dividing regional income by the regional population figure.

Source: Bureau of Economic Analysis, U.S. Department of Commerce.

Per Capita Income Growth Table 2-17 shows the per capita income growth in this region, as compared to the United States. The regional per capita income growth is generally somewhat lower than income growth in the United States. The region's per capita income growth is also slightly more variable than the nation's growth rates.

The average annual per capita income growth rate for Region VII, from 1980-1988 is 6.4 percent. This number should not be viewed as predictive in any way. The more pertinent

Table 2-17 Per Capita Personal Income Growth Rates

Year	Region VII	U.S.A.
1980-81	+.124	+.104
1981-82	+.039	+.048
1982-83	+.034	+.054
1983-84	+.086	+.084
1984-85	+.058	+.060
1985-86	+.053	+.050
1986-87	+.055	+.060
1987-88	+.043	+.066

data would be those growth rates for the last two years, 5.5 percent and 4.3 percent respectively.

Other Measures of Income

Relative income levels may be seen by looking at the average manufacturing wage among regions. With a national index average at 1.00, the Great Lakes states paid a relative wage of about 1.1, whereas the Plains states paid a relative average of only 0.96. Iowa's relative manufacturing wage is about 1.02.[19]

Although income data for 1983 and 1984 may have been skewed due to the infusion of large agricultural subsidy payments through the "PIK" (Payment-in-Kind) program, by 1985, agricultural subsidies and federal transfer payments, taken as a whole, do not seem to be out of balance with federal tax collections in the respective states of the region.

Summary of Economic Trends

Regional growth of income and employment continues to lag behind the nation as a whole, as it did throughout much of this decade. The underlying indicators of economic performance of the region's economy, however, have improved significantly in the period from 1986-1989. Analysts predicted continuing slow growth for the region for 1989. The growth will probably be most evident in agricultural income and manufacturing employment.[20]

For 1988 and 1989, some areas of every state in Region VII were hit hard with a combination of drought and a farm recession. The severe financial and liquidity crises in agriculture and their attendant bankruptcies on the farm and on main street seem to have been relieved in the last two years, with solid farm incomes and modest increases in farmland values.

These improved trends were also augmented by significant increases in export demand for the region's agricultural and food products. However, the outlook for raw bulk commodities, such as wheat, corn, and soybeans, still remains mixed. The region and the nation still retain huge stocks of grain, in spite of the drought. Even with strong export markets for grain, the weak grain prices have done little to net exports. Although the value of the dollar fluctuated significantly in world financial markets in the 1986-1989 period, it seemed to have little effect on net export value.

Missouri, with the most broadly diversified economy, would be expected to outpace employment and income growth figures for the other three states. Based on the information presented in this chapter, this is just what has happened, at least since 1984.

A resurgence in manufacturing in the region, especially in high-technology manufacturing and food-related manufacturing and processing, is evident. Although this has been shared by all four states, it is most dramatic in Iowa and Missouri. Recent manufacturing income growth rates in those states have exceeded 6 percent annually. This trend, if it continues, would foretell roughly equivalent increases in demand for transportation of manufactured goods, including unassembled parts and components coming into the region, as well as finished goods leaving the region by truck or rail.

Endnotes

1 Iowa Department of Economic Development, "Announcement" (October, 1989).

2 Mid-year estimates by the U.S. Bureau of the Census, Washington, D.C.

3 U.S. Department of Commerce, Bureau of the Census, Historical Statistics (Washington, D.C., USGPO), Vol. I, P. 457; and U.S. Department of Agriculture, Agricultural Statistics, (Washington, D.C., USGPO, 1986), p. 382.

4 Office of the Governor of the State of Kansas, The State of Kansas Economy, 1988-1989, Topeka, Kansas (1989).

5 The Federal Reserve Bank of Chicago and Iowa Business Council, The Iowa Economy: Dimensions of Change, Chicago, The Federal Reserve Bank of Chicago, (1987), p. 71.

6 U.S. Department of Commerce, Bureau of the Census, U.S. Census of Population, 1980, Washington, D.C., USGPO, (1981).

7 Mark Drabenstott and Lynn Gibson, eds., Rural America in Transition, (Kansas City, Mo., The Federal Reserve Bank of Kansas City, April, 1988), p. 62.

8 Office of the Governor of the State of Kansas, p. 5.

9 The Federal Reserve Bank of Chicago and the Iowa Business Council, p. vii, Their data are from the U.S. Department of Commerce, Bureau of the Census, Census of Manufacturers, (Washington, D.C., USGPO, 1984).

10 New Seed for Nebraska: Strategies for Building the Next Economy (Menlo Park, CA., S.R.I., International, 1987), p. 1.

11 New Seeds for Nebraska: Strategies for Building the Next Economy, pp. 7-11.

12 Ibid.

13 The Federal Reserve Bank of Chicago and Iowa Business Council, p. 16. Data from the U.S. Department of Labor, Bureau of Labor Statistics.

14 Ibid, p. 6.

15 The Federal Reserve Bank of Chicago and Iowa Business Council, pp. 26 and 28. Data from the U.S. Department of Commerce, Bureau of the Census, County Business Patterns.

16 Total personal income (by place of residence) is derived by taking total earnings by place of work, less personal contributions for social insurance, plus an adjustment for location of resident, equals: net earnings by place of residence; plus dividends, interest,

and rent, plus transfer payments, equals: total personal income. See: U.S. Department of Commerce, Local Area Personal Income (Washington, C.C., USGPO, July, 1988), Vol. 3, p. 15.

17 Office of the Governor of the State of Kansas, pp. 23-24.

18 U.S. Department of Commerce, Bureau of Economic Analysis. This is also the source for this section's graphic representations entitled "Per Capita Income" and "Per Capita Income Growth."

19 The Iowa Economy, p. xiii. The Federal Research Bank of Chicago and The Iowa Business Council, data from the Bureau of Labor Statistics.

20 Tim R. Smith, "The Tenth District Economy: Trailing the Nation," Economic Review - Federal Reserve Bank of Kansas City (Kansas City, Mo., The Federal Reserve Bank of Kansas City, December 1988), p. 19.

Chapter Three
Federal and State Economic Regulatory Policy Changes in Surface Transportation Since 1980

The late 1970s and early 1980s will be remembered as the time of economic deregulation of the transportation industries in the United States. The breadth and depth of federal regulatory reform in the transportation industries surprised even the most ardent advocates of deregulation. The major regulatory reform legislative actions include the Railroad Revitalization and Regulatory Reform Act of 1976, the Federal Aviation Act of 1958 (Amended)-Insurance Risks Act of 1977, the Airline Deregulation Act of 1978, the Motor Carrier Act of 1980, the Staggers Rail Act of 1980, the Household Goods Act of 1980, and the Bus Regulatory Reform Act of 1982. The freight forwarder component of the industry was deregulated in 1986.

This chapter focuses on the nature and extent of the economic regulatory reforms at the federal and state levels in the trucking and rail industries. First, at the federal level, the chapter defines the framework for regulation and how it has been applied. Then, statutes enacted to reform federal regulation are examined as well as their application. Next, intrastate regulation of motor carriers is reviewed and the reforms that have taken place on the state level are investigated. A comparison of the four states in Region VII provides a contrast of the diverse paths taken by states to deal with intrastate regulation in the face of the 1980s reform movement. Lastly, the chapter examines the role of states in intrastate regulation of rail carriers.

Definition of Economic Regulation

Regulation is any attempt by government to control or alter the behavior of firms or individuals. Business regulations can usually be classified as either social or economic -- the latter type being the focus of this chapter.

Economic regulations concern the control of one, some, or all of the following: entry into and exit from the industry or a particular market, prices, certain dimensions of service, and selected financial transactions such as the issuance of stock. To administer these economic regulations, Congress has established a number of regulatory commissions or

agencies such as the Interstate Commerce Commission (ICC), Federal Maritime Commission, Federal Deposit Insurance Corporation, and the Securities and Exchange Commission. Many of these are designed to administer regulations to a particular industry. But there are exceptions such as the Federal Trade Commission, which has some regulatory oversight over almost all industries.

On the other hand, social regulations concern safety, employment fairness, health, and other noneconomic issues. Regulations and regulatory agencies were established to eliminate or mitigate the dangers and inequities to employees (e.g., the Occupational Safety and Health Administration), consumers (e.g., the Consumer Product Safety Commission), and the general public (e.g., the Environmental Protection Agency). Unlike the economic regulatory agencies, the focus of social regulatory agencies is not limited to a single industry. Yet, in certain respects, social regulators operate in a narrower sphere. They are not concerned with the totality of a company or industry, but only with one segment of operation that falls under their jurisdiction. These social regulations may have significant economic effects on the firms regulated.

In the area of transportation, carriers are faced with social regulations issued by the Federal Aviation Administration, the Federal Railroad Administration, and the Federal Highway Administration, all under the administrative framework of the U.S. Department of Transportation (DOT). In addition, transportation firms are faced with social regulations issued and administered by agencies having authority over all industries. For example, the trucking industry must abide by the relevant regulations issued by the Environmental Protection Agency, the Occupational Safety and Health Administration, and others.

Rationale for Economic Regulation

Several basic views exist on why governments in the United States establish economic regulations for the business sector. The "public interest" or "consumer protection" rationale holds that regulation is legislated in response to the public demand for the correction of inefficient or inequitable market practices. There is a "market failure" in the classical sense, i.e., monopoly elements in the market prevent competitive price and output levels from being realized. Regulation is established to protect the public from the adverse effects of monopoly. The market-determined prices or services may also be viewed as inequitable or inconsistent

with political objectives. Nationalizing the industry, which is an alternative to establishing economic regulations, is normally considered to be too extreme. Relying upon existing antitrust laws instead of economic regulations may be considered ineffective.

Another rationale holds that regulation is procured by politically effective groups, usually assumed to be composed of the members of the regulated industry itself, for their own protection or enhancement. Regulations are established under this rationale to restrict or prevent entry and to allow higher prices, more discrimination, and larger profits than would exist under an unregulated situation. This view is sometimes referred to as the "capture" or "producer protection" rationale.

A third view states that neither rationale adequately explains a very common phenomenon of regulated industries. That is the deliberate and continued provision of many services at lower rates and in larger quantities than would be offered in an unregulated competitive market or in an unregulated monopolistic market. In short, this view argues that one of the functions of regulation is to perform distributive and allocative chores usually associated with the taxing or financial branch of government.

This "internalization of subsidies" rationale does appear to explain several legislative actions establishing regulation of certain modes of transportation. Primary to this rationale of economic regulation is the regulation of entry. Regulation of entry allows a firm to earn excess profits in certain markets which it can use to subsidize markets or routes which are not or cannot be profitable. Also common in these regulated environments is the existence of the duty to serve and the regulatory power over abandonment of service. The regulation of airlines and trucking before regulatory reform had elements of this rationale.[1]

Nature of Federal Economic Regulation Prior To Regulatory Reform

The nature and scope of regulation just before the regulatory reform process began can be illustrated by examining the most important provisions of the Interstate Commerce Act. These provisions pertained to the regulation of: (1) rates, (2) entry and exit, (3) service, and (4) mergers.

Regulation of Rates

Rate regulation addressed two major issues: (1) reasonableness of the rate, and (2) rate discrimination. The reasonableness of the rate referred to whether the rate was unreasonably high or unreasonably low. Both maximum rate and minimum rate regulation existed for all rail rates and all motor common carrier rates. Only minimum rate regulation existed for contract motor carriers.

With respect to the regulation of rate discrimination, the law prohibited personal discrimination by railroads and contained a blanket prohibition of all forms of undue preference or advantage and any undue prejudice or disadvantage on the part of railroads with respect to place and commodity. The railroads were also prohibited from practicing long-and-short-haul rate discrimination unless specifically approved by the ICC. Although a less important issue for shippers using trucking, the discrimination provisions also applied to the motor common carrier industry. There were no specific regulations relative to rate discrimination by contract carriers.

All railroad rates and all regulated trucking rates had to be published and any deviation from these published rates was strictly prohibited. The requirement that rates had to be published was included to help enforce the regulations pertaining to discrimination and reasonableness of the rate. In addition, all rates had to have 30 days public notice before the rate could be implemented. This allowed all interested parties -- normally shippers for maximum and discriminatory rate issues and other carriers of all modes for minimum rate issues -- to file a protest with the ICC.

During this time period, a related and important issue was the role that rate bureaus played in the regulation of railroad and trucking rates. Rate bureaus, which are organized by mode and by region, are institutions through which collective ratemaking was, and to some degree, remains to be practiced in the United States. Literally thousands of rates were filed with the ICC each year. Given the size of staff and budget of the ICC, it would not have been possible for it to review even a significant percentage of the rates filed. Of course, the case law and the rulemakings from the ICC provided guidelines to carriers on what rates would likely be acceptable to the ICC and, thus, rates not meeting ICC guidelines might not be filed. Rate bureaus served to screen many of the rates proposed that would have been protested at the ICC and thus served as first-line regulators. Carriers that opposed another

carrier's proposed rate would first protest and vote against the rate at the rate bureau level. The rate bureaus' procedures and standards were regulated by the ICC, however, and thus the ICC indirectly regulated all rates.

Regulation of Entry and Exit

In the height of regulatory oversight of the railroad industry, both rail entry and exit were highly regulated. Although construction of new lines was virtually non-existent in the 1900s, the acquisition of rail lines by a railroad or the use of other means to enter into new markets was not allowed unless the railroad was issued a certificate of public convenience and necessity. The abandonment of a rail line, though possible, was regulated -- and some have argued inhibited -- by the nature of the standards and the costs involved in the regulatory process of abandoning a line.[2]

The cornerstone of the economic regulation of trucking, an inherently competitive industry with relatively easy entry, was the regulation and control of entry. The entry standards, both to get into the industry and into new markets, differed between motor common carriers and motor contract carriers, with the former facing a more difficult standard. Both types of carriers had to be found by the ICC to be "fit, willing, and able," which was determined by examining the applicant's financial resources, past violations of the Interstate Commerce Act, experience and skill of the personnel, and the insurance coverage held by the person or firm.

If a contract carrier successfully passed the "fit, willing, and able" test, it had to obtain a permit for the proposed service. That required showing that the proposed service was consistent with the "public interest" and the national transportation policy. A common carrier's second test was obtaining a certificate of public convenience and necessity, which required evidence that the proposed operation was required by the "public interest" and the national transportation policy, a much more difficult standard as interpreted and implemented by the ICC.

Regulation of exit was a minor aspect of economic regulation of trucking in the United States. Although a motor common carrier was by law required to seek and receive permission from the ICC should it wish to terminate service at a particular community, many carriers did not seek or receive such permission and simply let the operating rights for that part of their

service become dormant. The ICC had the power but never used it to revoke a carrier's operating certificate for not serving a community listed in its operating certificate.

Regulation of Service

For railroads, the regulation of service pertained to the regulatory efforts by the ICC to ensure that the railroads provided adequate service and did not discriminate in providing service. The ICC had regulatory jurisdiction over several facets of railroad freight service. For example, the ICC could order railroads to deliver freight cars to other railroads and to hasten repair work on out-of-order cars. The ICC also had substantial authority to prescribe per diem and demurrage charges. The ICC also could require two or more railroads to jointly use the same terminal facilities, to enter into joint switching agreements, to establish interchange facilities with one another, and to interchange freight with one another by establishing through routes and joint rates. In addition, the ICC regulated the construction of switch connections with private sidings, extension of credit to users, and diversion and reconsignment of freight. Regulations pertaining to loss and damage claims also existed which made the railroad responsible for all loss and damage in all but a few situations.

The Interstate Commerce Act was less specific about the regulation of motor carrier service than it was about the regulation of rail service. Motor common carriers were required to provide safe and adequate service, equipment, and facilities for the transportation of persons or property. The ICC interpreted the law to require the motor common carrier to serve all the points listed in its operating certificate but did not regulate the various dimensions of service such as the frequency of service and the type of equipment used.[3] The terms of the extension of credit were also regulated for motor common carriers. The motor common carriers had the same regulations as the railroads with respect to the handling of loss and damage claims. In contrast to the rail situation, the ICC could not compel one motor carrier to interchange or "interline" traffic with another motor carrier. Service by contract carriers was specified by agreement between the carrier and the shipper and was not regulated by the ICC.

Regulation of Mergers and Acquisitions

Both railroads and trucking firms were highly regulated with respect to their merger and acquisition activities. Mergers approved by the ICC were exempt from antitrust laws. During this time period, the ICC used the Interstate Commerce Act to determine if proposed rail-rail mergers should be allowed and whether or not to attach conditions to the mergers. The ICC was criticized for its rail merger regulatory actions, largely on two aspects. First, the ICC required in many cases that the merged carrier keep all of the pre-merger routes open although certain routes would be duplicates. Secondly, the ICC decisions were often delayed for long periods of time -- with several cases taking longer than five years. Almost all of the trucking mergers were approved by the ICC.

During this time period, the ICC interpreted and implemented the laws in such a manner that railroads were effectively prohibited from acquiring non-rail transportation companies. The Panama Canal Act of 1912 prohibited rail acquisitions of water carriers using the Panama Canal and severely restricted rail acquisitions of water carriers operating on the inland waterway system. As of 1978, only two relatively minor barge lines were controlled by railroads.

The Motor Carrier Act of 1935, as amended, placed certain restrictions on rail acquisitions of trucklines. The ICC established certain standards through case law based on the Interstate Commerce Act that required railroad-owned trucking operations to be used in an auxiliary and supplemental manner to the rail operations. Rail acquired trucking firms could not provide direct service between two points served by the acquiring railroad. The trucking firms could only provide pickup and delivery service in conjunction with rail service.

Nature and Extent of Regulatory Reform

The thrust of regulatory reform in both railroad and trucking industries was toward more reliance on market forces and reduced dependence upon the decisions of the ICC. Neither industry was totally deregulated. Arguably the trucking industry was deregulated more than the rail industry, but neither was deregulated to the degree that the airline industry was in 1978. Although neither the rail nor the trucking industry was deregulated totally, the terms of "deregulation" and "regulatory reform" are used interchangeably in this chapter.

In addition, although the basic changes in the nature and scope of economic regulation resulted from legislative changes, many significant changes were made administratively by the ICC, particularly in the case of trucking. In the trucking area, the ICC had eased entry regulations, reduced the anticompetitive aspects of the rate bureaus, eliminated certain restrictions in operating authorities, and expanded commercial zones. These changes took place before regulatory reform legislation had been passed by Congress.

The two industries differed in several important ways with respect to the regulatory reform movement:

- The rail industry was more pervasively regulated before regulatory reform was started.
- The rail industry supported the move toward deregulation while the trucking industry did not.
- The basic statutory changes for rail regulation resulted from two pieces of legislation -- the Railroad Revitalization and Regulatory Reform Act and the Staggers Rail Act, with the latter being more important. Regulatory reform for the trucking industry resulted from only one piece of legislation, the Motor Carrier Act of 1980.

Nature of Economic Regulatory Reform for Railroads

Although the Staggers Rail Act (Staggers Act) is considered the statutory foundation for much of the regulatory reform in the rail industry, the first "regulatory reform" act was the Railroad Revitalization and Regulatory Reform Act (4-R Act). The 4-R Act was a comprehensive act that explicitly recognized the railroads' need for adequate revenues and that railroads did not have monopoly power in many of the markets they served. The law was geared to give railroads more commercial freedom in several areas including the key areas of ratemaking, mergers, and abandonments. Despite the promise that the 4-R Act held for meaningful regulatory reform, the restrictive interpretation and implementation of it by the ICC, and to a lesser extent, the contradictions in the law itself, prevented substantial reform from taking place.[4] The Staggers Act reflects the most dramatic change in federal policy with respect to rail regulation since the 1887 Act to Regulate Commerce. In fact, some have argued that its nature and impact are more dramatic since the 1887 Act to Regulate Commerce

adopted many of the common carrier precepts in existence at the time.[5] This review will focus on the most important provisions of the Staggers Act.

New Regulatory Policy The Staggers Act established a separate policy for the rail industry. The purpose of the act was to provide for the restoration, maintenance, and improvement of physical facilities and financial stability of the railroad system. Revenue adequacy for the rail system was clearly the act's primary goal. Among the other goals was the provision of a regulatory process that balanced the needs of carriers, shippers, and the public. Much of the controversy of the ICC's implementation of the Staggers Act involves certain shippers' complaints that this balance has not been maintained with the "captive shipper" not being protected. Underlying this new rail regulatory policy is the Congressional presumption that most of the transportation within the United States is competitive.

Rates and Ratemaking Provisions The Staggers Act, building upon the concepts and standards introduced in the 4-R Act, made it more difficult for the ICC to find a rail rate to be too low, too high, or unreasonably discriminatory.

The concept of market dominance has played a pivotal role in reducing the ICC's jurisdiction in regulating railroad maximum rates. The concept, which was first introduced in the 4-R Act, states that the ICC will not intervene to rule on a maximum rate issue if the railroad is not market dominant of the traffic under question. In contrast to the 4-R Act, which left total discretion to the ICC to determine when a railroad is market dominant, the Staggers Act established a revenue-to-variable cost standard that must be exceeded before the carrier can be found to be market dominant. If the shipper fails to show that the railroad's rate exceeds the cost recovery percentage, the ICC loses jurisdiction over the rate under issue. If the rate is shown to exceed the threshold test, then the shipper must prove that the carrier is market dominant on the traffic in question.

As a result of the Staggers Act, the ICC issued new market dominance standards in 1981 which have made it more difficult for shippers to show that the railroad has market dominance. The ICC now determines if the railroad has effective competition for the traffic at issue based upon its evaluation of evidence on intramodal, intermodal, geographic, and product competition. If the shipper can't show that the carrier has market dominance, it loses its protection on the traffic under question. If it can prove market dominance, the ICC retains

jurisdiction over the rate and the carrier then must be found to be charging an unreasonably high rate.

The standard for finding rates unreasonably high, which had been developed through ICC case law, was also slightly altered by Congress in a manner that might be viewed as favoring the railroads. The ICC has issued a number of decisions since 1980 in cases and rulemakings that have made it more difficult for shippers to prove a rate is unreasonably high. In 1985, the ICC issued its final guidelines on maximum coal rates called "Constrained Market Pricing" (CMP). These guidelines are based on the Ramsey Pricing concept with some constraints and thus are demand-oriented. The ICC introduced the controversial "stand-alone cost" constraint in this decision which coal shippers viewed as meaningless as a constraint on rail rates. In 1986, the ICC started the process of extending the CMP guidelines to other commodities.

In short, the Staggers Act, and the ICC interpretation and implementation of it, have led to two developments that tend to favor the railroads over the shippers. First, the scope of the ICC's jurisdiction over maximum rate cases has been narrowed substantially. Second, even in cases in which the ICC has retained jurisdiction, the chances of a shipper's winning the case have been reduced.

The Staggers Act essentially confirmed the 4-R Act with respect to the minimum rate standards. The standard established in the 4-R Act was any rail rate that exceeded the variable cost for the service was lawful. The ICC established a presumptive cost floor defined as the sum of the line-haul cost of lading, applicable switching costs, and station clerical costs as the standard of reasonableness. The railroads felt that for many years they were unable to lower their prices sufficiently to capture a lot of traffic moving by truck or barge. The ICC's preference before regulatory reform was to use the fully-allocated cost standard in minimum rate cases.

In many ways, the most dramatic change in policy in the Staggers Act did not concern maximum or minimum rates but addressed the issue of what constituted unlawful discrimination. The regulatory policy conflicts between the discrimination provisions of the Interstate Commerce Act and the ratemaking freedoms introduced by the 4-R Act limited the 4-R Act's impact on regulatory reform. Although the basic discrimination provisions of the Interstate Commerce Act were not altered by the Staggers Act, their application was limited

to fewer situations. For example, the Staggers Act removed the application of the discrimination provisions from situations involving contract rates, surcharges and cancellations of routes, separate rates for distinct services, and rail rates on different routes. Before the Staggers Act, shippers could use the discrimination provisions to effectively protest and block an innovative rate that was not provided to all similarly situated shippers.

Closely related to the new policy on discrimination was the policy that endorsed the railroads' use of contract rates, possibly the most significant regulatory reform introduced by the Staggers Act. The 4-R Act did not address this issue. The ICC historically denied the railroads the right to use contract rates on the basis that they were discriminatory and reflected unfair competition.

Congress drafted and the ICC implemented the contract rates provision in a way that encourages the use of contract rates. Except for a contract involving agricultural commodities, a contract can be challenged by a shipper only on the grounds that the contract unduly impairs the ability of the contracting carrier to meet its common carrier obligations to the plaintiff. A contract for the transportation of agricultural commodities may be challenged on two additional grounds.

Rail contract rates in the United States are highly confidential with only a minimum amount of information provided to the public. The contract itself is filed with the ICC. At present contract rates can be implemented on a one-day notice.

The impact of contract rates on carrier operations and shipper-carrier relations has been substantial. Shippers and carriers from other modes opposed this provision and the manner in which it was implemented. The use of contract rates removes a substantial portion of rail traffic out of all ICC regulation.

The Staggers Act slightly increased the restrictions on railroad rate bureaus, restrictions that were first instituted by the 4-R Act. Each of the big three railroad rate bureaus had to alter their practices. Key changes were that the railroads could no longer discuss and vote on single-line rates and only those carriers that could practicably participate in a joint-line movement could vote on a proposed rate. Rate bureau activities for railroads have been effectively eliminated.

Exemptions from Regulation A major regulatory reform provision of the 4-R Act allowed the ICC to exempt from economic regulation any rail service if the ICC ruled that

regulation was not necessary to carry out the national transportation policy, was limited in scope, or was not necessary to protect shippers from market abuse by the railroads. The Staggers Act strengthened the provision with a clear Congressional intent that the ICC should use the exemption provision liberally.[6] Before the Staggers Act, the ICC had only exempted rail movements of fresh fruits and vegetables. Since 1980, reflecting both the more pro-deregulation commissioners and the policy goals of the Staggers Act, the ICC has exempted from economic regulation several types of rail traffic including piggyback, boxcar, and export coal. The ICC ruling which exempted export coal was later overturned by the federal courts in 1985. These movements are virtually free of economic regulations except for some that operationalize the common carrier duty to deliver, i.e., regulations dealing with loss and damage procedures, and labor protection requirements.

Unilateral Actions on Joint Rates/Through Routes Before regulatory reform, joint rates could not be changed by an individual carrier participating in a joint-line movement without the concurrence of all participating carriers. The Staggers Act allowed a carrier to raise rates unilaterally on joint-line movements if the carrier instituting the surcharge was earning less than 110 percent of its variable costs. In addition, a carrier could cancel joint rates and through routes under certain conditions.

The impact has been dramatic. It has affected both the level of intramodal competition in the rail industry and the ability of the railroads to operate as a system. Although the Staggers Act did not remove reciprocal switching agreements from regulatory control, the ICC's liberal policy allowing carriers to institute high switching charges and to cancel switching agreements has added to what many see as anticompetitive problems in the rail industry. In 1985, the ICC adopted new standards with respect to cancellation of joint-line rates and through routes and reciprocal switching agreements in an attempt to reduce the anticompetitive concerns expressed by certain shippers.

Rationalization of Rail System Mergers and abandonment are the primary ways to restructure the rail system to reflect current market conditions. The major changes in these areas were established by the 4-R Act although the Staggers Act provided some additional, primarily procedural, regulatory reform. Despite the lack of a substantive statutory change to the merger approval standards, the ICC has used the regulatory reform environment to approve almost all rail mergers since 1980. Although neither the 4-R Act nor the Staggers Act clearly

suggests a substantive easing of abandonment controls, these laws have been used by railroads to propose more lines for abandonment and by the ICC to approve more abandonments during the last 10 years.

Nature of Economic Regulatory Reform for Trucking

The Motor Carrier Act of 1980 (MC Act) provided the statutory changes in the Interstate Commerce Act that established the foundation for economic regulatory reform for the trucking industry. The household-goods moving sector of the industry was not affected by the legislation. In October of 1980, Congress passed a law -- the Household Goods Transportation Act -- that specifically addressed the concerns of that portion of the trucking industry. In addition, the motor carrier passenger component, that is, the intercity bus industry, was not affected. The Bus Regulatory Reform Act, which substantially deregulated the intercity bus industry, was not enacted until 1982.

The provisions of the MC Act addressed many different issues. But the most important ones directly or indirectly dealt with the regulation of entry and rates (and ratemaking). In addition, many operating restrictions on motor carriers were eased or eliminated which greatly increased the amount of competition and efficiency in the industry.

New Regulatory Policy The ICC has relied upon several of the policy goals expressed in the MC Act, and the Staggers Act, to support regulatory reform decisions. The philosophy of the MC Act was reflected in the "Purpose of the Act" section where it stated the new law is part of the continuing effort by Congress to reduce unnecessary regulation by the federal government. The MC Act noted that the existing (before 1980) protective regulation had resulted in some operating inefficiencies and some anticompetitive pricing. The MC Act established a separate policy for motor carriers of property with a variety of goals for the trucking industry. The emphasis of these goals was on efficiency and competition. This emphasis not only sharply contrasted with the one of the Motor Carrier Act of 1935, but also differed from the policy section of the Staggers Act which emphasized revenue adequacy for the carriers.

Entry Provisions Both the substantive standards and the procedures for entry were changed by the MC Act to make entry easier -- both into the industry and into new markets by existing firms. Historically, firms applying for a common carrier operating certificate had

to pass two tests: (1) the fitness test, and (2) the public convenience and necessity test. Although the fitness test -- which is a much less demanding standard -- was not altered, the public convenience and necessity test was changed substantially.

The applicant now must show only that the proposed service will serve a useful public purpose (instead of the more demanding standard that the service is required by the public convenience and necessity) and will be responsive to the public demand or need. A major procedural change established was that the carriers protesting the application now have the burden of proving that the proposed service is inconsistent with the public convenience and necessity. The entry standards used since 1936 by the ICC, the Pan American standards, were essentially discarded by Congress.

The ICC has essentially deregulated entry de facto by its very liberal interpretation and implementation of the entry standards. It has granted many carriers nationwide authority without restrictions. The courts have overturned several of their entry regulations on the basis that the regulations promulgated by the ICC implemented more regulatory reform than intended by Congress.

Rates and Ratemaking Provisions Although less dramatic than the substantive changes in the area of entry regulations, Congress did make meaningful changes in the area of rates and ratemaking. For example, common carriers were granted greater freedom to set rates without ICC regulatory oversight by the zone of rate freedom concept. This concept stated the ICC could not suspend, investigate, or revoke a rate on the basis that it was too high or too low if it was within plus or minus 10 percent of the existing rate. The upside constraint of 10 percent would be later adjusted for the rate of inflation. In addition, the individual common carriers could offer released rate alternatives, which would reduce the loss-and-damage responsibilities of the carrier, without ICC approval. The ICC has used the rate provisions in the MC Act to approve about all proposed rate reductions and discount rates. The existence of unreasonably high rates has not been a problem in the trucking industry.

With regard to rate bureaus, the MC Act prohibited carriers from establishing, discussing, and voting on single-line rates after July 1, 1984. In addition, the right of independent actions was reinforced and voting on rates was restricted to those who were legally able to provide service on the traffic under question. In short, the power and activities of rate bureaus were curtailed although not as much as the railroad rate bureaus were by the

rail regulatory reform legislation. The rate bureau provision of the MC Act also established a Motor Carrier Ratemaking Study Commission which was given the task of studying the need for continuation of collective ratemaking in trucking and making a recommendation to Congress. Incidentally, this commission recommended that the antitrust immunity should be eliminated which would effectively eliminate collective ratemaking in the trucking industry.[7]

Elimination of Operating Restrictions Provision Although too numerous to review individually, these provisions collectively injected a substantial amount of competition into the trucking industry. One of the more important provisions required the ICC to eliminate gateway and circuitous route limitations that had existed on operating authorities since 1935. In particular, the provision compelled the ICC to broaden the restrictive categories of goods allowed to be transported by a particular carrier, remove restrictions against serving intermediate points, convert all one-way authorities to round-trip authorities, and eliminate narrow territorial limitations and other restrictions wasteful of fuel, inefficient or contrary to public interest. Another provision allowed carriers to haul regulated and exempt goods in the same vehicle. In addition, the exemption provision was broadened to include more commodities and trucking services incidental to air movements. Furthermore, contract carriers, which historically had been restricted to serving eight or fewer shippers, were allowed under the MC Act to service an unlimited number of shippers in the commodity grouped served. Finally, the MC Act allowed a single carrier to have both contract-carrier and common-carrier operations in the same geographical area a change that has injected substantial price competition and price discounting into the trucking industry

Nature of Regulatory Reform: Intermodal Transportation

Both the Staggers Act and the MC Act amended the Interstate Commerce Act in a way that provided for an environment that supports both the substitution of one mode for another and the use of intermodal transportation. The intent of Congress with respect to intermodal transportation is clearly expressed in policy sections of both statutes. The MC Act added the provision to the National Transportation Policy which stated that its goal was "to promote intermodal transportation."[8] The Staggers Act added to the Rail Transportation Policy the phrase "to ensure effective competition and coordination between rail carriers and other modes."[9] The regulatory reform legislation has improved the environment for intermodal

transportation in two basic ways: (1) by enhancing the ability of existing carriers of different modes to provide intermodal transportation, and (2) by making it easier for the formation of transportation companies providing service by more than one mode.

Examples of the first approach of improving the environment includes the ICC's use of the exemption provision of the Staggers Act to exempt economic regulation of transportation that is provided by a rail carrier as part of a continuous intermodal movement. The exemption decision by the ICC has been credited as the primary reason for the growth of piggyback movements in the United States in the last several years. The MC Act exempted from regulation "transportation of property by motor vehicle as part of a continuous movement, which has been or will be transported by air carrier."[10] The CAB had previously specified a thirty-five mile radius limit around airport cities for surface pickup-and-delivery services as part of air transport movement and amended its regulations in October, 1981, as a result of this provision.

In addition to these legislative changes, the ICC has recently decided cases with respect to the formation of transportation companies that should increase the amount of intermodal transportation. The pre-1980 policy opposing common ownership and, thus, mergers creating integrated "transportation companies," has been viewed as negative and restrictive.[11] The general policy had been to confine transport ownership to modal boundaries. Although no provisions in the regulatory reform legislation specifically addressed intermodal mergers or transportation companies, the ICC used the general regulatory reform provisions of the acts passed in 1980 to change its long-standing policy with respect to rail ownership of trucklines and bargelines.

The ICC was granted authority over rail-barge mergers in the Panama Canal Act of 1912, eight years before it was granted complete authority over railroad mergers. The Panama Canal Act amended the Interstate Commerce Act and made it unlawful for any railroad to own, lease, operate, or control any water carrier carrying freight or passengers through the Panama Canal or elsewhere with which such railroad does or may compete. A railroad was allowed to continue to own a competing water carrier purchased before 1912 if the water carrier did not operate through the Panama Canal and if the water carrier was operated in the public interest advantageously to interstate commerce and allowed competition, without reduction, on the water route under consideration. The Transportation Act of 1940 authorized

the ICC to approve new acquisitions by a railroad of a competing water carrier not using the Panama Canal subject to these same standards.

The Panama Canal Act has survived numerous attempts in Congress to modify or eliminate it and remains the major statute guiding ICC policy on rail-barge mergers. The Panama Canal Act, now Section 11321 in the Interstate Commerce Act, along with the less demanding section 11344, provides the statutory framework for rail-barge rulings. Using these statutes, the ICC did not allow a major rail-barge merger until after 1980.

In September 1984, the ICC unanimously decided to approve the merger of the CSX Transportation, Inc. (CSX), the third largest railroad at the time, with the American Commercial Barge Lines, Inc. (ACBL), the largest or second largest bargeline at the time depending upon the measure used. Although this is the only rail-barge merger reviewed by the ICC since 1980, it was viewed by some as a dramatic shift in the ICC policy and an emasculation of the Panama Canal Act.[12] Although the ICC found that the CSX and ACBL did compete, it approved the merger based upon its determination that the CSX-ACBL operation would be effectively constrained from successfully engaging in any type of anticompetitive activity and thus would not reduce the competition on the water route in question.

It is not clear what impact this decision will have on the amount of rail-barge mergers in the future. No other rail-barge mergers have been proposed since the decision and its court review. It is clear that the ICC was influenced by the 1984 Department of Justice (DOJ) merger guidelines, which are pro-merger. In addition, the ICC stated it would examine transactions proposing rail-barge affiliations under the Panama Canal Act consistent with its established policies in Ex Parte No. 438, Acquisitions of Motor Carriers by Railroads, which made it easier for railroads to acquire motor carriers.[13]

The acquisition by a rail carrier of a motor carrier is governed by Section 11344(c) of the Interstate Commerce Act. The ICC gained control over rail-truck mergers with the Motor Carrier Act of 1935. This policy was slightly modified by the Transportation Act of 1940. The small number of rail-motor carrier firms suggests, and others have argued, that rail-truck merger transactions were limited by Section 11344(c) of the Interstate Commerce Act as interpreted by the ICC.[14] Since 1980, the ICC has been very active with respect to rail-truck mergers. In policy statements issued in Ex Parte MC-156, Applications for Motor Carriers

Operating Authority by Railroads and Rail Affiliates (1982), and Ex Parte 438, Acquisitions of Motor Carriers by Railroads (1984), the ICC eliminated the "special circumstances" policy which had been a presumptive policy against rail carriers acquiring trucklines and which had a chilling effect on the development of intermodal operations.

Within a month of the ICC decision in Ex Parte No. 438, the Norfolk Southern Corporation applied to the ICC to acquire control of North American Van Lines, Inc. for $315 million. The ICC approved the rail-truck merger in April of 1985 in an unanimous decision. The ICC also allowed the Union Pacific Railroad to acquire Overnite Trucklines. The court system overruled the ICC in both of these decisions but Congress included a provision in a nontransportation law that allowed these acquisitions to remain.

The ICC based its new policy on rail-truck mergers on several factors, including the new emphasis on competition and intermodalism in the Interstate Commerce Act resulting from the amendments added by the MC Act and the Staggers Act. In addition, in its analysis of the anticompetitive effects of the rail-truck mergers, the ICC relied heavily upon the 1984 DOJ merger guidelines.

Extent of Regulatory Reform: Motor Carrier and Rail Industries

Table 3-1 illustrates the impact of the deregulation movement in the rail and trucking industries on the amount of intercity freight transportation remaining under federal regulation. The figures in the table are based on the assumption that, if the carriers handling the traffic had to obtain federal operating authority and that the traffic moved under filed rates, the traffic was under federal regulation. From a practical standpoint, the percentages in the table overstate the amount of federal regulation since 75 percent to 80 percent of all rail traffic moves at rates less than 180 percent of variable costs -- and thus not subject to ICC jurisdiction on maximum rates. These rates can still be scrutinized by the ICC with respect to being too low and/or discriminatory. A sizeable volume of truck traffic moves on independent rates filed with the ICC on very short notice and thus is basically unregulated. Figure 3-1 illustrates the changes in the amount of regulation between 1980 and 1987.

Table 3-1 Regulated Freight Moving in Domestic Intercity Commerce

(Percent of Each Mode's Total Ton-Miles)

Year	Rail	Truck	Oil Pipeline	Rivers & Canals	Total Inter-City Freight
1970	100.0	40.5	85.1	15.1	59.0
1980	100.0[a]	43.6[b]	90.0	9.2	56.0
1981	91.0	43.1	90.0	8.6	52.9
1982	69.0	39.4	90.0	6.2	45.4
1983	54.0	33.6	90.0	6.9	40.6
1984	50.0	34.5	90.0	7.8	40.1
1985	48.0	33.8	90.0	6.0	38.8
1986	35.0	33.1	90.0	7.3	35.7
1987	32.0	33.0	90.0	7.9	33.9

[a] Figures based on assumption that rail contract rates were deregulated in 1980.
[b] Figures since 1980 reflect assumption that contract carriers are no longer regulated.
Source: Transportation in America, ENO Foundation, May 1989, page 15.

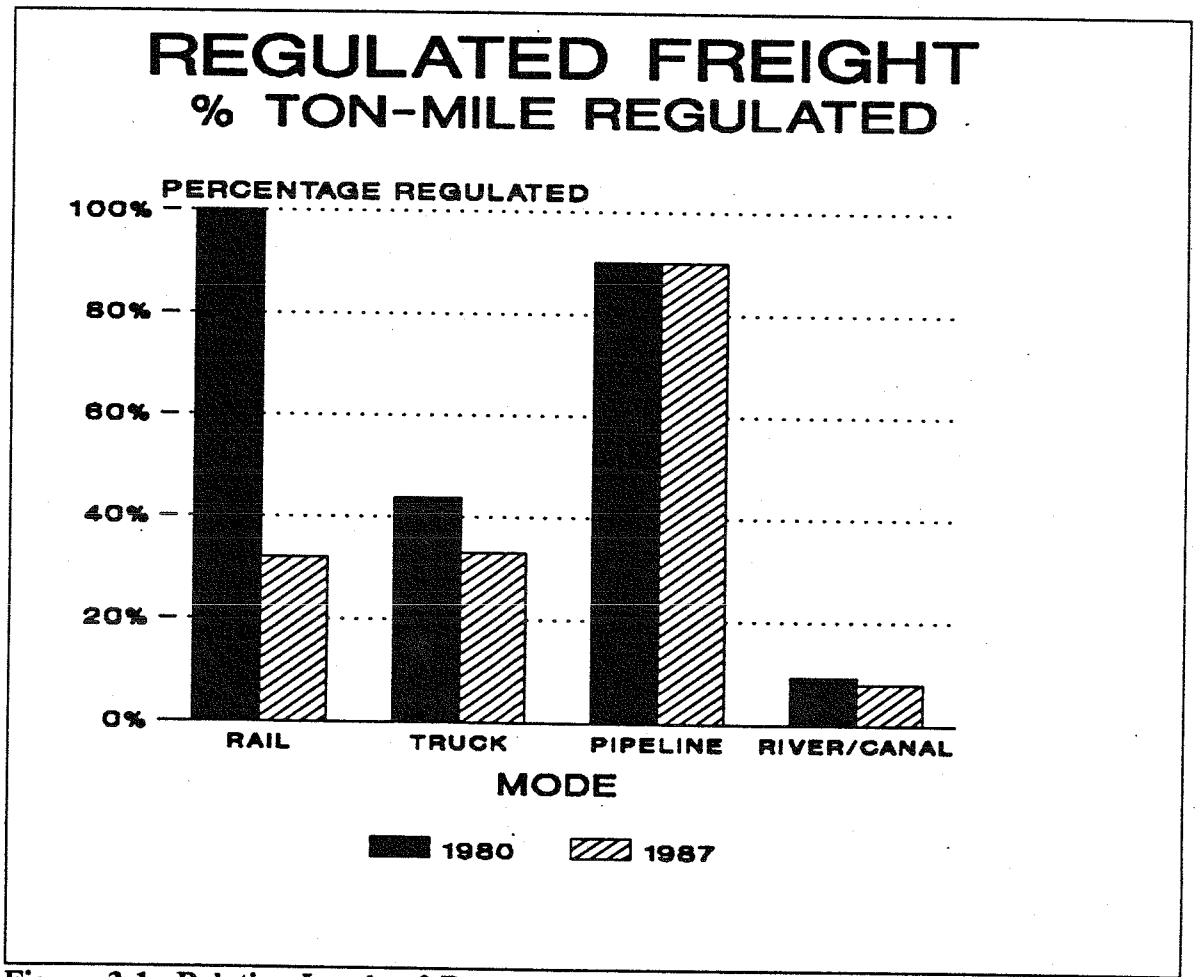


Figure 3-1 Relative Levels of Regulated Freight Moving in 1980 in Comparison to 1987

Changes in State Regulatory Policy Since 1980

Important regulatory issues are related to the regulation of transportation at the state level and the relationship between federal and state regulatory activities. Most of the states regulate intrastate railroad and trucking operators and the intrastate operations of interstate railroads and trucking firms. The commerce clause of the U.S. Constitution delegates the regulation of commerce between the states to the federal government and the regulation of the intrastate commerce is left to the states. A substantial amount of case law and literature exists on the conflicts between the ICC and the states with respect to the issue of which agency, the ICC or a particular state agency, has the primary jurisdiction in a particular situation. The regulatory reform legislation affected the state-versus-federal jurisdictional issue for railroad regulation and appears to have generated interest in reducing the role of the states in regulating trucking.

Intrastate Motor Carrier Regulation in Federal Region VII

The regulatory control of motor carriers was first undertaken at the state level. By 1933, 42 states had some type of economic regulation of the motor common carrier of property industry.[15] Although a mixture of motives existed for establishing legislation that created the state regulations of motor carriers, the prevalent idea was that motor carriers for hire should be regulated as common carriers, and the railroads fostered this idea.[16] The states' attempts to treat all for-hire trucking firms as common carriers for regulatory purposes were rejected by the U.S. Supreme Court. The Supreme Court did not challenge the rights of states to regulate common carriers and later approved the practice of regulating contract carriers -- under less stringent regulations.

Federal regulation of trucking was established in 1935 with the Motor Carrier Act. Both railroads and existing principal trucking firms pushed for federal regulation of trucking to curb the excessive amount of competition that existed at the time. Following the passing of the Motor Carrier Act of 1935, many states patterned their motor carrier regulations after the federal regulations, which were patterned after the existing federal railroad regulations. Intrastate economic regulation of the motor carrier industry was "remarkably consistent despite differing approaches to taxation, licensing, registration, safety, and other requirements" in the pre-1980 time period.[17]

In 1980, the federal motor carrier regulatory model changed substantially. The degree to which the states will follow this new approach -- which relies more on market forces and less on ICC edict -- for setting rates and service levels remains unanswered. While six states (Alaska, 1984; Arizona, 1981; Florida, 1980; Maine, 1982; Vermont, 1986; and Wisconsin, 1983) have virtually deregulated intrastate trucking since 1980 and two others (Delaware and New Jersey) historically have had little economic regulation, most of the 48 contiguous states, including the four states in Region VII, have some form of intrastate regulation.

The Transportation Lawyers Association's sixth annual study of states' motor carrier regulatory policies and legislation provides some insights on the degree to which the deregulation movement at the federal level has affected the regulation of motor carriers by the individual states. Highlights of that report include the following:[18]

- In 1988, no deregulation legislation was considered by 38 of the states, five states considered such legislation but the legislation died in the initial committees, and in one state the deregulation proposal reached a vote and was defeated.

- In 1989, no deregulation legislation was proposed in the legislatures of 33 states, six states introduced such legislation but in all six states it was defeated, five states introduced legislation to partially deregulate trucking which is still pending at the end of 1989, and two, Michigan and Wyoming, introduced legislation to completely deregulate motor carriers.

- Tariff bureaus exist in all of the states maintaining regulation of motor carriers but antitrust immunity for the bureaus exists in only 31 of these states.

Of all the major pieces of legislation deregulating the various modes of transportation, only the MC Act left state jurisdiction over intrastate commerce unmolested.[19]

Two recent ICC rulings have been construed by some as having the same effect as federal preemption. One case, Armstrong, Inc.--Transportation within Texas, 2 I.C.C. 2d 63 (1986), involved the motor carrier transportation of carpet between Arlington, Texas, and other Texas points, after a prior movement from Dalton, Georgia. The ICC ruled that in this case the in-state transportation was a part of a continuous interstate movement and thus the ICC, not the state of Texas, had jurisdiction.

In a more recent case involving one of the four states in Region VII, Missouri, the ICC ruled that transportation from distribution points in Missouri to customers in Missouri is

part of a continuous interstate operation originating outside of Missouri (Matlack, Inc. - Transportation Within Missouri - Petition For Declaratory Order, Docket No. MC-C-10999 (1987)). The decision was upheld by the United States Court of Appeals for the Eighth Circuit. In October, 1989, the U.S. Supreme Court affirmed the ICC decision by refusing to hear an appeal of the Circuit Court decision.

Some state regulatory officials see these decisions as providing encouragement to shippers and carriers to go to the ICC to seek a declaratory judgement that a particular movement within a state is a part of an interstate movement and thus under the jurisdiction of the ICC. It is argued that these "declaratory proceedings" serve to preempt the authority of state legislatures and regulatory agencies to regulate the movement of goods within their respective borders. It is feared by certain state officials that a more liberal interpretation by the ICC of the term "essential character" of a movement will lead to more and more federal preemption of state regulations.

In this section of the chapter, the current regulatory practices of Iowa, Kansas, Missouri, and Nebraska are described and substantive changes since 1980 are identified. Major differences among the four Midwest states are noted as well as areas where their policy differs significantly from federal policy. Topics covered include a brief description of the four regulatory agencies, how each state classifies motor carriers for regulatory purposes, entry and rate regulation practices, and non-economic regulation by each of the states.

Agency Background and Governance -- Motor Carrier Regulation

Iowa: Motor Carrier Division, Iowa Department of Transportation (IDOT)

Intrastate motor carrier regulation is currently administered by the Motor Carrier Division of the IDOT. Several organizational changes since 1975 include:

- 1975 -- Iowa Commerce Commission's Motor Transportation Department and Railroad Department were transferred to the newly formed IDOT.

- 1986 -- Iowa Transportation Regulation Authority (TRA) was abolished. All relevant statutory responsibilities were transferred to IDOT. Three retained staff positions moved to the IDOT while 15 economic and accounting positions were eliminated. A separate state agency, the Iowa Department of Inspections and

Appeals, hears contested cases and appeals of agency decisions, including IDOT.

Kansas: Kansas State Corporation Commission (KSCC) The KSCC is currently responsible for regulating motor freight carriers, railroads, both energy and water utilities, and radio operations (cellular and common carriers). The three commission members are appointed by the governor and confirmed by the senate for four-year staggered terms. In 1925, the original (1883) Railroad Commission became the Kansas Corporation Commission and jurisdiction was extended to motor carriers.

In 1982, the Kansas legislature amended state law to adopt the major provisions of the federal MC Act. In 1981, a sunset performance audit of the KSCC found that the trucking industry in other unregulated environments was stable, that the present system of regulation had impaired rural motor carrier service, and that increased monopolistic concentration is more characteristic of a regulated environment than an unregulated one. The Kansas Legislative Division of Post Audit recommended discontinuing economic regulation and continuing safety regulation of motor carriers.

Missouri: Department of Economic Development, Division of Transportation (MDOT) MDOT is currently responsible for regulating common carriers, rail corporations, motor carriers and express companies, and street railroads. A staff of 36 members is responsible for economic and safety regulation of motor carriers. Three administrative law judges are nominated by the deputy director, appointed by the governor and confirmed by the senate for six-year staggered terms. Missouri started regulating intrastate trucking in 1931.

In 1985, transportation functions were transferred from the Public Service Commission to the Division of Transportation of the new Department of Economic Development. At that time, state transportation issues and needs were evaluated and it was determined that economic regulation was still necessary.

Nebraska: Nebraska Public Service Commission (NPSC) Intrastate motor carriers are currently regulated by the NPSC which is also responsible for regulating railroads, grain warehouses, and telephones. About 12 staff members are assigned to motor carrier regulation. The former Nebraska State Railway Commission began regulating motor freight carriers in 1937 and became the NPSC in 1972. Unlike the other three states, Nebraska's five commissioners are elected by district for six-year staggered terms.

Scope of Statutory Authority

The legislative authorities of the four states appear to be very similar in the area of motor carrier regulation. The common statutory authority is to license, supervise, and regulate common and contract public motor carriers of property. The powers necessary to carry out these duties are typically enumerated as some form of the following:

- o set or approve reasonable, just and non-discriminatory maximum and minimum rates or charges;
- o set and approve reasonable freight classifications;
- o prescribe a uniform system of accounts;
- o require filing annual reports and other data;
- o adopt safety rules and conduct safety inspections; and
- o regulate all matters affecting shipping and traveling public.

The power to regulate entry is specified as a general power by all of the states. Statutes generally provide that no carrier can operate in a state without a certificate from the regulatory agency.

The scope of authority of the four states is similar to that of other states. With the exception of Kansas' easier entry standard, all four have some degree of regulation over motor freight carrier entry, rates, operating territory, abandonment, accounting, service, insurance, reporting requirements, and mergers and acquisitions. The four states of the region, like 35 other states, have authority over mergers and acquisitions. While Kansas and Missouri, like 15 other states, have some authority over security issues, Iowa and Nebraska do not.[20]

Missouri law specifically notes authority to define commercial zones and to investigate the business and personal activities of persons associated with a carrier's business. In addition, as will be shown later, the four states are not uniform when statutes, administrative rules, and agency practice are considered in toto.

Entry and rate regulation are key areas of economic regulation of an inherently competitive industry such as trucking. Before examining these regulatory areas, however, it is necessary to review how each of the four states classify various types of trucking operations. The nature and degree of regulation of a trucking operation will vary according to its placement in the classification scheme.

Motor Carrier Classes

In the four states comprising Federal Region VII, regulatory authority over intrastate for-hire carriers applies to both common and contract carriers. While Kansas and Nebraska only distinguish between common and contract carriers, Iowa and Missouri further classify common carriers for regulatory purposes. Table 3-2 summarizes the four state classifications of common carriers.

Table 3-2 Categories of Regulated Common Motor Carrier

State	Common Carrier Categories	Distinguishing Characteristic
Iowa	1 - Motor carriers of freight	Regular route, fixed termini
	2 - Liquid carriers	Regular route, fixed termini
	3 - Truck operators	No regular route, no fixed termini
Kansas	1 - Common carriers	
Missouri	1 - LTL general & specialized commodities & bulk non-ag products	
	2 - TL general & specialized commodities & bulk ag products	
Nebraska	1 - Common carriers of freight	

Each state classification is further discussed in the following section while entry and rate requirements are discussed later.

Iowa Iowa has authority over four categories of motor carriers: (1) regular route motor carriers of property, (2) liquid transport carriers, (3) truck operators, and (4) contract carriers. The transportation of stone and road material is exempt from economic regulation. Motor carriers of property are for-hire common carriers who transport property over a regular route or between fixed termini. Liquid transport carriers move bulk liquids over a regular route or between fixed termini with exceptions for dairy products, petroleum distributors, and cargo tanks of 2,000 gallons or less.

Truck operators do not travel over a regular route or between fixed termini and essentially operate on demand rather than under contract. This classification includes many very small carriers, often farmers operating trucks in the off season and some very large truckload (TL) carriers.

The Iowa Supreme Court established the following seven criteria that truck operators must meet.

1. Carried only when called rather than advertise or solicit business.

2. Carried only according to call rather than making more or less regularly scheduled trips.

3. Made trips between different termini on the basis of calls received rather than generally established, declared, or commonly known termini.

4. Used different routes according to calls received rather than generally established and commonly known routes used with reasonable regularity.

5. Charges vary according to loading and unloading time, weight, volume, distance, etc., rather than established regular or commonly known, fixed, or terminal rates.

6. Carrier refused to carry in a substantial number of instances rather than usually and customarily accepting all goods for transit.

7. Picked up and hauled only on the basis of calls received, rather than adopting standing and more or less regular pickup arrangements.

Kansas Kansas identifies two categories of regulated motor carriers of property, public motor carriers and contract motor carriers. Kansas statutes enumerate several exemptions based on urban service areas, commodity type, and purpose of movement. Exemptions generally include transportation within corporate city limits and commercial zones, agricultural products, stone and other construction materials, and movement of property related to specific business uses such as custom combining, farm implement, and new vehicle dealers.

Missouri Missouri has authority over three general categories of motor carriers: (1) common carriers of less-than-truckload (LTL) general and specialized commodities and non-agricultural commodities in bulk dump trucks, (2) common carriers of TL general and specialized commodities and agricultural commodities in bulk dump trucks, and (3) contract carriers. Private carriers are subject only to motor vehicle public safety regulations. Various exemptions are specified, generally related to agricultural products and purposes, governmental units, transportation related to specific business uses such as towing and newspaper distribution, and vehicles of 6000 pounds or less gross weight.

Nebraska Nebraska has authority over two categories of motor carriers: common carriers and contract carriers. Exemptions are generally related to agricultural products and purposes, governmental units, stone and construction materials, and transportation related to specific business uses not for hire such as towing and newspaper distribution.

Entry Requirements

Iowa[21] Carrier certificates are issued to motor carriers of property and liquid transport (except dairy products) based on public convenience and necessity, while contract carrier and truck operator permits are issued on a fit, willing, and able standard. Dual authority to operate as both common and contract carrier is not granted. However, a firm may hold both contract carrier and truck operator permits, though not for the same commodities.

The motor carrier certificate application process includes a showing of need for service, proof of financial fitness, insurance certificate, and an inspection of safety fitness. Departmental administrative rules provide further detail on entry standards and how applications are evaluated.

In order to provide evidence of present and future public need for a proposed service, an applicant must show user support with verified statements from expected users describing their reasons for using the proposed service, points of use, expected frequency, and volume of product to be shipped. In the late 1970s, Iowa administrative rules followed the ICC's lead to shifting the burden of proof of need for service from applicants to protestors. If an application is challenged, the protestor must present evidence disproving a material element in the initial showing. Challenges based on lack of need for proposed service must show existing service is sufficient to meet public convenience and necessity. If an application is not protested, the department presumes existing service is inadequate and that the proposed service is needed.

According to administrative rules, eight different ratios testing liquidity, capital structure, and profitability are evaluated in order to determine financial fitness. Since an applicant need not prove sufficiency under each ratio, regulators have some discretion. Statutory liability insurance requirements for personal injury or death are a minimum of $100,000/person/accident or $300,000/more than one person/accident.

Overall, Iowa has deregulated common carriers in some measure. The change in burden of proof eases the showing of need for carrier entry. Iowa regulators have continued to carefully review carrier financial and service fitness. An applicant may receive a six-month conditional authority or receive approval for less than originally applied for, but is seldom denied entry. Although difficult to challenge the need for service, hearings on protested applications are still common. In some contested cases, applicants and protestors will negotiate settlement outside of the hearing such as restricting operating areas or shippers.

The contract carrier or truck operator permit application simply requires that the applicant file an insurance certificate, the contract or applicable tariff, and certify (rather than being inspected for) equipment safety. Permits are granted when filing requirements are met and fees paid.

The department has statutory authority over the number of contracts which a carrier may have in effect at one time. No limits are imposed by departmental rules, but the department does investigate contract carriers with large numbers of contracts (about 50) to determine if they are operating as common carriers. The department has statutory authority to require carriers to file annual reports, but does not currently require them.

Kansas[22] The 1982 statutory amendments in combination with subsequent case law significantly relaxed license standards for both common carrier certificates and contract carrier permits. Before 1982, authority would only be granted for service which the applicant proved would promote public convenience and necessity. Authority would be denied if existing carriers appeared to be providing reasonably adequate service. Since 1982, granting of authority is based solely on applicant fitness, omitting a required showing of either need or useful public purpose. Protestors have the burden to prove the service inconsistent with public convenience and necessity. The effect on existing carrier revenues is insufficient to show this inconsistency.

Kansas' fitness standard for entry is similar to the ICC's. Financial fitness, evidence of insurance, safety record, and willingness to comply with the law are evidence of applicant fitness. Selected portions of federal safety rules (transportation, highway administration, etc.) have been adopted in KSCC administrative rules. Regulators rely on these rules and ICC case law to interpret "fit, willing, and able".[23]

Nebraska[24] Common carriers include both regular and irregular route for-hire freight carriers. A certificate of public convenience and necessity is based on whether the applicant is fit, willing, and able and the proposed service is or will be required by present or future public convenience and necessity.[25] Although Nebraska regulators review financial condition, insurance, and safety fitness, need for service is usually the determining issue. The applicant has the burden of proof to demonstrate need for the service, and the Nebraska PSC considers the effect of new service on other carriers in reaching its decision.

A review of the Nebraska standards clearly indicates that each state's definition of public interest in transportation is unique, evolving from litigation and judicial interpretation. A 1989 review of Nebraska judicial history shows early courts equating public interest with competitive restraint that protected existing carriers. A later decision held that the rights of established carriers are not absolute, but must be weighed against public interest. Entry has been eased to the extent that existing service can be shown inadequate or deficient.[26]

Contract carriers are for-hire motor carriers other than common carriers. A permit is issued if the applicant is fit, willing, and able to perform the service of a contract carrier and if the proposed operation will be consistent with public service designed to meet distinct needs of each individual customer, or a specifically designated class of customer. Nebraska statute provides that an unlimited number of contract customers can be served. The NPSC may grant carriers dual authority to operate as both common and contract carriers, and dual authority is becoming increasingly common.

Nebraska PSC administrative rules classify motor carriers based on three factors: type of operation, type of service, and type of commodity transported. Carrier operations include common, contract, and exempt. Class A service is regular route, scheduled service; Class B service is irregular route, radial service, and within the radius of a fixed base point or terminus; Class C service is irregular route, non-radial service, and not within the radius of a fixed base point. Carrier commodity categories include general freight of all types, or 13 other specific groups ranging from bulk liquids, heavy machinery and structures to hazardous materials and petroleum products, retail store deliveries, and motion picture films.

Missouri[27] The Missouri Legislature reregulated general and specialized freight carriers in 1986 and bulk agricultural commodity carriers in 1987. Entry was eased through statutory changes in the application process, the entry standards applied, and through judicial

interpretation of Missouri statute. Prior to these changes, all for-hire applicants were held to both the fitness and the public convenience and necessity standards, subject to public hearing (and thus challenge). Applicants also bore the burden of proof to show public convenience and necessity.

Certificates for common carriers of LTL general and specialized commodities, bulk hazardous liquids, and non-agricultural commodities in bulk dump trucks are now based on fitness and an easier standard of "useful public purpose," while challengers bear the burden of proof. A fitness test is applied to applicants for common carrier certificates of TL general and specialized commodities, agricultural commodities in bulk dump trucks, and also applicants for contract carrier permits. Procedurally, common and contract carriers of LTL and non-agricultural commodities and bulk hazardous liquids are still subject to hearing and protest. Common and contract carriers of TL and agricultural commodities in bulk dump trucks are no longer subject to public hearing.

All common or contract carrier applications must include information on ownership, financial condition, equipment list and values, and route descriptions. Common carriers must file proposed rates and schedules. Contract carriers must file a copy of the original contract; however, a rate schedule may be substituted for filing specific rates.

Missouri's revised language on the entry standards and criteria applied to certificates for LTL and non-agricultural common carriers warrants further examination. The law now states that if "the service proposed will serve a useful present or future public purpose, a certificate . . . shall be issued" to an applicant unless a protestor's evidence shows it is inconsistent with public convenience and necessity. The effect of this language is twofold, both easing entry and shifting the burden of proof. "Useful public purpose" has been interpreted to be an easier or looser entry standard than the prior public convenience and necessity standard. The applicant does not have to prove need for service; instead, the challenger must demonstrate harm.

In order to reach a decision on these applications, Missouri code directs the department to consider and make findings on transportation policy (i.e., stated purpose of law), evidence presented, proposed service users, and any other relevant testimony and evidence. Furthermore, in cases where persons object to the issuance of a certificate, the diversion of revenue or traffic from existing carriers shall be considered. Case law provides a

procompetitive interpretation of this section, considering overall, marketwide revenues, and service, rather than the specific impact on a single or limited number of carriers.

Permit standards for common carriers of TL general and specialized commodities and agricultural commodities in bulk dump trucks and for contract carriers are less rigorous, especially for the former. A permit shall be issued to common carriers of TL and agricultural commodities who show fitness while contract carriers must show both fitness and a useful public purpose. As with LTL and non-agricultural common carriers, contract carrier challengers must present evidence that the permit is inconsistent with public convenience and necessity. However, there is no statutory language on factors to be weighed when considering public purpose for contract carriers.

Rate Regulation -- Common Carriers

Rates and Ratemaking All four states permit joint and collective ratemaking by rate bureaus, subject to final approval by the regulatory agency. Missouri reports that rate bureaus have an active role in general commodity ratemaking. All four states review all tariffs filed. None of the four states expressly provides for a zone of rate freedom though carriers may have some degree of rate flexibility.

According to a former attorney with the KSCC, Kansas' dramatic relaxation of entry regulation has not had a corresponding loosening of rate regulation. The KSCC allows tariffs to include shipper-named discounts based on the commodity, volume or route if such rates are given to similarly situated users.[28]

Missouri regulators claim an active role in ratemaking. In the past, MDOT had prescribed carrier rates or approved each rate change proposal that was filed. Since the mid-1980s, the agency has prescribed maximum class rates for general commodity carriers and both minimum and maximum rates for bulk commodity carriers. Tariffs filed within these limits are reviewed only for compliance with filing requirements, prior orders, and adopted tariffs. Rate levels are analyzed only for justification when tariff filings over established maximums or under established minimums initiate a rate hearing. A carrier may lower a rate on a specific commodity or decrease a class rate. A carrier who gives a different rate to one shipper must match the rate to other shippers to avoid discrimination.

Iowa and Nebraska review each tariff filed in order to determine allowable increases and prescribe or approve the appropriate rate level. Iowa allows discounts that have been published in a tariff.

Notice The minimum notice period to publish tariff changes is usually 30 days for Iowa, Kansas, and Nebraska. This provision is not absolute since each regulatory agency may allow a tariff to become effective in a shorter period for good cause. Notice may be shortened or waived for tariff reductions, small rate increases, increases affecting a small number of shippers, or increases that are sent directly to affected shippers. In Kansas, the carrier's desire to meet tariff publications of a competing carrier may be considered a factor permitting publication on as little as one day's notice.

In Missouri, general commodity rates may be increased with five days' notice and decreased with one day's notice. Such rates are usually under one of the half-dozen tariff agencies in the state. MDOT indicates that this permits competitive flexibility under their system of establishing maximum rates for general commodities. In contrast, all other common carrier rates (specialized and bulk commodities) require 30 days publication. These are typically independent actions filed by individual carriers.

Rate Justification In Iowa, the carrier's operating ratio is the primary measure of a proposed rate's reasonableness. Regulators use national cost indices to project anticipated costs, applying a computer formula to estimate a carrier's operating ratio. A rate may be increased only to the level that yields a 93.25 percent operating ratio. In collective rates, carrier costs are averaged and the filing is reviewed as a single rate.

Nebraska regulators review both carrier financial data and similar rates to determine if a change is justified. Carrier profit margins and common cost operating ratios are evaluated, though the operating ratio is more important for general or class rates rather than for specific commodity rates. Nebraska generally considers past costs, although a fuel-cost surcharge has been used in the past. Fully allocated costs (variable plus fixed) apply for individual commodity rates while variable costs apply for general rates.

Nebraska statutes also specify that the two following criteria be considered in ratemaking, although this language does not have a significant effect on current ratemaking practices in the state:

- Lowest rates published or charged by any common carrier for substantially the same service in Nebraska or another state, shall

when introduced into evidence, be accepted as prima facie evidence of a reasonable rate for the service.

- Common carrier's own rates in another state for substantially the same or greater service will be considered the reasonable rate.

In order to determine maximum or minimum rate levels, Missouri analyzes the findings of its field audits (the annual reporting requirement was abolished in 1984). A fully allocated cost approach is used to set maximum rates for general commodities. Variable costs are considered to set minimum rate levels for specialized and bulk commodities. Costs and their effect on carrier operating ratios, however, are only a part of the rate review decision rather than the controlling criterion. Like the ICC, Missouri is most concerned with rate of return, which encompasses costs of operations, revenues, and investment alternatives, when setting intrastate rate levels.

In its annual regulatory survey, the National Association of Regulatory Commissioners (NARUC) questions agencies about the average operating ratio granted to intrastate carriers, whether their intrastate rates were above or below the comparable interstate rate, and the percent of variation. Midwest region regulators responded with the following results in Table 3-3.

Table 3-3 Average Ratio, Rate Level Comparisons, and Rate Variation, 1987

State	Average Operating Ratio Granted	Intrastate Rate in Comparison with vs Interstate Rate	% Rate Variation
Iowa	93.25	Same	---
Kansas	93	Below	10-15
Missouri	93-95	Below	10-15
Nebraska	93	Below	20

Source: NARUC Annual Report on Utility and Motor Carrier Regulation 1987, page 718.

Comparing intrastate and interstate rates among the total of 36 respondent states in the same report, two states reported rates above interstate levels, eight states reported same or comparable rates, twenty below, and two reported varied rates.

Rate Regulation -- Contract Carriers

Few states have jurisdiction over intrastate contract carriage rates. Instead, regulatory agencies simply require that carriers file copies of original contracts, with carriers and shippers

maintaining current contracts and rates. Nebraska is the only state in the region to review contract rates, requiring that contract rates be the same as or higher than comparable common carrier rates.

Interstate Registration

As of 1987, these four states, like 35 other states, had adopted the ICC's standards for interstate carriers operating within their states. These standards for required evidence of lawfulness of interstate operations of motor carriers are contained in NARUC's "Public Law 89-170 and Standards for Operations of Interstate Motor Carriers."

States charge interstate carriers various registration fees. Iowa's and Nebraska's $25 fee for original registration of ICC authority is the same as that charged by 26 other states. Nebraska charges $25 while Iowa charges $10 for supplemental registration. Kansas charges $10 for both original and supplemental registrations, while Missouri, along with three other states, has no charge for either original or supplemental registrations of a carrier's ICC authority. Missouri and Nebraska reduce the amount of various Cab Card fees under reciprocity agreements with other states.

Non-economic Regulation: Financial Responsibility and Safety Requirements

Federal and state authorities also impose social regulations on motor carriers in order to promote safe, responsible public transportation. Various federal laws administered by the Federal Highway Administration (FHWA) have a far-reaching impact on motor carriers because they also serve as guidelines for state statutes. Among the most important provisions are those addressing financial responsibility, safe driver and equipment operations, and equipment weight and size limits. For example, the Surface Transportation Act of 1982 created the Motor Carrier Safety Assistance Program (MCSAP) while the Commercial Motor Carrier Safety Act of 1986 initiated the current move to a single commercial driver's license (CDL).

Funding provisions in such laws are the incentive for their widespread adoption by states. In past years, many states voluntarily applied federal standards to interstate and intrastate carriers registering in their state (e.g., Iowa adopted federal hazardous standards in 1975). Now state access to federal highway funds is contingent on adoption of the federal

motor carrier standards for safety, financial responsibility, and weight/size requirements. MCSAP pays up to 80 percent of the cost of state safety programs, while failure to adopt weight and size limits or the CDL will mean a state loses federal highway funds. Iowa, Kansas, Missouri, and Nebraska have adopted the major provisions of the Code of Federal Regulations regarding driver, equipment, and hazardous materials safety, minimum financial responsibility requirements, and vehicle weight and size limits. Although carriers favor this recent movement towards uniformity, interstate and intrastate rules and requirements still vary.

Financial responsibility Part 387 of the Federal Motor Carrier Safety Regulations specifies the minimum level of financial reserves (e.g., insurance or surety bond) that a carrier must have to cover any public liability (death or bodily injury) or property damage caused by its vehicles. Other federal rules (49 CFR 171-173) define three different categories of hazardous materials. However, there are no specific federal requirements regarding cargo liability.

Interstate and foreign common and contract carriers of non-hazardous general freight are responsible for $750,000 combined single limit (CSL) of public liability coverage. All carriers (interstate, foreign, intrastate, common, contract, and private) of one category of bulk hazardous materials are subject to $5 million in public liability. All interstate and foreign carriers (common, contract and private) of certain explosives, poison gases, and radioactive materials are also subject to $5 million in public liability. Bulk intrastate carriers and interstate and foreign for-hire and private carriers of any quantity of oil and certain other hazardous materials are subject to $1 million in public liability.

Thus state financial responsibility requirements are most likely to apply only to intrastate for-hire carriers of non-hazardous general freight. States often enumerate three classes of public liability: bodily injury, property damage, and cargo. As long as a state's requirement is less than the $750,000 CSL federal requirement, differing levels would not pose a serious problem for an interstate carrier who also holds intrastate authority. However, a carrier with intrastate authority only in several states may face a more complex risk management situation. Table 3-4 presents a comparison of the minimum financial responsibility requirements for intrastate carriers in the four states.

Safety Industry observers have predicted that in the wake of deregulation, state regulators either would or should increasingly emphasize motor carrier safety. Data from a

Table 3-4 Minimum Financial Responsibility Requirements for Intrastate Carriers

Public Liability		Cargo
Bodily Injury	Property Damage	
Iowa		
$100,000/person $300,000/accident	$10,000 Liquid: $100,000	Common: $10,000 Contract: $5,000/semi Contract: $2,000/truck
Kansas		
$100,000/person $300,000/accident	$50,000	$3,000/vehicle
Missouri		
$100,000/person $300,000/accident	$50,000 $5,000/accident	$2,500/vehicle
Nebraska		
$5,000,000/accident*		Common only: $5,000

* Certificate of PCN can provide for other insurance amounts.
Source: Compiled by author.

recent federal report on the MCSAP, supplemented by data from the American Trucking Associations, Inc. (ATA) and NARUC, will illustrate some differences in the four state's efforts. First the number of carriers registered in each state is reported in order to assess a state's relative emphasis on safety enforcement. Table 3-5 shows the number of carriers registered in each of the four states during 1986. Several states noted a decline in the number of intrastate freight carriers and an increase in interstate carriers registered since 1980, probably reflecting carriers' shift to broader operating authority under ICC's eased entry standards.

Table 3-5 Number of Carriers Registered in Midwest States, 1986

State of Domicile	Interstate Common	ICC Carriers in Domicile	Intrastate Common	Intrastate Contract
Iowa	N/A	1025	5123	1596
Kansas	19,333	598	1400*	217
Missouri	20,000*	1073	1277	221
Nebraska	20,000	664	885	N/A

* Agency estimate.
Source: Compiled by author from ATA, NARUC, and agency estimates.

MCSAP, a state and Federal cooperative safety inspection program, is the foundation of most state safety efforts. MCSAP will grant funding to states that conduct inspections according to uniform federal safety procedures and standards. Inspection costs are shared with

80 percent from the federal highway trust fund and 20 percent from the participating state. States may choose to spend more than 20 percent. Thus federal expenditure levels are one indicator of a state's emphasis on motor carrier safety. Table 3-6 reports the amount of federal MCSAP funds budgeted for each of the Midwest states in fiscal years 1987 and 1988.

Table 3-6 Federal Contribution, MCSAP Grants

State	Fiscal Year 1987	Fiscal Year 1988
Iowa	$384,836	$629,269
Kansas	644,317	794,279
Missouri	916,109	1,062,002
Nebraska	382,620	487,442

Source: Paul Rothberg, Motor Carrier Safety Assistance Program. Washington DC: Congressional Research Service, 1988.

The states have wide latitude, however, to determine the type and number of inspections conducted and the agency responsible for the program. Safety inspection is often done in conjunction with other types of inspections, from field audits at carrier terminals (Missouri) to driver/vehicle inspections by state troopers. Thus motor carrier safety programs vary a great deal among the four states in Federal Region VII.

In Iowa, motor carrier economic regulation and safety enforcement are handled by two separate offices of the IDOT; i.e., Motor Carrier Operations and Motor Carrier Enforcement. Safety is only one responsibility of the Enforcement Office, which also monitors compliance with other motor carrier regulations such as registration, taxes, and weight and size requirements. These enforcement efforts are usually carried out through weigh station stops, patrols, and pull-overs.

Missouri seems to have the most comprehensive safety program of the four states. The MCSAP program in Missouri involves five agencies (public safety, transportation, natural resources, and two cities) with public safety the lead agency. MDOT's main responsibility is to conduct safety audits in carrier terminals while the state patrol handles vehicle inspections on the road and at the scales.

In Nebraska, the Office of Public Safety also has the primary MCSAP responsibility. The role of Nebraska regulators is much different from that of the other three states. The Office of Public Safety is responsible for investigating illegal transportation activities and rate and service violations.

The next two tables reflect the four states' diverse approaches to safety activities. State programs are flexible and may include any combination of vehicle inspections, which are usually done in the field, terminal audits of a carrier's vehicle and safety operations, and in-house reviews of a carrier's entire safety management program. Table 3-7 lists each state's expected mix of these program activities during fiscal year 1988.

Table 3-7 Projected MCSAP Activities for Fiscal Year 1988

State	Vehicle Inspections	Terminal Audits	Safety Program Review
Iowa	32,500	260	0
Kansas	12,500	300	740
Missouri	50,625	465	0
Nebraska	15,451	0	20

Source: Paul Rothberg, Motor Carrier Safety Assistance Program. Washington DC: Congressional Research Service, 1988, page 2.

NARUC's annual survey collects information of state road checks for operating authority and safety. Iowa and Kansas figures are reported in Table 3-8. Since Nebraska and Missouri regulators do not have lead responsibility for motor carrier safety, they did not provide data.

Table 3-8 Motor Carrier Enforcement Activities, 1987

Agency	State Op Auth Road Checks	State Op Auth Violations	Safety Road Checks	Safety Violations	Safety Inspections
Iowa DOT	721,008	132	21,323	15,232	82
Kansas SCC	45,533	1,416	45,533	11,801	3

Source: NARUC Annual Report on Utility and Motor Carrier Regulation 1987, page 707.

The above information is not a comprehensive review of state safety efforts, but provides some basic comparisons. While traffic volume of the four states is dissimilar, Missouri and Iowa appear to have relatively greater safety emphasis for their probable traffic volume than Nebraska and Kansas.

State Motor Carrier Taxes

American Trucking Associations' (ATA) 1988 taxation data levels for the Midwest region are listed in Table 3-9. The four states are within the middle range in comparison with other state taxation levels.

Table 3-9 State Motor Carrier Fees and Taxes

State	Annual registration & wt fees	Diesel fuel tax rate	Total annual hwy-user fees	Rank by total US fees paid
Iowa	$1,705	$0.185/gal	$4,301	13th
Nebraska	1,281	.179	3,793	23rd
Missouri	1,659	.110	3,203	32nd
Kansas	1,351	.130	3,176	33rd
Midwest Avg	1,499	.151	3,618	
National Avg	946	.157	3,902	

Source: American Trucking Associations, Department of State Laws, January 1988.

Conclusions -- State Regulation of Motor Carriers

Since 1980, the states of Kansas and Missouri formally evaluated the need for continued economic regulation and reached different conclusions. Kansas has moved to reregulate in line with ICC changes while Missouri adopted certain procompetitive features with the overall intention of continuing regulation. Iowa and Nebraska have had few substantive statutory changes. Iowa, however, has modified its administrative rules and practices with a net effect of relaxing its regulatory stance while Nebraska continues its historic and traditional approach to regulation.

Kansas Procompetitive features have been introduced throughout the region. Kansas made the earliest and most sweeping changes of the four states and can be viewed as having the least amount of overall regulation. The state's entry standard based solely on fitness appears to be even easier than the ICC's. Its rate regulation has also been relaxed, though not to the same extent as entry. On the other hand, carrier safety has received greater emphasis. Kansas apparently has also simplified the administrative burden on carriers with the lowest effective tax rate in the region and relatively small administrative and safety staffs.

Missouri Missouri has also eased entry by adopting a lower standard of fitness and useful public purpose for LTL and bulk non-agricultural commodities and hazardous liquids

and a fitness standard only for TL and agricultural commodity common carriers and also contract carriers. Among the four states, Missouri has made the most substantive changes in rate regulation. The state ceased prescribing general freight rates in 1984 and now only prescribes maximum rates. The MDOT has stepped up its safety efforts and appears to have the strongest safety program of the four states. Missouri may have presented the most innovative response to deregulation of the four states. Overall, the MDOT has adopted a procompetitive posture and streamlined administrative processes (e.g., carrier annual reports were abolished in 1984).

Iowa Although there have been no substantive changes in statutes since 1980 in Iowa, changes in administrative rules and agency practices have resulted in de facto easing of regulation as the state became less aggressive in its administration of existing laws and regulations. In the late 1970s, Iowa administrative rules shifted the burden of proof to those protesting a grant of authority. In the mid-1980s, the state deemphasized economic regulation by reducing its professional staff, adding their functions to other administrative functions such as carrier registration, taxing, and licensing. Iowa has the highest tax rate of the four states in the region.

Nebraska Among the four states, Nebraska appears to have made the fewest changes in response to deregulation. There have been no significant legislative changes, and few substantive changes in agency practice. Nebraska continues to apply the pre-MCA public convenience and necessity standard for entry, places the burden of proof on applicants and prescribes carrier rates.

Intrastate Regulation of Railroads in Region VII

The initial attempts at establishing economic regulation of railroads were made at the state level. The initial state laws that established economic regulation of railroads were known as the Granger Laws and were passed in the states of Illinois, Iowa, Minnesota, and Wisconsin. A number of practices were regulated, including maximum rates, discriminatory long and short haul ratemaking, and mergers. Because the laws were not well constructed, they did not work well in practice. All but the Illinois law were repealed and replaced by weak regulation within a short period of time.

During this time period, states applied their regulation to both interstate and intrastate commerce, despite the U.S. Constitution providing in the "commerce clause" that regulation of commerce between the states is delegated to the federal government. In the famous Wabash Case of 1886, the U.S. Supreme Court ruled that the State of Illinois could not regulate railroad rates beyond its borders because such regulation violated the commerce clause in the Constitution. Because most of the rail traffic at this time was interstate, this case called for federal legislation if regulation of railroads was to be made effective.[29] The Act to Regulate Commerce, which was passed in 1887, established federal economic regulation of railroads.

Thus, as of 1887, the states could only regulate intrastate rail operations. There was a revival of state economic regulation of railroads after 1900, following a long period of ineffectiveness. Alaska is the only state that does not provide economic regulation of intrastate rail operations. State regulation of railroads varies considerably from state to state. In 1987, for example, several states regulated 11 of the 12 aspects of railroading (listed in Table 3-10) while at the other end of the spectrum, three states regulated only one aspect. Two factors, however, limit the jurisdiction of the states:

- Most railroad traffic is interstate in nature.
- The federal government has taken over several major areas of regulation of intrastate railroad operation.

In chronological order, the key areas which the federal government has taken over include:

- The ICC may require that a low intrastate rate or fare which has the effect of unjustly discriminating against traffic in interstate commerce be changed in order to remove the unjust discrimination. This "Shreveport" doctrine was set forth in Supreme Court cases involving Minnesota and Louisiana in 1913.
- The Transportation Act of 1920 gave additional powers to the ICC over intrastate rail matters by (a) giving the ICC the power to prescribe intrastate rates when necessary to remove discrimination against interstate commerce, and (2) by giving the ICC the power to raise purely intrastate rates if they do not contribute a fair share of the revenue to maintain an adequate system of interstate commerce.
- The Transportation Act of 1920 also gave the ICC virtually complete control over all railroad line abandonments, even those in intrastate commerce. The role of states has been reduced to protesting abandonment of railroad lines in ICC cases.

- The Transportation Act of 1920 also gave the ICC exclusive jurisdiction over interstate railroad security issues, regardless of state regulation on the subject.

- The Railroad Revitalization and Regulatory Reform Act of 1976 (4-R Act) gave the ICC exclusive jurisdiction to change intrastate rates and fares, provided that a state agency has not acted on a carrier's price proposal within 120 days.

- The Staggers Act reduced state authority over intrastate rates by providing that a state may exercise jurisdiction over intrastate rail rates and fares only if it submits to the ICC the standards and procedures used in regulating such prices. If a state's procedures and standards are not in accord with the those of the ICC, or if a state fails to submit its standards and procedures, the state may not exercise jurisdiction over intrastate rates and fares. (Currently, only 24 states, including Iowa, Kansas, and Missouri, are certified under this requirement.)

- The Staggers Rail Act also prohibited a state from exercising any jurisdiction over general rate increases or inflationary-based rate increases.

Given the small amount of intrastate rail traffic, and the increasing limited jurisdiction of the states on intrastate rail operations, the state economic regulation of railroads is of minor importance and is limited to local matters. The nature and amount of economic regulation of intrastate rail operations by each of the four states in Region VII are indicated in Table 3-10. It should be noted that some of the information provided in this table is inconsistent with reports received directly from regulatory agencies.

Table 3-10 Scope of Agency Regulation of Railroads for Federal Region VII

Scope of	ICC		Iowa		Kansas		Missouri		Nebraska	
Regulation	1980	1987	1980	1987	1980	1987	1980	1987	1980	1987
Number of RR Carriers	483	558	5	20	14	14	15	15	6	6
Entry	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	Yes
Operating Territory	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes
Abandonments	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Rates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Accounting	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Services	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Safety	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Construction	Yes	Yes	No	No	No	No	Yes	Yes	No	Yes
Security Issues	Yes	Yes	No	No	No	No	Yes	Yes	No	Yes
Mergers/ Acquisitions	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes
Insurance	Yes	No	No	No	No	No	No	No	Yes	Yes
Reporting	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Endnotes

1. See Richard A. Posner, "Taxation by Regulation," Bell Journal of Economics and Management, Vol. 22 (1971), pp. 22-50, for a discussion of the "internalization of subsidies" rationale and its comparison to the other two rationales.

2. Theodore E. Keeler, Railroads, Freight, and Public Policy (Washington, D.C.: The Brookings Institution, 1983), p. 39.

3. Dennis A. Breen and Benjamin J. Allen, "The Nature of Motor Common Carrier Service Obligations," ICC Practitioners' Journal, Vol. 46, No. 4 (May-June 1979), pp. 192-203.

4. Keeler, op. cit., p. 97.

5. Ibid., p. 99.

6. Daniel J. Sweeney, Charles J. McCarthy, Steven J. Kalish, and John M. Cutler, Jr., Transportation Deregulation--What's Deregulated and What Isn't (Washington, D.C.: NASSTRACT, 1986), p. 3.

7. Collective Ratemaking in the Trucking Industry, Motor Carrier Ratemaking Study Commission Report (June 1, 1983), p. xv.

8. Public Law 96-296, Section 4, National Transportation Policy.

9. Public Law 96-448, Section 101, Rail Transportation Policy.

10. Public Law 96-296, Section 7, Exemptions.

11. Byron Nupp, "Regulatory Standards in Common Ownership in Transportation," ICC Practitioners' Journal, Vol. 34 (November-December 1966), p. 21; and Donald Harper, Transportation (Englewood Cliffs, N.J., Prentice-Hall, Inc. 1978), pp. 544.

12. See Richard A. Zellner and Smith R. Brittingham, III, "Common Rail-Barge Ownership: The Destruction of Effective Competition," Eastern Transportation Law Seminar (1984), p. 83.

13. See Michael R. Crum and Benjamin J. Allen, "U.S. Transportation Merger Policy: Evolution, Current Status, and Antitrust Considerations," International Journal of Transport Economics, Vol. 13 (February 1986), pp. 41-75, for a more detailed discussion of the current ICC policies on multimodal transportation companies.

14. Clinton Whitehurst, Jr., ed. Forming Multimodal Transportation Companies (Washington, D.C.: American Enterprise Institute, 1978), pp. 73 and 79.

15. Donald V. Harper, Transportation in America, 2nd ed. (Englewood Cliffs, NJ: Prentice-Hall, Inc., 1982), p. 467.

16. Dudley F. Pegrum, Transportation (Homewood, IL: Richard D. Irwin, Inc., 1973), p. 311.

17. James Freeman and Richard Beilock, "State Regulatory Responses to Federal Motor Carrier Reregulation," University of Florida Law Review, Vol. XXXV (1983), pp. 60-61.

18. See Daniel W. Baker, State Motor Carrier Regulatory Status, Trends and Preemption (advance copy provided to authors on August 28, 1989), for more details on the most current report.

19. Paul S. Dempsey, "Deregulation of Intrastate Transportation: The Texas Debate," Baylor Law Review, Vol. 39, No. 1 (1987), p. 4.

20. National Association of Regulatory Utility Commissioners, Annual report on utility and carrier regulation of the National Association of Regulatory Utility Commissioners (Washington, D.C.: NARUC, 1988).

21. See various chapters of Iowa Administrative Code, 1987, and the Code of Iowa, 1989, Chapters 325, 327A, and 327B, for the statutory foundation of the state's regulation of entry and other aspects of motor carriers.

22. See Kansas Administrative Regulations (1982) and Kansas Statutes Annotated (1966) for the statutory foundation of the state's regulation of entry and other aspects of trucking.

23. M. P. Wetting, "Transportation in transition: KSCC regulation of motor carriers in the 1980s," Journal of the Kansas Bar Association, Vol. 57, No. 5 (1988), pp. 19-23.

24. See the Nebraska Administrative Code and the Revised Statutes of Nebraska, R.S. Supp. (1988), Chapter 75, for the statutory foundation of the state's regulation of entry and other aspects of the motor carrier entry.

25. Judicial interpretation by the Nebraska Supreme Court has defined public convenience and necessity as a useful public purpose responsive to public need and demand without harming existing carriers. See J. R. Felton and R. C. Huttsell, "Entry Regulation: The Nebraska Experience." in J. R. Felton and D. G. Anderson (eds.) Regulation and Deregulation of the Motor Carrier Industry (Ames, IA: Iowa State University Press, 1989), p. 34.

26. Ibid.

27. See Revised Statutes of Missouri (1986), Chapters 622 and 390, for the statutory foundation for the state's regulation of entry and other aspects of the motor carrier industry.

28. The Supreme Court of Kansas invalidated a Commission order permitting a maximum collective rate with individual carrier's option to charge a lesser amount. (See Wettig, p. 37.)

29. Harper, op. cit., p. 461.

Chapter Four
Freight Transportation Traffic Patterns in Region VII

This chapter examines traffic volumes and patterns of truck and rail traffic in Region VII during the 1980s. Although the publicly available data base on rail traffic is rich, there are fewer data available for truck traffic.

For both modes, it is clear that the transportation companies that operate in the region and the region's transportation facilities are of strategic importance to the movement of goods for the nation as a whole. The volumes of goods moving through, from and to the region are growing. Growth trends appear to be concentrated around areas of densest activity, however. For example, railcar loadings have grown in the region during the decade, despite their decline throughout the country, but the increases have been concentrated in a few counties that generated the majority of the traffic. Even truck traffic, on the average, appears to have declined on non-interstate highways and the growth is concentrating on interstates highways.

The first section of this Chapter deals with intermodal and railcar traffic carried by railroads. Rail traffic and changes in traffic are discussed individually for each state and the traffic data for all four states are summarized together at the end of the section. The second section summarizes the limited data available on truck traffic trends.

Rail Traffic In Region VII

This section deals with railroad traffic volume and pattern changes during the period from 1980 to 1987. Traffic data from 1980 are used as a benchmark to identify changes that occurred during the 1980s. The year 1987 was the most recent year in which data were available for this study. Rail traffic data were obtained for the years 1980 and 1987 through the ICC's confidential waybill samples. Waybill samples are published annually by the ICC with participation from the Association of American Railroads. The data are extracted from a sample of railroad shipment waybills.

The samples were expanded using appropriate expansion factors to approximate total shipments. The data collected and coded in each year's data set contains slightly different

shipment information. The differences are due to changes made by the ICC in the data elements included in the data sets for each year. For example, the 1987 waybill data base included the number of containers and trailers transported. The 1980 data set did not include the number of containers or trailers but rather the number of flatcars transported. The number of flatcars has to be multiplied by the average number of containers and trailers per railcar to arrive at the number of containers and trailers.

The ICC prepared two magnetic tapes containing data from the 1980 and 1987 waybill samples for federal Region VII (the four states of Iowa, Kansas, Missouri, and Nebraska). The 1987 tape includes all records of shipments that passed through (including originations and terminations) any of the four states in Region VII. The 1980 tape includes shipments originating in, destined to, or interchanging in any of the four states. No information on through traffic is available in the 1980 waybill sample, however. Therefore, it is not possible to compare information on bridge traffic for the two years.

The analysis of each state's traffic volumes and patterns is divided into intermodal and railcar traffic analysis. For each type of traffic (intermodal and railcar), the following issues are covered:

- Changes in originating, terminating, junction, and total traffic between 1980 and 1987.
- Changes in commodity mix and origins/destinations of the shipments originating and terminating in the state.
- Traffic changes on a county level, for counties with measurable traffic volumes.
- Changes in traffic handled by major stations in the state.
- Proportion of total traffic carried by railroads in the state.

Summary of Iowa Rail Traffic

Intermodal Traffic

Iowa's originating intermodal traffic accounted for less than 8 percent of the region's originating trailers and containers in 1980 and about 7 percent in 1987. Further, during the 1980s, although several Class I carriers have continued to operate intermodal loading facilities in Iowa, none of the Class I carriers operate a stand-alone, integrated, intermodal hub facility

in the state.[1] It is difficult to determine how much intermodal traffic was generated by Class I carriers in Iowa because the containers or trailers would be trucked to an intermodal loading facility in one of the states adjoining Iowa. Nevertheless, Iowa's originating intermodal traffic more than doubled between 1980 and 1987, growing from 10,675 trailers and containers in 1980 to 23,220 trailers and containers in 1987.

Although no information is available in the 1980 waybill sample on through traffic (traffic passing through the state without interchanging between carriers), more than one million trailers and containers passed through Iowa in 1987. Roughly 97 percent of all intermodal traffic in Iowa is bridge traffic (through traffic or junction with an origin and destination outside of Iowa). The bridge traffic is largely originated on the West Coast (California) and terminated in Chicago. Table 4-1 summarizes intermodal traffic changes for Iowa[2].

Table 4-1 Iowa's Intermodal Traffic (In Number of Trailers or Containers)

CATEGORY	1980	1987	CHANGE	% CHANGE
ORIGINATING	10,675	23,220	12,545	118%
DESTINED	4,900	8,924	4,024	82%
JUNCTION	2,440	5,440	3,000	123%
THROUGH*	NA	1,099,834		
TOTAL **	18,015	37,584	19,569	109%

* Includes junction traffic
** Excluding through traffic
All data reported in rail related tables were taken from the ICC's waybill sample.

The commodities most frequently originating in Iowa in 1980 and 1987 are shown in Table 4-2a and Table 4-2b. Also listed in those tables are destinations for Iowa's traffic. Commodities are classified according to the Standard Transportation Commodity Code (STCC). Miscellaneous and mixed shipments were the most frequent commodity originating in Iowa. Food and kindred products were the second most frequently shipped commodity group in 1980, and third in 1987, accounting for about 12 percent of originating trailers and containers in both years. Electrical machinery, equipment, and supplies were the third most frequently shipped commodity class in 1980 and second in 1987. The large increase (slightly over 300 percent) in electrical machinery, equipment, and supplies during the period was largely attributable to Iowa Interstate Railroad's operation of their intermodal loading facility in Newton, Iowa.

Table 4-2a 1980 Iowa Originating Intermodal Traffic By Destination State (In Number of Trailers and Containers)

STCC	OH	IL	FL	IA	MO	LA	TX	CO	OR	CA	TOTAL*
MISC. & MIXED SHIPMENTS	0	700	525	0	175	350	700	350	525	700	5075
FOOD & KINDRED PRODUCTS	525	0	175	0	0	0	0	0	0	0	875
ELECT. MACHINERY	0	0	0	525	0	0	0	0	0	0	700
HAZARDOUS MATERIALS	0	0	0	0	0	0	0	175	0	0	525
SHIPPERS ASSOCIATION	0	0	0	0	0	0	525	0	0	0	525
EMPTY CONTAINERS	0	350	0	0	0	0	0	0	0	0	350
METALLIC ORE	0	0	0	0	0	0	175	0	0	0	175
FORWARDER	0	0	175	0	0	0	0	0	0	0	175
LUMBER	0	0	0	0	0	175	0	0	0	0	175
MACHINERY	0	0	0	0	175	0	0	0	0	0	175
SUM	525	1050	875	525	350	525	1400	525	525	700	8750
Percentage of Total	5%	10%	8%	5%	3%	5%	13%	5%	5%	7%	82%

* Total only for destination states listed

Table 4-2b 1987 Iowa Originating Intermodal Traffic By Destination State (In Number of Trailers and Containers)

STCC	CA	FL	IL	MN	MO	NV	TN	TX	VA	WA	TOTAL*
MISC & MIXED SHIPMENTS	2120	1120	6100	40	1200	80	40	640	120	40	11500
ELECT. MACHINERY	2120	160	0	0	0	40	80	40	0	200	2640
FOOD & KINDRED PRODUCTS	760	240	600	0	100	360	280	0	0	0	2340
MAIL OR OTHER CONTRACT TRAFFIC	0	0	1080	100	340	0	0	0	0	40	1560
EMPTY CONTAINERS	120	0	700	500	100	0	0	0	120	0	1540
FURNITURE	240	40	40	0	0	0	0	0	80	40	440
CHEMICAL	0	0	200	0	0	0	0	200	0	0	400
TRANSPORT EQUIPMENT	0	0	100	100	0	0	0	0	0	0	200
SUM	5360	1560	8820	740	1740	480	400	880	320	320	20620
Percentage of Total	23%	7%	38%	3%	7%	2%	2%	4%	1%	1%	89%

* Total for on the listed destination states

As shown in Table 4-2a and 4-2b, a large portion of traffic originating in Iowa terminates in Illinois, California, Texas, and Florida. About 10 percent of Iowa's shipments in 1980 and 38 percent of 1987 shipments terminated in Illinois. Also, 7 percent of the 1980 shipments and 23 percent of 1987 shipments from Iowa terminated in California. These shipments were largely made up of mixed shipments, electrical machinery, and food and kindred products.

In 1980, intermodal traffic flows were more widely distributed among several states. In 1987, however, flows were more concentrated between Iowa and a smaller number of states (Illinois, California, and, to some extent, Texas). Iowa originated trailers and containers going to the five most frequently shipped to states constituted 79 percent of total originating traffic in 1987. Whereas in 1980, the five states most frequently shipped to states constituted only 43 percent of total originating trailers and containers.

The commodity groups most frequently terminating in Iowa in 1980 and 1987 are shown in Table 4-3a and Table 4-3b. Miscellaneous and mixed shipments accounted for the largest number of trailers and containers terminated. In 1987, there were 920 empty containers terminating in Iowa; 840 of these originated in Illinois and were probably positioned in Iowa to be filled before returning to the West Coast. Chemicals, food and kindred products, and electrical machinery were some of the commodities terminating in Iowa in modest numbers of trailers and containers in both 1980 and 1987.

Tables 4-4a and 4-4b list the counties generating the most intermodal traffic. The tables contains the county, the county's major city, and the county's number of originating and terminating trailers and containers.

Jasper County was ranked first in 1987 with 6,840 originating trailers and containers, or 30 percent of Iowa's total originating trailers and containers. Jasper County was ranked fourth in 1980, however, with 1,050 originating trailers and containers, or 10 percent of Iowa's 1980 originating trailers and containers. The rapid increase in intermodal traffic from Jasper County is explained by the Iowa Interstate Railroad's ambitious marketing of intermodal services from its Newton facility. About 50 percent and 29 percent (3,400 and 1,960) of Jasper County 1987 trailers and containers terminated in Illinois and California, respectively.

Table 4-3a 1980 Iowa Terminating Intermodal Traffic By Origin State (In Number of Trailers and Containers)

STCC	KY	IL	TN	IA	TX	WA	TOTAL*
MISC. MIXED SHIPMENTS	0	525	350	0	175	175	1,225
ELECTRICAL MACHINERY	0	0	0	525	175	0	700
FOOD & KINDRED PRODUCTS	350	0	0	0	0	0	350
EMPTY CONTAINERS	0	350	0	0	0	0	350
CHEMICALS & ALLIED PRODUCTS	0	0	0	0	0	175	175
FABRICATED METAL	0	0	0	0	0	0	0
RUBBER	0	0	0	0	0	0	0
SUM	350	875	350	525	350	350	2,800
% OF ALL SHIPMENTS	7%	18%	7%	11%	7%	7%	57%

* Total for only origin states listed

Table 4-3b 1987 Iowa Terminating Intermodal Traffic By Origin State (Number of Trailers and Containers)

STCC	CA	IL	MO	NC	TX	UT	VA	TOTAL*
MISC. MIXED SHIPMENTS	1,140	2,380	120	0	480	0	240	4,360
EMPTY CONTAINERS	0	840	0	0	0	0	80	920
CHEMICALS & ALLIED PRODUCTS	0	0	0	320	0	400	0	720
MAIL OR OTHER| CONTRACT TRAFFIC	0	400	300	0	0	0	0	700
FOOD & KINDRED PRODUCTS	120	300	200	0	0	0	0	620
APPAREL & TEXTILE PRODUCTS	0	0	0	0	0	0	0	0
SHIPPER ASSOCIATION	136	0	0	0	48	0	0	184
FARM PRODUCTS	40	0	0	0	0	0	0	40
TOTAL	1,436	3,920	620	320	528	400	320	7,544
% OF ALL SHIPMENTS	16%	44%	7%	4%	6%	4%	4%	85%

* Total for only origin states listed

Table 4-4a 1980 Intermodal Traffic by County and Number of Trailers and Containers

County	Major City In County	Originating	Terminating
BOONE	BOONE	1,925	350
POLK	DES MOINES	1,750	1,050
SCOTT	DAVENPORT	1,225	700
JASPER	NEWTON	1,050	0
LEE	FORT MADISON	1,050	175
POTTAWATTAMIE	COUNCIL BLUFFS	700	875
LINN	CEDAR RAPIDS	700	350
WOODBURY	SIOUX CITY	525	0
Total of Top Eight Counties		8,925	3,500
All Counties Total		10,676	4,900
Top Six Percent of All Counties		84%	71%

Table 4-4b 1987 Iowa Intermodal Traffic by County and Number of Trailers and Containers

County	Major City In County	Originating	Terminating
JASPER	NEWTON	6,840	100
POLK	DES MOINES	5,420	3,800
SCOTT	DAVENPORT	4,300	940
POTTAWATTAMIE	COUNCIL BLUFFS	3,300	2,260
LINN	CEDAR RAPIDS	1,160	600
WOODBURY	SIOUX CITY	800	100
Total of Top Six Counties		21,820	7,800
All Counties Total		23,220	8,924
Top Six Percent of All Counties		94%	87%

Iowa's stations and their originating, terminating and junction trailer and container volumes for 1980 and 1987 are summarized in Table 4-5. The stations in Table 4-5 are arranged according to their originating trailer and container volumes in 1987. The ranking in Table 4-5 nearly follows the county rankings in Table 4-4b That is, the county economic activity is somewhat concentrated in its major city.

Originating and terminating trailers and containers by railroad are shown in Table 4-6a and Table 4-6b for 1980 and 1987, respectively. The railroads are ordered according to their originating trailer and container volumes. The Iowa Interstate Railroad carried the largest portion of originating trailers and containers in 1987 (7,220 trailers and containers, or 31.1 percent), followed by Chicago and North Western (6,460 trailers and containers, or 27.8 percent), and the Soo Line (4,500 trailers and containers, or 19.4 percent). In 1980, the Chicago and North Western railroad carried 34.4 percent of Iowa's originating trailers and containers.

Table 4-5 Iowa Intermodal Stations (In Number of Trailers and Containers)

	1980			1987		
STATION	ORIGINATIONS	TERMINATIONS	JUNCTIONS	ORIGINATIONS	TERMINATIONS	JUNCTIONS
NEWTON	1,050	0	0	6,840	100	0
DES MOINES	1,050	875	0	5,420	3,800	0
DAVENPORT	1,225	700	0	4,300	940	0
COUNCIL BLUFFS	700	875	2,450	3,300	1,360	2,800
CEDAR RAPIDS	350	0	0	1,160	600	0
SIOUX CITY	525	0	0	800	100	0
FT DODGE	0	0	0	480	0	0
FT MADISON	1,050	175	0	360	224	0
IOWA CITY	0	0	0	240	200	0
MUSCATINE	350	0	0	200	0	0
WATERLOO	350	0	0	120	0	0
CRESTON	0	175	0	0	0	0
BURLINGTON	175	175	0	0	0	0
MARSHALLTOWN	350	175	0	0	0	0
POSTVILLE	175	0	0	0	0	0
MARION	0	175	0	0	0	0
MASON CITY	175	175	0	0	0	0
BOONE	1,925	350	0	0	400	0
DUBUQUE	175	700	0	0	0	0
TOTAL	8,575	4,550	2,450	16,380	7,624	2,800

Table 4-6a 1980 Iowa Railroads Ordered By Trailers and Container

RR		Originating	% Total	Terminating	% Total
CNW	CHICAGO & NORTH WESTERN	3,675	34.4%	1,050	21.4%
RI	ROCK ISLAND	2,100	19.7%	350	7.1%
MIL	MILWAUKEE ROAD	1,925	18.0%	1,575	32.1%
ATSF	SANTA FE	1,050	9.8%	0	0.0%
BN	BURLINGTON NORTHERN	1,050	9.8%	1,400	28.6%
ICG	ILLINOIS CENTRAL GULF	700	6.6%	350	7.1%
NW	NORFOLK & WESTERN	175	1.6%	175	3.6%
	TOTAL	10,675		4,900	

The role of the Burlington Northern railroad changed dramatically between 1980 and 1987. While in 1980 the Burlington Northern handled 10 percent and 29 percent of originating and terminating trailers and containers, respectively, it handled only a very small

Table 4-6b 1987 Iowa Railroads Ordered By Trailers and Container

RR		Originating	% Total	Terminating	% Total
IAIS	IOWA INTERSTATE	7,220	31.1%	600	6.7%
CNW	CHICAGO & NORTH WESTERN	6,460	27.8%	4,400	49.3%
SOO	SOO LINE	4,500	19.4%	940	10.5%
UP	UNION PACIFIC	2,280	9.8%	1,160	13.0%
NW	NORFOLK & WESTERN	1,680	7.2%	1,600	17.9%
CC	CHICAGO CENTRAL & PACIFIC	600	2.6%	0	0.0%
ATSF	SANTA FE	360	1.6%	224	2.5%
BN	BURLINGTON NORTHERN	120	0.5%	0	0.0%
	TOTAL	23,220		8,924	

number of trailers and containers (less than one-half percent) in 1987. This is due to the Burlington Northern's closing its ramps in Iowa.

About 50 percent of the traffic terminated in Iowa in 1987 was carried by the Chicago and North Western. Although the Iowa Interstate Railroad carried a large portion of Iowa originating traffic, it handled less than 7 percent of the terminating traffic. In 1980, the Milwaukee Road and the Burlington Northern handled more than 50 percent of the terminating trailers and containers.

Railcar Traffic

Iowa's originating railcar traffic accounted for more than 26 and 29 percent of the total originating tonnage of Region VII in 1980 and 1987, respectively. Iowa originating tonnage increased by 9.9 million tons (40.1 percent) between 1980 and 1987, compared to Region VII's increase of 24 percent. Through traffic in 1987 equaled 37.5 million tons. This bridge traffic represented 37 percent of the total Iowa railcar traffic which was a significantly smaller percentage than rail intermodal through traffic represented. Table 4-7 shows tonnage originating in, terminating in, or interchanged in Iowa.

Iowa's terminating tonnage accounted for 20 and 29 percent of the total terminating tonnage of Region VII in 1980 and 1987, respectively. Iowa's terminating tonnage increased by 60.5 percent between 1980 and 1987.

The commodities most frequently shipped from Iowa in 1980 and 1987 and termination states are shown in Tables 4-8a and 4-8b. Farm products accounted for the largest originating tonnage in 1980 and 1987. In 1980, more than 12.5 million tons of farm products originated in Iowa, 19 percent of which also terminated in Iowa. More than 20 million tons of farm

products were shipped from Iowa in 1987. About 36 percent of the 1987 farm product tonnage terminated in Iowa (as intrastate shipments).

Table 4-7 Iowa Railcar Traffic Changes (In Millions of Tons)

CATEGORY	1980 TONS	1987 TONS	CHANGE	% CHANGE
ORIGINATING	24.7	34.6	9.9	40.1%
DESTINED	19.0	30.5	11.5	60.5%
JUNCTION	7.4	16.8	9.4	127.0%
THROUGH*	NA	37.5		
TOTAL**	51.1	81.9	30.8	60.3%

*Includes junction traffic
**Excludes through traffic

Table 4-8a 1980 Iowa Originating Railcar Traffic By Destination State (In Thousands of Tons)

STCC	Total	CA	IA	IL	LA	MN	MO	TX	WA	TOTAL*
FARM PRODUCTS	12,522	231	2,382	1,453	1,322	30	1,159	3,031	1,000	10,608
FOOD & KINDRED PRODUCTS	6,883	967	265	2,027	178	173	202	404	81	4,297
CHEMICAL & ALLIED	1,235	71	366	153	0	88	78	5	0	761
STONE, CLAY & CONCRETE	1,115	10	84	60	0	719	0	6	12	891
WASTE & SCRAP	894	0	280	166	0	47	76	0	7	576
TOTAL	22,649	1,279	3,377	3,858	1,500	1,056	1,515	3,445	1,100	17,133
ALL COMMODITIES	24,700									
TOP 5 OF TOTAL	92%	5%	14%	16%	6%	4%	6%	14%	4%	69%

* Total for only originating states listed

Table 4-8b 1987 Iowa Originating Railcar Traffic By Destination State (In Thousands of Tons)

STCC	Total	CA	IA	IL	LA	MN	MO	TX	TOTAL*
FARM PRODUCTS	20,404	552	7,410	5,263	1,215	209	2,903	558	18,110
FOOD & KINDRED PRODUCTS	8,934	977	653	34	107	310	587	366	3,034
CHEMICALS & ALLIED	1,869	67	785	134	8	158	53	53	1,258
STONE, CLAY & CEMENT	1,403	2	314	127	0	717	0	3	1,163
WASTE & SCRAP	732	0	313	179	0	0	17	4	513
TOTAL	33,342	1,598	9,475	5,737	1,330	1,394	3,560	984	24,078
ALL COMMODITIES	34,600								
TOP 5 OF TOTAL	96%	5%	27%	17%	4%	4%	10%	3%	70%

* Total for only terminating States listed

Food and kindred products accounted for the second largest originating tons in 1980 and 1987. Iowa accounted for about 37 and 48 percent of Region VII's food and kindred products originating tons in 1980 and 1987, respectively. About 4 percent of Iowa's

originating tons of food and kindred products in 1980 and 6 percent of that in 1987 were local (intrastate) shipments.

Chemicals and allied products ranked third in originating tonnage in both 1980 and 1987. About 30 and 42 percent of Iowa's originating chemicals and allied products tons terminated in the state as intrastate shipments in 1980 and 1987.

A large portion of Iowa's originating tons in 1987 terminated in the state (intrastate). Almost 28 percent of the Iowa originating tons in 1987 terminated in Iowa. In 1980, only 15 percent of Iowa's originating tonnage were intrastate shipments. Tonnage terminating in Illinois accounted for about 27 percent of Iowa's originating tonnage in 1987. About 7 percent of Iowa 1980 tonnage and 11 percent its 1987 originating tonnage terminated in Missouri.

The major commodities terminating in Iowa in 1980 and 1987 are shown in Tables 4-9a and 4-9b. Coal accounted for the largest terminating tonnage in 1980 and 1987. Terminating coal tonnage accounted for 46 percent of Iowa terminating tonnage in 1980 and 41 percent of the 1987 terminating tonnage. Wyoming provided 72 and 95 percent of Iowa coal in 1980 and 1987, respectively. The amount of coal shipped from Illinois to Iowa decreased from 1.5 million tons in 1980 to only 350 thousand tons in 1987. Similarly, 452 thousand tons of coal were shipped from Colorado in 1980 and none in 1987. Wyoming is becoming the sole provider of Iowa's coal.

Table 4-9a 1980 Railcar Traffic Terminating in Iowa by Origin State (In Thousands of Tons)

STCC	Total	IL	MN	IA	WY	CO	TOTAL*
COAL	8,790	1,533	0	33	6,288	452	17,096
FARM PRODUCTS	3,093	69	284	2,382	0	0	5,828
CHEMICAL & ALLIED	1,753	195	40	366	25	0	2,379
NON-METALLIC MINERALS	783	25	39	583	20	0	1,450
FOOD & KINDRED PRODUCTS	1,012	98	213	265	0	0	1,588
TOTAL	15,431	1,920	575	3,628	6,333	452	12,908
ALL COMMODITIES	19,000						
TOP 5 OF TOTAL	81%	10%	3%	19%	33%	3%	68%

* Total for only originating states listed

The second largest commodity group terminating in Iowa was farm products. A considerable portion of this traffic is intrastate, however. Other commodity groups listed in Table 4-9a and 4-9b are chemicals and allied products, nonmetallic ore, and food and kindred

Table 4-9b 1987 Railcar Traffic Terminating in Iowa by Origin State (In Thousands of Tons)

STCC	Total	IL	MN	IA	WY	SD	TOTAL*
COAL	12,462	351	0	0	11,837	0	12,188
FARM PRODUCTS	8,971	34	740	7,409	0	373	8,556
CHEMICAL & ALLIED	3,189	356	306	749	47	0	1,458
NON-METALLIC MINERALS	1,743	4	157	519	4	915	1,599
FOOD & KINDRED PRODUCTS	1,225	38	178	653	0	6	875
TOTAL	27,590	783	1,381	9,330	11,889	1,294	24,676
ALL COMMODITIES	30,500						
TOP 5 OF TOTAL	90%	3%	5%	30%	39%	4%	81%

* Total for only originating states listed

products. Chemicals and allied products terminating in Iowa originate mainly in Illinois, Minnesota, North Dakota, Louisiana, and Kansas. More than 50 percent of nonmetallic ore tonnage terminating in Iowa in 1987 originated in South Dakota.

Tables 4-10a and 4-10b list the Iowa counties that originated the most railcar tonnage (4-10a) and terminated (4-10b) the most tonnage in 1980 and 1987. Only two of the Iowa counties listed (Woodbury and Lee) sustained losses of originating tonnage between 1980 and 1987. The rest of the listed Iowa counties' originating tonnage increased at various rates between 1980 and 1987. The average increase for the top 10 originating counties was 86 percent, whereas all counties' originating tonnage grew by only 40 percent between 1980 and 1987. The 10 counties generating the most tonnage accounted for 50 percent of the 1980 Iowa originating tonnage and 66 percent of the 1987 Iowa originating tonnage, an indication of the activity concentration. On the other hand, the terminating tonnage from the 10 counties in Table 4-10b achieved an average increase of 79 percent between 1980 and 1987. None of the 10 Iowa counties terminating the most tonnage sustained a loss in tonnage.

Wright County was ranked first in 1987 with more than 4.2 million originating tons (12 percent of Iowa originating tonnage). Farm products accounted for 3.5 million tons (82 percent) of Wright County's tonnage in 1987. Approximately two million tons of farm products originating in Wright County and terminated in Iowa, and about 1.3 million tons terminated in Illinois.

Pottawattamie County had the second largest amount of originating tons in 1987, it was sixth in 1980. Almost 3.8 million tons (11 percent of Iowa's total originating tonnage) originated from Pottawattamie County in 1987. Farm products tonnage constituted 85 percent of the tonnage originating in Pottawattamie. About 30 percent of Pottawattamie County's farm

Table 4-10a Iowa Counties Originating the Most Tonnage in 1987

County	Major City In County	1980	1987	CHANGE	CHANGE
WRIGHT	EAGLE GROVE	506,900	4,282,090	3,775,190	745%
POTTAWATTAMIE	COUNCIL BLUFFS	1,021,800	3,758,166	2,736,366	268%
CERRO GORDO	MASON CITY	1,175,700	3,513,865	2,338,165	199%
LINN	CEDAR RAPIDS	2,533,400	3,469,736	936,336	37%
POLK	DES MOINES	1,802,200	2,203,568	401,368	22%
CLINTON	CLINTON	1,104,200	1,826,829	722,629	65%
WOODBURY	SIOUX CITY	1,381,800	1,240,199	(141,601)	-10%
LEE	FORT MADISON	1,229,000	630,560	(598,440)	-49%
SCOTT	DAVENPORT	727,500	953,720	226,220	31%
MUSCATINE	MUSCATINE	811,500	951,300	139,800	17%
SUB TOTAL		12,294,000	22,830,033	10,536,033	86%
ALL COUNTIES		24,694,500	34,546,838	9,852,338	40%
% TOP 10 of Total		50%	66%		

Table 4-10b Iowa Counties Terminating the Most Tonnage in 1987

COUNTY	Major City In County	1980	1987	CHANGE	CHANGE
WOODBURY	SIOUX CITY	3,097,600	4,479,506	1,381,906	45%
POTTAWATTAMIE	COUNCIL BLUFFS	2,521,400	3,900,960	1,379,560	55%
MUSCATINE	MUSCATINE	846,200	3,824,850	2,978,650	352%
LINN	CEDAR RAPIDS	1,730,000	3,179,860	1,449,860	84%
WAPELLO	OTTUMWA	597,800	2,530,270	1,932,470	323%
CLINTON	CLINTON	1,304,200	2,246,155	941,955	72%
POLK	DES MOINES	1,746,900	1,816,315	69,415	4%
DUBUQUE	DUBUQUE	301,100	1,457,315	1,156,215	384%
LEE	FORT MADISON	1,342,500	1,410,888	68,388	5%
SCOTT	DAVENPORT	1,186,800	1,369,723	182,923	15%
SUB TOTAL		14,674,500	26,215,842	11,541,342	79%
ALL COUNTIES		18,965,000	30,484,887	11,519,887	61%
% TOP 10 of Total		77%	86%		

products in 1987 terminated in Louisiana. The rest of these farm products terminated in Illinois, California, Texas, Washington, Missouri, and locally in Iowa. Pottawattamie County also ranked second in terminating tonnage. About 2.6 million tons of coal and 900 thousand tons of farm products terminated in Pottawattamie County in 1987.

Cerro Gordo County was third in 1987 originating tonnage with more than 3.5 million tons (10 percent of the Iowa total). About 66 percent of Cerro Gordo County's originating tonnage in 1987 was farm products. Linn County was in fourth position with about 3.5 million tons. More than 2.7 million tons (80 percent) of Linn County's tonnage were food and kindred products. A number of food manufacturers are located in Linn County's seat, Cedar Rapids.

As Tables 4-10a and 4-10b illustrate, the tonnage carried in rail cars in Iowa both increased during the 1980s and became concentrated in fewer shipping and receiving points.

This was probably partially a function of the reduction in the number of country grain elevators and the concentration of larger terminal facilities.

Originating and terminating tonnages carried by Iowa railroads in 1980 and 1987 are shown in Tables 4-11a and 4-11b. About 83 percent of Iowa's originating tonnage and 84 percent of its terminating tonnage were carried by Class I railroads in 1987. Class II railroads handled approximately 14 percent of originating tonnage and 12 percent of terminating tonnage in 1987. In 1980, however, more than 96 percent of Iowa originating and terminating tonnage was handled by Class I railroads.

Table 4-11a 1980 Iowa Railroads by Class and Tons

RR	RR Name	ORIGINATE	TERMINATE
Class I Railroads			
CNW	Chicago and Northwestern	12,145,300	7,800,700
BN	Burlington Northern	3,553,900	6,267,300
MIL	Milwaukee Road	2,818,400	1,915,200
ICG	Illinois Central Gulf	2,610,800	1,178,100
RI	Rock Island	1,369,100	783,600
UP	Union Pacific	603,600	42,500
NW	Norfolk and Western	371,600	116,600
ATSF	Atchison, Topeka and Santa Fe	219,100	107,700
Class II Railroads			
TPW	Toledo, Peoria and Western	148,200	110,700
Class III, Short line and Terminal Railroads		733,900	642,600
Total		24,573,900	18,965,000

Table 4-11b 1987 Iowa Railroads by Class and Tons

RR	RR Name	ORIGINATE	TERMINATE
Class I Railroads			
CNW	Chicago and Northwestern	18,315,810	12,031,825
BN	Burlington Northern	3,348,387	7,946,136
SOO	Soo Line	3,255,250	5,083,840
UP	Union Pacific	1,775,285	175,248
NW	Norfolk and Western	690,424	293,784
MP	Missouri Pacific	520,071	57,280
MKT	Missouri-Kansas-Texas	433,179	0
ATSF	Atchison, Topeka and Santa Fe	225,760	31,324
Class II Railroads			
CC	Chicago Central and Pacific	4,374,593	2,829,655
IAIS	Iowa Interstate	572,228	778,400
Class III, Short Line and Terminal Railroads		1,035,851	1,257,395
Total		34,546,838	30,484,887

Summary of Kansas Traffic

Intermodal Traffic

The number of trailers and containers originating in Kansas accounted for about 24 percent of Region VII's originating trailers and containers in 1980 and 32 percent in 1987. The number of originating trailers and containers more than tripled between 1980 and 1987 (a 211 percent increase). More than 887,000 trailers and containers passed through Kansas in 1987. Roughly 80 percent of the intermodal traffic in Kansas was bridge traffic in 1987.

Traffic terminating in Kansas almost doubled between 1980 and 1987. There were 33,600 trailers and containers terminating in Kansas in 1980, compared to 63,929 trailers and containers in 1987. Kansas' terminating traffic accounted for about 34 percent of Region VII's terminating traffic in 1980. But in 1987, Kansas' percentage of Region VII's terminating traffic dropped to 27 percent. A summary of Kansas' intermodal traffic changes can be found in Table 4-12.

Table 4-12 Kansas Intermodal Traffic Changes (In Number of Trailers and Containers)

CATEGORY	1980	1987	CHANGE	% CHANGE
ORIGINATING	33,075	102,944	69,869	211%
DESTINED	33,600	63,929	30,329	90%
JUNCTION	6,390	22,005	15,615	244%
THROUGH*	NA	865,560		
TOTAL**	73,065	188,878	115,813	159%

*Includes junction traffic
**Excluding through traffic

The commodity groups most frequently originating in Kansas in 1980 and 1987 and their major destinations are shown in Table 4-13a and Table 4-13b. The distribution of Kansas' major commodities closely follows that of the region. About 19,000 and 61,000 trailers and containers of miscellaneous and mixed shipments originated in Kansas in 1980 and 1987, respectively, making this class of commodities first among commodity classes originating in Kansas. About 41 percent and 23 percent (25,000 and 14,500 trailers and containers) of the 1987 miscellaneous shipments terminated in California and Illinois, respectively.

Table 4-13a 1980 Kansas Originating Intermodal Traffic By Destination State (In Number of Trailers and Containers)

STCC	IL	TX	CO	AZ	CA	WA	TOTAL*
MISC. & MIXED	2275	1575	2100	1400	5950	525	13825
SHIPPER ASSOC.	525	350	350	350	3500	1050	6125
CHEMICALS & ALLIED	0	1575	0	0	0	0	1575
MAIL & CONTRACT TRAFFIC	0	525	700	0	0	0	1225
FOOD & KINDRED	0	700	0	175	175	0	1050
EMPTY CONTAINERS	700	175	0	0	175	0	1050
LEATHER	0	350	0	0	0	0	350
TRANSPORT EQUIPMENT	175	175	0	0	0	0	350
ELECTRICAL MACHINERY	0	175	0	0	0	0	175
TOTAL	3675	5600	3150	1925	9800	1575	25725
% OF ALL SHIPMENTS	11%	17%	10%	6%	30%	5%	78%

*Total only for destination states listed

Table 4-13b 1987 Kansas Originating Intermodal Traffic By Destination State (In Number of Trailers and Containers)

STCC	AZ	CA	CO	IL	MO	OR	TX	TOTAL*
MISC. & MIXED	2,032	25,268	2,828	14,500	1,800	2,400	6,068	54,896
FOOD & KINDRED	156	9,696	360	1,760	40	80	840	12,932
CHEMICALS & ALLIED	80	4,336	0	760	0	720	1,040	6,936
SHIPPER ASSOC.	216	1,408	240	1,608	40	40	296	3,848
EMPTY CONTAINERS	0	1,852	0	240	80	0	280	2,452
RUBBER & MISC.	560	1,000	80	360	0	0	80	2,080
MAIL & CONTRACT TRAFFIC	200	600	0	400	40	0	80	1,320
PULP, PAPER & ALLIED	0	960	200	200	0	0	0	1,360
MISC. FREIGHT	0	1,048	0	40	0	0	0	1,088
ELECTRICAL MACHINERY	40	960	40	0	0	0	40	1,080
TOTAL	3,284	47,128	3,748	19,868	2,000	3,240	8,724	87,992
% OF ALL SHIPMENTS	3%	46%	4%	19%	2%	3%	8%	85%

* Total only for destination states listed

Food and kindred products were the second most frequently originating commodity group in 1987. About 72 percent of these shipments terminated in California. Food and kindred products shipments were fifth most frequent in 1980.

Chemicals and allied products were the third most frequent commodity group shipped in 1980, accounting for less than five percent of Kansas' originating trailers and containers, and third in 1987, accounting for eight percent of Kansas' 1987 intermodal origination.

Tables 4-14a and 4-14b show the major commodity groups terminating in Kansas in 1980 and 1987, respectively. About 73 percent and 63 percent of Kansas' terminating traffic in 1980 and 1987, respectively, were miscellaneous and mixed shipments. About 52 percent and 12 percent of these shipments originated in Illinois and California, respectively, in 1980. In 1987, California's share grew to 60 percent of Kansas' miscellaneous and mixed shipments,

Table 4-14a 1980 Kansas Terminating Intermodal Traffic By Origin State (In Number of Trailers and Containers)

STCC	NJ	IL	MO	TX	CO	WA	CA	TOTAL*
MISC. & MIXED	700	12,775	700	1,050	700	1,400	3,150	20,475
SHIPPER ASSOC.	0	3,850	0	175	0	0	0	4,025
FOOD & KINDRED	0	350	0	0	0	0	350	700
TRANSP. EQUIPMENT	0	0	175	0	350	0	0	525
EMPTY CONTAINERS	0	350	0	0	0	0	0	350
TOTAL	700	17,325	875	1,225	1,050	1,400	3,500	26,075
% OF ALL SHIPMENT	2%	52%	3%	4%	3%	4%	10%	78%

* Total for only the listed destination states

Table 4-14b 1987 Kansas Terminating Intermodal Traffic by Origin State (In Number of Trailers and Containers)

STCC	CA	CO	IL	NJ	OR	PA	TX	UT	WA	TOTAL*
MISC. MIXED	24,118	396	9,796	760	540	40	2,304	280	840	39,074
TRANS. EQUIPMENT	264	0	4,563	0	0	0	120	0	0	4,947
FOOD & KINDRED	2,588	120	1,000	0	0	0	760	120	0	4,588
SHIPPER ASSOC.	1,876	0	2,068	0	0	0	320	0	0	4,264
EMPTY CONTAINERS	340	80	2,316	0	0	0	260	0	0	2,996
MAIL & CONTRACT TRAFFIC	0	0	940	0	0	460	0	0	0	1,400
FURNITURE	0	0	0	0	0	0	1,400	0	0	1,400
LEATHER	680	0	0	0	0	0	0	0	160	840
TOTAL	29,866	596	20,683	760	540	500	5,164	400	1,000	59,509
% OF ALL SHIPMENT	47%	1%	32%	1%	1%	1%	8%	1%	2%	93%

* Total for only origin states

whereas Illinois's share dropped to 24 percent.

Transportation equipment was the fourth most frequently received class of commodities in 1980 and second in 1987. A large portion of these shipments (more than 92 percent) originated in Illinois. Food and kindred products were the third major commodity group in both 1980 and 1987. About 56 percent and 21 percent of food and kindred shipments terminating in Kansas in 1987 originated in California and Illinois, respectively.

Table 4-15a lists Kansas' counties based on their originating trailers and containers. For each of the counties, Table 4-15a includes the county's originating trailers and containers in 1980 and 1987, along with its absolute and percentage changes. The eight counties that originated and terminated the most intermodal traffic accounted for 94 percent and nearly 100 percent of the total number of trailers and containers originating in Kansas in 1980 and 1987, respectively. The concentration of traffic in a few locations reflects the withdrawal of Class I carriers to a limited number of central hubs facilities.

Wyandotte County generated the most traffic with 29,400 and 89,360 originating trailers and containers in 1980 and 1987, respectively. It accounted for most of Kansas' originating

trailers and containers. Trailers and containers originating in Wyandotte County made up about 89 percent and 87 percent of Kansas' total originating trailers and containers in 1980 and 1987, respectively. These shipments primarily terminated in California and Illinois. The number of trailers and containers originating in Wyandotte county more than tripled between 1980 and 1987. The rest of the counties listed in Table 4-15a accounted for small portions of Kansas' originating trailers and containers. Finney County was second; Shawnee County was third.

Table 4-15a Kansas Originating Intermodal Traffic By County and Number of Trailers and Containers

COUNTY	MAJOR CITY IN COUNTY	1980	1987	CHANGE	% CHANGE
WYANDOTTE	KANSAS CITY	29,400	89,360	59,960	204%
FINNEY	GARDEN CITY	0	3,116	3,116	
SHAWNEE	TOPEKA	875	2,760	1,885	215%
FORD	DODGE CITY	0	2,280	2,280	
HARVEY	NEWTON	350	1,520	1,170	334%
LYON	EMPORIA	525	1,508	983	187%
SEWARD	LIBERAL	0	1,320	1,320	
SEDGWICK	WICHITA	0	920	920	
TOTAL		31,150	102,784	71,634	230%
ALL COUNTIES		33,075	102,944	69,869	211%
Top 8 of Total		94%	100%		

Listed in Table 4-15b are Kansas' counties ordered by their number of terminating trailers and containers in 1987. The eight counties listed in Table 4-15b accounted for 93 percent of the 1980, and 100 percent of the 1987 number of trailers and container terminating in Kansas. In 1987, Wyandotte County accounted for almost all (96 percent) of Kansas' terminating trailers and containers.

Table 4-16 lists the four Kansas stations that accounted for the majority of the originating trailers and containers in 1987. Kansas City is the main station for intermodal activity in Kansas. By 1987 there were no other stations producing any significant volume of intermodal traffic.

Railcar Traffic

In 1980 and 1987 Kansas' originating tonnage of railcar traffic made up 29 percent and 25 percent of Region VII's originating tonnage, respectively. Kansas originating tonnage grew less than 6 percent between 1980 and 1987, compared to Region VII's 24 percent

Table 4-15b Kansas Terminating Intermodal Traffic By County and Number of Trailers and Containers

COUNTY	MAJOR CITY IN COUNTY	1980	1987	CHANGE	% CHANGE
WYANDOTTE	KANSAS CITY	23,275	61,109	37,834	163%
SHAWNEE	TOPEKA	1,225	1,280	55	4%
SEDGWICK	WICHITA	5,075	552	(4,523)	-89%
LABETTE	PARSONS	175	480	305	174%
FINNEY	GARDEN CITY	175	468	293	167%
HARVEY	NEWTON	350	0	(350)	-100%
MONTGOMERY	INDEPENDENCE	525	0	(525)	-100%
SALINA	SALINA	525	0	(525)	-100%
TOTAL		31,325	63,889	32,564	104%
ALL COUNTIES		33,600	63,929	30,329	90%
Top 8 of Total		93%	100%		

Table 4-16 Major Stations in Kansas By Number of Trailers and Containers

STATION	1980 Trailers & Containers			1987 Trailers & Containers		
	ORIGINATIONS	TERMINATIONS	JUNCTIONS	ORIGINATIONS	TERMINATIONS	JUNCTIONS
KANSAS CITY	29,225	22,925	6,300	89,360	61,109	19,745
TOPEKA	525	350	0	2,760	1,280	0
NEWTON	350	350	0	1,520	0	0
WICHITA	0	5,075	0	680	312	0
MAJOR STATIONS	30,100	28,700	6,300	94,320	62,701	19,745
KANSAS TOTAL	33,075	33,600	6,390	102,944	63,929	30,329
% MAJOR STATION	91%	85%	99%	92%	98%	65%

growth over the same period. Kansas terminating tonnage amounted to 22.7 million tons in 1980 and 26.1 million tons in 1987, a 15 percent increase. Total tonnage terminating in Kansas accounted for about 25 percent of railcar tonnage terminating in Region VII in 1980 and 1987. More than 100 million tons of through railcar traffic passed through Kansas in 1987, 65 percent of the railcar traffic was bridge traffic (having neither origin nor destination in Kansas). A summary of railcar tonnage changes between 1980 and 1987 is given in Table 4-17.

The major commodities originating in Kansas and their destinations in 1980 and 1987 are shown in Table 4-18a and Table 4-18b. Farm products led other commodities in originating tonnage in both 1980 and 1987. About 40 percent of farm product tonnage originating in Kansas also terminated in Kansas in 1980. Similarly, 32 percent of the farm products tonnage originated and terminated in Kansas (intrastate shipments) in 1987. About 32 percent and 35 percent of Kansas' farm products tonnage terminated in Texas in 1980 and 1987, respectively.

Table 4-17 Kansas Railcar Traffic Changes (By Million of Tons)

CATEGORY	1980	1987	CHANGE	% CHANGE
ORIGINATING	27.8	29.4	1.6	5.8%
DESTINED	22.7	26.1	3.4	15.0%
JUNCTION	1.4	5.7	4.3	306.3%
THROUGH*	NA	100.9		
TOTAL**	51.90	61.18	9.28	17.9%
JUNCTION % OF TOTAL	2.7%	9.3%		

* Includes junction traffic
** Excluding through traffic

Table 4-18a 1980 Kansas Originating Railcar Traffic By Destination State (In Thousands of Tons)

STCC	TOTAL	IL	MO	OK	KS	TX	TOTAL*
FARM PRODUCTS	17,033	96	1,339	853	6,799	5,886	14,972
FOOD & KINDRED	4,033	251	583	295	366	965	2,459
HAZARDOUS MATERIAL	1,578	111	249	168	142	310	978
CHEMICALS & ALLIED	994	140	149	45	124	89	547
STONE,CLAY,CONCRETE	993	5	32	149	573	63	822
PETROL & COAL PROD.	976	43	97	241	164	62	607
NONMETALLIC MINERALS	708	18	33	0	509	12	572
COAL	574	0	335	0	200	0	535
WASTE & SCRAP	405	33	137	17	44	101	332
TRANSPORT EQUIPMENT	251	42	4	0	16	33	95
TOTAL	27,545	739	2,956	1,767	8,936	7,520	21,918
ALL COMMODITIES	27,800						
TOP 10 OF TOTAL	99%	3%	11%	6%	32%	27%	79%

* Total for only terminating states listed

Table 4-18b 1987 Kansas Originating Railcar Traffic By Destination State (In Thousands of Tons)

STCC	TOTAL	CA	KS	MO	OK	TX	TN	TOTAL*
FARM PRODUCTS	21,437	543	6,811	1,419	819	9,050	823	19,464
FOOD & KINDRED	3,781	457	283	160	127	1,628	173	2,828
CHEMICALS & ALLIED	1,273	76	170	167	46	223	36	718
NONMETALLIC MINERALS	861	0	761	24	0	23	0	807
WASTE & SCRAP	478	0	43	38	109	127	0	317
STONE,CLAY,CONCRETE	345	4	161	0	49	14	0	227
TOTAL	28,175	1,080	8,228	1,808	1,149	11,065	1,032	24,362
ALL COMMODITIES	29,375							
TOP 6 OF TOTAL	96%	4%	28%	6%	4%	38%	4%	

* Total only of origin states listed

The second most important originating commodity group in Kansas in 1980 and 1987 was food and kindred products. The largest portion of Kansas' food and kindred products terminated in Texas in both 1980 and 1987. About 40 percent and 32 percent of Kansas'

originating food and kindred products tonnage also terminated in Kansas as intrastate shipments in 1980 and 1987, respectively.

Chemicals and allied products were the third most important commodity group in originating tonnage in 1987 and fourth in 1980. The remaining commodity groups listed in Table 4-18a and Table 4-18b are commodities of very high weight-bulk ratios. Their tonnage is high due to their density and not necessarily because of heavy trading.

In 1980, 32 percent of all originated railcar traffic was intrastate movements. In 1987, 28 percent of all originated traffic was intrastate movements.

Table 4-19a and Table 4-19b show the most important terminating commodities in Kansas and their origins. These commodities are very similar to the most important originating commodities, except for coal. It was the second most commonly terminating commodity in 1980 and the first in 1987. Wyoming provided 82 percent and 88 percent of the coal tonnage terminating in Kansas in 1980 and 1987, respectively. The amount of coal shipped to Kansas increased by 93 percent between 1980 and 1987.

Table 4-19a 1980 Railcar Traffic Terminating In Kansas By Origin State (In Thousands of Tons)

STCC	TOTAL	NE	KS	MO	OK	TX	WY	TOTAL*
FARM PRODUCTS	9,120	1,058	3316	274	167	10	0	4,825
COAL	5,840	0	200	0	495	0	4,817	5,511
FOOD & KINDRED	1,553	61	366	117	5	124	10	682
CHEMICALS & ALLIED	1,276	10	124	101	157	170	229	791
STONE,CLAY,CONCRETE	1,010	13	573	8	8	124	22	748
NONMETALLIC MINERALS	698	0	509	33	20	0	0	562
TOP 6 COMMODITIES	19,498	1,141	5,087	534	851	428	5,077	13,118
ALL COMMODITIES	22,744							
TOP 6 OF TOTAL	86%	5%	22%	2%	4%	2%	22%	58%

* Total for only the listed destination states

The second most important terminating commodity class in 1987 and the first in 1980 was farm products. The main portion of farm product shipments in Kansas is intrastate, however. In fact, 32 percent of (1980) and 75 percent of (1987) farm products terminating in Kansas were intrastate shipments. Nebraska provided more than a million tons (12 percent of farm products terminating in Kansas) of farm products to Kansas, in both 1980 and 1987.

Table 4-20a lists the major counties in Kansas based on their originating tonnage in 1980 and 1987. The six counties with the greatest amount of originating traffic accounted for

Table 19b 1987 Railcar Traffic Terminating in Kansas by Origin State (In Thousands of Tons)

STCC	TOTAL	IL	KS	NE	OK	TX	WY	TOTAL*
COAL	11,262	428	0	973	0	0	9,862	11,263
FARM PRODUCTS	9,059	0	6,811	1,146	85	53	0	8,094
NONMETALLIC MINERALS	1,360	52	761	0	437	19	5	1,274
CHEMICALS & ALLIED	1,296	28	170	18	203	237	162	819
FOOD & KINDRED	965	64	283	74	2	20	0	443
TOTAL	23,942	572	8,024	2,210	727	329	10,030	21,892
ALL COMMODITIES	26,114							
TOP 5 OF TOTAL	92%	2%	31%	8%	3%	1%	38%	84%

* Total for only the listed destination states

39 percent and 52 percent of the tonnage originating in Kansas in 1980 and 1987, respectively.

Table 4-20b shows major counties in Kansas according to their terminating tonnage. Coal and farm products are the two main terminating commodities for these counties. Pottawatomie County was first, with more than 3.5 million and 7.8 million tons of terminating traffic in 1980 and 1987, respectively. Coal made up more than 70 percent of its terminating tonnage. The rest of the ranked counties are the same as those in the originating tonnage ranking in Table 4-19a.

Table 4-20a Kansas Originating Rail Traffic by County (In Thousand of Tons)

COUNTY	MAJOR CITY IN COUNTY	1980	1987	CHANGE	% CHANGE
WYANDOTTE	KANSAS CITY	2,677	5,189	2,511	93.8%
SEDGWICK	WICHITA	2,370	3,115	745	31.4%
RENO	HUTCHINSON	1,746	2,783	1,037	59.4%
SHAWNEE	TOPEKA	2,010	1,690	(320)	-15.9%
SALINE	SALINA	1,190	1,435	245	20.6%
ATCHISON	ATCHISON	932	1,102	171	18.3%
SUB TOTAL		10,926	15,315	4,389	40.2%
ALL COUNTIES		27,800	29,375	1,575	5.7%
Top 6 of all		39%	52%		

Table 4-20b Kansas Terminating Rail Traffic by County (In Thousand of Tons)

COUNTY	MAJOR CITY IN COUNTY	1980	1987	CHANGE	% CHANGE
POTTAWATOMIE	WESTMORELAND	3,577	7,886	4,309	120.5%
WYANDOTTE	KANSAS CITY	3,317	5,725	2,408	72.6%
SEDGWICK	WICHITA	2,870	2,641	(229)	-8.0%
SHAWNEE	TOPEKA	2,510	1,820	(690)	-27.5%
RENO	HUTCHINSON	2,242	1,460	(782)	-34.9%
DOUGLAS	LAWRENCE	1,380	1,010	(370)	-26.8%
SUB TOTAL		15,897	20,543	4,646	29.2%
ALL COUNTIES		22,744	26,114	3,370	14.8%
Top 6 of all		70%	79%		

Originating and terminating tonnage carried by Kansas railroads in 1980 and 1987 are shown in Tables 4-21a and 4-21b. Almost all of Kansas' originating and terminating tonnage was carried by Class I carriers in 1980 and 1987. The Santa Fe railroad moved about 45 percent of the originating tonnage and 39 percent of the terminating tonnage in 1980. It handled about 46 percent of Kansas' originating tonnage, and 30 percent of its terminating tonnage in 1987. In fact, the Santa Fe's share of Kansas' terminating tonnage declined from more than 8.8 million tons in 1980 to less than eight million tons in 1987.

Table 4-21a 1980 Kansas Railroads By Tons

RR	RR Name	ORIGINATING	TERMINATING
Class I Railroads			
ATSF	ATCHISON,TOPEKA AND SANTA FE	12,339,900	8,781,900
MP	MISSOURI PACIFIC	5,536,200	3,596,500
UP	UNION PACIFIC	4,304,900	6,799,700
SLSF	ST LOUIS-SAN FRANCISCO	2,044,300	1,292,100
BN	BURLINGTON NORTHERN	937,600	435,100
RI	CHICAGO,ROCK ISLAND AND PACIFIC	859,100	347,000
MKT	MISSOURI-KANSAS-TEXAS	785,900	524,400
SSW	ST LOUIS SOUTH WESTERN	680,300	685,600
KCS	KANSAS CITY SOUTHERN	42,400	10,400
CNW	CHICAGO AND NORTH WESTERN	3,000	29,500
ICG	ILLINOIS CENTRAL	0	158,900
Total		27,533,600	22,661,100

Table 4-21b 1987 Kansas Railroads By Class and Tons

RR	RR Name	ORIGINATING	TERMINATING
Class I Railroads			
ATSF	ATCHISON,TOPEKA, AND SANTA FE	13,408,853	7,946,924
MP	MISSOURI PACIFIC	7,416,182	4,208,964
UP	UNION PACIFIC	3,857,248	11,064,098
MKT	MISSOURI-KANSAS-TEXAS	1,712,186	498,292
BN	BURLINGTON NORTHERN	1,512,532	1,601,096
SSW	ST LOUIS SOUTH WESTERN	1,377,732	521,880
OKT	OKLAHOMA-KANSAS-TEXAS	45,608	0
KCS	KANSAS CITY SOUTHERN	14,384	5,040
CNW	CHICAGO AND NORTH WESTERN	14,175	252,230
ICG	ILLINOIS CENTRAL	0	15,440
CLASS III			
GCW	GARDEN CITY WESTERN	15,960	0
Total		29,374,860	26,113,964

The Missouri Pacific railroad handled 20 percent of Kansas' originating tonnage and 16 percent of its terminating tonnage in 1980. The Missouri Pacific also carried 25 percent of Kansas' originating tonnage and 16 percent of its terminating tonnage in 1987.[3] The Union Pacific carried about 16 percent and 13 percent of Kansas' originating tonnage in 1980 and

1987, respectively. The Union Pacific accounted for 30 percent of Kansas' terminating tonnage in 1980 and 42 percent of its tonnage in 1987. The amount of Kansas' terminating tonnage carried by the Union Pacific increased by 61 percent between 1980 and 1987.

Summary of Missouri Traffic

Intermodal Traffic

After the general concentration of intermodal loading and unloading facilities by rail companies in the 1980s, Missouri was left with more facilities than any other state in Region VII. The Union Pacific System, Burlington Northern, Norfolk and Western, Soo Lines, and Chicago and North Western all have intermodal terminals in St. Louis and/or Kansas City, Missouri. During the 1980s, Missouri continued to be the region's predominant source of intermodal traffic. The number of trailers and containers originating in Missouri accounted for about 64 percent of region's originating trailers and containers in 1980 and 50 percent in 1987.

Missouri's originating trailers and containers doubled between 1980 and 1987. This increase of 101 percent between 1980 and 1987 was slightly less than the region's growth rate. More than 88,000 trailers and containers originated in Missouri in 1980. This number grew to more than 177,000 trailers and containers in 1987. Traffic terminating in Missouri almost tripled between 1980 and 1987, growing at a rate similar to that of the region. There were 51,625 trailers and containers terminating in Missouri in 1980, compared to 150,420 trailers and containers in 1987. Missouri's terminating traffic accounted for about 53 percent of Region VII's terminating traffic in 1980 and 1987. About 1.4 million trailers and containers passed through Missouri in 1987. Table 4-22 summarizes intermodal traffic changes for Missouri between 1980 and 1987.

The five most important originating commodity groups, based on tonnage, in Missouri in 1980 and 1987 and their major destinations are shown in Table 4-23a and Table 4-23b. Compared to other states in the region, only a modest portion of the shipments (13 percent in 1987) terminated in Illinois and California. Most significantly, a much higher than average proportion of Missouri shipments were destined to Texas. Also unique within the region, Missouri experienced a significant number of intrastate, intermodal movements in 1987. About 12,000 trailers and containers (12 percent of Missouri's originating trailers and containers)

Table 4-22 Missouri Intermodal Traffic Changes (In Number of Trailers and Containers)

CATEGORY	1980	1987	CHANGE	% CHANGE
ORIGINATING	88,550	177,057	88,507	100%
TERMINATING	51,625	150,420	98,795	191%
JUNCTION	69,300	140,696	71,396	103%
THROUGH*	NA	954,675		
TOTAL**	209,475	468,173	258,698	123%

* Includes junction traffic
** Excluding through traffic

Table 4-23a 1980 Missouri Originating Intermodal Traffic By Destination State (In Number of Trailers and Containers)

STCC	CA	FL	LA	IL	TX	MO	TOTAL*
MISC. & MIXED	2,975	4,375	3,151	9,100	14,000	875	34,476
FREIGHT FORWARDER	3,150	0	0	0	2,100	0	5,250
SHIPPER ASSOC.	2,100	175	0	0	350	700	3,325
CHEMICALS	0	175	700	525	1,750	0	3,150
ELECTRIC MACHINERY	0	0	0	0	2,450	0	2,450
TOP FIVE	8,225	4,725	3,851	9,625	20,650	1,575	48,651
% OF ALL SHIPMENTS	9%	5%	4%	11%	23%	2%	55%

* Total only for destination states listed

Table 4-23b 1987 Missouri Intermodal Traffic By Destinations (In Number of Trailers and Containers)

STCC	CA	IL	MO	OH	TX	WA	TOTAL*
MISC. & MIXED	5,956	8,788	12,000	6,809	29,316	4,020	66,889
EMPTY CONTAINERS	120	1,200	800	160	920	4,888	8,088
FOOD & KINDRED	160	200	1,760	120	1,360	680	4,280
CHEMICALS	480	2,180	360	40	1,520	40	4,620
ELECTRIC MACHINERY	880	120	1,200	0	1,680	40	3,920
TOP FIVE	7,596	12,488	16,120	7,129	34,796	9,668	87,797
% OF ALL SHIPMENTS	4%	7%	9%	4%	20%	5%	50%

* Total only for destination states listed

originated and terminated in Missouri in 1987, evidence of the economic activity in between St. Louis and Kansas City.

About 52 percent and 62 percent of the intermodal shipments from Missouri in 1980 and 1987, respectively, were miscellaneous and mixed shipments. The second most frequent intermodal shipment from Missouri was empty containers. About 13,000 empty containers originated from Missouri in 1987; 4,888 of these terminated in Washington state.

Tables 4-24a and 4-24b show the major commodity groups terminating in Missouri in 1980 and 1987. Again, miscellaneous and mixed shipments were the most frequent commodity group shipped to Missouri in both of 1980 and 1987. The third most frequently shipped

commodity group in 1980 was transportation equipment, accounting for 3,500 trailers and containers (7 percent of Missouri's total). More than half of the transportation equipment terminating in Missouri in 1980 originated in Michigan.

Table 4-24a 1980 Missouri Terminating Intermodal Traffic By Origin State (In Number of Trailers and Containers)

STCC	CA	NC	MI	IL	TX	MO	TOTAL*	
MISC. & MIXED	3,325	1,575	875	5,250	5,950	875	17,850	
SHIPPER ASSOC.	875	0	0	1,925	350	700	3,850	
TRANSPORT EQUIPMENT	0	0	1,925	700	0	175	2,800	
FREIGHT FORWARDER	1,225	0	0	1,050	0	0	2,275	
FABRICATED METAL	1,050	0	0	0	1,050	0	2,100	
TOP FIVE	6,475	1,575	2,800	8,925	7,350	1,750	28,875	
% OF ALL SHIPMENTS	80%	13%	3%	5%	17%	14%	3%	56%

* Total for only the origin states listed

Table 4-24b 1987 Missouri Terminating Intermodal Traffic By Origin State (In Number of Trailers and Containers)

STCC	CA	IL	MO	LA	TX	WA	TOTAL*
MISC. & MIXED	5,952	7,000	12,000	1,120	24,480	10,792	61,344
FOOD & KINDRED	2,216	640	1,760	480	1,320	40	6,456
PULP,PAPER & ALLIED	100	0	920	80	1,360	40	2,500
EMPTY CONTAINER	0	1,420	800	360	480	40	3,100
CHEMICALS	120	160	360	280	760	160	1,840
TOP FIVE	8,388	9,220	15,840	2,320	28,400	11,072	75,240
% OF ALL SHIPMENTS	5%	5%	9%	1%	16%	6%	42%

* Total for only the origin states listed

In 1987, food and kindred products were the second most frequent commodity group terminating in Missouri. Pulp, paper, and allied products were the third most frequent. Interestingly, empty containers were the fourth most frequent intermodal shipment. Unlike the empties originated in Missouri, however, most empty containers destined to Missouri are commonly from Illinois.

The major counties contributing to Missouri's originating trailers and containers are shown in Table 4-25a. St. Louis County (containing the City of St. Louis) accounted for the largest number of trailers and containers in both 1980 and 1987. More than 67,000 trailers and containers (76 percent of the total number of trailers and containers originating in Missouri) originated in St. Louis County in 1980. This number grew to more than 91,000 trailers and containers by 1987, a 35 percent increase between 1980 and 1987. Jackson

County (the Kansas City area) originated more than 11,500 trailers and containers, accounting for 13 percent of Missouri's originating trailers and containers in 1980. However, the number of trailers and containers originating in Jackson County in 1987 was about 75,880 trailers and containers, about six and half times that of 1980. Kansas City's dramatic increase in intermodal traffic can be partially attributed to Class I carriers (particularly, the Burlington Northern and the Union Pacific System) locating hub facilities in Kansas City, Missouri. Greene and Cape Girardeau counties accounted for a small number of Missouri's originating trailers and containers. Greene County's high intermodal traffic growth rate is attributable to the Burlington Northern's building of a hub facility in Springfield, Missouri.

Table 4-25b shows the top three counties in Missouri with respect to terminating intermodal traffic the number of terminating trailers and containers. Jackson and St. Louis counties approximately split Missouri's terminating trailers and containers in 1980. In 1987, the traffic terminating in Jackson County was more than 74,000 trailers and containers, about 50 percent of Missouri's total. St. Louis County's terminating traffic was about 63,800 trailers and containers, about 42 percent of Missouri's total.

Table 4-25a Missouri Originating Intermodal Traffic (By County and Number of Trailers and Containers)

COUNTY	MAJOR CITY IN COUNTY	1980	1987	CHANGE	% CHANGE
ST LOUIS	ST LOUIS	67,200	91,017	23,817	35%
JACKSON	KANSAS CITY	11,550	75,880	64,330	557%
GREENE	SPRINGFIELD	525	9,420	8,895	1694%
CAPE GIRARDEAU	CAPE GIRARDEAU	2,275	0	(2,275)	-100%
TOTAL		81,550	176,317	94,767	
ALL COUNTIES		88,550	177,057	88,507	
Top 4 of Total		92%	100%		

Table 4-25b Missouri Terminating Intermodal Traffic (By County and Number of Trailers and Containers)

COUNTY	MAJOR CITY IN COUNTY	1980	1987	CHANGE	% CHANGE
JACKSON	KANSAS CITY	21,875	74,288	52,413	240%
ST LOUIS	ST LOUIS	26,425	63,796	37,371	141%
GREENE	SPRINGFIELD	1,225	11,496	10,271	838%
TOP THREE COUNTIES		49,525	149,580	100,055	
ALL COUNTIES		51,625	150,420	98,795	
Top 3 of Total		96%	99%		

Missouri's major intermodal stations in 1980 and 1987 are shown in Table 4-26. Table 4-26 lists the station and its number of originating, terminating, and interchange trailers and containers. The two major stations that accounted for most of Missouri's trailer and container movements in both 1980 and 1987 were St. Louis and Kansas City. They also accounted for all the traffic interchanged in Missouri in 1980 and 1987.

Table 4-26 Major Stations in Missouri (By Number of Trailers and Containers)

	1980 Trailers & Containers			1987 Trailers & Containers		
STATION	ORIGINATIONS	TERMINATIONS	JUNCTIONS	ORIGINATIONS	TERMINATIONS	JUNCTIONS
ST LOUIS	62,125	26,075	15,225	90,977	61,716	3,080
KANSAS CITY	11,550	21,175	54,075	75,880	74,928	137,256
SPRINGFIELD	525	1,225	0	9,720	11,496	0
LUTHER	5,075	175	0	0	0	0
MAJOR STATIONS	79,275	48,650	69,300	176,577	148,140	140,336
MISSOURI TOTAL	88,550	51,625	69,300	177,057	150,420	140,696
% MAJOR STATION	90%	94%	100%	100%	98%	100%

Railcar Traffic

About 19.4 million tons of railcar traffic originated in Missouri in 1980, accounting for 20 percent of Region VII's tonnage. In 1987, tonnage originating in Missouri was at 32.2 million tons, and accounted for 27 percent of the region's tonnage. While railcar traffic originating in the region increased by 24 percent between 1980 and 1987, Missouri's tonnage increased by 66 percent.[4] About 40.6 million tons of commodities in railcars terminated in Missouri in 1980, accounting for 43 percent of the region's terminating tonnage. Missouri's terminating tonnage was more than 43.9 million tons in 1987, and accounted for 42 percent of the region's terminating tonnage. Tonnage terminating in Missouri increased by 8 percent between 1980 and 1987, compared to a ten percent increase in the region. About 177 million tons reflected bridge traffic in 1987 or about 60 percent of all Missouri traffic. Table 4-27 summarizes railcar traffic changes for Missouri between 1980 and 1987.

Tables 4-28a and 4-28b list the major commodity groups originating in Missouri and their major destinations in 1980 and 1987. The seven major commodity groups in Table 4-28a that accounted for 83 percent of the tonnage originating in Missouri in 1980. These same groups also accounted for 59 percent of Missouri's 1987 originating tonnage.[5] Food and kindred products' tonnage originating in Missouri declined from 5.1 million tons in 1980 to

Table 4-27 Missouri Railcar Traffic Changes (By Thousands of Tons)

CATEGORY	1980	1987	CHANGE	% CHANGE
ORIGINATING	19,400	32,193	12,793	66%
TERMINATING	40,600	43,932	3,332	8%
JUNCTION	60,061	63,389	3,329	6%
THROUGH*	NA	113,198		
TOTAL**	120,061	139,514	19,453	16%

* Includes junction traffic
** Excluding through traffic

3.8 million tons in 1987, suffering an 18 percent decrease. Recall that food and kindred products moved by intermodal trailers and containers increased considerably between 1980 and 1987 (a 471 percent increase). Food and kindred products accounted for 24 percent and 13 percent of Missouri's originating tonnage in 1980 and 1987, respectively.

Table 4-28a 1980 Missouri Originating Railcar Traffic By Destination State (In Thousands of Tons)

STCC	TOTAL	CA	AR	LA	IL	TX	MO	TOTAL*
FOOD & KINDRED	5,106	587	247	214	243	430	985	2,706
FARM PRODUCTS	4,651	20	561	271	356	2,011	786	4,003
STONE,CLAY,CONCRETE	2,164	51	9	42	360	249	533	1,244
METALLIC ORE	1,328	0	0	0	547	46	395	988
NONMETALLIC MINERALS	1,148	36	0	126	256	44	108	571
CHEMICALS & ALLIED	909	9	10	2	137	48	211	417
TRANSPORT EQUIPMENT	739	43	0	27	59	85	5	218
TOP SEVEN	16,045	745	826	682	1,957	2,912	3,023	10,145
ALL COMMODITIES	19,400							
TOP 7 OF TOTAL	83%	4%	4%	4%	10%	15%	16%	52%

* Total for only destination states listed

Farm products tonnage originating in Missouri increased from 4.7 million tons in 1980 to 6.7 millions in 1987, a 43 percent increase. A large portion of these products terminated in Texas in both 1980 and 1987. About 17 percent (1980) and 10 percent (1987) of these shipments also terminated in Missouri as intrastate traffic. About 2.1 million tons of stone, clay, and concrete products originated in Missouri in 1980. Missouri's originating tonnage of these products, however, increased to 2.4 million tons in 1987, about a 12 percent increase. Metallic ore tonnage originating in Missouri declined from 1.3 million tons in 1980 to 1.1 million tons in 1987. Nonmetallic minerals tonnage also declined from 739,000 tons in 1980 to 473,000 tons in 1987. Transportation equipment tonnage originating in Missouri increased from 739,000 tons in 1980 to 1.5 million tons in 1987, more than a 200 percent increase. The

transportation equipment originating in Missouri in 1987 terminated largely in California, Florida, Ohio, and Texas.

Table 4-28b 1987 Missouri Originating Railcar Traffic By Destination State (In Thousands of Tons)

STCC	TOTAL	AR	IL	MO	OK	TX	CA	TOTAL*
FARM PRODUCTS	6,710	1,279	728	669	187	2,764	85	5,712
FOOD & KINDRED	3,826	394	346	399	210	666	224	2,239
STONE,CLAY,CONCRETE	2,441	4	485	606	141	104	12	1,351
TRANSPORT EQUIPMENT	1,494	0	87	3	29	148	155	422
CHEMICALS & ALLIED	1,243	17	234	194	14	33	0	491
METALLIC ORE	1,094	0	825	247	0	2	0	1,074
NONMETALLIC MINERALS	473	0	4	89	157	20	0	270
TOP SEVEN	17,281	1,693	2,708	2,207	738	3,737	475	11,559
ALL COMMODITIES	29,375							
TOP 7 OF TOTAL	59%	6%	9%	8%	3%	13%	2%	39%

* Total for only the destination states listed

The major commodity groups terminating in Missouri in 1980 and 1987 are shown in Tables 4-29a and 4-29b. The major commodity groups received in Missouri are listed in Table 4-29a and accounted for 87 percent of its 1980 terminating tonnage whereas the most frequently terminated commodities in 1987 accounted for nearly 90 percent of the terminating total tonnage. Coal accounted for the largest number of tons terminating in Missouri. More than 21 million tons of coal terminated in Missouri in 1980, or 52 percent of the total terminating tonnage. In 1987, coal terminating tonnage was 21.9 million tons, less than a 3 percent increase from 1980, and accounted for about 50 percent of the total terminating tonnage. More than 11 million tons and 8.5 million tons of the coal terminating in Missouri in 1980 originated in Illinois and Wyoming, respectively. In 1987, Illinois and Wyoming each provided nearly half of the coal terminating in Missouri.

More than five million tons of farm products terminated in Missouri in 1980, accounting for 12 percent of its terminating tonnage. In 1987, more than 7.6 million tons (17 percent of terminating tonnage) of farm products terminated in Missouri, a 52 percent increase from 1980. More than 70 percent of the farm products terminating in Missouri in 1980 originated in Kansas (27 percent), Iowa (23 percent), or Nebraska (22 percent). The portion of Missouri's farm products originating in Iowa, however, increased from 1.2 million tons in 1980 to 2.9 million tons in 1987, a 250 percent increase. Iowa provided 38 percent of the farm products tonnage terminated in Missouri in 1987. The amount of farm products

tonnage that originated and also terminated in Missouri (intrastate) was 16 percent and 9 percent of its total terminating tonnage in 1980 and 1987, respectively.

Table 4-29a 1980 Railcar Traffic Terminating In Missouri By Origin State (In Thousands of Tons)

STCC	TOTAL	MI	NE	IA	KS	IL	WY	MO	TOTAL*
COAL	21,261	0	0	0	335	11,101	8,572	60	20,068
FARM PRODUCTS	5,038	0	1,122	1,159	1,339	8	10	786	4,424
FOOD & KINDRED	3,370	24	162	202	583	300	5	985	2,237
LUMBER & WOOD	1,533	61	7	78	149	87	196	211	728
TRANSPORT EQUIPMENT	1,517	747	0	5	4	84	0	5	97
PULP, PAPER & PROD.	1,361	62	0	4	6	28	0	25	63
STONE, CLAY, CONCRETE	1,084	11	0	0	32	66	26	533	657
TOTAL	35,165	905	1,291	1,449	2,446	11,673	8,810	2,605	28,273
ALL COMMODITIES	40,600								
TOP 7 OF TOTAL	87%		3%	4%	6%	29%	22%	6%	70%

* Total for only the destination states listed

Table 4-29b 1987 Railcar Traffic Terminating In Missouri By Origin State (In Thousands of Tons)

STCC	TOTAL	IA	IL	KS	MO	MI	NE	WY	TOTAL
COAL	21,866	0	10,717	0	29	0	0	10,284	21,030
FARM PRODUCTS	7,643	2,903	62	1,419	669	0	1,360	7	6,420
CHEMICALS & ALLIED	3,139	53	192	167	194	41	30	187	865
FOOD & KINDRED	2,481	587	92	161	399	24	103	40	1,406
TRANSPORT EQUIPMENT	1,790	1	108	23	3	795	0	4	933
LUMBER, WOOD & ALLIED	1,447	0	27	4	67	64	0	7	168
PULP, PAPER & ALLIED	1,238	2	4	2	22	68	0	0	97
TOTAL	39,603	3,545	11,202	1,775	1,383	992	1,494	10,529	30,920
ALL COMMODITIES	43,932								
TOP 7 OF TOTAL	90%	8%	25%	4%	3%	2%	3%	24%	70%

Food and kindred products tonnage terminating in Missouri declined from 3.4 million tons in 1980 to 2.5 million tons in 1987, a 26 percent decline. While 6 percent of the food and kindred products terminating in Missouri originated in Iowa in 1980, Iowa's share grew to 24 percent in 1987. Chemicals and allied products tonnage terminating in Missouri increased from 1.5 million tons in 1980 to 3.1 million tons in 1987, more than a 100 percent increase. Transportation equipment tonnage terminating in Missouri increased from 1.5 million tons in 1980 to 1.8 million tons in 1987, an 18 percent increase. About 50 percent of the 1980 and 44 percent of the 1987 transportation equipment tonnage terminating in Missouri originated in Michigan.

As can be seen in Table 4-30a, 60 percent of Missouri's originating tonnage in 1980 and 79 percent of its tonnage in 1987 originated from five counties. The increased

concentration of shipments from the five major counties was largely due to Jackson County's tonnage increase. The total tonnage originating in Jackson County (the Kansas City area) grew from 4.3 million tons in 1980 to 19.8 million tons in 1987, achieving a 361 percent increase. While the state originating tonnage increased by about 12.8 million tons between 1980 and 1987, Jackson County originating tonnage had a 15.5 million tons increase.

Table 4-30a Missouri Originating Railcar Traffic (By County and Thousands of Tons)

COUNTY	MAJOR CITY IN COUNTY	1980	1987	CHANGE	% CHANGE
JACKSON	KANSAS CITY	4,303	19,824	15,520	361%
ST LOUIS	ST LOUIS	2,849	1,969	(880)	-31%
BUCHANAN	ST JOSEPH	1,803	1,618	(185)	-10%
STE. GENEVIEVE	STE. GENEVIEVE	1,104	1,362	258	23%
IRON	IRONTON	1,525	678	(847)	-56%
TOTAL		11,584	25,449	13,866	120%
ALL COUNTIES		19,400	32,193	12,793	66%
Top 5 of Total		60%	79%		

The largest part of this increase is due, however, to having about 12.9 million tons of coal originating in the Kansas City area, according to the 1987 waybill sample. Having such an amount of coal originating in that area seemed unlikely. It is more likely that this coal was actually originated from Wyoming and was shipped to Kansas City and stored. Then the coal is moved from Kansas City to Arkansas and Oklahoma. The coal is still traffic moved from Missouri, however, although it was not produced there. If the coal tonnage is excluded, there were about seven million tons originating in Jackson County in 1987, a 63 percent increase from 1980.

On the other hand, St. Louis County originating tonnage decreased from 2.9 million tons in 1980 to 2.0 million tons in 1987, a 31 percent decline. Similarly, Buchanan County (St. Joseph area) originating tonnage also declined from 1.8 million tons in 1980 to 1.6 million tons in 1987.

Table 4-30b shows the major counties in Missouri, based on terminating railcar tonnage. Many of these counties' terminating tonnages were largely coal shipments. The major nine counties listed in the table accounted for 83 percent (1980) and 86 percent (1987) of the total tonnage terminating in Missouri. The state's overall increase in terminating tonnage between 1980 and 1987 was only 8 percent. More than 7.2 million tons and 11.2 million tons terminated in Jackson County in 1980 and 1987, respectively. The tonnage terminating in

Jackson County increased by 56 percent between 1980 and 1987. St. Louis County terminating tonnage also increased from eight million tons in 1980 to 9.9 million tons in 1987, a 24 percent increase. Jackson and St. Louis counties accounted for 38 percent of Missouri's terminating tonnage in 1980 and 48 percent of its tonnage in 1987.

Table 4-30b Missouri Terminating Railcar Traffic (By County and Thousands of Tons)

COUNTY	MAJOR CITY IN COUNTY	1980	1987	CHANGE	% CHANGE
JACKSON	KANSAS CITY	7,222	11,286	4,064	56%
ST LOUIS	ST LOUIS	8,048	9,941	1,893	24%
FRANKLIN	WASHINGTON	5,525	5,355	(170)	-3%
JEFFERSON	S.L. SUBURB	4,445	3,056	(1,389)	-31%
BATES	BUTLER	2,231	2,272	41	2%
PLATTE	K.C. SUBURB	2,061	2,027	(34)	-2%
ST. CHARLES	ST. CHARLES	1,785	1,835	51	3%
GREENE	SPRINGFIELD	1,016	1,287	270	27%
BUCHANAN	ST. JOSEPH	1,184	792	(391)	-33%
TOP NINE COUNTIES		33,518	37,852	4,334	13%
ALL COUNTIES		40,600	43,932	3,332	8%
Top 9 of Total		83%	86%		

Originating and terminating tonnage handled by Missouri railroads in 1980 and 1987 are shown in Table 4-31a and 4-31b. Almost all of Missouri's traffic was carried by Class I railroads. The Missouri Pacific Railroad carried 39 percent of Missouri's originating tonnage in 1980 and 61 percent of its tonnage in 1987. The portion of Missouri's originating tonnage handled by the Missouri Pacific increased from 7.5 million tons in 1980 to 19.7 million tons in 1987, a 163 percent increase. The Missouri Pacific also handled 28 percent and 26 percent of Missouri's terminating tonnage in 1980 and 1987, respectively. The amount of Missouri's terminating tonnage carried by the Missouri Pacific increased by less than 2 percent between 1980 and 1987.

About 2.5 million tons of the 1980 and four million tons of the 1987 tonnage originating in Missouri was carried by the Burlington Northern. The Burlington Northern handled about 13 percent of Missouri's originating tonnage in 1980 and 12.5 percent of its tonnage in 1987. The amount of Missouri's terminating tonnage handled by the Burlington Northern increased from 10.5 million tons in 1980 to 17.3 million tons in 1987, a 65 percent increase. The Burlington Northern handled 26 percent of the 1980 and 39 percent of the 1987 tonnage terminating in Missouri. Part of the jump in the Burlington Northern's business may be accounted for by its merger with the St. Louis-San Francisco in late 1980. The St. Louis-

Table 4-31a 1980 Missouri Railroads By Tons

RR	RR Name	ORIGINATING	TERMINATING
Class I Railroads			
MP	MISSOURI PACIFIC	7,494,600	11,297,000
BN	BURLINGTON NORTHERN	2,499,900	10,447,600
SLSF	ST LOUIS-SAN FRANCISCO	2,397,300	6,467,800
NW	NORFOLK AND WESTERN	2,172,100	2,604,900
ATSF	ATCHISON,TOPEKA AND SANTA FE	1,093,600	1,413,500
MKT	MISSOURI-KANSAS-TEXAS	852,900	363,800
ICG	ILLINOIS CENTRAL	644,000	962,400
SSW	ST LOUIS SOUTH WESTERN	630,900	338,600
CNW	CHICAGO AND NORTH WESTERN	414,000	1,825,100
UP	UNION PACIFIC	276,100	1,108,900
KCS	KANSAS CITY SOUTHERN	275,800	2,446,200
LN	LOUISVILLE AND NASHVILLE	168,100	144,900
CR	CONRAIL-CONSOLIDATED RAIL CORP	106,500	491,100
RI	CHICAGO,ROCK ISLAND AND PACIFIC	93,700	69,200
BO	BALTIMORE AND OHIO	77,600	176,900
SOU	SOUTHERN	58,100	99,100
MIL	MILWAUKEE ROAD	37,200	238,800
CLASS III			
ITC	ILLINOIS TERMINAL	99,300	104,400
Total		19,391,700	40,600,200

Table 4-31b 1987 Missouri Railroads By Tons

RR	RR Name	ORIGINATING	TERMINATING
Class I Railroads			
MP	MISSOURI PACIFIC	19,686,411	11,474,698
BN	BURLINGTON NORTHERN	4,011,486	17,260,377
NW	NORFOLK AND WESTERN	2,383,512	2,225,984
ATSF	ATCHISON,TOPEKA, AND SANTA FE	1,913,424	1,054,201
KCS	KANSAS CITY SOUTHERN	1,179,097	4,519,834
MKT	MISSOURI-KANSAS-TEXAS	747,972	1,281,988
CR	CONRAIL-CONSOLIDATED RAIL CORP	490,704	266,680
SSW	ST LOUIS SOUTH WESTERN	353,430	435,470
CNW	CHICAGO AND NORTH WESTERN	316,850	3,022,945
CSXT	CSX TRANSPORTATION	275,860	141,040
ICG	ILLINOIS CENTRAL	263,920	270,588
SOO	SOO LINE	224,540	533,725
SOU	SOUTHERN	86,560	50,480
UP	UNION PACIFIC	78,112	965,840
DRGW	DENVER AND RIO GRANDE WESTERN	57,960	427,900
CLASS II			
CMNW	CHICAGO,MISSOURI AND WESTERN	106,944	0
CLASS III		16,320	0
Total		32,193,102	43,931,750

San Francisco railroad handled more than 12 percent of Missouri's originating tonnage and 16 percent of its terminating tonnage in 1980. The Norfolk and Western handled about 11 percent of Missouri's originating tonnage and six percent of its terminating tonnage in 1980. In 1987, the Norfolk Western handled more than seven percent of Missouri's originating tonnage and five percent of its terminating tonnage. The Santa Fe railroad handled about six percent of Missouri's originating tonnage in both 1980 and 1987. It also handled about three percent of Missouri's terminating tonnage in both years.

Summary of Nebraska Traffic

Intermodal Traffic

The number of trailers and containers originating in Nebraska accounted for about 4 percent of Region VII's originating trailers and containers in 1980 and 6 percent of that in 1987. The number of trailers and containers terminating in Nebraska grew from 8,050 trailers and containers in 1980 to 15,504 trailers and containers in 1987. The amount of intermodal traffic interchanged in Nebraska grew from 91,700 trailers and containers in 1980 to 287,903 trailers and containers in 1987, a 126 percent increase. Almost 555,000 trailers and containers of bridge traffic passed through Nebraska in 1987 (through traffic and interchange traffic) and 93 percent of all Nebraska intermodal traffic was bridge traffic. Table 4-32 summarizes Nebraska's intermodal traffic changes between 1980 and 1987.

Table 4-32 Nebraska Intermodal Traffic Changes (By Number of Trailers and Containers)

CATEGORY	1980	1987	CHANGE	% CHANGE
ORIGINATING	5,775	20,860	15,085	261%
DESTINED	8,050	15,504	7,454	93%
JUNCTION	91,700	287,903	196,203	214%
THROUGH*	NA	554,974		
TOTAL**	105,525	324,267	218,742	207%

* Through traffic includes junction traffic
** Excludes non-junction through traffic

The most frequently originating commodities in Nebraska in 1980 and 1987 and their major destinations are shown in Table 4-33a and Table 4-33b. Similar to the regional traffic, miscellaneous and mixed shipments accounted for the largest number of trailers and containers and showed the greatest increase in shipments.

As can be seen in Table 4-34a and Table 4-34b, miscellaneous and mixed shipments also had the largest number of trailers and containers terminating in Nebraska in 1980 and 1987.

Table 4-35a and Table 4-35b list the two Nebraska counties that account for the preponderance of originating and terminating number of trailers and containers in 1980 and 1987. Douglas and Lancaster counties accounted for 88 percent of the 1980 and 97 percent

Table 4-33a 1980 Nebraska Originating Intermodal Traffic By Destination State (In Number of Trailers and Containers)

STCC	CA	IL	PA	TX	UT	TOTAL*
MISC. & MIXED	350	525	0	0	525	1,400
FOOD & KINDRED	175	0	1,575	0	0	1,750
TRANSPORT EQUIPMENT	175	0	0	350	0	525
EMPTY CONTAINERS	0	175	0	175	0	350
ELECTRICAL MACHINERY	350	0	0	0	0	350
TOP FIVE	1,050	700	1,575	525	525	4,375
% OF ALL SHIPMENTS	18%	12%	27%	9%	9%	76%

* Total only for destination states listed

Table 4-33b 1987 Nebraska Originating Intermodal Traffic By Destination State (In Number of Trailers and Containers)

STCC	CA	IL	CO	TX	WA	TOTAL*
MISC. MIXED SHIPMENTS	1,720	1,320	1,800	640	1,560	7,040
FOOD & KINDRED	840	40	240	200	1,240	2,560
ELECTRICAL MACHINERY	440	40	240	80	120	920
EMPTY CONTAINERS	280	400	0	120	960	1,760
TRANSPORT EQUIPMENT	0	480	0	120	160	760
TOP FIVE	3,280	2,280	2,280	1,160	4,040	13,040
% OF ALL SHIPMENTS	16%	11%	11%	6%	19%	63%

* Total for only the destinations listed

Table 4-34a 1980 Nebraska Terminating Intermodal Traffic By Origin State (In Number of Trailers and Containers)

STCC	CA	WA	IL	TX	TOTAL*
MISC. MIXED SHIPMENTS	175	0	2,450	350	2,975
SHIPPER ASSOCIATION	0	0	175	875	1,050
TRANSPORT EQUIPMENT	525	350	0	0	875
EMPTY CONTAINERS	0	0	0	0	0
FOOD & KINDRED	0	0	0	0	0
TOP FIVE	700	350	2,625	1,225	4,900
% OF ALL SHIPMENTS	9%	4%	33%	15%	61%

* Total for only the origins listed

Table 4-34b 1987 Nebraska Terminating Intermodal Traffic By Origin State (In Number of Trailers and Containers)

STCC	CA	IL	TX	WA	TOTAL*
MISC. MIXED SHIPMENTS	1,868	3,360	1,120	3,836	10,184
EMPTY CONTAINERS	0	1,000	120	0	1,120
FOOD & KINDRED	440	0	0	0	440
SHIPPER ASSOCIATION	0	40	0	0	40
TRANSPORT EQUIPMENT	40	0	0	0	40
TOTAL	2,348	4,400	1,240	3,836	11,824
% OF ALL SHIPMENTS	15%	28%	8%	25%	76%

* Total for only the origins listed

of the 1987 total originating trailers and containers. They also accounted for 93 percent of the 1980 and 97 percent of the 1987 total terminating trailers and containers. In 1987, each county shown was the site of a Class I railroad's intermodal hub facility (Burlington Northern and Union Pacific). Table 4-36 summarizes the different types of traffic handled by these stations.

Table 4-35a Nebraska Originating Intermodal Traffic (By County and Number of Trailers and Containers)

COUNTY	MAJOR CITY IN COUNTY	1980	1987	CHANGE	% CHANGE
DOUGLAS	OMAHA	2,275	9,520	7,245	318%
LANCASTER	LINCOLN	2,800	10,780	7,980	285%
TOP TWO COUNTIES		5,250	20,300	15,050	
ALL COUNTIES		5,775	20,860	15,085	
TOP 2 OF TOTAL		88%	97%		

Table 4-35b Nebraska Terminating Intermodal Traffic (By County and Number of Trailers and Containers)

COUNTY	MAJOR CITY IN COUNTY	1980	1987	CHANGE	% CHANGE
DOUGLAS	OMAHA	6,475	9,796	3,321	51%
LANCASTER	LINCOLN	1,050	5,308	4,258	406%
TOP TWO COUNTIES		7,525	15,104	7,579	
ALL COUNTIES		8,050	15,504	7,454	
Top 2 of Total		93%	97%		

Table 4-36 Major Stations in Nebraska (By Number of Trailers and Containers)

	1980			1987		
STATION	ORIGINATING	TERMINATING	JUNCTION	ORIGINATING	TERMINATING	JUNCTION
FREMONT	175	0	91,525	0	0	287,783
OMAHA	2,275	6,300	175	9,400	9,796	120
LINCOLN	2,800	1,050	0	10,780	5,308	0
MAJOR STATIONS	5,250	7,350	91,700	20,180	15,104	287,903
NEBRASKA TOTAL	5,775	8,050	91,700	20,860	15,504	287,903
% MAJOR STATION	91%	91%	100%	97%	97%	100%

Railcar Traffic

About 23.0 million tons of railcar traffic originated in Nebraska in 1980, accounting for 24 percent of Region VII's tonnage. Originating railcar tonnage in 1987 was 21.7 million tons, and accounted for 18 percent of the region tonnage. While railcar traffic originating in

the region increased by 24 percent between 1980 and 1987, Nebraska's tonnage decreased by five percent. About 12 million tons of commodities in railcars terminated in Nebraska in 1980, accounting for less than 13 percent of the region's terminating tonnage. Nebraska's terminating tonnage was about 13.5 million tons in 1987, and accounted for 13 percent of the region's terminating tonnage. Tonnage terminating in Nebraska increased by 13 percent between 1980 and 1987, compared to a 10 percent increase for the region.

Railcar traffic interchanged in Nebraska increased from about 15 million tons in 1980 to 48.3 million tons in 1987, achieving a 223 percent increase. About 155 million tons of railcar traffic passed through Nebraska in 1987. In 1987, roughly 77 percent of the railcar traffic was bridge traffic. Table 4-37 summarizes railcar traffic changes for Nebraska between 1980 and 1987.

Table 4-37 Nebraska Railcar Traffic Changes (By Thousands of Tons)

CATEGORY	1980	1987	CHANGE	% CHANGE
ORIGINATING	22,947	21,722	(1,225)	-5%
TERMINATING	11,950	13,499	1,549	13%
JUNCTION	14,965	48,332	33,367	223%
THROUGH*	NA	154,924		
TOTAL**	49,862	83,554	33,691	68%

* Includes junction traffic
** Excluding bridge traffic

Table 4-38a and Table 4-38b list the most frequently originating commodity groups in Nebraska and their predominant destinations in 1980 and 1987. There are three commodity groups listed in Table 4-38a that accounted for 94 percent of the tonnage originating in Nebraska in 1980. The first two commodities also accounted for 87 percent of Nebraska's 1987 originating tonnage. The amount of farm products shipped from Nebraska suffered a seven percent loss between 1980 and 1987.

Coal was the largest tonnage terminating in Nebraska in 1980 and 1987. Terminating coal tonnage grew from 4.8 million tons in 1980 to 7.7 tons in 1987, a 60 percent increase. Coal tonnage to Nebraska made up 41 percent of the 1980 and 57 percent of its 1987 terminating tonnage. Farm products tonnage terminating in Nebraska declined from 1.9 million tons in 1980 to 1.6 million tons in 1987. Also nonmetallic minerals terminating in Nebraska

declined during the same period. Table 4-39a and Table 4-39b list the most frequently terminating commodities in Nebraska and their major origins in 1980 and 1987, respectively.

Table 4-38a 1980 Nebraska Originating Railcar Traffic By Destination State (In Thousands of Tons)

STCC	TOTAL	NE	KS	MO	CA	TX	WA	TOTAL*
FARM PRODUCTS	18,082	1,412	1,058	1,122	3,501	2,015	5,357	14,464
FOOD & KINDRED	2,549	270	61	162	379	152	96	1,119
NONMETALLIC MINERALS	947	942	0	0	0	0	0	942
TOP THREE	21,578	2,623	1,118	1,284	3,880	2,167	5,452	16,524
ALL COMMODITIES	22,947							
TOP 3 OF TOTAL	94%	11%	5%	6%	17%	9%	24%	72%

* Total for only the listed destination states

Table 4-38b 1987 Nebraska Commodities Originating By Railcar (By Major Destinations and Thousands of Tons)

STCC	TOTAL	NE	KS	MO	CA	TX	WA	TOTAL*
FARM PRODUCTS	16,867	774	1,146	1,360	2,422	1,806	3,634	11,141
FOOD & KINDRED	2,010	507	74	103	433	174	68	1,358
COAL	1,128	128	972	0	0	0	0	1,100
TOP THREE	20,004	1,409	2,191	1,463	2,854	1,980	3,702	13,600
ALL COMMODITIES	21,722							
TOP 3 OF TOTAL	92%	6%	10%	7%	13%	9%	17%	63%

* Total only for the listed destination states

Table 4-39a 1980 Railcar Traffic Terminating In Nebraska By Origin State (In Thousands of Tons)

STCC	TOTAL	NE	KS	IA	WY	TOTAL*
COAL	4,842	3	0	0	4,093	4,097
FARM PRODUCTS	1,910	1,412	162	108	7	1,688
NONMETALLIC MINERALS	1,129	942	0	28	7	977
FOOD & KINDRED	939	270	44	65	9	388
CHEMICALS & ALLIED	774	86	36	93	0	216
TOP FIVE	9,594	2,627	205	202	4,116	7,149
ALL COMMODITIES	11,950					
TOP 5 OF TOTAL	80%	22%	2%	2%	34%	60%

* Total for only listed destination states

The Nebraska counties with the greatest amount of railcar originating and terminating tonnage are listed in Table 4-40a and Table 4-40b, respectively. The six counties listed accounted for about 34 percent of the 1980 and 1987 tonnage originating in Nebraska. Originating traffic in both years was dispersed over a larger number of counties with similar

tonnage. Only Lancaster County experienced a decline in its proportion of the state's terminating traffic. The counties listed in Table 4-40b accounted for 64 percent of the 1980 and 74 percent of the 1987 tonnage terminating in Nebraska.

Table 4-39b 1987 Railcar Traffic Terminating In Nebraska By Origin State (In Thousands of Tons)

STCC	TOTAL	NE	KS	IA	WY	TOTAL*
COAL	7,757	128	0	0	7,332	7,460
FARM PRODUCTS	1,617	774	35	221	0	1,030
CHEMICALS & ALLIED	1,011	195	63	61	54	373
FOOD & KINDRED	754	113	18	121	0	252
NONMETALLIC MINERALS	749	507	9	0	31	546
TOP FIVE	11,888	1,717	125	402	7,417	9,661
ALL COMMODITIES	13,499					
TOP 5 OF TOTAL	88%	13%	1%	3%	55%	72%

* Total for only listed destination states

Table 4-40a Nebraska Originating Railcar Traffic (By County and Thousands of Tons)

COUNTY	MAJOR CITY IN COUNTY	1980	1987	CHANGE	% CHANGE
LANCASTER	LINCOLN	1,812	1,847	35	2%
DOUGLAS	OMAHA	2,565	1,467	(1,098)	-43%
DODGE	FREMONT	845	1,223	379	45%
BUFFALO	KEARNEY	1,209	1,163	(46)	-4%
RICHARDSON	FALLS CITY	80	1,123	1,042	1297%
ADAMS	HASTINGS	1,208	811	(397)	-33%
TOP SIX COUNTIES		7,719	7,634	(85)	-1%
ALL COUNTIES		22,947	21,722	(1,225)	-5%
TOP 6 OF TOTAL		34%	35%		

Table 4-40b Nebraska Terminating Railcar Traffic (By County and Thousands of Tons)

COUNTY	MAJOR CITY IN COUNTY	1980	1987	CHANGE	% CHANGE
DOUGLAS	OMAHA	3,135	3,189	54	2%
LANCASTER	LINCOLN	3,236	2,968	(269)	-8%
LINCOLN	NORTH PLATTE	1,213	2,906	1,693	140%
RICHARDSON	FALLS CITY	10	970	961	9903%
TOP FOUR COUNTIES		7,594	10,033	2,439	100%
ALL COUNTIES		11,950	13,499	1,549	13%
Top 4 of Total		64%	74%		

Tables 4-41a and 4-41b list the proportion of Nebraska's tonnage handled by the different railroads operating in Nebraska in 1980 and 1987. The majority of Nebraska's traffic was handled by the Union Pacific and the Burlington Northern in both 1980 and 1987. The

Union Pacific handled more than nine million tons (40 percent) of Nebraska's originating tonnage in 1980 and ten million tons (47 percent) in 1987. The Burlington Northern handled more than nine million originating tons in 1980 (39 percent) and about 8.6 million tons in 1987 (40 percent). The same railroads also handled the largest part of Nebraska's terminating traffic in 1980. The role of the Union Pacific in carrying terminating tonnage in Nebraska, however, declined significantly from about 3.5 million tons in 1980 to 1.8 tons in 1987.

Table 4-41a 1980 Nebraska Railroads By Tons

RR	Railroad Name	ORIGINATING	TERMINATING
Class I Railroads			
BN	BURLINGTON NORTHERN	10,069,400	6,522,000
UP	UNION PACIFIC	9,036,900	3,490,600
MP	MISSOURI PACIFIC	2,455,600	701,100
CNW	CHICAGO AND NORTH WESTERN	994,400	989,300
ICG	ILLINOIS CENTRAL	208,100	110,200
ATSF	ATCHISON,TOPEKA AND SANTA FE	104,500	14,600
RI	CHICAGO,ROCK ISLAND AND PACIFIC	73,000	116,400
NW	NORFOLK AND WESTERN	5,500	5,600
Total		22,947,400	11,949,800

Table 4-41b 1987 Nebraska Railroads By Tons

RR	Railroad Name	ORIGINATING	TERMINATING
Class I Railroads			
UP	UNION PACIFIC	10,162,519	1,797,893
BN	BURLINGTON NORTHERN	8,662,453	10,256,525
MP	MISSOURI PACIFIC	1,980,902	262,188
CNW	CHICAGO AND NORTH WESTERN	501,544	1,061,665
ATSF	ATCHISON,TOPEKA AND SANTA FE	319,289	0
MKT	MISSOURI-KANSAS-TEXAS	11,400	6,600
CLASS II			
CC	CHICAGO CENTRAL AND PACIFIC	83,985	114,200
TOTAL		21,722,092	13,499,071

Regional Rail Traffic Summary

Intermodal Traffic

In 1980, a total of 3,059,402 trailers and containers were loaded in the United States This number jumped to 5,155,737 trailers and containers in 1987, a 41 percent increase from 1980. Table 4-42 indicates that in Region VII there was a total of 236,250 and 562,858 trailers and containers (involving originating and terminating traffic but excluding through

traffic) in 1980 and 1987, respectively. These data reflect a 138 percent increase over the seven-year period. Region VII's percentage increase in intermodal traffic is more than three times that of the United States during the same period.

Table 4-42 Region VII Intermodal Traffic (In Number of Trailers or Containers)

CATEGORY	1980	1987	CHANGE	% CHANGE
ORIGINATING	138,075	324,081	186,006	135%
DESTINED	98,175	238,777	140,602	143%
ALL TRAFFIC	236,250	562,858	326,608	138%

In 1980, Region VII intermodal traffic, excluding through traffic, accounted for about 13 percent of the United States total number of trailer and container loadings. In 1987, however, this percentage grew to almost 18 percent of the total U.S number of trailers and containers. These percentages would have been more significant if through bridge traffic had been included. For example, 1,258,776 trailers and containers (25 percent of United States total number of trailers and containers) passed through the region in 1987. The most important originating commodities in Region VII are shown in Table 4-43. Fifty percent of these shipments are miscellaneous and mixed shipments. Food and kindred products were the second most heavily shipped commodity class in both 1980 and 1987. Chemicals and allied products were the third most important commodity shipped from the region (mainly from Kansas and Missouri), followed by empty containers and electrical equipment and supplies. Shipments to the region have the same top two commodity classes: mixed shipments and food and kindred products (Table 4-44). Shipper associations and freight forwarder traffic, however, were the fourth and fifth most important shipped commodity groups in terms of tonnage shipped from Region VII.

Tables 4-45a and 4-45b identify the proportion of intermodal traffic generated in each state during 1980 and 1987. In both years, Missouri and Kansas accounted for the majority of the intermodal origination and terminations. Tables 4-46a and 4-46b show the number of intra-regional intermodal shipments in 1980 and 1987, respectively. In both years, the predominant intra-regional intermodal traffic flow was intrastate traffic within Missouri.

Table 4-43 Most Important Commodities Originating in Region VII In Intermodal Trailers and Containers

STCC	1980	1987
MISC. AND MIXED SHIPMENTS	73,500	193,629
FOOD AND KINDRED PRODUCTS	6,300	30,832
CHEMICALS AND ALLIED PRODUCTS	5,950	19,616
EMPTY CONTAINERS	3,325	19,280
ELECT. MACHINERY, EQUPMT AND SUPPLY	4,200	9,520

Table 4-44 Most Important Commodities Destined To Region VII In Intermodal Trailers and Containers

STCC	1980	1987
MISC. AND MIXED SHIPMENTS	58,975	149,962
FOOD AND KINDRED PRODUCTS	2,975	15,284
EMPTY CONTAINERS	2,625	10,976
SHIPPER ASSOCIATION TRAFFIC	11,725	6,648
FREIGHT FORWARDER TRAFFIC	2,975	6,740

Table 4-45a 1980 Intermodal Traffic Originating and Terminating By State (In Number of Trailers and Containers)

Category	REGION	IOWA	KANSAS	MISSOURI	NEBRASKA
ORIGINATING	138,075	10,675	33,075	88,550	5,775
% OF REGION	100%	7.7%	24.0%	64.1%	4.2%
TERMINATING	98,175	4,900	33,600	51,625	8,050
% OF REGION	100%	5.0%	34.2%	52.6%	8.2%

Table 4-45b 1987 Intermodal Traffic Originating and Terminating By State (In Number of Trailers and Containers)

Category	REGION	IOWA	KANSAS	MISSOURI	NEBRASKA
ORIGINATING	324,081	23,220	102,944	177,057	20,860
% OF REGION	100%	7.2%	31.8%	54.6%	6.4%
TERMINATING	238,777	8,924	63,929	150,420	15,504
% OF REGION	100%	3.7%	26.8%	63.0%	6.5%

Table 4-46a 1980 Intra-Region Intermodal Traffic (By Number of Trailers and Containers)

ORIGIN\DESTINATION	IOWA	KANSAS	MISSOURI	NEBRASKA	TOTAL
IOWA	525	0	350	0	875
KANSAS	0	350	350	175	875
MISSOURI	0	1,050	2,975	350	4,375
NEBRASKA	0	0	0	0	0
SUM	525	1,400	3,675	525	6,125

Table 4-46b 1987 Intra-Region Intermodal Traffic (By Number of Trailers and Containers)

ORIGIN\DESTINATION	IOWA	KANSAS	MISSOURI	NEBRASKA	TOTAL
IOWA	200	0	1,840	100	2,140
KANSAS	0	120	2,080	0	2,200
MISSOURI	620	280	21,360	520	22,780
NEBRASKA	0	80	320	0	400
SUM	820	480	25,600	620	27,520

Railcar Traffic

Changes in railcar traffic measured by tons shipped are shown in Table 4-47. Total tons originating in, terminating to, or interchanged in the region in 1987 was 356 million, compared to 273 million tons in 1980, a 30 percent increase. Total originating tons for the United States was 1,492 million in 1980 and 1,372 million tons in 1987, a decline of 8 percent. Region VII originating tons, as a percentage of the total United States tonnage, changed from approximately 6 percent in 1980 to about 9 percent in 1987.

Table 4-47 Region VII Railcar Traffic (In Millions of Tons)

CATEGORY	1980 TONS	1987 TONS	CHANGE	% CHANGE
ORIGINATING	94.84	118	23	24%
TERMINATING	94.26	104	10	10%
JUNCTION	83.94	134.22	50.28	60%
ALL TRAFFIC	273.04	356.02	82.97	30%
% JUNCTION TO	31%	38%		

As seen in Table 4-47, the percentage increase in Region VII's railcar traffic over the same period is considerably less than those for intermodal traffic. None of the categories had a negative change, however. Rail traffic destined to the region grew at a modest rate of 10 percent, compared to 192 percent for intermodal traffic. Another difference from intermodal traffic is the smaller tonnage variation between inbound and outbound railcar traffic (i.e., the region's exports verses its imports).

The most important commodity groups originating in Region VII are listed in Table 4-48. Farm products accounted for more than 55 percent of the region's total originating tonnage in both 1980 and 1987. Food and kindred products were the second frequent commodity group shipped and accounted for about 20 percent and 16 percent of total

originating tonnage in 1980 and 1987, respectively. Chemicals and allied products came in third and accounted for more than four percent of the total originating tons.

Table 4-48 Railcar Traffic Originating In Region VII (Tons)

STCC	1980	1987
FARM PRODUCTS	52,288,100	65,418,284
FOOD AND KINDRED PRODUCTS	18,570,200	18,550,396
CHEMICALS AND ALLIED PRODUCTS	3,368,600	4,864,764
STONE,CLAY,CONCRETE PRODUCTS	4,469,200	4,508,926
NONMETALLIC MINERALS	3,438,500	2,407,570
WASTE AND SCRAP MATERIAL	2,087,700	1,928,566
TRANSPORTATION EQUIPMENT	1,120,300	1,774,254
METALLIC ORE	1,327,800	1,093,646
PRIMARY METAL PRODUCTS	1,121,800	1,040,392

Table 4-49 Railcar Traffic Destined To Region VII (Tons)

STCC	1980	1987
COAL	40,732,100	53,347,897
FARM PRODUCTS	19,161,500	27,290,970
CHEMICALS AND ALLIED PRODUCTS	5,335,900	8,634,190
FOOD AND KINDRED PRODUCTS	6,873,600	5,424,904
NONMETALLIC MINERALS	3,142,500	4,086,101
PULP,PAPER AND ALLIED PRODUCTS	2,793,600	2,494,720
STONE,CLAY,CONCRETE PRODUCTS	2,640,200	2,479,288
LUMBER AND WOOD	1,198,200	2,256,536
TRANSPORTATION EQUIPMENT	2,205,800	2,187,564
PRIMARY METAL PRODUCTS	2,166,600	1,643,920
PETROLEUM AND COAL PRODUCTS	1,060,800	1,468,296

The most important commodity groups destined to the region are listed in Table 4-49. Coal was the top commodity, accounting for about 43 percent of all destined tonnage in 1980 and 51 percent in 1987. Farm products were second in volume and accounted for 20 percent of all destined tonnage in 1980 and 26 percent in 1987.

Tables 4-50a and 4-50b list the amount of railcar tonnage transported within the states of the region. Both Iowa and Kansas had significant intrastate movements. Iowa's intrastate movements increased three fold between 1980 and 1987. Iowa's increases may be largely due to the movements of grains to Iowa river ports.

Table 4-50a 1980 Intra-Region Railcar Traffic (By Tons)

ORIGIN\DESTINATION	IOWA	KANSAS	MISSOURI	NEBRASKA	TOTAL
IOWA	4,071,000	331,200	1,579,800	482,800	6,464,800
KANSAS	345,200	8,968,400	2,980,800	394,200	12,688,600
MISSOURI	426,500	698,300	3,406,400	235,400	4,766,600
NEBRASKA	324,400	1,180,800	1,326,700	3,022,200	5,854,100
SUM	5,167,100	11,178,700	9,293,700	4,134,600	29,774,100

Table 4-50b 1987 Intra-Region Railcar Traffic (By Tons)

ORIGIN\DESTINATION	IOWA	KANSAS	MISSOURI	NEBRASKA	TOTAL
IOWA	10,079,699	550,766	3,569,965	543,832	14,744,262
KANSAS	123,548	8,382,304	1,863,759	177,187	10,546,798
MISSOURI	229,304	428,236	2,552,868	122,260	3,332,668
NEBRASKA	419,489	2,377,584	1,514,337	1,836,700	6,148,110
SUM	10,852,040	11,738,890	9,500,929	2,679,979	34,771,838

Truck Traffic In Region VII

Data identifying truck traffic volumes, travel patterns and commodities carried by trucks during the 1980s in Region VII are unavailable. There are no truck traffic data bases that are similar to the railroad waybill statistics. Further, because of the dispersed nature of the trucking industry, the ease of entry into several sectors of trucking (particularly carriers of agricultural commodities and livestock), the number of private carriers, and the freedom of movement by trucks, it is unlikely that sampling every movement, similar to the railroad waybill sample, would be feasible. However, each state in the region does conduct periodic roadway volume and vehicle classification counts.[6] Truck traffic counts are used to obtain inferences into the truck traffic trends in the region.

The state highway agencies in the region are not uniform in their methods of data collection. Therefore, two adjustments were made to make the data compatible:

1. The state highway agencies are not uniform in their classifications of trucks. Iowa, for example, divides trucks into several classes by size and number of axles. Other states are not as specific. However, the data of all states permit the division of the traffic flow between trucks (straight trucks and larger vehicles) and other small vehicles (passenger cars, pickup trucks and motorcycles). Therefore, trucks are identified as a straight truck or larger vehicle.

2. The state highway agencies in Iowa, Kansas, and Nebraska publish reports documenting truck volumes and truck counts every two years. Therefore, to obtain consistent data, reports were procured for the years 1980 and 1986 for Iowa, Kansas, and Nebraska. Missouri, however, publishes a similar report every three years and Missouri data were

obtained for the years 1982 and 1985. When comparisons are made to identify rates of change, the Missouri growth rate over three years is doubled and assumed comparable to the growth rate for the other states over a six-year period.

State Highways

The reports and maps from each state highway agency were reviewed for counting locations on primary highways (non-interstate facilities) whose counts would provide trends that were indicative of changes in traffic volumes and patterns. Locations on primary highways were selected which fit the following criteria:

- Locations should be at or near a state border, preferably at a geographical bottle neck like a river crossing.
- Locations should be outside an urbanized area so that truck traffic is intercity traffic.
- Locations should have truck traffic volumes that average more than 500 trucks (commercial vehicles) per day.

Shown in Figure 4-1 is a map of the four state region. All state highways shown on the map are those that meet the volume criteria within at least one segment of the highway. The dots on the map are the points where truck traffic volumes meet the criteria; their truck traffic volumes are recorded in Table 4-51.

At the eighteen selected locations, only five experienced an increase in volume. The majority of the locations experienced a decline in truck traffic. This may be partially attributable to truck traffic concentrating on interstate facilities. Generally, truck traffic on the primary highway system appears to be declining.

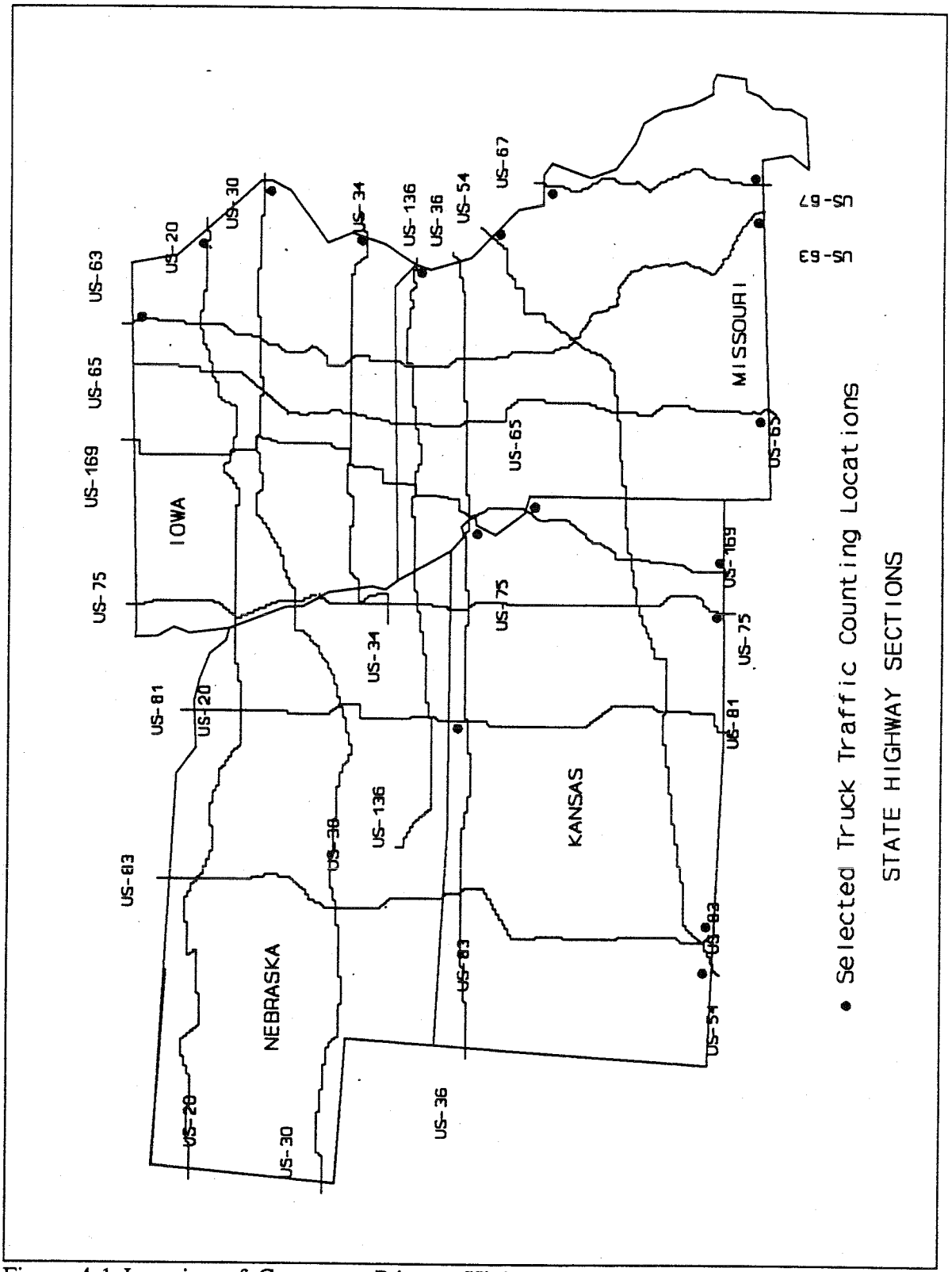


Figure 4-1 Location of Counts on Primary Highways

Table 4-51 Change in Truck Traffic Volumes at Selected Locations in Region VII

ROUTE	LOCATION				
IOWA LOCATIONS		1980	1986	CHANGE	% CHANGE
US-63	MN STATE LINE	521	398	(123)	-23.6%
US-20	IL STATE LINE	2,109	1,096	(1,013)	-48.0%
US-30	IL STATE LINE	817	739	(78)	-9.5%
US-34	IL STATE LINE	1,231	1,026	(205)	-16.7%
KANSAS LOCATIONS		1980	1986	CHANGE	% CHANGE
US-54	OK STATE LINE	940	1,133	193	20.5%
US-83	OK STATE LINE	810	477	(333)	-41.1%
US-75	OK STATE LINE	480	562	82	17.1%
US-169	OK STATE LINE	885	565	(320)	-36.2%
US-36	MO STATE LINE	1,825	894	(931)	-51.0%
US-169	MO STATE LINE	730	670	(60)	-8.2%
US-81	NE STATE LINE	835	780	(55)	-6.6%
MISSOURI LOCATIONS*		1982	1985	CHANGE	% CHANGE
US-65	AR STATE LINE	630	650	20	3.2%
US-136	IL STATE LINE	800	750	(50)	-6.3%
US-54	IL STATE LINE	500	480	(20)	-4.0%
US-67	IL STATE LINE	1,050	1,230	180	17.1%
US-50	IL STATE LINE	1,280	1,030	(250)	-19.5%
US-67	AR STATE LINE	740	770	30	4.1%
US-63	AR STATE LINE	570	620	50	8.8%

* Missouri conducts counts every three years. The 1988 counts were not ready by the time data was collected for this project.

No primary highways in Nebraska met the volume criteria.

Interstate Facilities

Locations for selecting truck traffic volumes on the Interstate Highway System were based on the following criteria:

- o Locations should be close to the boarder of a state where ever possible.
- o Locations should not be within an urbanized area so that truck traffic counted is intercity and not intracity traffic.
- o Locations should be on the legs of the intersections of interstate facilities.

Because many of the intersections of interstate highways are within urbanized areas, locations had to be selected on the legs on the intersection that were a significant distance away from the urbanized area. A map of the locations selected is shown in Figure 4-2. For purposes of comparison, the counts on north-south segments and east-west segments are recorded separately in Tables 4-52 and 4-53, respectively.

In both directions (north-south and east-west), the interstate highways experienced a 23 percent increase in truck traffic. This is equivalent to roughly a 3.5 percent per year increase.

The truck traffic volumes averaged 50 percent more, however, on east-west facilities than they did on north-south facilities.

Table 4-52 Truck Volumes on Interstates at Selected North-South Locations

ROUTE	Section Description	1980	1986	Change	Change	Adjusted Percentage*
I-35	KS/OK STATE LINE	2,030	2,549	519	25.6%	25.6%
	SOUTH LINE OF CHASE CO, KS	1,285	1,600	315	24.5%	24.5%
	SOUTH LINE OF JOHNSON CO, KS	1,215	1,850	635	52.3%	52.3%
	SOUTH LINE OF DAVIESS CO, MO	2,000	2,100	100	5.0%	10.0%
	IA/MO STATE LINE	1,418	1,963	545	38.4%	38.4%
	SOUTH LINE OF HAMILTON CO, IA	2,069	2,608	539	26.1%	26.1%
	IA/MN STATE LINE	1,772	2,167	395	22.3%	22.3%
I-29	WEST LINE OF ANDREW CO, MO	2,500	2,600	100	4.0%	8.0%
	IA/MO STATE LINE	1,393	1,805	412	29.6%	29.6%
	SOUTH LINE OF MONONA CO, IA	1,509	1,824	315	20.9%	20.9%
KTA	WEST LINE OF OSAGE CO, KS	525	764	239	45.5%	45.5%
I-135	SOUTH LINE OF SALINE CO, KS	1,790	1,785	(5)	-0.3%	-0.3%
I-55	SOUTH LINE OF PERRY CO, MO	4,000	3,950	(50)	-1.3%	-2.5%
	MO/AR STATE LINE	2,600	3,000	400	15.4%	30.8%
AVERAGE Of ALL NORTH-SOUTH SECTIONS		**1,865**	**2,183**	**319**	**17.1%**	**23.6%**

* Missouri's counts were taken in 1982 and 1985. The Missouri truck traffic percentage change is double to make the three year reporting period equivalent in length to the six year interval report by other states.

Table 4-53 Truck Volumes on Interstates at Selected East-West Locations

ROUTE	Section Description	1980	1986	Change	Change	Adjusted* Change
I-80	NE/WY STATE LINE	1,485	1,455	(30)	-2.0%	-2.0%
	WEST LINE OF KEITH CO, NE	2,140	2,895	755	35.3%	35.3%
	WEST LINE OF SEWARD CO, NE	3,055	3,410	355	11.6%	11.6%
	WEST LINE OF ADAIR CO, IA	3,080	3,928	848	27.5%	27.5%
	WEST LINE OF IOWA CO, IA	4,127	5,061	934	22.6%	22.6%
I-70	KS/CO STATE LINE	1,005	1,135	130	12.9%	12.9%
	WEST LINE OF RUSSEL CO, KS	1,190	1,995	805	67.6%	67.6%
	WEST LINE OF WABAUNSEE CO, KS	1,195	1,920	725	60.7%	60.7%
	WEST LINE OF SALINE CO, MO **	4,050	4,250	200	4.9%	9.9%
	WEST LINE OF MONTGOMERY CO, MO	4,500	4,750	250	5.6%	11.1%
I-44	MO/OK STATE LINE	2,760	2,930	170	6.2%	12.3%
	SOUTH LINE OF FRANKLIN CO, MO	4,500	4,800	300	6.7%	13.3%
AVERAGE OF ALL EAST-WEST SECTIONS		2,757	3,211	454	16.4%	23.6%

* Missouri's counts were taken in 1982 and 1985. The Missouri truck traffic percentage change is double to make the three year reporting period equivalent in length to the six year interval report by other states.

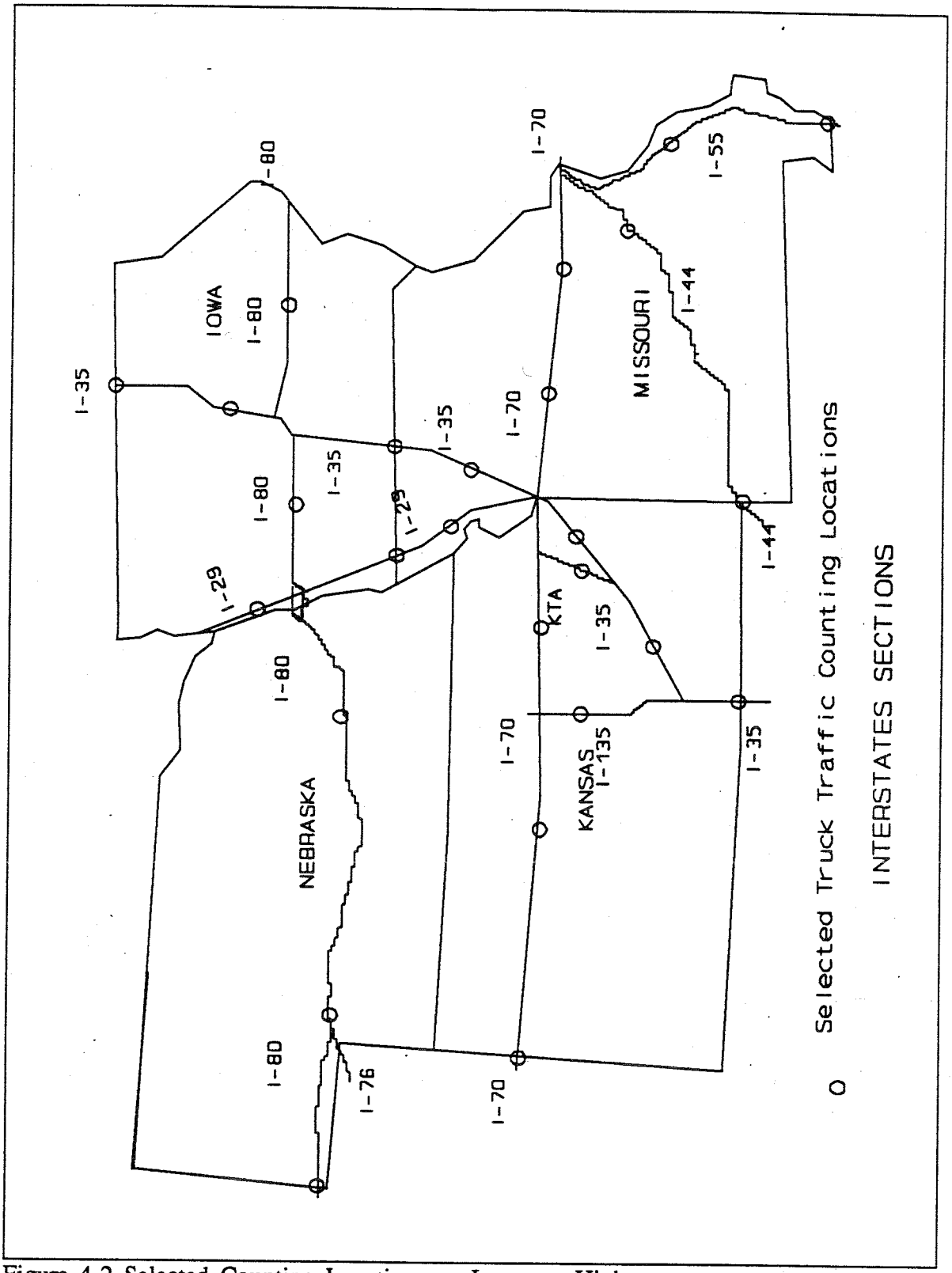


Figure 4-2 Selected Counting Locations on Interstate Highways

Regional Truck Traffic Trends

Because there is little publicly available information on truck traffic, very little analysis of truck traffic trends was undertaken. The predominant source of information is volume and classification counts. Unfortunately, these counts do not include information on commodities carried or origins and destinations. However, the analysis of the data presented in this section results in three conclusions:

- Truck traffic, in general, is not increasing on primary highways and is likely to be concentrating on interstate highways.

- Truck traffic through the region moves predominantly east-west. Although truck traffic is increasing on interstate highways in all directions at roughly the same rate, truck traffic on east-west segments of the interstate system carry about 50 percent more traffic than do segments of north-south interstate highways.

- Truck traffic on the interstate system has experienced fairly constant growth. Truck volumes on the interstate system increased almost 25 percent in six years.

Endnotes

1. The Iowa Interstate Railroad, a regional railroad and a Class II carrier, operates a mechanized intermodal facility in Newton, Iowa. In the summer of 1989 (after the data reported here were collected), a "mini-hub" was built on the Soo Line Railroad in Davenport, Iowa.

2. All data on rail traffic reported in the chapter's tables are taken from the ICC's waybill sample.

3. The Missouri Pacific Railroad and the Union Pacific merged in 1980. However, the Missouri Pacific continues as a separate division of the Union Pacific System and the ICC waybill statistics report the Missouri Pacific's traffic separately from the Union Pacific.

4. According to the 1987 waybill sample, about 12.88 million tons of coal originated from Kansas City, Missouri. However, it is unlikely that this coal is mined in the Kansas City area. Additional discussion of this issue is provided in the county traffic analysis.

5. Excluding the 12.88 million tons of coal originating from the Kansas City area.

6. Volume counts are typically conducted using automatic counting devices (portable pneumatic tube counters or permanent counting stations with induction loops embedded in the pavement). The counts generally record only the number of axles crossing the counting point. The number of axles are extrapolated to vehicle counts through periodic counts of the vehicle mixes which identifies the number of axles and vehicle configuration (classifications) in the traffic flow. The combination of traffic volume counts and periodic samples of the vehicle mix are used to estimate the numbers of trucks of various sizes in the traffic flow.

Chapter Five
Trends for Motor Carriers and Motor Carrier Shippers

During the 1980s, regulatory reform promoted strong competition in the motor carrier industry and gave shippers and carriers a freer hand to customize services. For shippers, the competition in the wake of regulatory reform generally reduced rates and gave them more leverage in the specification of transportation services. Greater flexibility allowed shippers to utilize new logistics strategies that have led to new trends in the services motor carriers provide and in the methods used to purchase trucking services.

For the motor carriers, competition has caused financial hardship for some and forced many others to become more cost efficient. In this chapter, emerging logistics strategies for both motor carriers and shippers are examined. The first section investigates the financial performance of the trucking industry by examining financial measures of a representative sample of motor carriers headquarted in Federal Region VII. The second section presents the results of interviews conducted with management from selected motor carriers. The purpose of the interviews is to help interpret the changes that have occurred in the trucking industry during the 1980s. The last section describes the results of a shipper survey which identifies and assesses important emerging logistics strategies.

Aggregate Analysis of Motor Carriers

Changes in a specific industry are reflected in a variety of measures. Many of them are financial in nature and based upon data reported to government agencies and trade associations. Motor carriers' data are collected nationally by the American Trucking Associations (ATA), Inc. which compiles, categorizes, and publishes industry averages. The Interstate Commerce Commission (ICC) has, in past years, required detailed data on finances and operations to be filed on Motor Carrier Report M. These reporting requirements were relaxed in 1984, reducing both the number of carriers who file and the amount of detail reported by the carriers who continue to file. Within the region, the Iowa Department of Transportation has maintained fairly stringent reporting requirements. This data source is not

restricted to Iowa since the service area of many carriers reporting to the Iowa Department of Transportation includes other states in the region.

This study compiled data for 18 carriers, covering a wide range of size and financial condition. These data were tabulated and analyzed to observe the presence or absence of trends or unusual patterns. To enable comparisons, financial data were generally expressed in terms of ratios. A calculated score of financial viability provided a composite measure for each firm. Dollar figures were adjusted by the GNP deflator to express amounts in 1982 dollars.

The financial and operating ratios were observed over time, generally from 1980 until the date of the most recent available ICC reports (usually 1987, depending on data reporting requirements). Ratios of individual firms were compared to industry averages and to other sampled firms. Thus, it was possible to obtain a general picture of the performance of the motor carrier industry and to consider how individual carriers have changed relative to their peers.

Motor carrier changes are not all reflected in their financial and operating figures. Some conditions may be better understood through on-site interviews and observations. Top-level executives of five carriers consented to interviews averaging two hours in length. These carriers covered a variety of types, including truckload (TL) and less than truckload (LTL), coast-to-coast routes and regional, as well as small (fewer than 25 employees) and large (over 5,000 employees). The responses of these officers, which appear below as individual case studies, provided qualitative as well as quantitative insight to their firms and the motor carrier industry as a whole.

Financial measures

Financial analysis frequently depends on established ratios to judge the health of a company. Some standard categories described by Platt are the following:[1]

Liquidity: the firm's ability to meet current liabilities
Debt: how the firm is financed
Activity: how effectively assets are used
Profitability: compares profits to sales, assets, and investments
Growth: where the firm is going
Value: how the firm is judged by the market

With the exception of value, these categories were used as bases for tracking the financial health of motor carriers from 1980. ("Value" would be more applicable to firms with publicly traded common stock. Since most of the carriers observed were privately held corporations, their market values could not be determined.)

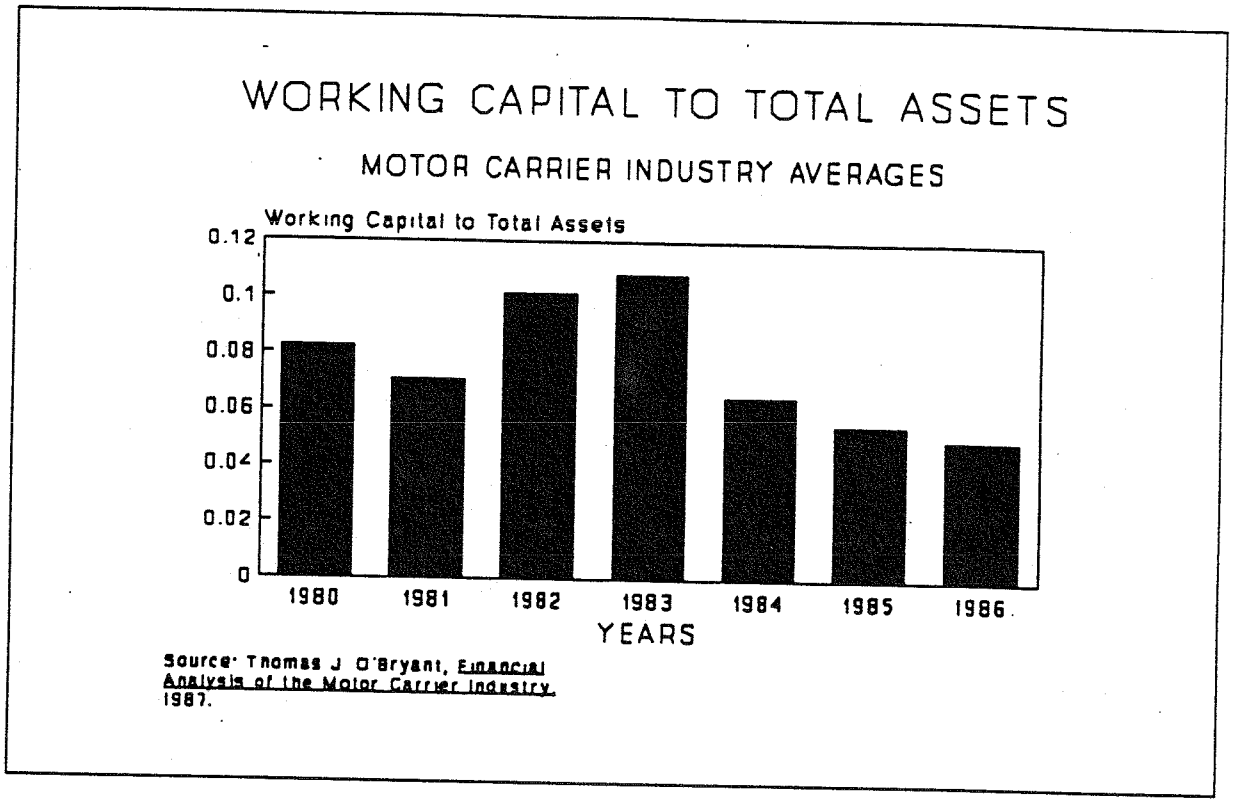
Liquidity The liquidity ratio was calculated as working capital to total assets (WC/TA). Working capital (current assets minus current liabilities) by itself is one measure of a firm's ability to pay its current obligations. If it is positive, the firm still has cash, or shortly-to-become cash items (if necessary) to pay additional current expenses. If negative, all available current assets would be expended on current obligations -- if the firm chose to pay them when due -- and it would still have some left outstanding. After a firm's current bills are paid, the relative amount of the firm's assets that are short-term are indicated in the ratio of WC/TA. This ratio is based on balance sheet reports and is an annual "snap-shot." The weakness is that the ratio may be much different the other 364 days per year.

The industry averages, as reported by the American Trucking Associations, Inc. and displayed in Figure 5-1, show a somewhat tighter situation in 1986 (the latest year for which data was available) than in 1980.[2] Working capital was approximately 5 percent of total assets, but had been double that three to four years earlier.

Debt Several debt or financial leverage ratios have evolved, including debt-to-equity, equity-to-debt, debt-to-total assets, and its converse, equity-to-total assets. A firm with relatively large amounts of debt is considered to be highly leveraged; i.e., a small amount of equity financing controls a large amount of total assets. It is similar to a homeowner paying $10,000 down so that he or she may live in ("control") and benefit from a $100,000 house. The concomitant negative side is the increased risk with higher debt obligations, in the form of interest payments and other restrictions, placed on the debtor. If these obligations are not met, the physical assets may revert back to the grantor of the debt, effectively closing down the firm.

The debt measure used for the selected trucking firms was debt-to-total assets. Viewed as a percentage of assets, the proportion of debt provides an indication of financial leverage. If the return on total assets exceeded the average interest rate paid for debt financing, the return on equity would be "leveraged" up as a result. Conversely, should the return on assets fall lower than the cost of debt (which still must be paid), the return on equity will be

Figure 5-1 American Trucking Associations, Inc., Industry Average Ratio of Working Capital to Total Assets



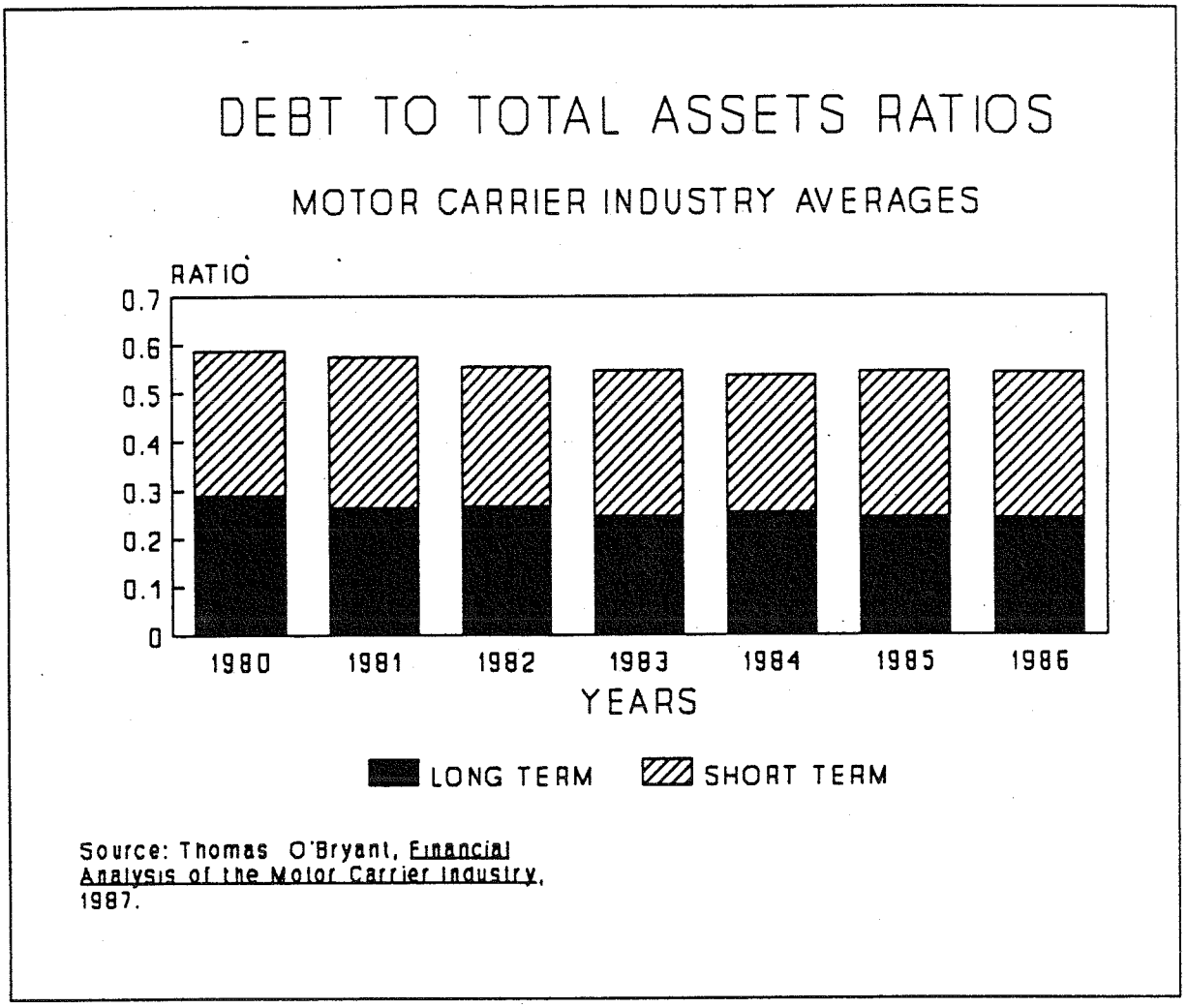
proportionately lower because of the leverage effect.

This ratio was graphed with the bar representing the debt portion broken into two segments, long-term debt and current liabilities. This split provided still another risk demonstration: firms that rely predominately on short-term debt must also have a steady flow of income (or, less likely, ample current assets to provide positive working capital). Otherwise, a default on the debt, loss of assets, and bankruptcy are liable to occur.

Figure 5-2 shows the American Trucking Associations, Inc. industry averages for long-term and short-term debt-to-total assets.[3] While overall debt fell slightly, the decrease was due to a reduction in long-term debt. Since long-term debt is considered permanent financing, this reduction may represent a weaker position than formerly, especially since short-term debt did not decrease.

Activity (Operating) The more frequently used activity ratios which indicate how effectively assets are used were developed for manufacturers and sellers of goods from inventories. Generally reported as asset turnover (sales/assets), these ratios did not provide useful comparisons for trucking firms because their assets were sometimes owned, sometimes

Figure 5-2 American Trucking Associations, Inc., Industry Average Debt to Total Assets Ratios



Source: Thomas O'Bryant, Financial Analysis of the Motor Carrier Industry, 1987.

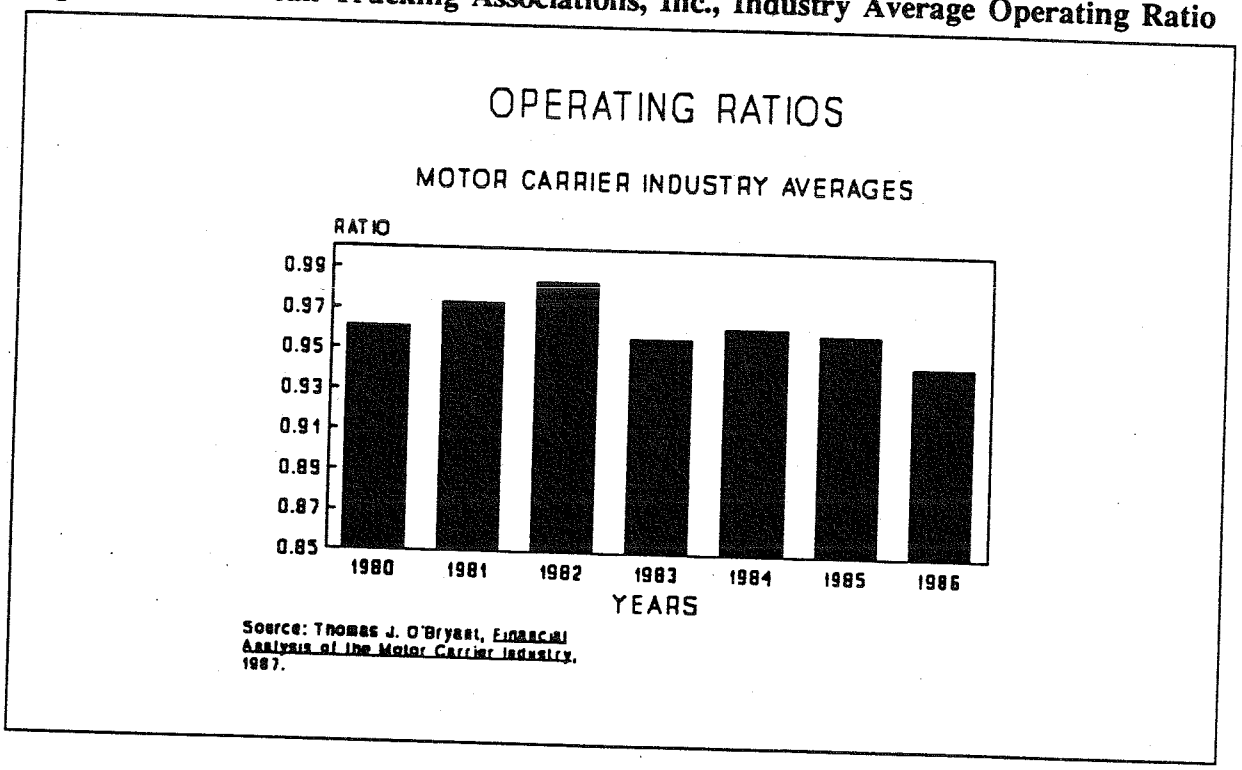
leased, and sometimes combined with labor expenses (when using owner-operators). In addition, trucking firms do not sell products from inventory, which is a major asset account of firms calculating turnover ratios.

In place of asset turnover ratios, several alternative and commonly used ratios were selected to measure motor carrier productivity. The "operating ratio" (OR) is one standard ratio and divides operating expenses by operating revenues. (There are other expenses, such as overhead and interest, that are not the direct result of hauling a load of freight, and there may be other sources of revenue arising from selling equipment or services other than transportation.) A benchmark for judging ORs is the number "one." A ratio greater than one indicates that the expenses incurred carrying freight were more than the revenue generated.

If all the costs were truly operating costs, the carrier would be dollars ahead to decline the loads at those prices. While this may appear to be an obvious reaction, many costs and revenues are not known accurately enough in advance and some loads very well may be accepted at disadvantageous rates for competitive or other reasons. A ratio less than one indicates that a carrier is paying its operating expenses from the associated revenues and contributing the remainder toward other expenses. The American Trucking Associations, Inc. industry averages for operating ratio hovered between 0.95 and 0.98 during the seven years observed in Figure 5-3, indicated a stable relationship between operating revenues and expenses.

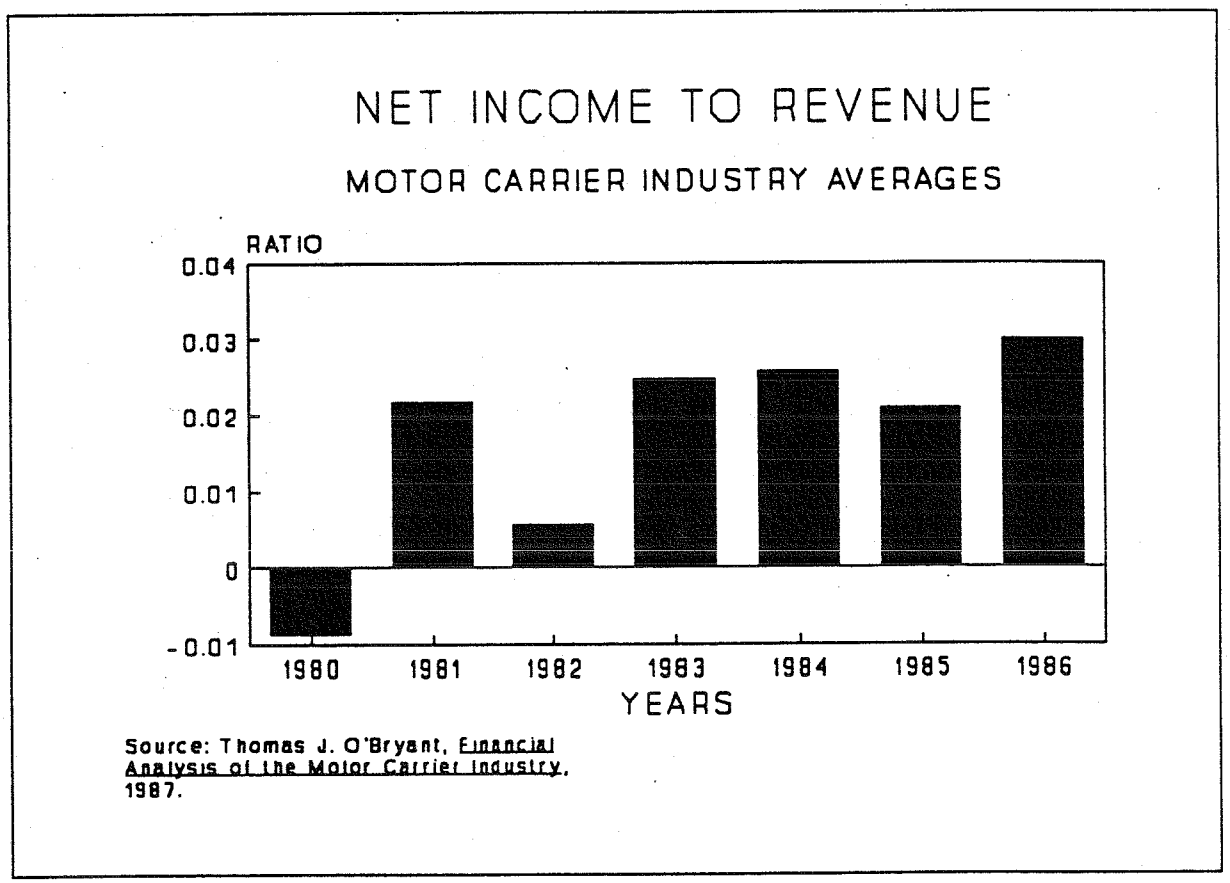
Four additional, and quite specific, productivity ratios were calculated for the 18 carriers studied: revenue per driver, revenue per employee, revenue per tractor, and revenue per trailer. Since these ratios were based on dollar amounts, they were adjusted by the GNP deflators. One weakness is that they reflect the effects of some firms' switching between their own employees as drivers, and the use of owner-operators.

Figure 5-3 American Trucking Associations, Inc., Industry Average Operating Ratio



Profitability Comparisons of net income to sales and to assets are referred to as profitability ratios. The first, net profit margin, expresses annual earnings remaining after all expenses, including taxes, have been charged as a percent of revenues. It is nearly the converse of the operating ratio (described above), except the latter includes operating expenses, not fixed expenses and income taxes. Differences are observed in the industry average data shown in Figure 5-4. The ratios for most years show a profit margin of 2 to 3 percent of revenue, although lower results are evident for 1980 and 1982. (The differences are magnified by the scaling of the graphs.)

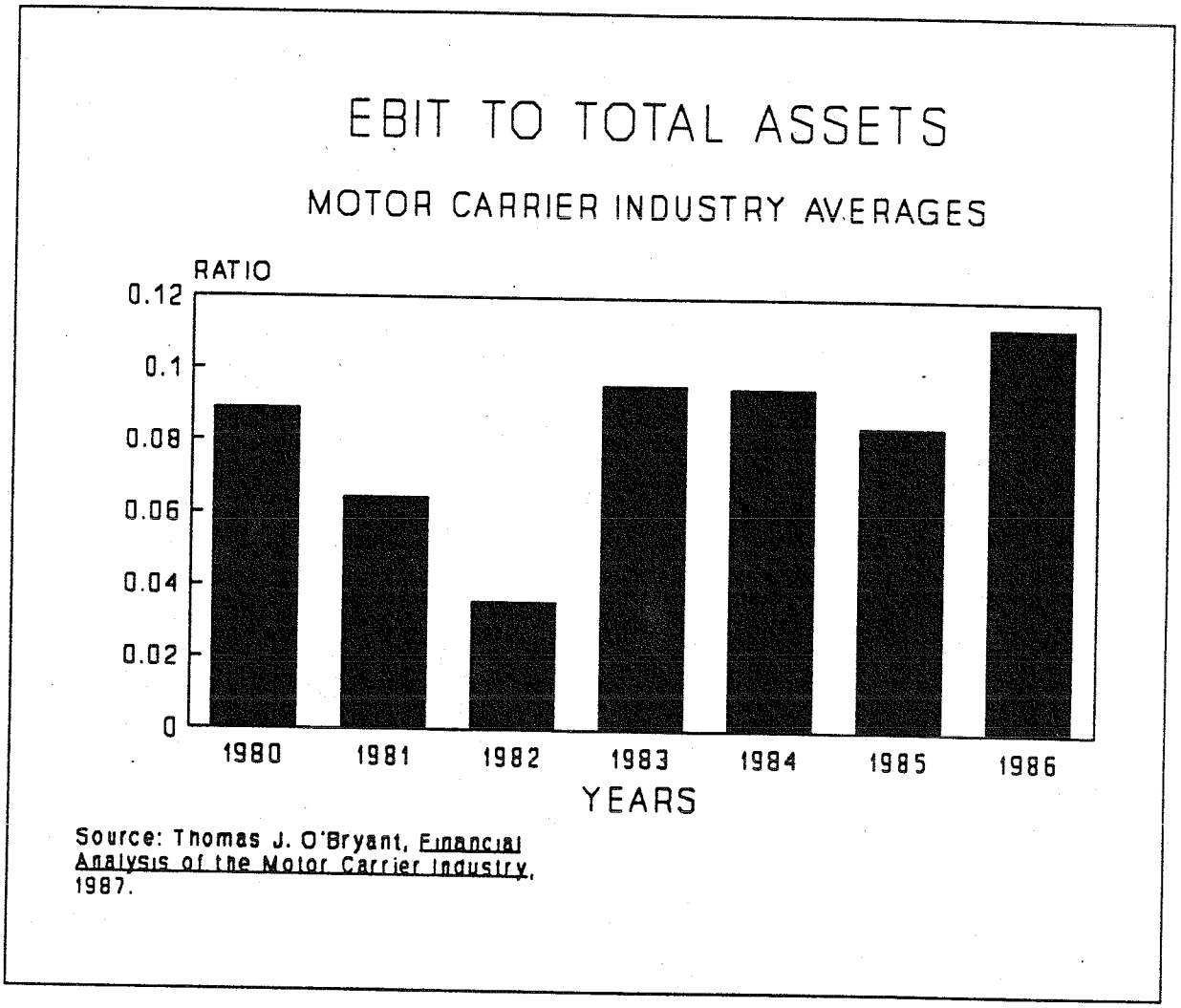
Figure 5-4 American Trucking Associations, Inc., Industry Average Ratio of Net Income to Revenue



A second profitability measure employed in this study was the ratio of earnings before interest and taxes (EBIT) to total assets. This ratio provides a good comparison with the cost of debt because interest, which must be paid from EBIT, is a tax-deductible business expense and is expressed on this basis. In five out of seven years observed in Figure 5-5, the EBIT

to total assets ratio for the industry exceeded eight percent. Results were lower in 1981 and 1982 but still positive.

Figure 5-5 American Trucking Associations, Inc., Industry Average Earnings Before Taxes to Total Assets Ratio



Source: Thomas J. O'Bryant, Financial Analysis of the Motor Carrier Industry, 1987.

A third ratio, calculated as a measure of accumulated past profitability, is retained earnings to total assets. This expresses the portion of the firm that has been effectively "purchased" by its past efforts. This form of financing is also called internally generated funds.

Growth Although growth was considered a description of where the firm is going, the available measures show where the firm has been in terms of revenues and asset size.

The presence of inflation had considerable influence on these figures, especially in the early part of the decade. A firm providing the same amount of service might be seen as "growing" simply because the dollars received in 1987 were, practically speaking, a lower-valued currency than they were in 1980. Revenue and asset amounts were adjusted by the GNP deflator to provide more valid comparison over time. (The ratios described in earlier sections were not adjusted because inflation would have affected both numerator and denominator in a similar fashion. An argument could be made, however, that long-term asset figures should also be adjusted for inflation because their historical costs understate their replacement costs. Such adjustment was not performed for this report because information on the purchase dates of the assets were not available. Also, the average life of motor carriers' major assets; i.e., their equipment, tends to be short compared to the life of, for example, manufacturing plants.)

The American Trucking Associations, Inc. averages, plotted in Figure 5-6, show a decrease in real revenues after 1981. Although 1982 was shown to be a difficult year financially for trucking firms (see Figures 5-4 and 5-5), real revenues never returned to their 1980 and 1981 levels during the next five years.

Altman's Z"-scores The ratios described above were similar to those utilized by Altman, who developed sets of "Z-scores" for predicting corporate bankruptcies. Altman, considered by some to be the "father of modern bankruptcy analysis",[4] utilized discriminant analysis to categorize (after the fact) firms as viable or bankrupt. The mathematical details resemble multiple regression, with a discriminant score (Z) being produced from a linear function of the independent variables:

$$Z = v_1 x_1 + v_2 x_2 + \ldots + v_n x_n$$

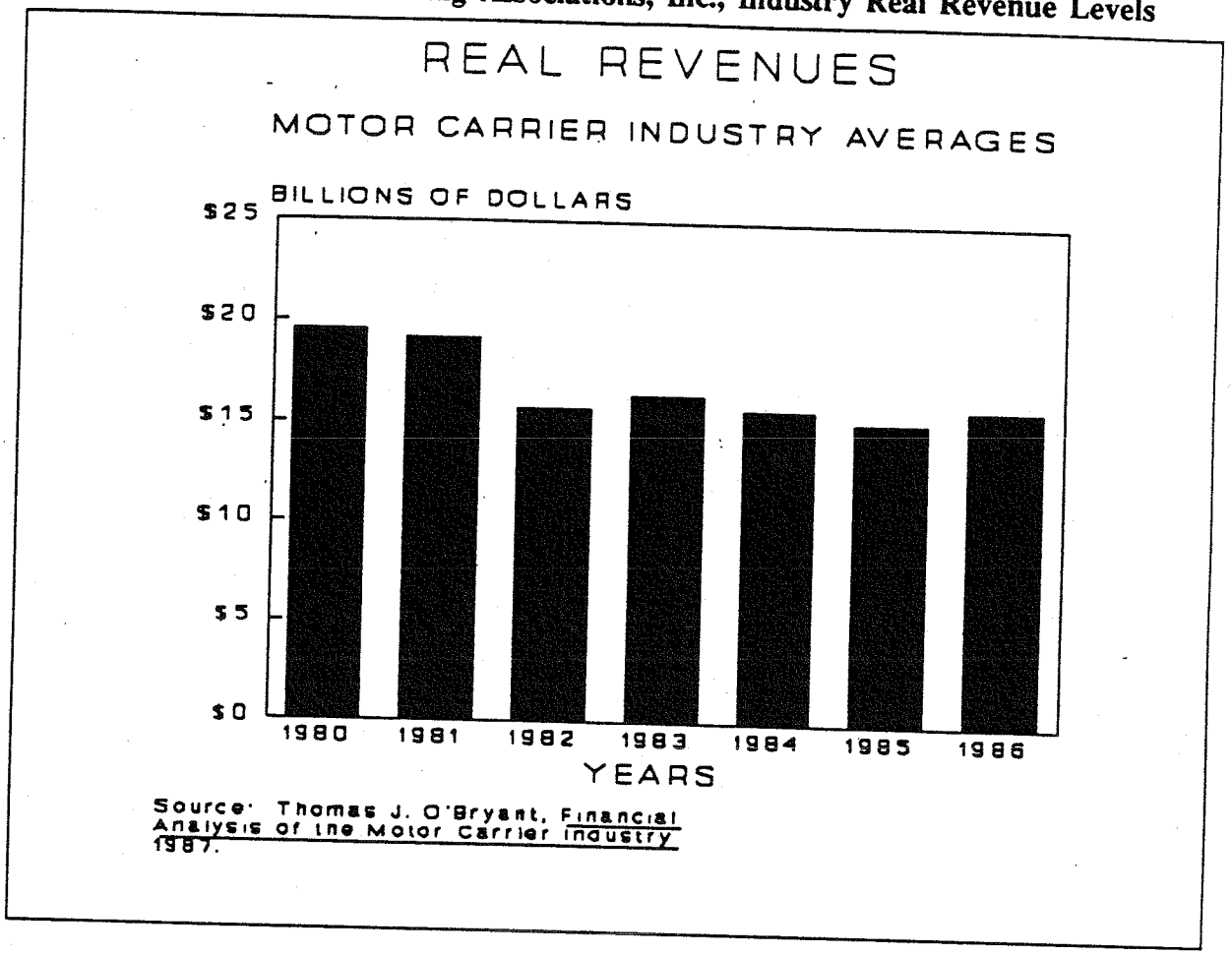
where: v_i = discriminant coefficient for the i^{th} variable (calculated by the discriminant analysis program)

x_i = independent variable (e.g., financial ratios)

Altman's studies tested a variety of ratios as inputs to the discriminant function. He then selected a discrete number of inputs that provided the best predictability.

As a demonstration of the strength of his model, Altman's 1968 article described tests of financial ratios from 33 firms that had gone bankrupt since 1946 and 33 firms still existing 20 years later. Using data from one year prior to bankruptcy, Altman's discriminant model correctly assigned firms to the correct category, bankrupt or non-bankrupt, in 95 percent of

Figure 5-6 American Trucking Associations, Inc., Industry Real Revenue Levels



the cases. The percentage of correct assignments fell when longer term predictions were made. For example, the model would have predicted 72 percent of the bankrupt firms two years before filing bankruptcy.[5]

Altman developed a model for the railroad industry which, using historical data, correctly classified rail firms 97 percent of the time, both one and two years prior to bankruptcy.[6] Other variations followed, by Altman and by others.[7] More recent applications include Altman and Gritta's airline prediction study,[8] Chow and Gritta's predictions of motor carrier bankruptcies,[9] and McNair and Walter's analysis of shortline railroads.[10]

Altman's "Zeta Analysis" studies produced several models, labeled Z, Z', and Z".[11] The latter uses four financial ratios as inputs and was successfully applied by Chow and Gritta to predict 85 percent of bankrupt motor carriers.[12] In tests of Altman's three models (on local and regional railroad data), Wolfe called it "the best of the public domain models."[13] The Z" equation is:

$$Z'' = 6.56(X_1) + 3.26(X_2) + 6.72(X_3) + 1.05(X_4)$$

where: X_1 = The ratio of working capital to total assets (WC/TA), a liquidity measure

X_2 = The ratio of transportation expenses to operating revenues (TE/OR), which shows how efficiently the carrier is operating

X_3 = The ratio of earnings before interest and taxes to total assets (EBIT/TA), which is also a profitability measure

X_4 = The ratio of the book value of equity to the book value debt (BVE/BVD), a gauge of financial leverage

A Z"-score of 2.60 or more indicates a strong financial position, and a Z"-score of less than 1.10 indicates a very weak position. Scores in between are considered difficult to gauge.

Analysis of Data

Detailed financial and operating reports filed with the ICC as Motor Carrier Annual Report M (with "Iowa Insert") and with the Iowa Department of Transportation furnished the data analyzed below. For each category, industry changes were observed and described for 18 motor carriers which were selected to provide examples of firms ranging from financially strong to bankrupt.[14] The median revenue in this sample was $11 million (in 1987), with two firms reporting income below $1 million; three firms (including United Parcel Service (UPS) at $5 billion) had revenues exceeding $100 million. The analysis should be thought of as a case study of a selected group of representative firms. While there may be no "typical" motor carrier, this review of a cross-section of TL, LTL, and small package carriers may tend to indicate general directions of financial trends. In addition, representatives from five individual firms accepted invitations to be interviewed more extensively. These findings, along with graphs of their financial analyses, appear in a subsequent section of this report.

Liquidity: Working Capital to Total Assets The working capital to total assets ratio ranged from a low of -.427 to .648 during the study period. The aggregate measure was .115 in 1980 and .038 in 1987. This measure varied quite a bit among firms and from year to year which might reflect the fact that it is a snapshot type of ratio. There does seem to be a tendency for smaller firms to have a higher working capital to assets ratio than larger firms.

This ratio for all firms declined during the 1980 to 1987 period, with the declines occurring in 1986 and 1987.

Debt measure: Debt to Total Assets This ratio for individual firms ranged from a low of .063 to a high of 1.003. The ratio of 1.003 indicates that the firm had more debt than assets. The aggregate measure of the mean ranged from .469 in 1985 to .568 in 1987. The measure has been relatively stable, ranging between .50 and .55, save for the outlying values in 1984 and 1987.

Long-Term Liabilities to Assets The overall debt to total assets ratio hides the proportions of permanent, or long-term, debt financing and temporary debt financing. The relatively simple step of dividing debt into its components provided additional insight into the industry's ability to finance equipment and terminals (long-term) and pay its bills (short-term).

The long-term liabilities to assets ratio, for individual firms, has ranged from 0, the use of no long-term financing, to a high of .636. For all the firms, the average measure has ranged from .263 in 1981 to .167 in 1987. This measure has remained fairly stable but did decline from 1986 to 1987. Firms vary greatly in their use of long-term financing.

Current Liabilities to Total Assets The current liabilities to total assets ratio ranged from .053 to .726 for individual firms. The aggregate measures range from .108 in 1985 to .204 in 1987. There seems to be a trend to use more current debt rather than long-term debt. Firms vary less in their usage of short-term debt than in using long-term debt. An increased dependence upon short-term debt likewise increases short-term financial risk. As long as operating resources are supplied by permanent capital (either debt or equity), a firm is still "in business," whether profitable or not. When a firm cannot pay its obligations, its creditors may take legal action to obtain the assets they had furnished, thus reducing the ability of a firm to operate or forcing it to declare bankruptcy.

Activity: Operating Ratio The operating ratios for individual firms vary from .723 to 1.165. The aggregate measure varies from .947 to .988 in 1987. There seems to be a tendency for the operating ratio to be increasing through the study period. The ratio does not vary a great deal from firm to firm.

Activity: Productivity ratios Four additional, and quite specific, productivity ratios were calculated: revenue per driver, revenue per employee, revenue per tractor, and revenue per trailer. The productivity measures discussed here are real revenue measures. The revenue

figures provided by the firms have been deflated by the GNP implicit price deflator. It should be mentioned that there are more data omissions for the revenue measures than for the other financial ratios that have been examined. This is mostly due to the omission of Schedule 700 by many of the firms, a document which shows the equipment the carrier operates. Also, the productivity ratios vary greatly from carrier to carrier, more so than other financial measures.

Revenue per Driver This ratio varies from $42,595 to $866,674 for individual firms during the period studied (United Parcel Service accounted for the high end-point of this range). Averages for the groups range from $198,211 observed in 1981 to $137,959 in 1987. The general trend for the group appears to be downward.

Revenue per Employee This measure ranges from $19,961 to $234,317 for individual firms. For the average measure, values range from a low of $60,473 in 1980 to a high of $79,559 in 1986. The average measure for the group shows no discernable trend.

Revenue per Tractor This ratio varies greatly from firm to firm, ranging from $63,181 to $1,028,599 (the latter was for UPS). The industry average ranges from $261,980 in 1983 to $149,000 in 1987. The 1987 figure does not include a figure for UPS, however. UPS has by far the highest revenue per tractor for the group so the 1987 amount is not representative. For this particular ratio, the median is a better measure of central tendency. The median goes from a high of $165,372 in 1983 to $110,657 in 1987. The trend for measure trends downward fairly steadily after its high in 1983.

Revenue per Trailer Again, this measure is highly variable from firm to firm. Individual observations range from a low of $30,599 to a high of $330,624. The average measure ranges from a high of $123,283 in 1982 to a low of $62,011 in 1987. The general trend for this particular ratio appears to be downward.

Profitability: Net Income to Revenue The first, net profit margin, expresses annual earnings remaining as a percent of revenues after all expenses, including taxes, have been charged. This measure varies from -.164 to .110 among the various firms during the study period. The aggregate measure varies from .010 in 1980 to .031 in 1981, 1984, and 1985. There does not appear to be any marked trend demonstrated in this ratio, which given the variability of revenues generated by the firms, is not surprising.

Profitability: EBIT to Total Assets A second profitability measure employed in this study was "earnings before interest and taxes (EBIT) to total assets." For individual firms this

ratio varies from -.308 to .664. The aggregate measure varies from .132 in 1980 to .050 in 1987. This measure of profitability has declined during the study period. This measure varies greatly from firm to firm.

Profitability: Retained Earnings to Total Assets A third ratio, calculated as a measure of accumulated past profitability, is retained earnings to total assets. For individual firms this ratio varies from -.206 to .915. The aggregate measures vary from .450 in 1980 to .342 in 1987. Although there appears to be no dramatic trend, this measure does appear to be edging downward, probably reflecting the decreasing profitability of the firms studied, as demonstrated by the EBIT to total assets ratios. The effects of decreased profitability would take a while to show in the retained earnings measure.

Growth The available measures track where the firm has been in terms of revenues and asset size. While absolute dollar measures are not as useful for comparing firms as ratios, three (of the 18) carriers had annual revenue increases exceeding 10 percent during the 1980 to 1987 reporting period; four more exceed 5 percent, and four others had smaller increases. Five carriers reported declining revenues up to 6.6 percent, and two ceased business. In terms of total assets, nine carriers increased in size; two carriers are no longer in business.

Altman's Z"-scores As described above, a strong financial position is indicated by a Z"-score of 2.60 or more. A Z"-score of less than 1.10 indicates a very weak position. As one overall measure of the financial condition of the group, average ratio values were applied to Altman's Z" formula. (Selected individual firms are analyzed in the "Case Studies" section below). The results of this formula should give an indication of the general financial condition of the group studied from year to year. The Z"-score for the group ranged from a high of 3.193 in 1983 to a low of 1.532 in 1987. There has been a steady downward trend in the Z"-score since 1983. The average score had moved from above the 2.6 level, which would indicate that the group has strong financial condition, to the intermediate condition. If the Z"-score fell below 1.1, that would indicate the group had moved into a weak and precarious financial condition.

Conclusions of Aggregate Analysis

The analysis of the 18 motor carriers does not provide the brightest financial picture. As a group, the ratio of working capital to total assets has declined, total debt has remained

constant but short term debt has grown, operating ratios have increased, and profitability has declined in the period between 1980 and 1987. Changes in productivity measures have been mixed: revenue per employee and revenue per driver remained steady but revenue per tractor and revenue per trailer have declined. The fall in revenue per tractor and per trailer while revenue per driver remaining constant probably reflects the substitution of capital to permit the continued level of utilization of labor. Finally, the decline of Altman's Z" from a value indicating financial strength to one indicating weakness clearly demonstrates that the financial performance of carriers sampled, as a group, has declined as a result of greater competition during the 1980s.

Case Studies: Interviews with Representatives of Five Carriers

Financial and performance reports permit quantitative measurements that may track industry changes during the 1980s. Additional perspectives were obtained through interviews with executives of a selected group of carriers whose service area included all or parts of the four-state region. Two firms were TL carriers, two regional LTL carries, and one was an LTL carrier that had gone bankrupt and is no longer operating. The observations of these managers are organized below in the areas of (1) their evaluation of changes that have occurred in the 1980s, (2) their assessment of current problems, and (3) anticipated future issues.

TL Carrier: Umthun Trucking Company

Background

Umthun Trucking Company (Umthun) of Eagle Grove, Iowa, began as a one-truck company in 1944, Steve Umthun and later his son, Joe, hauled dry freight, beans, and feed intrastate. The 1950s saw Umthun become an interstate carrier, expanding through the purchase of equipment and a three-year ownership of General Cartage of Sterling, Illinois. Products carried included containers, gypsum, bulk feed, and eggs.

During the 1960s, Umthun expanded as a contract carrier of gypsum and then, using a fleet of air pneumatic trailers, became the largest agricultural carrier in Iowa. Terminals

were opened in Fremont, Nebraska, and Muscatine, Iowa. Expansion continued through the seventies as Umthun built a terminal at Mediapolis, Iowa, and started intra-Minnesota hauls through the operation of Forrest Olson, Inc. The product mix expanded to include steel and lumber.

Financial Situation

The 1980s The decade of the eighties has seen Umthun add terminals in Fort Dodge and Buffalo, Iowa, and in Hammond, Indiana, and Hutchins, Texas. Umthun approached $36 million in sales in 1988. Umthun has become both customer-oriented and driver-oriented. The company's stated principle is that "customer service is all-important."[15] The company attributes much of its success to adopting this philosophy, feeling that shippers recognize the sales value of their transportation company.

Financial condition Umthun's financial reports were similar to the averages calculated by the American Trucking Associations, Inc. for earnings before interest and taxes/total assets, total debt/total assets, and operating ratio. As can be seen in Figure 5-7, its working capital/total assets ratio was noticeably lower than the American Trucking Associations, Inc. average (which generally exceeded 5 percent) and often negative during the past seven years. This is an end-of-the-year report, however, and may indicate the very close cash management philosophy of a family-owned company.

Umthun's debt to total assets ratio was closer to 60 percent in the early eighties but rose to 70 percent in 1986 and 1987. Figure 5-8 shows the short-term versus long-term components of their liabilities. Their current liabilities, as a proportion of the total assets, has declined. The increased long-term debt indicates greater financial stability. By reducing the portion of short-term debt, they may have reduced the financial risk of bankruptcy.

Figure 5-7 Umthun: Working Capital to Total Assets

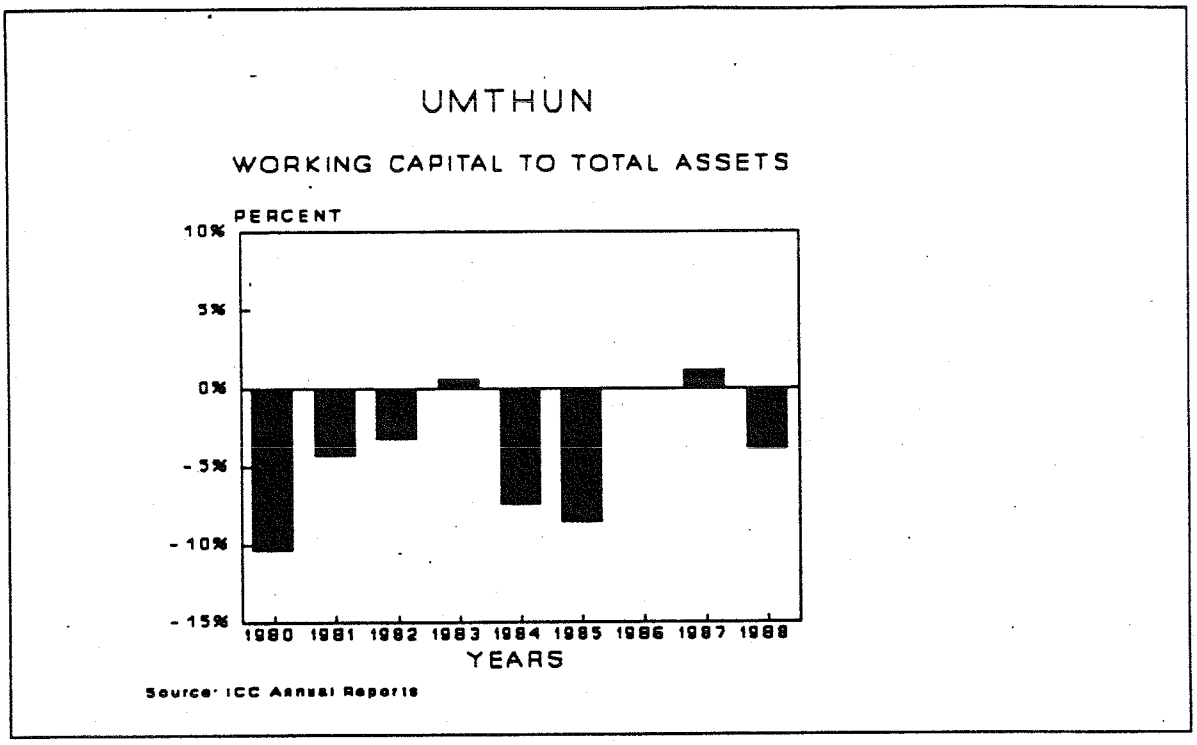
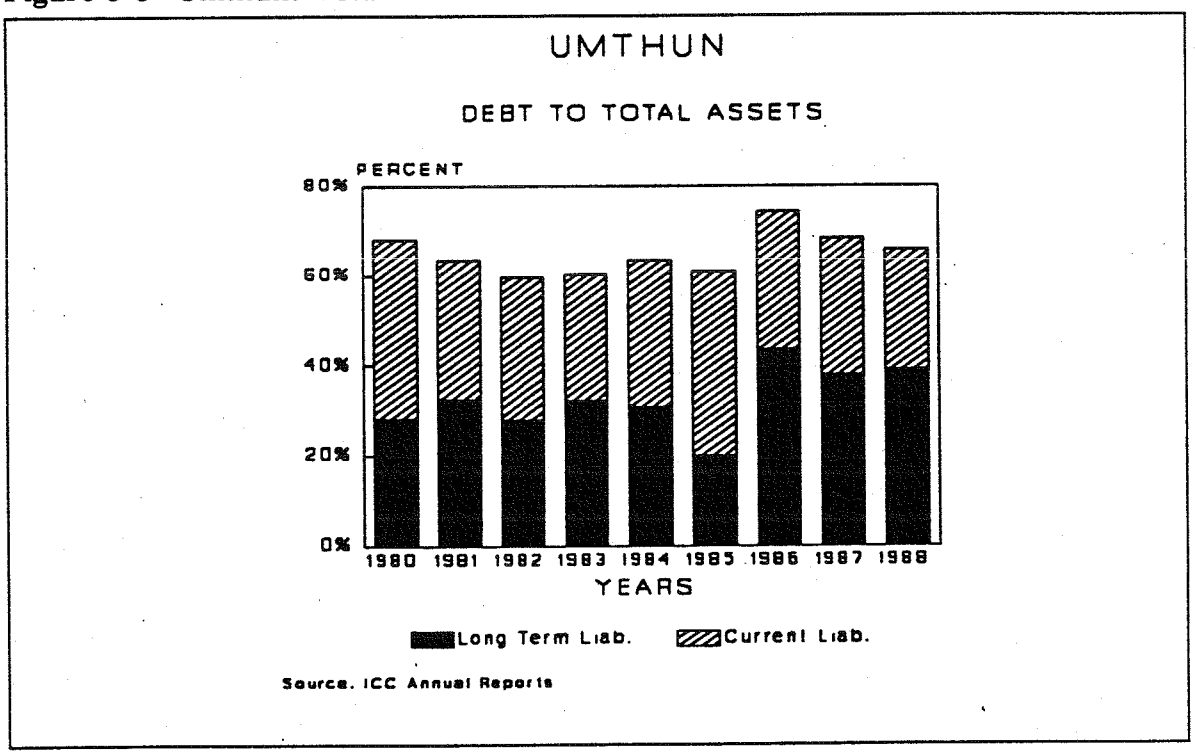
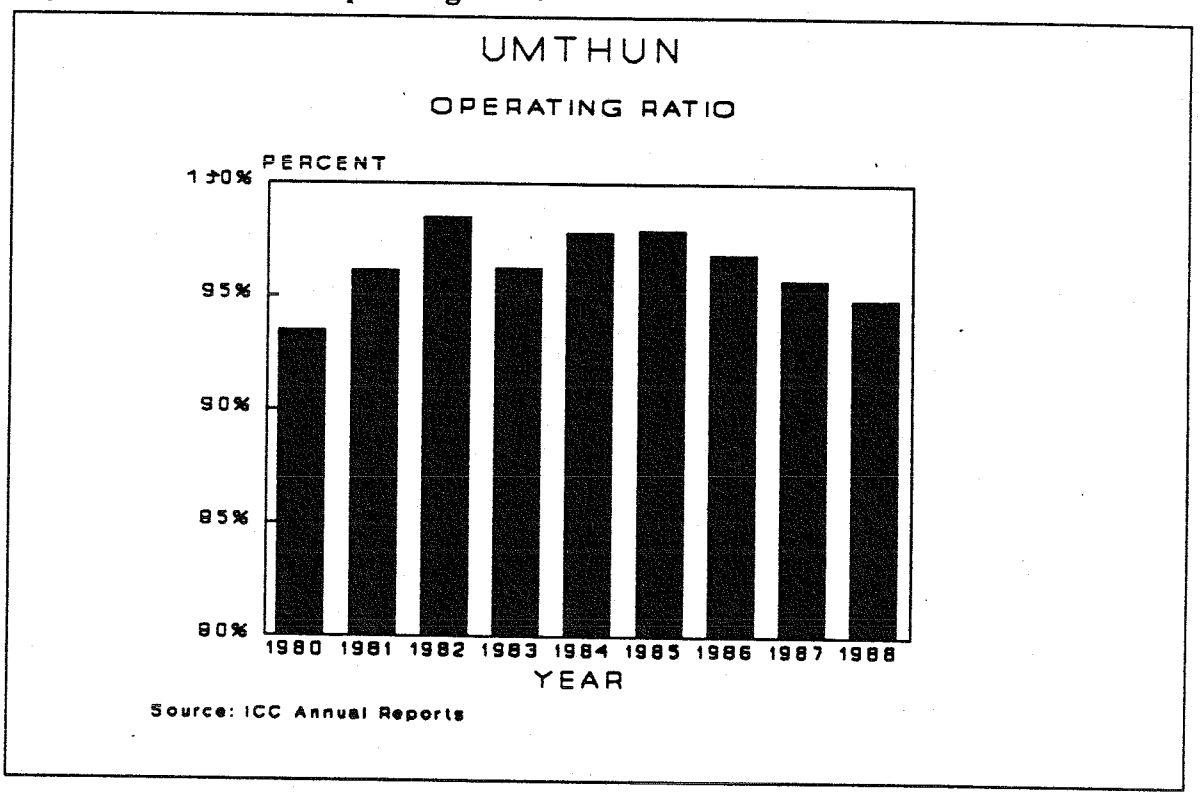


Figure 5-8 Umthun: Total Debt to Total Assets



Productivity ratios Umthun's operating ratios, plotted in Figure 5-9, were generally stable, between 0.9 and 1.0. With operating ratios at or near the mid-range of the carriers interviewed, Umthun would appear to have its operating expenses in control, relative to revenues.

Figure 5-9 Umthun: Operating Ratio



Revenue per driver, adjusted for changes in the value of the dollar and plotted in Figure 5-10, was stable during the 1980s, and exceeded $100,000. Revenue per employee, plotted in Figure 5-11, was likewise fairly stable at $80,000 or more. Umthun appears to have adjusted its labor force to compensate for changing business conditions.

Equipment-related productivity ratios showed more fluctuations. The plot of real revenue per tractor in Figure 5-12 shows increases in 1986 and 1987 of $100,000 above the old range of 140,000 to $160,000. Reducing the number of tractors owned, coupled with increased revenues, could explain this change. Revenue per trailer in Figure 5-13, does not vary perceptibly, remaining near $60,000 throughout the eight-year range of data.

Figure 5-10 Umthun: Productivity; Real Revenue Per Driver

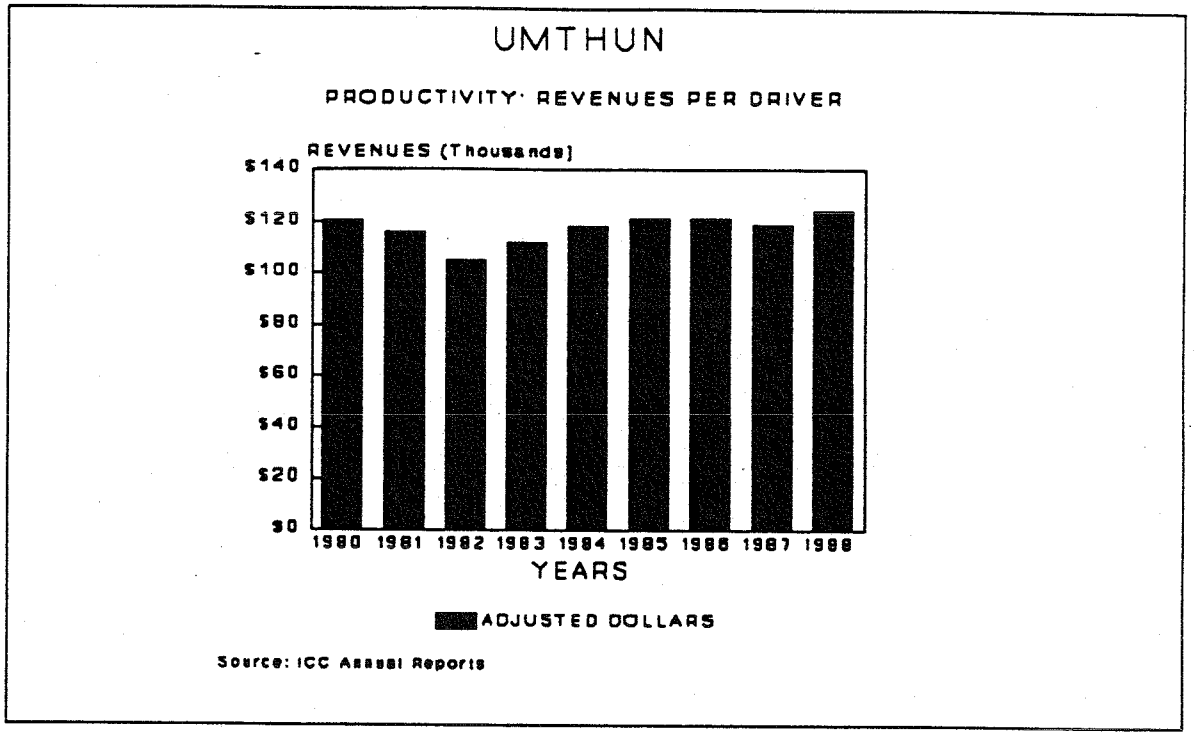


Figure 5-11 Umthun: Productivity; Real Revenues Per Employee

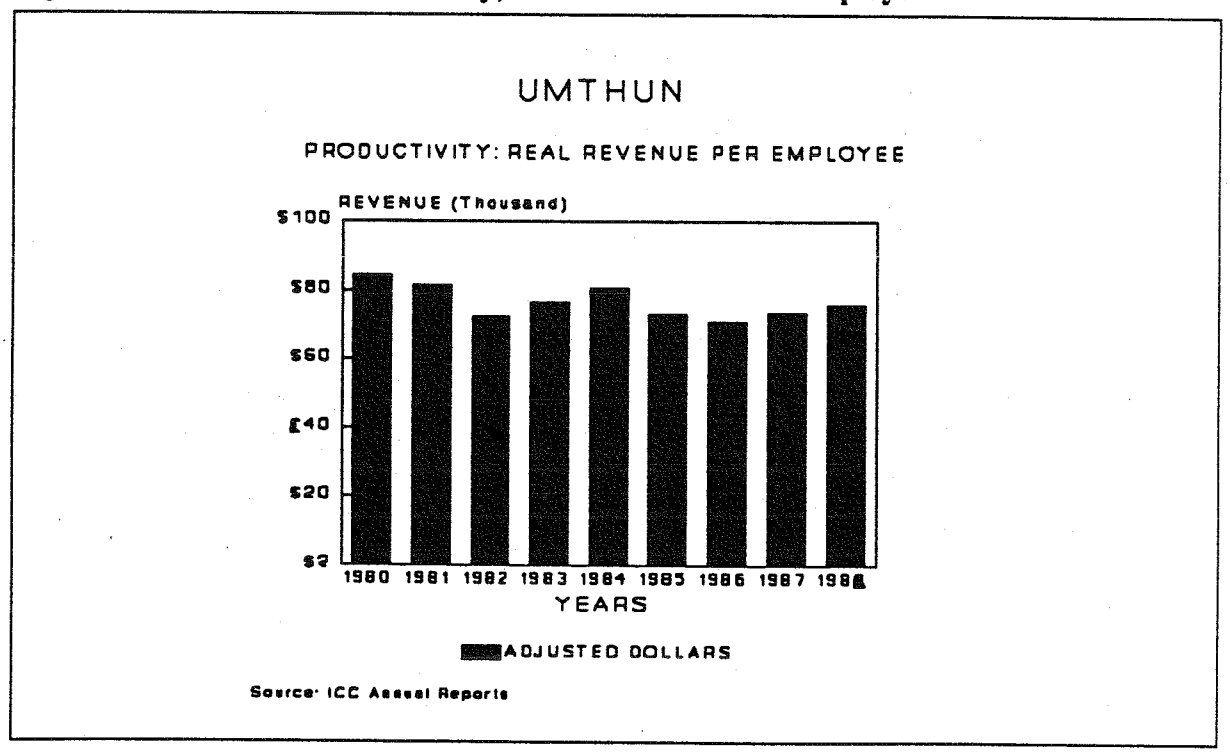
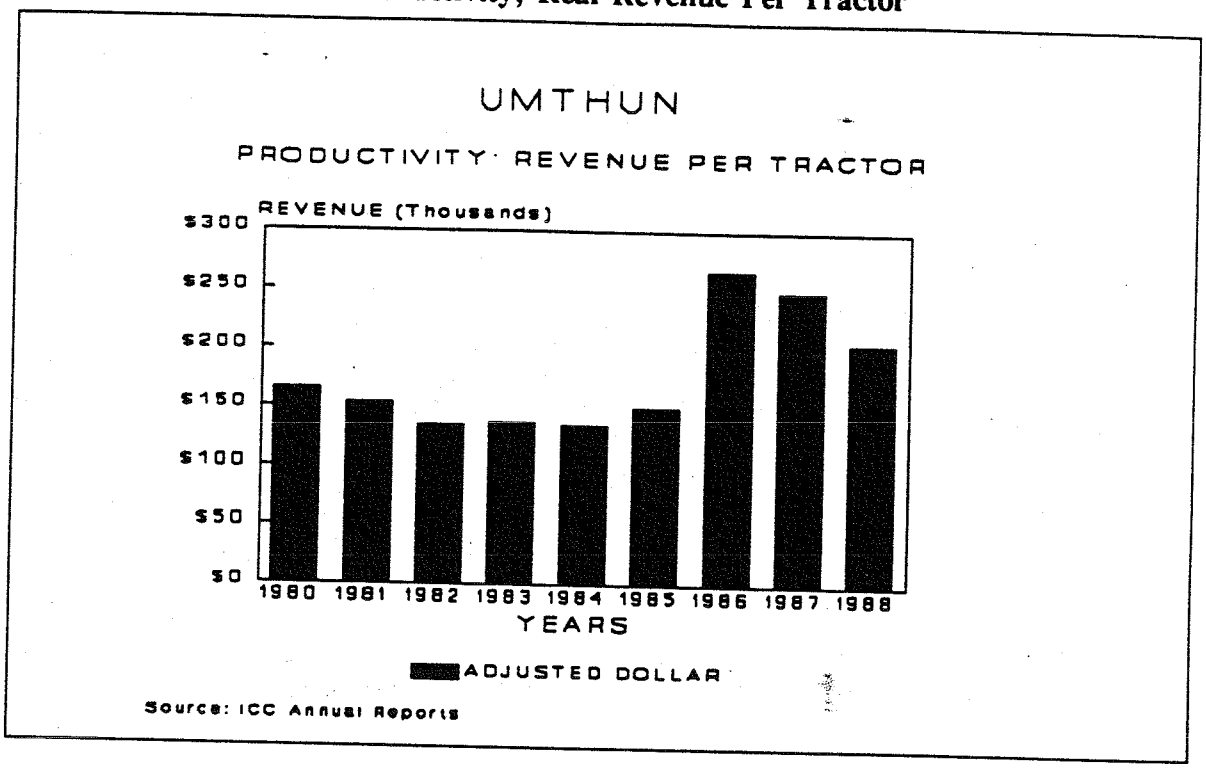


Figure 5-12 Umthun: Productivity; Real Revenue Per Tractor



Umthun's profit margin (net income/revenues, plotted in Figure 5-14) began the decade near 4 percent, but seems to have fallen significantly; recent reports show margins between 1 and 2 percent. Figure 5-15 shows that as a return on investment, earnings before interest and taxes to total assets exceeded 10 percent in most years, although 1982, 1984 and 1985 were lower. Umthun was again in mid-range of the carriers interviewed in this profitability measure.

The final profitability measure plotted in Figure 5-16 showed Umthun's retained earnings to total assets ratio ranging between 30 and 40 percent, as would be expected from its debt to total assets ratio.

Figure 5-13 Umthun: Productivity; Real Revenue Per Trailer

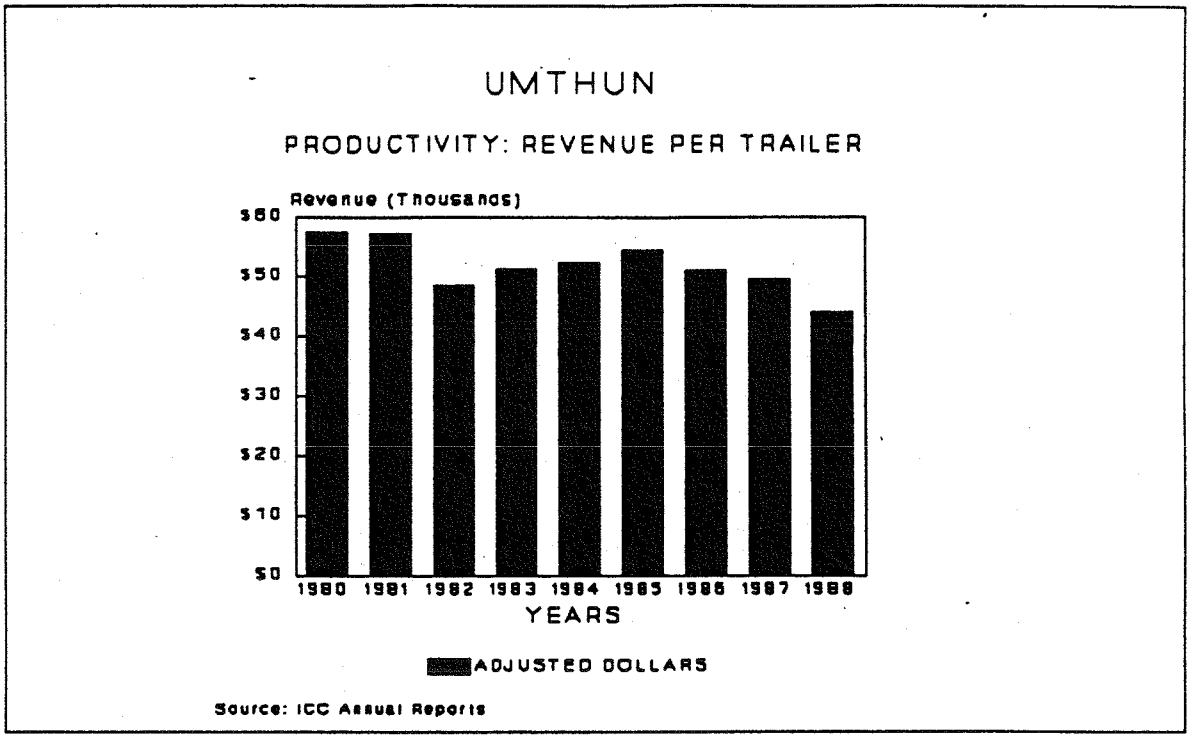


Figure 5-14 Umthun: Net Income to Revenue

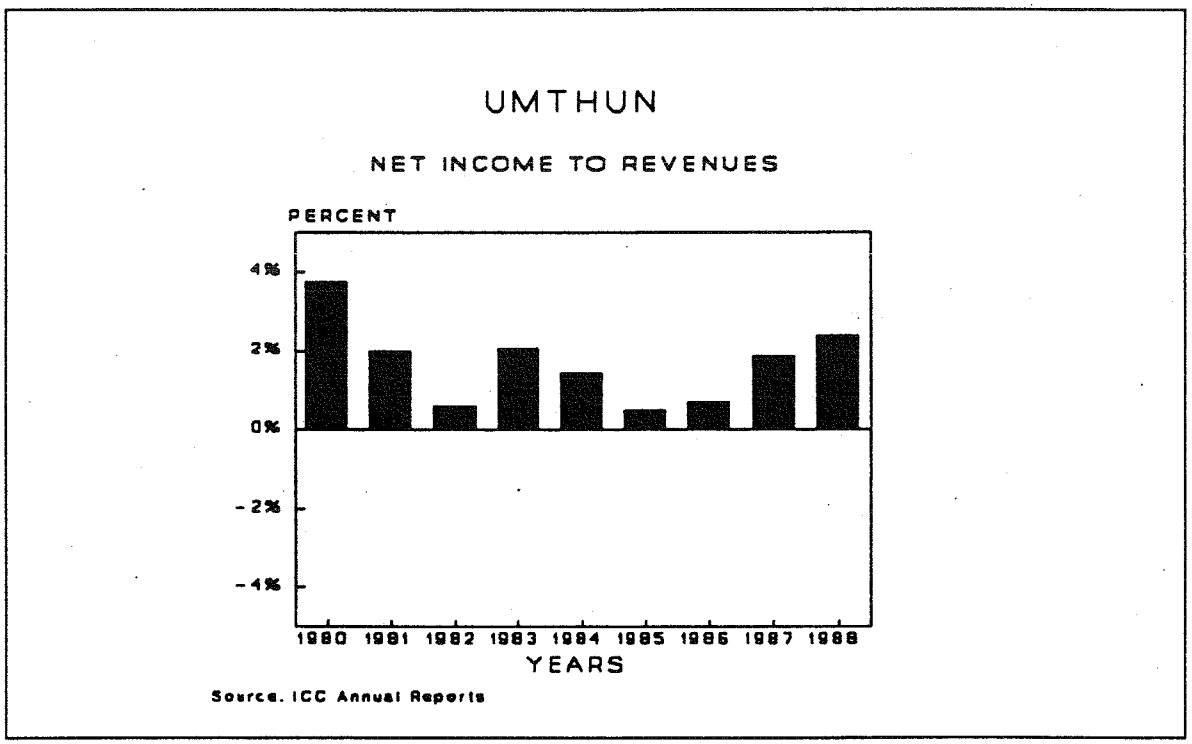


Figure 5-15 Umthun: Earnings Before Interest and Taxes to Total Assets

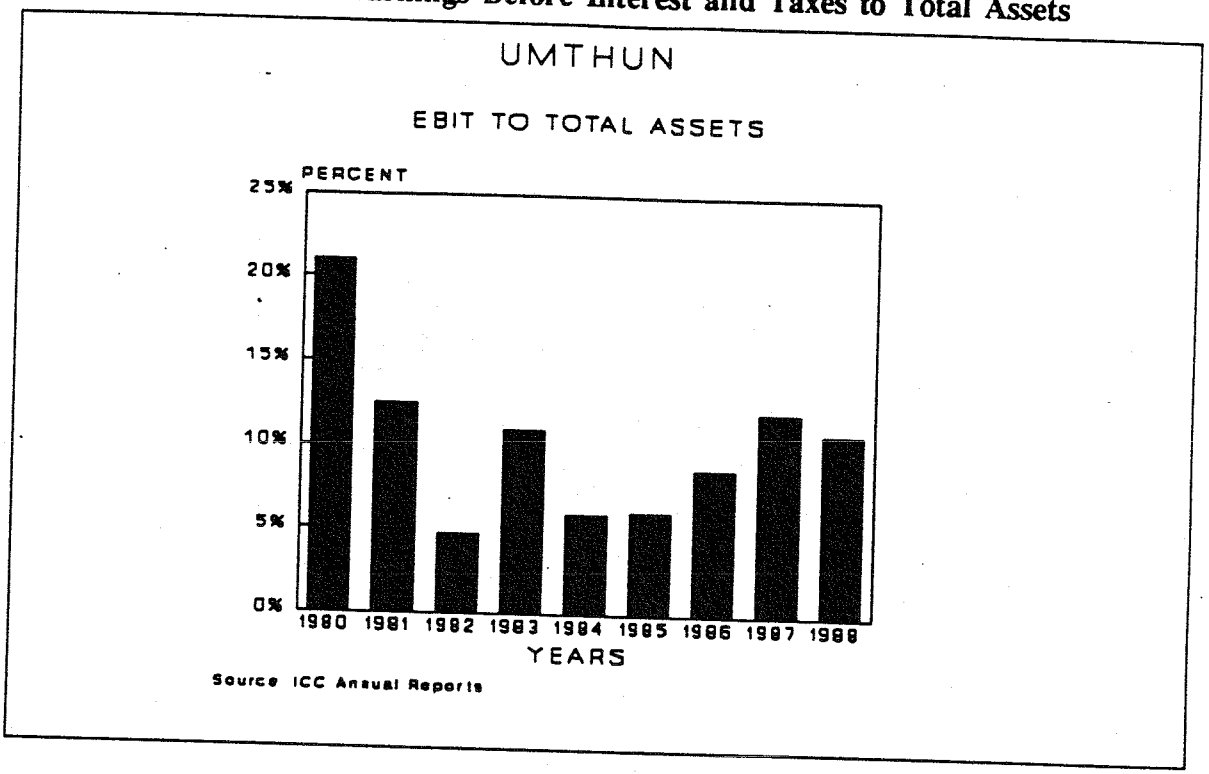
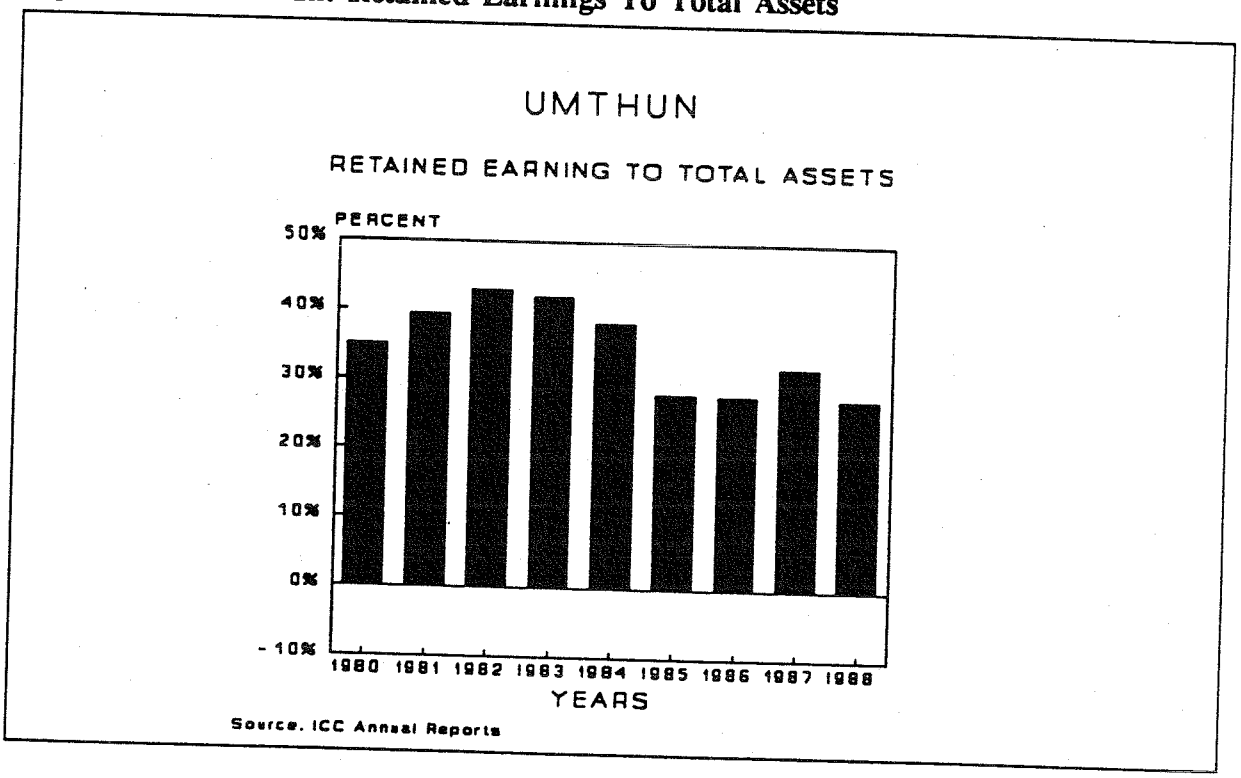


Figure 5-16 Umthun: Retained Earnings To Total Assets



Growth After a dip in 1982, the plot of Umthun's revenues in Figure 5-17 returned to a level of $26 million (stated in 1982 dollars), rising by one million per year in 1987 and 1988. Total assets, plotted in Figure 5-18, followed this general pattern, except for a significant jump in 1988.

Altman's Z"-scores The calculations of Altman's Z"-scores produced values that were nearly always in that "indeterminant" region (between 1.1, signifying a weak firm, and 2.6, considered strong). The plot of Z" scores in Figure 5-19 indicates that, during two years, Umthun's scores did slightly exceed 2.6. As an overall measure of financial condition, the Z"-scores suggest that Umthun is neither strong nor weak. This conclusion seems to be borne out by the other financial ratios observed.

Figure 5-17 Umthun: Adjusted Total Revenue

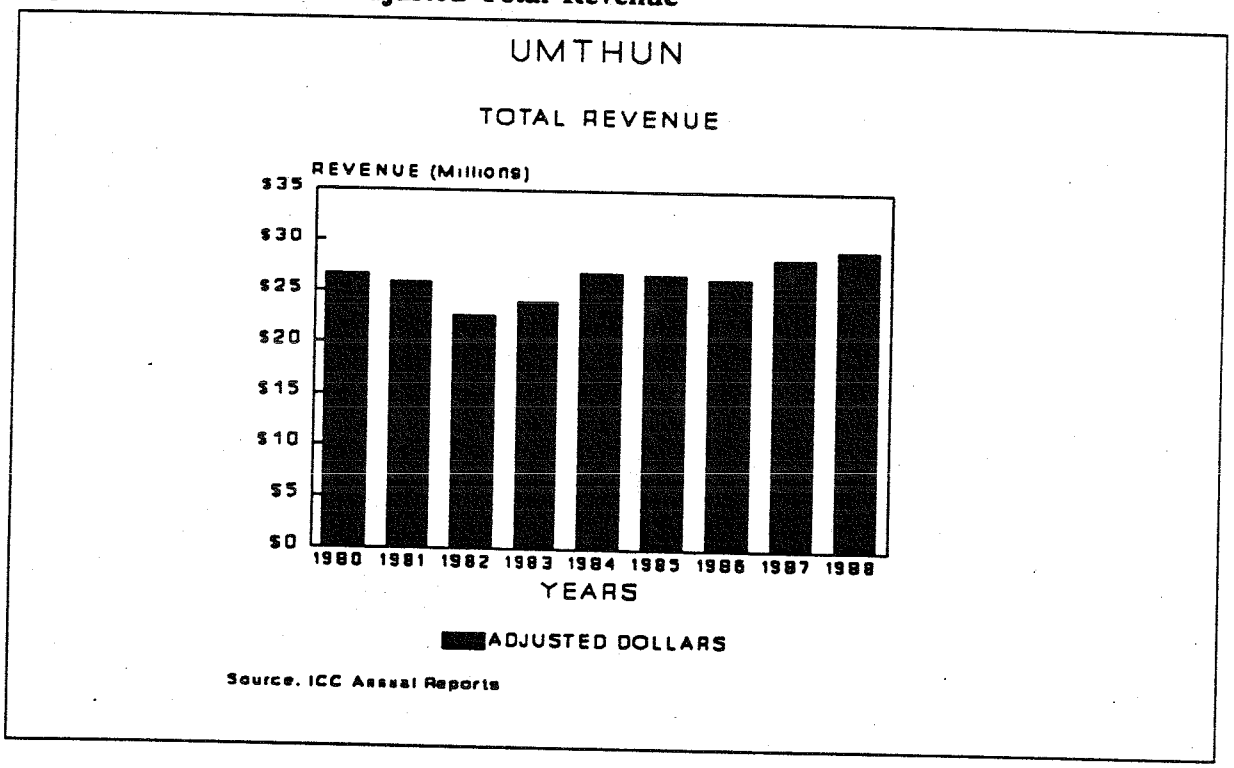


Figure 5-18 Umthun: Adjusted Total Assets

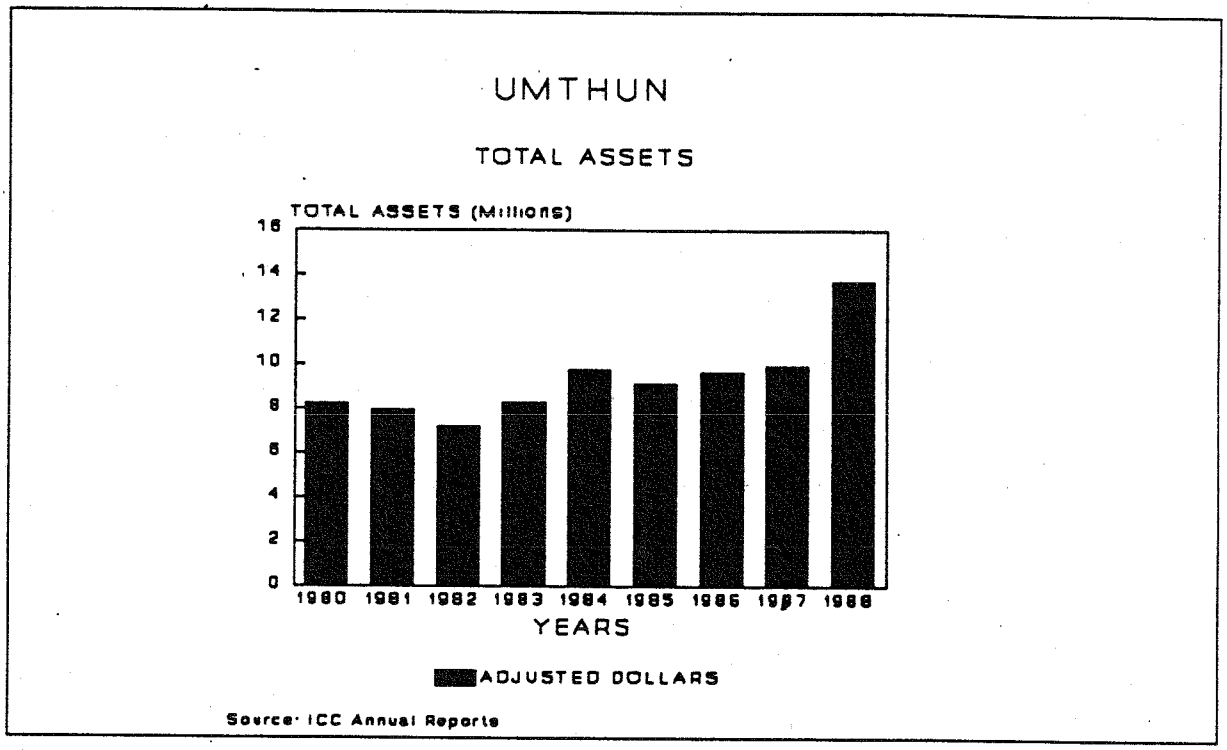
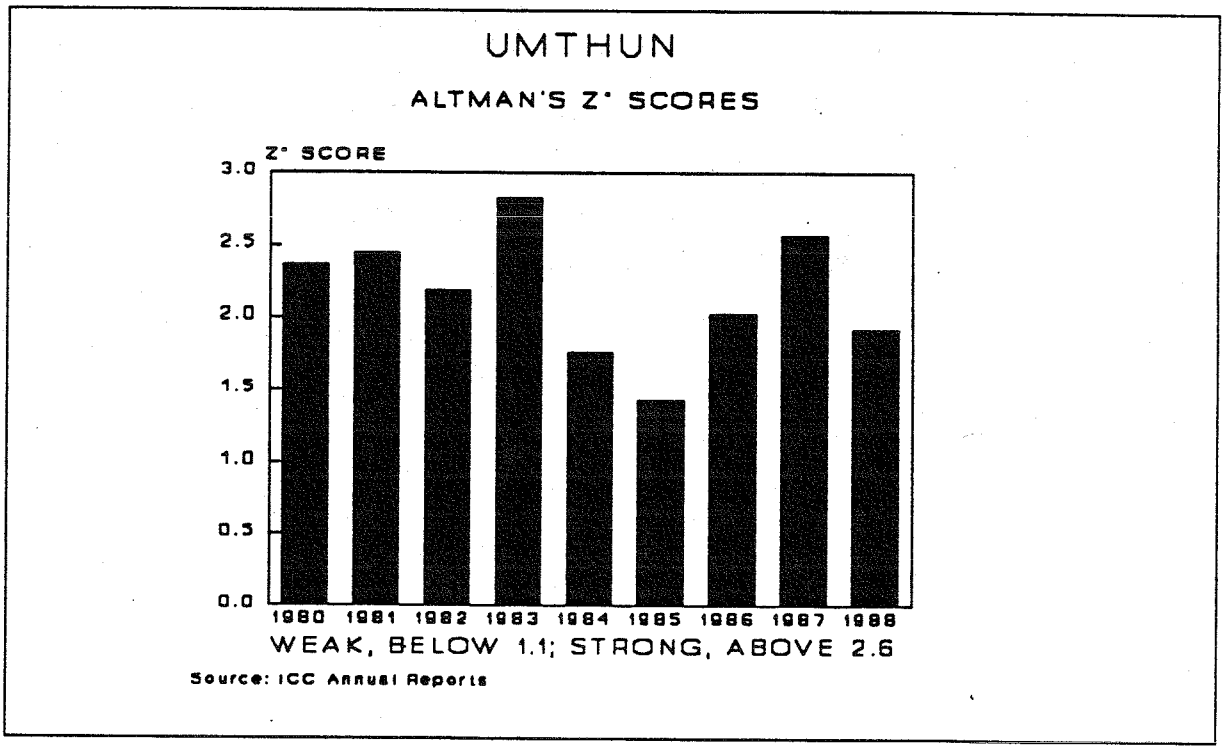


Figure 5-19 Umthun: Altman's Z" Scores



Current situation

Drivers Umthun's main problem is a shortage of drivers. Its selection criteria are stringent because they are self-insured for the first million dollars in damage for each accident. Applicants are rejected for past traffic violations, indications of drug usage, back problems, and for failing Umthun's own training course. Drivers must be at least 25 years old, further reducing the available pool of applicants. Drivers contract with an in-house union which is not affiliated with the Teamsters Union.

Risk management A second area of concern, closely allied with the above, is risk management. Because of its self-insurance liabilities, Umthun stresses the importance of its hiring criteria, training, and safety measures. Its public liability and property damage insurance premiums have fallen from $1.4 million to $800,000 per year.

Regulations The company would prefer one license plate per vehicle rather than complying with the different requirements of each state individually. This would save administrative time and expense and simplify licensing. This particular wish appeared to be for a change in procedures rather than for reduced license fees paid.

Equipment Umthun's 388 employees operated a fleet that included 391 tractors and 667 trailers at the end of 1988. The company keeps approximately two trailers per tractor so its customers may load and unload without tying up tractors. About two-thirds of the tractors are company owned or leased, and the remaining are supplied by owner-operators. Out of consideration for its drivers, equipment is replaced far more frequently than in the past. For example, the average age of tractors is now between three and five years, compared to the former replacement age of eight years. In addition to increased driver comfort (and retention), Umthun's maintenance costs have fallen from 21 cents per mile to 7 cents. Much of the maintenance is done under new equipment warranties of 500,000 miles.

Outlook for the future

Equipment Umthun tends to keep up-to-date with equipment innovations. The company currently uses the PACER electronic controls system from Cummins Engine. The 1990s will probably see on-board computer communications and some form of satellite locator equipment. Umthun already has electronic data interchange (EDI) with a steel manufacturer for billing purposes and will be able to work with additional customers who use this

technology. Some customers have adopted Just-In-Time scheduling for their manufacturing operations; further direct communications with shippers will be required. For example, one shipper schedules its output only one day in advance. Umthun, as its carrier, must meet these changing needs.

Markets Umthun sees itself as a "niche" carrier for building supplies. While a larger carrier might have economies of scale that might lead to lower rates, Umthun's earned reputation for service enables the company to compete effectively. Its market representation is through the company's own sales force and through contracted agents in Cleveland, St. Louis, Joplin, Kansas City, Westville, Indiana, and in the Black Hills of South Dakota. Umthun has had experiences with the use of brokers and did not encourage their use.

Size At over $35 million of revenue per year, Umthun considers itself still to be about one-half the size of a "major" carrier. Several smaller carriers in the region have been bought or merged and similar opportunities might become open to Umthun.

TL Carrier (anonymous)

Background

This TL carrier, roughly three times the size of Umthun, is headquartered in the region and provides service without "geographic ties" throughout the country.

Financial Situation

Markets The company focuses on the giant multi-national corporations and serves them anywhere, mainly under contract. Once business is established with one large shipper, the firm then concentrates on getting another customer for backhaul. Within the state, this carrier hauls manufactured and processed grain products outbound.

This carrier currently has no intermodal traffic. It was explained that the railroads had raised the price of this service, reducing its advantage.

Financial condition Reports for the years 1980 to 1983 were analyzed. Due to the ICC's relaxed reporting requirements, data are lacking after 1984. (To maintain anonymity, graphs are not shown for this carrier.) As a privately held corporation, this firm did not publish stockholders reports.

Liquidity was the highest of those carriers observed: working capital to total assets ranged between 30 and 50 percent, a function of both cash flow and fewer fixed assets (compared with LTL carriers). Debt to total assets fell from 70 percent in 1980 to under 50 percent in 1983, reflecting a reduction in long-term liabilities. Current debt remained near 30 percent of assets during the period.

Productivity ratios The operating ratio was typical of the carriers interviewed, indicating reasonable cost control. The firm's productivity ratios of revenue per driver, per employee and per trailer were significantly higher than those of other carriers and showed improvement over the short data period. This may be the result of more extensive scheduling of both employees and equipment.

Profitability Net income to revenue fluctuated, not unlike other carriers. Between 40 and 60 percent of the firm's total assets were financed by retained earnings, slightly above average. The third profitability ratio, EBIT to total assets, was also higher than average, another indication of asset utilization.

Growth Except for a decrease in real revenues in 1983, this carrier displayed increased revenues between 1980 and 1984, with the largest increase coming in the latter year. Total assets remained steady until 1984, when they increased markedly.

Altman's Z"-scores Data for calculating the ratios necessary for the Z"-equation were available only for four years. The scores ranged from 6 to 7.5, well above Altman's cut-off score of 2.6 for a strong financial condition.

Current situation

Drivers With over 1500 drivers, the firm was experiencing difficulty finding and retaining sufficient numbers of drivers. Applicants must be 25 years old or older and are screened for back injuries and drugs; an estimated 15 percent are eliminated by the latter. Potential drivers receive training at community or technical colleges in Iowa, Oklahoma, and Ohio before a 90-day assignment with an experienced driver.

Because of a combination of turnover and growth, less than one-third of the drivers have been with this firm for more than a year. One-half of the drivers that leave do so in their first 90 days. Drivers being away from home for extended periods is perceived to be

the biggest problem. Although driver benefits have come down in the last half-dozen years, the firm is still considered to have a good retirement package.

Most drivers were assigned to three primary terminals which provide maintenance and additional driver services. Since the company hauls TL traffic, the terminals do not handle freight. The location of these terminals are along traffic lanes, with the sites being influenced by the states' workman's compensation laws. For example, Indiana and Oklahoma were selected over Illinois, Iowa, and Ohio when facilities were relocated. Oklahoma was identified specifically as encouraging the trucking industry; Iowa's approach to workers compensation was cited negatively.

Risk management Insurance coverage has been varied for this firm; five insurance companies have been tried during the decade. The line now has a $1 million self-insured limit, up from only $10,000 deductible in 1981. The next $7 million is insured; they have a $25 million "top end." This significant self-insured level has successfully encouraged the firm to take a stronger stand on risk management which led to its reduced accident rate.

Equipment The firm owns essentially all of its equipment and its drivers are employees, although owner-operators are utilized in smaller divisions of the firm. Of approximately 800 tractors, two-thirds are two-person types for longer hauls. A team operates 1,000 miles a day, about 180,000 miles a year; single drivers averaged 110,000 miles annually.

Similar to Umthun, a two-to-one trailer-to-tractor ratio was maintained to allow spotting trailers for loading and unloading. The number of trailers has increased from a previous level of 1.5-to-1. Tractors are on a three-year trade cycle and are purchased with air-ride suspension and an upgraded interior for the benefit of their drivers. The Cummins "300" engine is currently being specified for new equipment; they also have some Caterpillar engines.

Rates Pricing is still important, but most sophisticated shippers work within a range of rates. A minimum quality of service is required, generally by contract. Contracts have fuel escalator clauses.

The demise of rate bureaus and published rates encouraged price competition. The interviewee cited an Alex Brown Corporation study which showed that average rates were still down for TL traffic (compared to earlier in the eighties) although LTL rates are slightly up.

Brokers The carrier works with four or five brokers on a selective basis. Brokers were likely to be used for imported shipments as well as for domestic traffic to balance front and backhauls.

Outlook for the future

Equipment This carrier turns over its equipment frequently and will probably adopt technological advances as they are proven beneficial. They had experimented with tracking and locating systems three years ago, but do not currently use them. Electronic Data Interchange is used for billing some customers, and sometimes for pickup and delivery information.

Markets While the carrier has some customers interested in "Just-In-Time" delivery, it has not seen much freight of this nature yet. One problem with JIT is that the companies implementing it are large and tend to be very demanding. An automobile manufacturer was cited as an example.

Size While the firm has experienced considerable growth during the decade, increases were expected to be "limited" this year, and dependent upon changes in day-to-day traffic.

Regulations The Commercial Driver's License was identified as a potential problem area because of the tough written test. Many individuals with good driving skills may be lacking in reading skills.

LTL Carrier: North Iowa Express

Background

Now 25 years old, North Iowa Express began with two pieces of equipment and had been part of Des Moines Transport, an intrastate carrier. In the years before 1980, North Iowa Express grew through five acquisitions while it increased its service area to include Iowa, Minnesota, and Nebraska. North Iowa Express is now an LTL regular route carrier and has total intrastate authority in Iowa. Its territory runs west from Charles City and Waverly, and its annual revenue is $1.4 million.

Markets Since beginning operations, North Iowa Express has seen shifts in the population pattern of its service area. Fewer people on farms led to small-town merchants "drying up." Although it paid to serve small towns in the past, more carriers were competing

for decreasing amounts of freight after 1980. For example, Mason City formerly had four carriers; it now has 28. The result was smaller loads and empty trailers. North Iowa Express's proportion of empty miles was less than 1/2 percent before 1981 but is now 10 percent. The interviewee commented, "that wastes a lot of fuel," since it costs about as much to deliver small shipments as large shipments. Corresponding with the smaller shipments was an increase in the number of customers from 300 or 400 to 11,000. The nature of shipments has also changed, going from 95 percent intrastate to 15 percent, indicating additional interline activity.

Another change has been in the customers' expectations. Extending the Just-In-Time (JIT) concept, carriers have increased their service levels (in terms of time). For example, a trailer of LTL freight now may make 20 stops in a 500-mile round-trip from Des Moines to Keokuk, taking 14 hours. In the past, a trailer would not be dispatched until the load limit was reached before departure.

The interviewee estimated that JIT users expected 70 percent of their LTL shipments delivered overnight; the figure was 95 percent for TL shipments. North Iowa Express has a truckload division named DonCo, a separate company, that hauls for several major customers who require both a high level of service and a low price. As an example of JIT service, one load was to be picked up in Des Moines at midnight on a Friday and delivered in Seattle at 5 AM Monday.

Financial condition North Iowa Express's liquidity, measured by the working capital to total assets ratio and plotted in Figure 5-20, was stronger during the first half of the decade than most of the other regional carriers surveyed. In two out of five years its ratio was 10 percent or better. Not unlike other family-owned carriers, North Iowa Express's working capital to total assets ratio fell into the negative range in 1986 and 1987, suggesting cash flow was very tight. This situation is supported by a current debt to total assets ratios plotted in Figure 5-21 that rose from 15 percent to over 70 percent six years later. Long-term debt remained low throughout this period, peaking at 15 percent of assets in 1985.

Activity and profitability ratios In Figure 5-22 it can be seen that North Iowa Express's operating ratio rose from 88 percent in 1980 to over 1.0 for the rest of the reporting periods, indicating that operating expenses were not being fully paid by operating revenues. In other words, North Iowa Express is eating into its capital base rather than building retained earnings. This conclusion is supported by its ratios of earnings (before interest and taxes) and

Figure 5-20 North Iowa Express: Working Capital to Total Assets

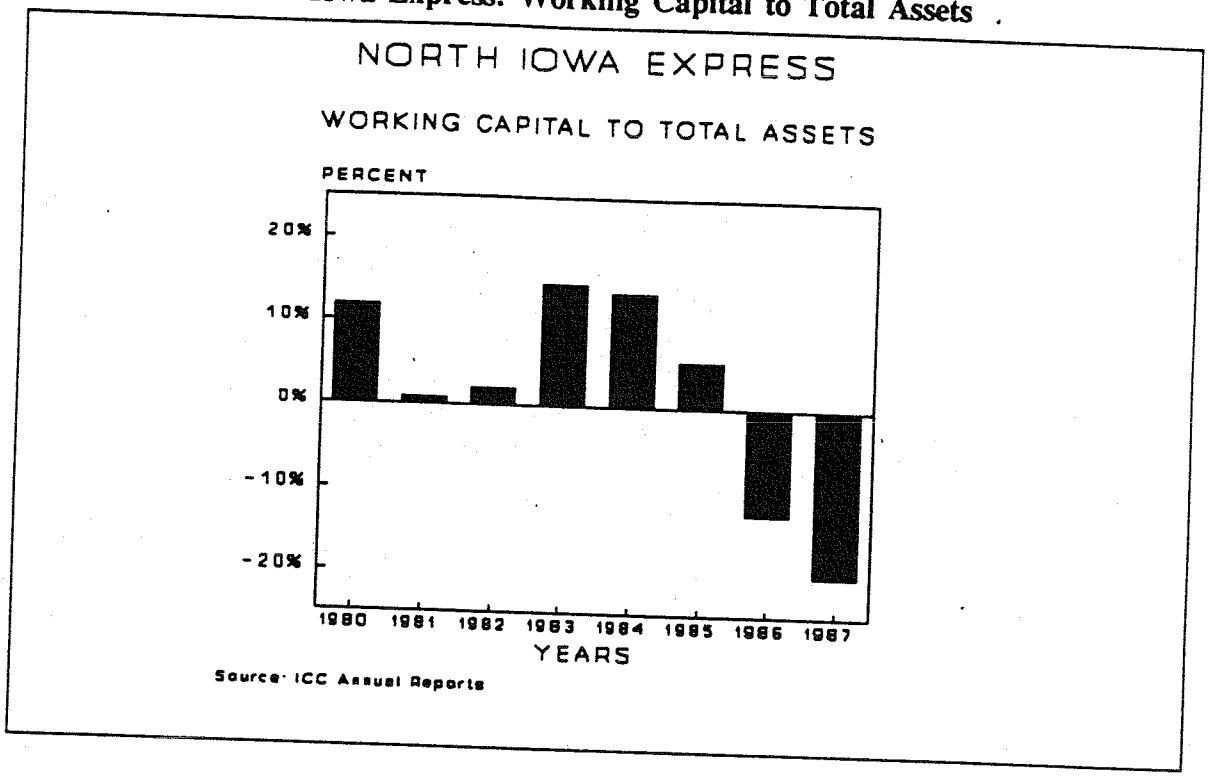


Figure 5-21 North Iowa Express: Total Debt to Total Assets

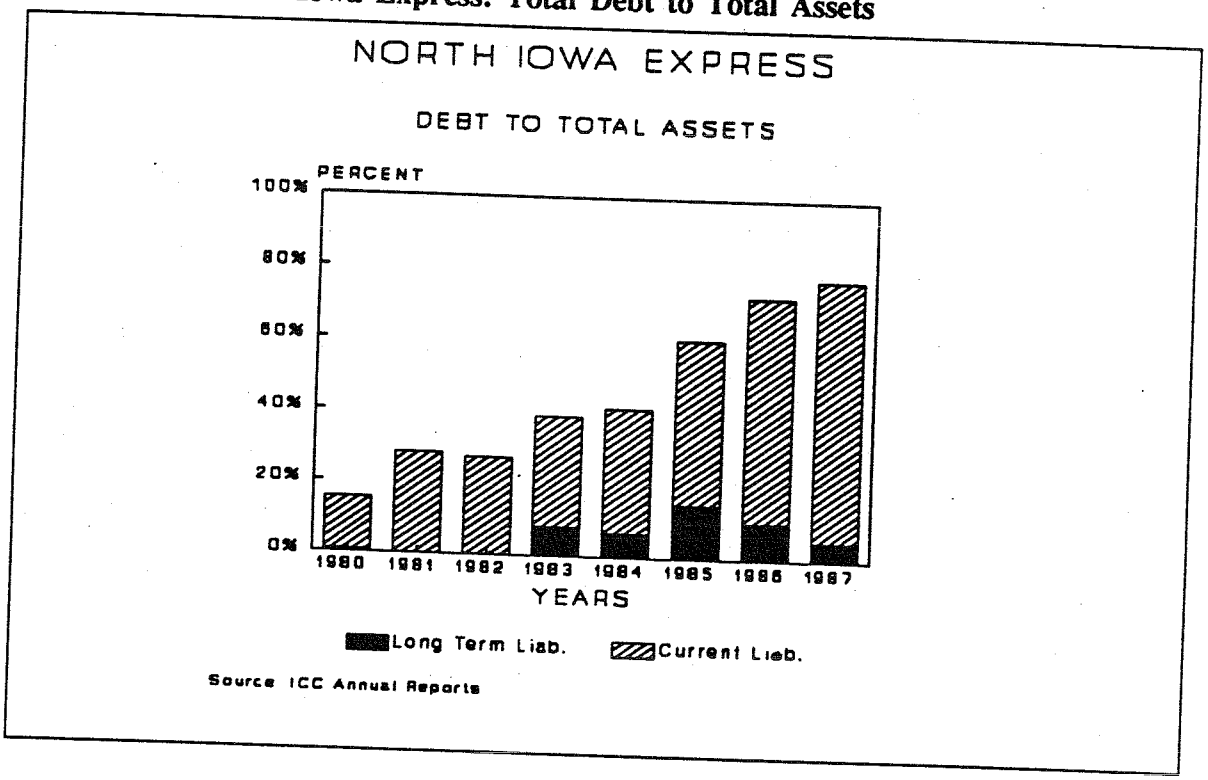
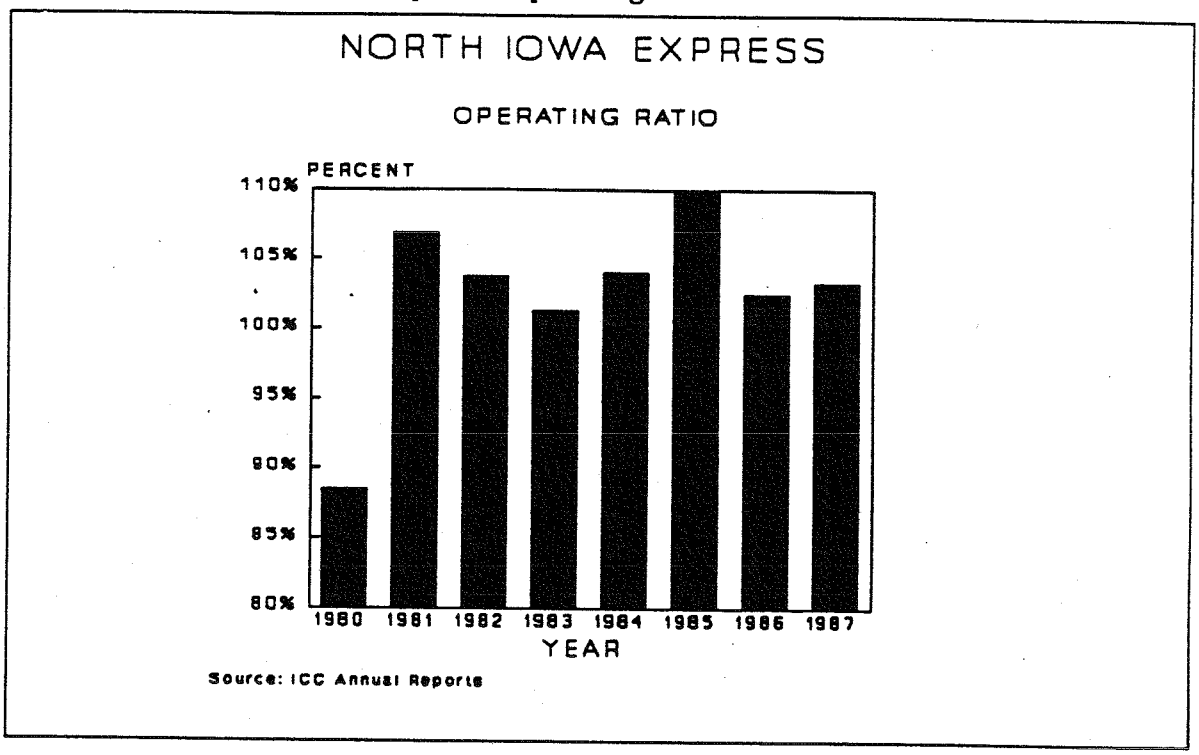


Figure 5-22 North Iowa Express: Operating Ratio



earnings. This conclusion is supported by its ratios of earnings (before interest and taxes) and retained earnings to total assets shown in Figures 5-23 and 5-24. Return on investment (EBIT/TA) has been negative since 1981 and retained earnings, as a portion of total capitalization, have fallen steadily. Similarly, net income (after interest and taxes) to revenue, in Figure 5-25, has been negative.

Productivity ratios North Iowa Express's productivity ratios, plotted in Figures 5-26, 5-27, 5-28, and 5-29, showed reasonable amounts of revenue per driver, employee, tractor, and trailer. North Iowa Express's results are similar to corresponding ratios of other carriers in the region. Its financial position is more a result of severe competition and a weak financial structure than from how the carrier is being operated.

Growth Revenues, in 1982 adjusted dollars, shown in Figure 5-30, exhibited an unsteady pattern and ended the reporting period lower than they began. Figure 5-31 shows that total assets also declined, but fairly steadily, throughout the 1980 to 1987 period. Asset declines may be traced to reduced values of equipment, either through depreciation or slower replacement. Some of these changes in revenues and assets coincided with the owner's

building up of DonCo, the TL carrier. While North Iowa Express has reduced its size, the owner's presence in the transportation market may have remained more constant.

Altman's Z"-scores During the first five years of the decade, North Iowa Express's financial viability, as measured by its Z"-scores, was strong. The scores, plotted in Figure 5-32, exceeded the 2.6 level by significant margins. From 1985 until 1987, however (the year of the most recently available data), scores were well below the 1.1 cut-off signifying a weak financial condition. This conclusion is supported by the individual financial measures.

Figure 5-23 North Iowa Express: Earnings Before Interest and Taxes

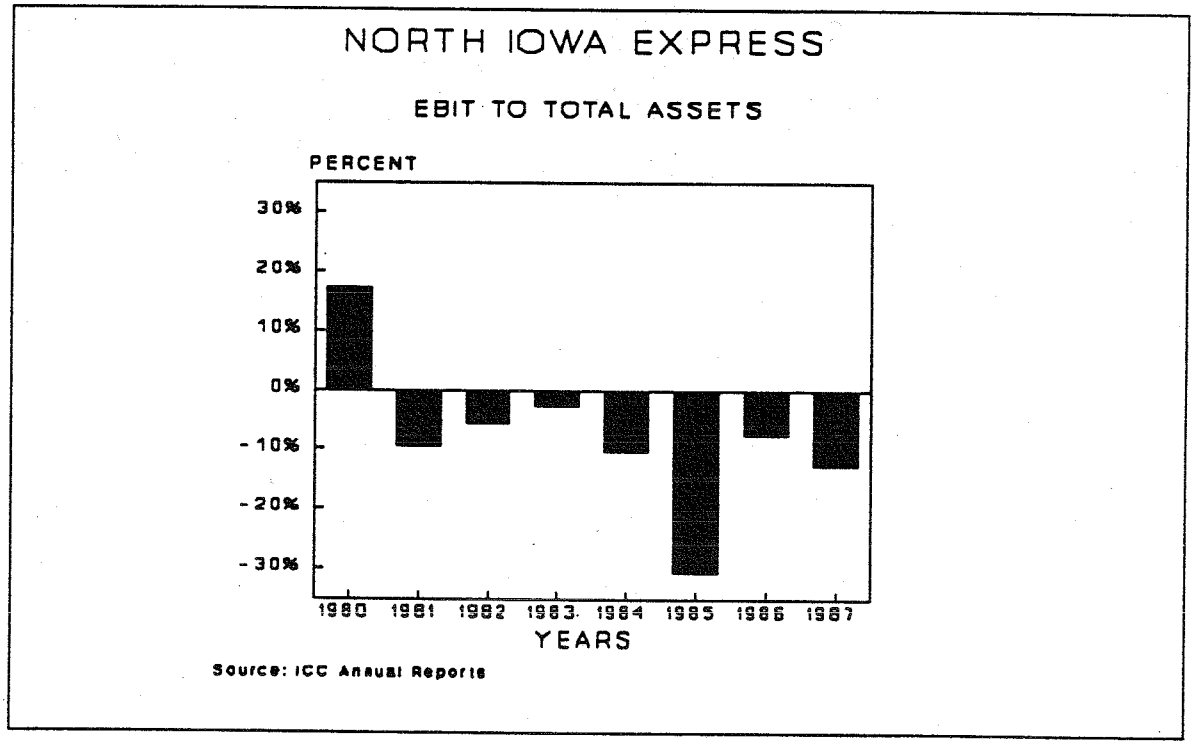


Figure 5-24 North Iowa Express: Retained Earnings to Total Assets

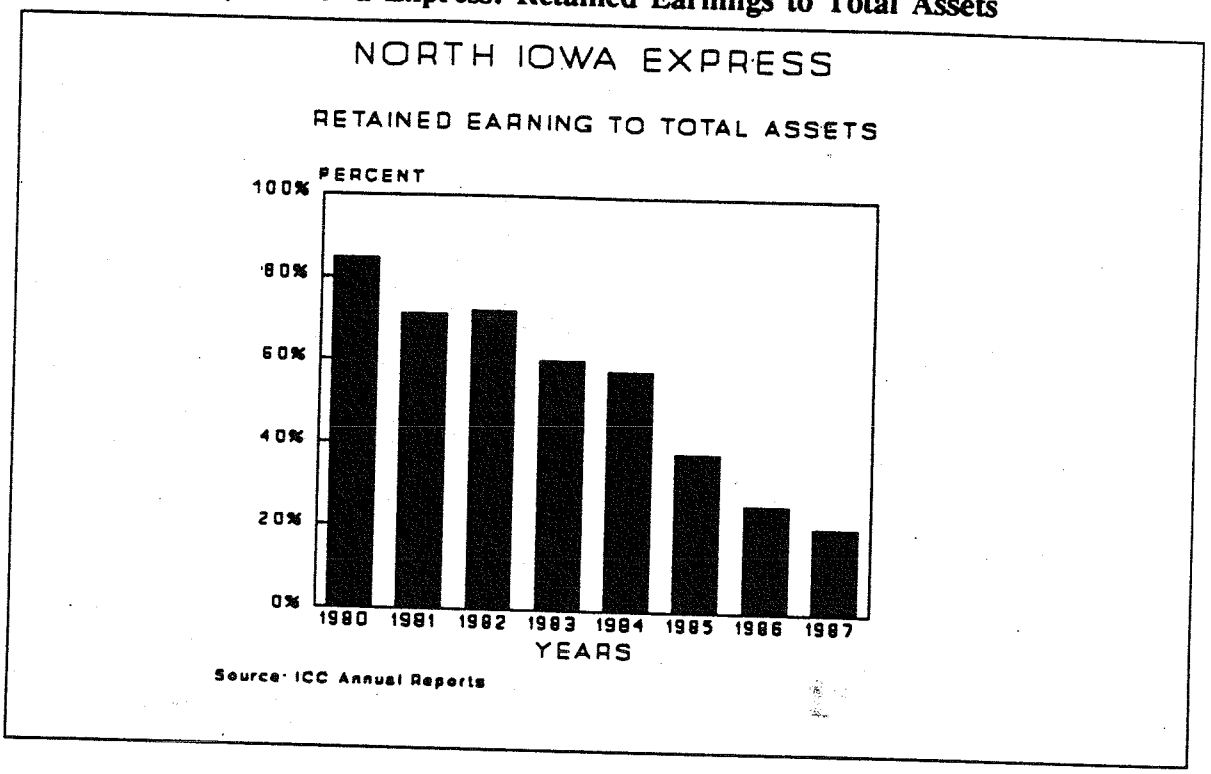


Figure 5-25 North Iowa Express: Net Income to Revenue

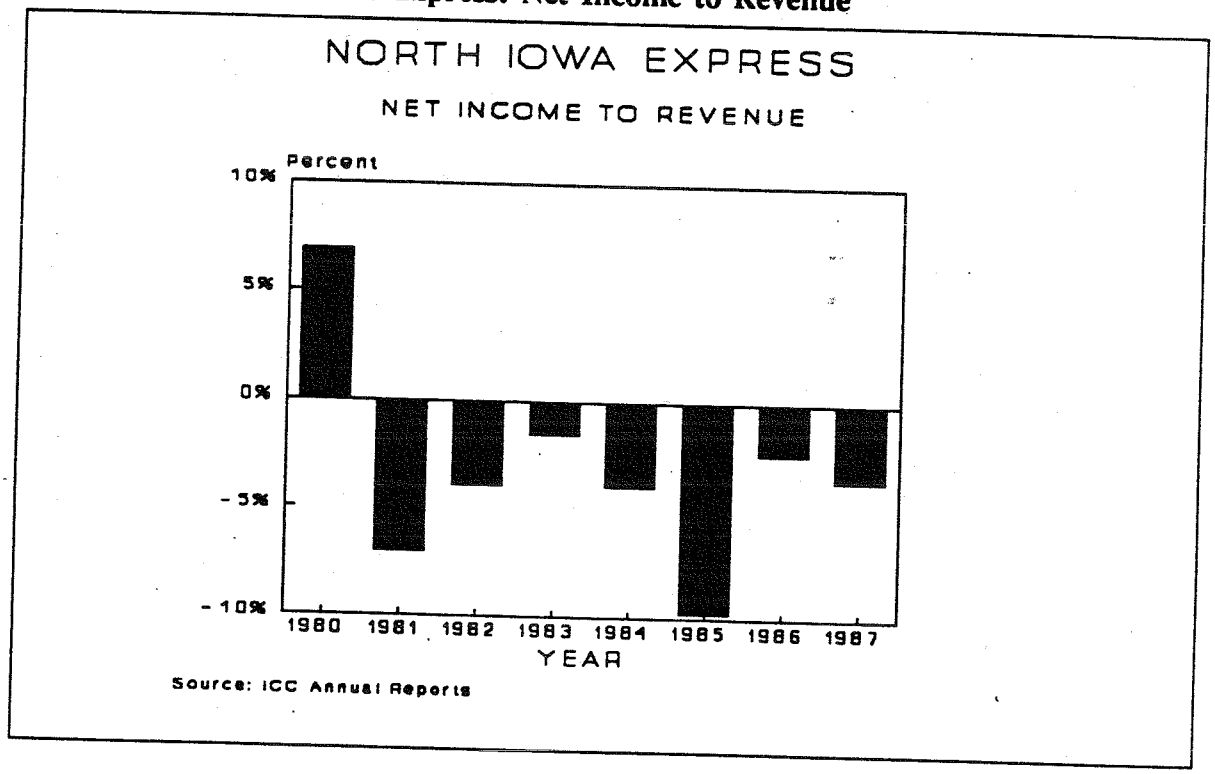


Figure 5-26 North Iowa Express: Productivity; Real Revenue Per Driver

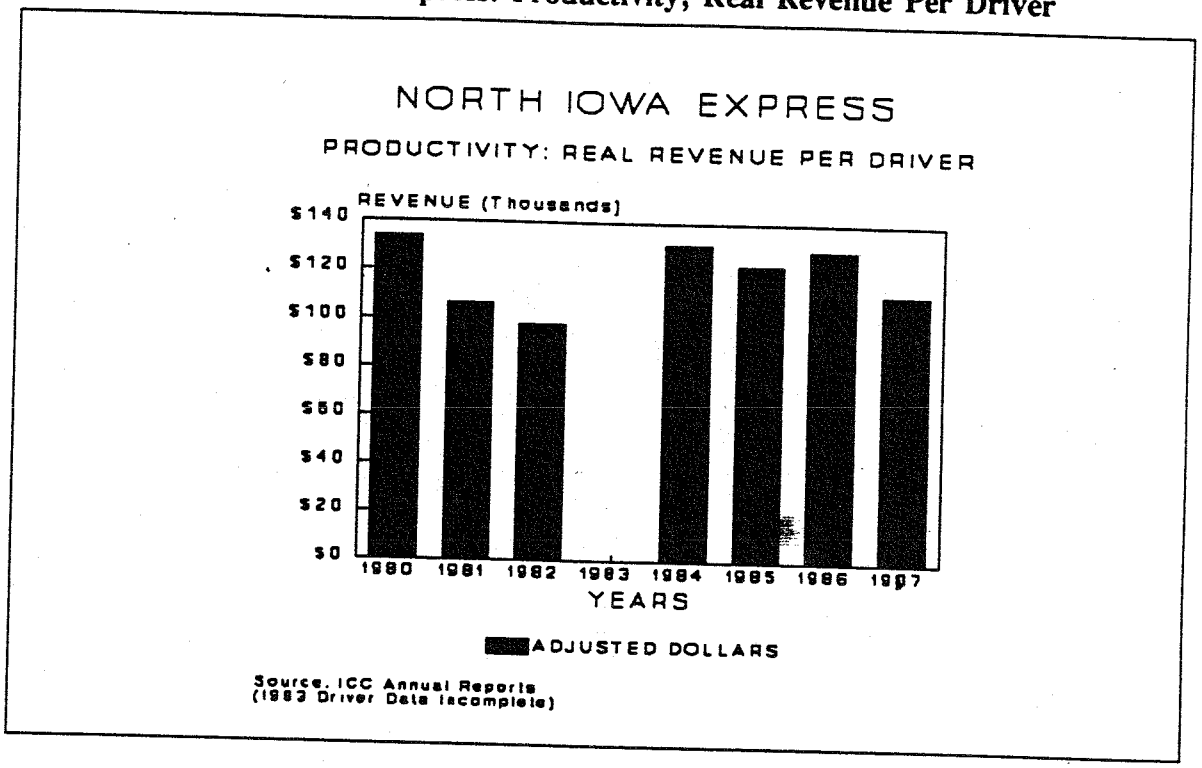


Figure 5-27 North Iowa Express: Productivity; Real Revenue Per Employee

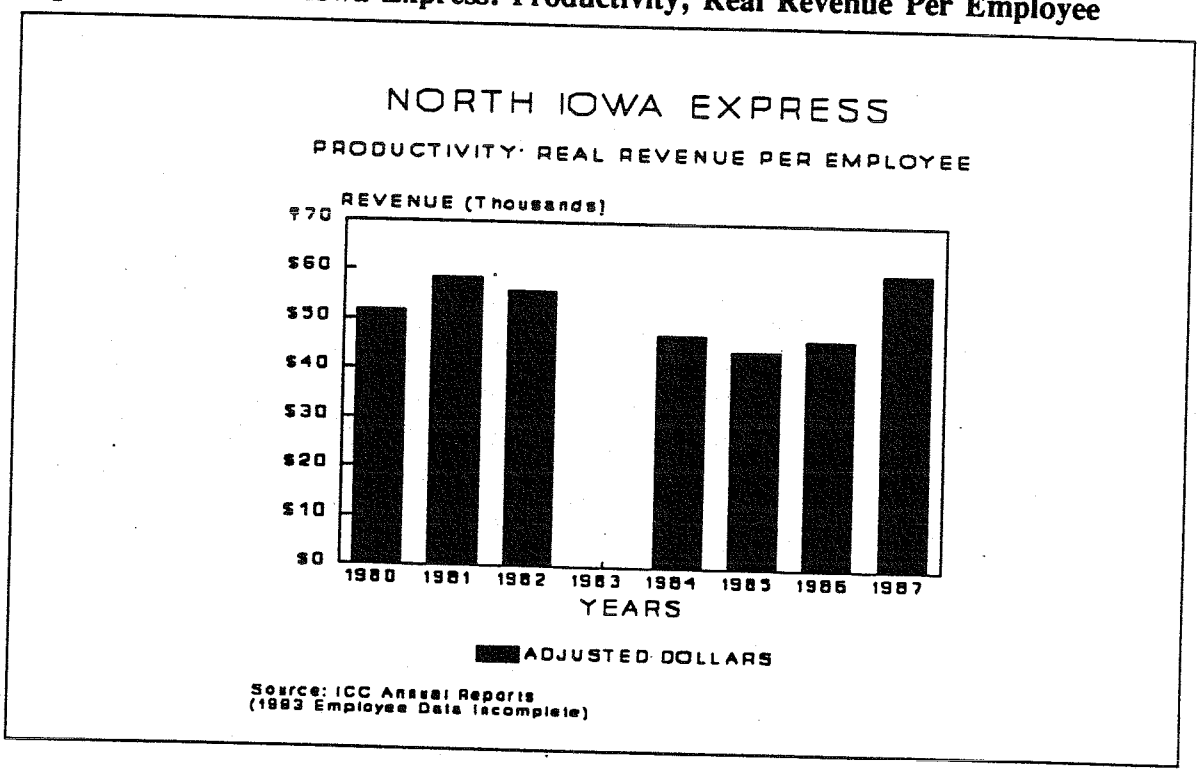


Figure 5-28 North Iowa Express: Productivity; Real Revenue Per Tractor

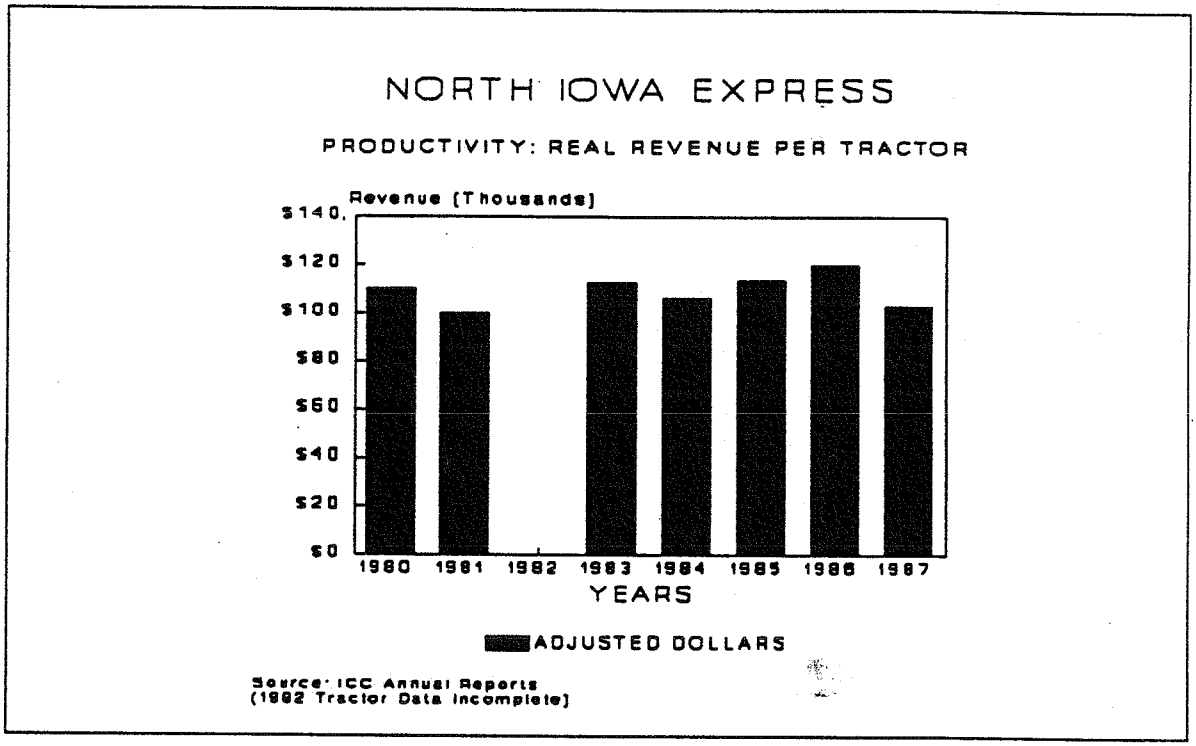


Figure 5-29 North Iowa Express: Productivity; Real Revenue Per Trailer

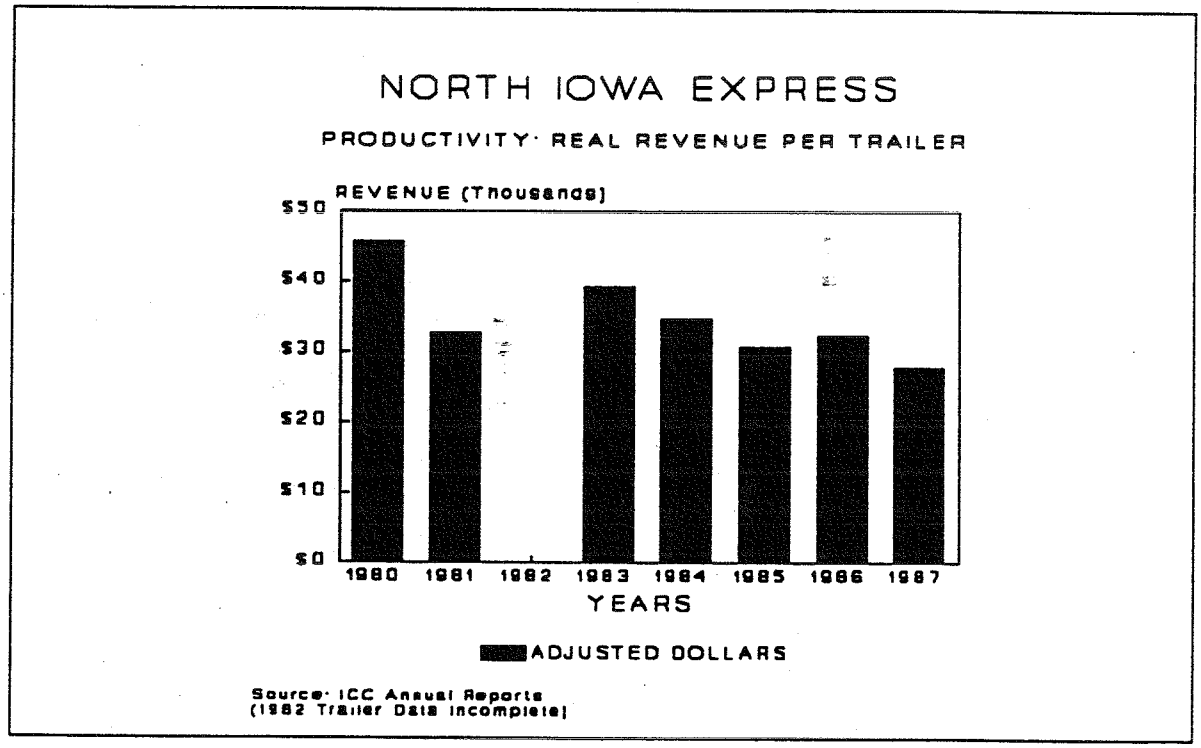


Figure 5-30 North Iowa Express: Adjusted Total Revenue

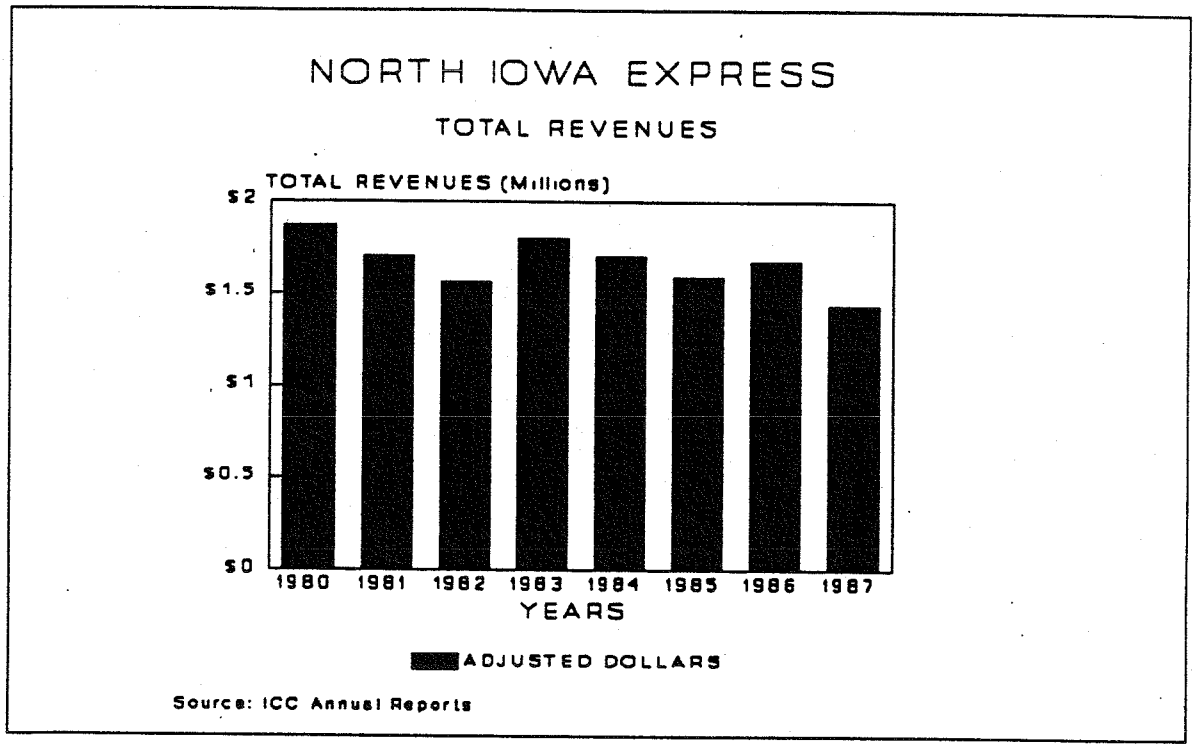


Figure 5-31 North Iowa Express Adjusted Total Assets

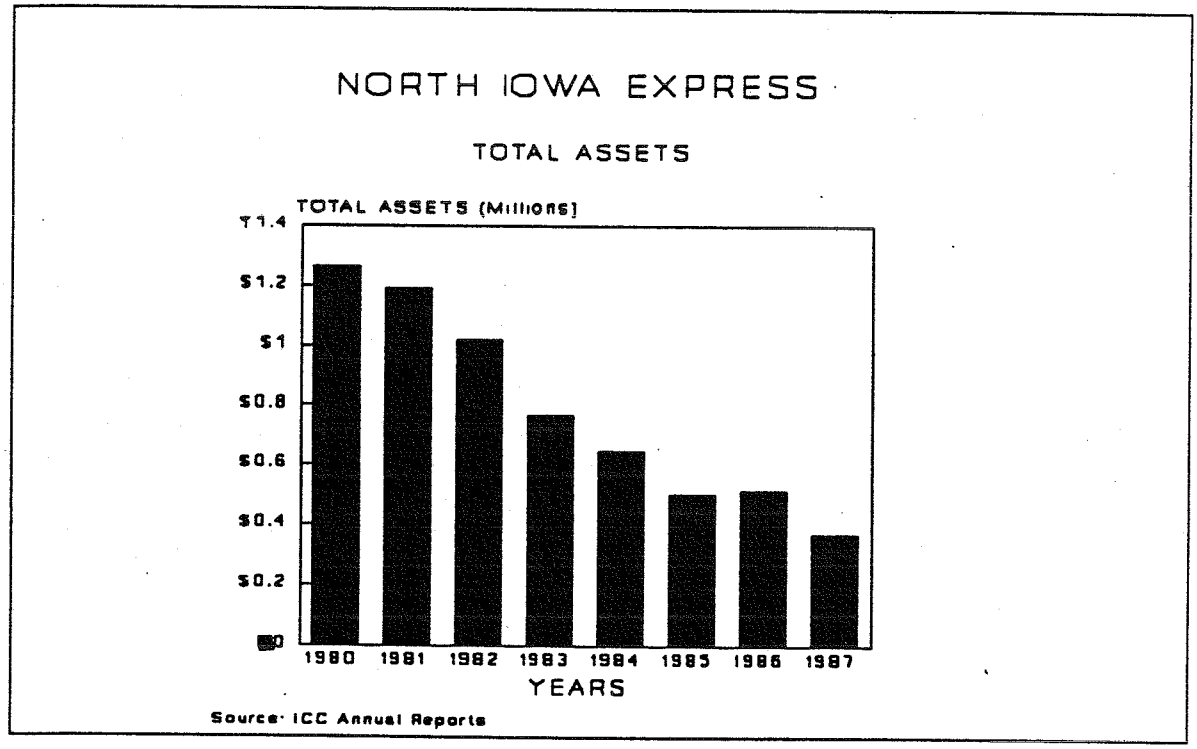
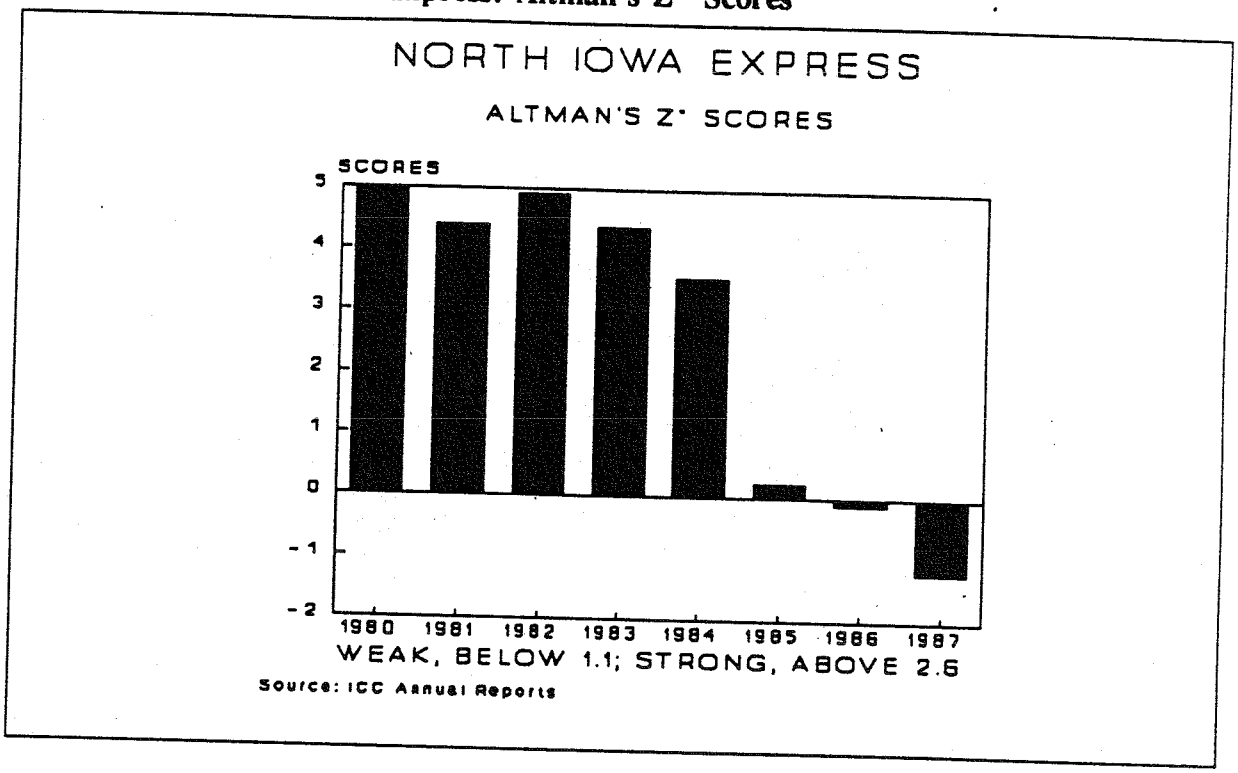


Figure 5-32 North Iowa Express: Altman's Z" Scores



Current Situation

Drivers North Iowa Express has 35 employees. Finding and retaining qualified drivers was viewed as a "critical situation." Driver hiring standards include two years of experience, passing a drug test, passing the Federal DOT (Commercial Driver's License) test, and a physical exam. North Iowa Express Teamsters Union represented drivers make up to $55,000 per year, have up to 22 years of experience, and are home nightly. This was contrasted with the non-union, over-the-road TL drivers.

Risk management The company has seen its insurance costs increase by about 300 percent in the eighties. It carries no collision insurance and has $5 million in liability coverage. The deductible amount has increased to $2,500 per accident.

North Iowa Express management suggested that there are now more serious accidents for two reasons. First, there are more trucks that are bigger, heavier, and capable of speeds up to 80 miles per hour. Second, drivers are pushed beyond human endurance. North Iowa

Express's insurance carrier now monitors newly hired drivers. North Iowa Express has had one fatality in 31 years.

Equipment North Iowa Express has 20 tractors and 50 trailers. The trailers are both 48-foot and 53-foot units and are primarily for van operations, although some are refrigerated. Trailers are expected to last for 1.5 million to 2 million miles (4 million miles in the TL division), about eight times the distance 10 years earlier. They pay $75,000 for a tractor and expect to replace it in three to four years. Tractors are assigned to individual drivers and North Iowa Express buys better seats and air conditioners to improve their drivers' comfort and efficiency. Vehicle mileage costs for North Iowa Express are from $1.01 to $1.04. It spends eight to nine cents per mile on maintenance and performs 95 percent of its own maintenance.

Rates North Iowa Express has its own tariffs and discounts which are totally computerized. It does some EDI on billing and tracing with one large shipper.

Brokers North Iowa Express has had mixed experience with brokers ("some are good, some bad") It lost $180,000 to brokers last year. When a broker does not pay its freight bills, the carrier ends up deadheading more non-revenue miles rather than fewer. Regulation of brokers was suggested.

Regulations Every state has its own rules. They may be similar but are still different. North Iowa Express is now licensed in 31 states, and must keep track of the miles driven in each. The fuel permit system was called a "nightmare." A uniform system of fuel taxes and equipment inspection would be welcome.

There was criticism of the Iowa Department of Transportation. Cutbacks have left one person in intrastate carrier matters, and "enforcement is nil." North Iowa Express reported trouble getting trailers licensed and has had license plates stolen.

Outlook for the future

Equipment and size In a direct response to the financial situation described above, North Iowa Express's management is taking a wait and see attitude toward the future. Operations are expected to expand somewhat to 50 tractors. They will add trailers to achieve a three-to-one trailers-to-tractor ratio; formerly it was two-to-one. Instead of scheduling equipment replacement during the next five years, it will replace equipment when necessary.

Regulations Management considered the new federal drivers license a good deal and supported federal truck standards on weights and length limits. North Iowa Express management noted that the federal license will change testing of drivers but questions whether it would be by the book or by actual driving tests.

LTL Carrier: Van Wyk Freight Lines, Inc.

Background

Van Wyk Freight Lines, Inc. (Van Wyk) was started like many other trucklines: one man and one truck. In this case, Van Wyk did corn shelling and drove an 18-foot straight truck for Pals Transfer, serving five towns under leased authority. He bought a second truck in 1964 and hired Roger Jenson as its driver. Jenson is still with Van Wyk as general manager.

The firm grew through leasing authorities to serve additional points. It filed for its own authority in 1969 with protests from other carriers. After its customers supported its request, Van Wyk received its authority in 1970, was incorporated, and moved from Sully to Grinnell. As a LTL common carrier, Van Wyk now has authority for Iowa and 47 states.

Van Wyk's Grinnell terminal is its only terminal. Opened in 1989, it contains 39 doors and dock facilities and custom-designed offices. From there it hauls west as far as Ft. Dodge and transfers shipments destined further west to Clark Brothers transfer of Des Moines. The firm employs 108, with Vernon Van Wyk serving as president and treasurer. His wife is vice president and secretary.

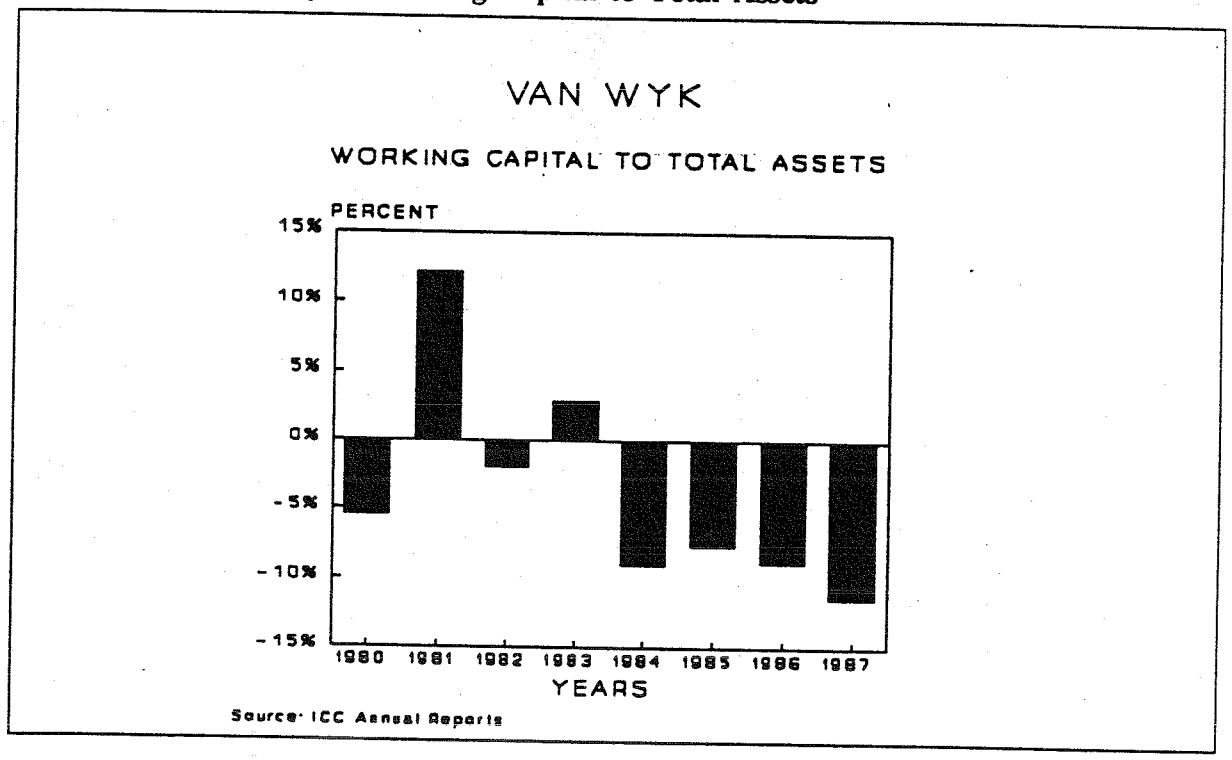
Financial Situation

Markets At first, the company did not have a sales force, operating under the philosophy of: "Service was all we had to sell." Van Wyk now has 1,500 customers. Their freight increased in 1988 after the demise of American Freight.

Van Wyk has recently begun selling service to shippers in California, Arizona, Utah, and Nevada. Through an arrangement with a TL carrier in Knoxville, Iowa, traffic from Grinnell can arrive in Los Angeles 40 hours later. The TL carrier's haul of 1,535 miles costs $1.00 per mile. In Los Angeles, Corona Trucking distributes locally. Corona's operation is similar to Van Wyk's.

Financial condition In Figure 5-33 it appears that Van Wyk keeps few current assets relative to its current liabilities, just as the other family-owned carriers interviewed. Its debt to assets ratio, shown in Figure 5-34, averaged around 60 percent from 1980 to 1987, and was roughly split between current and long-term liabilities. Its ratios were very much like the industry averages. (Debt may have increased recently because of the new terminal building.)

Figure 5-33 Van Wyk: Working Capital to Total Assets



Activity ratios Van Wyk's operating ratio is plotted in Figure 5-35 and was consistently among the lowest of the group surveyed. The firm has shown good balance of cost control and revenue generation.

Earnings Supporting the operating ratio, Van Wyk's earnings record has been positive (and better than industry averages) in terms of net income to total revenues (in Figure 5-36) net margin, earnings before interest and taxes to total assets (in Figure 5-37), retained earnings (in Figure 5-38), and net income to total revenues (in Figure 5-39).

Figure 5-34 Van Wyk: Debt to Total Assets

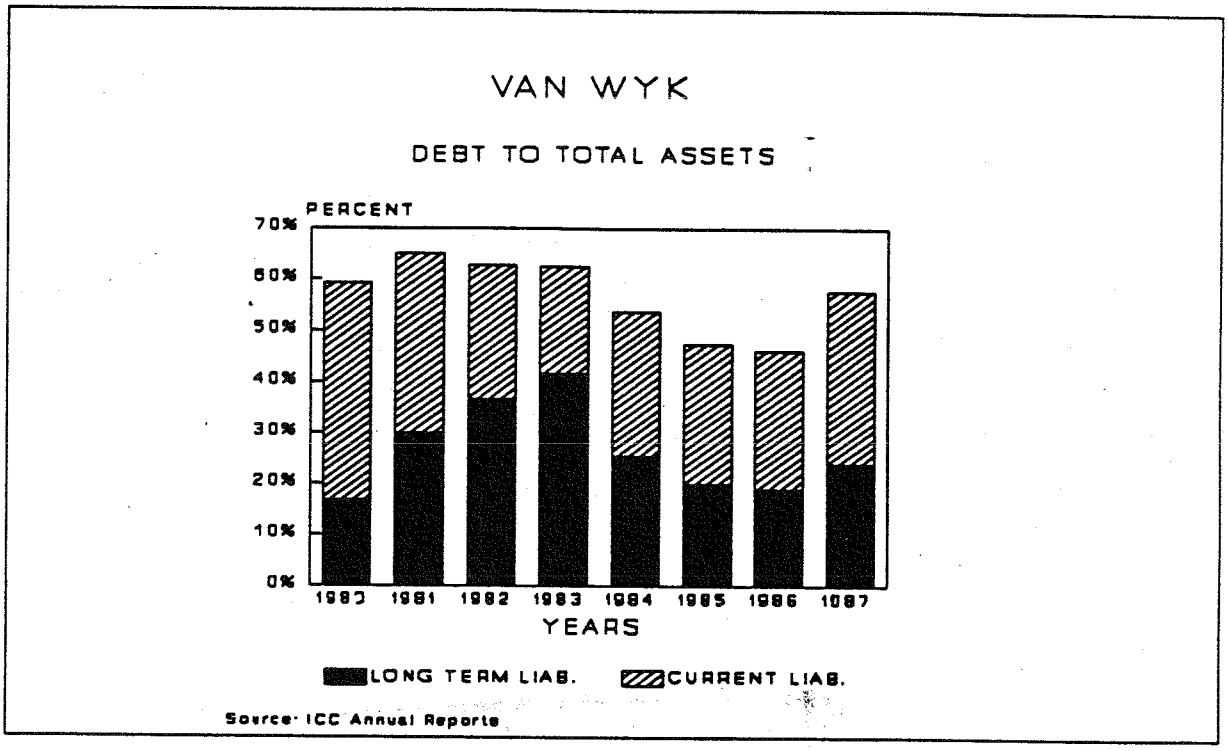


Figure 5-35 Van Wyk: Operating Ratio

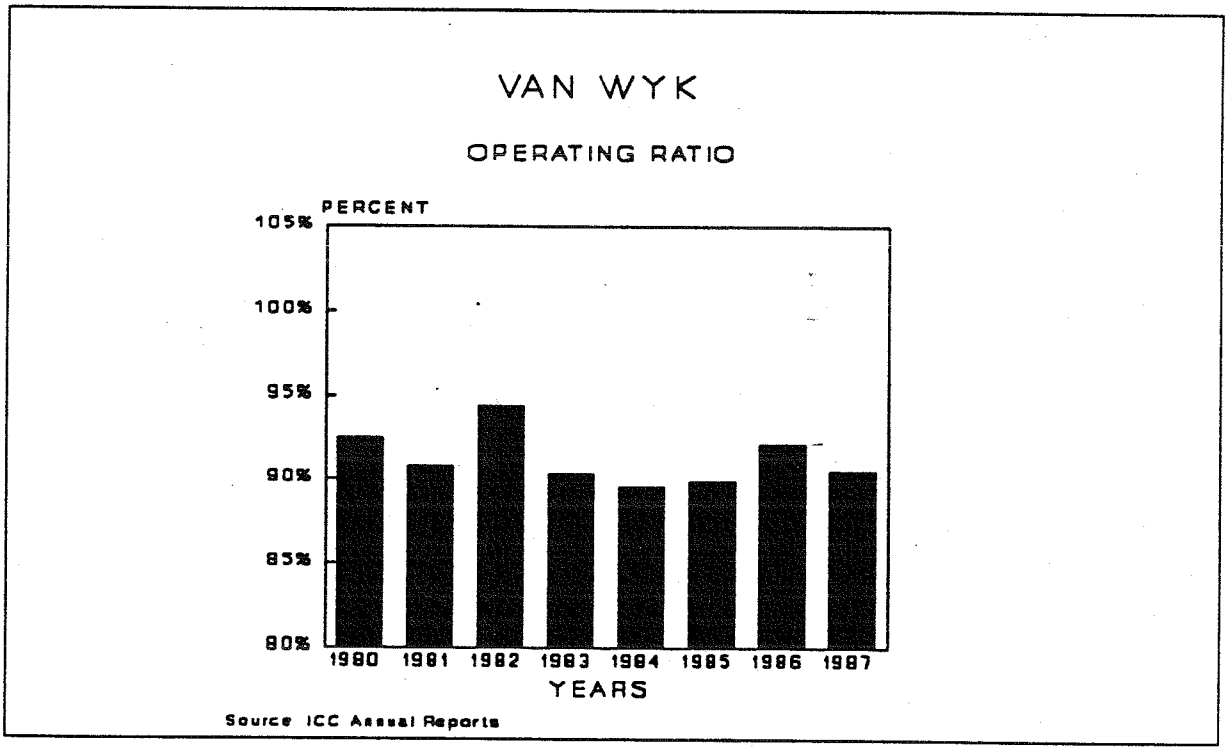


Figure 5-36 Van Wyk: Net Income to Total Revenues

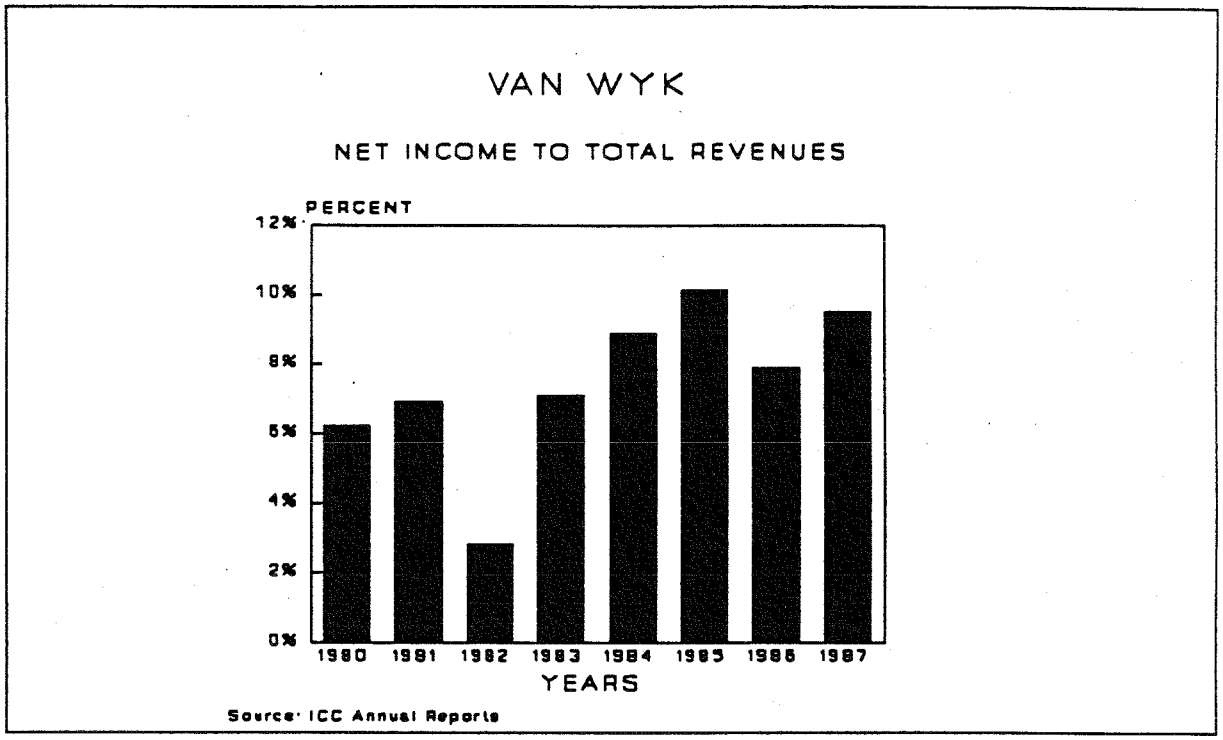


Figure 5-37 Van Wyk: Earnings Before Interest and Taxes to Total Assets

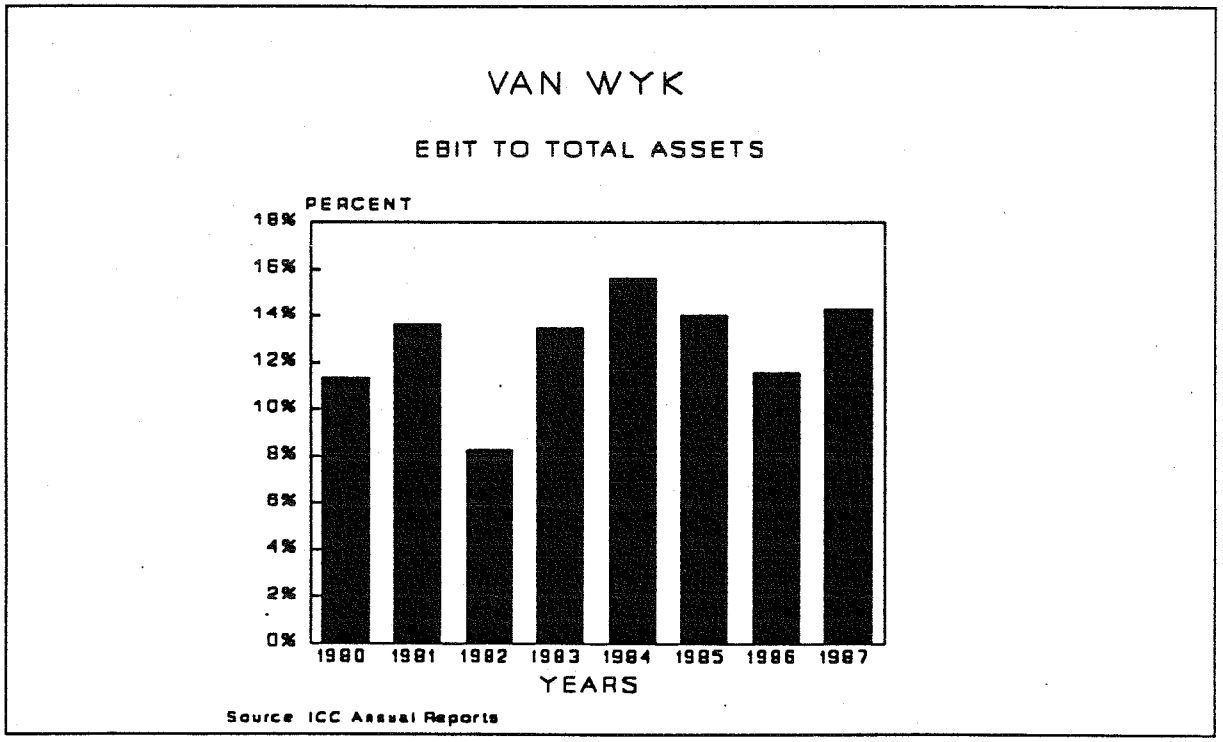
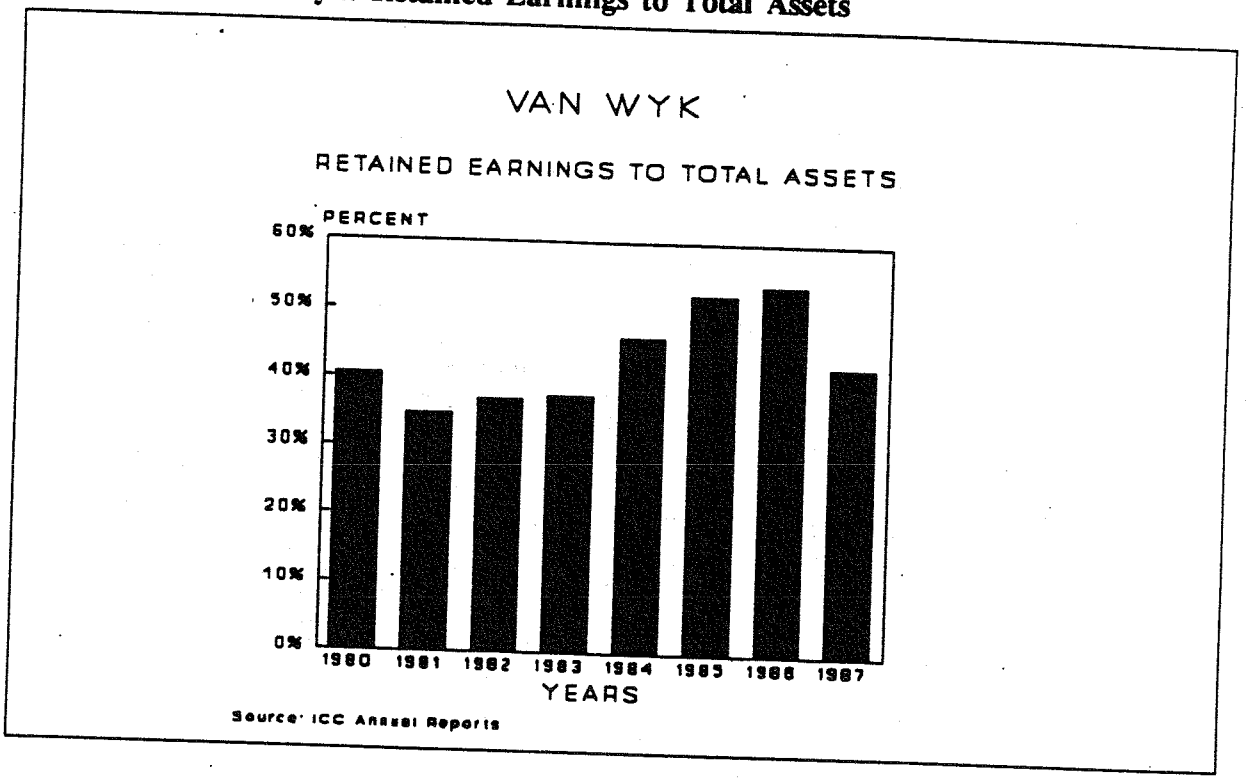


Figure 5-38 Van Wyk: Retained Earnings to Total Assets



Productivity ratios Perhaps surprisingly, Van Wyk's productivity ratios were not higher than most other firms' and often were lower. The ratios of real revenue per driver, real revenue per employee, real revenue per tractor, and real revenue per trailer are shown in Figures 5-39, 5-40, 5-41 and 5-42, respectively. This result may be explained by their service-orientation, which may require more drivers than average for a given amount of freight, and by an overall attention to cost control.

Growth Van Wyk's revenues grew fairly steadily during the 1980s (except during the recession of 1982). The shape of a plot of its total assets, in Figure 5-43, parallels its plot revenue growth in Figure 5-44.

Figure 5-39 Van Wyk: Productivity; Real Revenue Per Driver

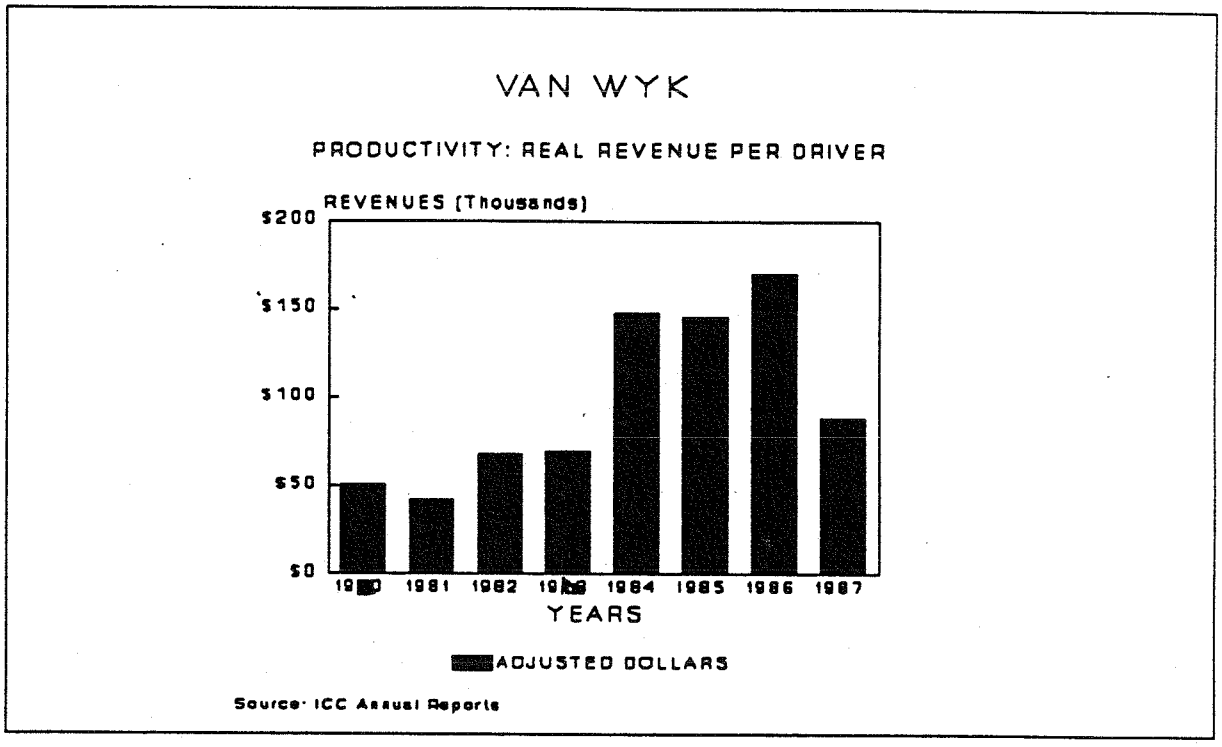


Figure 5-40 Van Wyk: Productivity; Real Revenue Per Employee

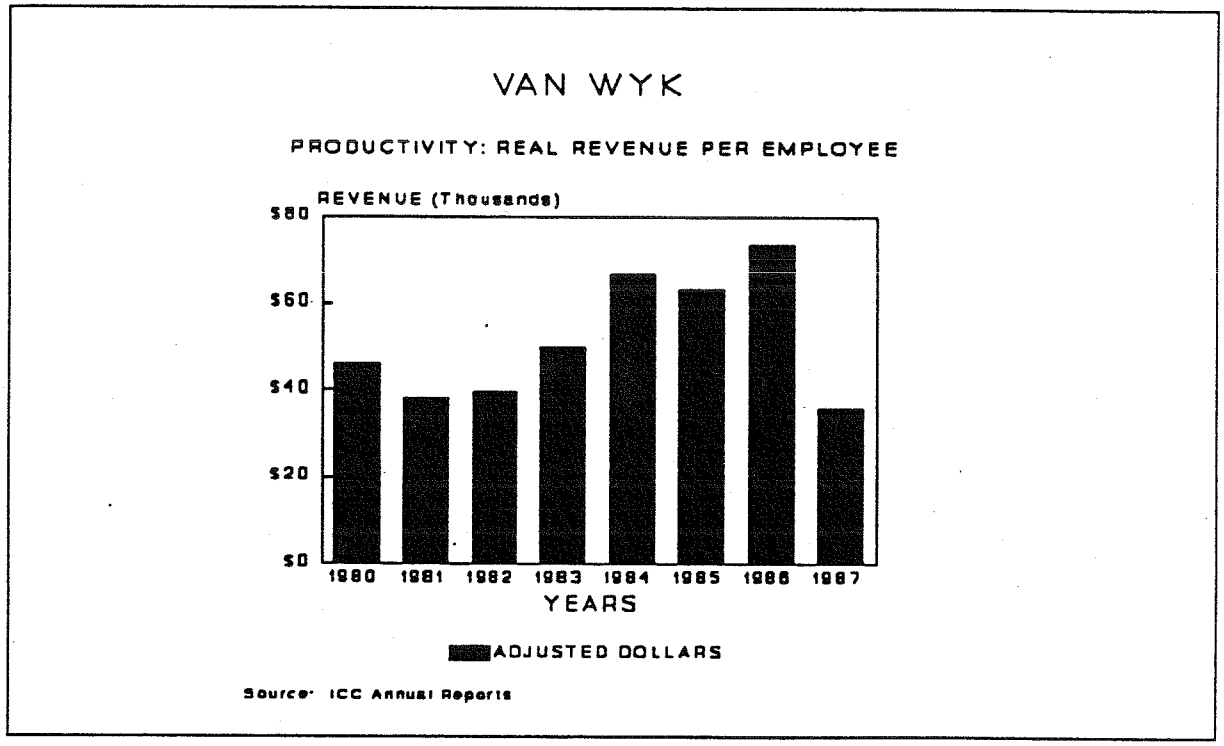


Figure 5-41 Van Wyk: Productivity; Real Revenue Per Tractor

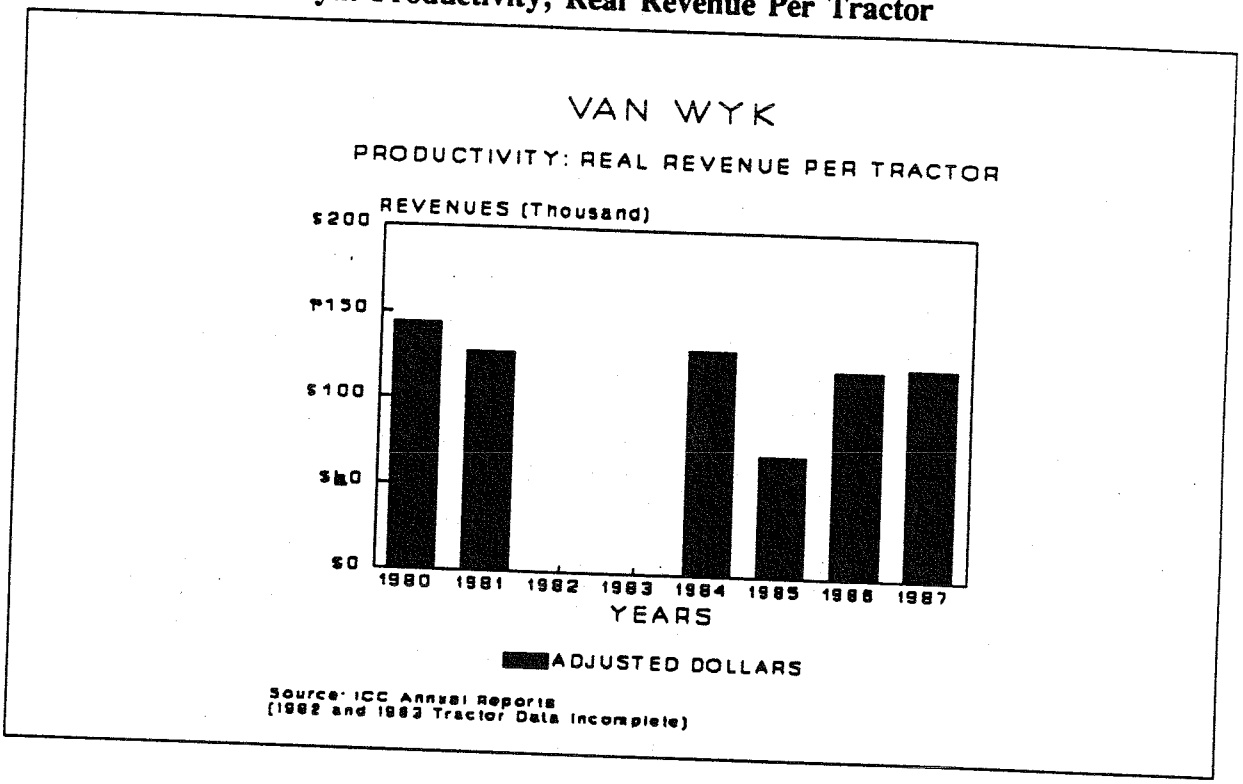


Figure 5-42 Van Wyk: Productivity; Real Revenue Per Trailer

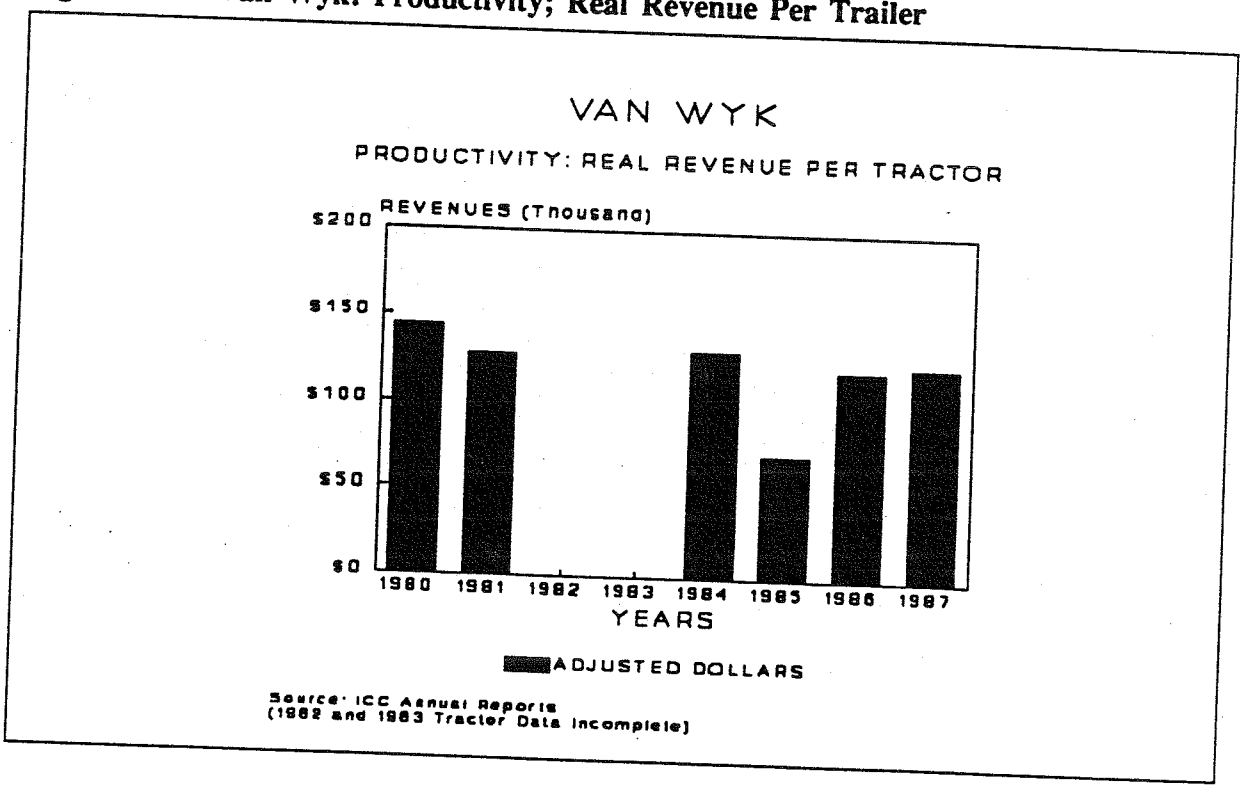


Figure 5-43 Van Wyk: Total Assets

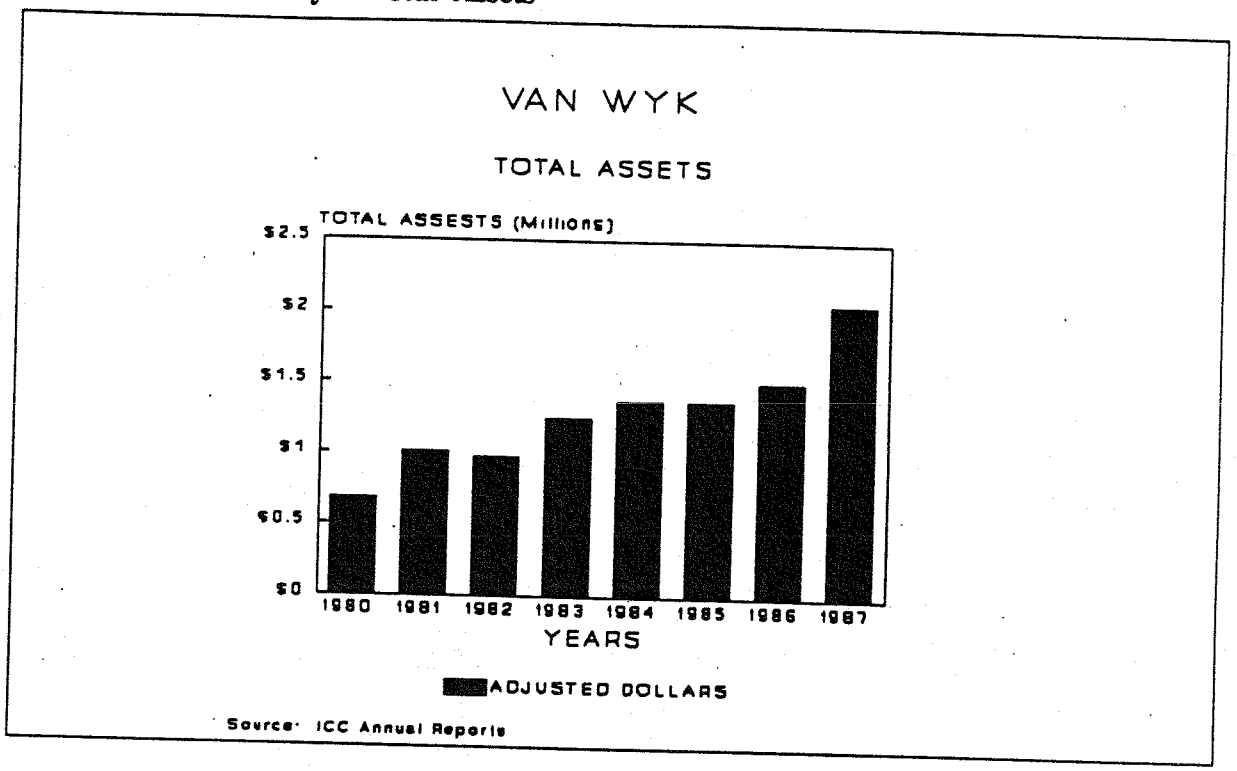
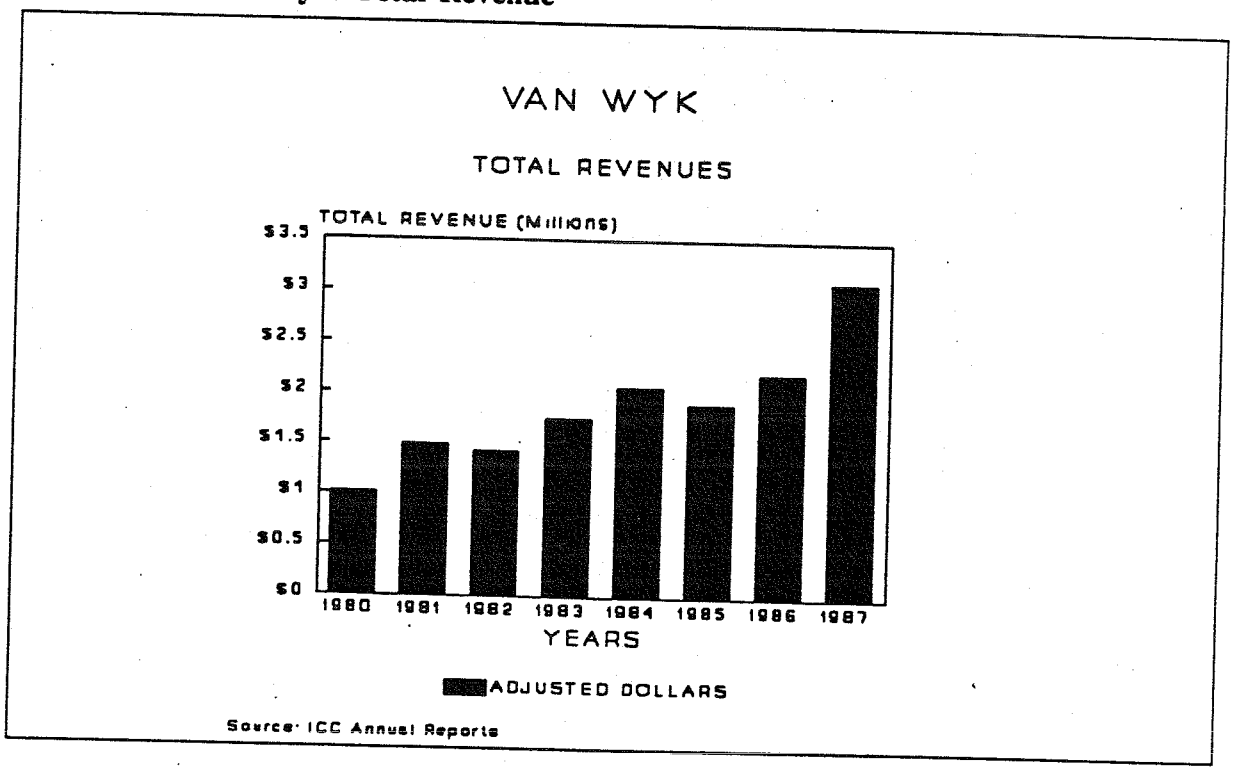
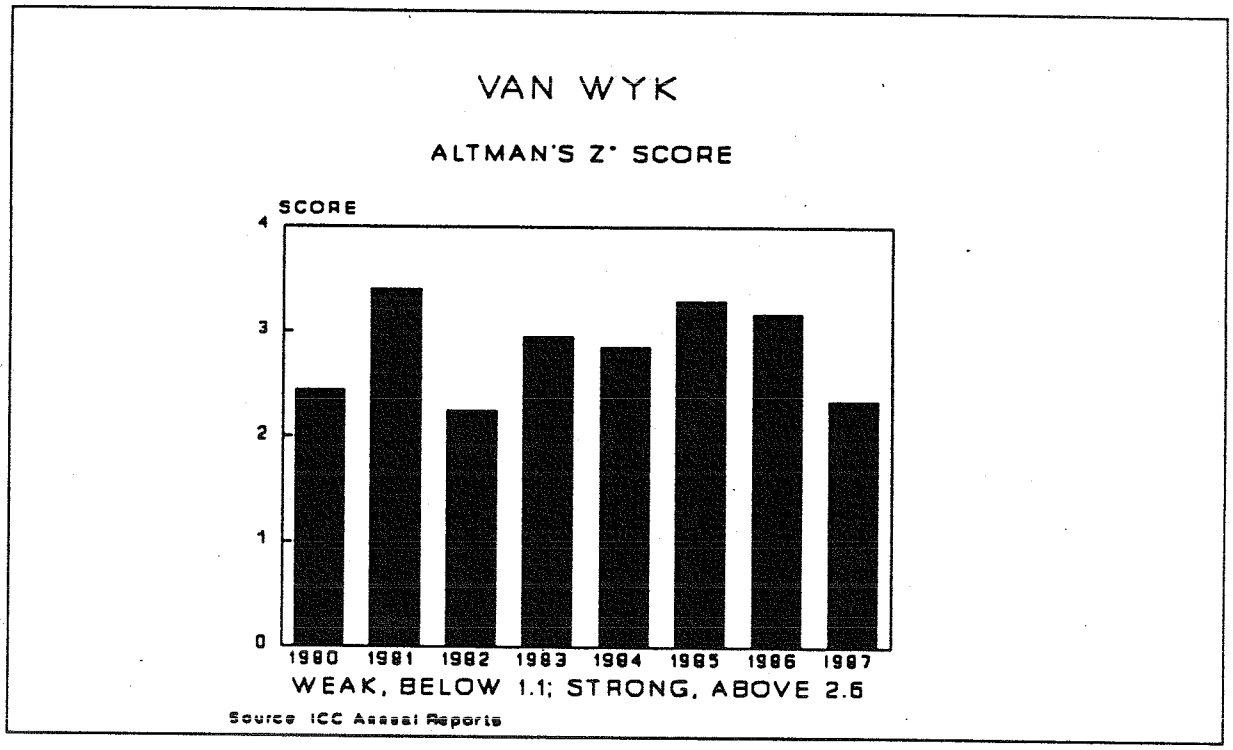


Figure 5-44 Van Wyk: Total Revenue



Altman's Z"-scores Except for the 1984 results, Van Wyk's Z"-scores plotted in Figure 5-45 were in the "strong" financial condition range, exceeding 2.6 (but remaining below 4.0). Van Wyk would be considered to be a viable business entity. Although the two Van Wyks are salaried officers of the firm, as owners they consider their real return on investment would come only if the firm were sold.

Figure 5-45 Van Wyk: Altman's Z" Scores



Current Situation

Drivers Van Wyk's drivers range in ages between 20 and 62; most are in their forties. The owner said they had no driver problems as the drivers are home every night after their regular routes from Grinnell. The longest run is to northeast Iowa. Drivers have a profit-sharing pension plan, and are non-union. Their driving hours are not to exceed 60 in five days.

New driver applicants do not need prior experience and are not tested for drugs at this time (summer, 1989). Van Wyk saw no problems with the Commercial Driver's License. This carrier also uses some owner-operators.

Risk management Insurance costs were considered to be under control, with a total of $43,000 in costs per year. The carrier has cargo insurance, coverage on automobiles and buildings, and $5,000 collision coverage on trucks newer than 1985. Older trucks have no collision coverage.

Equipment Van Wyk has 50 tractors and 105 trailers for a typical two-to-one trailer-to-tractor ratio. They have moved to larger trucks in recent years. Tractors bought in the last four years have a planned 10-year life. Average mileage is 50 to 60 thousand per year. Five mechanics are employed to keep this equipment running.

Rates As an LTL carrier, Van Wyk depends on tariff rates. They have no negotiated contract rates.

Outlook for the future

Markets Van Wyk was in favor of regulated entry and considered operating authority to be a precious commodity. With deregulation, "if the biggies want to smash the little guy out, it will happen." Eventually the small shipper will get hurt if the service-oriented regional carriers are lost.

Size Van Wyk now has the facilities to handle 50 percent more freight. Although it grew after other carriers dropped out of business, the owner assumes that the market has "gotten rid of the deadwood;" additional growth will come more slowly.

Bankrupt Carrier: American Freight

Chain of events

The end of American Freight was signaled by its purchase of Smith Transfer in 1987. Operating capital was obtained through ARA Services, the former owner of Smith Transfer, with the stipulation that the debts go back to Smith, rather than American Freight, if the firm went under within one year.

Since the two firms served similar markets, the merger is described as parallel, not end-to-end. Facilities and personnel of the two merging carriers were essentially duplicated.

Smith Transfer had a substantial amount of freight from the Northeast, the highest cost area in the country. To reduce these costs, Smith cut service to that area. In response, shippers reduced or ceased business with Smith Transfer.

The end came when their insurance payment came due. A potential bank loan to cover the payment was not backed by General Electric Credit. Lacking insurance coverage, the company shut down on a Monday night. All of their existing freight went to Roadway within a week or so.

Observations

American Freight had a background of growing one town or state at a time. For example, instead of adding a route from Sioux Falls to Kansas City, they began with Sioux Falls to Des Moines, and later extended from Des Moines to Kansas City. In 1980, American Freight had added a 65-door terminal in Des Moines with 250 employees to handle its LTL freight. They concentrated on handling costs, on training for sales and loading, and on keeping long-term debt low. American Freight did not have a driver shortage. The interviewee described it as a company that "Grew big but still operated little." Contracts were the exception although there were some, with K-Mart and J. C. Penney, for example. Its TL subsidiary was Midwest Coast, of Sioux Falls, South Dakota.

Financial Situation

Finance A comparison of American Freight's productivity ratios with other carriers' suggests their operations were reasonably well managed. Unfortunately, its financial measures did not fare as well as other operators. Its productivity ratios, in terms of real revenue per driver, employee, tractor and trailer in Figures 5-45, 5-46, 5-47, and 5-48, were in the middle of the range or slightly above. In other words, both American Freight's employees and equipment were generating revenues effectively. Its operating ratio was also in the mid-range except for 1987, the last year of data.

Figure 5-49 shows that American Freight consistently had negative working capital to total assets ratios. While they were not alone among motor carriers in this aspect, there is a strong suggestion of a problem with cash.

Figure 5-46 American Freight: Productivity; Real Revenue Per Driver

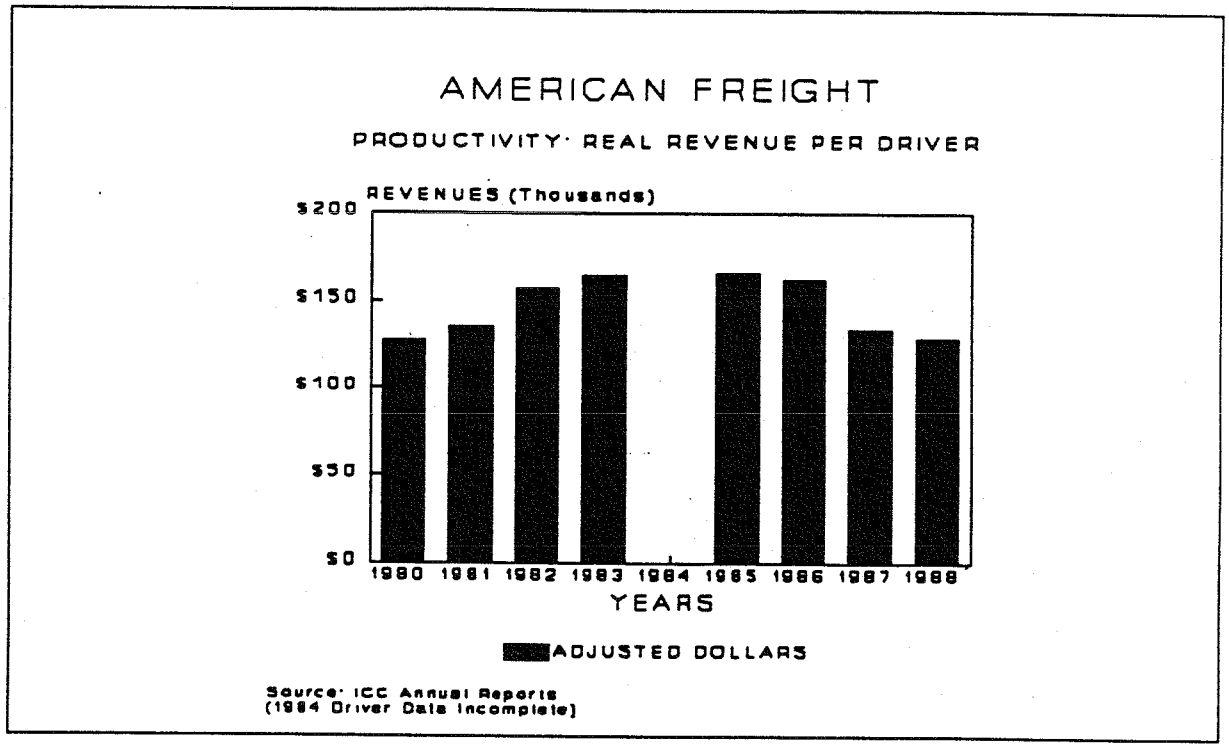


Figure 5-47 American Freight: Productivity; Real Revenue Per Employee

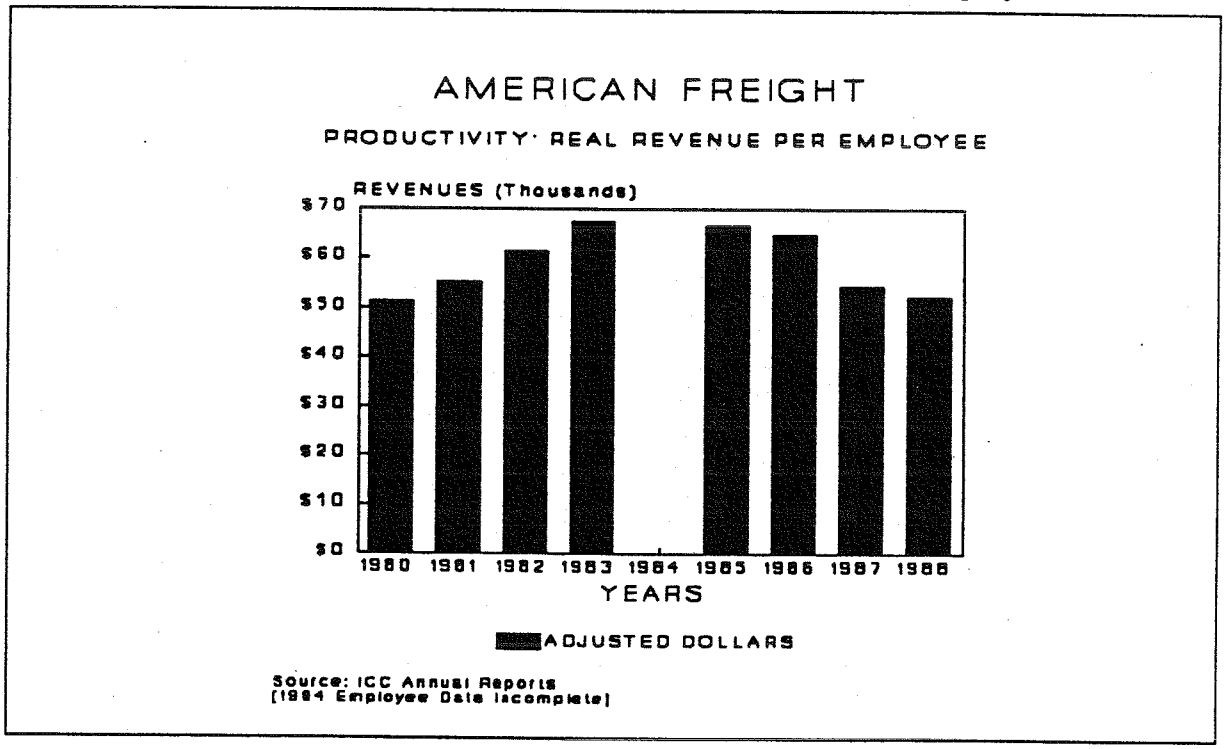


Figure 5-48 American Freight: Productivity; Real Revenue Per Tractor

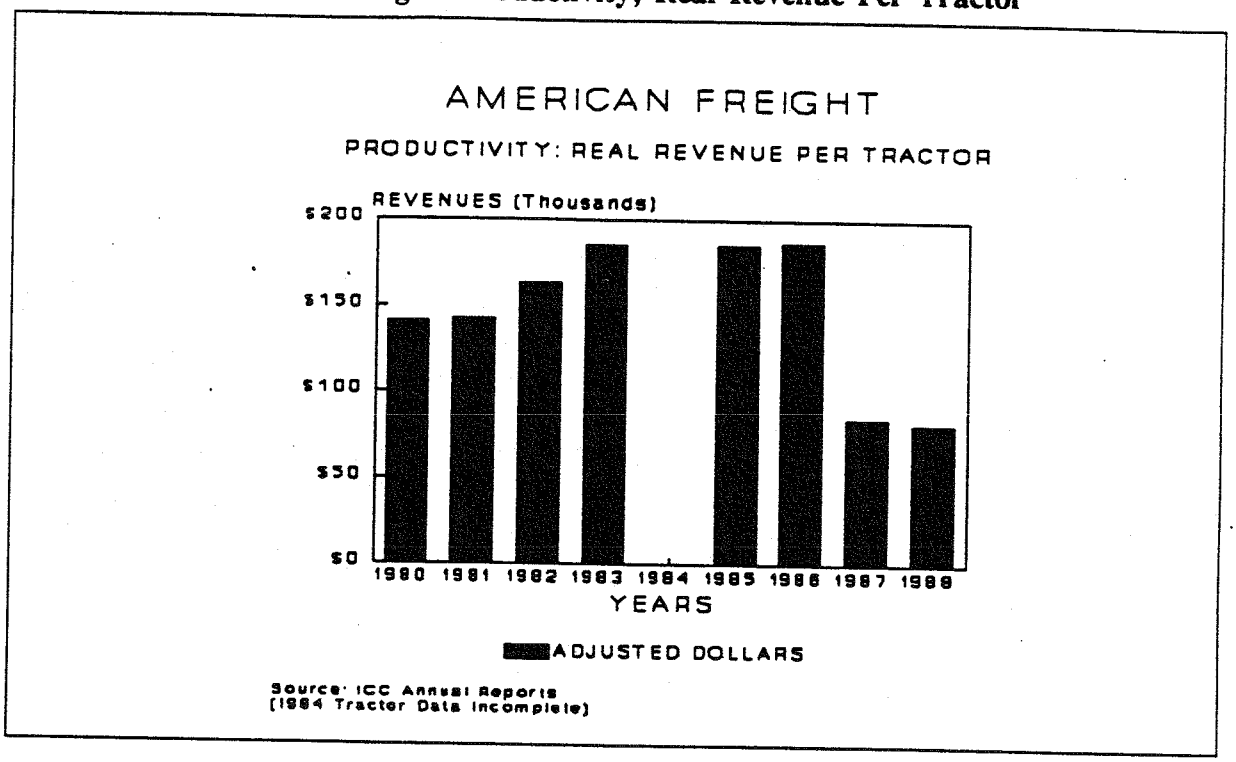
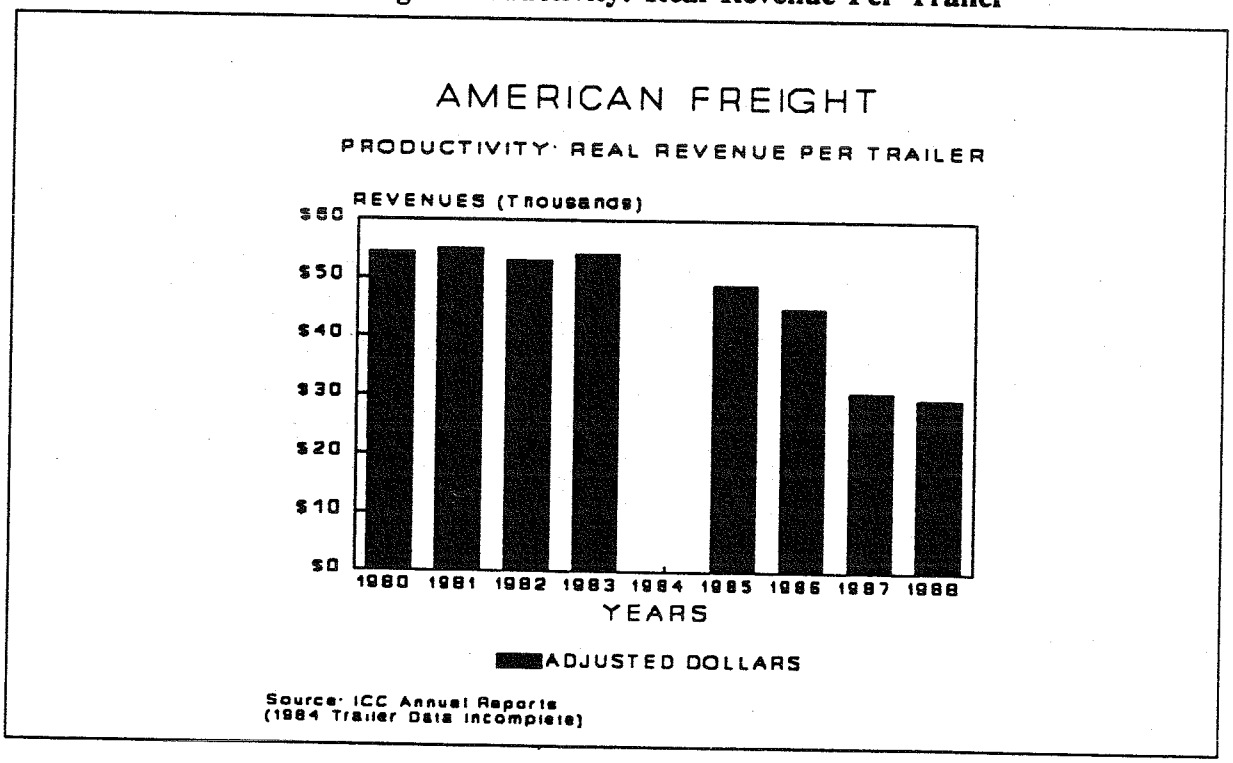


Figure 5-49 American Freight Productivity: Real Revenue Per Trailer



American Freight's operating ratio, plotted in Figure 5-50, maintained respectable levels during the mid-1980s until 1987 when it shot well above 100. American Freight's profits (Figure 5-51) and earnings (Figure 5-52 and 5-53) improved in the early eighties and, while lower than some, were still higher than some carriers' until 1987.

American Freight's overall debt-to-assets ratio, plotted in Figure 5-54, was not low, indicating that short-term debt, due within the current year, was depended upon to finance operations. When currently due obligations, namely the insurance payment, could not be paid from current assets, the firm was technically bankrupt. Had more permanent financing been employed, it is possible that current obligations could have been paid without creating a crisis situation. While American Freight seemed to have other serious problems, a different financial structure might have "bought time" for the firm to resolve them.

Growth American Freight was a large carrier, with revenues exceeding $200 million every year in the decade until it terminated operations. American Freight's total revenue, plotted in Figure 5-55, continued to grow, in current dollars, until it reached $300 million in 1985. When adjusted for inflation, the apparent revenue growth was seen to be much more gradual and actually declined after 1984. The plot of total assets in Figure 5-56 fluctuated in a pattern similar to revenues.

Altman's Z"-scores American Freight's Z"-scores are graphed in Figure 5-57 and they were usually in the "weak" area, rising to the indeterminant zone only in 1984. Its Z" scores corroborated the conclusions made from the analysis of its short- and long-term debt: American Freight was undercapitalized.

Figure 5-50 American Freight: Working Capital to Total Assets

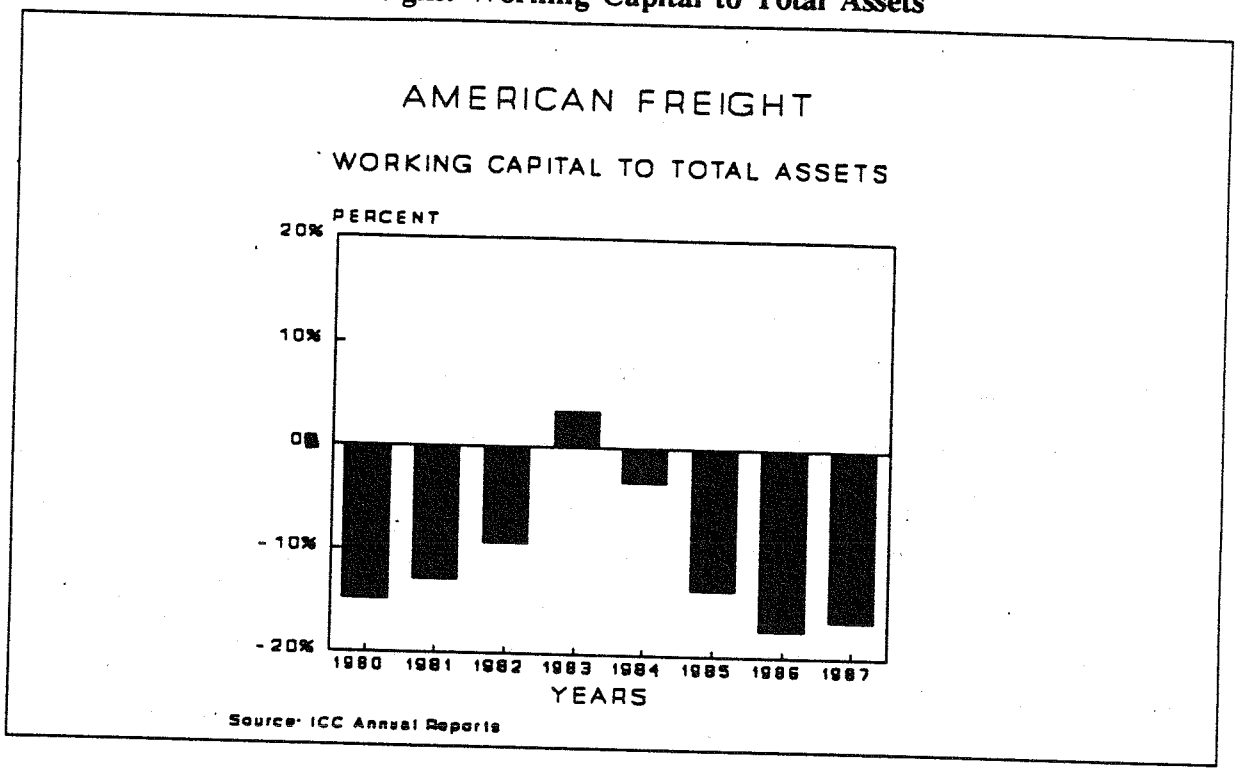


Figure 5-51 American Freight: Operating Ratio

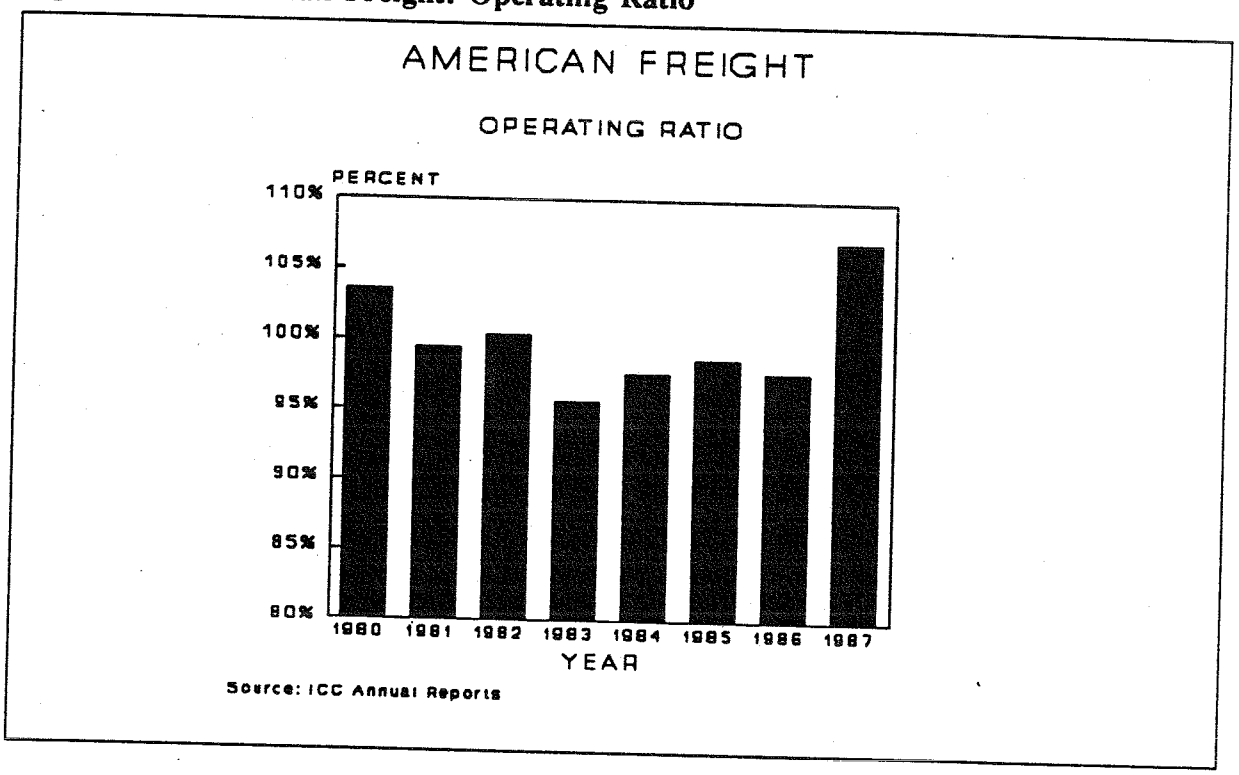


Figure 5-52 American Freight: Net Income To Revenues

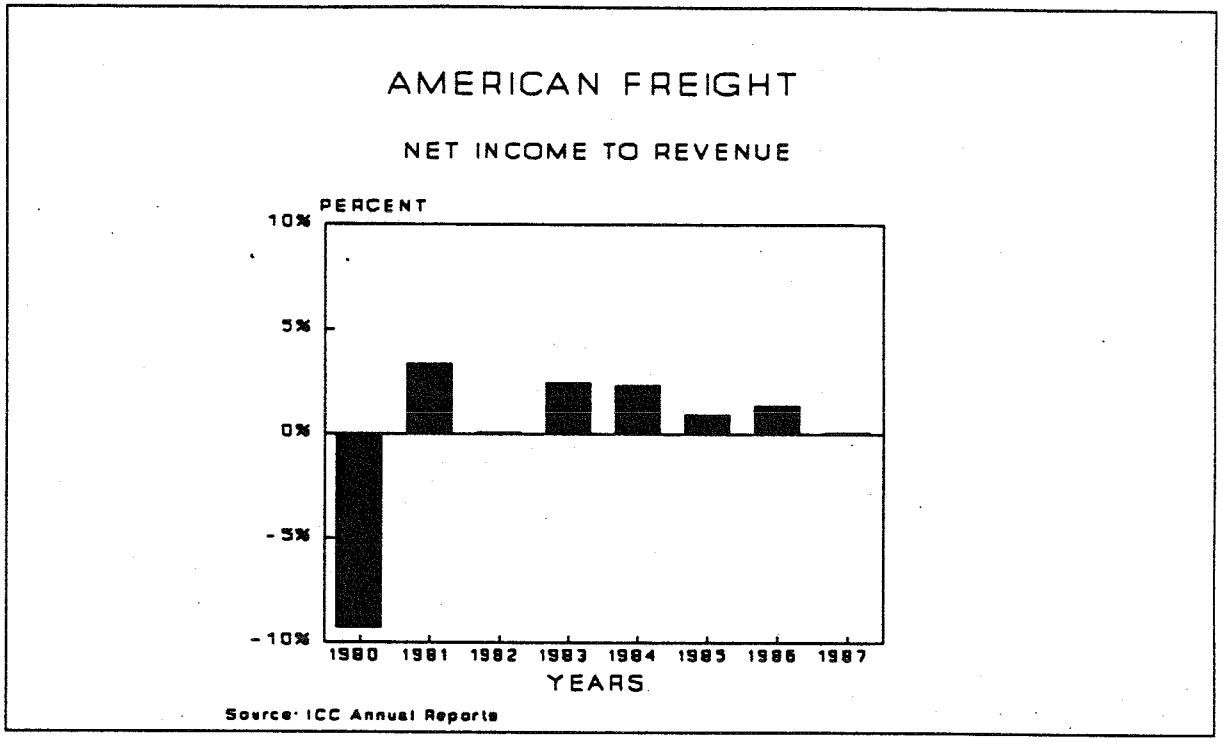


Figure 5-53 American Freight: Earnings Before Interest and Taxes to Total Assets

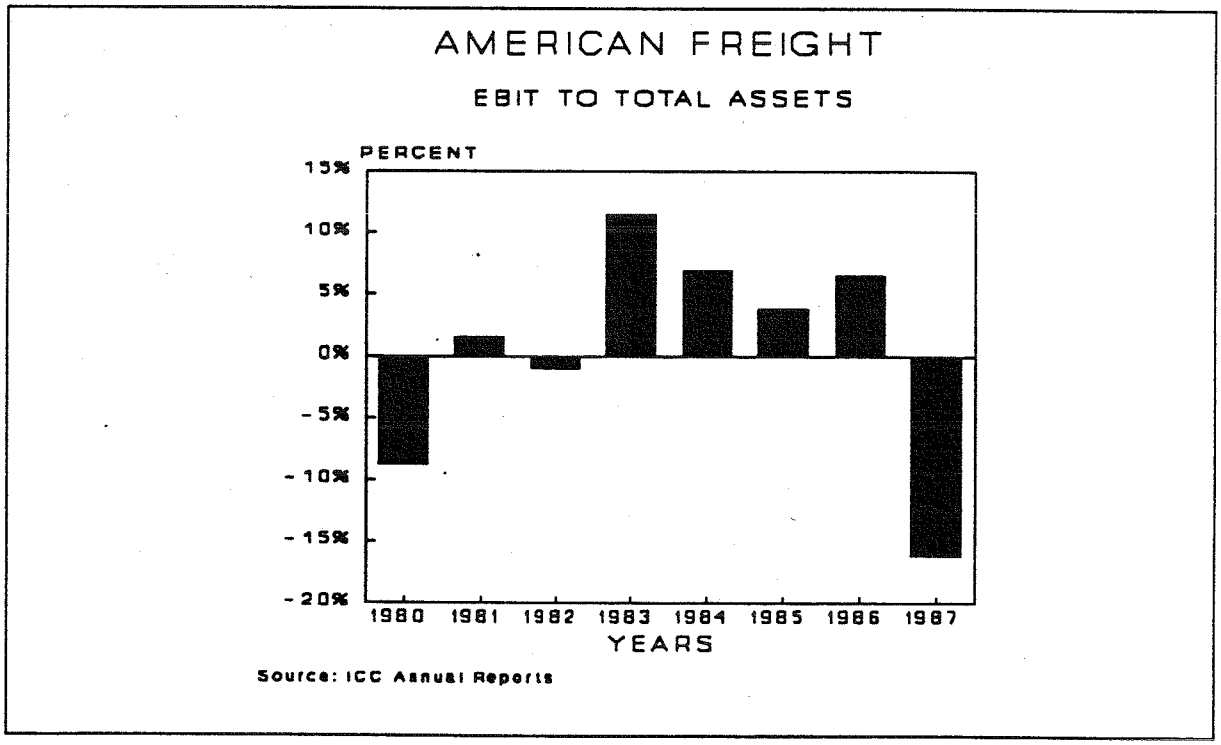


Figure 5-54 American Freight: Retained Earnings to Assets

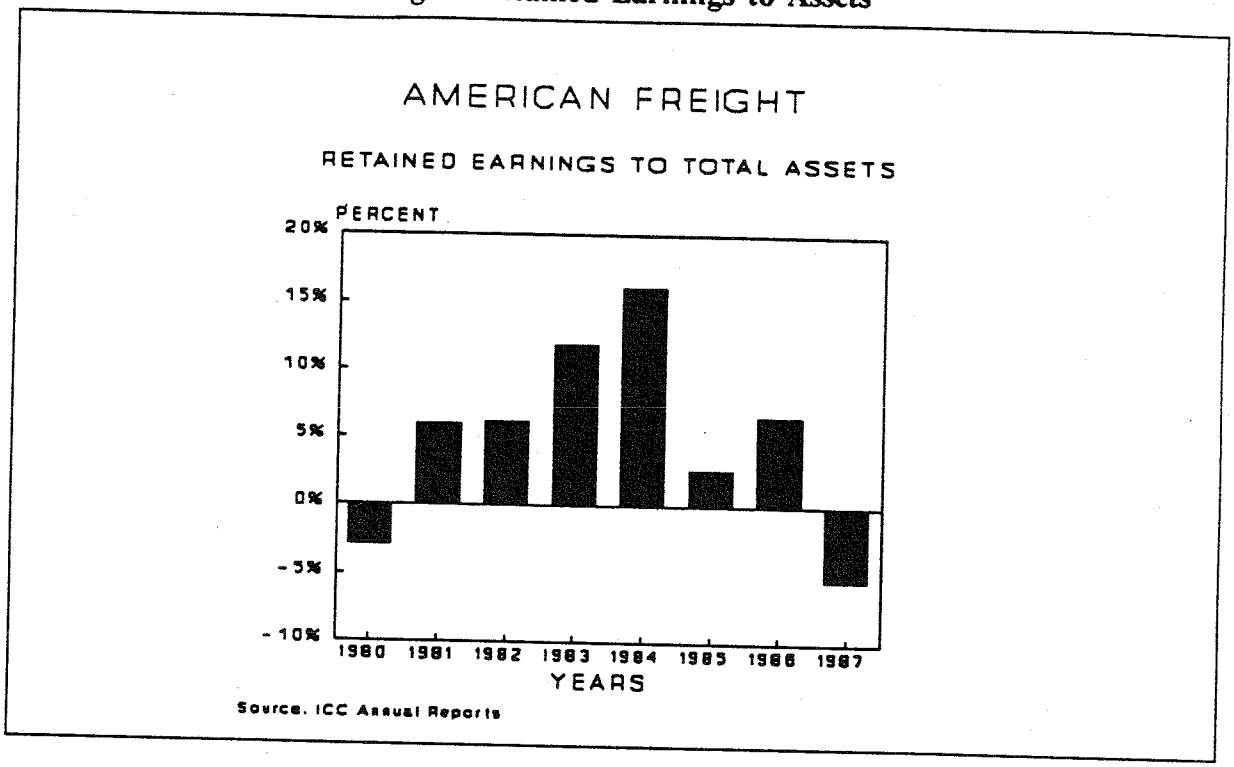


Figure 5-55 American Freight: Debt to Total Assets

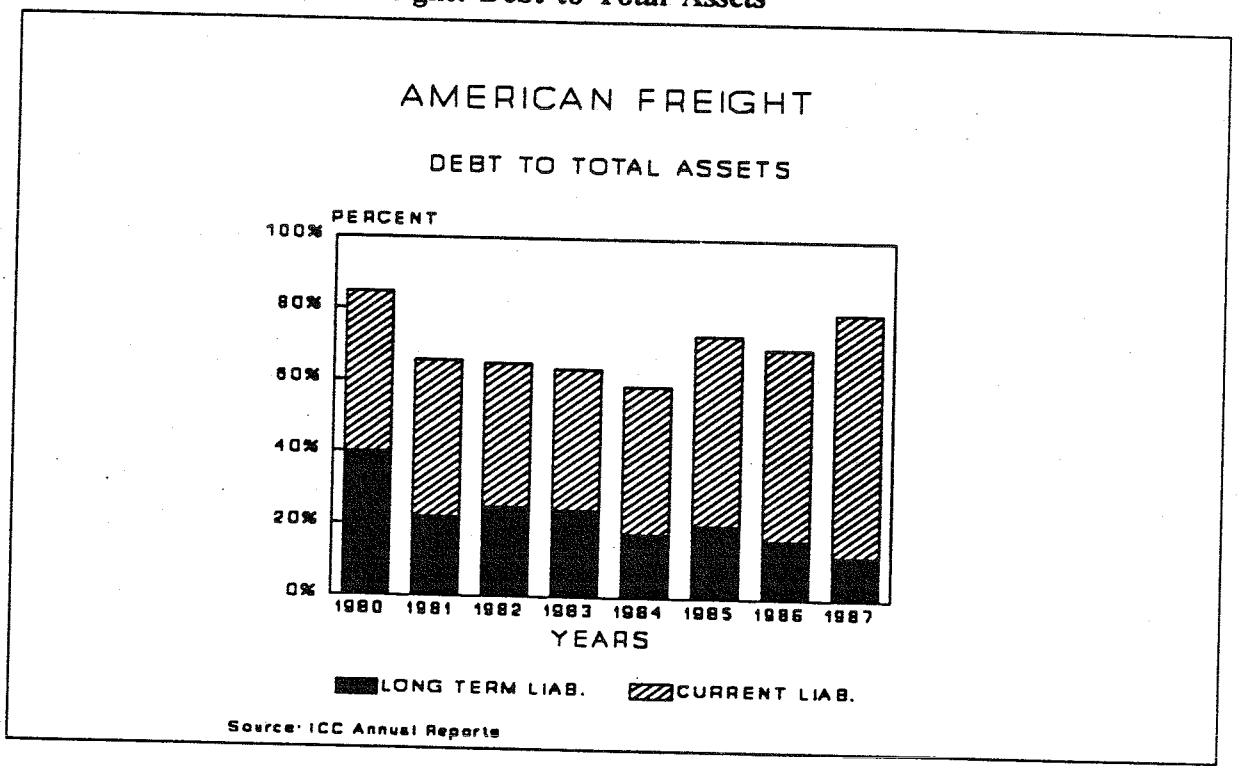


Figure 5-56 American Freight: Total Revenue

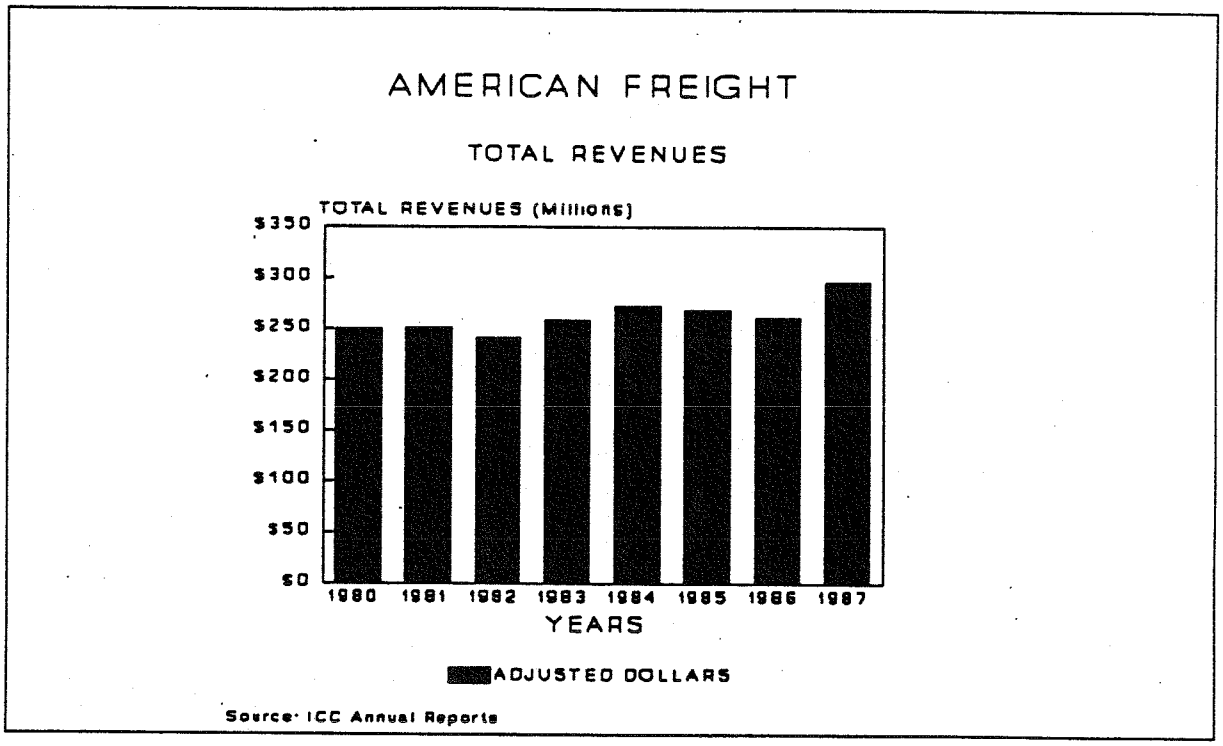


Figure 5-57 American Freight: Total Assets

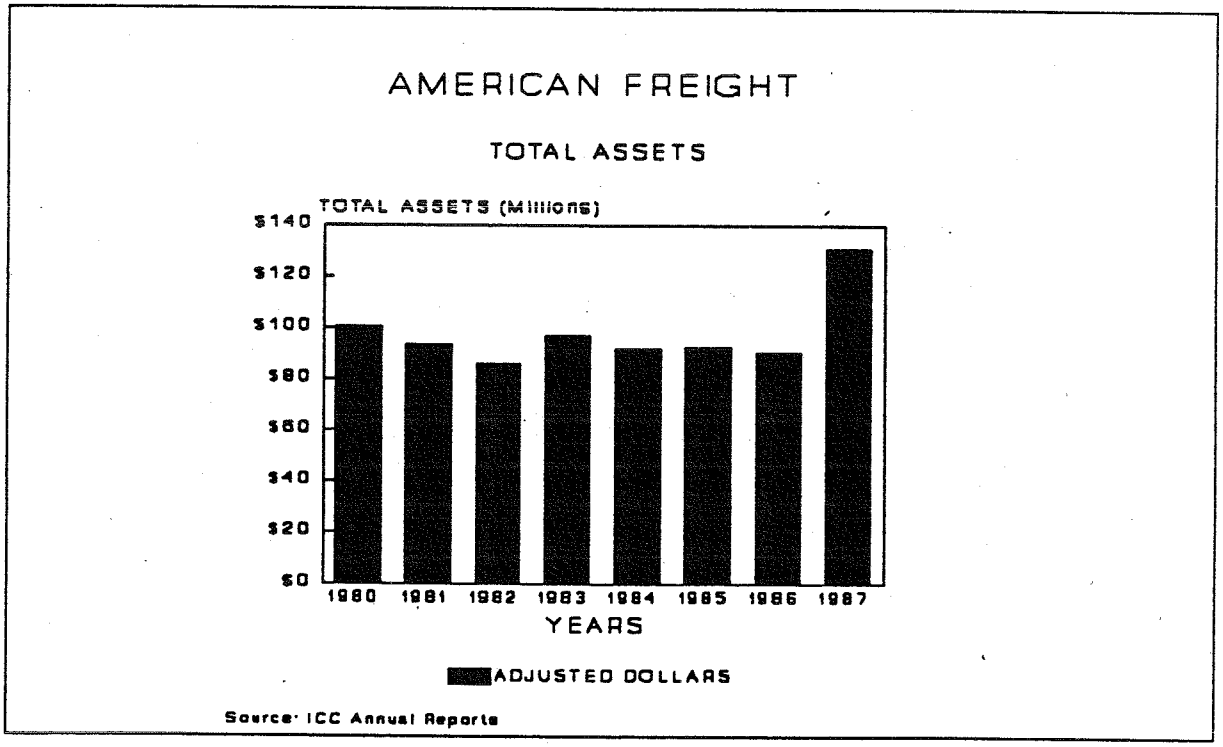
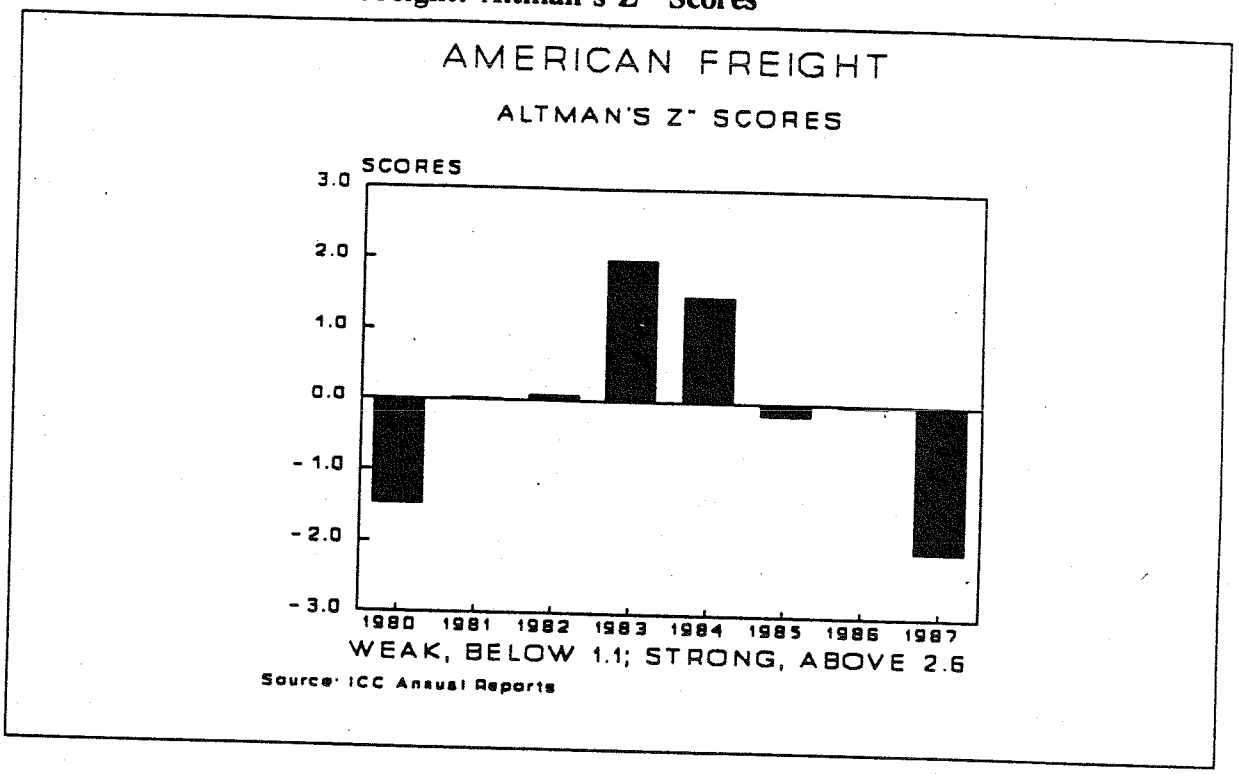


Figure 5-58 American Freight: Altman's Z" Scores



Conclusions

Each of the five firms interviewed was distinctly different but had several factors in common. These factors are discussed in the categories of drivers, regulations, finance and ownership, and risk management.

Drivers Evidence exists of a shortage of qualified applicants for some firms. Firms that gave drivers higher priority, whether in equipment selection, work assignments, employee benefits, or family considerations, had few problems. Carriers whose drivers were scheduled for long hours and days away from home experienced turnovers and shortages.

Regulations The effects of the Motor Carrier Act of 1980 seem to have been assimilated by the carriers interviewed. The easing of provisions on market entry and exit was of some concern with respect to increasing the number of trucks on the road but not, apparently, with respect to any reduction in service to small communities.

Carriers that operate in more than one state were somewhat frustrated by varying state regulations. The Commercial Driver's License may be one step toward more uniform

operating regulations. While there may be some problems implementing the Commercial Driver's License, the concept seemed to be accepted by the representatives of the firms interviewed.

Finance and ownership The uniformly high operating ratios reported suggest that trucking is a competitive, low margin business. A high portion of carriers' costs are variable; i.e., they increase with truck miles produced, especially for TL carriers that have fewer terminals than do LTL carriers. With adequate long-term financing, whether debt or equity, these carriers should be able to weather economic downturns by decreasing operations, hence operating costs, accordingly.

There will be questions of changing ownership, especially with smaller firms that tend to be family owned, as their owners mature toward retirement age. One parallel merger demonstrated problems of duplication. Other buyouts may prove equally unsuccessful. Unlike manufacturing firms, however, the operating assets of a truckline are relatively mobile and may be more readily liquidated if that option is chosen. Terminals would prove a problem in a liquidation, as their design and layout probably would limit potential buyers to other trucklines.

Risk management The carriers have adopted a time-tested method of dealing with increasing insurance premiums; that is, increase the deductible amount. In other words, the carriers are "self-insured" to a greater degree than before. With their own assets at risk, carriers have become more selective in employing drivers. This caution is most noticeable in times of driver shortages. Even when openings cannot be filled, the carriers apparently are not relaxing their hiring and training standards. It may be argued that the influence of insurance costs has had a beneficial effect on carriers' business priorities.

Motor Carrier Shipper Logistics Strategy Trends

The regulatory reform of the U.S. trucking industry, because of its greater reliance upon market forces, has directly affected the nature of trucking operations, and the structure, organization, and performance of the for-hire trucking industry. Additionally, deregulation is exerting an indirect affect upon trucking by permitting or fostering logistics opportunities previously unavailable to shippers. Shippers are employing new logistics strategies which have produced fundamental changes in the purchasing and management of truck transportation service and in the relationships between themselves and carrier firms.

Three shipper logistics strategies were identified which may shape the future structure and organization of the U.S. trucking industry: (1) a reduction of the number of motor carriers utilized by individual shippers, (2) an increase in the use of EDI, and (3) an increase in the use of long-term contracting. Each of these developments leads to greater coordination or integration of the carrier's and shipper's operations and to greater shipper control over the transportation function. This section investigates the extent to which these logistics strategies have been adopted and implemented in the United States, the prognosis for their implementation in the future, and their potential impact on the United States for-hire motor carrier industry.

Potential Impacts of Shipper Logistics Strategies

The impacts of the EDI, contracting, and carrier reduction strategies on the trucking industry will likely be observed in three important areas: (1) trucking firm size, (2) the ability of trucking firms to enter new markets (i.e., to switch or add shippers), and (3) the role of transport third parties, a rapidly growing segment of the for-hire motor carrier industry. Furthermore, the effects on trucking firm size and market entry will affect industry concentration. The expected relationship between trucking firm size and industry concentration is, *ceteris paribus,* positive. The expected relationship between the ability to enter new markets and industry concentration is, *ceteris paribus,* negative.

Figure 5-59 provides a model depicting the expected inter-relationships among the logistics strategies and between individual strategies and individual dimensions of the trucking industry organization. In order to explore the relationships depicted in this model, relevant data were collected from a sample of shippers and processed for analysis. The following subsections describe the research methodology and preliminary results of the survey analysis.

Research Methodology

The purpose of the questionnaire was to explore: (1) the extent and nature of implementation of the three logistics strategies, (2) the interactive effects among them, and (3) implications for the for-hire trucking industry. Toward this end a questionnaire was designed and mailed to two sample groups of shippers.

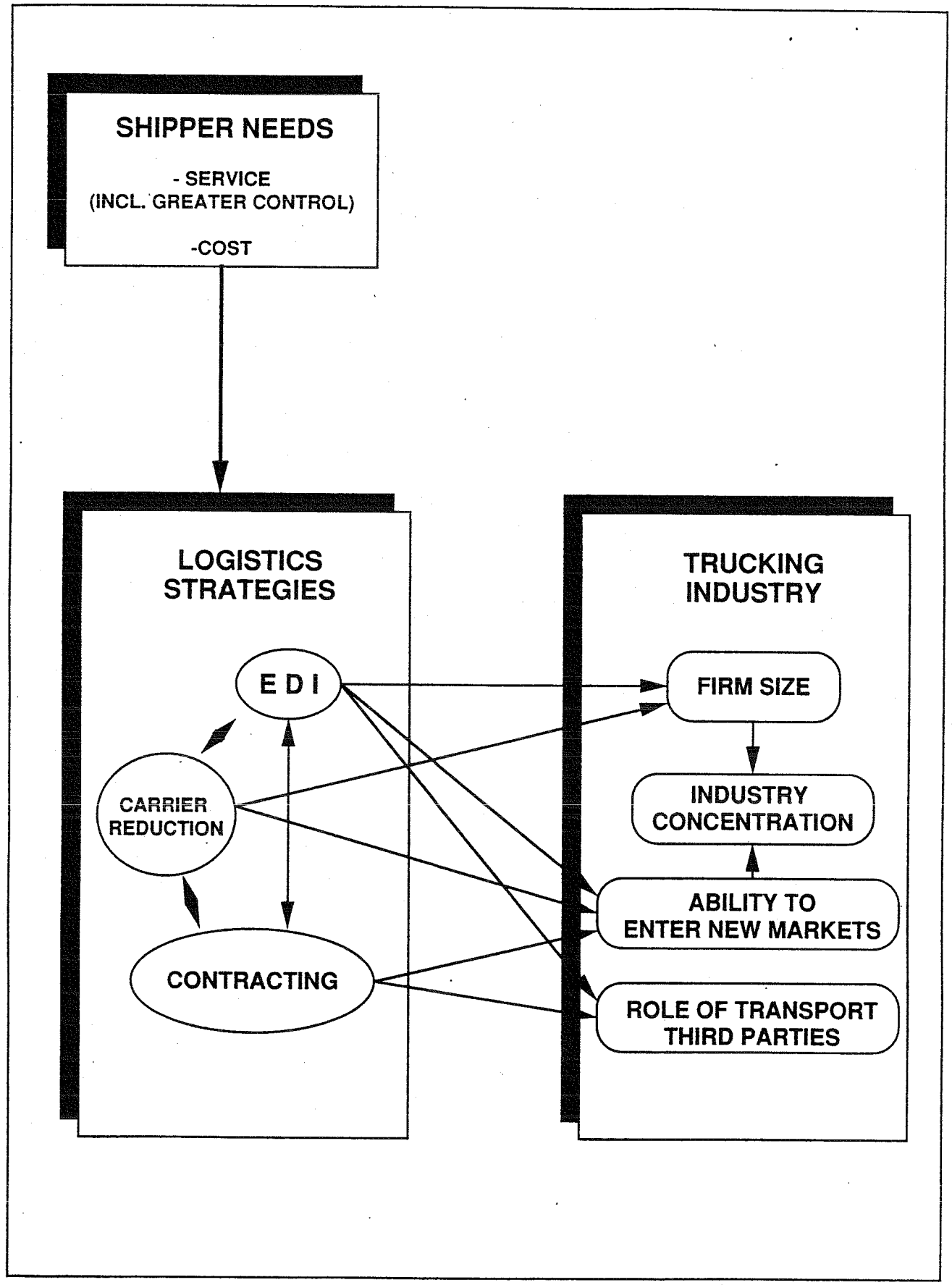


Figure 5-59 Inter-relationship Logistics Strategies

Questionnaire The seven-page questionnaire consisted of five sections: (1) shipper firm characteristics, (2) the use and operation of transportation third party firms, (3) the use of EDI, (4) the use of contracting, and (5) the number and size of for-hire carriers used and carrier selection criteria. The survey instrument solicited both quantitative data and non-quantitative information (e.g., future plans with regard to logistics strategies). A copy of the questionnaire is included in Appendix A.[16]

Sample In late July 1989, questionnaires were sent to 412 shipper members of the American Society of Transportation and Logistics (AST&L). The AST&L is a national society dedicated to the promotion of professionalism and education of its shipper and carrier members. Firms belonging to this society are perceived to be more progressive and innovative in the area of logistics than the average or typical United States firm. They are also likely to be more willing to participate in research projects focusing on logistics management.

Results

An analysis of the first 114 usable responses, all from the AST&L sample, has been performed. The following discussion is based on this analysis.

Respondents tended to be large firms as 47 percent had 1988 sales revenue in excess of $1 billion and 40 percent had sales revenue between $100 million and $1 billion. More than two-thirds of the respondents list their primary function as manufacturing or processing, reflecting the membership consist of the AST&L. Consequently, certain results obtained from this group may not be generalizable to the total population of shippers in the United States Some insights may be gained, however, especially with respect to the interactive effects among the logistics strategies and the relationship between specific logistics strategies and the organizational dimensions of the trucking industry.

Extent of Implementation of Logistics Strategies

Results show that, in general, the survey respondents are actively engaged in each of the three logistics strategies. Furthermore, they expect to increase their application of the strategies over the next five years.

Contracting Nearly 45 percent of the respondents reported that more than 50 percent of their company's total 1988 expenditures on for-hire motor carrier service occurred under

contract agreement. Only 14 percent currently do not contract for trucking service. Additionally, approximately 78 percent of the shippers expect to increase their use of contracting over the next five years, and 33 percent expect the increase to be significant.

EDI Almost 59 percent of the respondents employ EDI. Each respondent on average reported that 46 percent of its motor carriers had the capability for EDI with its company in 1988. Additionally, more than 92 percent of the respondents who engaged in EDI in 1988 expected to increase their use of EDI over the next five years. On average, respondents anticipated that about 81 percent of their motor carriers would have EDI capabilities five years from now.

Carrier Reduction Of the 88 respondents who supplied data on the number of motor carriers used in 1984 and 1988, 55 (62.5 percent) reported a decrease, 22 (25 percent) reported an increase, and 11 (12.5 percent) reported no change. The 1984 average number of carriers per respondent was 214, and the 1988 average was 150 carriers -- a 30 percent reduction on average. This trend will apparently continue as almost two-thirds of the respondents expect to reduce the number of motor carriers over the next five years, and more than 25 percent expect the reduction to be significant.

Interactive Effects Among Logistics Strategies

Various analyses of the data reveal strong interactive effects among the EDI, contracting, and carrier reduction strategies. The strategies generally tend to be positively correlated. For instance, current EDI users were questioned directly about the impact of the EDI strategy upon contracting and carrier reduction. More than 60 percent indicated that EDI influenced their decision to contract, but noted that EDI was not the most important consideration in this decision. Nearly one-half reported that EDI considerations led to carrier reduction.

An analysis of future logistics plans produced similar findings. A significant positive correlation between plans to increase the use of the contracting and carrier reduction strategies was found. Additionally, almost three-fourths of the respondents who expect to increase their use of EDI over the next five years also expect to increase their use of the carrier reduction strategy -- and about one-half of these shippers expect to significantly reduce the number of

carriers they employ. Similarly, more than 80 percent of the respondents who expect to increase EDI also expect to increase their use of contracting, with 40 percent of these shippers anticipating a significant increase.

Impacts of Logistics Strategies on the Trucking Industry

The impacts of the three logistics strategies on the trucking industry were investigated by determining the degree to which carriers are locked-in with specific shippers (i.e., potential impacts on ability of carriers to enter new markets), the degree to which large carriers vis-a-vis small carriers benefit from the logistics strategies (i.e., the potential impacts on trucking firm size), and the impact on the future use of transportation third parties.

Responses concerning the nature and length of contracts were analyzed to determine the degree to which carriers are locked-in with specific shippers. Of the 98 respondents currently engaged in contracting, 43 (43.9 percent) include in the majority of their contracts a requirement that the motor carrier dedicate certain equipment to meet the respondent's service needs. Only one respondent includes a provision that places a limit on the numbers or types of other shippers the motor carrier may also serve. No respondent reported the inclusion of an exclusivity clause which prohibits the motor carrier from serving other shippers. The preference of the 44 respondents who require some form of dedicated service is clearly for contracts of one to two years duration, as 35 (79.5 percent) indicate such. Only five (11.4 percent) prefer contracts of less than one year duration, and only four (9.1 percent) prefer contracts of more than two years duration.

In order to determine whether larger carriers have an advantage over smaller carriers in the usage of EDI, users were asked to indicate agreement or disagreement with two assertions: (1) "The cost of developing and implementing EDI capabilities is too great for all but the largest motor carriers." and (2) "Motor carrier management often lacks the expertise needed to develop and implement EDI capabilities." (Presumably, smaller carriers are less likely than larger carriers to possess EDI expertise.)

Of the 70 EDI users who responded to these statements, only 14 (20 percent) agreed that the cost of EDI was too great for all but the largest carriers while 40 (57.1 percent) disagreed. Conversely, 32 (45.7 percent) agreed with statement two while 25 (35.7 percent) disagreed. A second approach to gauging whether larger trucking firms benefit from the

logistics strategies entailed an analysis of those respondents expecting to increase their use of the strategies over the next five years to determine if they favored larger carriers both in contracting and in the allocation of their total traffic (both measured by their relative use of Class I carriers -- carriers earning at least $5 million annual revenue). Results show that the vast majority of the contracts of each of the three sub-samples were with Class I carriers, and that a very large percentage of their total traffic went to Class I carriers. The same three sub-samples (i.e., respondents increasing their use of each of the three strategies) were analyzed to determine what percentage of each respondent's expenditures on for-hire trucking service went to the carrier providing the most service to the respondent in 1988 and how these percentages were expected to change over the next five years. A higher level of traffic concentration to one carrier would be expected to create larger trucking firms and increase the interdependence of shipper and carrier (perhaps locking-in each to the other).

A relatively large number of respondents in each sub-sample report giving more than 25 percent of their business to their primary carrier, and an overwhelming majority of respondents anticipate an increase in the percentage of their business going to their primary carrier over the next five years. Given the average number of carriers used in 1988 per respondent (i.e., 150), it is obvious that respondents are not spreading their freight equally among their carriers.

Finally, responses concerning the shippers' expectations about changes in the use of transportation third parties over the next five years were analyzed for each sub-sample. In each of the three sub-samples, a majority of respondents expected a decrease or no change in the use of third parties. In all sub-samples motor freight brokers and shippers' agents are not affected as adversely as freight forwarders and shippers' associations.

Discussion of Results

The preliminary results suggest that the EDI, contracting, and carrier reduction strategies provide some competitive advantage for larger trucking firms. This is evident in the distribution of contracts and total traffic among Class I and non-Class I (i.e., smaller) carriers. Also, the relatively large proportion of the respondents' freight business going to their primary carriers and the expectation that the primary carriers' relative share will continue to increase

suggests that the concentration level of the trucking industry will increase (i.e., the larger carriers will gain an even greater market share).

Though respondents appear to favor using larger carriers, the logistics strategies they are using do not seem to directly limit the ability of carriers to switch markets or enter new ones, or to establish significant cost barriers to small carriers. Respondents express the opinion that the cost of EDI is not beyond the means of smaller motor carriers. Lack of EDI expertise is, in their opinion, a more likely reason for a carrier not providing EDI capabilities. The questionnaire did not, however, address the issue of large carriers having an advantage vis-a-vis small carriers in the area of EDI expertise. The nature of the respondents' contracts do not seem to unduly lock-in the carrier. Explicit limitations of carrier service to other shippers are not characteristic of most shipper/carrier contracts, though requirements of dedicated equipment are fairly common. These need not limit the carrier's ability to add shippers or take on more business from its other shippers, however. Also, the durations of the vast majority of the respondents' contracts do not seem prohibitively long.

Not surprisingly, most of the respondents who are employing at least one of the logistics strategies do not expect to increase their use of transportation third parties. The use of third parties would seem to be contrary to the objective of better control and integration of transport service by the shipper. Also, other research has projected less growth in the usage of third parties by large shippers in the future, and most of the survey respondents are large shippers. Yet, there is a significant number of respondents who anticipate some increase in usage of third parties, especially in the services of freight brokers and shippers' agents. The expected increase in the use of shippers' agents may merely reflect the rapid growth of intermodal transport in the United States.

Endnotes

1. Harlan D. Platt, Why Companies Fail (Lexington, Mass.: D. C. Heath and Company, 1985), p. 85.

2. Industry Averages are based on Thomas J. O'Bryant, Financial Analysis of the Motor Carrier Industry (Alexandria, VA: American Trucking Associations, 1987), p. 10.

3. Industry Average Debt to Total Assets Ratios taken from, Thomas J. O'Bryant.

4. Platt, p. 89.

5. Edward I. Altman, "Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy," Journal of Finance, 23 (September 1968), pp. 589-609.

6. Edward I. Altman, "Predicting Railroad Bankruptcies in America," Bell Journal of Economics and Management Science 4 (Spring 1973), pp. 184-211.

7. Edward I. Altman, Corporate Financial Distress (New York: John Wiley, 1983); Edward I. Altman, Robert B. Avery, Robert A. Eisenbeis, and Joseph F. Sinkey, Jr., Application of Classification Techniques in Business, Banking, and Finance (Greenwich, Conn.: JAI Press Inc., 1981); E. I. Altman, R. Haldeman, and P. Narayanan, "Zeta Analysis: A New Model to Identify Bankruptcy Risk of Corporations," Journal of Banking and Finance 1 (June 1977), pp. 29-54; example cited in Platt, p. 138.

8. Edward I. Altman and Richard Gritta, "Airline Bankruptcy Propensities: A ZETA Analysis," Transportation Research Forum Proceedings, (October 1984), pp. 150-153.

9. Garland Chow and Richard Gritta, "Motor Carrier Bankruptcy: An Industry Assessment of Financial Condition," in Proceedings--Twenty-sixth Annual Meeting, Transportation Research Forum, (1985), pp. 434-440.

10. Henry J. McNair and Clyde Kenneth Walter, "Viability Measures Applied to Iowa Shortline Railroads," Regional Issues Session of the Mid-Continent Regional Science Association, St. Louis, (June 3, 1988).

11. Altman, Corporate Financial Distress, pp. 120-124.

12. Chow and Gritta, "Motor Carrier Bankruptcy," pp. 434-440.

13. K. Eric Wolfe, "Financial and Demographic Conditions Associated With Local and Regional Railroad Service Failures," Transportation Quarterly 43 (January 1989), p. 25.

14. Firms were identified by Iowa Department of Transportation personnel as representing a range of carriers, Truckload and Less-than-truckload, from the largest serving the area (United Parcel Service) to small firms, and with varying degrees of financial success.

15. Umthun Trucking Co., Employee Manual, Eagle Grove, Iowa, (1985), p. 1.

16. The questionnaire was prepared through allied but independent research project directed Drs. Michael R. Crum and Benjamin J. Allen. The development of the questionnaire was not funded through the Midwest Transportation Center. The research team of the "The Changing Role of Freight Transportation Modes and Intermodal Freight" greatly appreciate the opportunity to report the results of the preliminary results of Drs. Crum and Allen's findings.

Chapter Six
Trends For Railroad Companies, Services and Facilities

This chapter reports changes in the region's railroad facilities and services, and presents findings made in interviews with management personnel of five railroad companies serving the region. The bankruptcy and sale of the holdings of the Chicago, Rock Island and Pacific Railroad and the Chicago, Milwaukee, St. Paul and Pacific Railroad and the rationalization of the rail systems by individual companies had significant impacts on the structure of the rail system in the region during the 1980s. The Interstate Commerce Commission's (ICC) liberalization of rate making to permit multi-car rates in the 1970s and further pricing and service provision freedoms offered through the Staggers Act have completely revised service and business patterns in the railroad industry.

The first section of this chapter discusses changes to the physical rail network in each state and in the region as a whole. Included is a description of the status of each state's rail financial assistance program. Although Kansas and Missouri have had temporary state financial assistance programs in the past, only Iowa has an established state rail assistance program. The lack of an assistance program to pro-actively manage the rationalization of their rail systems may become a severe problem for Nebraska and Kansas. Both states appear to have excess lines in their rail networks, in comparison to their population and to traffic volumes, and the rail planning organization for each state has predicted that they are each likely to see at least 1,000 miles cut from the states' rail system.

The next section reports on general trends in intermodal transportation services. As reported in Chapter Four, intermodal traffic originating or terminating in the region increased by 138 percent between 1980 and 1987, while intermodal traffic for the entire country increased by 41 percent. In addition, the region is a major conduit for intermodal traffic moving between the East and West Coasts. Clearly, the region's railroads are benefiting from growth of intermodal movements.

The last section reports on interviews with the management of five rail carriers. The purpose of the interviews was to obtain, interpret and report the carriers' perspective on the major issues facing the railroad industry.

State Rail Systems

Iowa Rail System

Changes in the Iowa rail physical plant in the last 10 years have been dramatic. Iowa had two predominant Class I rail carriers cease operation during this period: the Chicago, Rock Island and Pacific Railroad Company (Rock Island) and the Chicago, Milwaukee, St. Paul and Pacific Railroad Company (Milwaukee Road). The roughly 7,000 miles of Rock Island lines[1] that were liquidated created the nation's largest sell-off of lines to other rail companies and line abandonments.[2] The Milwaukee Road was reorganized and the core of its system was sold to the Soo Line Railroad Company (Soo Line).[3] Prior to their liquidation and reorganization, the Rock Island and the Milwaukee Road operated the second and third largest amount of track miles of all Iowa carriers.

Iowa's pre-1980 fifth largest rail carrier (in track miles), the Illinois Central Gulf Railroad Company (Illinois Central Gulf), sold or abandoned all of its Iowa lines. The sell-off of Illinois Central Gulf lines was part of a corporate strategy to reduce the railroad's system from roughly 9,600 miles in the 1970s to a system of 3,000 miles.[4]

Table 6-1 compares the rail carriers and their roadway miles operating in Iowa in 1980 with the carriers and their roadway miles in 1987. The difference is due mostly to the loss of three Class I carriers (although the Milwaukee Road was replaced by the Soo) and the reduction of over 2,000 roadway miles, a loss of roughly 31 percent. Figure 6-1 shows the entire Iowa rail system with the lines of the Class I carriers identified by color codes. Figure 6-2 contains a similar map with the local and regional railroads (Class II and Class III carriers) identified by color codes.[5]

Table 6-1 Iowa Railway Miles -- Changes 1980 to 1987

Railroad	Iowa Rail Mileage* 1980 Roadway Miles	1987 Roadway Miles
Class I Railroads		
C&NW, Includes Des Moines and Central Iowa Railway and Fort Dodge, Des Moines and Southern Railway	2,135	1,861
Rock Island	1,575	Bankrupt
Milwaukee Road	1,341	Liquidated
Burlington Northern	729	633
Soo Line Railroad Co.	0	620
Illinois Central Gulf	585	0
Norfolk & Western R.R.	168	66
Atchison, Topeka and Santa Fe Ry Co.	20	20
Union Pacific	2	2
Class II		
Chicago, Central, & Pacific RR Co.	Not Est.	537
Iowa Interstate Railroad Ltd.	Not Est.	362
Dakota, Minnesota & Eastern RR Co.	Not Est.	(trackage rights)
Class III Railroads		
Iowa Northern Ry Co.	Not Est.	134
Cedar Valley RR Co.	Not Est.	103
Iowa Southern RR Co.	Not Est.	67
Cedar Rapids and Iowa City Ry Co.	25	50
D & I RR Co.	Not Est.	39
Davenport, Rock Island and NW Ry. Co.	35	35
Iowa Terminal Railroad Co.	25	0
Des Moines Union Ry Co.	5	19
Waterloo railroad Co.	12	0
Appanoose County Community RR Co.	Not Est.	10
Iowa Traction RR Co.	Not Est.	6
Ottumwa Terminal RR Co.	Not Est.	4
Keokuk Junction Ry Co.	Not Est.	1
Burlington Junction Ry Co.	Not Est.	<1
Des Moines Terminal Co.	<1	0
Iowa Transfer	<1	0
Total	6,659	4,570

* Carriers that were not established in 1980 are identified at "Not Est."

Source: 1980 Rail Mileages were taken from the Iowa Department of Transportation "1980 Iowa Railroad Analysis Update," prepared by Planning and Research Division in cooperation with the Railroad Division and the Transportation Regulation Board (1980) 1987 Rail Mileages were provide by Rail and Water Division, Iowa Department of Transportation (1989)

The most significant change in the rail system between 1980 and 1987 was the reorganization of the lines previously operated by the Rock Island, the Milwaukee Road, and the Illinois Central Gulf. Figure 6-3 shows Iowa's 1980 Rock Island network. All lines are marked with the current status: either operated by another carrier or abandoned. The 1980 networks are similarly shown for the Milwaukee Road, the Illinois Central Gulf, and the Chicago and North Western Transportation Company (Chicago and North Western), in Figures 6-4, 6-5, and 6-6, respectively. The figures show either their current owner or the current status of the Iowa track.

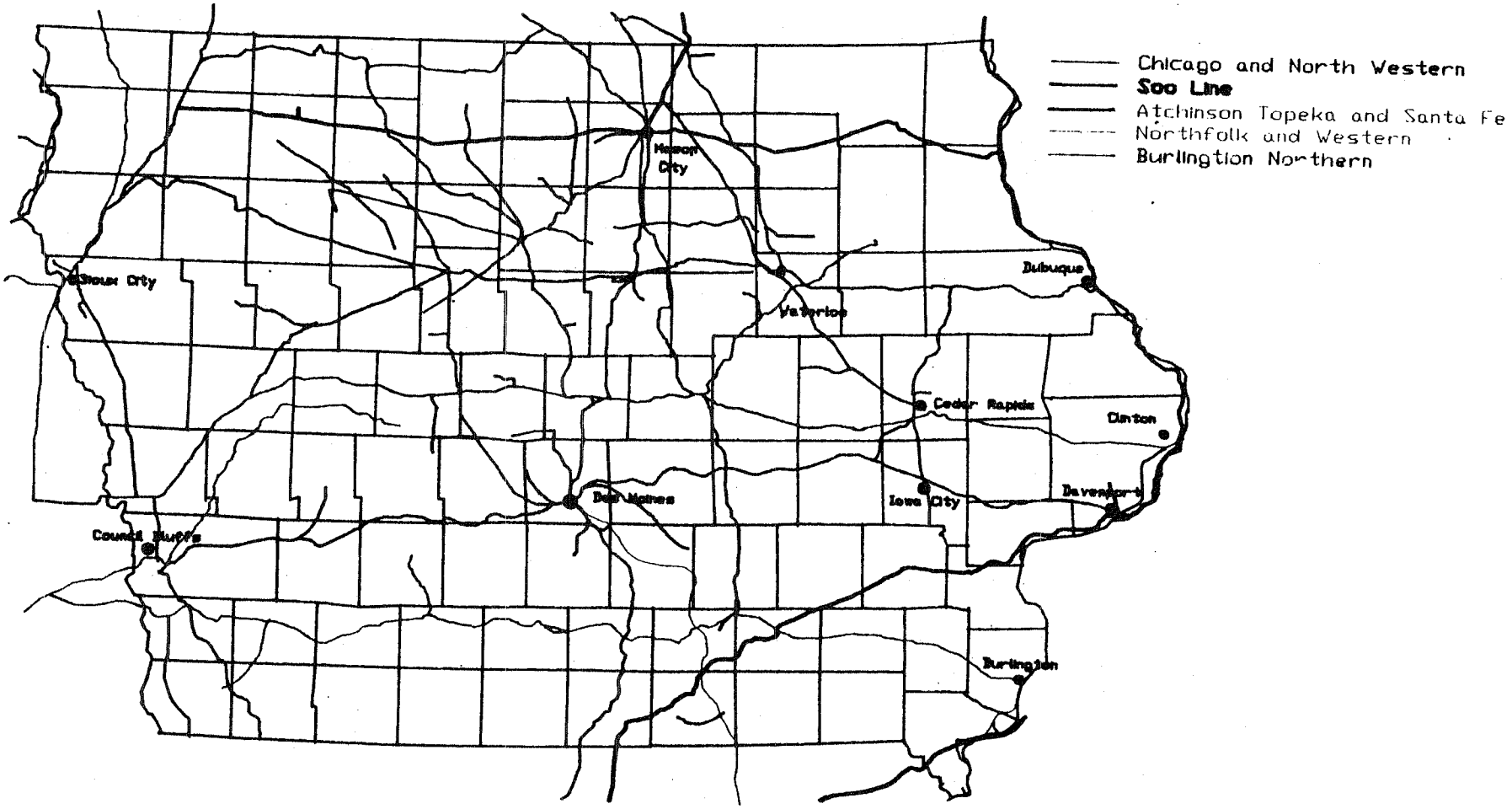


Figure 6-1: Iowa Class I Railroads (Terminal Railroads Not Shown)

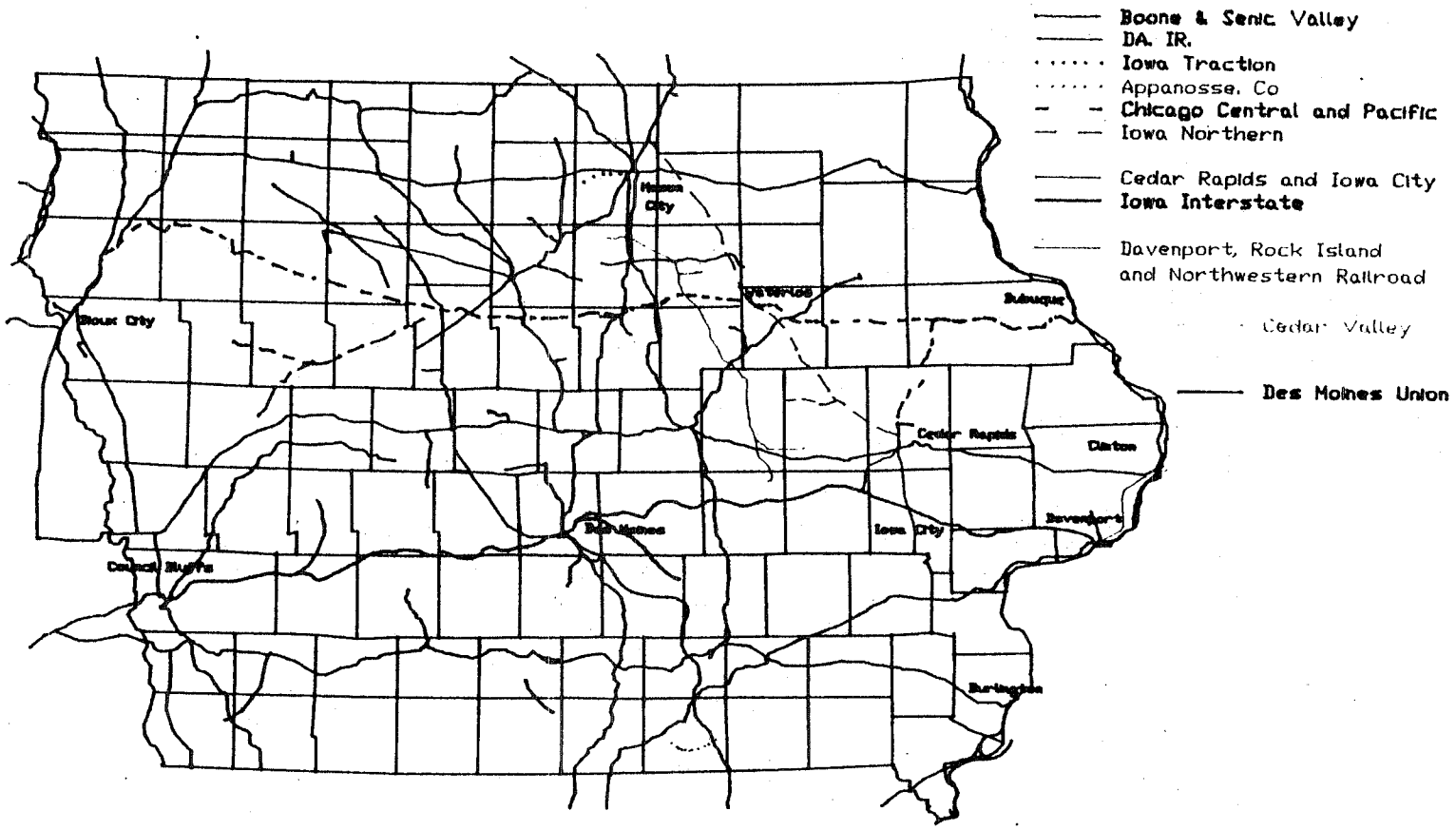


Figure 6-2: Iowa Local and Regional Railroads
(Terminal Railroads not shown)

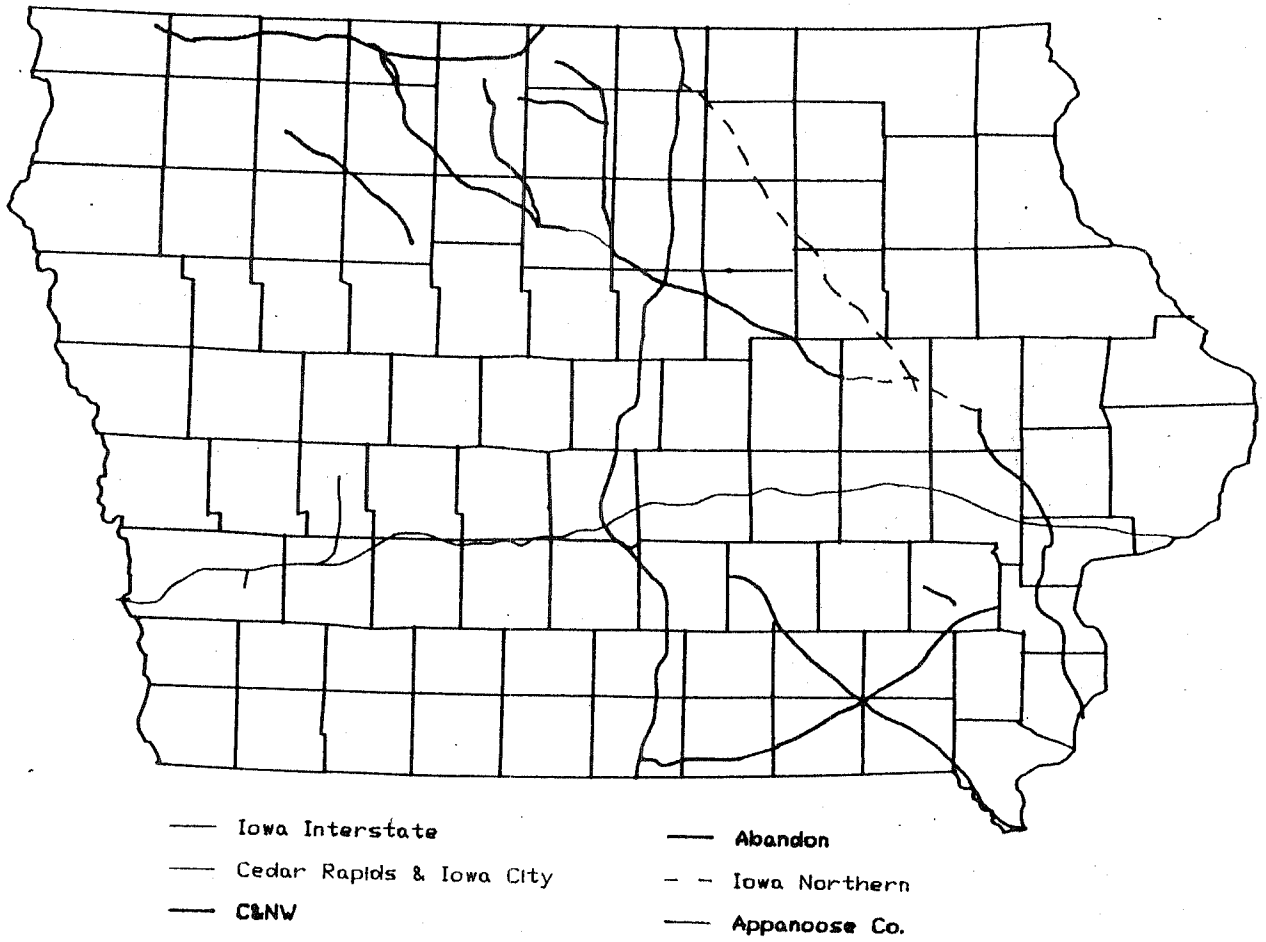


Figure 6-3: Disposition of Chicago, Rock Island and Pacific Railroad Company

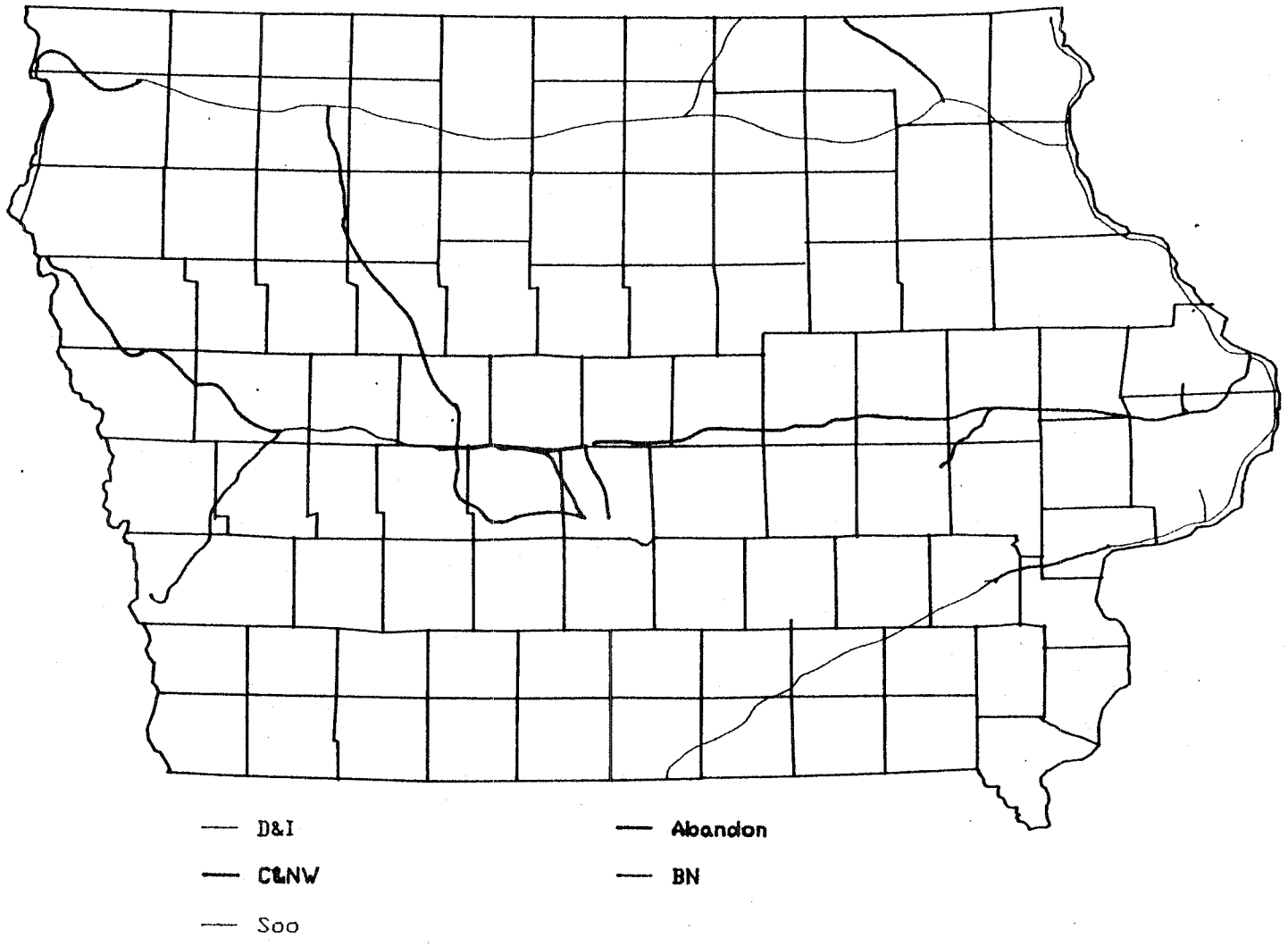


Figure 6-4 Disposition of the Chicago, Milwaukee, St. Paul and Pacific Railroad

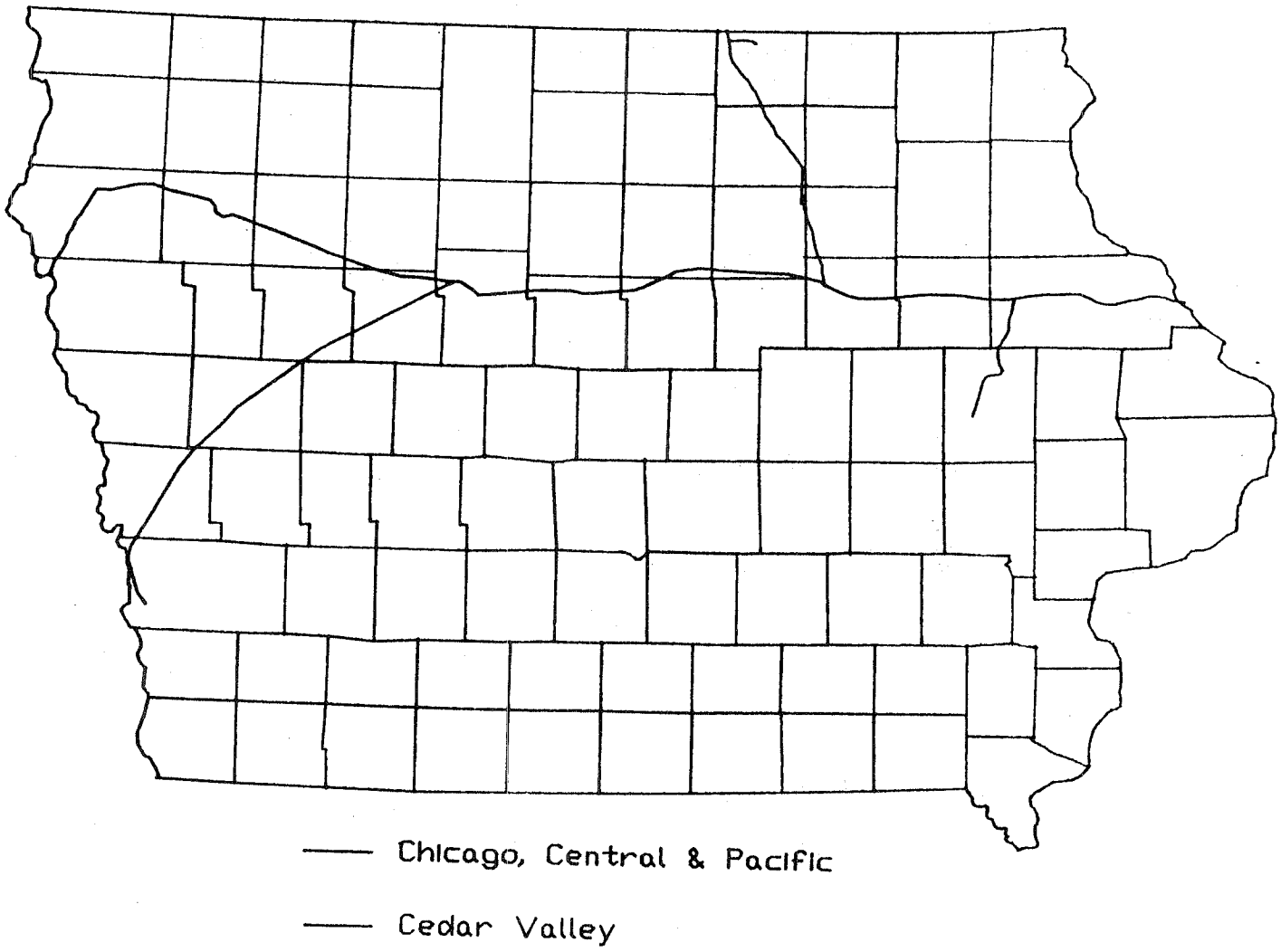


Figure 6-5: Disposition of Illinois Central Gulf Railroad Company

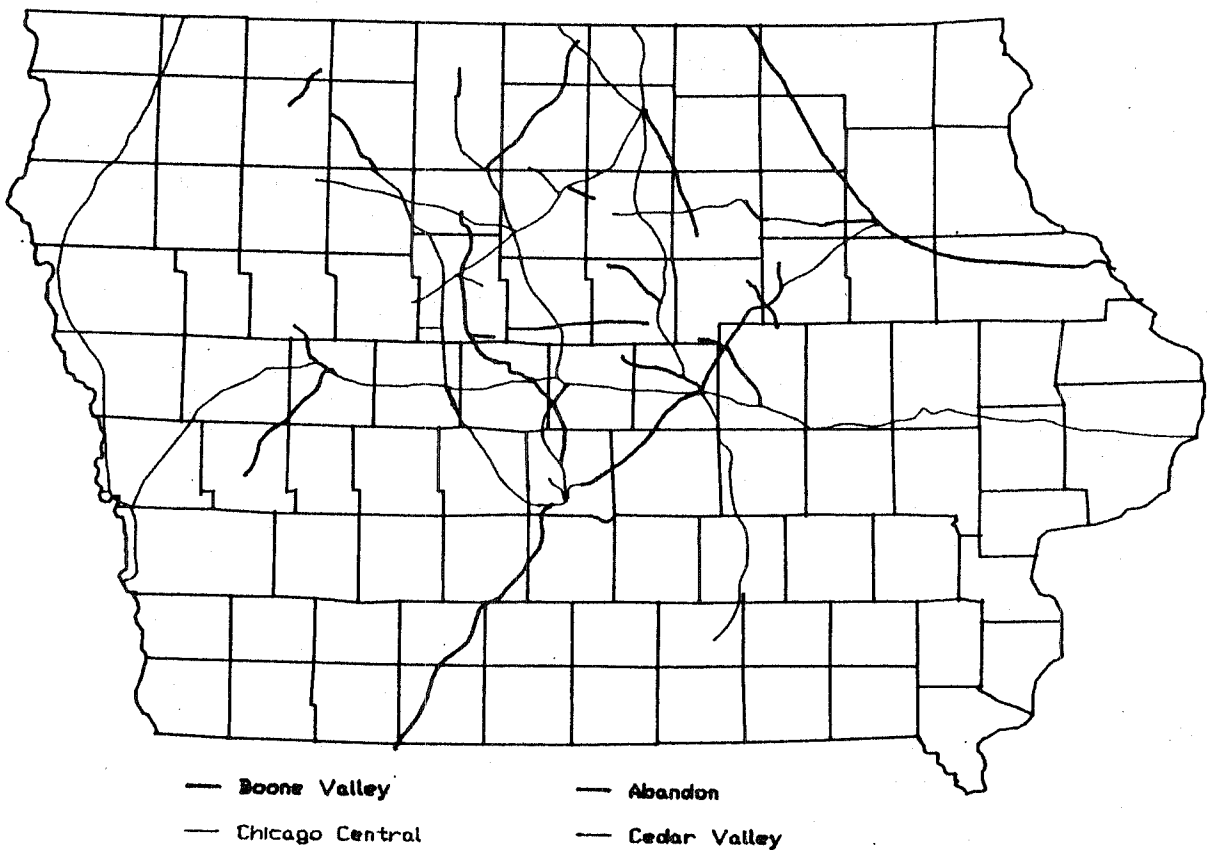


Figure 6-6: Disposition of Chicago and North Western Transportation Company

By reviewing Figures 6-3 through 6-6 it is apparent that a great deal of change has occurred. Portions of the liquidated Rock Island lines are now operated by regional and local railroads. The Iowa Interstate Railroad, LTD. (Iowa Interstate) operates on the Rock Island's Chicago to Omaha line and the Iowa Northern Railway operates on the Rock Island line between Cedar Rapids (connecting with the Chicago and North Western east-west mainline) and Manly (connecting with the Chicago and North Western north-south mainline north of Mason City). Other major portions of Rock Island lines were purchased by the Chicago and North Western to augment its own network. Of particular importance to the Chicago and North Western was its purchase of 720 miles of Rock Island mainline between Minneapolis/St. Paul and Kansas City.[6] Other minor portions of the Rock Island were purchased by the Milwaukee Road (later the Soo Line), the Cedar Rapids and Iowa City Railroad[7], and the Appanoose County Community Railroad.[8] Roughly 1,100 miles of the 1,500 miles of Rock Island's Iowa system are still in use today.[9]

The Chicago and North Western's purchase of the Rock Island mainline from Minneapolis/St. Paul to Kansas City (the Spine Line) was highly contested by the Soo Line.[10] The two carriers had competing bids for the purchase of the line and the Chicago and North Western bid was accepted by the Rock Island trustee, after being approved by the ICC and a Federal Court. The $93 million purchase included the mainline and grain gathering lines in northwestern Iowa. The Spine Line has been productive, with most Iowa portions of the line generating over 10 million tons per mile. The Spine Line is the most direct route between Minneapolis/St. Paul and Kansas City and also provides the Chicago and North Western with a link between Chicago and Kansas City. The Spine Line provides an intermediate link for the most direct route between Minneapolis/St. Paul and the Upper Great Plains, and Gulf ports.

The Chicago and North Western's purchase of the Rock Island's grain gathering lines, its purchase of some minor segments of the Milwaukee Road, and its abandonment of its own duplicative lines improved the efficiency, connectivity, and coverage of the Chicago and North Western's Iowa network.

The Milwaukee Road reorganization resulted in the Soo Lines operating roughly half of Milwaukee Road's original Iowa system. The major portions operated by the Soo are the Milwaukee Road's line across the northern third of Iowa and the line along the Mississippi

River then cuts across to Kansas City at Muscatine.[11] Other minor portions of the Milwaukee Road were purchased by the Cedar Rapids and Iowa City Railroad Company, the Burlington Northern Railroad (Burlington Northern), Chicago and North Western, and the D&I Railroad.[12]

The Soo Line's purchase of the Milwaukee Road was met with strong bidding competition from the Chicago and North Western and the Grand Trunk Western Railroad Company (Grand Trunk).[13] Ultimately, the ICC approved the purchase proposals of the Chicago and North Western and the Soo Line and the trustee accepted the Soo's proposal.[14]

The Illinois Central Gulf's network concentration of its rail system resulted in the sale of all its Iowa holdings (including the Waterloo Railroad Company, a terminal railroad). A regional and a local railroad were spun off in the sale of the Illinois Central Gulf: the Chicago, Central and Pacific Railroad Company (Chicago, Central and Pacific) and the Cedar Valley Railway (Cedar Valley). The Chicago, Central and Pacific operates on the Illinois Central Gulf lines between Sioux City and Omaha and its Omaha to Chicago mainline, with a branch line to Cedar Rapids. In addition, the Chicago, Central and Pacific has purchased a branch line to Ida Grove from the Chicago and North Western. The Cedar Valley operates between Waterloo and north to just over the Minnesota border where it connects with the Chicago and North Western's Minneapolis/St. Paul to Kansas City line.

A central issue in the evolution of Iowa's rail network has been the Chicago to Omaha corridor. In 1980, all five of Iowa's major Class I railroad companies served this corridor. In 1988, only two of the original five (the Chicago and North Western and the Burlington Northern) were still providing service between Chicago and Omaha. The Rock Island and the Illinois Central Gulf lines are now operated by regional rail carriers, the Iowa Interstate Railroad and the Chicago, Central and Pacific, respectively. All of the Milwaukee Road's Iowa line between Chicago and Omaha has been abandoned except about 100 miles east of Omaha purchased by the Burlington Northern and a few short pieces that were bought by the Chicago and North Western. Clearly, even though the status of the corridor was a cause for a great deal of concern, the rail service in the corridor has remained relatively intact.

Financial Assistance Iowa has two financial assistance programs that are partially sponsored by state funds. One, the Iowa Rail Assistance Program, is administered through the Iowa Department of Transportation, and the other, through the Iowa Railway Finance Authority.

The Iowa Rail Assistance Program was initiated in 1974 by the Iowa General Assembly. The legislature initially appropriated $3 million and has contributed roughly $20 million to the program since 1974. The program uses state funds and funds from other sources to provide financial assistance for the rehabilitation of rail lines. The funding pool also includes Federal Railroad Administration Local Rail Assistance Program funds and repayments of loans by shippers and railroads.

The Iowa Rail Assistance Program awards funds for line rehabilitation through a mixture of grants and no-interest loans. The mix of grant versus loan in each project depends on the type of recipient of the funds and the individual project's circumstances. If shippers are the recipient, the project is funded through a no-interest loan and repayment may be based on time repayment or payment on a per car basis. If the loan is to a rail carrier, then a mixture of grant and loan may be used and the proportion of each depends on the circumstances involved in each particular project. Assistance funds are limited to a maximum of 80 percent of the cost of a project. The levels of funding may vary, however, depending on the priority of the project.

A project's priority is based on several factors, including the financial participation in the project by non-governmental organizations, the ability of the line to be financially viable, and the project's benefit-to-cost ratio. Recently, the program adopted a policy of funding small projects that have the potential for generating economic development benefits. These usually involve spur line projects and are to be less than $100,000. The major criteria used for measuring economic development is the creation of new jobs. Projects that create jobs in economic sectors that help to diversify the state's economy (specifically in industries other than agriculture or agriculture-related) are given preference.

Since the beginning of the Iowa Rail Assistance program, 44 projects have been funded at a cost of $125,690,000. The current balance in the pool is about $1.9 million. The pool is kept liquid through repayment of loans. No funds have been appropriated by the state for the program in the last four years and federal funding was discontinued in October, 1988.

The Iowa Railway Finance Authority (IRFA) was created by the Iowa General Assembly in 1980.[15] The purpose of the IRFA was to take an active role in the restructuring of Iowa's rail network in the face of the Rock Island bankruptcy and the Milwaukee Road reorganization. Initially, the IRFA was given the power to enter into partnerships with the

private sector to purchase, improve or operate a rail facility, and the funds were to be provided to the IRFA through a tax on fuel used in railroad locomotives, delinquent tax payments on railroad property, and a railroad mileage tax.

Later, the fuel tax and the railway mileage tax were found by the courts to be unconstitutional. In 1983, the General Assembly made an interest-free loan to the IRFA from the highway use tax and $2.2 million in delinquent property taxes from bankrupt Iowa railroads were deposited in the IRFA's Special Railway Facility Fund. A small amount of revenue was received from locomotive fuel tax from non-common carrier operations. The General Assembly withdrew the fuel tax completely in 1985. From 1985 to the present, the only source of revenue has been the repayment of loans.

The IRFA makes loans available for rehabilitation projects at interest rates below commercial rates. Typically the interest rate is as high as the particular project will bear while remaining financially viable. In the past, most loans bore interest rates of 3 percent, but one loan was as high as 6.9 percent.

Once the Iowa Department of Transportation Commission requests that a specific project be examined as a potential loan candidate, three tests are administered. The first test measures the likely cash flow. If the cash flow is likely to provide a return on investment high enough to attract a commercial loan, then state assistance is inappropriate. If revenues are unlikely to cover costs, then the project is unwarranted. Once the project is found to be between either extreme, a second test is administered.

The second test examines the rate of return on the investment for all investors (the state, shippers, and the carrier). In the calculation of the state's return, all public benefits are taken into account, including the incremental property taxes if rail service continues on the right-of-way and the incremental damage done to highways as a result of increased truck traffic if the railroad ceases to exist. If the rate of return on the investment is not roughly the same for the state and the private sector, the terms are renegotiated to bring the rates of return back into balance. The last test is one of economic efficiency based on a benefit-to-cost ratio.

Intermodal Table 6-2 contains the reported trailer on flat car (TOFC) and container on flat car (COFC) loading sites in Iowa.[16] There was a significant decline in the number of sites between 1980 and 1988. In 1980, there were 37 sites in 22 different locations (cities).

Table 6-2 Iowa Intermodal Loading Facilities in 1980 and 1988

CITY	CARRIER[1]	INTERMODAL SERVICE	YEAR SERVED 1980	1988
Boone	CNW	TOFC	Y	Y
Burlington	BN	TOFC	Y	N
Cedar Rapids	MILW	TOFC	Y	..
Cedar Rapids	CRIP	TOFC	Y	..
Cedar Rapids	CC	TOFC	.	Y
Cedar Rapids	CNW	TOFC	N	Y
Council Bluffs	ICG	TOFC	Y	..
Council Bluffs	CRIP	TOFC	Y	..
Council Bluffs	CNW	TOFC/COFC(88)	Y	Y
Council Bluffs	CC	TOFC/COFC	.	Y
Council Bluffs	IAIS	TOFC	.	Y
Creston	BN	TOFC	Y	N
Davenport	CRIP	TOFC	Y	..
Davenport	SOO	TOFC	.	Y
Des Moines	MILW	TOFC	Y	..
Des Moines	CRIP	TOFC	Y	..
Des Moines	CNW	TOFC/COFC(88)	Y	Y
Des Moines	N&W	TOFC	Y	Y
Dubuque	BN	TOFC	Y	N
Dubuque	MILW	TOFC	Y	..
Dubuque	CC	TOFC	.	Y
Forest City	ICG	TOFC	Y	..
Fort Dodge	ICG	TOFC	Y	..
Fort Dodge	CC	TOFC	.	Y
Fort Madison	ATSF	TOFC	Y	Y
Fort Madison	BN	TOFC	Y	N
Iowa City	CRIP	TOFC	Y	..
Iowa City	IAIS	TOFC	.	Y
Keokuk	BN	TOFC	Y	N
Marion	MILW	TOFC	Y	..
Marshalltown	CNW	TOFC	Y	N
Mason City	MILW	TOFC	Y	..
Mason City	CRIP	TOFC	Y	..
Mucatine	MILW	TOFC	Y	..
Newton	IAIS	TOFC/COFC	.	Y
Ottumwa	BN	TOFC	Y	N
Ottumwa	MILW	TOFC	Y	..
Perry	MILW	TOFC	Y	..
Postville	MILW	TOFC	Y	..
Sioux City	BN	TOFC	Y	N
Sioux City	MILW	TOFC	Y	..
Sioux City	CNW	TOFC	Y	N
Sioux City	ICG	TOFC	Y	..
Sioux City	CC	TOFC	.	Y
Spencer	MILW	TOFC	Y	..
Waterloo	IGC	TOFC	Y	..
Waterloo	CRIP	TOFC	Y	..
Waterloo	CC	TOFC	.	Y

[1] Carrier abbreviations are: BN-Burlington Northern; CNW-Chicago and North Western; MILW-Chicago, Milwaukee, St. Paul and Pacific; CC-Chicago, Central and Pacific; CRIP-Chicago, Rock Island and Pacific; IAIS-Iowa Interstate; SOO-Soo Line; N&W-Norfolk and Western; ICG-Illinois Central Gulf.

. Railroad was not established in 1980.

.. Railroad was not in operation in 1988.

In 1988, there were only 15 sites in 12 different locations. Also, the competition for service at specific locations declined. In 1980, nine locations were served by two or more carriers, Des Moines was served by three, and Council Bluffs and Sioux City were served by four

carriers. In 1988, only three cities -- Cedar Rapids, Council Bluffs, and Des Moines -- were served by two carriers. Several cities lost service from all carriers including Burlington, Creston, Forest City, Keokuk, Marion, Marshalltown, Mason City, Muscatine, Ottumwa, Perry, Postville, and Spencer. Most notably, the Burlington Northern closed all of its TOFC ramps in Iowa during this period.

Kansas Rail System

The Kansas rail network remained relatively intact during the 1980s. In 1980, there were 7,368 miles of track and in 1988 there were 6,896 miles. The total route miles are listed in Table 6-3. Figure 6-7 contains a map highlighting Kansas' Class I railroads and Figure 6-8 highlights Kansas' Local and Regional carriers.

The Kansas rail system is dominated by two carriers. The Union Pacific System (Union Pacific), including the Union Pacific Railroad, Missouri Pacific Railroad, Missouri-Kansas-Texas Railroad Co. and Oklahoma-Kansas-Texas Railroad Co., accounts for 44 percent of the total track miles. The Atichison, Topeka and Santa Fe Railway Co. (Santa Fe) accounts for 37 percent. Together, the Santa Fe and the Union Pacific haul about 90 percent of the traffic originating or terminating in Kansas.

Before the liquidation of the Rock Island, Kansas had almost 1,000 miles of Rock Island track. About 85 percent of the mileage operated by the Rock Island is still being utilized by three railroads: the Kyle Railroad Co. (a regional operator), the Oklahoma-Kansas-Texas Railroad Co. (part of the Union Pacific System), and the St. Louis Southwestern Railway Company (a subsidiary of the Southern Pacific Transportation Company).

The portion operated by the Kyle Railroad Co. (Kyle) is owned by the Mid-States Port Authority (the Port Authority). The Port Authority purchased the Rock Island line running from Fairway, Nebraska (south of Lincoln), south to Kansas and across the northern part of Kansas to Limon, Colorado. The Port Authority was created by the Kansas legislature to restore the line and operate rail service. Members of the Port Authority include representatives from the 14 counties across northern Kansas (one county has dropped out). The Port Authority acquired about 320 miles of track in Kansas.

The Port Authority acquired a loan from the Federal Railroad Administration to purchase and restore the line. The State of Kansas provided a partial guarantee for the loan.

Table 6-3 Kansas Railway Miles -- Change From 1979 to 1988

Railroad	Kansas Rail Mileage* 1979 Track Miles	1988 Track Miles
Class I Railroads		
Atchison, Topeka, and Santa Fe	2,553	2,480
Burlington Northern	208	596
Chicago, North Western	1	0
Chicago, Rock Island and Pacific	984	(Bankrupt)
Kansas City Southern Industries	26	26
Missouri-Kansas-Texas	220	192
Missouri Pacific	1,821	(Merged With UP)
Oklahoma-Kansas-Texas	Not Est.	150
St. Louis-San Francisco	527	(Merged With BN)
St Louis Southwestern	0	348
Union Pacific	991	2,590
Class III Railroads		
Dodge City, Ford and Bucklin	Not Est.	25
Garden City Western	14	14
Hutchinson and Northern Railway	5	5
Johnson County Industrial Airport railway	4	4
Kansas and Missouri Railway and Terminal Co.	2	2
Kansas City Terminal	10	11
Kyle	0	336
Midland Railway (tourist train)	Not Est.	11
Southeast Kansas	Not Est.	104
Wichita Union Terminal	2	2
Total Mileage	7,368	6,896

* Carriers that were not established in 1980 are identified as "Not Est."

Source: 1979 Rail Mileages were taken from the Kansas Department of Transportation, "1982 Kansas State Rail Plan" (1982)
1988 Rail Mileages were taken from the Kansas Department of Transportation, "1988 Kansas State Rail Plan Update" (1988)

In case the Port Authority defaults, the state is liable for half the balance. The line in Kansas is currently operated by the Kyle Railroad under a lease-purchase arrangement. The line in Nebraska is no longer connected to the Kansas portion due to the abandonment of a segment; service on the remaining Nebraska segment is provided by the Union Pacific under a lease agreement.

The Saint Louis Southwestern Railway Company (St. Louis Southwestern) purchased the Rock Island line running from Tucumcari, New Mexico, through Liberal, Kansas, to Topeka, Kansas (the Golden State Route). This linked Kansas with the Southern Pacific Transportation Company's (Southern Pacific) line to the West Coast through El Paso, Texas. The purchased track includes 373 miles within Kansas.

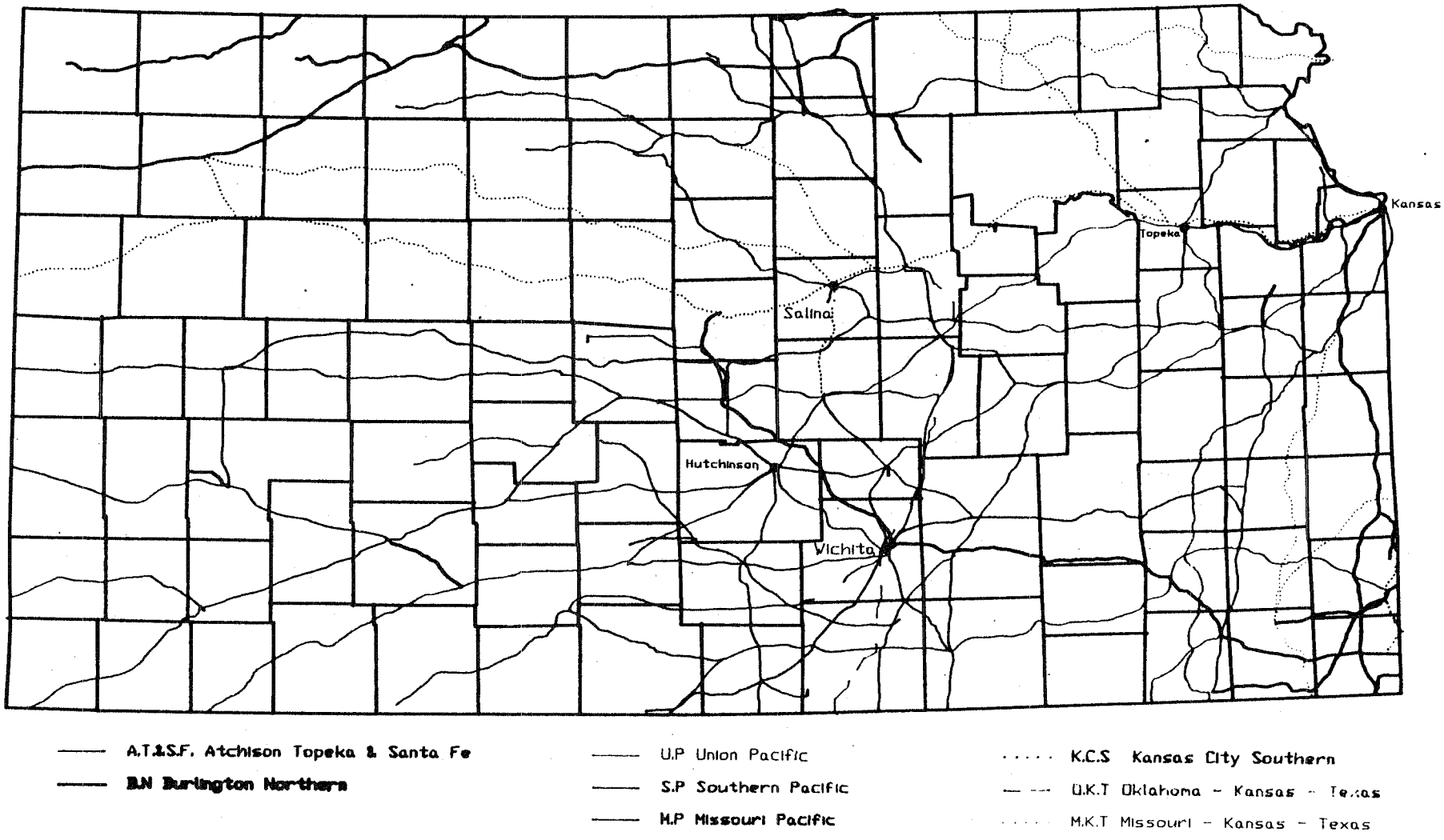


Figure 6-7: Kansas Class I Railroads (Terminal Railroads Not Shown)

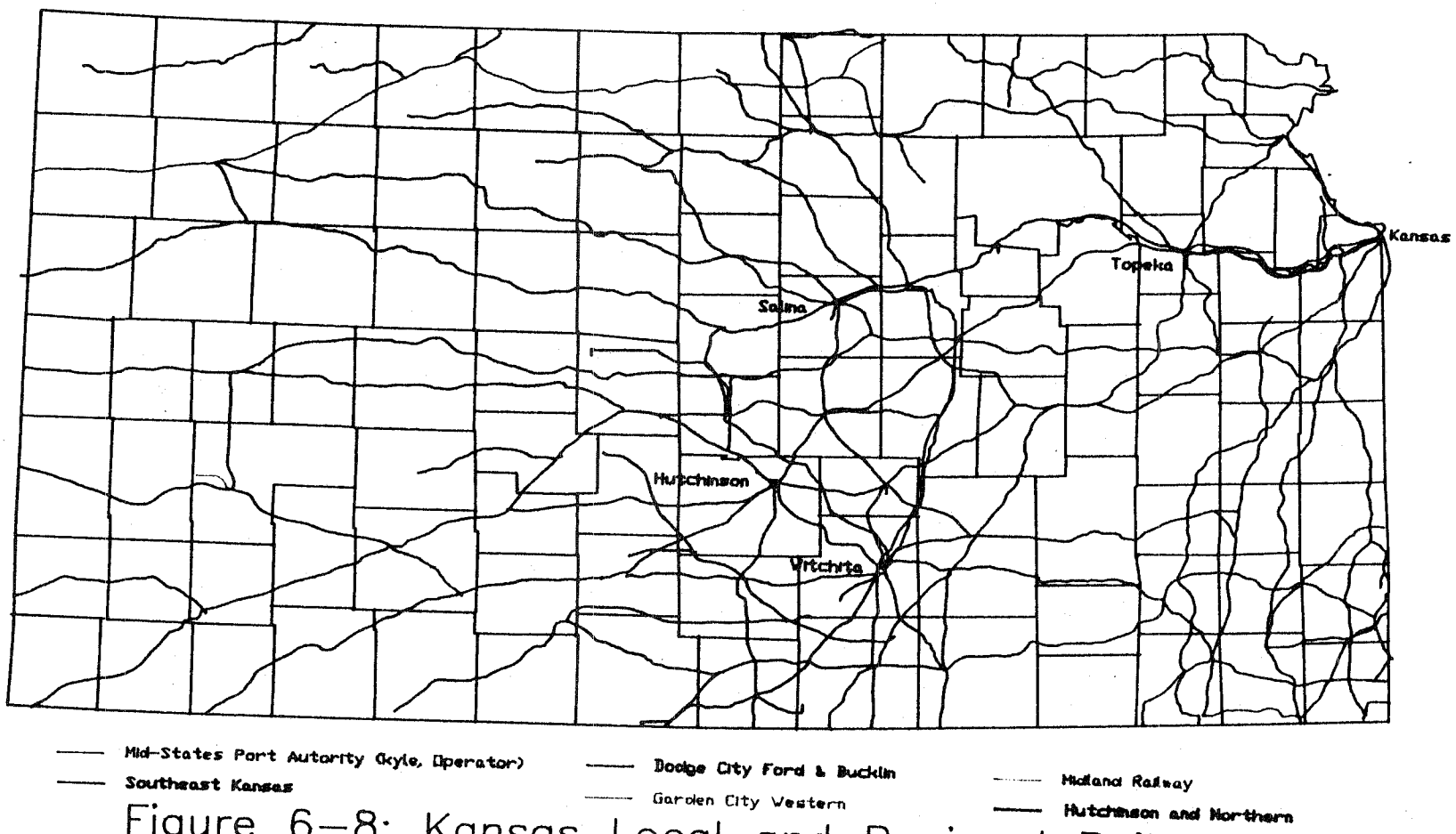


Figure 6–8: Kansas Local and Regional Railroads
(Terminal Railroads Not Shown)

This purchase provides the Southern Pacific with its deepest penetration into the upper Midwest (the St. Louis Southwestern originally served St. Louis, entering Missouri along the Mississippi River).[17] The St. Louis Southwestern has trackage rights on the Union Pacific line from Topeka to Kansas City, Missouri. From Kansas City east to St. Louis, the St. Louis Southwestern purchased the Rock Island's line across Missouri. The link between Tucumcari, New Mexico, and St. Louis provides the Southern Pacific system with a large circle of mainlines with the line from El Paso, Texas, through Kansas on the top of the circle and the original lines running south from St. Louis through San Antonio, Texas, to El Paso on the bottom.

The last portion of Rock Island track salvaged is the line running from Abilene, Kansas, through Wichita, Kansas, and south across Oklahoma to Fort Worth and Dallas, Texas.[18] The purchase of the line was arranged through the Oklahoma-Kansas-Texas Users Association. The Users Association, with the use of a Federal Railroad Administration loan, purchased about 150 miles of the line in Kansas and about 110 miles in Texas. The State of Kansas partially guaranteed the loan to purchase the Kansas portion of the line in a manner similar to its Mid-States Port Authority guarantee. The State of Oklahoma purchased 351 miles of the line in that state. The Oklahoma-Kansas-Texas Railroad, a subsidiary of the Missouri-Kansas-Texas Railroad, operates the line under a lease-purchase agreement. The Missouri-Kansas-Texas Railroad is now part of the Union Pacific.

Roughly 150 miles of additional Rock Island track was abandoned. The abandoned track includes the line from Topeka northeast to St. Joseph, Missouri.

In 1980, the Burlington Northern operated only three branch lines in Kansas. All three branched from its southern Nebraska east-west mainline. In 1980, the Burlington Northern's merger with the St. Louis-San Francisco Railway was approved. The St. Louis-San Francisco Railway owned lines in Kansas running from Kansas City south and from Ellsworth in central Kansas to the southeastern border with Missouri.

The other major railroad spinoff is the Southeast Kansas Railroad (Southeast Kansas). The Southeast Kansas purchased, from the Union Pacific, the Missouri Pacific line running from Coffeyville, Kansas, to Nevada, Missouri. A railcar repair company, located in Pittsburg, Kansas, (roughly in the middle of the line) owns and operates the railroad. The Southeast

Kansas has connections with five Class I carriers (Kansas City Southern, Missouri-Kansas-Texas, Santa Fe, Burlington Northern, and Union Pacific).

There are three Class I railroads that have trackage rights in Kansas but own no track. The Norfolk and Western Railway Co. (Northfolk and Western) operates over two miles of Santa Fe track from the Missouri state line into Kansas City to a Santa Fe yard. The Soo Line operates on approximately seven miles of track in the Kansas City area. The Denver, Rio Grande and Western Railroad purchased track rights from the Union Pacific over a Missouri Pacific line; the line runs from Pueblo, Colorado, to Kansas City.[19] Approximately 445 miles are in Kansas.

Although Kansas has lost only about 7 percent of its rail system miles since 1980, the Kansas Department of Transportation Rail Plan concludes that, given existing conditions, roughly an additional 1,000 miles of railway are likely to be abandoned during the next few years.[20] All the lines that are likely to be abandoned in the near future, however, are segments of less than 70 miles and all provide service parallel to financially stable lines.

Financial Assistance Prior to 1980, the State of Kansas was prohibited from participating in the improvement of facilities other than those dealing with highways and water resources. In 1980, the Kansas constitution was amended by a public vote to allow the state to become directly involved in the subsidizing, operations, construction, or maintenance of railroads or their facilities.[21] The current policy is tied to federal assistance to rail carriers, however, by stating, ". . . contributing any state funds appropriated in accordance with law for such purpose in any amount not exceeding the amount received from the Federal Government for such improvements."[22] In other words, the state can only contribute funds when they are matched by an equal amount or more of federal funds. Because the Federal Railroad Administration's local assistance program was phased out of existence, there are now no federal funds for rail line assistance and implicitly no rail assistance funds from the state.

Intermodal The location and number of intermodal loading and unloading facilities are shown in Table 6-4.[23] In 1980, there were 36 intermodal loading facilities; 26 locations had one or more intermodal loading facilities. In 1988, there were nine intermodal loading facilities serving only six locations. In 1980, there were 20 locations served by one facility; Salina, Coffeyville, and Winfield were served by two intermodal facilities of two railroads; Kansas City, Kansas, and Wichita each had intermodal facilities of three railroads; and Topeka

was served by intermodal loading facilities of four railroads. In 1988, four cities were served by one intermodal loading facility; Wichita was served by two railroads' intermodal loading facilities; and Kansas City, Kansas, was served by three railroads' intermodal facilities.

Missouri Rail System

Over the last 10 years, the Missouri rail system has experienced a number of ownership changes through mergers, the purchase of lines from bankrupt carriers by other railroad companies, and through abandonment of light-density lines. Missouri, more than any of the other states in the region, has been affected by changes in rail line ownership. For example, two Missouri mainlines are currently (1989) being reviewed by the ICC for purchase by their third owner in the last five years. Maps highlighting Missouri's Class I carriers, and Local and Regional carriers are included in Figures 6-9 and 6-10.

Missouri was affected very little by the bankruptcy of the Rock Island and the reorganization of the Milwaukee Road. The Rock Island operated two mainlines in Missouri: the southern portion of the Spine Line (the line from Minneapolis/St. Paul to Kansas City) and the eastern portion of the Golden State Route (the line between Tucumcari, New Mexico, and St. Louis). The Spine Line was part of the Chicago and North Western purchase and the line has been rehabilitated. The Golden State Route was purchased by the St. Louis Southwestern (a subsidiary of the Southern Pacific Transportation Company) which has since rehabilitated the entire line except the Missouri portion linking Kansas City and St. Louis. The St. Louis Southwestern provides only local service along portions of the Kansas City and St. Louis line and has trackage rights for through traffic on the Missouri Pacific line between Kansas City and St. Louis.

Table 6-4 Kansas Intermodal Loading Facilities in 1980 and 1988

CITY	CARRIER[1]	INTERMODAL SERVICE	YEAR SERVED 1980	1988
Abilene	ATSF	TOFC	Y	N
Arkansas City	ATSF	TOFC	Y	N
Chanute	ATSF	TOFC	Y	N
Coffeyville	MP	TOFC	Y	N
Coffeyville	ATSF	TOFC	Y	N
Dodge City	ATSF	TOFC	Y	N
Emporia	ATSF	TOFC	Y	Y
Garden City	ATSF	TOFC	Y	N
Great Bend	ATSF	TOFC	Y	N
Hays	UP	TOFC	Y	N
Hutchinson	ATSF	TOFC	Y	N
Junction City	UP	TOFC	Y	N
Kansas City	CRIP	TOFC	Y	N
Kansas City	ATSF	TOFC/COFC	Y	Y
Kansas City	UP	TOFC/COFC	Y	N
Kansas City	SLSW	TOFC	N	Y
Kansas City	SP	TOFC	N	Y
Kansas City	MKT	TOFC/COFC(88)	Y	Y
Lawrence	ATSF	TOFC	Y	N
Liberal	CRIP	TOFC	Y	**
McPherson	ATSF	TOFC	Y	N
Neodesha	MP	TOFC	Y	*
Newton	ATSF	TOFC	Y	Y
Ottawa	ATSF	TOFC	Y	N
Parsons	MKT	TOFC	Y	Y
Pittsburg	ATSF	TOFC	Y	N
Pratt	ATSF	TOFC	Y	N
Salina	ATSF	TOFC	Y	N
Salina	MP	TOFC	Y	*
Topeka	UP	TOFC	Y	Y
Topeka	ATSF	TOFC	Y	N
Topeka	MP	TOFC	Y	*
Topeka	CRIP	TOFC	Y	**
Wellington	ATSF	TOFC	Y	N
Wichita	CRIP	TOFC/COFC	Y	*
Wichita	MKT(OKT)	TOFC/COFC	***	Y
Wichita	SLSF	TOFC	****	Y
Wichita	MP	TOFC/COFC	Y	*
Wichita	ATSF	TOFC/COFC(88)	Y	Y
Winfield	MP	TOFC	Y	*
Winfield	ATSF	TOFC	Y	N

[1] Carrier abbreviations are: ATSF-The Atchison, Topeka and Santa Fe Railway; CRIP-Chicago, Rock Island and Pacific; MKT-Missouri-Kansas-Texas Railroad Co.; MP-Missouri Pacific Railroad Co.; OKT-Oklahoma-Kansas-Texas Railroad Co.; SLSF-St. Louis-San Francisco Railway Co.; SLSW-St. Louis Southwestern Railway Co.; SP-Southern Pacific Transportation Company; UP-Union Pacific Railroad.

* The Missouri Pacific merged with the Union Pacific and Western Pacific Railroads and is now part of the Union Pacific System.

** Railroad is no longer in operation.

*** Railroad did not exist in 1980.

**** Railroad did not serve this location in 1980.

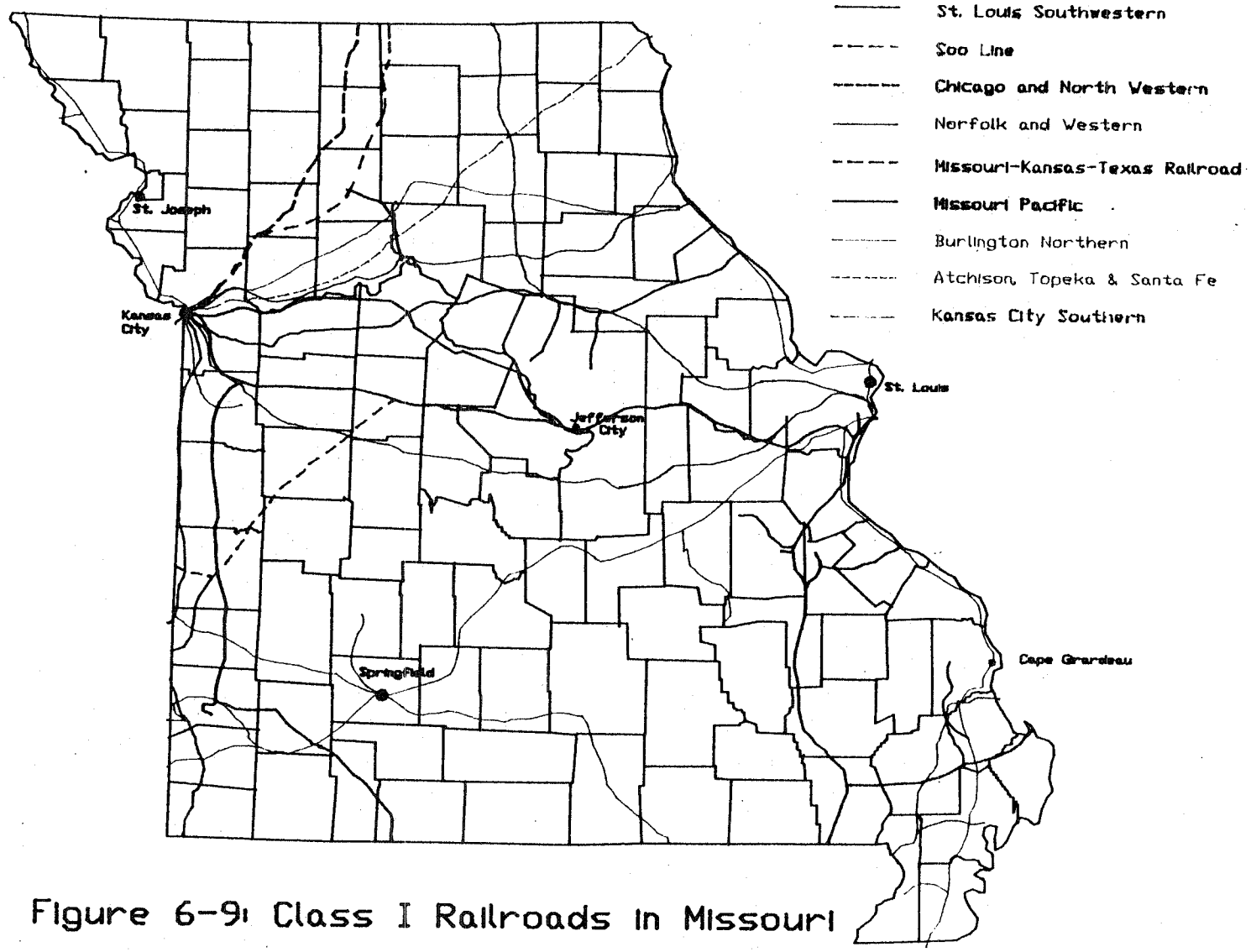


Figure 6-9: Class I Railroads in Missouri
(Terminal Railroads Not Shown)

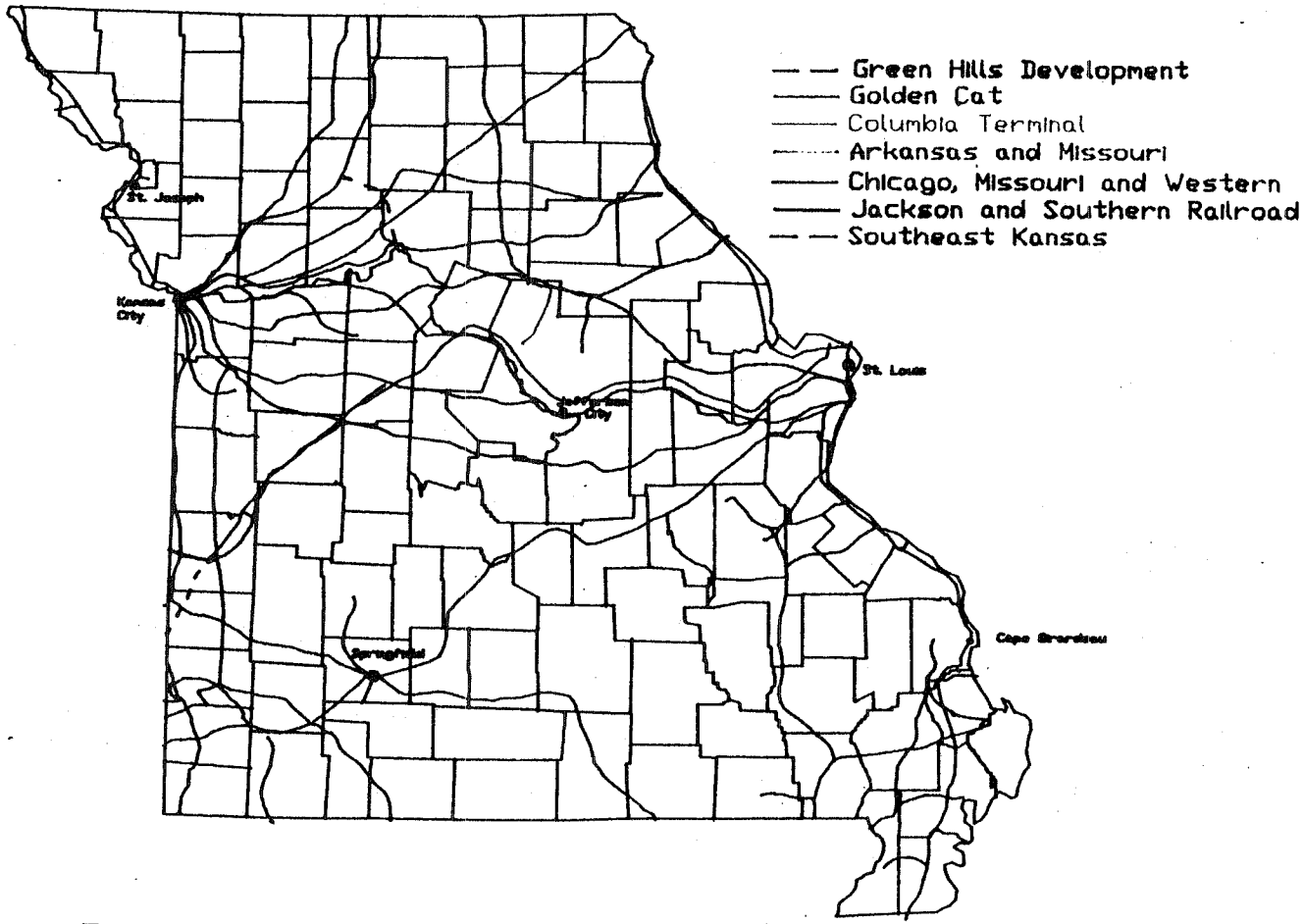


Figure 6-10: Missouri Local and Regional Railroads
(Terminal Railroads Not Shown)

The Milwaukee Road mainline from Kansas City, angling northeast across the southeastern quarter of Iowa and across northern Illinois to Chicago, was part of the reorganized Milwaukee Road system that was sold to the Soo Line Railroad Company. Rio Grande Industries (the parent company of the Southern Pacific Transportation Company) has reached an agreement with the Soo Line to purchase the line. Under the agreement, the Soo Line would retain trackage rights. The proposed agreement is under review by the ICC.[24] The Illinois Central Gulf line from Kansas City west to the Mississippi River at Louisiana, Missouri, and north to Chicago through Springfield, Illinois, and south from Springfield into East St. Louis was purchased by the Chicago South Shore and South Bend Railroad in 1986.[25] In 1987, the line started operating as the Chicago, Missouri and Western Railroad. Less than one year later it filed for bankruptcy.[26] The Southern Pacific has offered to purchase the East St. Louis to Chicago portion of the line and the agreement is subject to review by the ICC.[27] The East St. Louis to Chicago link would provide access to the Chicago gateway for freight generated in Texas, Louisiana, and Arkansas on the St. Louis Southwestern. The Chicago, Missouri and Western bankruptcy trustee is expected to retain the line from Kansas City across Missouri and south through Illinois into East St. Louis.

The 1979 and current Missouri railroad mileages are shown in Table 6-5.[28] Missouri lost about one-fourth of its rail mileage over this period. None of the lost miles, however, are attributable to the bankruptcy of the Rock Island, the reorganization of the Milwaukee Road, or the Illinois Central Gulf's sale of its lines. The loss was predominately due to the sell-off or abandonment of light-density lines and branch lines by the Burlington Northern, the Union Pacific, and the Norfolk and Western.

In the early 1980s, the Norfolk and Western operated on a line that runs 156 miles northwest from Brunswick (branching off of the Norfolk and Western's Kansas City to St. Louis mainline) to the Iowa border.[29] The line continued north in Iowa to Council Bluffs. The line was owned by the Wabash Railway Company (the Wabash). In 1984 the ICC authorized the abandonment of the line by the Wabash and the discontinuance of operation by the Norfolk and Western. Shortly after, the Northern Missouri Railroad began operation on the line under a lease-purchase agreement. The Iowa portion is operated under a lease-purchase agreement by the Iowa Southern Railroad.

Table 6-5 Missouri Railway Miles -- Changes From 1980 to 1987

Railroad	Missouri Rail Mileage* 1979 Roadway Miles	1989 Roadway Miles
Class I Railroads		
Atchison, Topeka and Santa Fe	220	220
Burlington Northern	1,054	1,587
Milwaukee Road	135	Bankrupt
Chicago and North Western	82	122
Denver and Rio Grande Western	0	20
Rock Island	509	Bankrupt
Illinois Central Gulf	231	0
Kansas City Southern	195	195
Missouri-Kansas-Texas	340	(Merged with UP)
Missouri Pacific	1,352	(Merged with UP)
Norfolk & Western	613	443
St. Louis - San Francisco	1,144	(Merged with BN)
St. Louis Southwestern	193	384
Soo Line	0	135
Union Pacific Systems (includes MP and MKT)	1	1,155
Class II		
Chicago, Missouri & Western	Not Est.	231
Class III Railroads		
Arkansas and Missouri	Not Est.	32
Bevier and Southern	10	0
Columbia Terminal	Not Est.	22
Golden Cat	Not Est.	11
Green Hills	Not Est.	37
Jackson Industrial	Not Est.	18
Illinois Terminal	2	0
Kansas City Public Service	9	0
Kansas City Terminal	7	7
Manufacturer's Railway	2	25
St. Joseph Belt	5	0
St. Joseph Terminal	<1	<1
Southeastern Kansas	Not Est.	32
Terminal Railroad of St. Louis	Not Est.	17
Terminal Railroad Association	23	0
Union Terminal	4	0
Total Mileage	6,132	4,694

* Carriers that were not established in 1979 are identified as "Not Est."

Source: 1979 Rail Mileages were taken from Missouri Highway and Transportation Department, "Missouri Rail Plan: 1980 Update" (1980)
1989 Rail Mileages were provided by Rail Planning, Missouri Highway and Transportation Department (1989)

Due to financial difficulties, partially caused by flooding that knocked two bridges out of commission, the Northern Missouri Railroad was unable to generate its lease payments. The Norfolk and Western sold about 40 miles of the line's southern end from Brunswick to Chillichothe to Green Hills Development, Inc. In 1987, the Northern Missouri Railroad ceased operation on the remainder of the line.

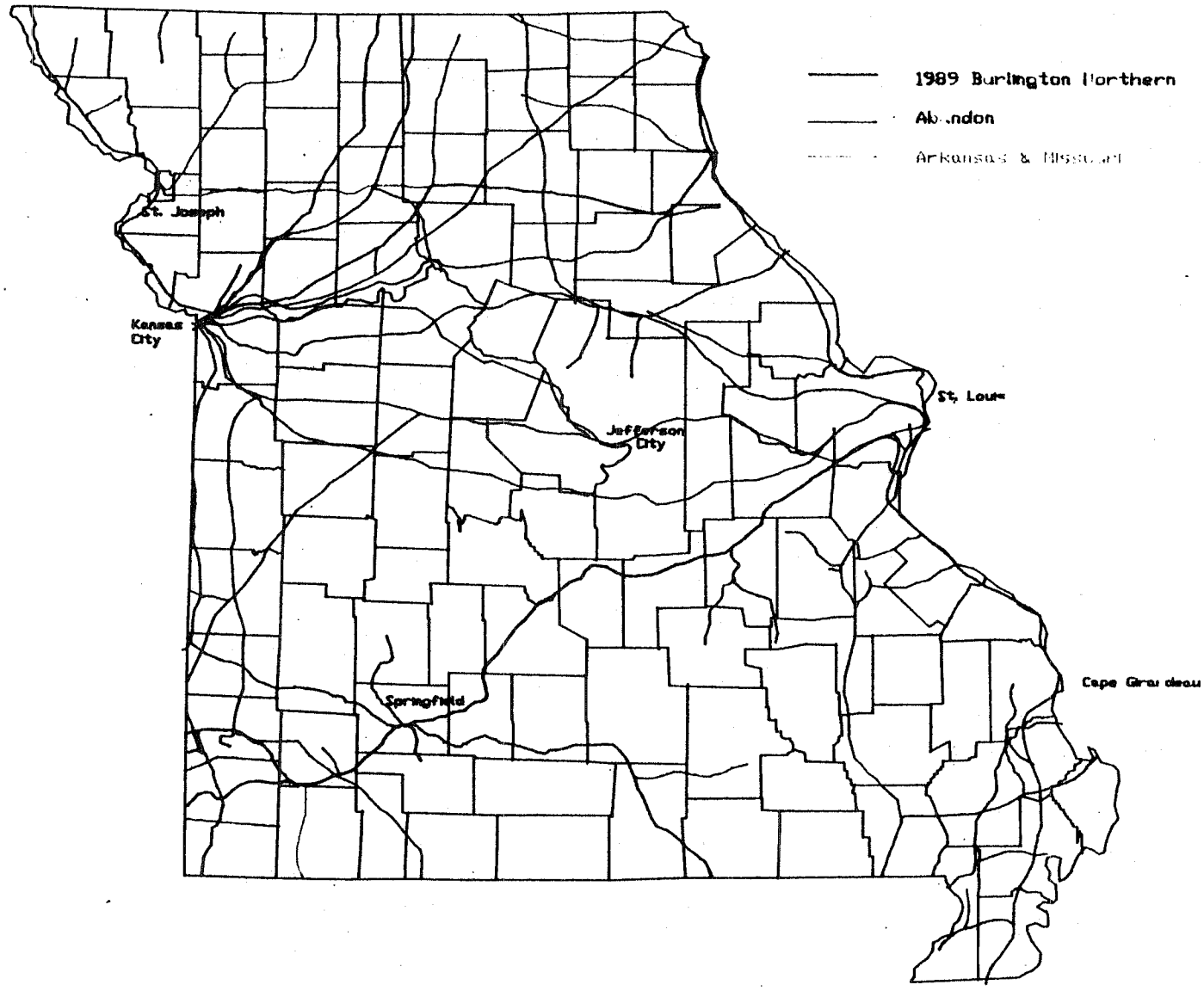


Figure 6-11: Disposition of Burlington Northern and St. Louis - San Francisco Rail Systems

The Norfolk and Western line to Columbia, branching off of the east-west main line at Centralia, was spunoff into a shortline. The Columbia Terminal is a 22-mile shortline owned and operated by the City of Columbia.

The combined 1979 Missouri rail networks of the Burlington Northern and the St. Louis-San Francisco railroads are shown in Figure 6-11. The two railroads merged in 1980 under the Burlington Northern name. All of Burlington Northern's branchlines in northern Missouri have been abandoned. In total, Burlington Northern abandoned 579 miles of track and was able to spinoff 32 miles in Missouri and 107 miles in Arkansas to the Arkansas and Missouri Railroad.

The northwestern portion of Missouri (north of Kansas City and between the Missouri River and Interstate 35) was critically affected by the Burlington Northern abandonments. The Burlington Northern's abandonments of branchlines, in combination with the abandonment of the Norfolk and Western line (subsequently operated by the Northern Missouri) and abandonment of a Chicago and North Western line south from Iowa into St. Joseph, have left the entire northwestern portion of the state without rail service.

The combined Union Pacific system is shown in Figure 6-12. In 1979, the Union Pacific operated only one mile in Missouri where one of its lines terminated in St. Joseph. The Union Pacific in 1982 merged with the Missouri Pacific and the Western Pacific, and later, in 1988, it merged with the Missouri-Kansas-Texas Railroad to create the present Union Pacific.[30] The change between 1979 and 1989 in the railway mileage of the current members of the Union Pacific system is 537 miles. Four hundred seventy-six miles were abandoned and 61 miles were spunoff into shortline railroads.

In the mid-1980s, 29 miles of Missouri Pacific branchlines in the southeastern portion of the state were spunoff into shortlines, the Jackson and Southern Railroad (18 miles) and the Golden Cat Railroad (11 miles). The Missouri Pacific line from Nevada, Missouri, to Coffeyville, Kansas, was spunoff into a shortline, Southeastern Kansas Railroad.[31] Thirty-two miles of the Southeastern Kansas Railroad are in Missouri and 72 miles are in Kansas.

Financial Assistance The Missouri State Rail Preservation Act specifically prohibits the use of state funds, property, or credit to assist in the funding of rail assistance programs. In a public referendum, however, Missouri voters authorized the issuance of $600,000,000 of

state bonds. The main purpose of the referendum, the "Third State Building Fund," was to assist projects that would encourage economic development.

Rail-related funds appropriated from the Third State Building Fund were administered through the Missouri Rail Facility Improvement Authority. The funds were granted to three organizations. The City of West Plains received funds to build an industrial spur. The Jackson and Southern shortline received funds to rehabilitate its line. The Green Hills Development, Inc. received funds to buy the track for its shortline from the Wabash Railway Company. The Third State Building Fund was a one-time funding source that has been depleted. Without changing the law or without another public referendum, Missouri has no mechanism to provide further financial assistance.

Intermodal In Table 6-6 are the intermodal loading sites reported in Missouri during 1980 and 1988.[32] Also included are the facilities of carriers that operate in Missouri but have their St. Louis area operation on the Illinois side of the Mississippi River. In 1980, there were 39 intermodal loading and unloading facilities in 18 cities. Eleven locations were served by one railroad, four cities by two railroads, one city (St. Joseph) was served by three railroads. Kansas City, Missouri was served by six and St. Louis was served by eight railroads.

In 1988, there were 14 intermodal facilities located in three Missouri urban areas. The Burlington Northern has a hub in Springfield, six loading and unloading facilities are located in Kansas City, and seven are in St. Louis.

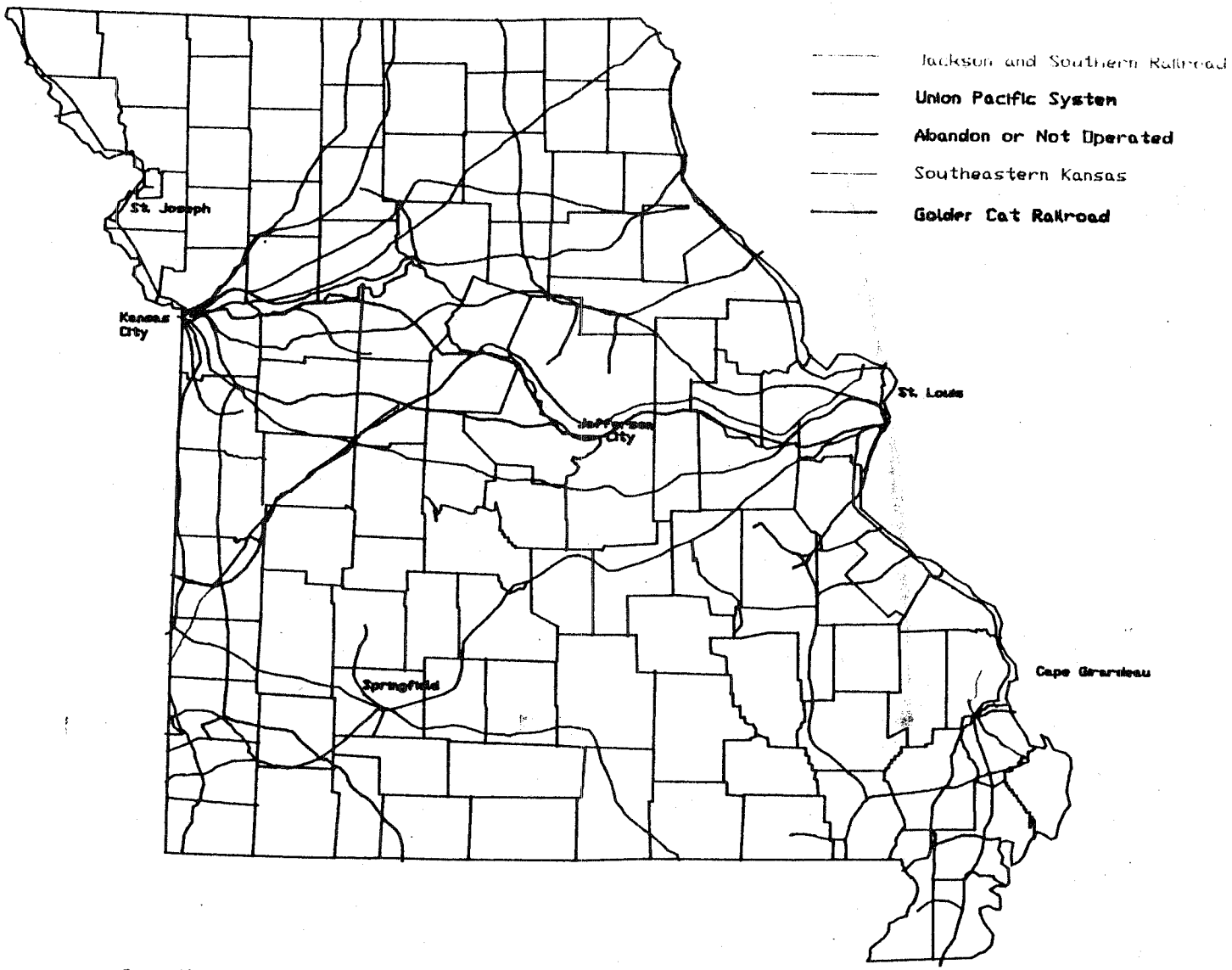


Figure 6-12: Disposition of Union Pacific, Missouri Pacific and Missouri-Kansas-Texas Railroads

Table 6-6 Missouri Intermodal Loading Facilities in 1980 and 1988

CITY	CARRIER[1]	INTERMODAL SERVICE	YEAR SERVED 1980	1988
Cape Girardeau	MP	TOFC	Y	*
Carrolton	ATSF	TOFC	Y	N
Carrolton	BN	TOFC	Y	N
Hannibal	BN	TOFC	Y	N
Jefferson City	MP	TOFC	Y	N
Joplin	SLSF	TOFC	Y	**
Joplin	MP	TOFC	Y	*
Kansas City	BN	TOFC/COFC	Y	Y
Kansas City	CMNW	TOFC	***	Y
Kansas City	N&W	TOFC/COFC(88)	Y	Y
Kansas City	DGRW	TOFC/COFC	N	Y
Kansas City	SLSF	TOFC	Y	**
Kansas City	KCTR	TOFC	Y	N
Kansas City	MP	TOFC/COFC	Y	*
Kansas City	N&W	TOFC	Y	Y
Kansas City	SOO	TOFC/COFC	****	Y
Kansas City	UP	TOFC/COFC	N	Y
Moberly	N&W	TOFC	Y	N
Neosho	SLSF	TOFC	Y	N
Nevada	MP	TOFC	Y	*
North Jeff. City	MP	TOFC	Y	*
Parsons	MKT	TOFC	Y	Y
Poplar Bluff	MP	TOFC	Y	*
Sedalia	MP	TOFC	Y	*
Springfield	BN	TOFC/COFC	N	Y
Springfield	SLSF	TOFC	Y	**
Springfield	MP	TOFC	Y	*
St. Joseph	ATSF	TOFC	Y	N
St. Joseph	MP	TOFC	Y	**
St. Joseph	CRIP	TOFC	Y	***
St. Louis	BN	TOFC/COFC	Y	Y
St. Louis (in IL)	CNW	TOFC	Y	Y
St. Louis (in IL)	MP	TOFC	Y	*
St. Louis (in IL)	SLSW	TOFC	Y	Y
St. Louis (in IL)	UP	TOFC/COFC	N	Y
St. Louis	CRIP	TOFC	Y	***
St. Louis (in IL)	ICG	TOFC	Y	Y
St. Louis	MKT	TOFC	Y	Y
St. Louis	N&W	TOFC/COFC	Y	Y
West Plains	SFSW	TOFC	Y	N
Wyaconda	ATSF	TOFC	Y	N

[1] Carrier abbreviations are: ATSF-The Atchison, Topeka and Santa Fe Railway; CRIP-Chicago, Rock Island and Pacific; DRGW-Denver, Rio Grande and Western; ICG-Illinois Central Gulf; KCTR-Kansas City Terminal Railway; MKT-Missouri-Kansas-Texas Railroad Co.; MP-Missouri Pacific Railroad Co.; N&W-Norfolk and Western; SLSF-St. Louis-San Francisco Railway Co.; SLSW-St. Louis Southwestern Railway Co.; SOO-Soo Line Railroad; UP-Union Pacific Railroad.

* The Missouri Pacific merged with the Union Pacific and Western Pacific Railroads and is now part of the Union Pacific System.

** The St. Louis-San Francisco merged with Burlington Northern.

*** The Chicago, Rock Island and Pacific was not operating in 1988.

**** The Soo Line did not serve this location in 1980.

Nebraska Rail System

In the late 1970s, Nebraska was served by 11 rail carriers. Although eight rail carriers owned track in Nebraska, the Illinois Central Gulf, the Milwaukee Road, and the Norfolk and Western owned only trackage rights in Nebraska. Of the eight carriers, the Union Pacific and the Burlington Northern carried the overwhelming preponderance of freight traffic. For example, in 1977 the Union Pacific carried 57 percent of the ton miles, the Burlington Northern carried 39 percent, the Chicago and North Western carried 3 percent, the Missouri Pacific carried 1 percent, and the Rock Island and the Santa Fe each carried less than 1 percent.[33] Little has changed since then and the Nebraska rail network is heavily dominated by two railroads, the Burlington Northern and the Union Pacific.

Nebraska remained relatively untouched by the reorganization and liquidation of midwest rail properties in the early 1980s. Although the Milwaukee Road leased trackage rights in Nebraska, it owned no right-of-way. Similar to the Milwaukee Road, the Illinois Central Gulf had only trackage rights in Nebraska so the state rail network was unaffected by the Illinois Central Gulf's internal reorganization. The Rock Island operated only 130 miles of route in Nebraska; 51 miles of that track is currently owned by a non-operating consortium (the Mid-States Port Authority) and the Union Pacific operates the line.

Table 6-7 shows the Nebraska railroad mileage in 1979 and 1989. The map in Figure 6-13 shows the Nebraska rail system. Nebraska lost only 742 miles over the 10-year period. Nebraska's rail system is largely oriented towards providing of east-west rail service. In the beginning of the 1980s, roughly 80 percent of the Union Pacific traffic and 90 percent of the Burlington Northern traffic originated from and was destined to locations out of state. About 75 percent of all traffic on all railroads in Nebraska is through traffic.

Table 6-7 Nebraska Railway Miles -- Change From 1979 to 1989

Railroad	Nebraska Rail Mileage* 1979 Track Miles	1989 Track Miles
Class I Railroads		
Atchison, Topeka, and Santa Fe	1	1
Burlington Northern	2,590	2,274
Chicago and North Western	514	441
Chicago, Rock Island, and Pacific	130	Bankrupt
Missouri Pacific	314	Merged with UP
Union Pacific	1,297	1,307
Class II Railroads		
Chicago Central and Pacific	Not Est.	3
Class III Railroads		
Brandon Corporation	17	17
Omaha, Lincoln, and Beatrice	4	5
Sidney and Lowe	Not Est.	10
Non-Operating Rail Line Owners		
Ideal Cement (operated by BN)	Not Est.	2
Mid-States Port Authority (operated by UP)	Not Est.	51
Nebraska Public Power District (operated by BN)	Not Est.	20
Western Railroad Properties (subsidiary of and operated by CNW)	Not Est.	14
Total	4,867	4,145

* Carriers that were not established in 1979 are identified as "Not Est."

Source: 1979 Rail Mileages were taken from Nebraska Department of Economic Development, "Nebraska Rail Plan: 1980" (1980)
1989 Rail Mileages were taken from the Map of Nebraska Railroads, prepared by the Nebraska Department of Roads (1989)

Nebraska has only one common carrier shortline, the Sidney and Lowe Railroad. Located in western Nebraska, it provides service principally to a freight car repair facility. One regional rail line operates in Nebraska, the Chicago, Central and Pacific. But it operates only three miles of line (into Omaha), which is less than 1 percent of the length of the railroad. The Brandon and the Omaha, Lincoln, and Beatrice railroads are terminal switching railroads.[34] Ideal Cement and Nebraska Public Power District own lines, and service is operated by the Union Pacific and the Burlington Northern, respectively.

The Mid-States Port Authority is an entity created by the Kansas legislature in 1980 for the sole purpose of purchasing the Rock Island line running from Fairway, Nebraska, to Clay Center, Kansas, and west across northern Kansas to Limon, Colorado.[35] The Port Authority owns and has rehabilitated the track, but service in Nebraska is operated by the Union Pacific.

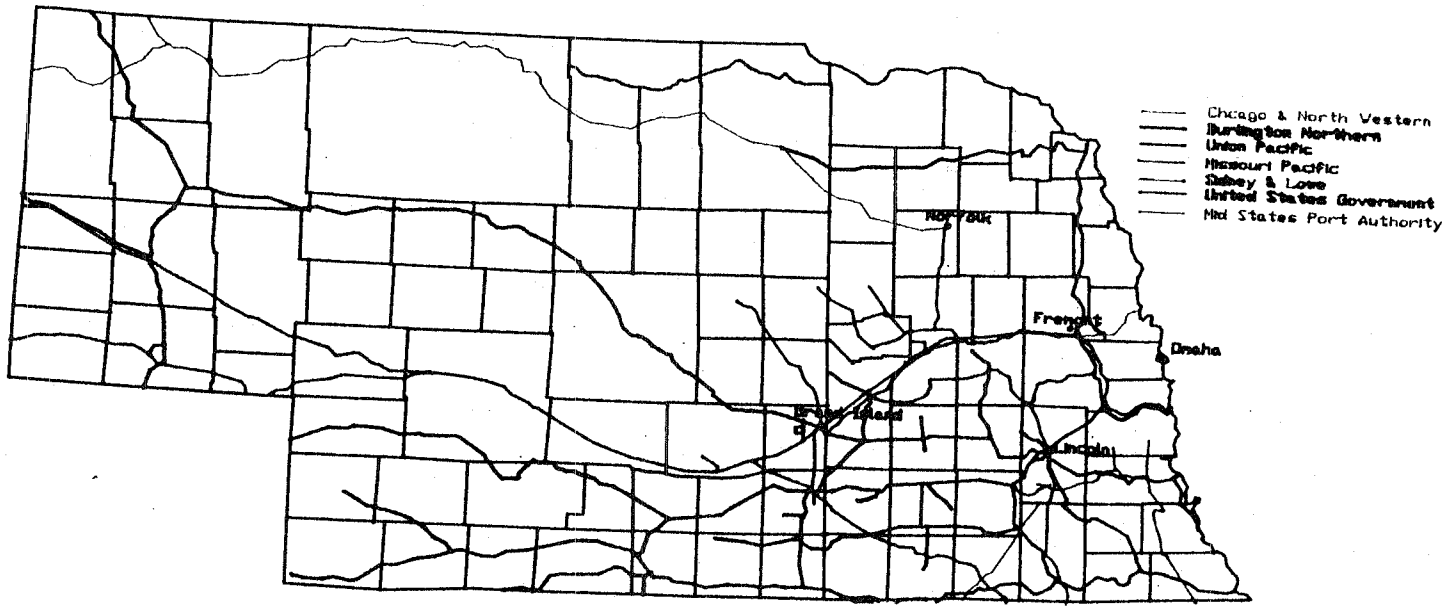


Figure 6–13: Nebraska Railroads (Terminal Railroads Not Shown)

Western Railroad Properties is a subsidiary of the Chicago and North Western and it is the originating line for coal trains from Campbell and Converse Counties, Wyoming. The Chicago and North Western's coal line stems from a 1976 ICC authorization to the Chicago and North Western and the Burlington Northern to jointly serve the area of coal production in eastern Wyoming for delivery to utilities located in the north central states, the south central states, Florida, and Texas. The Chicago and North Western requested a $532 million loan guarantee from the Federal Railroad Administration to upgrade its entire mainline from Shawnee, Wyoming, to Fremont, Nebraska (Nebraska's north line). When the loan guarantee was not received, the Chicago and North Western developed an alternative proposal. The railroad asked for a $231 million loan guarantee from Federal Railroad Administration to rehabilitate portions of its existing line between Shawnee and Crandall, Wyoming, and construction of a new line (the Western Rail Properties line) between Crandall, Wyoming, and Joyce, Nebraska. At Joyce, the coal cars are transferred to the Union Pacific which moves them to Fremont, Nebraska, where the coal cars are transferred back to the Chicago and North Western.

The Union Pacific and Burlington Northern east-west main lines through the state are highly utilized. The only highly utilized north-south line is the Burlington Northern line that runs from Billings, Montana, to eastern Colorado through the western one-quarter of Nebraska. In 1984, 1,673 miles of lines accounted for less than three million gross ton miles per mile per year and 434 miles carried between 3 and 5 million gross ton miles per year.[36] In other words, roughly half of Nebraska's rail lines were potential candidates for abandonment or assistance under the Federal Railroad Administration's Local Rail Service Assistance Program.[37] Therefore, under the Federal Railroad Administration definitions, half of Nebraska's rail system is made-up of light-density lines and branch lines. The traffic on these lines is about 95 percent agricultural products.

Financial Assistance Prior to 1980 the State of Nebraska was forbidden from granting or loaning funds for private sector activities. This included the granting or loaning of funds by the state government even if the funds were originally granted or loaned to the state by the Federal Government. The state law reads: "The credit of the State shall never be given or loaned in aid of an individual, association, or corporation except that the State may

guarantee or make long-term, low interest loans to Nebraska residents seeking adult or post high school education of any public or private institution in this state."[38]

In 1980, the Nebraska legislature passed a bill permitting the use of public funds for rail revitalization. In this case, the term public funds meant only federal or local public funds. The bill, the Agricultural and Industrial Branch Rail Revitalization Act of 1980, established a seven-member council to oversee state railroad revitalization activities. The council has the authority to issue bonds but does not possess taxing authority and may not use state tax revenues on rail line assistance projects. Local entities may form regional rail councils and will ultimately be responsible for each line revitalization project. Because there are currently no federal funds for the state to administer, the state currently has no rail assistance program.

With the large number of lines that are potential abandonment candidates and without an assistance program, the State of Nebraska's local rail service system sits in a fairly tenuous position. In 1989, the state commissioned a study to investigate the status of the almost 2,000 miles of low-density lines and branch lines in the state.[39] The study divided lines into four categories: (1) those that generate enough traffic to be profitable, (2) those which are borderline profitable, but that the Nebraska Department of Roads feels are viable enough not to be in jeopardy, (3) those which could qualify for assistance based on benefit to cost ratio analysis which takes into account social costs of abandonment, and (4) those lines which do not have a benefit to cost ratio that warrants financial assistance. Based on the analysis, 412 miles are in the third category and 621 miles fall into the forth category. Given the current lack of financial assistance, the majority the third and forth category lines are likely to be abandoned with very few being viable candidates for local and regional railroads.

The most important low-density line that is likely to be abandoned or spun-off is the Chicago and North Western north line running from Norfolk, Nebraska, to the northwestern Nebraska-South Dakota border and north through Rapid City, South Dakota, and on to Colony, Wyoming. Roughly two-thirds of the traffic along the entire line is produced in the segment between Rapid City and Colony. Most of the remaining traffic is generated in the Norfolk area. Only negligible amounts are generated between South Dakota and Norfolk. The traffic generated in the segment between Rapid City and Colony consists of wood chips, cement, and bentonite.

The Chicago and North Western originally operated two parallel east-west lines, one running through Rapid City and Pierre across the middle of South Dakota and one running through northern Nebraska. The Chicago and North Western attempted to abandon the South Dakota line in 1983 and move all the traffic to the north Nebraska line. The Dakota, Minnesota and Eastern[40], however, purchased the line between Rapid City and Pierre. Under the operation of the Dakota, Minnesota and Eastern and with financial assistance from the state of South Dakota, the South Dakota line has been rehabilitated. A large portion of the through traffic has been diverted to the South Dakota line. It is quite likely that more of the traffic from the Colony to Rapid City line will be moved to the South Dakota line and the northern Nebraska line will be abandoned or spun-off.

Intermodal In Table 6-8 the locations of intermodal loading and unloading facilities in Nebraska in 1980 and in 1988 are listed. In 1980, 12 cities had intermodal facilities with one city being served by two carriers and three cities being served by three carriers. In 1980, there were no container loading facilities. In 1988, the only loading and unloading facilities were located in the Omaha area. Omaha is served by four railroads and three can handle containers.

Summary of Regional Rail System Changes

A summary of the rail mileage in each of the four states is listed in Table 6-9. Also listed at the bottom of the table are the miles abandoned during the 1980s.

In this discussion, no attempt is made to quantify the likely future changes in the rail mileages or rail service. This summary identifies, however, general trends in the changes to the rail networks of the states in Region VII.

By reviewing the total miles per state and the percentage decrease in mileage listed in Table 6-9, it is clear that the rail systems of Nebraska and Kansas were relatively unchanged during the 1980s. Nebraska's and Kansas' networks are likely to lose a significant portion of their total mileage in the next several years. The rail plans of each state have identified roughly 1,000 miles in each that are likely abandonment candidates.

Table 6-8 Nebraska Intermodal Loading Facilities in 1980 and 1988

CITY	CARRIER[1]	INTERMODAL SERVICE	YEAR SERVED 1980	1988
Columbus	BN	TOFC	Y	N
Fremont	BN	TOFC	Y	N
Fremont	UP	TOFC	Y	N
Fremont	CNW	TOFC	Y	N
Gering	UP	TOFC	Y	N
Grand Island	BN	TOFC	Y	N
Grand Island	UP	TOFC	Y	N
Hastings	BN	TOFC	Y	N
Lincoln	CRIP	TOFC	Y	*
Lincoln	MP	TOFC	Y	**
Lincoln	UP	TOFC	Y	N
McCook	BN	TOFC	Y	N
Norfolk	CNW	TOFC	Y	N
North Platte	UP	TOFC	Y	N
Omaha	BN	TOFC/COFC(88)	Y	Y
Omaha	IAIS	TOFC/COFC	***	Y
Omaha	CC	TOFC	***	Y
Omaha	UP	TOFC/COFC(88)	Y	N
Omaha	MP	TOFC	Y	**
Scottsbluff	BN	TOFC	Y	N
Seward	BN	TOFC	Y	N

[1] Carrier abbreviations are: BN-Burlington Northern; CNW-Chicago and North Western; CC-Chicago Central and Pacific; CRIP-Chicago, Rock Island and Pacific; IAIS-Iowa Interstate; MP-Missouri Pacific Railroad Co.; UP-Union Pacific Railroad.

* The Chicago, Rock Island and Pacific Railroad Co. began liquidation in 1980.

** The Missouri Pacific is now part of the Union Pacific System.

*** The Iowa Interstate and Chicago, Central and Pacific did not exist in 1980.

Neither Kansas nor Nebraska has a financial assistance program. The lack of an assistance program inhibits the state's ability to foster an efficient restructuring of the rail system. For example, out of the 1,000 miles of lines in Nebraska that are likely to be abandoned, over 400 miles warrant public assistance based on the state's benefit-to-cost analysis. But the lines are likely to be abandoned because of the inability of the state to provide financial assistance. The remaining 600 miles do not warrant public assistance. Beyond the 1,000 miles of track, an additional 460 miles of lines are considered marginal and also candidates for abandonment.

Spinning off unprofitable or marginally profitable lines by Class I carriers to local or regional railroad operators in lieu of abandonment has been a popular strategy. During the 1980s, over 190 new local and regional railroads have begun service in the United States.[41] Class I carriers can reduce the need to market their services in a thin, dispersed market along branch and low-density lines by spinning them off to smaller, local operations, allowing the Class I carriers to concentrate their efforts in denser markets. Some Class I carriers are

Table 6-9 Current Regional Railway Mileage

Railroad	Iowa Mileage	Nebraska Mileage	Kansas Mileage	Missouri Mileage	Regional Mileage
CLASS I RAILROADS					
Chicago & North Western	1,861	441	0	122	2,424
Burlington Northern	633	2,274	596	1,587	5,090
Soo Line	620	0	0	135	755
Norfolk and Western	66	0	0	443	509
Santa Fe	20	1	2,480	220	2,721
Union Pacific	2	1,307	2,932	1,155	5,396
Denver & Rio Grande Western	0	0	0	20	20
Kansas City Southern	0	0	26	195	221
St. Louis Southwestern	0	0	348	384	732
Class I Total	3,202	4,023	6,382	4,261	17,868
REGIONAL RAILROADS*					
Chicago Central & Pacific	537	3	0	0	540
Iowa Interstate	362	0	0	0	362
Chicago, Missouri and Western	0	0	0	231	231
Kyle	0	0	336	0	336
	899	3	336	231	1,501
NON-OPERATING LINE OWNERS	0	87	0	0	0
LOCAL RAILROADS*	469	0	178	234	1,185
TOTAL MILES	4,570	4,145	6,896	4,694	20,554
MILES LOST DURING THE 1980s	2,089	722	472	1,438	4,721
	31%	7%	6%	23%	19%

* The American Association of Railroads defines regional railroads as non-class I railroads that operate at least 350 miles of rail line and/or earns at least $40 million in annual revenues. All other non-class I railroads, short lines terminal, and switching railroads, are considered local railroads. ("Statistics on Regional and Local Railroads," American Association of Railroads, Economics and Finance Department, Washington, D.C., 1988.)

known to actively recruit and foster local and regional railroad suitors for their light-density lines.[42] Oftentimes there is no loss of traffic for the Class I carrier because the local or regional railroad may have no other connection but to the line's original owner.

A recent Federal Railroad Administration study surveyed Class I railroads to determine their plans to spin off rail lines.[43] Of the 10 railroads that responded to the survey, seven indicated plans to transfer lines to non-Class I railroads over the next five years, totalling 17,265 miles. The miles of line reported by each carrier is reported in Table 6-10. All railroads reporting plans to spin off lines operate in Region VII except the Grand Trunk and CSX. Clearly, the four states will be significantly affected.

The Staggers Act gave the ICC power to approve line sales without extensive regulatory oversight or the automatic imposition of labor protective conditions. Later this was interpreted to imply that the sale of a line is not a subject that is bargainable with labor.

Table 6-10 Rail Miles of Spin-off Candidates

Railroad Surveyed	Miles Targeted For Transfer
Atchison, Topeka and Santa Fe	4,000
Burlington Northern	2,244
Chicago and North Western	1,797
Conrail	No plans for spin offs
CSX	2,115
Grand Trunk Western	142
Kansas City Southern	Did not respond
Norfolk Southern	1,251
Soo Line	Did not respond
Union Pacific	5,716
Total	17,265

Source: Federal Railroad Administration, "Deferred Maintenance and Delayed Capital Improvements on Class II and Class III Railroads: A Report to Congress," U.S. Department of Transportation (Washington, D.C., 1989)

The ICC further clarified its position in a decision regarding the spinning off of an Illinois Central Gulf line to the Gulf and Mississippi Railroad.[44] In this decision, the ICC felt that it would not impose labor protection payments generally required of major railroads in consolidation or restructuring cases when light density lines are sold to new, independent railroads. The ICC restated and clarified its policy in Ex Parte 392, in which it stated that the imposition of labor protective conditions would seriously jeopardize the ability of new local and regional railroads to be economically viable.[45]

The relaxation of labor protection on newly formed local and regional railroads permitted new owners to streamline their labor costs by abandoning costly manpower requirements agreed to by the previous owner. Between 1982 and 1987, several local and regional railroads were created without having to negotiate the conditions of the sale with labor. Not assuming the costly labor requirements of the previous Class I owner allowed many local and regional railroads to be profitable where the previous owner was unprofitable.

The sale of lines to local and regional railroads was partially stymied by the Pittsburgh and Lake Erie (P&LE) Railroad case that began in 1987 when the P&LE attempted to sell itself entirely to the Chicago West Pullman Transportation Corp. The crux of the P&LE case revolves around the Railway Labor Act (RLA) of 1926. The RLA defined a lengthy six-step process for settling rail labor disputes.[46] The unions representing P&LE's labor struck at the announcement of the sale, arguing that the railroad had unilaterally changed working conditions without settling the dispute through the RLA process. A Pennsylvania District Court upheld the union's right to strike which, in effect, gave labor bargaining power in the sale of the line.

An Appeals Court upheld the lower court's decision and the case was eventually heard by the Supreme Court.[47]

The Supreme Court overturned the lower court decision in a five to four vote. Although the final decision allows the sale to proceed without bargaining with labor, the narrow margin of the affirmative vote does not provide clear direction for future cases.

If the position taken by the Supreme Court becomes industry practice again, the sale of lines to local or regional railroads should continue. Through observations of line sales and conversations with railroad company officials, Mielke notes this trend on a national level:

> There are 11 Class I railroads that have been active or may become active in short line and regional track sales. The most active in terms of feeder line sales is Burlington Northern (BN). Between October 1986 and December 1987 BN sold nearly 2,000 miles of track to seven different entities; all these sales were designed to feed and enhance BN's remaining rail operations. Other carriers are watching BN closely and may adopt a similar strategy if it proves successful.[48]

It is reasonable to expect that this trend will continue within Region VII and light-density lines will become spin off targets for Class I railroads. It appears that this would be particularly true of lines in Nebraska and Kansas. Some of the lower-density lines in Missouri also may become spin off targets. In Iowa, many of the light-density, grain-gathering lines may become spin off candidates, although carriers strongly deny that it is their intention to spin off these lines.[49]

Perhaps a harbinger of things to come is the Union Pacific's offer to lease two sets of lines to short line railroads.[50] One set is 347 miles long and the other is 289 miles. In both cases, the Union Pacific has offered to help with the new operator's start-up and develop cooperative agreements for marketing and leasing equipment.

A recent report to Congress by the Federal Railroad Administration on regional and local railroads points out that many of the lines spun off by Class I carriers have been the victims of deferred maintenance and the lines typically have substantial rehabilitation needs.[51] The Federal Railroad Administration surveyed regional and local railroads to determine the costs of deferred maintenance. One of the questions asked about the one-time cost of rehabilitating their line to allow "the removal of slow orders and weight restrictions and to bring the track and track structure up to a condition that -- with ongoing maintenance -- will permit continued operation at current timetable speeds."[52] The Federal Railroad Administration

estimated the cost nationally is $600 million or more.[53] Of the $600 million, the Federal Railroad Administration predicts that $150 million can be raised internally by the railroads themselves.[54] Raising the remaining capital from commercial financial institutions may be difficult for most debt-ridden regional and local railroads. Alternatively, shippers, the original Class I owner, or the state could provide financial assistance. Twenty states have ongoing financial assistance programs including one state in the region, Iowa.[55] All federal assistance expired in 1988.

Regional Intermodal Trends

Intermodal loading and unloading facilities have greatly diminished in number. Most current sites are located only in major traffic centers and serve as hubs for the surrounding area. For example, the Burlington Northern views its intermodal hubs as serving an area of roughly 250 miles in radius.[56] Each Burlington Northern hub has its own marketing and sales capabilities and has the authority to develop cooperative agreements with motor carriers and set prices for service.[57] The large coverage area of intermodal centers (hubs) and their capacity to perform independently greatly diminish the number of sites necessary to cover a region.

Table 6-11 Number of Intermodal Sites in the Region, 1980 and 1988

	1980		1988	
State	Number of Facilities	Number of Cities Served	Number of Facilities	Number of Cities Served
Iowa	37	22	15	12
Kansas	36	26	9	6
Missouri	37	19	16	3
Nebraska	19	12	3	1
Total	131	79	43	22

The number of intermodal loading and unloading sites in Region VII in 1980 and 1988 are listed in Table 6-11; the number of cities served in each state is also listed. Many of the facilities are concentrated within larger cities (for example, Kansas City, Missouri has seven). The concentration of intermodal facilities in fewer locations is part of a national trend in the railroad industry.

Intermodal Transportation Trends In The United States

This section very briefly discusses general trends in intermodal transportation. The discussion specifically focuses on intermodal movements involving rail transportation and another mode. The discussion is also limited to freight moving in either truck trailers or containers. Intermodal traffic and trends in the design and marketing of intermodal service are highlighted because of its high level of change and growth. Further, as will be identified in the next section (case studies of railroad companies), the growing intermodal sector is of strategic importance to many of the region's rail carriers.

Background

As the fledgling trucking industry came into being in the 1920s, rail carriers became aware of the advantages of moving freight in a truck trailer to reduce the handling at the railroad terminal and improve pickup and delivery flexibility. In the 1920s, trucking was not subject to federal economic regulation and, therefore, railroads could expand their service territory without being stifled by regulatory restrictions. In 1926 the first trailer on flatcar service tariff was published by the Chicago North Shore and Milwaukee Railroad.[58]

In 1931, the ICC created regulations which tended to suppress expansion of intermodal activity by requiring that rail rates for intermodal containers must be related to the class rate structure. The ICC required that no container traffic be moved at less than the carload rate or more than one class lower than the any-quantity basis applicable to the commodity in question.

Piggyback traffic increased slowly in the period between the 1930s and the late 1970s. In 1955, intermodal trailer on flat car (TOFC) or container on flat car (COFC) traffic consumed a significant enough share of total rail traffic that railroads began reporting piggyback loadings (both TOFC and COFC) as a separate business category.[59] By 1980, piggyback accounted for roughly 13 percent of all loadings and was second to coal in frequency of loadings by commodity groups.[60]

Federal regulation has tended to suppress intermodal traffic volumes. Regulation is developed and administered on a single mode basis without any thought to coordination among the modes. Additionally, rail carriers have been unable to integrate with other modes through

prohibition on their ownership of carriers of other modes. Because intermodal activity requires that shippers and their agents are free to arrange the most desirable transportation services regardless of the mode or carrier involved, regulation has stymied intermodal activity.

In Ex Parte 346, the ICC deregulated rail rates on fresh fruits and vegetable in 1979. Fresh fruits and vegetables that had been moved by rail were moved mostly by piggyback; this inaugurated the deregulation of intermodal movements. Later in 1981, the ICC effectively freed rail piggyback movements from all economic regulation.[61] This marked a surge in intermodal traffic and the beginning of an era where railroads, ocean shipping companies, trucking firms, barge companies, third party agencies, and multimodal transportation service companies would cooperatively market creative intermodal transportation services.

During the 1980s, double-stack technology and its efficiencies helped increase intermodal traffic volume. The number of double-stack container spaces has increased from 400 in 1983 to an estimated 24,000 in 1988.[62] At the same time the number of slots for conventional TOFC/COFC has dropped by about 20,000, from about 109,000 in 1983 to 88,000 in 1988. Currently (1989), containers account for at least 40 percent of the intermodal freight[63] and intermodal loadings account for 20 percent of all rail traffic.[64]

Intermodal Traffic and Facilities

Double-stack container shipping has experienced the most growth in the intermodal industry. This growth began with international trade entering the U.S. in containers at ports and then being transported in double-stack unit trains to inland terminals. American President Lines (APL) initiated the first dedicated double-stack train (linertrain) in 1984.[65] Recently, double-stack traffic has grown in domestic markets. Current double-stack train designs incorporate platforms that are five cars long with articulated connections between interior cars. The interior cars rest on articulated connectors riding on a single truck. Recent designs permit weights up to 125,000 pounds per truck. The interior wells (the bottom position) can handle 40-, 45- or 48-foot containers, with the capability to hold 53-foot containers on the top position.[66] Double-stack cars typically move in unit trains which facilitates their high rate of utilization. A double-stack platform will average 50 trips per year in comparison to the 12 trips that box cars average.[67]

Double-stack service is attractive because it offers piggyback service flexibility, plus a smoother and less damaging ride as a result of modern articulated equipment designs.[68] The cost advantages of double-stack trains are substantial. The tare weight of a double stack car is roughly 40,000 pounds less (less than half) than a standard flatcar.[69] As a result of lower weights and better aerodynamics, the operating costs are lower. A double-stack train can operate 20 to 25 percent more efficiently than a conventional piggyback train.[70] When capital costs of cars and locomotives and the costs of fuel, crew and equipment maintenance are taken into account, cost-savings estimates of double-stack in comparison to standard container or trailer on flat car operation range as high as 50 percent.[71] Although the containers operated in international trade are 20 and 40 foot boxes, domestic boxes are as long as 53 feet to offer comparable volume and capacity to truck trailers.

The developments in EDI have and will help to make intermodal transportation services more attractive. EDI improves the coordination between carriers and enhances shippers' ability to trace movements of cargo. Because better information flows quickly through an EDI system, dealing with a specific carrier or a single mode becomes less important to the customer and thus increases the desirability of cooperative intermodal services.

In 1955, when the railroads began collecting data on intermodal loadings, less than one half of one percent of total loadings were intermodal. In 1987, intermodal piggybacks or double-stack containers accounted for 20 percent of the loadings. Figure 6-14 shows a graph of the number of intermodal loadings by Class I railroads.[72] Although there was steady growth in loadings during the entire period, the graph clearly illustrates the significant surge in intermodal loadings that took place after 1981.

While intermodal traffic volumes have increased, the number of intermodal terminals has dropped dramatically. In Table 6-12 is shown the number of intermodal terminals in 1974, 1984, and 1989. During the last 15 years, the majority of the terminals have been eliminated and the traffic has been consolidated to larger, mechanized central facilities (hubs). Many of the ramps were eliminated because it was uneconomical to staff the facility for the modest amount of traffic the facility generated. Further, because containers now play an increasingly important role and require a mechanized facility, it would be even more inefficient to mechanize the proliferation of ramps that existed in the 1970s.

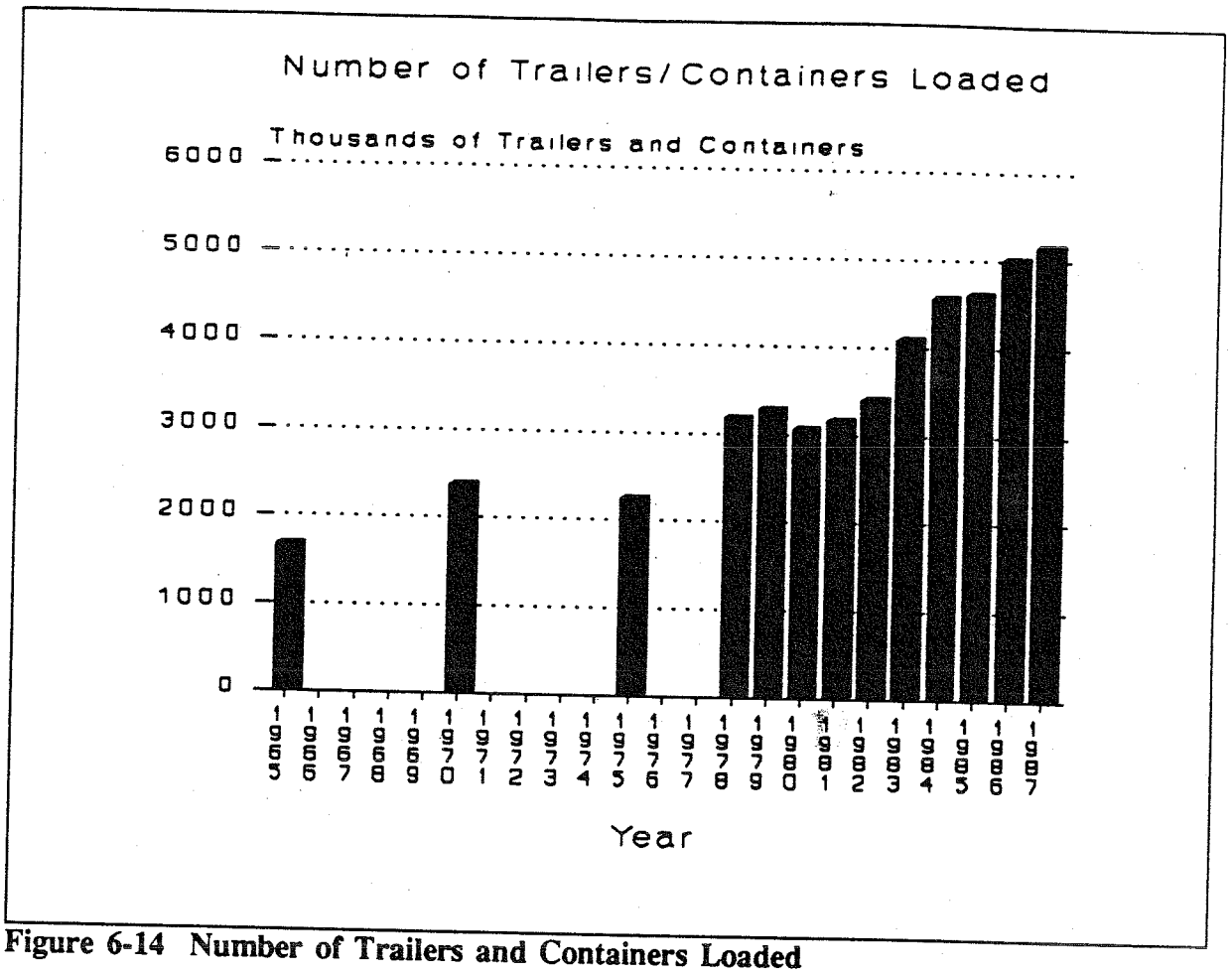


Figure 6-14 Number of Trailers and Containers Loaded

Table 6-12 U.S. Rail Intermodal Terminals

Year	Total Terminals	Mechanized Terminals
1974	1,500	105
1984	430	150
1989(est)	300	215

Source: Daniel S. Smith, "Double-Stack Container Systems: Implications for U.S. Railroads and Ports," Proposal submitted by Manalytics, Inc., ALK Associates, Inc., TR Transportation Consultants, and Transportation Research and Marketing (July, 1988)

Some railroads have allowed hubs to take on independent marketing and sales functions for the local territory. Some are equipped with neutral container chassis pools for the drayage to and from the terminal.

Most of the transcontinental Class I carriers market an expedited intermodal service to capture domestic markets. For example, the Santa Fe's Quality Service Network and the

Burlington Northern's Expeditor Network are examples of Class I carriers marketing high quality intermodal service to domestic customers. These services are often provided with conventional equipment, however. Because of the cost savings that are possible with double-stack container movements and as double-stack equipment becomes more available in domestic corridors,there is potential for the railroads to divert more traffic away from motor carriers.

Intermodalism in International Trade

Dedicated double-stack trains were first cultivated through agreements between shipping lines and railroads. Typically, a dedicated double-stack train runs from the port where the containerships dock to an inland terminal from where the freight is distributed. The space inside the containers on the double-stack train's backhaul to the port is marketed either to domestic or international shippers. All train arrivals and departures have to be synchronized with the arrival of the freighter.

Although all international, dedicated double-stack trains provide basically the same high-quality service, the negotiated arrangement and the relationships between the transportation service providers tend to vary. Archambault has summarized the relationships between the ocean shipping company and the railroad into three approaches to intermodal cooperation.[73] They are:

1. The integrated intermodal approach which corresponds to a contract unit train. The shipping company, either owning or leasing parts of its railway rolling stock, contracts with the railways to provide only track, locomotive, and train crews over specific corridors. Usually through a subsidiary company, the container line has full responsibility to manage and solicit cargo in both directions, including pricing and marketing. The shipping company must have a sophisticated pool of logistical expertise to solve the problems of synchronization and coordination of unit trains, containers, container freight, and the ship line's schedule.

2. The dedicated approach is where a ship line contracts for a unit train of a specific capacity to move from the port over a designated corridor. The contracts generally commit a specific traffic volume at a specific frequency. Under the agreement, the rail carrier has to synchronize its service with the schedule of the ship line. Unlike the integrated approach, the dedicated train remains under the control of the operating railroad or interconnected railroads. And, the railroads do not allow the ship line to have a freehand in soliciting backhaul freight on the reverse direction.

3. Tailored rail intermodal service packages consist of a negotiated arrangement between ship lines and the railroad where the containers move on common-use unit trains. Common-use intermodal trains combine the volumes of various shipping lines, as well as other rail customers, to achieve the expected linehaul and traffic density.

Integrated intermodal, the first approach, requires that the ship line have a sophisticated logistics and marketing staff. Because this permits the ship company to maintain complete control over transportation services, the larger, integrated ship companies are attracted to this approach. The ship company's ability to market space on the train -- and particularly space on the backhaul trip -- creates competition for the railroad's other parallel services and diminishes the railroad's control over its own operation. Most railroads are willing to lose partial sovereignty over their operation in return for the lucrative business offered by the ship companies. Until recently, one major railroad, the Santa Fe Railway, was unwilling to accept business under the integrated approach.

The third approach (tailored rail intermodal service) is attractive to smaller ship lines because it does not require the investment in volumes of freight necessary to fill an entire train. Also, the third approach may be more desirable to destinations where one ship company does not have enough freight to justify an integrated or dedicated unit train.

Case Studies: Interviews with Representatives of Five Rail Carriers

Representatives from five railroad companies were interviewed. Their responses were augmented by published information. The companies represented in the interviews include the Iowa Interstate Railroad Ltd. (a regional railroad), the Chicago and North Western Transportation Company, the Atchison, Topeka and Santa Fe Railway Company, the Union Pacific Railroad, and the Burlington Northern Railroad Company. All experienced significant changes during the 1980s. The Class I railroads shared two key issues: (1) reducing the high costs related to labor requirements and inflexibility of labor rules, and (2) the down-sizing of their networks. All the carriers (including the Iowa Interstate) are planning strategies to increase their intermodal traffic and attract traffic away from motor carriers.

The three smaller of the five carriers (the Iowa Interstate, the Chicago and North Western, and the Santa Fe), see themselves as marketing in a specific growth niche. The smaller the carrier, the more narrowly defined is the niche. For example, the Iowa Interstate's

niche is traffic originating or destined to points in the railroad's corridor. The Santa Fe's growth niche is in high quality intermodal services, in which the Santa Fe provides all the services from the shipper's dock to the receiver's.

Atchison, Topeka and Santa Fe Railway Co.

Introduction The 1980s have been a troubled period for the Atchison, Topeka and Santa Fe Railway Co. (Santa Fe). The biggest obstacle for the railroad was the ICC's denial of its proposed merger with the Southern Pacific Transportation Company. On October 4, 1983, the two railroads developed a merger agreement.[74] In 1986 and at the second appeal on June 30, 1987, the ICC denied the merger plans of the two railroads.[75] During the four years between the first agreement and the final denial, the Santa Fe planned its future assuming it would be allowed to merge with the Southern Pacific. In anticipation of the merger, the Santa Fe put off efforts to cultivate international business (specifically container freight) because it intended to depend on its merger partner's preeminent position as originator of double-stack trains in Los Angeles basin.

Another major setback for the Santa Fe was a $1 billion judgement the railroad received for antitrust violations while fighting a slurry coal pipeline from the Wyoming Powder River Basin to Texas.[76] The Santa Fe and other railroads fought to keep the proposed Energy Transportation System, Inc. (ETSI) pipeline from being constructed. After ETSI terminated its construction plans, it sued the group of railroads that had fought the pipeline for alleged antitrust violations. All the railroads named in the suit, except the Santa Fe, settled out of court. A U.S. District Court handed down a judgement of $750 million against the Santa Fe which was lower than the original judgement of $1 billion made by a jury. The judgement was reduced to reflect the settlements made by the other railroads.

The last major misfortune thrust on the Santa Fe was a takeover attempt in 1988. The takeover was fought off by offering shareholders a special dividend. The plan caused the Santa Fe to incur $1.3 billion of debt.

Despite the number of setbacks suffered by the Santa Fe, the railroad has some rather important strengths. Most importantly, the Santa Fe has the shortest transit time between Los Angeles and Chicago, a corridor of growing importance for international trade. The Santa Fe's line is almost entirely double-tracked.[77]

The Santa Fe has also developed a strong reputation for providing premium intermodal service. In 1988, roughly 40 percent of the total freight revenue for the railroad came from intermodal traffic, predominately piggyback service.[78] Growth in the Santa Fe's intermodal traffic has been in the range of 14 percent per year while, overall, intermodal in the railroad industry has grown by roughly 7 percent per year.

In addition the Santa Fe has made great strides in working with labor to reduce the railroad's number of union-represented employees. Since 1981 the labor force has been reduced by 40 percent.[79] Currently, top management is looking to cut the number of employees even further by reducing the crew size on through freight trains to two employees and to three on stopping freight trains, rather then the current crew size of four.

The Denied Merger The most significant event to shape the Santa Fe's strategies during the 1980s was its planned merger with the Southern Pacific and its corporate adjustments when the merger was denied. At the time the merger was conceived, of the four transcontinental western railroads (Union Pacific, Burlington Northern, Southern Pacific, and Santa Fe) the Santa Fe and the Southern Pacific had the smallest networks, each operating a system of about 12,000 miles. A merger of the two systems would accomplish two goals: (1) expand their market penetration in both the freight market segments served and network coverage, and (2) create a large western transcontinental railroad that would be a viable merger partner for one of the eastern transcontinental railroads (Conrail, CSX and Norfolk Southern). Because there were four western and three eastern transcontinental railroads, Santa Fe's top management wanted to insure that the Santa Fe would not be the odd railroad without a merger partner.

When the Santa Fe and Southern Pacific merger was denied, the Santa Fe was ordered to divest itself of holdings in the Southern Pacific. In August of 1988 the ICC approved the sale of the Southern Pacific to Rio Grande Industries and the Southern Pacific was merged with the Denver, Rio Grande and Western Railroad (Rio Grande).[80] The new railroad will operate under the Southern Pacific name and the merger gave the new Southern Pacific a 15,000-mile network. The Santa Fe is now the smallest of the seven transcontinental carriers.

The merger had offered the Santa Fe a business opportunity of expanding its system physically and of integrating the resources and capability of the Southern Pacific. The Santa

Fe's new approach is to expand through better and more flexible marketing, and through partnerships with other transportation companies rather then through a merger.

Intermodal In 1983, the Santa Fe initiated a program to rationalize its intermodal facilities. At the time, conventional piggyback traffic accounted for about 25 percent of the railroad's total traffic and intermodal traffic was growing.[81] The Santa Fe consolidated its more than 100 terminals to 38 hubs. The facilities eliminated accounted for less than 2 percent of all intermodal traffic. The consolidation allowed the Santa Fe to provide more efficient mechanized service at the remaining hubs.

Intermodal traffic is a significant share of the Santa Fe's business. The bulk of the Santa Fe's business has been conventional piggyback service with freight originated by third party agencies. Major LTL motor carriers are large clients of the Santa Fe, however. United Parcel Service and the U.S. Post Office have become the Santa Fe's largest customers.

Until 1988, the Santa Fe had two intermodal marketing initiatives, conventional piggybacks and double-stack service. Santa Fe's double-stack service (EconoPac) was unique because the railroad required a more active role in the service then did its competing railroads. The Santa Fe's double-stack service used the railroad's own cars and restricted the ship lines from marketing space on the return trip (from the East to the West Coast). Reasons for not allowing the ship lines to market on the westbound leg included not wanting the ship companies to compete for the Santa Fe's existing east-to-west domestic intermodal market. In addition, the Santa Fe wanted to make full use of existing investments sunk into conventional piggyback facilities and services.[82] EconoPac service ran from Los Angeles to Chicago and represented a less pervasive effort than many of the Santa Fe's competitors to enter the international double-stack market.

The Santa Fe's expedited conventional piggyback service, Quality Service Network, was much more successful. The Quality Service Network is a system of high-speed intermodal trains operating between major city pairs. The trains operate with three-person crews rather than four- or five-person crews. The coverage of the service was later expanded through the use of regional motor carriers outside of the Santa Fe's service area, including trucking firms acting as feeders in Detroit, Cleveland, Columbus, Cincinnati, and Indianapolis. The shipper arranges for service with the local agent and the trailer or container is drayed from the shipper's dock to the local yard and then trucked to Chicago and loaded onto a

flatcar. Similar service is provided in the west through motor carriers in Nogales, Tucson, and Sacramento.

In 1988, the Santa Fe introduced another double-stack service (Quality Stack Service) which it operates from the West Coast and continues on to eastern destinations on Conrail's system. The Santa Fe owns the rolling stock and markets the service in both directions. The transportation services are integrated with drayage and warehouse services. The Santa Fe's service is modeled after American President Lines' successful total distribution service.[83] In addition, the Santa Fe has modified its prior position and is allowing some steamship companies to sell westbound backhaul space in the steamship's containers.[84]

The market coverage of the Santa Fe was greatly improved by a Voluntary Cooperative Agreement with the Burlington Northern. Under the agreement, the two carriers will coordinate marketing efforts for piggyback and double-stack service moving through Avard, Oklahoma, (a junction between the two railroads) into the southeast on the Burlington Northern and into the southwest on the Santa Fe system.[85] The Santa Fe and the Burlington Northern have also agreed to establish single-market rates for non-intermodal cars running through Avard and St. Louis. A similar agreement covers non-intermodal traffic running north and south along the West Coast through Bieber and Stockton, California.

Line Sales During the period of the pending merger between the Santa Fe and Southern Pacific, line sales and abandonment planning were halted. The Santa Fe has recently identified 3,200 miles of lines that will have to be examined as sales or abandonment candidates.[86] Although the Santa Fe is likely to continue to serve major grain terminal facilities in Kansas and Oklahoma, the grain gathering branch lines may become candidates for line sales to shortline operators.

Other Issues The Santa Fe over the last several years has been rebuilding existing locomotives. They have, however, reached a limit on the availability of equipment it can rebuild. To continue to expand and modernize its locomotive fleet, the Santa Fe is planning to lease locomotives from manufacturers rather than purchase the equipment. The leasing plan will provide for payment on a per mile basis (power-by-the-mile) where the manufacturer is responsible for maintenance. Under their agreement with the manufacturers, the Santa Fe will provide the manufacturer with the Santa Fe's outdated locomotives. The manufacturers will

be allowed to rehabilitate the old locomotives and sell or lease the equipment in the second-hand market.

Deregulation and the ability to contract with shippers has been beneficial for the Santa Fe. Because of the ability of the shipper and carrier to make commitments in advance, the Santa Fe can better plan the utilization of its equipment. As a result, costs have dropped and turn-around time on equipment has improved.

Burlington Northern Railroad Company

Introduction The Burlington Northern's current system is a result of two large railroad mergers. First was in 1970: the Great Northern Railway; the Northern Pacific Railway; the Chicago, Burlington and Quincy Railway; and the Spokane, Portland and Seattle Railway merged to form the Burlington Northern. In 1980, the St. Louis-San Francisco Railway merged with the Burlington Northern. The Burlington Northern is the largest U.S. railroad (in terms of route mileage) with 27,207 miles of railroad in 24 states and two Canadian provinces.[87] The railroad and other natural resources companies (pipelines, timber-forest products, oil and gas, metals and minerals) are all subsidiaries of Burlington Northern Inc., a holding company.

During the 1980s, the Burlington Northern reorganized. In 1980 the headquarters were located in St. Paul and management of the entire system was centralized.[88] Since then decision making has been distributed throughout the railroad.

The Burlington Northern's system is now organized into five regional offices where the regional manager is in charge of business within the region. The system-wide management of operations and maintenance is centered in Overland Park, Kansas. Marketing and the corporate headquarters is located in Ft. Worth, Texas, although the intermodal hubs do their own marketing, selling, and pricing.

The Burlington Northern has become the nation's largest grain hauler.[89] With the growth in low sulphur western coal, the Burlington Northern has become the second largest coal hauler (to CSX), carrying about 140 million tons of western coal in 1988.[90] Coal represents about 50 percent of the tonnage hauled by the railroad and about one-third of the Burlington Northern's revenue, compared to 22 percent for the entire railroad industry.

Labor High labor cost and crew size requirements are significant issues for all Class I carriers. The Burlington Northern has chosen to attack labor issues vigorously. The Burlington Northern's pressure to streamline labor rules and crew requirements was a principal avenue for the railroad to reduce its costs. Management has sought to downsize the labor ranks and to remove the inflexibility of restrictive labor work rules. In 1980, there were 50,000 Burlington Northern employees; by the end of 1986, the number was down to about 35,000.[91]

One of Burlington Northern's major attempts to streamline labor was through the Expeditor network. The Expeditor network is a system of short, fast and frequent intermodal trains operating between Burlington Northern intermodal hub locations with two-man crews.[92] In 1985 the railroad was able to win concessions allowing two-man crews which helped to lower the cost. Another strategy for reducing labor costs was the use of outside contractors for upgrading track beds with concrete ties. The contractor performed the work until Burlington Northern maintenance-of-way workers asked to negotiate back the installation work. The negotiated contract provides more efficient use of the Burlington Northern's own personnel than the railroad had experienced previously and employees won back the work.[93]

Probably the most noteworthy of the Burlington Northern's attempt to streamline labor and cut costs is its "Power-by-the-Hour" program. This program provides for the full-service leasing of modern locomotive power. Full service means that the manufacturer has to meet reliability requirements and maintain the equipment. Burlington Northern entered into an agreement with ElectroMotive Division (EMD) of General Motors in which EMD conducts maintenance in its own shops.[94] Burlington Northern machinists went on strike and the dispute was settled in a Federal Court which ruled that the railroad must negotiate with the machinists before entering into such an agreement. The EMD equipment is currently maintained at a Burlington Northern shop where the work force is split half-and-half with manufacturer employees and railroad employees. General Electric (GE), the other major U.S. builder of locomotives, has also entered into an agreement with Burlington Northern but was able to avoid the difficulties that the agreement with EMD encountered. GE maintains GE "Power-by-the-Hour" equipment with railroad employees under GE supervision.

Burlington Northern management does not see the need to further merge with other carriers to expand its business opportunities. Instead, Burlington Northern has promoted

Voluntary Cooperation Agreements (VCA). Two or more carriers participate in a VCA; the agreement permits the two carriers to jointly market service and allows the carriers the freedom to price service into the other carrier's territory.

The Burlington Northern recently adopted a VCA with the Santa Fe. Each carrier has the ability to market intermodal services into the other's territory. Thus the VCA has greatly expanded the Burlington Northern's coverage without requiring an acquisition.

Intermodal Services The Burlington Northern operated 144 intermodal ramps in 1980 but has since collapsed its intermodal loading facilities down to 22 intermodal hubs.[95] Each hub has its own sales and marketing capabilities and the authority to price services. Burlington Northern feels that the hubs are cost competitive with truckload (TL) carriers as long as the origin and destination are within 250 miles of the hub.

Many of the TL carriers are selling their customers on the importance of the high quality service that motor carriers provide. Rail carriers are suffering from shippers' perceptions generated by past poor on-time performance and damage due to poor cargo blocking and bracing practices. Burlington Northern's intermodal services have been able to overcome some of customers' negative prior experiences and then have made inroads into TL markets. The markets where the railroad is having the most penetration, however, are predominately in corridors that are not attractive to large TL carriers and thus the trucking firms did not strongly compete.

Burlington Northern has developed the ability to schedule service by the car rather than by the train. This represents a conceptual difference in making-up trains. By creating automated scheduling capabilities necessary to schedule by the car, transportation times are reduced and on-time delivery reliability is improved. On-time delivery and fast travel times are the keys to attracting intermodal traffic.

Most of the Burlington Northern's intermodal traffic (roughly 95 percent) is generated through third party agencies and about one-third of that is through less-than-truck-load (LTL) trucking companies. The other 5 percent is traffic originating from shippers' traffic departments. Burlington Northern policy is to work through a third party for intermodal traffic except when approached directly by a shipper.

It was felt by the Burlington Northern manager interviewed that the number of third party agents that work with railroads will diminish and the industry will become concentrated

in fewer and larger third party firms. This also means that third parties will, in all likelihood, become aligned with specific carriers. To date, the only major rail carrier that has become aligned with a specific third party is the Union Pacific and its partnership with the American President Lines' domestic branch.

One of the problems for intermodal service, and particularly for container services, appears to be empty backhauling. On any day there are as many as 3,000 empty intermodal trailers and containers waiting in the Chicago area for a load back to the West Coast. This has provided an opportunity for inexpensive transportation to the West Coast for midwest shippers.

Line Sales The Burlington Northern will attempt to continue to reduce its rail network. Instead of looking at every line as a potential candidate for a line sale, however, the Burlington Northern is interested in creating strong shortlines and regional railroads that will survive and continue to feed the Burlington Northern system. A weak line feeding into the Burlington Northern will continue to be a liability to the system. Therefore, if a new carrier can be financially viable on a line, given the labor cost structure of a new operator, the Burlington Northern will seek to sell, as opposed to abandon, the line.

Once a sold Burlington Northern line is being operated by another carrier, the Burlington Northern will work with the new operator and assist in marketing. The Montana Rail Link is an example of a new operating carrier that Burlington Northern has assisted. The Montana Rail Link carries Burlington Northern traffic across Montana and originates forest products that feed into the Burlington Northern.

In the grain-producing regions of the plains, the rationalization of the Burlington Northern's lines began as a result of the multi-car rates, started before the 1980 Staggers Act. Service will continue to concentrate, taking advantage of multi-car rates and contracts, thus causing additional light density lines to be uneconomical to operate and become candidates for line sales or abandonment.

Mergers and Line Purchases By Class I Carriers The Southern Pacific and Rio Grande merger and its likely purchase of the Soo Line from Kansas City to Chicago provides a new competitor for the Burlington Northern in the Denver to Chicago corridor. Also, the Southern Pacific purchase of the Illinois Central Gulf from East St. Louis to Chicago from the Chicago, Missouri and Western's trustee provides access into Chicago for the Southern Pacific

from the south and southeast. This will provide additional competition from the south to Chicago.

Chicago and North Western Transportation Company

Introduction The Chicago and North Western has become a railroad that specializes in serving a few well defined market niches. Management sees the railroad's role as being the provider of bulk and wholesale transportation services. The Chicago and North Western's three market niches are:

1. High volume movement of coal from the Powder River Basin in Wyoming to power plants in the Midwest and South.

2. High volume movement of bridge traffic from the West Coast to the East where the Chicago and North Western acts as the wholesaler of transportation service across Iowa and Northern Illinois. The Chicago and North Western is the Union Pacific's partner, moving linertrains from the West Coast and destined to Chicago or to the Chicago and North Western's junction with Conrail.

3. The movement of grain from Iowa and southern Minnesota to destinations throughout its network but predominately to the Mississippi River.

To the end of serving these three niches, the Chicago and North Western has been working to shape its network by:

1. Spinning off and/or abandoning unprofitable lines. The Chicago and North Western has reduced its network from 10,117 miles in 1975[96] to just under 6,000 miles in 1988.[97] Further, in the future the railroad is likely to be interested in selling-off non-core segments of its rail network.[98]

2. Building a 107-mile long line that serves the coal mines in the Powder River Basin. The line opened in 1984; by 1988, it handled over 35 million tons of coal.[99]

3. Purchasing of lines from the Milwaukee Road and the Rock Island trustees that complement its existing system. This includes the Rock Island main line between Minneapolis/St. Paul and Kansas City (the Spine line). In addition, the Chicago and North Western attempted to purchase the entire Milwaukee Road system but was unsuccessful in competition with the Grand Trunk and the Soo Line. The Soo Line ultimately was allowed to purchase the reorganized Milwaukee Road system.

The Chicago and North Western benefits from its geographic location. It provides the shortest link between the Union Pacific at Fremont, Nebraska, and Chicago. At Chicago, the railroad has direct interchanges with the eastern railroads (predominantly Conrail) for

through services (to the East Coast) and it has built a high capacity container loading and unloading facility at its "Global One" location. The Chicago and North Western's close ties with the Union Pacific and its ownership of the most direct rail route across Iowa have been major benefits.

The 1980s were a period of great change for the Chicago and North Western. During the decade, three of its four Class I competitors discontinued operation (through line sales or bankruptcy) in the Chicago to Omaha corridor, making the Chicago and North Western mainline across Iowa and northern Illinois an important link for transcontinental rail traffic. Other significant issues for the Chicago and North Western during the 1980s and in the future are covered in the following paragraphs.

Leveraged Buyout In the spring of 1989, Japonica Partners, a New York investment group, tried to mount a leveraged buyout of the Chicago and North Western. In an unfriendly buyout attempt, Japonica made stockholders an offer which was later exceeded by a management-led offer. The management-led buyout was successful. Other partners in the successful buyout included Blackstone Capital Partners LP (an investment banking firm), Donaldson, Lufkin and Jenrette, Inc., and the Union Pacific. The total cost of the buyout amounted to roughly $1.6 billion.[100]

The proposed buyout by the Japonica Partners placed the Union Pacific in a compromising position. The Chicago and North Western is the Union Pacific's link with the Chicago gateway. The proposed hostile buyout left the Union Pacific troubled that its Chicago connection would be mired in debt and unresponsive to the Union Pacific's needs. In response, the Union Pacific bought an option to buy the Iowa Interstate, a parallel regional railroad running on the old Rock Island mainline between Omaha and Chicago. In the management buyout, the Union Pacific provided $100 million for assurances that the mainline from Fremont to Chicago would be improved and the Union Pacific will also receive one-quarter ownership of the Chicago and North Western in five years.[101]

Current management believes its buyout does little to change the business plans of the railroad that were made prior to Japonica's hostile takeover attempt.

Services and Operations The services provided by the Chicago and North Western changed dramatically during the 1980s. Two of the North Western's market niches did not exist before the 1980s: double-stack linertrains are a phenomena of the 1980s and the western

coal business did not exist before the Powder River line was completed in 1984. In addition, during this period the Chicago and North Western grain transportation services were reoriented.

In the 1970s, as the Chicago and North Western abandoned light-density lines, grain transportation was affected by forcing shippers to larger facilities where it is economical to continue providing rail services. Later, lower multi-car rates reinforced the advantages of shipping through larger facilities. Particularly in Iowa, the Chicago and North Western's management attributes the consolidation of grain terminal facilities to these two forces and believes that the railroad has helped to form a system of large terminals that are economical to serve. The use of multi-car rates required that shippers and the carrier cooperate in the positioning of equipment and the timing of loading and switching. Thus the multi-car rates helped to promote cooperation on the shipping end of the transportation service which resulted in improved utilization of equipment.

In the 1980s, the ability to contract provided by the Staggers Act permitted the carriers to negotiate terms and cooperate with both the shipper and receiver. This further improved both the efficiency of services and the utilization of equipment.

The Chicago and North Western also adopted a change in philosophy as a result of the ability to contract and negotiate. Before Staggers, its sales personnel concentrated on long-haul, all rail movements of grain, mostly to Gulf of Mexico ports. Long-haul movements generally helped to improve the utilization of equipment and increased the revenue generated because cars were not idle as frequently compared to short-haul movements. Now the Chicago and North Western views all termini of their network as potential destinations and cooperates with barge lines in rail-water movements. Management attributes this change in philosophy to quicker turn-arounds at terminals and better cooperation. Thus the Chicago and North Western more commonly provides short-haul grain transportation services.

In addition to the flexibility provided by the Staggers Act, introduction of better data exchange and computerized distribution modeling have improved the utilization of equipment. Also, its management culture, which stresses innovation and quality, has helped to improve utilization and efficiency.

Regional and Short Line Railroads, and Line Sales Although the Chicago and North Western has aggressively sought to reduce its network to a core group of lines, management was hesitant to propose further line spin-offs. The Chicago and North Western

has a small enough network that its markets can be challenged by regional railroads. For example, the Chicago Central and Pacific has successfully challenged the Chicago and North Western and has taken some of its overhead traffic in the Chicago to Omaha corridor.[102] The Iowa Interstate competes for some of the Chicago and North Western's local traffic; the Wisconsin Central does the same in Wisconsin. Clearly the regional railroads have an advantage over the Chicago and North Western because the regional railroads have lower labor costs and fewer work rules.

Chicago and North Western management stated that if they continued to operate a line that is gathering local traffic, the railroad could more efficiently utilize its own equipment. If the line was sold to a shortline operator, the equipment would be tied-up longer, implying higher costs. Also, they felt that through the consolidation of grain terminal facilities that had taken place in the last 20 years, they had cultivated a clientele that they could efficiently serve.

The Chicago and North Western management interviewed agreed that Nebraska's northern line would be sold or abandoned in the near future. The portion of the line from Rapid City, South Dakota, to Colony, Wyoming, will probably be sold to the Dakota, Minnesota and Eastern Railroad.

Iowa Interstate Railroad LTD.

Introduction The Iowa Interstate Railroad operates the former Rock Island mainline that runs between Chicago and Omaha. The line was a primary east-west rail connection for many of Iowa's largest cities: Davenport, Iowa City, Des Moines, and Council Bluffs. The line also provided rail service to two of Iowa's largest manufacturers, Maytag Co. in Newton and the Rolscreen Corporation in Pella. The Iowa Interstate started service on the line in 1984.

After the Rock Island discontinued operations in 1980, the line was operated briefly by the Kansas City Terminal Railroad; then shippers along the line were served by the Chicago and North Western and the Milwaukee Road. Late in 1981, the Iowa Railroad Company leased the line from the Rock Island trustee and commenced operation along the line from Council Bluffs into Bureau, Illinois.[103] The Iowa Railroad Company ceased operation in 1984 when the ICC ruled that it no longer had authority to operate on the line when it was

sold to Heartland Rail Corporation. The ICC order also forced the Milwaukee Road off the line.

The Heartland Railroad Corporation is a group of shippers formed in June, 1983 to preserve the Rock Island line. Heartland's members include the Cedar Rapids and Iowa City Railway, Maytag Co., Rolscreen Co., Pioneer Hi-Breed International, Adair Feed and Grain, Alter Barge Line, Midwest Color Printing, Marengo Elevator, Casey Mill and Elevator, Security Insurance, Grainco Inc., and Midland Iron and Steel. Through a number of sources, the Heartland group managed to amass $31 million to purchase the line from the trustee. Included in the purchase were 435 miles of line, and trackage rights on 14 miles of the Chicago and North Western through Des Moines, 74 miles over the Baltimore and Ohio Railroad (now part of the CSX railroad) between Bureau and Joliet, Illinois, and 24 miles over the Chicago Regional Transit Authority track from Joliet to the Blue Island terminal facility in Chicago.

The line was purchased through a highly-leveraged combination of funding sources. The largest share was a $15 million, 3-percent loan from the Iowa Railway Finance Authority (a state-sponsored railway assistance board).[104] The remainder of the $31 million necessary to purchase the line plus provide operating capital was funded through an $11.5 million bank loan to the Iowa Interstate Railroad, $5 million in stock purchases by the Heartland Railroad Corporation, a $1.5 million bank loan, which represented the Iowa Interstate's equity, and $0.5 million from the Cedar Rapids and Iowa City Railroad for working capital. In addition, the Federal Railroad Administration provided Heartland with $6.2 million through the 4-R Act of 1976 preference share program. The additional $6.2 million was used to bring the entire line back to 40 mile per hour standards.

Heartland owns the line and the Iowa Interstate leases the track and has an option to buy the line from Heartland in 1999. The line is a single track system. The Rock Island's signal system was destroyed by vandals, forcing the Iowa Interstate to operate a non-signalized system. Trains operate with two-man crews. Although the train and engine crew are unionized employees, the Iowa Interstate's ability to efficiently utilize labor appears unhampered.

In the Iowa Interstate's first year of operation, it had 95 employees and did about $11 million worth of business.[105] During the first two years, the railroad operated at a loss and

in the third year the Iowa Interstate showed a modest profit.[106] In 1989 the railroad had about 250 employees and expected to earn $2 to 2.5 million in revenue per month. Loadings in 1989 were up by about 30 percent over 1988 and intermodal business was up by 38 percent.

Marketing Service The Iowa Interstate markets in specific niches. Its major niche is the hauling of local traffic with an origin or destination or both along the line. Only 7 percent of all traffic on the Iowa Interstate is overhead traffic and the average length of haul is between 200 and 250 miles. The Iowa Interstate views the majority of its markets to be shippers along the line. The Iowa Interstate does not see itself as a competitor with the parallel Chicago and North Western line. The latter predominately provides faster services on long-haul freight.

The Iowa Interstate has an important subsidiary and a close partnership with a third party agent that enhance the marketing of their services. The Iowa Interstate's subsidiary is a reload facility operator in Chicago, "Interstate Reload." The reload facility deals in rail-to-truck transfer of lumber and other building supplies and some warehousing. Shippers and receivers can warehouse materials to accumulate entire truckloads to obtain truckload rates. The Iowa Interstate's third agent partner, "Interdom," operates the intermodal loading facility in Newton.

Through its intermodal facility in Newton, the Iowa Interstate can move double-stack platforms with empty containers westbound from Chicago and top-out the load in Newton, generally with freight from Maytag. At the Newton facility, however, the Iowa Interstate is also loading freight on double-stack platforms and conventional piggyback with goods from other manufactures, U.S. Postal Service bulk mail, and even seed corn.

Well over half of the Iowa Interstate's traffic moves under contract or letter quotes. Because the Iowa Interstate is a small railroad, it feels that it has closer ties with its shippers than a Class I carrier. Because its labor force is more flexible, the Iowa Interstate feels it provides better and more reliable service. Crews are paid on an hourly basis, and crew territories, in the conventional sense, do not exit. The trains are run and crews assigned when they are needed and their use is not bound by restrictive territory agreements or road and yard distinctions.

The Iowa Interstate has a modest research and development program. The company's President and CEO, Paul Banner, is experimenting with new intermodal equipment, the Trailer-

Rail systems. The emphasis is on the design of equipment that is easy to handle and affordable by small railroads.

Union Pacific Railroad

Introduction The Union Pacific experienced tremendous change during the 1980s. In 1982 the Union Pacific, Missouri Pacific and Western Pacific merged to form the Union Pacific System. The merger gave the railroad single-line access from major West Coast ports to Chicago (in conjunction with the Chicago and North Western), St. Louis, and Memphis gateways to the East, and the ports along the Louisiana and Texas gulf coast. More recently, the Missouri-Kansas-Texas Railroad (Katy) merged with the Union Pacific. The Katy merger was approved by the ICC in May, 1988.[107] The Union Pacific now is the second largest western railroad (in terms of route mileage) with a 23,300 mile system. Besides increasing the Union Pacific's service area, the merger with the Missouri Pacific brought the system valuable chemical traffic and the Katy provides the opportunity to further rationalize trackage in Kansas, Oklahoma, and Texas.[108]

The Union Pacific's period of restructuring corresponded with the recession of the early 1980s. During the 1982 recession, the Union Pacific's net income fell by roughly one-third. Since then it has experienced steady growth. For example, Union Pacific's 1988 carloadings were up 11 percent compared to 1987, and in 1989 were estimated to be 3 percent greater than those of 1988.[109] On the other hand, the Union Pacific's major western railroad rivals have been restructuring during the Union Pacific's expansion. The Burlington Northern has been loaded up with debt and the Southern Pacific and Santa Fe have been left weakened as a result of their failure to merge.

Other major events that have helped to improve the Union Pacific's performance include:

1. The Chicago and North Western's extension into the Powder River Basin which feeds into the Union Pacific system. The low sulfur coal traffic has increased dramatically.

2. The growth of double stack and the Union Pacific's close relationship with steamship lines. The Union Pacific and its partners have been leaders in the linertrain business.

3. The Union Pacific has reduced its labor force from a 1980 level of 52,000 to a current level of 29,000. About 55 percent of the Union Pacific's trains have three person crews with the remaining having four and five person crews.[110]

4. Major investments in track, facilities and terminals, and equipment. For example, in 1988 and 1989 the Union Pacific took ownership of 450 new locomotives.

Although it is impossible to determine how much of the improved performance is due to the Staggers Act and regulatory relaxation, the Union Pacific has clearly benefitted from regulatory reform. Approximately 60 percent of the Union Pacific's carloads move under contracts or letter quotes on exempt shipments. Clearly, many of the Union Pacific's service improvements would have been impossible if regulation had not been reduced.

The 1980s were a period of growth for the Union Pacific. Several important issues during the decade and in the future for the Union Pacific are listed in the following.

Marketing of Services The Union Pacific's main traffic is coal and chemicals. Only 15 percent of its revenues are received from intermodal movements. The Union Pacific has been quite actively promoting its intermodal services, however.

The Union Pacific has developed a strong partnership with American President Intermodal (API) and operates linertrains (dedicated double-stack trains where the Union Pacific provides the track, crew and power, and API provides the equipment, containers and markets the services). Union Pacific has similar arrangements with "K" Line and Maersk Line. Union Pacific and API have further fostered their dependence on one another through the development of domestic double-stack services. API-Union Pacific Domestic double-stack service was first initiated in 1988 when the Union Pacific terminated its experiment with RoadRailers in the Chicago-Dallas corridor. After the RoadRailer service was stopped, double-stack service was initiated and has been operating ever since. Union Pacific intends to phase-out its piggyback service and phase-in double-stack trains in other corridors. Union Pacific would like to phase-out of piggyback trailer services and have all intermodal traffic in containers within the next five years, although the railroad would maintain limited piggyback service for private trailers for customers that demand premium trailer service (i.e., United Parcel Service).

The Union Pacific manages its other intermodal activities through a subsidiary, Union Pacific Freight Service (UPFS). It works with 11 regional less-than-truckload (LTL) motor carriers that originate and deliver freight in its region, with the line haul being performed by Union Pacific. Major LTL trucking companies (Roadway, Yellow, and Consolidated Freight) are also major Union Pacific customers. The Union Pacific is used, however, for linehaul

largely as an overflow. In other words, the trucking companies allow the railroad to carry the trailers when there is a shortage of drivers or when the trucking company's equipment is not positioned to match the existing traffic. United Parcel Service and the U.S. Post Office have also been regular Union Pacific customers.

In 1987, the Union Pacific purchased Overnite Transportation Co. (a LTL motor carrier) for $1.2 billion.[111] There was much speculation that because the Union Pacific's service area was largely in the west and Overnite's territory was predominately in the east, the two carriers would complement each other. Freight would be originated on one system and delivered on the other. The two organizations have remained fairly independent of one another, however. Some coordination is maintained through the sharing of marketing information and computer resources.

Truckload freight carried by Union Pacific is organized primarily by third party agencies. The Union Pacific feels that the region is adequately served by the existing intermodal loading facilities. The cost of drayage to its facility in Omaha from any locations in Iowa or southern Minnesota is so inexpensive that it is not cost effective to load trailers and containers on railcars at closer locations and use high cost, low use loading facilities. For example, the drayage costs from Des Moines to Omaha is estimated at roughly $150. The $150 does not justify the cost of operating a sparsely-used facility in central Iowa. Union Pacific managers further believed the only reason that the Iowa Interstate can maintain its mechanized container loading facility in Newton is because Maytag requires that its traffic be carried by the Iowa Interstate.

Line Sales The Union Pacific would like to reduce its network to a core of 15,000 to 16,000 miles. The Union Pacific has been slower than other Class I carriers to begin the spinning off its lines. Industry leaders in this area, like the Illinois Central Gulf and Conrail, have sold significant portions of their networks.

The Union Pacific developed a program for the sale of lines in 1986 but did not make a sale until 1987. Its first short line was the Southeastern Kansas Railroad, a 104-mile line between Coffeyville, Kansas, and Nevada, Missouri. Since then the Southeastern Kansas has been successful in attracting additional traffic. The Union Pacific views this as the model for other line sales. Other lines sold in the Midwest include the Golden Cat and the Jackson and Southern, both in Missouri. Until 1989, the Union Pacific had sold only 246 miles of lines.[112]

The Union Pacific line sale program was slowed by the P&LE case. In 1989, the Union Pacific worked on a deal to sell 476 miles of lines in and around Boise, Idaho, and eastern Oregon. However, the Union Pacific may be forced to make a payment of six years' salary protection for jobs that would be lost as a result of the line sale and to pay the difference in transportation cost for a major shipper that will be denied railroad access.

In the summer of 1989, the Union Pacific offered to lease two groups of branch lines in Kansas totalling roughly 700 miles. Leasing was offered instead of selling by the Union Pacific because a lease would reduce the short line operator's initial capital outlay and, therefore, reduce the burden of servicing a large debt while trying to initiate service. The lease arrangement would help the short line's chances of survival. Selling the lines outright would be preferred by the Union Pacific, however, because a sale would terminate its responsibility for the line.

Kansas and Nebraska have been relatively untouched by rail line abandonments or line sales. Kansas particularly has a relatively large rail system compared to its population base. When this was pointed out to Union Pacific managers, they noted that both states are likely to see more abandonment and line sales in the future. They believed the high density of the networks in the two states is largely a function of the differences between the marketing of feed grains and wheat (feed grains being more commonly grown in Nebraska and Iowa and wheat more commonly grown in Kansas). Feed grains may be consumed locally by livestock and, therefore, there may not be as much need for transportation. Also, Iowa has barge competition, forcing the railroads to concentrate on more efficient and larger facilities. Wheat is always shipped, however, either for export or to domestic processing facilities. Further, there is no effective competition between rail and barge companies in Kansas.

Other Issues The Union Pacific felt that grain quality was an issue and that there are export grain quality problems. They are both difficult to deal with and more or less outside the railroad's control. If customers want to receive grain separated by quality and reduce the amount of damage done to grain while being transported, then the Union Pacific will work to satisfy the need.

The Union Pacific did not perceive a hopper car shortage. Its problems of car unavailability seems to stem more from cars being held by shippers or their inability to control the use of its cars. As an example, once a grain car has been assigned to a shipper

the ultimate destination of the car may change due to changes in the export market or a car may be delayed due to the late arrival of a steamship. The Union Pacific likes to own enough of its own grain hopper cars to cover the average demand for grain transportation and let the shippers handle the peaks with their own equipment.

The Union Pacific is not currently looking for merger partners or even a partner for an agreement similar to the Voluntary Cooperation Agreement (VCA) between the Santa Fe and Burlington Northern (see the Santa Fe description for more on VCA). Currently, the field for making cooperative agreements seems to be wide open. Therefore, the managers interviewed argued against the Union Pacific tieing itself to one other specific carrier through a merger agreement or a formal VCA in favor of dealing with any interested carrier.

Conclusions

The comments of the one regional railroad interviewed sharply contrasted with the comments of the Class I railroads. The regional railroad was looking for opportunities to expand and is increasing the size of its work force. By contrast, all Class I carriers are searching for opportunities to reduce their rail system and reduce the size of their work force.

Issues that were commonly addressed in the railroad companies case studies are:

Labor Class I railroads were all concerned with restrictive labor rules and high labor costs. The regional railroad reported having a productive and motivated workforce. Further, the problems of high labor costs have negative impacts on other issues. For example, many of the Class I railroads are spinning off lines to local and regional railroads so that the lines may be operated by new companies with less restrictive labor rules and lower labor costs. Therefore, line sales appear to be the symptom of the inflexibility of rail labor rules and high labor costs.

Each of the Class I carriers have taken an aggressive stand to reduce labor costs and inflexibility of labor rules. For example, the Burlington Northern reduced its employees by 30 percent in six years (1980 to 1986). All Class I carriers reported that they look to make additional cuts.

Line Sales Each of the Class I carriers is expecting to down-size its network through the spinning off of lines to regional and local railroads. The Iowa Interstate, by contrast, sees the sale of lines as a business opportunity. The line sales plans of many of the carriers

were shelved until the P&LE court case was decided.[113] Given that the Supreme Court's ruling was not definitive, carriers may be slow to re-initiate line sales programs.

Assuming that future contested line sales find that the conditions of the sale need not be bargained with labor, the three transcontinental carriers interviewed (the Burlington Northern, Union Pacific and Santa Fe railroads) all expect to have substantial line sales programs. Given the dominance of both the Union Pacific System and the Santa Fe in Kansas and Kansas' over abundance of rail lines, it is likely that Kansas will be most strongly affected by line sales.

Intermodal All the carriers expected growth in their intermodal business. They believed that there is a need for greater integration of transportation services (i.e., line haul, shipment information, drayage, warehousing, transfer) to increase the desirability of cooperative intermodal services. Some railroads hope to achieve integration of services through partnerships with third parties and other carriers, while others are integrating through internally provided total transportation services.

Endnotes

1. John W. Ingram, "Government and Midwest Railroads: Demise of the Chicago, Rock Island and Pacific Railroad Company," Transportation Journal Vol. 19, No. 3 (Spring 1980), p. 29.

2. John F. Due, "New Railroad Companies Formed to Take Over Abandoned or Spun-Off Lines, Transportation Journal Vol. 24, No. 1 (Fall 1984), p. 33.

3. "Soo Buys Milwaukee Road following Final Court OK," Rail News Update, No. 2417 (March 6, 1984).

4. "ICI to Spin Off ICG as Independent," Rail New Update, No. 2482 (September 30, 1987).

5. The American Association of Railroads defines regional railroads as non-class I railroads that operate at least 350 miles of rail line and/or earns at least $40 million in annual revenues. All other non-class I railroads, short lines, terminal, and switching railroads, are considered local railroads. "Statistics on Regional and Local Railroads," American Association of Railroads, Economics and Finance Department (Washington, D.C., 1988).

6. "1985 Iowa Railroad Analysis Update," Planning and Research Division in cooperation with the Rail and Water Division, Iowa Department of Transportation (1986), p. 87.

7. Cedar Rapids and Iowa City Railway Company is owned by the Iowa Electric Light and Power Company and provides line haul service between the two cities.

8. The Appanoose County Community Railroad Company is a non-profit community owned railroad of 9.5 miles. The primary purpose of the railroad is to connect the Union Carbide plant in Centerville with the north-south mainline of the Norfolk and Western Railway. The purchase of abandoned Rock Island and Burlington Northern lines was funded through a local fund raising campaign, a loan from the Farmers Home Administration, an Urban Development Action Grant, and an Iowa Department of Transportation Rail Assistance Program grant.

9. "1985 Iowa Railroad Analysis Update," Planning and Research Division in cooperation with the Rail and Water Division, Iowa Department of Transportation, Ames, Iowa (1986), p. 87.

10. "CNW Acquires RI Line After Receiving Court OK," Rail News Update, No. 2376 (July 13, 1983).

11. The portion of the present Soo Line between Davenport and Washington, Iowa (roughly 66 miles) was purchased from the Rock Island. The parallel Milwaukee Road track between Davenport and Washington was abandoned.

12. The D&I Railroad Company is owned by a construction company. Although the D&I is a common carrier, it is primarily engaged in hauling construction materials from a quarry in South Dakota into Sioux City.

13. "C&NW, Soo Line Bids Approval by Commission," Rail News Update, No. 2413 (January 9, 1984).

14. "Soo Buys Milwaukee Road Following Final Court OK," Rail News Update, No. 2417 (March 6, 1984).

15. "1988 Annual Report of the Iowa Railway Finance Authority," Rail and Water Division, Iowa Department of Transportation (Ames, Iowa 1988).

16. Data on the TOFC and COFC sites were reported in the "The Official Railway Guide: North American Freight Service Edition," National Railway Publication Company, New York, NY (Mar/April, 1980) and "The Official Railway Guide: North American Freight Service Edition," International Thomson Transportation Press, Inc., New York, NY (September/October, 1988).

17. The Southern Pacific is attempting to purchase (from the Missouri, Chicago and Western trustee) the Soo Line running into Chicago and the old Illinois Central Gulf line running from East St. Louis into Chicago.

18. T.H. Maze, Allen R. Cook, and Max Carter, "Restoring Rail Service Along the Old Chisholm Trail: The Oklahoma Brokerage Approach," Transportation Journal, Vol. 23, No. 3 (Spring, 1984), pp. 15-23.

19. In August 1988, the Denver, Rio Grande and Western merged with Southern Pacific.

20. Kansas Department of Transportation, "Kansas Rail Plan: 1988 Update" (Topeka, Kansas, 1988), p. 57.

21. Kansas Department of Transportation, "1982 Kansas State Rail Plan" (1982).

22. Section 9 of Article 11 of the Constitution of the State of Kansas After November 4 (1980).

23. "Official Railway Guide: North American Freight Service Edition" (Mar/April, 1980) and "The Official Railway Guide: North American Freight Service Edition" (September/October, 1988).

24. "Rio Grande To Purchase 532 Miles of Soo Trackage," Rail News Update, No. 2527 (July 19, 1989).

25. "631-Mile ICG Line Sold to CSS&SB for $81 Million," Rail News Update, No. 2453 (August 6, 1986).

26. "State-Funded Line OKd To Help Rescue CM&W," Rail News Update, No. 2505 (August 31, 1988).

27. "Southern Pacific to Purchase St. Louis-Chicago Line," Rail News Update, No. 2504 (August 16, 1989).

28. "Missouri Rail Plan 1980 Update," prepared for the Missouri Highway and Transportation Department by Wilbur Smith and Associates, Jefferson City, MO (1980).

29. "Missouri Rail Plan 1984 Update," Missouri Highway and Transportation Department, Transportation-Railroads, Jefferson City, MO (1984).

30. "Katy Railroad Merged with Union Pacific" Rail New Update, No. 2505 (August 31, 1988).

31. "Short Line Gives New Life To Kansas, Missouri Branch," On Track: A Railroad Industry Report, Vol. I, No. 8 (May 17-31, 1987).

32. "Official Railway Guide: North American Freight Service Edition" (Mar/April, 1980), and "The Official Railway Guide: North American Freight Service Edition" (September/October, 1988).

33. "Nebraska Rail Plan 1980," prepared by the Nebraska Department of Economic Development, with assistance from Wilbur Smith and Associates, Leo A. Daly Company, and Associated Engineers (July, 1980).

34. The Brandon provides switching services in South Omaha and the Omaha, Lincoln, and Beatrice provides switching services in Lincoln.

35. The Mid-States Port Authority will be discussed in more detail in the Kansas section.

36. "Nebraska Rail Plan: 1986 Update," Prepared by the Nebraska Department of Roads with assistance from Wilbur Smith and Associates in association with Wells Engineers (1986).

37. The Local Rail Service Assistance Act of 1978 was phased-out, effective October 1, 1988.

38. Constitution of the State of Nebraska, Article XIII, Section 3.

39. "Nebraska Rail Program Needs," prepared by the Nebraska Department of Roads with Assistance from Wilbur Smith Associates (1989).

40. The Dakota, Minnesota, and Eastern is a regional railroad which operates in North Dakota, South Dakota and Minnesota.

41. K.E. Wolfe, "The Downside Risk: An Analysis of Local and Regional Railroad Service Failures," Journal of the Transportation Research Forum, Vol. 24, No. 1 (1988), p. 124.

42. J. H. Mielke, "Short Line Railroad Creations: Terms of Sale, Impacts on Viability, and Public Policy Implications," Journal of the Transportation Research Forum, Vol. 24, No. 1 (1988), p. 144.

43. Federal Railroad Administration, "Deferred Maintenance and Delayed Capital Improvements on Class II and Class III Railroads: A Report to Congress," U.S. Department of Transportation, Washington, D.C. (1989), pp. 93-94.

44. Financial Docket No. 30439, "Gulf and Mississippi Railroad Corporation - Purchase (Portion) - Exemption - Illinois Central Gulf Railroad Company," Interstate Commerce Commission (January 2, 1985).

45. Ex Parte No. 392, "Class Exemption for the Acquisition and Operation of Rail Lines Under 49 U.S.C. 10901," Interstate Commerce Commission (August, 1985).

46. D.V. Harper, Transportation in America: Users, Carriers, Government, (Englewood Cliffs, N.J.: Prentice-Hall, 1978), pp. 323-324.

47. "High Court to Decide Short Line Sale Issue," On Track: A Railroad Industry Report, Vol. II, No. 2 (November 16-30, 1988).

48. J.H. Mielke, p. 144.

49. In an interview with Chicago and North Western managers, the rail carrier with the most track in Iowa, they stated that they had no intention of abandoning or selling any of the light density grain gathering lines in Iowa. For additional information on this topic, see the Chicago and North Western interview write-up in the last section of this chapter.

50. "UP is Asking for Bids on 2 Short Line Groups," Rail News Update, No. 2528 (August 2, 1989).

51. Federal Railroad Administration, "Deferred Maintenance and Delayed Capital Improvements on Class II and Class III Railroads: A Report to Congress," Washington, D.C. (1989).

52. Federal Railroad Administration (1989), p. 34.

53. Federal Railroad Administration (1989), p. 36.

54. Federal Railroad Administration (1989), p. 73.

55. Federal Railroad Administration (1989), p. 69.

56. "BN Intermodal Hub Opened in Memphis," Rail News Update, No. 2372 (May 18, 1983).

57. Greenwood, W.E., "Burlington Northern Railroad's View of Intermodal Hub Centers and Their Impact On Productivity and Customer Service," Transportation Research Record No. 1029 (1985), pp. 41-43.

58. John H. Mahone, Intermodal Freight Transportation, (Westport, Connecticut, Eno Foundation for Transportation, Inc. 1985), p. 8.

59. R.T. Sorrow, "Where, How Does Intermodal Fit In?," Modern Railroads (May, 1989), p. 23.

60. Association of American Railroads, "Railroad Facts," Washington, D.C. (1988).

61. John H. Mahone, p. 45.

62. Daniel S. Smith, "Double-Stack Container Systems: Implications for U.S. Railroads and Ports," Proposal submitted by Manalytics, Inc., ALK Associates, Inc., TR Transportation Consultants, and Transportation Research and Marketing (July, 1988).

63. G. Welty, "Containers Come On Strong," Railway Age, (February 1989), p. 25.

64. R.T. Sorrow, "Where, How Does Intermodal Fit In?"

65. American Association of Railroads, "Railroad Facts" (1988).

66. "Equipment Builders Respond to the Intermodal Challenge," Railway Age (April, 1988), pp. 44-50.

67. L.S. Miller, "Still Playing Catch-up," Railway Age (May, 1989), p. 53.

68. Daniel S. Smith., "Domestic Containerization: How Big Can It Get?," Transportation Research Forum Proceedings, Vol. 27, No. 1 (1986), pp. 289-295.

69. John H. Mahone, p. 70.

70. R.T. Sorrow.

71. G. Welty, "The Payoff in New Equipment," Railway Age (September, 1986), p. 29.

72. American Railroad Association (1988).

73. Archambault, M., "Intermodalism and Liner Shipping Intermodal Approaches," Transportation Practitioners Journal, Vol. 56, No. 2 (1989) pp 151-169.

74. "Santa Fe, SP Define Terms of Merger Pact," Rail News Update, No. 2383 (October 19, 1983).

75. "SFSP Sees Significant Realignment," Rail News Update, No. 2475 (July 8, 1987).

76. J. Abbott, "Santa Fe Can't Rest On Laurels," Modern Railroads (August, 1989), p. 34.

77. J. Abbott, "Santa Fe Can't Rest On Laurels," p. 29.

78. G. Welty, "ATSF Watches Its 'Q'," Railway Age (February, 1989), p. 34.

79. G. Welty, "Santa Fe's John Swartz," Railway Age (August, 1988) p. 42.

80. "Improved Rail Competition Big Factor in Sale of SP" Rail News Update, No. 2506 (September 14, 1988).

81. "Santa Fe Consolidates Intermodal Terminals," Rail News Update, No. 2379 (August 24, 1983).

82. L. Cena, "Santa Fe's Answer To The Double-Stack," Railway Age (June, 1985), pp. 54-55.

83. A. Chancellor, "Trip To Far East More Than a Junket," Modern Railroads (February, 1989), pp. 36-38.

84. J. Abbott (1989), p. 29.

85. J. Abbott (1989), p. 31.

86. J. Abbott (1989), p. 33.

87. Handy Railroad Atlas of the United States (Chicago: Rand McNally & Company, 1988).

88. T. Shedd, "Burlington Northern: Aggressive, Innovative and Thoroughly Non-Traditional," Modern Railroads (November, 1986), p. 22.

89. T. Shedd, "Meeting the Future Head-on: BN's Darius W. Gaskins, Jr.," Modern Railroads (January, 1988), p. 20.

90. G. Welty, "Coal-Hauling, Western Style," Railway Age (May, 1989), p. 43.

91. T. Shedd (November, 1986), p. 22.

92. F.K. Plous, "BN's Extraordinary Expediters," Railway Age (November, 1987), pp. 30-40.

93. T. Shedd (1988), p. 20.

94. J. Abbott, "Car and Locomotive Builders Can Taste Better Days Ahead," Modern Railroads (March, 1988) p. 34.

95. "Hub Centers Spark IM Gains," Modern Railroads (November, 1986), p. 35.

96. "1985 Iowa Railroad Analysis Update," prepared by Planning and Research Division in cooperation with the Rail and Water Division, Iowa Department of Transportation, Ames, Iowa (1986), p. 97.

97. Rand McNally & Company (1988), p. 53.

98. "C&NW's James R. Wolfe," Railway Age (April, 1988), p. 37.

99. Rail Age (April, 1988), p. 38.

100. "$1.6 Billion Merger Pact Approved by CNW Directors," Rail News Update, No. 2525 (June 21, 1989).

101. J. Abbott, "Union Pacific: A Railroad On A Roll," Modern Railroads (September, 1989), p. 44.

102. Rail Age (April, 1988), p. 37.

103. "1982 Iowa Railroad Analysis Update," prepared by Planning and Research Division in cooperation with the Railroad Division and the Transportation Regulation Authority, Iowa Department of Transportation, Ames, Iowa (1982).

104. G. Borzo, "One Interstate Takes on Another," Modern Railroads (October, 1986), p. 34.

105. F.K. Plous, "What's Different About the Iowa Interstate," Railway Age (January, 1988), p. 43.

106. F.K. Plous (January, 1988), p. 34.

107. "Katy Railroad Merged With Union Pacific," Rail News Update, No. 2505 (August 31, 1988).

108. J. Abbott, "Union Pacific: A Railroad on a Roll," Modern Railroads (September, 1989), p. 44.

109. J. Abbott (September, 1989), p. 44.

110. J. Abbott (September, 1989), p. 48.

111. "UP Overnite Buy Approved," Rail News Update, No. 2482 (September, 1987).

112. K. Keeney, "Program Poised to go Forward," Modern Railroads: Short Lines and Regionals, Vol. 43, No. 7 (April, 1988), p. 22.

113. The Pittsburgh and Lake Erie Railroad (P&LE) case is discussed in the Summary of Regional Rail System Changes section, earlier in this chapter. The key issue in the case is whether labor must be a party to the negotiations leading to the sale of a line.

Appendix A
Shipper Logistics Trends Questionnaire

IOWA STATE
UNIVERSITY

College of Business Administration
Department of Transportation and Logistics
300 Carver Hall
Ames, Iowa 50011
Telephone 515-294-3659

August 30, 1989

Dear Transportation Professional:

We are conducting an independent research project on trends and developments in the purchasing of motor carrier service. Specifically, we are investigating the extent to which shippers are utilizing transportation third parties, contracting, electronic data interchange (EDI), and carrier selection criteria in acquiring and managing motor carrier service.

Your firm was selected at random from the Official Directory of Industrial and Commercial Traffic Executives. Your input in this research would be greatly appreciated. The attached questionnaire was designed for ease of completion and should take no more than 30 minutes of your time. If possible, we would like to have the completed questionnaire returned in the accompanying envelope within ten days. We assure you that **absolute confidentiality** will be maintained as our interest lies only in the aggregate results of the survey.

If a sufficient number of responses are received, the aggregate results of this research will be submitted to both practitioner and academic journals. You may request a personal copy of the summary of the results by providing your mailing address at the bottom of this page.

We thank you in advance for the expeditious return of the completed questionnaire and for your contribution to the advancement of knowledge in the area of transportation and logistics management. If you have any questions, please feel free to contact us.

Sincerely,

Michael R. Crum

Dr. Michael R. Crum
Associate Professor
Department of Transportation & Logistics
Iowa State University
Ames IA 50011-2065

Benjamin J. Allen

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Please send a summary of the questionnaire results to:

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SHIPPER LOGISTICS TRENDS

1. Your company operates or has a subsidiary which operates as the following: (Mark X by all that apply)

   a. For-hire motor carrier _____
   b. Private motor carrier _____
   c. Motor freight broker _____
   d. Other 3rd party operator _____

2. Your company's 1988 sales volume in dollars was in which of the following ranges?

   a. Less than $25 million
   b. $26 million to $100 million
   c. $101 million to $500 million
   d. $501 million to $999 million
   e. $1 billion to $5 billion
   f. More than $5 billion

3. Your company's primary function in 1988 in terms of total sales revenue was: (Circle only one)

   a. Manufacturer/processor
   b. Retailer
   c. Distributor

4. Which of the following industrial classifications best describes your company? (Circle only one)

   a. Appliances
   b. Automotive & parts
   c. Clothing & textiles
   d. Furniture
   e. Hardware
   f. Machinery & tools
   g. Metal products
   h. Office equipment
   i. Electronics
   j. Food & beverage
   k. Paper & related products
   l. Publishing
   m. Pharmaceutical, health and beauty aids
   n. Rubber and related products
   o. Other (specify) _____
   _____

5. The geographical destinations of the majority of your firm's commodity shipments in 1988 were primarily: (Circle only one)

   a. International
   b. National (outside adjacent states)
   c. Regional (among adjacent states)
   d. Intrastate
   e. Local (in or around your community)

6. Approximately what **percentage** of your company's 1988 expenditures for **all freight transportation** services (private carriage plus for-hire carriage) was spent on **for-hire motor carrier service?** _____%

7. Your company's approximate **truck** transportation freight bill for **for-hire** service in 1988 fell into which of the following dollar ranges?

   a. Below $5 million
   b. $5 million to $10 million
   c. $11 million to $25 million
   d. $26 million to $50 million
   e. $51 million to $100 million
   f. More than $100 million

8. Approximately what **percentage** of 1988 expenditures on **for-hire** motor carrier service was spent on **less-than-truckload (LTL) service?**

a. 0%
b. 1% - 25%
c. 26% - 50%
d. 51% - 75%
e. 76% - 99%
f. 100%

PART I. USE & OPERATION OF TRANSPORTATION THIRD PARTIES

This section requests information concerning your company's use and operation of transportation third parties. If your company has not used and does not intend to use or operate third party service, please answer Question 1 and then go to Part II. If your company uses or operates transportation third parties, please skip Question 1 and go to Question 2.

1. Rate the following reasons which explain why your company **does not use** external transportation third parties for truck transport service. Use a rating scale from 1 to 7 with **1 = not important, 4 = moderately important,** and **7 = extremely important** in making a decision. Circle the appropriate number following each statement.

a. Do not want to lessen control over motor carrier service	1	2	3	4	5	6	7
b. Negative past experience with third party	1	2	3	4	5	6	7
c. In-house traffic or logistics department can obtain better rates from carriers than third parties can	1	2	3	4	5	6	7
d. Other. Please specify and rate: _____ _____	1	2	3	4	5	6	7

2. Approximately what **percentage** of your company's expenditures for motor carrier service was incurred on shipments tendered through a third party during 1984 and 1988?

1984: _____% 1988: _____%

3. Which of the following transportation third parties were used by your company for its motor freight needs in 1984 and 1988? (Mark X by all that were used in each year)

	1984	1988
a. Motor freight brokers	_____	_____
b. Freight forwarders	_____	_____
c. Shippers agents	_____	_____
d. Shipper associations	_____	_____

4. Please indicate how you expect your company's usage of external transportation third parties to change over the next five (5) years. Use a scale from 1 to 5 with **1 = significant increase, 2 = slight increase, 3 = no change, 4 = slight decrease, and 5 = significant decrease.** Circle the appropriate number following each third party.

a. Motor freight brokers	1	2	3	4	5
b. Freight forwarders	1	2	3	4	5
c. Shippers' agents	1	2	3	4	5
d. Shipper associations	1	2	3	4	5

5. Rate the following reasons which explain why your company **uses external transportation third parties** for truck transport service. Use a rating scale from 1 to 7 as described in Question 1 above. Circle the appropriate number following each statement.

a. Obtain better freight rates	1	2	3	4	5	6	7
b. Third parties have better knowledge of carriers, rates, etc. in some transport markets	1	2	3	4	5	6	7
c. Obtain traffic to better utilize the company's private truck fleet	1	2	3	4	5	6	7
d. Reduce in-house traffic or logistics department costs	1	2	3	4	5	6	7
e. Obtain a full range of distribution or logistics services (ie., purchase more than just transportation service from third parties)	1	2	3	4	5	6	7
f. Reduce the number of transactions required in acquiring motor carrier service	1	2	3	4	5	6	7
g. Other. Please specify and rate: _____ _____	1	2	3	4	5	6	7

6. If your company **operates** as a transportation third party with respect to truck transport service, please rate the following advantages of doing so. Use a rating scale from 1 to 7 as described in Question 1 above. Circle the appropriate number following each statement.

a. More fully utilize in-house traffic or logistics department	1	2	3	4	5	6	7
b. More fully utilize company's private truck fleet	1	2	3	4	5	6	7
c. "Marry" your company's freight with the freight of other shippers in order to receive better rates from for-hire carriers	1	2	3	4	5	6	7
d. Other. Please specify and rate: _____ _____	1	2	3	4	5	6	7

PART II. ELECTRONIC DATA INTERCHANGE

If your company has not employed electronic data interchange (EDI) with its for-hire motor carriers and has no intentions to do so in the future, omit this section and go to Part III.

1. Approximately what percentage of the **motor carriers** used (or expected to be used) by your company has (or is expected to have) capabilities for EDI with your company?

   1984: _____% 1988: _____% 5 years from now: _____%

2. Approximately what percentage of your company's **truck freight** was (or is expected to be) transported by a motor carrier which had (or is expected to have) EDI with your company?

   1984: _____% 1988: _____% 5 years from now: _____%

3. Which statement best describes the influence of EDI needs on your company's decision concerning the number of motor carriers to use?

   a. EDI requirements have exerted **no influence** on this decision.
   b. EDI requirements influenced the company to use **fewer** motor carriers.
   c. EDI requirements influenced the company to use **more** motor carriers.

4. Many motor carriers do not offer EDI capabilities. Please indicate the degree to which you agree or disagree with each of the following possible reasons why a motor carrier may not offer EDI capabilities. Use a scale from 1 to 5 with **1 = strongly agree, 2 = agree, 3 = neither agree nor disagree, 4 = disagree, and 5 = strongly disagree.** Circle the appropriate number following each statement.

a. Shipper demand for motor carrier EDI capabilities is not likely to increase by much in the foreseeable future.	1	2	3	4	5
b. The cost of developing and implementing EDI capabilities is too great for all but the largest motor carriers.	1	2	3	4	5
c. Motor carrier management often lacks the expertise needed to develop and implement EDI capabilities.	1	2	3	4	5
d. Due to the lack of uniformity among shippers' EDI systems, many motor carriers are wary of becoming "captive" to a given shipper or group of shippers.	1	2	3	4	5
e. Other. Please specify: _____	1	2	3	4	5

5. Circle the letter in front of the statement that best describes the influence of your company's EDI needs on its decision concerning whether to <u>contract</u> for motor carrier service with either common or contract carriers.

   a. EDI needs **have not been a consideration** in your company's decisions concerning contracting for motor carrier service.
   b. EDI needs have been a consideration in decisions concerning contracting for motor carrier service, but have not **been the most important consideration.**
   c. EDI needs **have been the most important consideration** in your company's decisions concerning contracting for motor carrier service.

PART III. CONTRACTING FOR MOTOR CARRIER SERVICE

1. Which of the following reflects the expected change in your company's use of contracting for motor carrier service over the next five years?

   a. Significant increase
   b. Slight increase
   c. No change
   d. Slight decrease
   e. Significant decrease

If your company does not currently contract for services with common or contract motor carriers, omit the rest of this section and go to Part IV.

2. Approximately what percentage of your company's total 1988 **expenditures** for for-hire motor carrier service occurred under contract agreement?

   a. Less than 10%
   b. 10 - 25%
   c. 26 - 50%
   d. 51 - 75%
   e. 76 - 99%
   f. 100%

3. Approximately what percentage of your company's contracts for motor carrier service is with Class I motor carriers? (Class I carriers earn more than $5 million operating revenue per year.)

   a. 0%
   b. 1 - 10%
   c. 11 - 25%
   d. 26 - 50%
   e. 51 - 75%
   f. 76 - 99%
   g. 100%

4. Circle the letter in front of the statement which best indicates your company's view concerning the appropriate length to contract for motor carrier service.

   a. Less than one year
   b. One to two years
   c. More than two years

5. Rate the following benefits of contracting for motor carrier service in terms of their importance to your company. Use a rating scale from 1 to 7 with **1 = not important, 4 = moderately important and 7 = extremely important.** Circle the appropriate number following each statement.

a. Improved availability of equipment	1	2	3	4	5	6	7
b. Improved reliability of transit time	1	2	3	4	5	6	7
c. Improved reliability of pick-up and delivery service	1	2	3	4	5	6	7
d. Carrier service is better tailored to company's transportation and logistics needs	1	2	3	4	5	6	7
e. Reduced carrier rates	1	2	3	4	5	6	7
f. Confidentiality of rates	1	2	3	4	5	6	7
g. Other. Please specify and rate: _____	1	2	3	4	5	6	7

_____

6. Mark X by all of the following statements which are included in the majority of your company's contracts for motor carrier service.

___ a. Exclusivity clause which prohibits motor carrier from serving other shippers
___ b. Limitation on the numbers or types of other shippers the motor carrier may also serve
___ c. Requirement that motor carrier dedicate certain equipment to meeting your company's service needs
___ d. Rate discounts for motor carrier's failure to meet promised service levels or quality
___ e. Freight bill payment due dates for services rendered
___ f. Procedures for settling freight claims
___ g. Guaranteed freight volumes per period of time
___ h. Other. Please specify: _____

_____

PART IV. FOR-HIRE CARRIAGE

This section requests information on your company's past, present, and future use of for-hire carriage.

1. Please provide the total number of for-hire motor carrier firms used by your company for 1984 and 1988:

1984: _____ 1988: _____

2. Which of the following reflects the expected change (over the next five years) in the number of motor carriers used by your firm?

a. Significant increase
b. Slight increase
c. No change
d. Slight decrease
e. Significant decrease

3. Approximately what percentage of your company's 1988 expenditures for for-hire motor carrier service went to Class I motor carriers? (Class I carriers earn more than $5 million operating revenue per year.)

a. 0%
b. 1 - 10%
c. 11 - 25%
d. 26 - 50%
e. 51 - 75%
f. 76 - 99%
g. 100%

4. Rate each of the following motor carrier firm and performance characteristics in terms of decision-making importance when your company selects a motor carrier. Use a rating scale from 1 to 7 with 1 = **not important**, 4 = **moderately important and 7 = extremely important** in making a decision. Circle the appropriate number following each characteristic.

a. Carrier financial stability	1	2	3	4	5	6	7
b. Geographical coverage	1	2	3	4	5	6	7
c. Capability (e.g., handle special products)	1	2	3	4	5	6	7
d. Pickup service reliability	1	2	3	4	5	6	7
e. Transit time reliability	1	2	3	4	5	6	7
f. Willingness to negotiate price	1	2	3	4	5	6	7
g. Willingness to provide service under contract	1	2	3	4	5	6	7
h. Familiarity with carrier	1	2	3	4	5	6	7
i. Availability of computerized billing and tracing services	1	2	3	4	5	6	7
j. Carrier reputation	1	2	3	4	5	6	7
k. Loss and damage performance	1	2	3	4	5	6	7
l. Claim settlement	1	2	3	4	5	6	7
m. Distribution/consolidation services	1	2	3	4	5	6	7
n. Quality of carrier personnel	1	2	3	4	5	6	7
o. Ability to provide extensive electronic data interchange	1	2	3	4	5	6	7
p. Other. Please specify and rate: _____	1	2	3	4	5	6	7

_____

5. Approximately what percentage of your company's 1988 expenditures for for-hire motor carrier service is paid to the motor carrier that provides the most service (in dollar terms) to your company?

a. Less than 10%
b. 11 - 25%
c. 26 - 50%
d. 51 - 75%
e. 76 - 99%
f. 100%

6. Which of the following reflects the expected change (over the next five years) in the percentage of your company's total motor carrier freight bill which will go to the carrier that provides the most service (in dollar terms) to your company?

a. Significant increase
b. Slight increase
c. No change
d. Slight decrease
e. Significant decrease

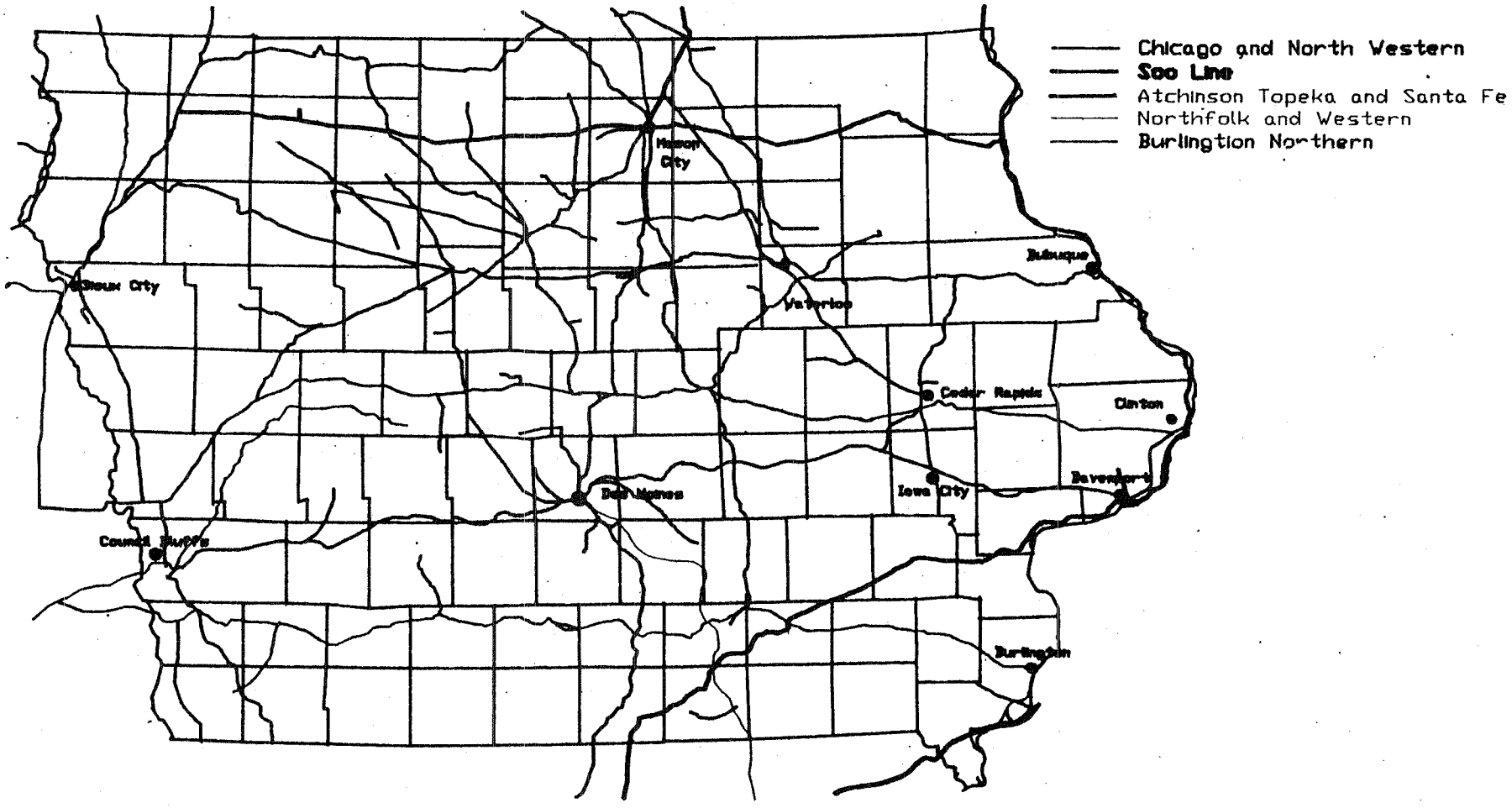

Figure 6-1: Iowa Class I Railroads (Terminal Railroads Not Shown)

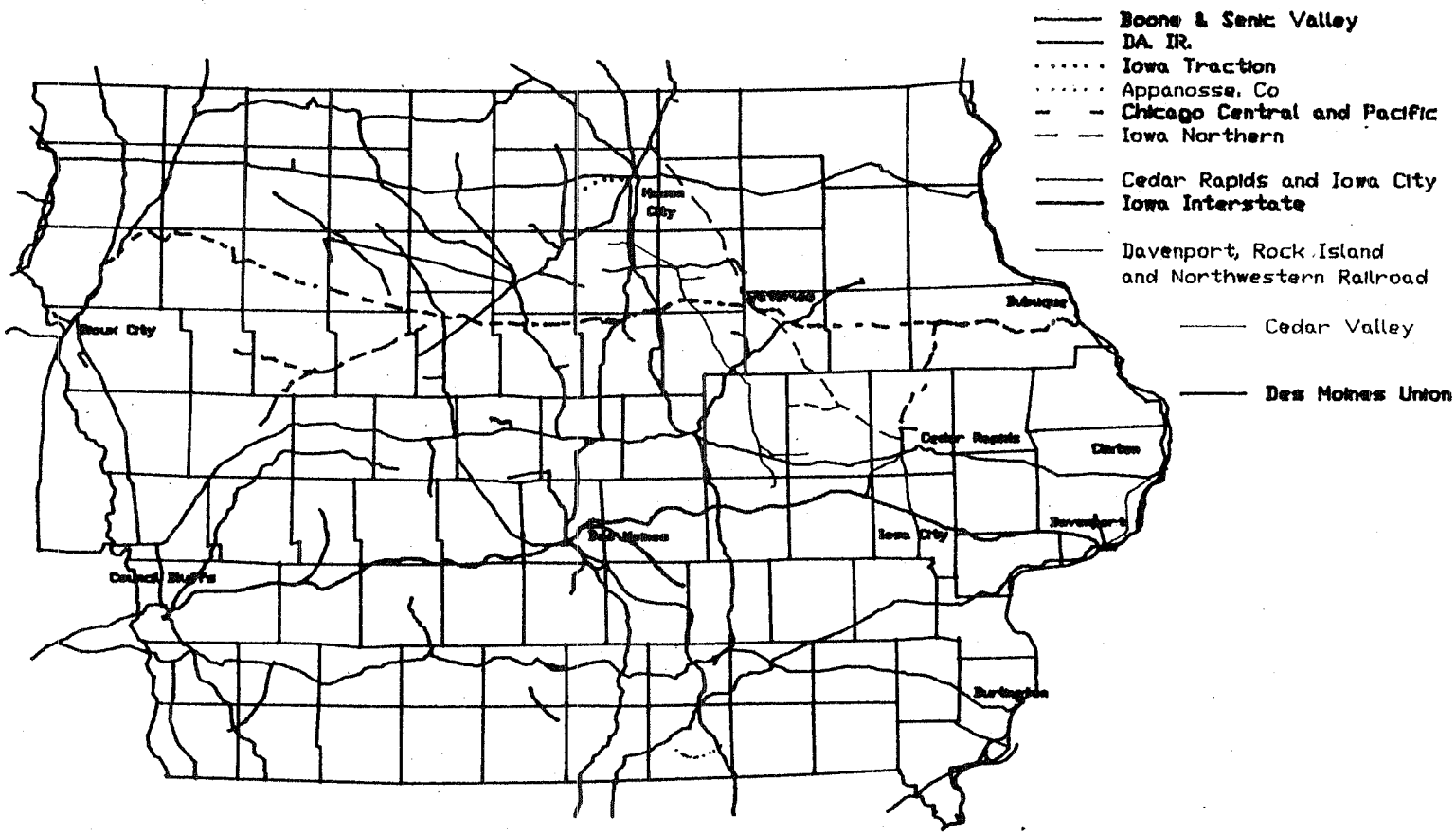

Figure 6-2: Iowa Local and Regional Railroads
(Terminal Railroads not shown)

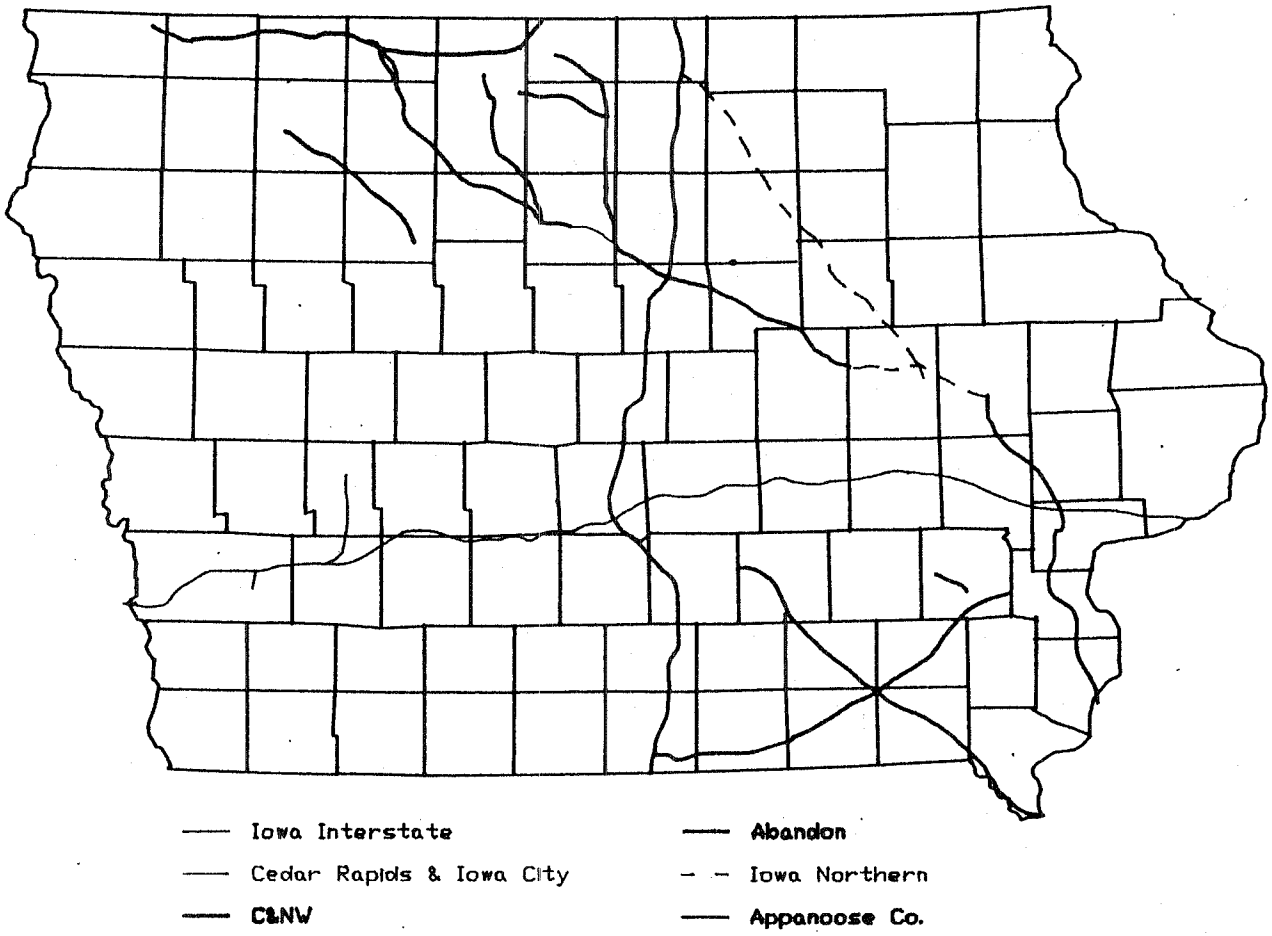

Figure 6-3: Disposition of Chicago, Rock Island and Pacific Railroad Company

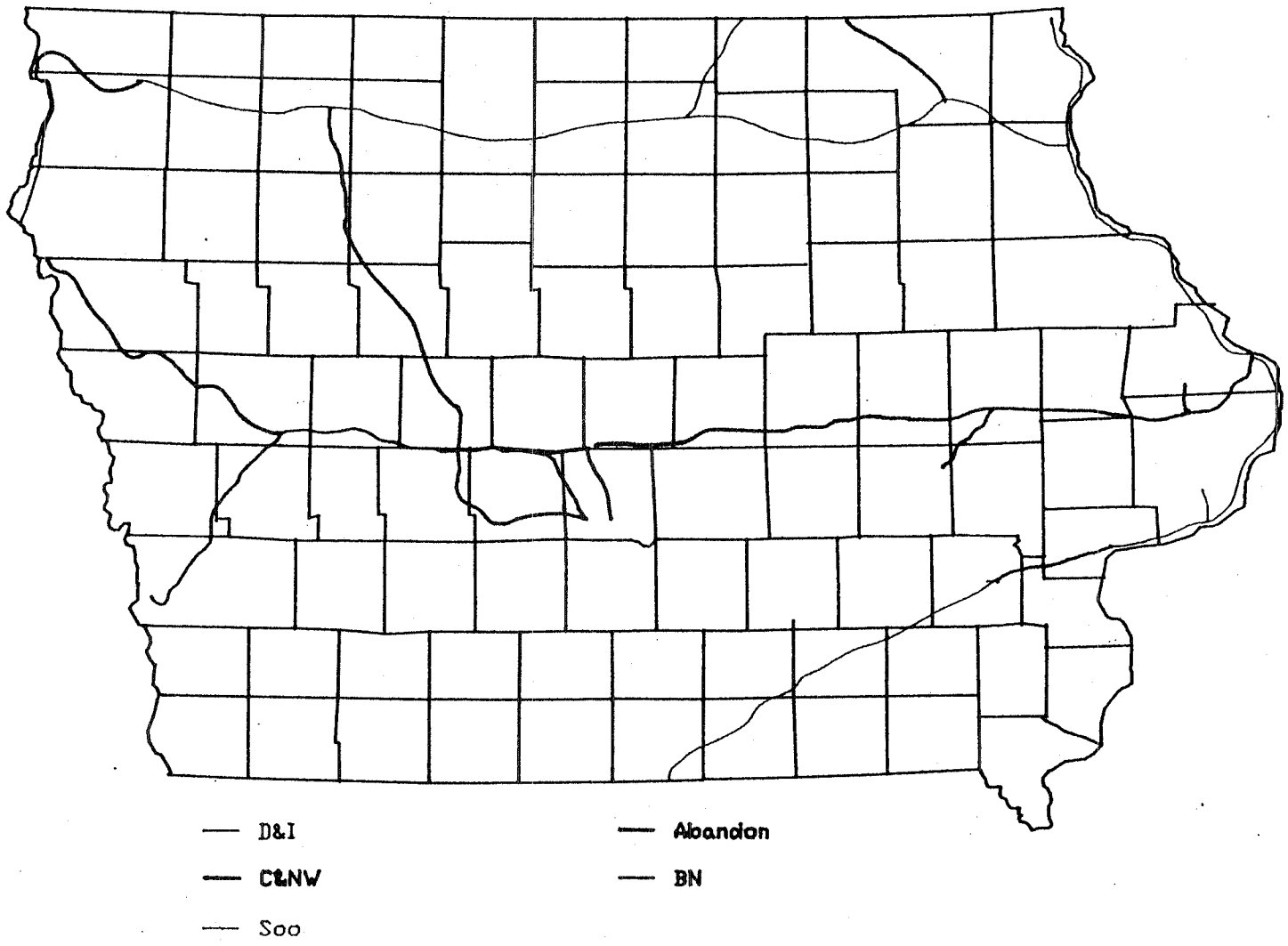

Figure 6-4 Disposition of the Chicago, Milwaukee, St. Paul and Pacific Railroad

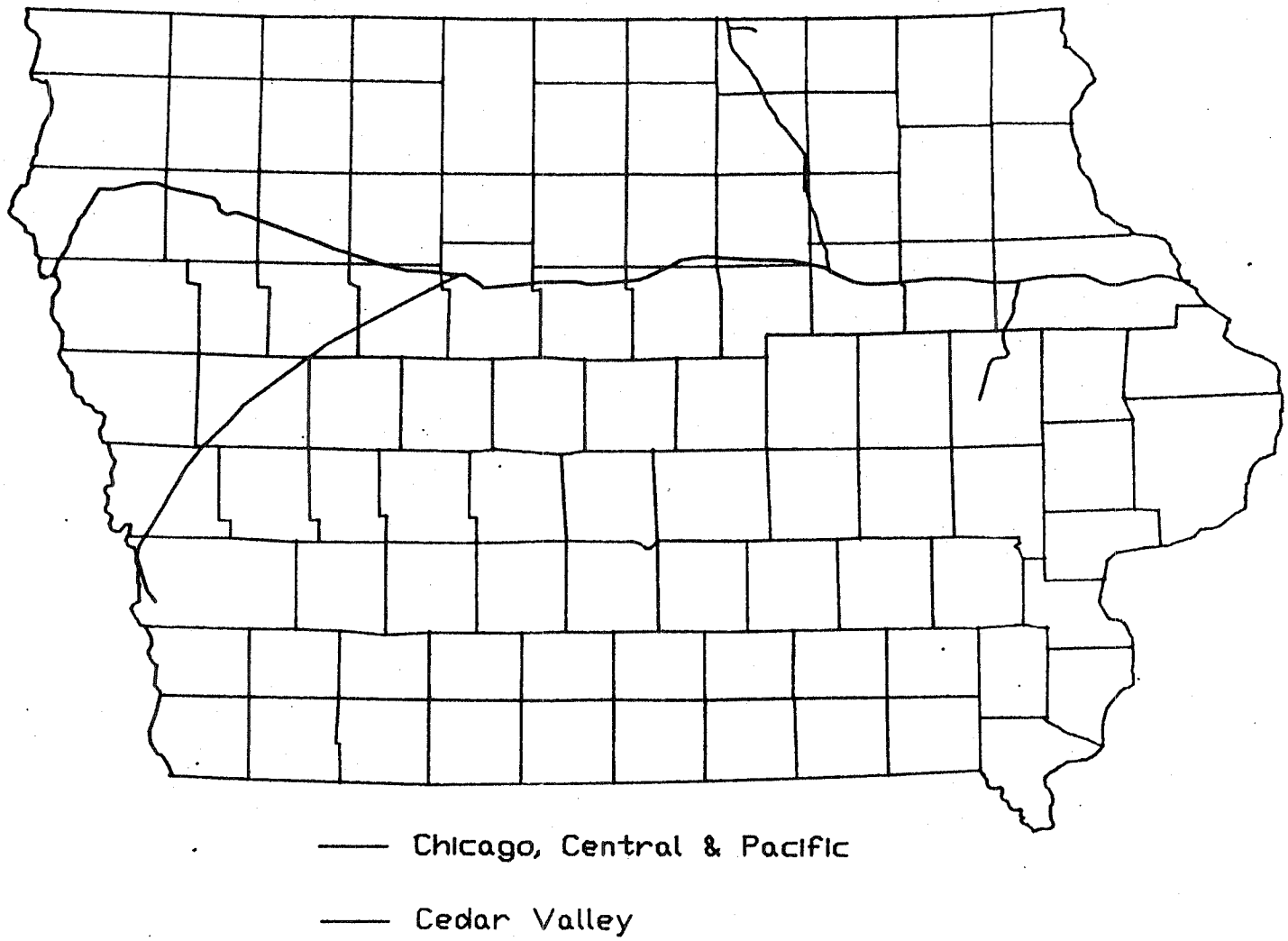

Figure 6-5: Disposition of Illinois Central Gulf Railroad Company

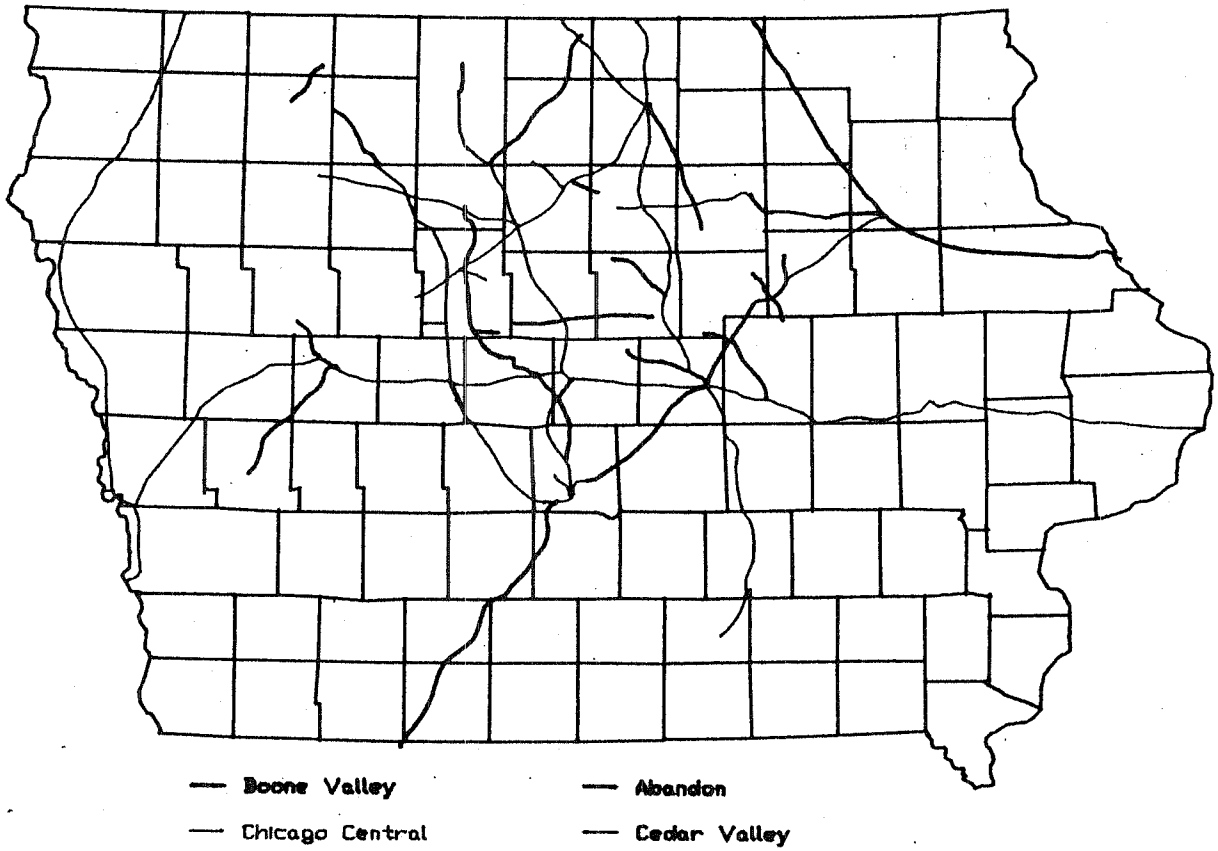

Figure 6-6 Disposition of Chicago and North Western Transportation Company

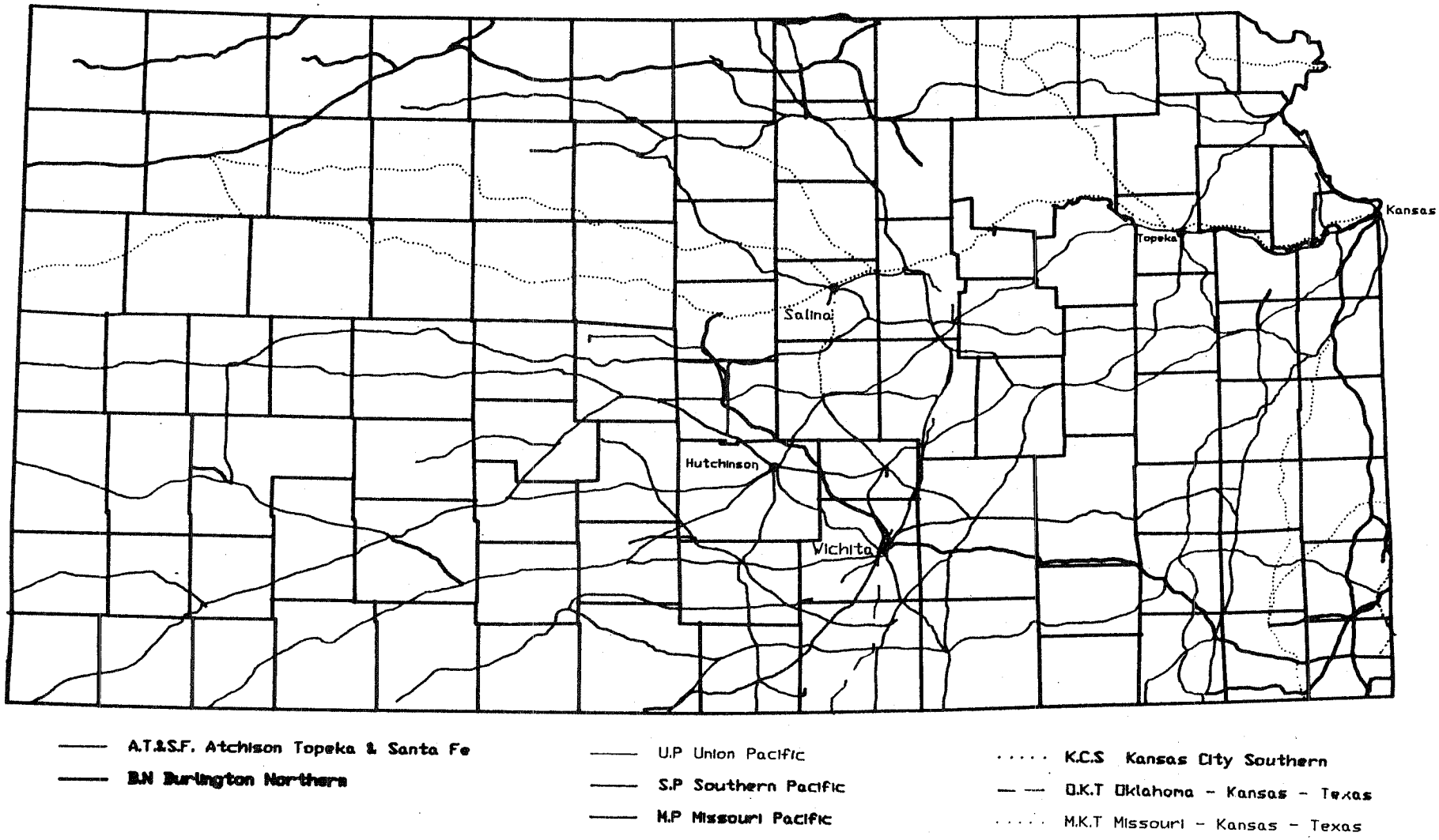

Figure 6-7: Kansas Class I Railroads (Terminal Railroads Not Shown)

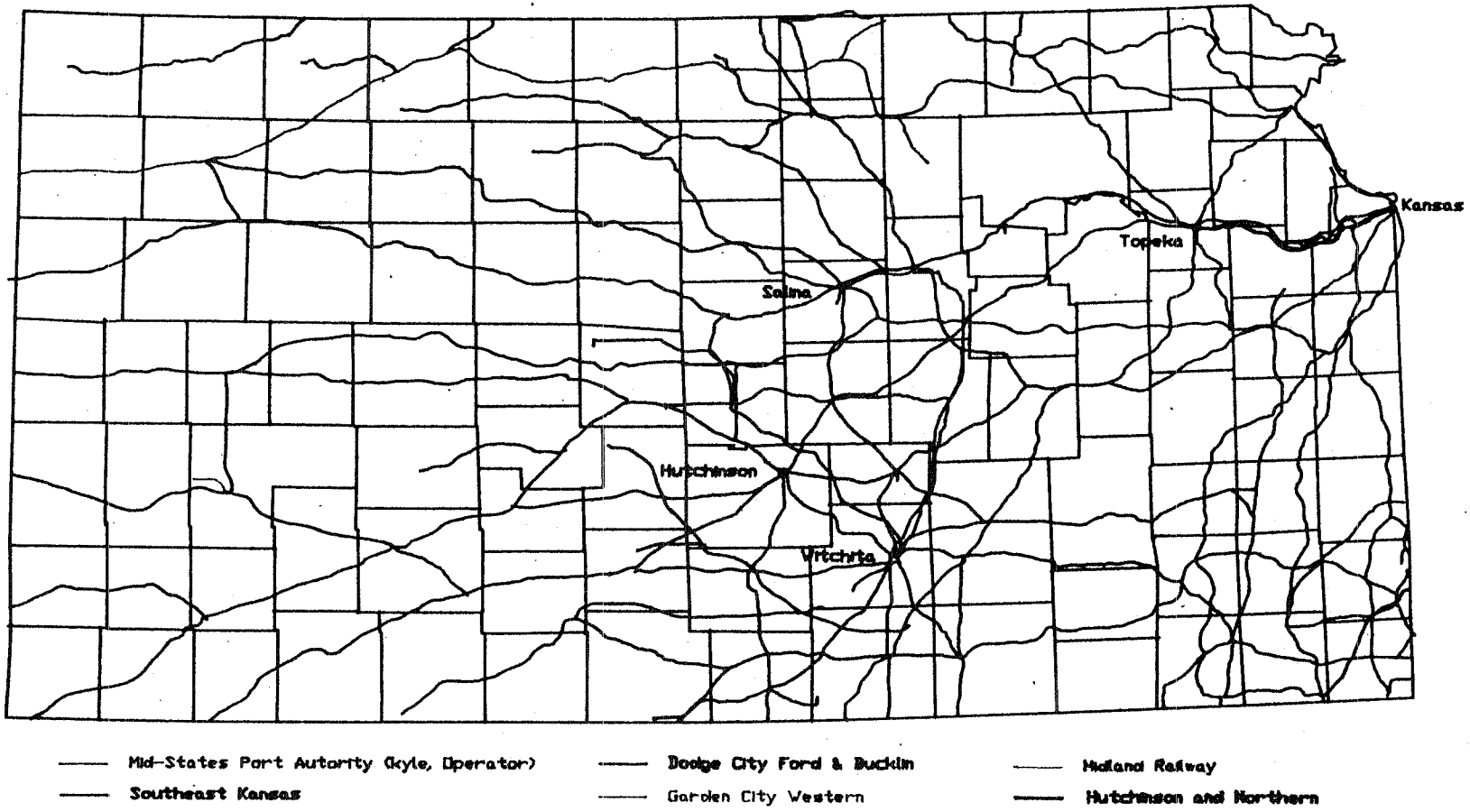

Figure 6–8: Kansas Local and Regional Railroads
(Terminal Railroads Not Shown)

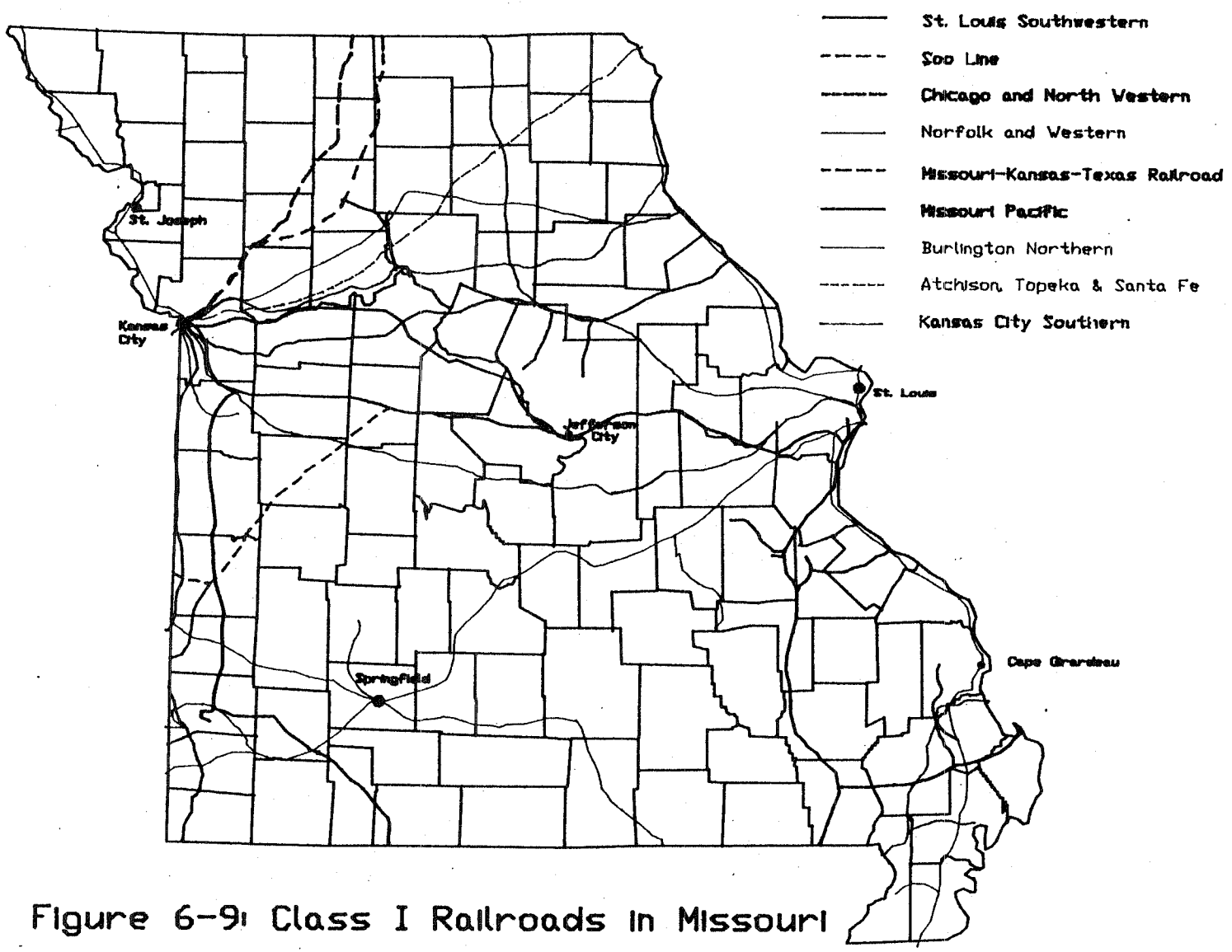

Figure 6-9: Class I Railroads in Missouri
(Terminal Railroads Not Shown)

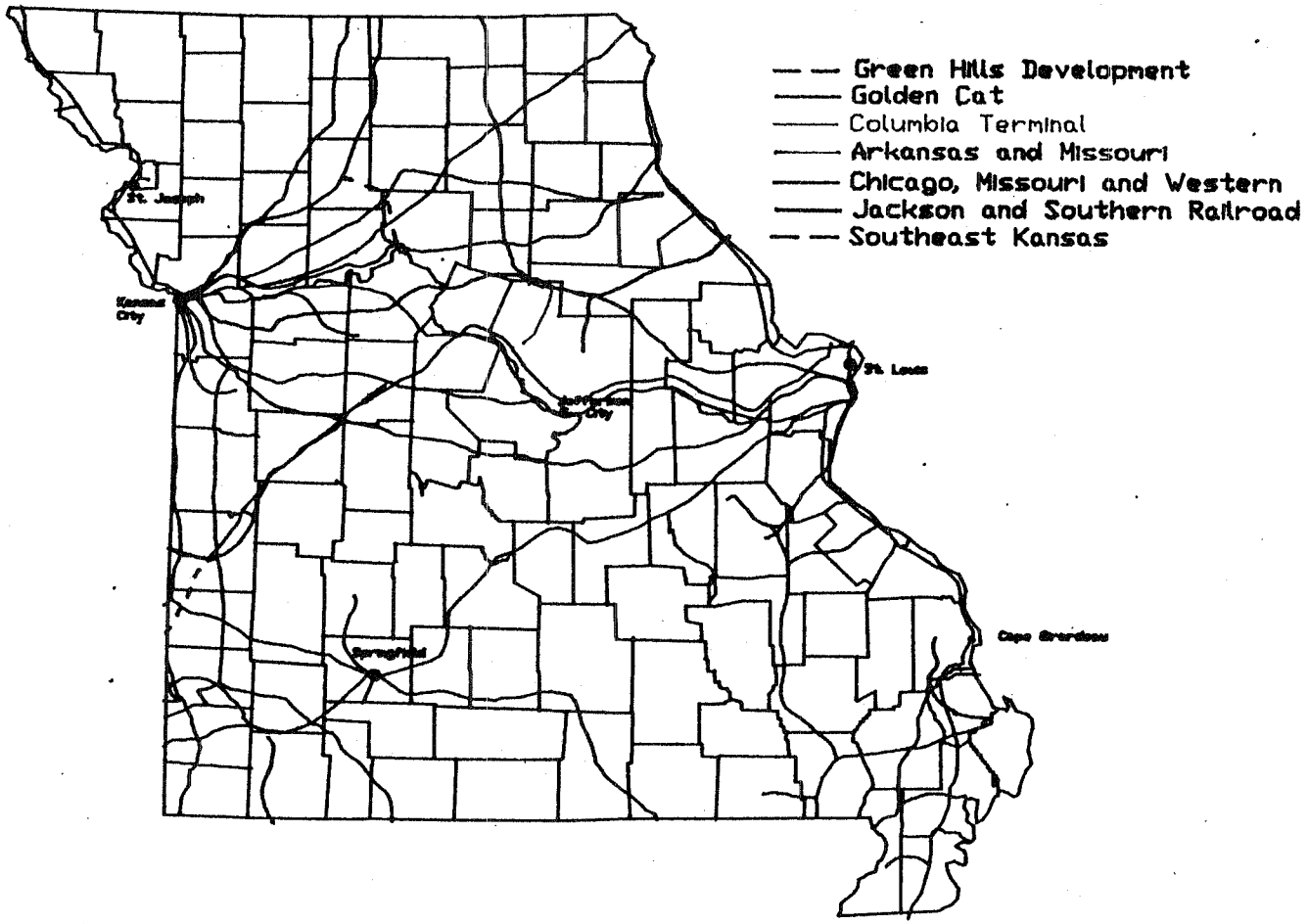

Figure 6-10: Missouri Local and Regional Railroads
(Terminal Railroads Not Shown)

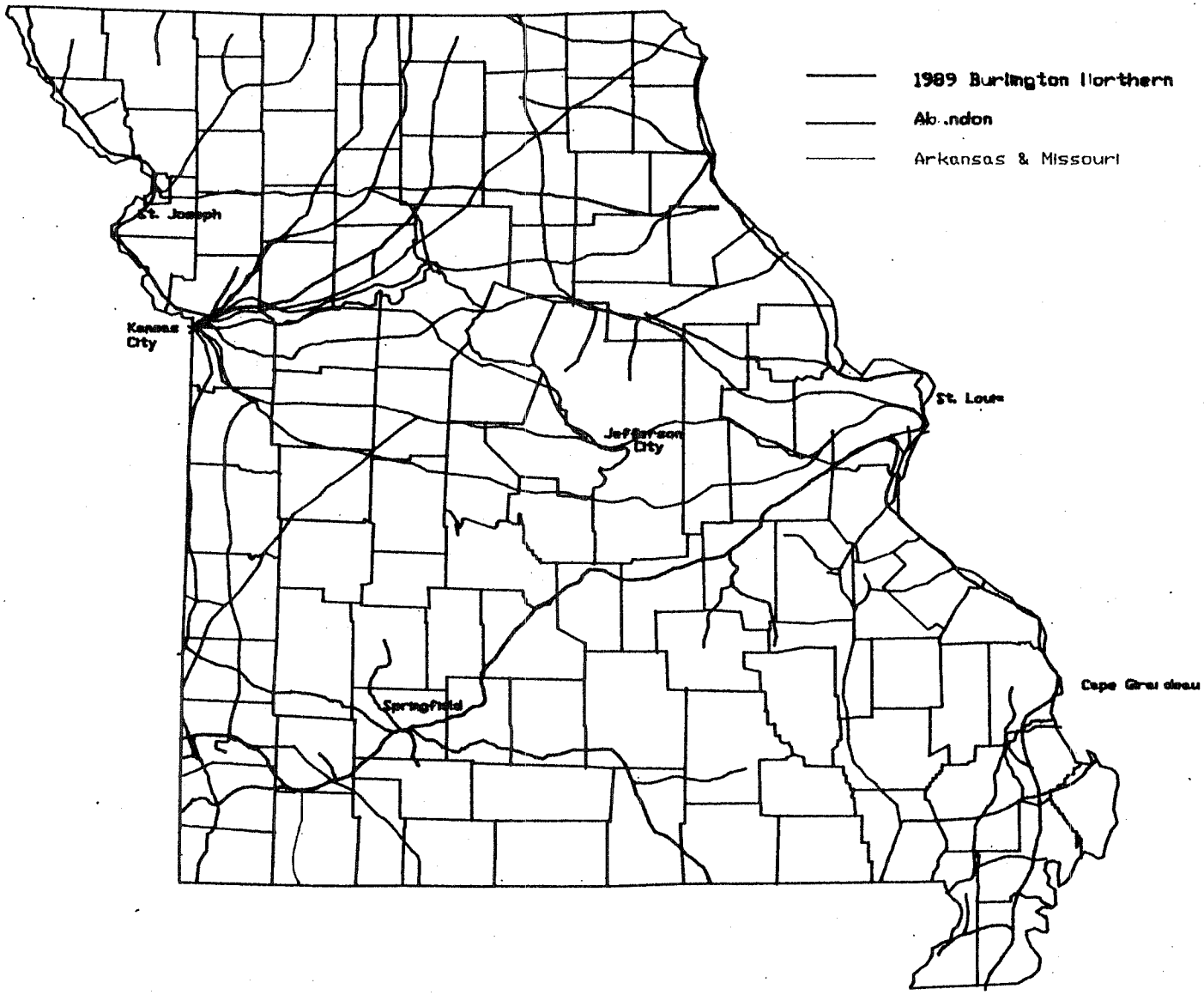

Figure 6-11: Disposition of Burlington Northern and St. Louis - San Francisco Rail Systems

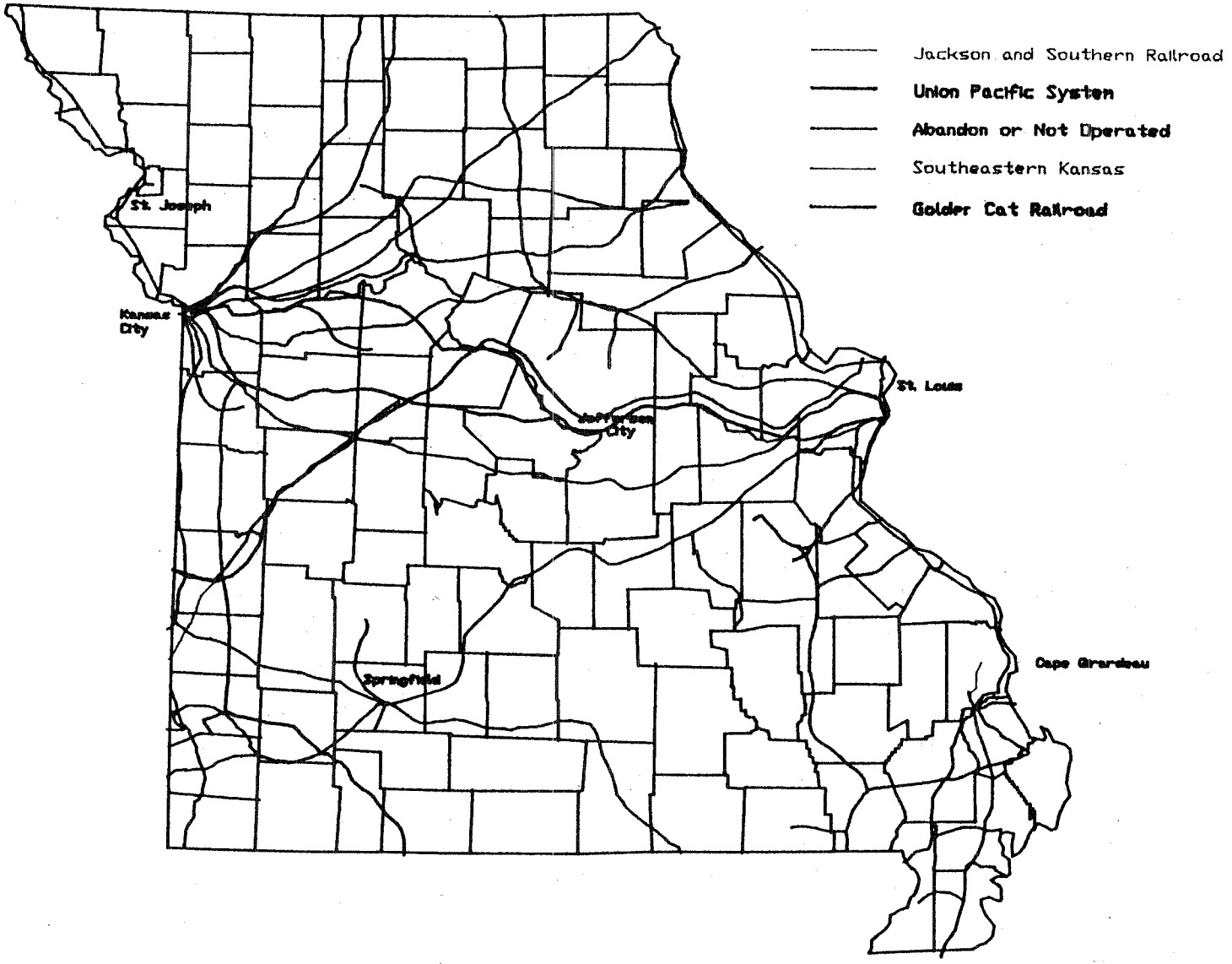

Figure 6-12: Disposition of Union Pacific, Missouri Pacific and Missouri-Kansas-Texas Railroads

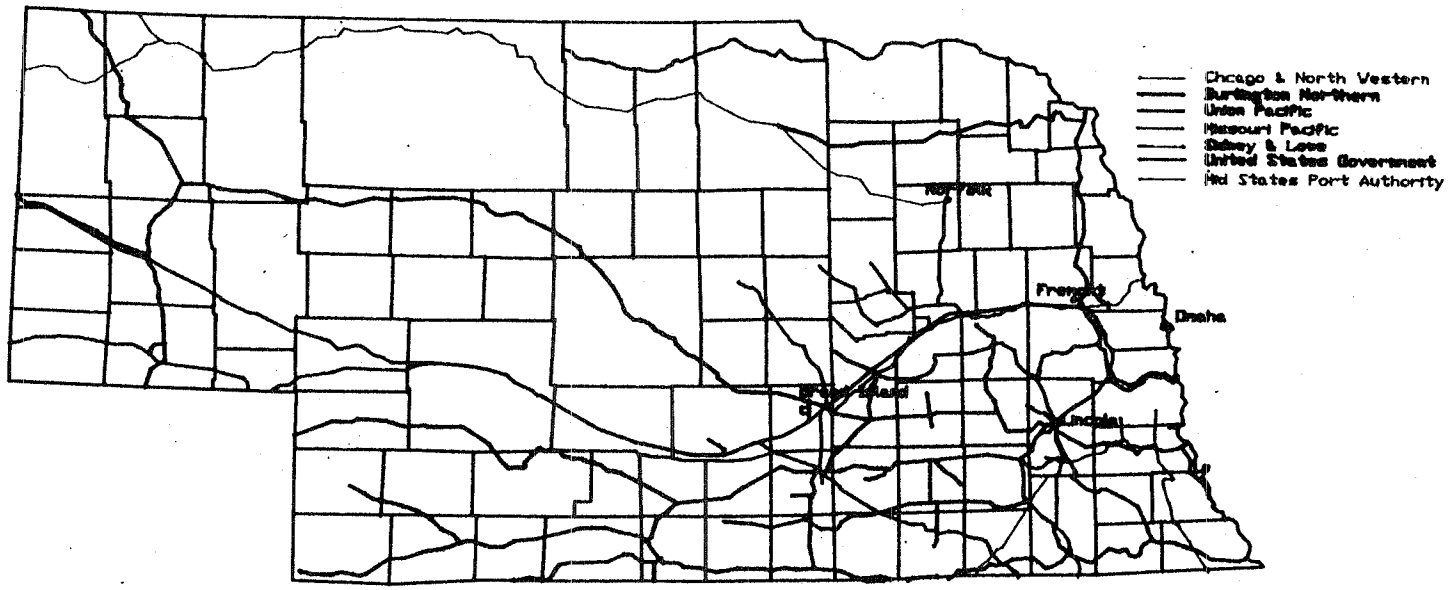

Figure 6–13: Nebraska Railroads (Terminal Railroads Not Shown)