

# Midcontinent Railroad Network Trends

T. H. MAZE, CLYDE KENNETH WALTER, BENJAMIN J. ALLEN, AND  
AYMAN G. SMADI

The railroad network of the United States underwent vast changes during the decade of the 1980s, removing miles of excess capacity and responding to the pricing and service freedoms provided by the Staggers Act. The four-state area of Iowa, Kansas, Missouri, and Nebraska lost about 5,000 railway mi, ending the decade with about 20,000 mi. These system changes are described in detail. Changes in the agricultural industry, major railroad mergers, bankruptcies, and reorganizations are identified. Network rationalization, public assistance programs, and intermodal facilities developments are assessed for each state. The following trends are anticipated to continue for the rail system in the region during the 1990s: (a) concentration of grain-gathering rail lines, (b) growth in intermodal traffic (bridge traffic), and (c) the shifting of the predominant grain traffic pattern from long-haul movements to the Gulf of Mexico to short-haul movements of grain within the region.

The decade of the 1980s was a period of substantial change for the railroad industry. Much of the change resulted from the passage of the Staggers Act of 1980, an act that gave rail management pricing and service freedoms. The new market freedoms revised the business patterns in the railroad industry, which greatly affected the structure of the rail system in the midwest. In addition to or in association with regulatory reform, four other major developments affected the rail structure. These are (a) changes in the agricultural industry and the resulting changes in grain shipment patterns, (b) the bankruptcy and sale of the holdings of the Chicago, Rock Island and Pacific Railroad (the Rock Island) and of the Chicago, Milwaukee, St. Paul and Pacific Railroad (the Milwaukee Road), (c) the rationalization, sometimes with state assistance, of the rail systems by the remaining rail carriers, and (d) the growth of intermodal traffic.

This paper reports changes in the railroad routes, facilities, and services for the four states Federal Region VII. After reviewing the structural changes in the agricultural sector and changes experienced by the region's carriers, including their intermodal operations, the rail system changes in each of the four states are described. The impacts of these major actions on the size and nature of the railroad systems are discussed, from the perspective of changes in each state's rail networks, intermodal facilities, and rail finance programs. Conclusions are presented concerning likely trends in the 1990s.

## STRUCTURAL CHANGES IN AGRICULTURAL SECTOR

Three major interrelated changes in the agricultural sector had impacts on the regional rail system or were affected by changes in rail services.

Midwest Transportation Center, Iowa State University, Ames, Iowa 50011.

## Diversification

The agribusiness industry has diversified in the four states, resulting in more processing of agricultural commodities rather than shipping the raw products out of the region in bulk. For example, a number of wet and dry milling facilities were built in Iowa, Kansas, and Nebraska during the 1980s to produce ethanol, sweeteners, starches, and other milling by-products. In Iowa alone, during the 1980s, milling plants were built that consumed nearly 90 million bushels of corn per year (1). During the late 1980s, income in the region derived from nondurable goods (mostly grain and meat processing) increased about 6 percent per year (2, p. 17).

The increase in processing facilities has been a major factor in diverting some of the flow of agricultural goods (primarily grains) to movements within the region, instead of shipping to facilities outside the region and to the Gulf of Mexico ports for export. The shift to short-haul grain movements during the 1980s has been striking. For example, in 1980, 19 and 12 percent of Iowa grain shipments by rail were destined to Iowa and Illinois, respectively, and 11 and 24 percent were destined to Louisiana and Texas, respectively, presumably for export. In 1987, 36 and 26 percent of Iowa grain shipments by rail were destined to Iowa and Illinois, respectively, and 6 and 3 percent were destined to Louisiana and Texas, respectively (2, p. 79). During the same period, Iowa rail grain shipment volume (measured in tons) increased by about 60 percent.

Another factor that partially contributed to the decline in rail shipments to Gulf of Mexico ports for export was the slump in exports of corn that occurred during the mid-1980s. The slump and temporary recovery (in 1988 and 1989) in U.S. corn exports can be seen in Figure 1. Total U.S. corn exports in 1990 and 1991 were 23 percent lower than 10 years earlier.

## Rail Regulatory Reform in 1980

The shift from long-haul rail grain movements to short-haul movements is also influenced by economic regulatory reform. Under the Staggers Act of 1980, railroads were permitted to contract for service, allowing transportation customers to negotiate with one or more carriers and using more than one mode. As a result, increases in short-haul traffic are partially attributable to movements to river ports on the Missouri, Mississippi, and Illinois rivers and then down the Mississippi on barges to Gulf of Mexico ports.

In the regulated environment before the Staggers Act, this type of cooperation was impossible, and rail carriers had an incentive to promote long-haul rail shipment of grain from the midwest to Gulf of Mexico ports. Contracting allowed shippers to negotiate with rail and barge carriers to obtain the most efficient services. The chronically depressed barge

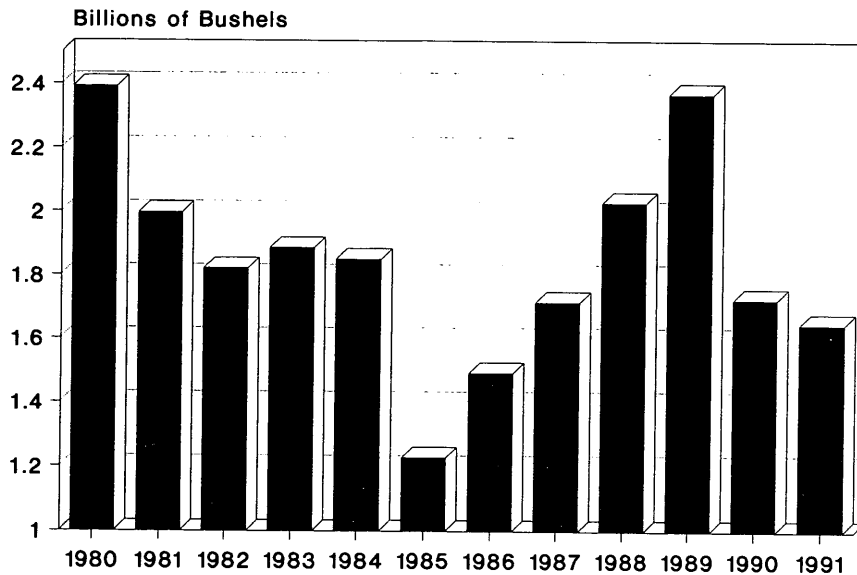


FIGURE 1 U.S. corn exports during the 1980s (U.S. Department of Agriculture).

rates also played a part, with railroads being forced by truck-barge competition to short-haul themselves to the river.

#### Concentration of Grain Shipping Points

The Staggers Act made it much easier for rail carriers to abandon unprofitable light-density lines and discontinue services. At the same time, grain movements from the farms were increasingly passing through large, more efficient, and more central grain terminals. These two forces have led to a concentration of services and grain shipments. For example, 50 percent of the rail tonnage in Iowa originated in 10 counties (from 99 total) in 1980. By 1987, the same counties originated 66 percent of the tonnage (2, p. 82).

In addition, the variability in export volumes, shown in Figure 1, had significant impacts on the traffic levels of grain-gathering lines. During poor export years, light-density agricultural lines, recently spun off to regional and short-line operators, may cease to carry any traffic. Where a large portion of the investment in rail lines is tied up in fixed assets, such fluctuations make the survival of these lines extremely tenuous. Their demise would further concentrate the rail network.

The concentration of grain origins, the shifting from long-haul grain transportation to short-hauls to river ports, and the diversification within agribusiness have all led to dramatic shifts in flows of grain movements. The shifts in transportation patterns along with changing regulatory requirements have helped to dramatically change the structure of the rail network in the Midwest.

### RAILROAD INDUSTRY STRUCTURAL CHANGES AFFECTING REGION VII

#### Railroad Bankruptcies

The four midwestern states examined were highly affected by the bankruptcies of the Milwaukee Road and the Rock Island

and the sale by the Illinois Central Gulf Railroad Company (ICG) of its lines. The Milwaukee Road and the Rock Island lines were largely reorganized and sold to other rail companies, and most of their lines remain in operation today. For example, the Rock Island operated nearly 3,200 mi of lines in the four states when it ceased service in 1980. At the end of the decade, roughly 2,400 mi of the Rock Island network was owned and operated by other carriers.

The changing of ownership of the Rock Island and Milwaukee Road lines was the result of Class I carriers becoming better aligned in existing service areas through acquisitions of entire railroads and of line segments to penetrate new markets. In addition, several parts of the rail system were spun off and are operated by new regional (railroads longer than 350 mi in length are considered regional railroads) and short-line railroads (3). For example, three new regional railroads, the Iowa Interstate Ltd. (IAIS), the Kyle Railroad Co., and the Oklahoma-Kansas-Texas Railroad Co. (a subsidiary of the Union Pacific System), were created in the region during the 1980s and operated on lines previously owned by the Rock Island.

The ICG sale was much like the reorganization of a bankrupt railroad because the ICG sold or abandoned about 820 mi of line in the four states during the 1980s. Similarly, most of the ICG lines were sold. ICG sold its lines only to regional and short-line railroads.

#### Line Spin-Offs

The strategies of spinning off unprofitable or marginally profitable lines by Class I carriers, instead of abandoning them, and actively recruiting local or regional operators, were popular in the 1980s, as over 190 new railroads began service in the United States (4, p. 144; 5, p. 124). Class I carriers, with their high labor costs, could then concentrate their efforts in denser markets rather than serve thin, dispersed markets along branch and low-density lines. Often there was no loss of traffic for the Class I carrier because the local or regional railroad

had no connection except to the line's original owner. In addition, the Interstate Commerce Commission's (ICC's) interpretation of the Staggers Act released the new non-Class I line owner from protective labor conditions imposed on the prior line owners. The new line operators functioned with lower wages and fewer labor rules, resulting in lower labor costs (6, pp. 93–94). Lower labor costs allow new short-line and regional railroads to remain profitable in markets where demand is too thin to support Class I carriers.

A 1989 Federal Railroad Administration (FRA) survey of 10 Class I railroads found 7 carriers (including 5 with Region VII operations) with plans to transfer 17,265 mi of track to non-Class I railroads over the next 5 years (6, pp. 93–94). An example of this form of transfer of service to short-line and regional railroads from Class I carriers and the symbiotic relationship between the original owner and new non-Class I operator is the Union Pacific's (UP's) offer to lease two lines and help the new operator develop cooperative agreements for marketing and equipment (7).

## Intermodal Operations

### *National Perspective*

Intermodal traffic in the form of piggyback or trailer-on-flatcar (TOFC) has been offered since 1926 (8, p. 8). By 1980, piggybacks accounted for about 13 percent of all rail loadings and were second to coal in frequency of loadings by commodity groups (9). More recently, double-stack technology and its efficiencies helped to increase container-on-flatcar (COFC) traffic volumes, with the number of double-stack container spaces increasing from 400 in 1983 to 24,000 in 1988 (10). During the period between 1980 and 1987, intermodal traffic originating or terminating in Region VII increased by 138 percent, compared with 41 percent for the entire country. In addition, the region was a major conduit for intermodal traffic moving between the east and west coasts, with roughly 25 percent of all U.S. rail intermodal movements passing through the four-state region [compiled from the ICC confidential waybill sample (2, p. 111)].

Double-stack container shipping showed the most growth in the intermodal area following the 1984 introduction of "Linertrain" service by American President Lines. Double-stack service was attractive because it offered piggyback flexibility, a smoother and less damaging ride as a result of modern articulated equipment designs, and 20 to 25 percent lower cost than conventional piggyback service (11). Cost savings came from the greatly reduced tare weights of the double-stack platforms (9), better aerodynamics (12), and better equipment utilization (13).

Containers accounted for 40 percent of the intermodal freight in 1989; 20 percent of all rail traffic was intermodal (11,14). Whereas double-stack trains originally hauled containers inland from ports, expedited domestic service also grew. As double-stack equipment became more available in domestic corridors, there was potential for the railroads to divert more traffic from motor carriers.

### *Facilities*

While intermodal traffic volumes increased, the number of intermodal terminals dropped dramatically, as simple piggy-

back ramps were closed and mechanized container loading hubs, each requiring sizable investment and serving a wider area, were located in major traffic centers. The Region VII facilities became concentrated mostly in larger cities, such as Kansas City, St. Louis, and Omaha.

## STATE RAIL STRUCTURES AND PROGRAMS

### **Iowa Rail System**

#### *Rationalization*

Within the four-state region, changes in the Iowa rail physical plant were the most dramatic. A comparison of Iowa's rail carriers and roadway miles in 1980 with those in 1987 [compiled from Iowa (15) and given in Table 1] identified a reduction of more than 2,000 roadway mi, a loss of 35 percent. Before their liquidation and reorganization, the Rock Island and the Milwaukee Road operated the second- and third-largest networks of track miles in Iowa. The 7,000 mi of Rock Island lines that were liquidated created the nation's largest sale of lines to other rail companies and rail line abandonment (16, p. 29; 17, p. 33). The Milwaukee Road was reorganized, and the core of its system was sold to the Soo Line (18). Iowa's fifth-largest (pre-1980) rail carrier, ICG, sold or abandoned all of its Iowa lines as part of a corporate strategy to reduce its system from 9,600 to 3,000 mi (19).

**Rock Island** The largest portions of the liquidated Rock Island lines were taken by regional and local railroads, with the IAIS operating on the Rock Island's Chicago to Omaha line and the Iowa Northern Railway operating on the Rock Island line between Cedar Rapids and Manly, and connecting with the Chicago and North Western (C&NW) main lines. Other major portions of Rock Island lines were purchased by the C&NW to augment its own network. Of particular importance to the C&NW was its purchase, for \$93 million, of 720 mi of Rock Island main line—the "Spine Line"—between Minneapolis–St. Paul and Kansas City, a transaction highly contested by the Soo Line (15, p. 87; 20). Other smaller portions of the Rock Island were purchased by the Milwaukee Road, the Cedar Rapids and Iowa City Railroad (CR&IC), which is owned by the Iowa Electric Light and Power Co., and the 9.5-mi Appanoose County Community Railroad. Almost 1,100 of the 1,500 mi of Rock Island's Iowa system were still in use at the decade's close (15, p. 87).

**Milwaukee Road** The Milwaukee Road reorganization resulted in the Soo Line's operating about half of its original Iowa system. The major portions were across the northern third of the state and along the Mississippi River, cutting across to Kansas City at Muscatine. About 66 mi between Davenport and Washington, Iowa, was abandoned in favor of parallel track purchased from the Rock Island. The Soo Line's purchase of the Milwaukee Road was met with strong bidding competition from the C&NW and from the Grand Trunk Lines (21). Ultimately, the ICC approved the purchase proposals of the C&NW and the Soo Line; the trustee then accepted the Soo's proposal (18). Other minor portions of the

TABLE 1 Iowa Railway Miles—Changes from 1980 to 1990

Railroad	1980 Roadway Miles	1990 Roadway Miles
<b>Class I</b>		
Chicago and North Western Transportation Co.	2,093	1,724
Rock Island	1,575	Bankrupt
Milwaukee Road	1,341	Bankrupt
Burlington Northern	729	646
Soo Line Railroad Co.	0	620
Illinois Central Gulf	669	0
Norfolk and Western RR	168	85
Atchison, Topeka and Santa Fe Railway Co.	20	20
Union Pacific	2	2
<b>Class II</b>		
Chicago, Central, & Pacific RR Co.	Not Est.	553
Iowa Interstate Railroad Ltd.	Not Est.	355
Dakota, Minnesota & Eastern RR Co.	Not Est.	Track. Rights
<b>Class III</b>		
Iowa Northern Railway Co.	Not Est.	134
Cedar Valley RR Co.	Not Est.	90
Iowa Southern RR Co.	Not Est.	5
Cedar Rapids and Iowa City Railway Co.	20	56
D & I RR Co.	Not Est.	Track. Rights
Davenport, Rock Island and NW Railway Co.	Not Est.	35
Iowa Terminal Railroad Co.	25	0
Des Moines Union Railway Co.	Not Est.	
Waterloo Railroad Co.	14	
Appanoose County Community RR Co.	Not Est.	10
Iowa Traction RR Co.	Not Est.	13
Ottumwa Terminal RR Co.	Not Est.	4
Keokuk Junction Railway Co.	1	5
Burlington Junction Railway Co.	Not Est.	2
Des Moines Terminal Co.	< 1	
Iowa Transfer	< 1	
<b>TOTAL</b>	<b>6,659</b>	<b>4,359</b>

Compiled from: Iowa, 1980 *Iowa Railroad Analysis Update* (Ames: Iowa Department of Transportation, 1980); Iowa Department of Transportation (unpublished data), Dec. 1990.

Milwaukee Road were purchased by the CR&IC, the Burlington Northern Railroad (BN), C&NW, and the D&I Railroad.

**ICG** The ICG's network concentration resulted in the sale of all its Iowa holdings. A regional railroad, the Chicago, Central and Pacific Railroad (CC&P), and a local railroad, the Cedar Valley Railway (CVR), were spun off. The CC&P operated the former ICG Omaha to Chicago main line, with branches to Sioux City and Cedar Rapids. The CVR operated between Waterloo and north of the Minnesota border, connecting with C&NW's line from Minneapolis-St. Paul to Kansas City.

A central issue in the evolution of Iowa's rail network was the Chicago-to-Omaha corridor. All five of Iowa's major Class I railroad companies served this corridor in 1980. Whereas the Milwaukee Road's line through Iowa had been largely abandoned (except for 100 mi) 10 years later, two Class I's and two regionals still provided Chicago-to-Omaha service.

#### *State Financial Assistance Programs*

The first of Iowa's two financial assistance programs partially sponsored by state funds was the Iowa Rail Assistance Pro-

gram (IRAP), which is administered through the Iowa Department of Transportation. The Iowa General Assembly appropriated \$3 million in 1974 for IRAP and has provided a total of \$20 million in state funds since the beginning of the program. No state funds have been approved for the past 5 years. Additional funding sources included the FRA's Local Rail Assistance Program (until October 1988) and repayments of loans by shippers and railroads. IRAP awarded funds for line rehabilitation through a mixture of grants and no-interest loans. The mix of grant versus loan in each project depended on an assessment of the recipient of the funds and the individual project.

IRAP-allocated assistance funds were limited to a maximum of 80 percent of the cost of a project. The levels of funding varied, depending on the priority of the project. Priorities were assigned on the basis of financial participation in the project by nongovernmental organizations, the ability of the line to be financially viable, the project's benefit to cost ratio, and the potential for economic development benefits. The IRAP revolving fund supported 44 projects costing \$125 million. With the ending of tax support, the funding pool was kept liquid through repayment of loans.

The second rail assistance program, the Iowa Railway Finance Authority (IRFA), was created by the Iowa General Assembly in 1980. Its purpose was to take an active role in

the restructuring of the state's rail network in the face of the Rock Island bankruptcy and the Milwaukee Road reorganization. Initially, IRFA was given the power to enter into partnerships with the private sector to purchase, improve, or operate a rail facility. IRFA also made loans available for rehabilitation projects at interest rates below commercial rates. An interest-free loan was provided in 1983 from the highway use tax, and \$2.2 million in delinquent property taxes from bankrupt Iowa railroads was deposited in IRFA's fund. With the loss of the fuel tax, the only revenue source for IRFA was the repayment of loans.

### Intermodal

The number of TOFC and COFC loading sites in Iowa has declined since 1980, from 37 sites in 23 cities to 18 sites in 14 cities by 1988 (22,23). Competition to provide service also declined. Nine locations were served by two or more carriers in 1980; Des Moines was served by three, and Sioux City and Council Bluffs were served by four carriers each. By 1988, three cities (Cedar Rapids, Council Bluffs, and Des Moines) were served by two carriers. Ten cities lost intermodal terminal sites entirely (although not necessarily all intermodal service that could still be provided by drayage); most notably, the BN closed all of its TOFC ramps in Iowa. Newton was the one city added to the facilities listing.

## Kansas Rail System

### Rationalization

The Kansas rail network remained relatively intact through the 1980s. There were 7,368 mi of track in 1980 and 6,491 mi in 1991. The total route miles are given in Table 2. The Kansas rail system was dominated during this period by two carriers with about 90 percent of the traffic originating or terminating in Kansas. The UP, including its Missouri-Kansas-Texas and Oklahoma-Kansas-Texas (OKT) subsidiaries, had 44 percent of the total track miles; the Santa Fe accounted for 37 percent.

**Rock Island** Before the liquidation of the Rock Island, Kansas had nearly 1,000 mi of its track. Afterwards, about 85 percent of this mileage in Kansas was being operated by three railroads: the Kyle (a regional operator), the OKT (part of the UP), and the St. Louis Southwestern [SLSW, a subsidiary of the Southern Pacific Railroad (SP)]. Roughly 150 mi of additional Rock Island track, including the line from Topeka northwest to Missouri, was abandoned.

The 320-mi portion across northern Kansas to Colorado operated by the Kyle (under a lease-purchase arrangement) is owned by the Mid-States Port Authority, which had been created by the Kansas legislature to restore the line and operate rail service. The authority acquired a loan, 50 percent guaranteed by the state, from FRA for the line's purchase.

TABLE 2 Kansas Railway Miles—Changes from 1979 to 1991

Railroad	1979 Roadway Miles	1991 Roadway Miles
<b>Class I</b>		
Atchison, Topeka and Santa Fe Railway Co.	2,553	2,026
Burlington Northern	208	576
Chicago and North Western Transportation Co.	1	0
Chicago, Rock Island and Pacific	984	Bankrupt
Kansas City Southern Industries	26	28
Missouri-Kansas-Texas	220	Merged with UP
Missouri Pacific	1,821	Merged with UP
Oklahoma-Kansas-Texas	Not Est.	Merged with UP
Southern Pacific (includes St. Louis Southern)		348
St. Louis-San Francisco	527	Merged with BN
St. Louis Southwestern	0	Merged with SP
Union Pacific	991	2,636
<b>Class III</b>		
Dodge City, Ford and Bucklin	Not Est.	25
Garden City Western	14	45
Hutchison and Northern Railway	5	3
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
Northeast Kansas and Missouri Railroad		107
South Kansas and Oklahoma		219
Southeast Kansas	Not Est.	71
T & P		41
Wichita Union Terminal	2	2
<b>TOTAL</b>	<b>7,368</b>	<b>6,491</b>

Compiled from: Kansas, 1982 *Kansas State Rail Plan* (Topeka: Department of Transportation, 1982); Kansas, *Kansas Rail Plan, 1991 Update* (Topeka: Department of Transportation, 1991).

The SP's SLSW subsidiary purchased the Golden State Route running from New Mexico to Topeka, Kansas, and linking the state with the SP's line between the West Coast and El Paso, Texas. This route provided the SP with its deepest penetration into the Upper Midwest (prior to an operating linkage into Chicago). The SLSW had trackage rights on the UP line from Topeka to Kansas City. The SLSW's purchase of the Rock Island's line from Kansas City to St. Louis completed a large circle of SP-operated main lines, with the track from El Paso through Kansas on the top and the original lines running south from St. Louis through San Antonio to El Paso on the bottom.

The third Kansas portion of Rock Island track salvaged was the line running from Abilene through Wichita and south to Fort Worth and Dallas (24). The OKT Users Association purchased about 150 mi of the line in Kansas and about 110 mi in Texas. Financing was through an FRA loan partially guaranteed by the state of Kansas. In Oklahoma, 351 mi of the line was purchased by the state. The OKT (now part of the UP) operates the line under a lease-purchase agreement.

**Other Line Changes** BN tripled its Kansas track miles in the 1980s with its acquisition of the St. Louis-San Francisco. Another major spin-off was the Southeast Kansas Railroad, which purchased the former Missouri Pacific Railroad (MoPac) line running from Coffeyville to Nevada, Missouri, and connecting with five Class I carriers. A railcar repair company in Pittsburgh, near the center of the line, owns and operates the railroad.

Three Class I railroads had trackage rights in Kansas but owned no track in 1991. The Norfolk and Western (N&W) and Soo Line operated over a few miles in the Kansas City area. The Denver, Rio Grande and Western purchased trackage rights over a MoPac line (with 445 mi in Kansas) running from Colorado to Kansas City.

Although Kansas lost only 12 percent of its rail system miles after 1980, it very likely could lose another 500 mi. Most lines that are likely to be abandoned are segments of less than 70 mi each and are paralleled by financially stable lines.

#### *State Financial Assistance Program*

Before 1980, Kansas was prohibited from participating in the improvement of facilities other than those dealing with highways and water resources. The state constitution was amended by a public vote in 1980 to allow direct involvement in the subsidizing, operations, construction, or maintenance of railroads or their facilities (25). However, the policy limited state financial support to the amount of federal matching funds received (26). Thus, when the FRA local assistance program was phased out of existence, rail assistance funds from Kansas were also curtailed.

#### *Intermodal*

The number of intermodal loading and unloading facilities in Kansas declined from 38 in 1980 to 11 in 1988. The number of cities having terminals or facilities likewise fell, from 26 to 7. Kansas City and Wichita maintained service by three rail-

roads, while Topeka fell, in terms of intermodal terminal availability, from four railroads to one. Others retaining facilities were Emporia, Newton, and Parsons (23,24).

### **Missouri Rail System**

#### *Rationalization*

Missouri, more than any of the other states in the region, was affected by changes in rail line ownership. For example, two Missouri main lines were purchased by their third owner in 5 years.

**Rock Island** The Rock Island operated two main lines in Missouri: (a) the southern portion of the Spine Line (from Minneapolis-St. Paul to Kansas City), later rehabilitated and part of the C&NW, and (b) the eastern portion of the Golden State Route, purchased by the SLSW, but with only local service along the Kansas City-to-St. Louis line.

**Milwaukee Road** The main line from Kansas City to Chicago was part of the reorganized Milwaukee Road system sold to the Soo Line.

**ICG** The ICG lines from Kansas City east to Chicago and Chicago to East St. Louis were purchased by the Chicago South Shore and South Bend Railroad in 1986 (27). Renamed the Chicago, Missouri and Western, it started operation in 1987 but filed for bankruptcy less than 1 year later (5).

**Other Rationalization** As indicated in Table 3, Missouri lost about one-fourth of its rail mileage in the 1980s (28). The reduction was mainly from the sale or abandonment of light-density lines and branch lines by the BN, the UP, and the N&W. In the early 1980s, the N&W (a subsidiary of Norfolk Southern) operated on a line, owned by the Wabash Railroad, that ran 156 mi northwest from Brunswick to the Iowa border, continuing north to Council Bluffs (29). ICC authorized the abandonment of the line in 1984. The Northern Missouri Railroad and Iowa Southern Railroad began operation on portions of this line under lease-purchase agreements. Financial difficulties, partially due to the loss of two bridges to floods, caused the Northern Missouri to cease operations in 1987. The N&W 22-mi branch line to Columbia was spun off into a short line, the Columbia Terminal.

The BN abandoned 579 mi of track in Missouri and was able to spin off 32 mi. Combined with the N&W and C&NW abandonments during the 1980s, the northwestern portion of Missouri was left without rail service. Within the UP system, 476 mi was abandoned and 61 mi was spun off, creating the Jackson and Southern (18 mi), the Golden Cat (11 mi), and the Southeastern Kansas Railroads (32 mi in Missouri, 72 in Kansas) (30,31).

#### *State Financial Assistance Program*

The Missouri State Rail Preservation Act specifically prohibited the use of state funds, property, or credit to assist in the

TABLE 3 Missouri Railway Miles—Changes from 1979 to 1989

Railroad	1979 Roadway Miles	1989 Roadway Miles
<b>Class I</b>		
Atchison, Topeka and Santa Fe Railway Co.	220	220
Burlington Northern	1,054	1,587
Milwaukee Road	135	Bankrupt
Chicago and North Western Transportation Co.	82	122
Denver and Rio Grande Western	0	20
Rock Island	509	Bankrupt
Illinois Central Gulf	231	0
Kansas City Southern Industries	195	195
Missouri-Kansas-Texas	340	Merged with UP
Missouri Pacific	1,352	Merged with UP
Norfolk and Western RR	613	443
St. Louis-San Francisco	1,144	Merged with BN
St. Louis Southwestern	193	384
Soo Line Railroad Co.	0	135
Union Pacific	1	1,155
<b>Class II</b>		
Chicago, Missouri & Western	Not Est.	231
<b>Class III</b>		
Arkansas and Missouri	Not Est.	32
Beiver 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 Public Service	9	0
Kansas City Terminal	7	7
Manufacturer's Railway	2	25
St. Joseph Belt	5	0
St. Joseph Terminal	< 1	< 1
Southern Kansas	Not Est.	32
Terminal Railroad of St. Louis	Not Est.	17
Terminal Railroad Association	23	0
Union Terminal	4	0
<b>TOTAL</b>	<b>6,132</b>	<b>4,694</b>

Compiled from: Missouri, *Missouri Rail Plan: 1980 Update* (Jefferson City: Missouri Highway and Transportation Department, 1980); Rail Planning, Missouri Highway and Transportation Department (unpublished data), 1989.

funding of rail assistance programs. However, a public referendum authorized the issuance of \$600 million of state bonds as a "Third State Building Fund" to assist projects that would encourage economic development. This fund supported three rail-related projects administered through the Missouri Rail Facility Improvement Authority. The city of West Plains built an industrial spur, the Jackson and Southern short line rehabilitated its line, and Green Hills Development, Inc., received funds to buy the former Wabash track. With the depletion of the Third State Building Fund, Missouri has no mechanism in force to provide further financial assistance.

#### Intermodal

Like Iowa and Kansas, Missouri lost more than 50 percent of its intermodal facilities after 1980. Its 35 loading and unloading facilities in 18 cities dropped to 16 facilities in the St. Louis area (including Illinois), Kansas City, Parsons, and Springfield (23,24).

#### Nebraska Rail System

##### Rationalization

The Nebraska rail network was dominated by two railroads, the BN and the UP. In 1980 these two rail carriers owned 86 percent of the track miles in the state (32). A third Class I carrier, the C&NW, had 441 miles across Nebraska. As indicated in Table 4, several regional and local lines were established in the 1980s. The net track loss was 742 mi over the 10-year period. Nebraska's rail system provided mostly east-west rail service with about 75 percent through traffic. The only highly utilized north-south route was the BN line from Montana to eastern Colorado, passing through the western quarter of Nebraska.

**Rock Island** The Rock Island formerly had 130 mi in Nebraska; 51 mi was acquired by the Mid-States Port Authority (see Kansas, above). Service in Nebraska was operated by the UP. The remaining Rock Island track was abandoned.

TABLE 4 Nebraska Railway Miles—Changes from 1979 to 1989

Railroad	1979 Roadway Miles	1989 Roadway Miles
<b>Class I</b>		
Atchison, Topcka, and Santa Fe Railway Co.	1	1
Burlington Northern	2,590	2,274
Chicago and North Western Transportation Co.	514	441
Chicago, Rock Island, and Pacific	130	Bankrupt
Missouri Pacific	314	Merged with UP
Union Pacific	1,297	1,307
<b>Class II</b>		
Chicago, Central, & Pacific RR Co.	Not Est.	3
<b>Class III</b>		
Brandon Corporation	17	17
Omaha, Lincoln, and Beatrice	4	5
Sidney and Lowe	Not Est.	10
<b>Non-Operating Rail Line Owners</b>		
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 C&NW)	Not Est.	14
<b>TOTAL</b>	<b>4,867</b>	<b>4,145</b>

Compiled from: Nebraska, *Nebraska Rail Plan: 1980* (Lincoln: Department of Economic Development, 1980); Nebraska, *Map of Nebraska Railroads* (Lincoln: Department of Roads, 1989).

**Other Rationalization** Nebraska remained relatively untouched by other reorganizations and liquidations. The Milwaukee Road leased trackage rights in Nebraska but owned no right-of-way. The ICG also had trackage rights (and 3 mi of rail) in state, so the effects of its emerging as the CC&P were minimal.

In addition to the already existing terminal switching railroads, the 10-mi Sidney and Lowe was established to serve a freight car repair facility in western Nebraska. In addition, the Ideal Cement and Nebraska Public Power District owned short lines, operated by the UP and the BN, respectively.

Western Railroad Properties, a subsidiary of the C&NW, was the originating line for coal trains from eastern Wyoming, and stemmed from a 1976 ICC authorization for the C&NW and BN to jointly serve this area. The C&NW transfers its coal traffic to the UP at Joyce for the haul east and switched back to its own tracks at Freemont.

#### Financial Assistance

Using federal or local public funds for rail revitalization was permitted by the Agricultural and Industrial Branch Rail Revitalization Act of 1980, which established a seven-member council to oversee state railroad revitalization activities. The council could issue bonds but had no taxing authority. Local entities were permitted to form regional rail councils and to be responsible for each line revitalization project (33). About one-half of Nebraska's system was light-density and branch lines, carrying about 95 percent agricultural traffic, and potential candidates for abandonment. A follow-up study of 2,000 mi of low-density lines and branch lines divided them into four categories: (a) those generating enough traffic to be

profitable, (b) those of borderline profitability but not in jeopardy, (c) those that could qualify for assistance based on analysis of benefit-to-cost ratios (including social costs of abandonment), and (d) lines that did not warrant financial assistance (34). On the basis of the analysis, 412 mi fell in the third category and 621 mi fell in the fourth category. Because there were no federal funds for the state to administer, Nebraska effectively has no state rail assistance program, and a majority of this mileage will likely be abandoned.

The C&NW has one line that is an abandonment or spin-off possibility. It runs north from Norfolk to South Dakota and on to Wyoming, with most traffic concentrated near Norfolk and north of Rapid City (and negligible amounts between).

#### Intermodal

The switch from TOFC to COFC meant that all 19 ramps in Nebraska, except for three in Omaha, were closed by 1988. Three of the four railroads serving Omaha have container-handling capabilities. Eleven cities lost intermodal loading ramps during the 1980s.

#### SUMMARY AND CONCLUSIONS

In the region, impacts on the rail system were most severe in Iowa, which lost about one-third of its roadway miles during the 1980s, and in Missouri. The rail systems of Kansas and Nebraska were comparatively unchanged. However, it is likely that the western half of the region will experience structural change in the 1990s that is similar to that already observed in Iowa. The insight provided by past experiences should help



to promote better policy concerning the restructuring of railroads in Kansas and Nebraska. On the basis of research of past trends presented in this paper, it is surmised that the three following trends will continue into the future.

### Networks

The rail system in the Midwest has gone through significant structural change in the 1980s and will continue to change. Clearly, much of the change is a result of the new pricing and service design freedoms that carriers were granted by the Staggers Act and that have allowed the carriers to develop a more efficient and compact rail transportation system. The rail system in Region VII is tightly linked to the structural and business pattern changes in the agricultural industry. The survival of short line and regional railroads operating on light-density grain gathering lines is uncertain, because many are precariously dependent on the stability of agricultural traffic.

The dramatic structural changes in Iowa's and Missouri's rail systems during the 1980s are likely to be paralleled by changes in Kansas and Nebraska in the 1990s. The rail plans of each state identified up to 1,000 mi as abandonment candidates. The major question will be which lines will actually be abandoned and which ones will become local railroads, still providing service at costs more in line with low levels of traffic. Neither Kansas nor Nebraska has financial assistance programs, a factor that will inhibit the states' abilities to promote efficient restructuring of their rail systems.

### Intermodal

Intermodal movements have experienced extensive growth, with intermodal activity being highly concentrated at large city hub facilities. These facilities will largely continue to be located in urban areas that have high levels of demand to support the costs involved in a mechanized facility. The facilities will provide regional service through cooperation with drayage firms and trucking firms. Nevertheless, because of the significant capital investment involved, the core of intermodal activities, supported by TOFC or double-stack unit trains, with only a few notable exceptions, is likely to expand only in the densest traffic markets. The Midwest states playing the role of conduit for intermodal traffic but not participating in the expansion of intermodal traffic may present an ironic circumstance, but one likely to continue.

### Agricultural Traffic

The large-scale deviations in the annual volumes of agricultural exports and fluctuations in traffic volumes make it very difficult for railroads, with high fixed investments, to remain profitable in light-density markets. On the other hand, marginal increases in regional processing capacity will provide more stable points of demand and consistent traffic. Barring a reduction in capacity of the major river traffic lanes (related to drought or lock and dam closures) or a major expansion

of exports, the trend toward more short-haul movements and concentration of shipping points should continue.

### ACKNOWLEDGMENTS

The authors would like to thank C. Phillip Baumel, their colleague, for his advice, interpretation, and assistance in the preparation of this paper.

### REFERENCES

1. *Overview of Iowa's Ethanol Industry*. Iowa Department of Natural Resources, Sept. 1991.
2. T. H. Maze, C. K. Walter, B. J. Allen, N. Fuller, M. Hanson, M. Maggio, S. McGinnis, A. G. Smadi, and K. Svede. *The Changing Role of Freight Transportation Modes and Intermodal Freight*. Midwest Transportation Center, Ames, Iowa, Oct. 1990.
3. *Statistics on Regional and Local Railroads*. Association of American Railroads, Washington, D.C., 1988.
4. J. H. Mielke. Short Line Railroad Creations: Terms of Sale, Impacts on Viability, and Public Policy Implications. *Journal of the Transportation Research Forum*, Vol. 29, 1988, pp. 138-148.
5. K. E. Wolfe. The Downside Risk: An Analysis of Local and Regional Railroad Service Failures. *Journal of the Transportation Research Forum*, Vol. 29, 1988, pp. 124-137.
6. *Deferred Maintenance and Delayed Capital Improvements on Class II and Class III Railroads: A Report to Congress*. Federal Railroad Administration, U.S. Department of Transportation, 1989.
7. State-Funded Line O.K.'d to Help Rescue CM&W. *Rail News Update*, Aug. 31, 1988.
8. J. H. Mahone. *Intermodal Freight Transportation*. Eno Foundation for transportation, Westport, Conn., 1985.
9. *Railroad Facts*. Association of American Railroads, Washington, D.C., 1988.
10. D. S. Smith. *Double-Stack Container Systems: Implications for U.S. Railroads and Ports*. Manalytics, Inc., July 1988.
11. D. S. Smith. Domestic Containerization: How Big Can It Get? *Transportation Research Forum Proceedings*, No. 27, 1986, pp. 289-295.
12. R. T. Sorrow. Where, How Does Intermodal Fit In? *Modern Railroads*, May 1989.
13. L. S. Miller. Still Playing Catch-Up. *Railway Age*, May 1989.
14. G. Welty. Containers Come on Strong. *Railway Age*, Feb. 1989.
15. *1985 Iowa Railroad Analysis Update*. Iowa Department of Transportation, Ames, 1986.
16. J. W. Ingram. Government and Midwest Railroads: Demise of the Chicago, Rock Island and Pacific Railroad Company. *Transportation Journal*, Spring 1980.
17. J. F. Due. New Railroad Companies Formed to Take Over Abandoned or Spun-Off Lines. *Transportation Journal*, Fall 1984, pp. 30-43.
18. Soo Buys Milwaukee Road Following Final Court OK. *Rail News Update*, March 6, 1984.
19. ICI to Spin Off ICG as Independent. *Rail News Update*, Sept. 30, 1987.
20. CNW Acquires RI Line After Receiving Court OK. *Rail News Update*, July 13, 1983.
21. C&NW, Soo Line Bids Approval by Commission. *Rail News Update*, Jan. 9, 1984.
22. *Official Railway Guide: North American Freight Service Edition*, International Thomson Transportation Press, Inc., New York, Sept./Oct. 1988.
23. *Official Railway Guide: North American Freight Service Edition*, National Railway Publication Company, New York, March/April 1980.
24. T. H. Maze, A. R. Cook, and M. Carter. Restoring Rail Service Along the Old Chisholm Trail: The Oklahoma Brokerage Approach. *Transportation Journal*, Spring 1984, pp. 15-23.

25. *1982 Kansas State Rail Plan*. Kansas Department of Transportation, Topeka, 1982.
26. Constitution of the State of Kansas after November 4, 1980, Article 11, Section 9.
27. 631-Mile ICG Line Sold to CSS&SB for \$81 Million. *Rail News Update*, Aug. 6, 1986.
28. *Missouri Rail Plan 1980 Update*. Wilbur Smith and Associates, 1980.
29. *Missouri Rail Plan 1984 Update*. Missouri Highway and Transportation Department, Jefferson, 1984.
30. Katy Railroad Merged with Union Pacific. *Rail News Update*, Aug. 31, 1988.
31. Short Line Gives New Life to Kansas, Missouri Branch. *On Track: A Railroad Industry Report*, May 17-31, 1987.
32. *Nebraska Rail Plan 1980*. Wilbur Smith and Associates, Leo A. Daly Company, and Associated Engineers, July 1980.
33. Constitution of the State of Nebraska, Article XIII, Section 3.
34. *Nebraska Rail Program Needs*. Wilbur Smith and Associates, 1989.

---

*This paper is part of the project "The Changing Roles of Freight Modes and Intermodal Freight" sponsored by the Midwest Transportation Center. The Midwest Transportation Center is a consortium of the Iowa State University and the University of Iowa and is the U.S. Department of Transportation's University Transportation Center for Federal Region VII. The conclusions and opinions are the authors' and do not necessarily reflect the views of the Midwest Transportation Center or its funding agencies.*

*Publication of this paper sponsored by Committee on Freight Transportation Planning and Marketing.*