

GAO

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Works and Transportation, House of
Representatives

December 1992

INTERMODAL
FREIGHT
TRANSPORTATION

Combined Rail-Truck
Service Offers Public
Benefits, but
Challenges Remain





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

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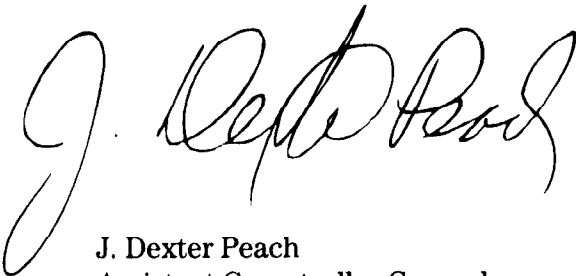
December 18, 1992

The Honorable Robert A. Roe
Chairman
The Honorable John P. Hammerschmidt
Ranking Minority Member
Committee on Public Works and Transportation
House of Representatives

This report reviews developments in intermodal freight transportation and its potential to relieve the nation's highways of some of the freight burden. The report addresses the prospect of greater cooperation between the rail and trucking industries and identifies some challenges that the industries must overcome if the nation is to fully realize the potential benefits from intermodal freight transportation. The report contains recommendations to the Secretary of Transportation for initiatives to promote efficient intermodal freight transportation.

We are sending copies of this report to appropriate congressional committees; the Secretary of Transportation; the Director, Office of Management and Budget; and other interested parties. We will make copies available to others upon request.

This work was performed under the direction of Kenneth M. Mead, Director, Transportation Issues, who may be reached at (202) 275-1000. Other major contributors are listed in appendix III.



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Executive Summary

Purpose

In 1990 the nation's highways carried 32 percent more freight than in 1980 and 78 percent more than in 1970. The trucking industry has provided flexible, reliable, and economical service, but the growth of trucking has contributed to concerns about safety, congestion, pollution, and highway deterioration. Many highways in and near cities such as Chicago and Los Angeles are carrying over 15,000 tractor-trailers a day. As a possible alternative to such heavy use of the highways, GAO examined the status and potential benefits of intermodal rail transportation, in which loaded containers or trailers are transferred intact from truck to rail and back to truck. Specifically, GAO (1) examined recent trends in intermodal rail transportation, (2) assessed the prospects for more intermodal cooperation between the rail and trucking industries, (3) identified problems that limit the effectiveness and benefits of intermodal transportation, and (4) considered whether any federal initiatives might be helpful in encouraging intermodal cooperation.

Background

While intermodal freight may involve trucks, railroads, marine vessels, and aircraft, this report focuses on intermodal rail service—the carriage of trailers or containers over long distances by railcars, with pickup and delivery at each end provided by trucks. Many containers are used in ocean commerce, moving inland by either truck or rail, but they are also being used increasingly for domestic cargo shipments. Intermodal rail transportation combines the long-haul efficiencies of rail with the flexibility of trucks and can be a cost-effective use of the nation's infrastructure. It can help reduce highway deterioration, save fuel, and improve safety.

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) required the states to plan for intermodalism in using federal highway trust funds. It established an Office of Intermodalism to promote efficient intermodal transportation and coordinate intermodal transportation policy among the agencies in the Department of Transportation (DOT).

Results in Brief

The shipment of highway trailers on rail flatcars grew slowly in the 1970s, and many railroads questioned its profitability. Intermodal rail operations expanded in the 1980s, stimulated by the deregulation of railroad freight rates and marketing practices under the Staggers Rail Act of 1980. Also, in 1984 containers from ocean carriers began moving inland from West Coast ports on double-stack railcars, which carry one container atop another. With improved service and equipment, intermodal shipments grew from 3

million trailers and containers in 1980 to 6.2 million in 1991, and have grown at an 8-percent rate in 1992.

The growth of intermodal transportation has also been stimulated in the 1990s by increasing rail and trucking company cooperation. Some large trucking companies have initiated intermodal service in recent years, which should reduce the growing reliance on the highway system to move freight.

Intermodal rail service has had difficulty in the more fragmented, shorter-haul markets of the eastern United States and has thus provided only limited relief to the eastern highway network. Moreover, the success of intermodal trains between Chicago and the West Coast has presented a challenge in that it has increased truck traffic on the highways leading to and from Chicago's intermodal terminals, adding to that city's congestion and pollution. Intermodal traffic is also aggravating congestion problems in Los Angeles, New York, and, to a lesser degree, other port cities.

Officials of rail, trucking, and ocean carriers generally favor allowing market forces, rather than government incentives or regulations, to determine the development of intermodal transportation. However, many of these officials believe that DOT's new Office of Intermodalism could play a useful role in helping the industry solve specific intermodal transportation problems in cities like Chicago, Los Angeles, and New York. ISTEA gave the Office the general mission of promoting efficient intermodal transportation. GAO believes that, with adequate resources, the Office could help industry and local government officials agree on plans and funding for intermodal projects. A combination of private and public funding may be needed for such projects, but ISTEA did not expressly authorize the use of highway trust funds for intermodal rail freight projects.

GAO's Analysis

Intermodal Rail Service Has Improved

In the 1980s railroads began to improve their intermodal service by segregating intermodal traffic from other freight operations, mechanizing intermodal terminals, and offering more regularly scheduled intermodal trains. Previous problems with cargo damage were significantly reduced by improved track and new types of intermodal railcars. Recent

agreements to reduce train crews (eliminating brakemen from most trains) should lower costs and permit more frequent train departures, further improving intermodal service.

Truckload Companies Are Taking New Interest in Intermodalism

Several large truckload companies that had not used intermodal service before 1990 have recently seen advantages in using it. They have realized cost savings on long hauls and have improved their options in competing for business. Moreover, by putting trailers or containers on railcars, they can handle more volume with their existing tractor and driver fleets. Finally, by using the railroads for long hauls, these companies have reduced driver turnover by getting their drivers home more often. Reducing long-haul driving can lessen fatigue, which has been identified as a factor in one-third of fatal truck accidents.

Challenges Remain for Intermodal Rail Service

While cooperation between the rail and trucking industries is growing, they still have several challenges to overcome if the public is to fully realize the benefits of intermodal freight transportation. In some major metropolitan areas, truck traffic to and from intermodal terminals is adding to urban congestion. For example, trailers and containers are being driven to Chicago from an increasingly large area to be loaded on intermodal trains to the West Coast. Because rail terminals have been historically located near the heart of the city, much of this truck traffic is commingled with Chicago commuter traffic. GAO estimated that intermodal activity is generating at least 8,000 truck trips a day in Chicago, including originating and terminating shipments, trips between rail terminals, and trips with empty containers to and from storage depots. In Los Angeles, international containers are driven 22 to 25 miles between the port and rail terminals located near downtown. In the New York area, intermodal rail terminals are located on the New Jersey side of the Hudson River, generating substantial truck traffic on the bridges into New York.

Intermodal service has had a limited impact on highway traffic in the eastern United States because cities are close to each other. It is difficult for intermodal service to compete with trucks when the rail haul is less than 700 miles because of the cost and time to pick up and deliver trailers and load and unload trains. To cope with this problem, one railroad has had moderate success with RoadRailers—specially built trailers that can be pulled on both rails and highways.

Some Federal Initiatives Could Encourage Intermodal Cooperation

In addition to its general mission to promote efficient intermodal transportation, DOT's Office of Intermodalism has several assigned tasks, such as assembling data on intermodal transportation and coordinating intermodal transportation policy among the agencies in DOT. In October 1992, the Office was staffed with personnel detailed from other DOT agencies. With adequate resources and direction, the Office could play a useful role in helping industry and local government officials to agree on plans and funding to solve intermodal transportation problems in major urban areas. Examples of possible solutions could involve improved rail access to the Port of Los Angeles or a multiuser intermodal terminal (open to multiple rail and trucking companies) on the outskirts of Chicago.

The use of highway trust funds for nonhighway purposes has long been a sensitive subject. ISTEA permits states greater flexibility in using trust funds and emphasizes the need for intermodal planning in solving transportation problems. However, none of the act's major funding sections specifically authorized the use of trust funds for intermodal freight facilities. Intermodal planning and the construction of access roads to intermodal freight facilities are eligible activities, but DOT officials said the Department had not resolved whether the act allowed trust funds to be used for intermodal freight projects.

Recommendations to the Secretary of Transportation

GAO recommends that the Secretary of Transportation ensure that the new Office of Intermodalism has the resources and direction to assume an active role outside DOT in addition to its coordinating role within the Department. The Office should interact with industry, state, regional, and local officials to identify intermodal transportation problems and help achieve solutions. It should facilitate communication and encourage agreement between the various parties, help identify funding sources, and ensure that the larger public interest is also taken into account.

GAO also recommends that the Secretary determine whether intermodal freight facilities are eligible for federal funding under ISTEA, provided that they would relieve highway congestion and deterioration and help improve safety and air quality.

Agency Comments

DOT officials responsible for intermodal transportation policy reviewed a draft of this report and made suggestions for clarification. They agreed with its content and said the Department is initiating actions consistent with the report's recommendations.

Contents

Executive Summary		2
Chapter 1		8
Introduction		
	Growth of the Trucking Industry	8
	Decline of Railroads' Market Share of General Freight	9
	Growth of Intermodal Rail Service	10
	Potential Benefits of Intermodal Rail Transportation	13
	Intermodal Surface Transportation Efficiency Act of 1991	13
	Objectives, Scope, and Methodology	14
Chapter 2		15
Intermodal Rail Transportation Has Shown Significant Promise in Recent Years		
	Operational and Technological Changes Have Improved Intermodal Effectiveness	15
	Domestic Container Service Started Slowly but Shows Promise	20
	Train Crew Agreements May Permit Expanded Intermodal Service	21
	Railroads Have Consolidated Intermodal Hubs to Achieve Greater Efficiency	22
	Shippers' Perceptions of Intermodal Rail Service Have Improved	22
	Significant Intermodal Growth Is Possible	23
Chapter 3		25
Trucking Companies' Use of Intermodal Rail Service Is Selective but Growing		
	UPS Uses Intermodal Service Extensively	25
	LTL Companies Began Using Intermodal Service in the 1980s	26
	Truckload Companies May Become Major Participants in the Intermodal Rail Business	27
	Intermodal Corporate Alliances	30
Chapter 4		33
Intermodal Growth Has Been Uneven and Has Aggravated Some Highway Congestion Problems		
	Intermodal Rail Service Has Had Limited Success East of the Mississippi River	33
	Intermodal Success Has Aggravated Traffic Problems for Some Areas	35

Chapter 5		42
Primary Reliance on Market Forces Does Not Rule Out a Role for the Federal Government	Industry Representatives Prefer to Rely on Market Forces Many Believe the Office of Intermodalism Could Play a Useful Role DOT Determination Needed on Funding Eligibility of Intermodal Projects Conclusions Recommendations Agency Comments	42 42 43 44 45 46
Appendixes	Appendix I: Organizations Contacted for This Report Appendix II: Some Efforts to Increase Intermodal Rail Service in Shorter-Haul Eastern Markets Appendix III: Major Contributors to This Report	48 50 55
Bibliography		56
Figures	Figure 1.1: Intermodal Trailers and Containers Shipped, 1972-92 Figure 2.1: Double-stack Railcars Figure 2.2: Intermodal Flatcars Figure 2.3: Intermodal Lift Equipment Figure 4.1: Railroad Mainlines Showing Intermodal Volume in 1987 Figure 4.2: Interstate Highways Affected by Intermodal Load-Centering in Chicago Figure 4.3: Truck Traffic on Chicago Area Interstate Highways Figure II.1: RoadRailer Train and Rail Wheels Positioned to Accept Trailer	12 17 18 19 34 37 38 51

Abbreviations

APL	American President Lines
COFC	container on flatcar
Conrail	Consolidated Rail Corporation
DOT	Department of Transportation
FHWA	Federal Highway Administration
GAO	General Accounting Office
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
LTL	less-than-truckload
TOFC	trailer on flatcar
UPS	United Parcel Service

Introduction

The United States has spent over \$120 billion to construct its interstate highway system, and in the process has become increasingly dependent on the system for the movement of freight. Of the nearly 6.4 billion tons of freight and commodities moving between U.S. cities in 1990, an estimated 41 percent moved by truck, compared with 27 percent by rail, 16 percent by water, and 16 percent by pipeline.¹ Since the nonhighway modes are heavily involved in transporting bulk materials such as coal, grain, petroleum, and chemicals, the highways have become the primary mode for transporting unfinished and finished manufactured products. This report assesses whether the intermodal movement of trailers and containers² by rail/truck combinations can relieve some of the nation's dependence on highways to move freight. The report also identifies some of the challenges that intermodal freight service must overcome in order to significantly benefit the public.

Growth of the Trucking Industry

The trucking industry has played a key role in the growth of the nation's economy. According to the Eno Transportation Foundation, a widely used source of transportation statistics, the movement of intercity freight by truck reached 735 billion ton-miles in 1990, an increase of 32 percent from 1980 and 78 percent from 1970. Since the Motor Carrier Act of 1980 made interstate operating authority for trucking companies easily obtainable, the industry has provided increasingly flexible and reliable service, which has received high marks from shippers. In a 1991 survey of 484 commercial transportation managers, 87 percent rated trucking service excellent or nearly excellent. The cost of shipping goods by truck increased less than the rate of inflation during the 1980s: revenue per ton-mile increased only 35 percent for less-than-truckload (LTL) carriers and 16 percent for truckload carriers, compared with a 59 percent increase in the consumer price index.³

While the public has benefitted considerably from the performance of the trucking industry, this has not come without a cost. Although the industry has consistently improved its safety record, its coexistence with the driving public remains a sensitive issue. In accidents involving medium or heavy trucks with another vehicle in 1990, 220 truck occupants were killed compared with 4,057 occupants of other vehicles. Congressional concern

¹Estimates by Eno Transportation Foundation, Transportation in America, 1991.

²A container resembles a trailer when locked on a trailer chassis. Containers are usually lifted off their chassis for transportation by rail.

³LTL companies primarily accept smaller shipments and consolidate them into truckloads at hub terminals. Conversely, truckload companies sell their services by the trailer load.

over the safety impact of growing truck traffic has been reflected in Congress' funding of roadside safety inspections, its requirement that truck drivers be tested to obtain a single commercial license, and its 1991 freeze on routes authorized for double- and triple-trailer combinations. The safety of the driving public is also affected by the rail industry, but to a lesser degree: 568 motorists were killed at public grade crossings in 1990, the majority at crossings that did not have automatic crossing gates or flashing lights.

The growth of truck traffic, along with the growth of vehicle traffic in general, has contributed to public concern over both air pollution and traffic congestion. In California, proposals have been made to reduce engine idling by stationary trucks and to restrict truck traffic during peak commuting hours. Many interstate highways in or approaching metropolitan Chicago and Los Angeles are carrying over 15,000 tractor trailers a day. When converted to vehicle equivalents (essentially, space occupied plus stopping margin), 15,000 tractor trailers would equate to 45,000 passenger cars.

The increasing ton-miles of highway freight traffic have also generated concern about accelerated highway deterioration. On the basis of truck weight surveys on rural interstate highways, the Federal Highway Administration (FHWA) has estimated that equivalent axle loadings increased more than 350 percent between 1970 and 1990. An equivalent axle loading represents the damage caused by one pass of an axle bearing 18,000 pounds. This relative damage factor increases geometrically with increased weight on the axles, so that a heavy truck accounts for many more axle loadings than a passenger car. FHWA estimated that 91 percent of the equivalent axle loadings on rural interstate highways in 1990 were from tractor trailers with five or more axles.

Decline of Railroads' Market Share of General Freight

During the period 1950 to 1980, trucking steadily replaced railroads as the mode of choice for transporting unfinished and finished manufactured products. In 1950 over 1.4 billion tons of intercity cargo moved over the rails compared with about 800 million tons on the highways. In 1980, when both the railroad and trucking industries were partially deregulated by legislation, railroads moved about 1.6 billion tons compared with over 2 billion on the highways. Moreover, since the railroads continued to transport large quantities of coal, grain, chemicals, and other bulk commodities, their declining share of general freight traffic was even more

dramatic. Boxcar loadings, for example, declined by 50 percent in the 1970s.⁴

We have reported previously on the difficulties that railroads had in competing for intercity freight in the 1960s and 1970s as the interstate highway system was constructed.⁵ This was especially true with regard to shipments for which transit time and reliable deliveries were important. As railroads' profitability declined, the condition of rights-of-way and equipment deteriorated, resulting in slower and less reliable service. Conversely, the trucking industry, aided by the new highway system, was improving its ability to deliver fast, reliable, and flexible service.

Since 1980 the railroads have nearly stabilized their share of intercity freight movements. Boxcar loadings continued their sharp decline, but railroads have increased their haulage of coal and their intermodal (trailers and containers) service. Trucking service also improved under the more competitive environment of deregulation, and the movement of freight over the highways has continued to increase. In 1990 railroads carried 1.7 billion tons of intercity freight compared with 2.6 billion by trucks.

Growth of Intermodal Rail Service

Today's intermodal rail operations represent a convergence of two trends that were largely separate before the mid-1970s: (1) railroad carriage of trailers on flatcars (TOFC) and (2) the use of containers in ocean commerce that could be loaded on a trailer chassis for delivery inland. TOFC (also known as piggyback) service was provided mainly in heavy-duty trailers owned by railroads or leasing companies. Before the transition to overhead cranes, trailers were driven onto flatcars from ramps. The railroads provided mostly ramp-to-ramp service, and left marketing and drayage arrangements (pickup and delivery) to third-party shippers' associations and agents.

Containerization in ocean commerce began essentially in the 1950s. In the 1970s steamship companies began discharging containers on the West Coast of the United States and shipping them across the country by rail flatcar, with final delivery by truck. American President Lines (APL), a

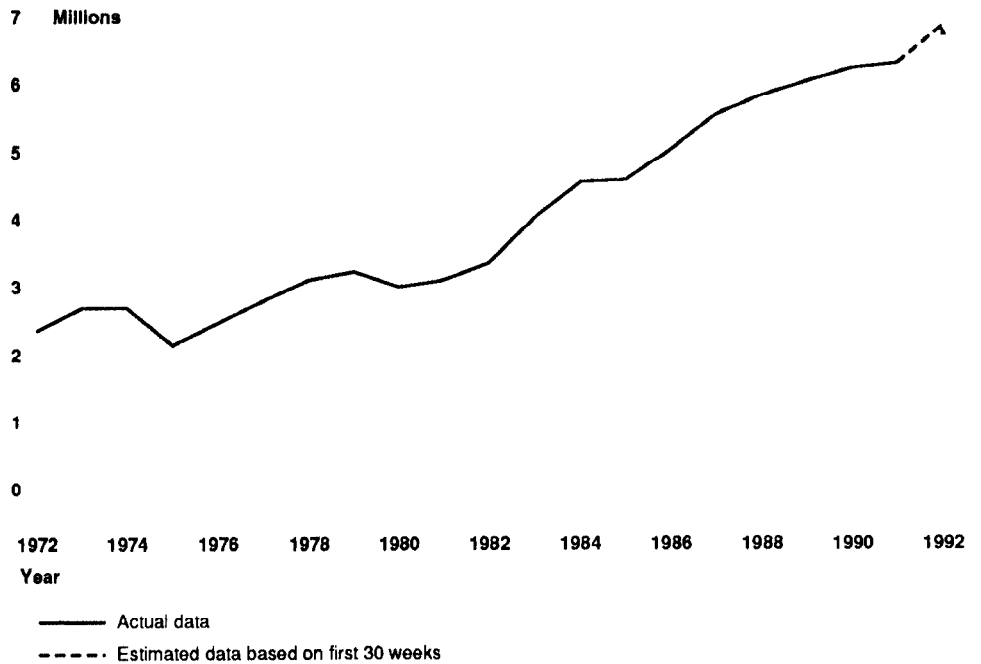
⁴The decline of boxcar loadings can be partially explained by the increased size of individual boxcars and by the shifting of freight to trailers carried on flatcars. But it also represents a decline in the railroads' share of merchandise freight.

⁵Railroad Regulation: Economic and Financial Impacts of the Staggers Rail Act of 1980 (GAO/RCED-90-80, May 16, 1990) and Railroad Competitiveness: Federal Laws and Policies Affect Railroad Competitiveness (GAO/RCED-92-16, Nov. 5, 1991).

steamship company which operated only in the Pacific trade, acquired its own railcars and organized entire trains, called liner trains. Initially, these trains went solely to East Coast ports, thence the containers were delivered by trucks to eastern markets. When regulatory changes allowed steamship companies to issue bills of lading to inland destinations, they began to deliver containers directly from the West Coast by rail to various cities around the country. This type of "landbridge" service eventually replaced much of the containership traffic through the Panama Canal to eastern and Gulf Coast ports.

As early as 1977, the Southern Pacific Railroad and Sea-Land Corporation, a steamship company and pioneer in containerization, tested the operation of railcars with wells between the wheel assemblies that could carry two 40-foot-long containers one atop the other. Sea-Land used these cars for a landbridge service between the ports of Los Angeles and Houston. APL began using similar well cars for its liner trains between Los Angeles and Chicago in 1984. Thus was born "double-stack" service, or "stack trains." The new technology spread quickly as other steamship companies saw its economic advantages and began organizing such trains. To fill their containers for the return trips to the West Coast (back hauls), the steamship companies began finding both export and domestic loads. Intermodal rail shipments jumped from 4.1 million trailers and containers in 1983 to 6.2 million in 1991 and have grown at an 8-percent rate in 1992. (See fig. 1.1.)

Figure 1.1: Intermodal Trailers and Containers Shipped, 1972-92



Source: Association of American Railroads.

With this jump in business came a change in railroads' attitudes toward intermodal service. After a period of promising growth in the 1960s, the intermodal rail business had shown only erratic growth in the 1970s. Many railroads were skeptical about the profitability of intermodal operations, especially when compared with bulk operations like coal and grain. Initially, railroads were even slow to perceive the opportunities presented by double-stack operations and were content to pull the steamship companies' double-stack trains across country. However, in the 1980s railroads began to view intermodal service as a potential growth area and began to compete for freight that had deserted them for the highways. Railroads began establishing separate intermodal departments and segregating intermodal traffic from regular freight traffic. They also began offering more scheduled, dedicated intermodal trains, and put a higher priority on customer service.

Potential Benefits of Intermodal Rail Transportation

The use of railcars to transport trailers and containers, with pickup and delivery by truck, has potential advantages for the public compared with using only trucks. To the extent that the rail network is underutilized, as many industry participants believe, increased intermodal activity provides a more balanced use of the nation's transportation infrastructure and slows deterioration of the highways. Also, accidents caused by driver fatigue could be reduced if some truck drivers did not have to drive long distances and spend long periods away from home. In a 1988 study of fatal truck accidents, the National Transportation Safety Board found that driver fatigue was the most probable cause in nearly one third of the accidents. Further public benefit can come from greater fuel efficiency. A study published in 1991 by the Federal Railroad Administration estimated that intermodal rail service was 1.4 to 3.4 times more fuel efficient than trucks, depending on the type of intermodal rail service used.

These benefits can be realized if an increasing portion of freight shipments make the long-haul portion of their journey by rail, and make the shorter-haul connections at either end by truck. Chapter 2 discusses developments in intermodal rail service that may lead to significant growth, and chapter 3 assesses the prospects for more intermodal cooperation between the rail and trucking industries. Chapter 4 identifies some of the challenges that still confront intermodal service and tend to limit the benefits it provides the public.

Intermodal Surface Transportation Efficiency Act of 1991

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA),⁶ which reauthorized the use of federal highway trust funds, also gave states more flexibility in using their allocations. Although the act does not expressly authorize the funding of intermodal rail freight projects, it does state that "It is the policy of the United States to develop a National Intermodal Transportation System that is economically efficient and environmentally sound, provides the foundation for the Nation to compete in the global economy, and will move people and goods in an energy efficient manner." An intermodal system is described as one which consists of all forms of transportation in a unified, interconnected manner.

Title V of the act instructed the Secretary of Transportation to "coordinate Federal policy on intermodal transportation and initiate policies to promote efficient intermodal transportation in the United States" by establishing an Office of Intermodalism and an Intermodal Transportation

⁶P.L. 102-240.

Advisory Board within the Office of the Secretary. The act also established a National Commission to study intermodal transportation.

Objectives, Scope, and Methodology

In light of congressional interest in a more integrated use of the various modes of transportation, we examined intermodal rail transportation to assess whether it could potentially reduce the nation's increasing reliance on highways for moving freight. Intermodal freight transportation encompasses the movement of goods in trailers or containers, without unpacking, by some combination of trucks, railroads, marine vessels, or aircraft. This report focuses on intermodal rail transportation because it is a realistic substitute for highways for a significant volume of freight. Our specific objectives were to

- examine recent developments in intermodal rail transportation,
- assess the prospects for more intermodal cooperation between the rail and trucking industries,
- identify problems that limit intermodal effectiveness and benefits, and
- consider whether any federal initiatives might be helpful in encouraging intermodal cooperation.

We conducted our review from August 1991 through August 1992 in accordance with generally accepted government accounting standards. Appendix I lists the organizations we met with, and the bibliography lists the 42 studies and data sources we used for this report. We met with representatives of the Department of Transportation (DOT), 3 transportation-planning organizations, 5 industry associations, 8 railroads, 10 trucking companies, 8 other companies associated with the trucking or rail industries, and 6 ports.

We observed intermodal rail and/or port operations in Los Angeles and Oakland, California; Seattle and Tacoma, Washington; Chicago, Illinois; Baltimore, Maryland; Cincinnati, Ohio; Norfolk, Virginia; Georgetown, Kentucky; and Ft. Wayne, Indiana, as well as trucking terminal operations in Akron, Ohio. We surveyed access routes to the ports of Los Angeles and Long Beach, California, by helicopter and rode in the locomotive of a Santa Fe intermodal train from Chicago to Kansas City, Kansas. We also attended conferences of the International Intermodal Expo, the National Industrial Transportation League, the Pacific Multimodal Expo, and the Transportation Research Board.

Intermodal Rail Transportation Has Shown Significant Promise in Recent Years

The intermodal transportation of trailers and containers by rail grew rapidly in the 1980s, stimulated by the growth in international trade and the advent of double-stack railcars that carry two containers—one atop the other. Railroads placed new emphasis on their intermodal business after years of doubting its profitability. Gradually, intermodal rail service has been overcoming its questionable reputation among shippers and gaining new customers. New rail labor agreements may encourage intermodalism's growth, and efforts are underway to penetrate new markets such as bulk liquids, refrigerated goods, and municipal waste. Intermodal rail service appears ready to assume a larger role in moving the nation's freight, providing it can overcome some remaining challenges.

Operational and Technological Changes Have Improved Intermodal Effectiveness

Intermodal rail service has suffered in the past from a reputation that it was slow, unreliable, cumbersome to work with, and prone to cargo damage. Intermodal flatcars were often included in regular freight trains that moved on irregular schedules. Shippers who used intermodal service sometimes allowed trailers to sit at terminals for several days before picking them up, in effect using them as warehouse space. Third-party agents charged fees to handle the arrangements and paperwork required for draymen (pickup and delivery drivers) at both ends of the trip, for per diem to trailer-leasing pools, and for multiple railroads involved in a move.¹ Cargo and trailer damage sometimes resulted from both switching operations and the jolting of slack action in the trains. Loaded intermodal cars were sometimes switched in "hump yards," in which yard engines push cars over a rise and then let them roll into other cars. To protect the railcars, the couplings were designed to retract like a shock absorber, but this feature also created slack action as trains accelerated and decelerated on the road.

In recent years, railroads have largely segregated their intermodal traffic from regular freight operations and confined the switching to intermodal terminals. Most intermodal trains operate with priority schedules, and intermodal users told us that railroads have greatly improved their reliability in making trailers or containers available for delivery when promised. Railroads have simplified order and billing operations by offering door-to-door service and by making their computer systems accessible to customers.

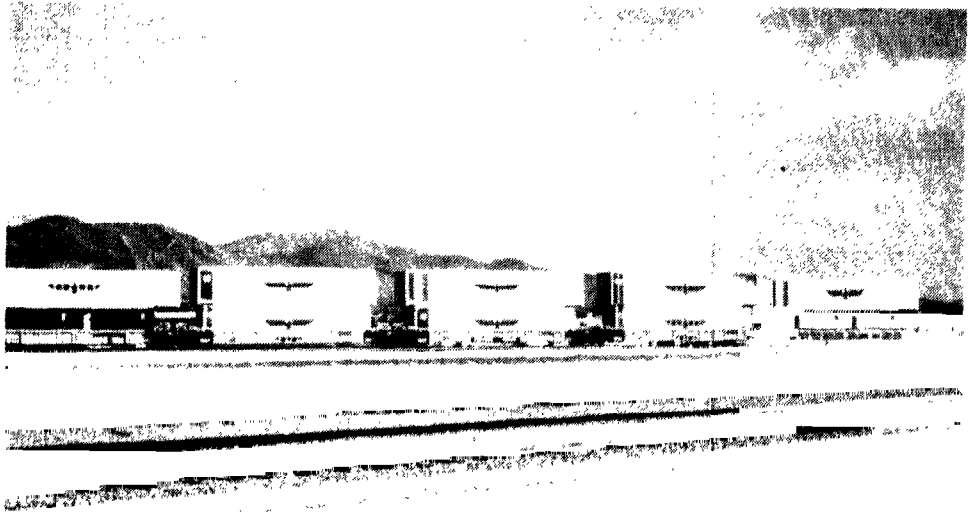
¹No single railroad crosses the country from east to west, so railcars are often interchanged between railroads to make connections.

The separate switching of intermodal trains (avoidance of hump yards) might be the most significant change affecting cargo damage, but improved ride quality has also been important. This was partially due to the upgrading of roadbeds and the laying of welded rail in place of the older jointed rails. These improvements became possible as the financial condition of railroads improved after the Staggers Act partially deregulated the industry in 1980. The latest generation of intermodal cars has also improved ride quality by reducing the effect of slack in the trains. This includes both double-stack cars, which are used for containers, and spine cars, which can be used for either trailers or containers. Double-stack cars are usually built in sets of five wells joined to each other by a swivel connector over a single wheel set (four wheels on two axles). (See fig. 2.1.) This principle of articulation eliminated slack action except at each end of the "five pack," where it was kept to about 3 inches on the assumption that heavy switching would be avoided. The same principle was used in the design of a new car to carry trailers—the spine car. Each section of these five-unit cars has a center beam flanked by partial side platforms on which the trailer wheels rest. (See fig. 2.2.) On many of the spine cars, as well as many of the older flatcars, the trailer hitches can be lowered to the floor to permit carriage of a container. Thus, the three common intermodal configurations are trailer on flatcar, container on flatcar, and double-stack. The loading and unloading of trailers and containers onto railcars are shown in figure 2.3.

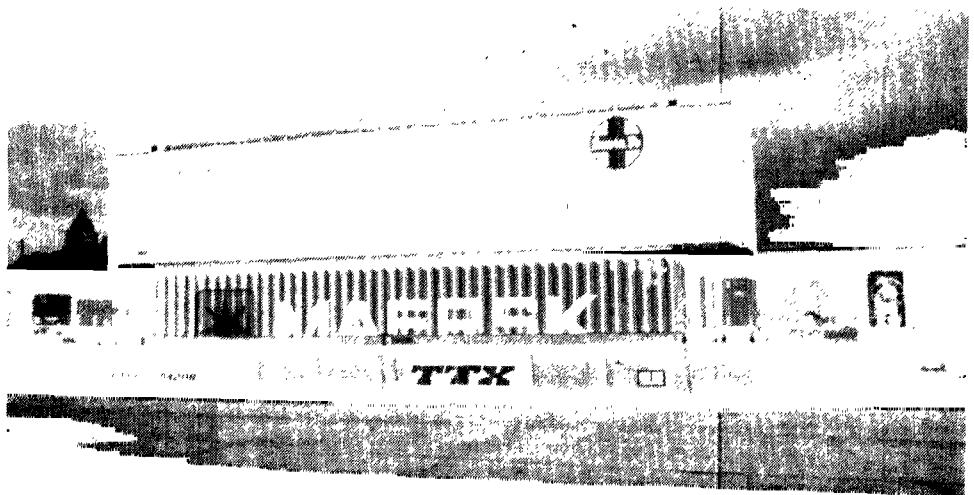
Double-stack trains offer several economic advantages. Since train lengths are often limited by the length of rail sidings, double-stacking allows twice as many loads to be carried on a given train length, with a consequent saving in personnel costs. Because double-stack cars have fewer wheel assemblies and each well carries two containers, more of the train's weight can be devoted to payload, thus making better use of the locomotive power needed and achieving greater fuel-efficiency. In terminals, the five-pack cars require less track space and less switching than conventional flatcars for the same number of loads.

Chapter 2
Intermodal Rail Transportation Has Shown
Significant Promise in Recent Years

Figure 2.1: Double-Stack Railcars



Articulated "five-pack": Each of the five wells carries two containers.

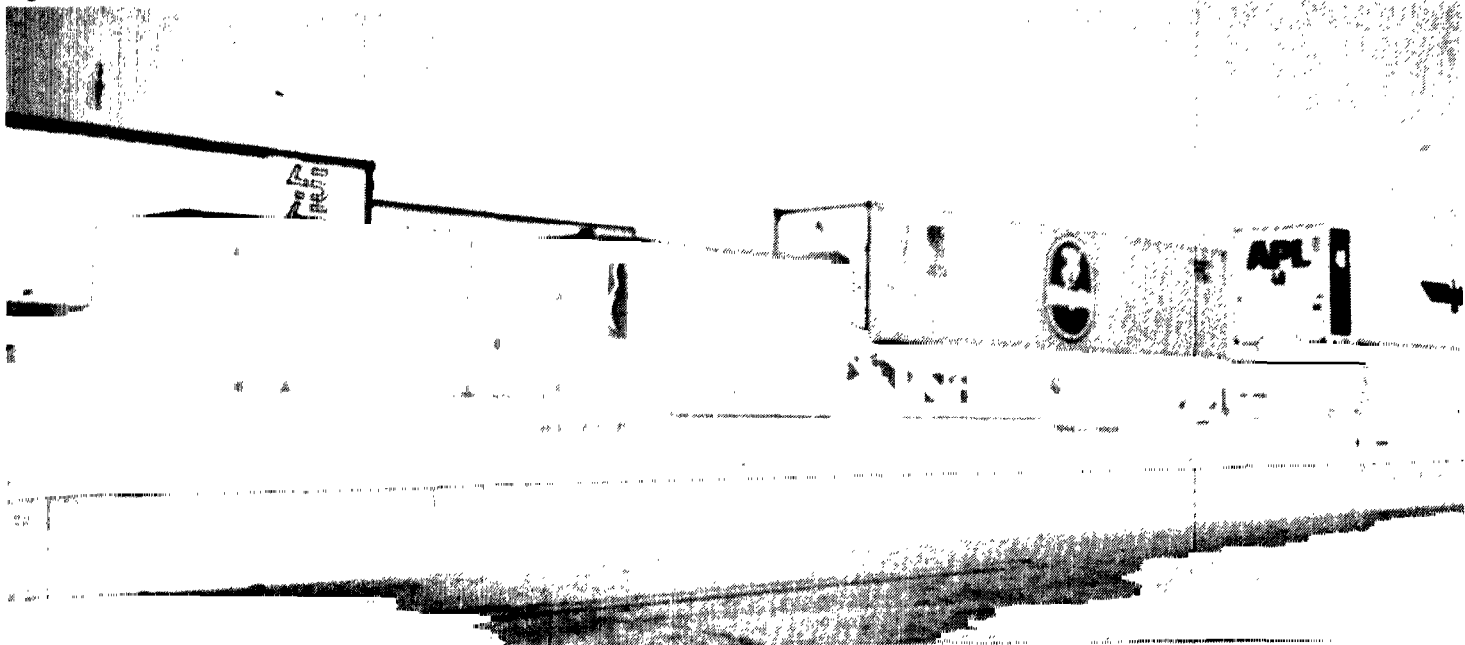


Stand-alone double-stack car.

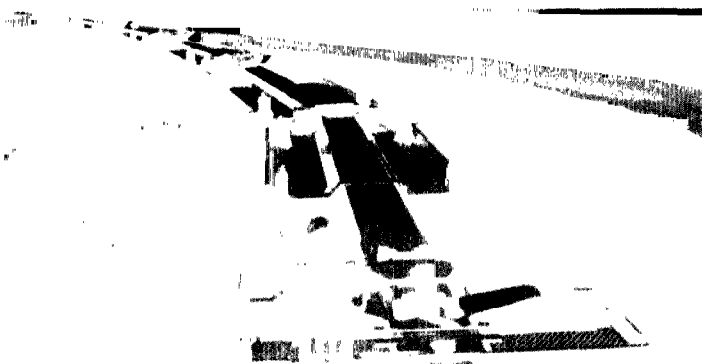
Source: TTX Company.

Chapter 2
Intermodal Rail Transportation Has Shown
Significant Promise in Recent Years

Figure 2.2: Intermodal Flatcars

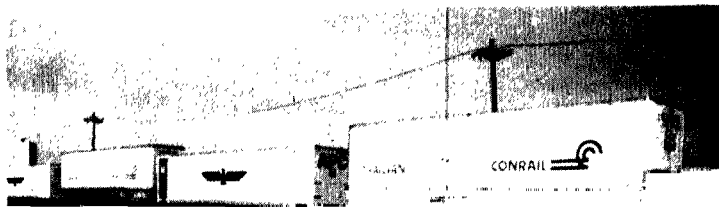


Two 20-foot containers and trailer on 89-foot flatcar.



Articulated spine car: Each platform holds one container or trailer.

Source: TTX Company.

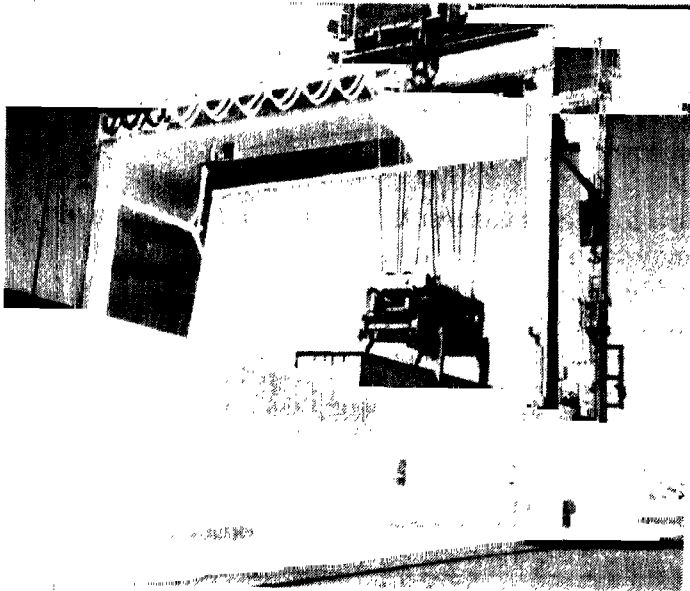


Spine car loaded with trailers and containers.

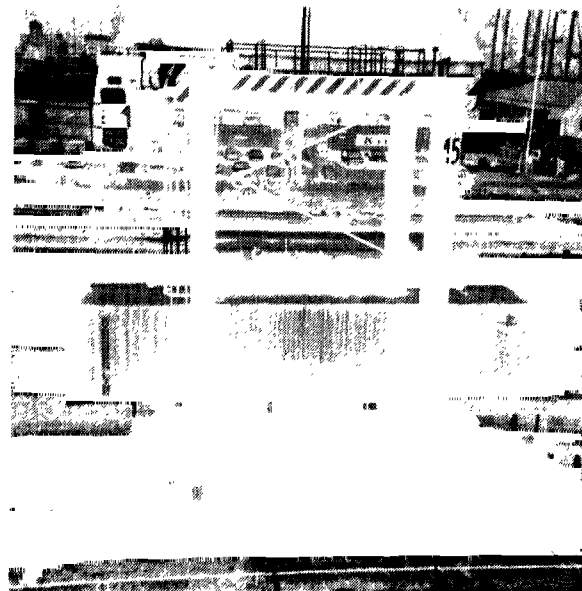
Figure 2.3: Intermodal Lift Equipment



Sideloader unloading double-stack cars.



Overhead crane loading trailers on flatcars.



Straddle crane unloading double-stack train.

Domestic Container Service Started Slowly but Shows Promise

The shipment of domestic loads in containers began in the early 1980s, when APL saw it as an alternative to shipping empty international containers back to the West Coast. As the economic advantages of double-stack trains became apparent, the company began to acquire larger containers for purely domestic service.² Railroads such as CSX and the Burlington Northern followed APL in offering domestic containers, but the business grew rather slowly.

Several reasons may explain the hesitancy with which the intermodal industry has approached domestic containers. One factor is the capital cost to railroads. In order to operate double-stack trains, railroads have had to spend millions of dollars to increase overpass and tunnel clearances. While this investment seemed clearly justified on the major transcontinental routes carrying international containers, it has been a more difficult decision on shorter routes with less obvious volumes of traffic.

Railroads and other intermodal companies have also been hesitant to invest in domestic containers because of uncertainty about the return on investment. This partly reflects the price competition from steamship companies offering low rates to get loads for their containers returning to the coasts.³ Added to the pricing concern has been the uncertainty over the utilization rates that could be achieved with domestic containers. This concern arose from the notoriously low utilization rates of rail trailers, often averaging only one revenue load every 18 days.

Nonetheless, recent developments suggest that domestic containers in double-stack service may soon become a major growth area for intermodal rail service.⁴ In 1991 container loadings (international and domestic) nearly equaled trailer loadings on the railroads (some containers that remain on their chassis when loaded on railcars are counted as trailers, so container loadings probably exceeded trailer loadings). The Santa Fe Railroad has acquired over 2,000 domestic containers and chassis. The Southern Pacific Railroad inaugurated domestic container services in 1991 in cooperation with Schneider

²Internationally approved containers are 20, 40, or 45 feet long. To compete with highway truckload service, 48- and 53-foot domestic containers were needed.

³Freight traffic is often unbalanced in one direction. The Midwest ships many more products to other parts of the country than it receives. But for international containers, the excess of imports over exports creates the opposite situation: returns to the West Coast are considered back-hauls.

⁴While growth in domestic container shipments should partly replace highway traffic, it is also replacing TOFC shipments.

National, a major truckload company, while the Norfolk Southern Railroad began service in 1992. At least one major intermodal marketing company is acquiring its own containers and intends to control them closely to achieve high utilization. In August 1992 truckload company J.B. Hunt announced a major acquisition of containers and chassis for its intermodal and highway service. This may be representative of the way that domestic containers will be acquired and managed, as opposed to the loosely controlled pools of trailers that have characterized TOFC operations.

Demand for domestic containers has increased as exports have grown relative to imports, creating a better balance in the use of international containers. In order to get adequate rates for domestic container shipments, railroads and intermodal companies have tried to market them as being comparable to highway service. One handicap has been the 107-inch internal height of domestic containers, compared with the 110-inch height of most highway trailers. In 1992 manufacturers were working on container designs with reduced floor and ceiling thicknesses to achieve the higher cargo space, and alternative lifting points for loading and unloading, to avoid intrusions into the ceiling. If these containers prove to be durable and virtually comparable to highway trailers, they could lead to a substantially greater use of double-stack service.

Train Crew Agreements May Permit Expanded Intermodal Service

Train crew agreements in the past year should make it possible for railroads to increase the frequency of train departures, a change that would make intermodal service more attractive. Railroads have been reluctant to increase the number of train departures in lower-density markets because of the cost of paying three or four crew members on each train. In competing with highways, intermodal service has been at a disadvantage when train departures have been limited to one or two a day. If a shipment missed a train, it might have a considerable wait for the next train. In the meantime, the shipment could be well on its way by truck. This has made it difficult for intermodal service to compete in shorter-haul markets for freight that is time-sensitive.

Following a brief nationwide strike in April 1991, the Congress required railroad management and the United Transportation Union⁶ to resolve issues involving the size of train crews or submit them to binding arbitration. The resulting agreements and arbitration settlements eliminated brakemen from the road crews of most freight trains, leaving an engineer and conductor. In return, the railroads agreed to substantial

⁶The United Transportation Union represents mainly conductors, brakemen, and switchmen.

severance payments for voluntary separation and to partial salary guarantees for employees placed on reserve status.

While the settlements were costly for railroads in the short term, they are likely to provide considerable cost savings in coming years.⁶ They may be of particular help to intermodal service by allowing railroads to increase the number of scheduled train departures. With more frequent service and the risk of long terminal waits reduced, intermodal service could grow in markets where volume has been thin.

Railroads Have Consolidated Intermodal Hubs to Achieve Greater Efficiency

In 1975 there were some 1,500 intermodal terminals in the United States; by 1990, about 230 were left.⁷ Railroads have been consolidating their intermodal service into a system of larger hub terminals, each drawing loads in from a radius around it. In so doing, they have tried to create rail hauls that would consistently have enough volume to be profitable.

The net impact of this process on highway traffic is unclear. If the consolidation into hubs allows the railroads to offer frequent, highly competitive intermodal service between remaining terminals, the consequent growth could relieve some of the freight traffic on the highways. The efficiencies achieved with higher volume might make service to intermediate stops profitable. If, on the other hand, intermodal rail service does not grow much beyond its traditional market, then a number of areas will have been abandoned to truckload service without compensating intermodal gains. The remaining intermodal service would be profitable, but more freight would be moving over the highways.

Shippers' Perceptions of Intermodal Rail Service Have Improved

Although intermodal rail service improved in the 1980s, it continued to suffer from a perception among many shippers that it was inferior to trucking service and unsuitable for shipments that were time-sensitive or susceptible to damage. Intermodal service was often viewed as attracting mainly the sector of the freight market in which time was of less concern than price. In recent years, railroads and other intermodal companies have worked at improving the reputation of the service in order to attract customers willing to pay higher prices for quality service.

⁶Reduced crew sizes and fewer crew changes have greatly reduced the complexity of staffing trains. The Santa Fe now uses 20 crewmen to move a train from Los Angeles to Chicago, compared with 85 in 1980. Other changes may result from a 2-day strike and lockout in June 1992 involving the machinists' union.

⁷Railroads often refer to intermodal terminals as ramps, reflecting the former practice of driving trailers up a ramp onto flatcars.

Many industry participants told us that the reputation of intermodal rail service has improved, but more still needs to be done. This was confirmed by surveys of commercial transportation managers done in 1990 and 1991 for the Intermodal Association of North America and the National Industrial Transportation League. Although the surveys indicated improvement in shippers' perceptions of intermodal service, trucking service still achieved better marks. For overall performance, 87 percent of the transportation managers surveyed rated trucking excellent or nearly excellent, compared with 69 percent for intermodal rail service. The largest gaps were for door-to-door transit time, service reliability, and the overall ease of doing business.

The surveys indicated that 70 percent of the companies had used intermodal rail service in 1991 compared with 64 percent in 1990, and 36 percent expected to increase their use in the next 3 years. Improved intermodal service was the reason given by 28 percent of the companies that anticipated increased use, but more than half cited price advantages as the reason. In fact, price considerations went from eighth in 1990 to third in 1991 among the factors influencing shippers' choices of transportation modes, probably as a result of the recession.

Significant Intermodal Growth Is Possible

Intermodal rail shipments increased by only 1 percent in 1991, but that was a year in which the gross national product declined. Most railroads told us that they expected their intermodal shipments to increase about 7 to 10 percent a year over the next 5 years. However, some of this growth is expected to come at the expense of competing railroads. TTX Company, which acquires intermodal railcars for lease and interchange between the railroads, has projected that total intermodal shipments will increase at about a 4-percent annual rate. Such a growth rate would be little above general economic growth and would not do much to relieve the use of highways for freight transportation.

It is possible, however, that intermodal rail shipments could grow at a faster rate and could attract a greater share of intercity freight. The transportation managers in the previously mentioned 1991 survey estimated that for trailerloads going 500 miles or more, the share being shipped intermodally had grown from 10 to 14 percent since 1988 and would increase to 18 percent by 1994. DOT officials pointed out, however, that a large majority of truckload freight travels less than 500 miles. A 1987 analysis by the investment banking firm of Alex Brown and Sons estimated

Chapter 2
Intermodal Rail Transportation Has Shown
Significant Promise in Recent Years

that 25 percent of the intercity trucking market was susceptible to competition between intermodal rail service and truckload companies.

In our view, intermodal rail service's ability to assume a greater role in the movement of freight depends on the following: (1) continued efforts to improve service in terms of reliability and equipment offered to customers; (2) penetration of new markets with containers for such things as refrigerated products, bulk liquids, or hazardous and municipal waste;⁸ (3) the growth of cooperative efforts between railroads and trucking companies; and (4) solutions to the problem of serving shorter-haul, lower-density markets in the eastern United States. The latter two subjects are dealt with in chapters 3 and 4.

⁸The Union Pacific has had initial success with a bulk container business. The opportunity for intermodal service in this area was estimated by an industry consultant in 1991 at \$200 million to \$300 million annually. The Union Pacific is also hauling solid waste by double-stack trains 330 miles from Seattle to a landfill in Oregon.

Trucking Companies' Use of Intermodal Rail Service Is Selective but Growing

Historically, much of the intermodal rail business has been generated by third-party shippers' agents or steamship companies, and has been seen as an alternative to trucking. In recent years, however, trucking companies have shown greater interest in using intermodal rail service for their longer hauls. Three types of trucking companies are using intermodal service: (1) the giant package company United Parcel Service (UPS), a long-time supporter of intermodal service and still its largest single customer; (2) less-than-truckload companies, which consolidate smaller shipments into truckloads, and began using intermodal service in the 1980s primarily to handle periodic surges in business and to avoid empty return trips in unbalanced markets; and (3) truckload companies, which have recently begun to use intermodal service for very long hauls, especially between Chicago and the West Coast.

The potential for expansion of this cooperation between modes varies between the different companies. In our view, UPS and the LTL companies will probably expand their use of intermodal rail service gradually as their business grows, and as their labor contracts permit. The truckload companies may expand their intermodal operations substantially if the current cooperative ventures provide the expected mutual benefits. This could provide significant relief to the highway system.

UPS Uses Intermodal Service Extensively

While recent attention in the intermodal industry has focused on new ventures involving railroads and truckload companies, the trucking company that has had the greatest influence on intermodal rail service has been UPS. Beginning in the 1960s, UPS became the largest single user of the service, accounting for about 9 percent of the intermodal shipments in 1991. Originally, intermodal service provided UPS a way to expand into unbalanced markets. However, the company came to operate a nationwide intermodal service for shipments with third-day-or-longer delivery, essentially those shipments going more than 450 miles where acceptable rail service was available.

UPS officials told us that using intermodal rail service relieved UPS of the need to organize a long-haul driver/tractor network. Its drivers can be home every night, which is better for morale. UPS generally maintains a clear distinction between its rail and highway service, minimizing potential disputes with its Teamsters Union drivers.

UPS has been a valued customer for intermodal rail service because it provides base volume for many trains and because it pays premium rates

for premium service. The company has often been the catalyst for agreements between railroads to establish connecting intermodal train service. One veteran observer of intermodal history credits UPS with providing a source of discipline to railroad operations that was once provided by passenger service. In return, UPS gets priority treatment from the railroads: trains scheduled to correspond to UPS' sorting schedules, late cutoff times for train departures, and notification of delays so it can adjust its drivers' assignments.

From 1980 to 1991, UPS' intermodal volume increased by about 135 percent. In 1992 the company started using a new train service between Atlanta and Dallas offered by the Norfolk Southern and Southern Pacific railroads, and UPS officials said they would like to get acceptable service between Dallas and Denver. But generally speaking, they expect the company's use of intermodal service to grow gradually as UPS' business grows.

LTL Companies Began Using Intermodal Service in the 1980s

Since railroads abandoned less-than-carload service many years ago, they have not competed directly with LTL companies. LTL companies consolidate smaller shipments into full truckloads, while intermodal rail service has historically handled truckload-size shipments. LTL companies began using intermodal rail service when it began to improve in the 1980s. Because they have elaborate hub-and-spoke systems in place, they can use rail carriers for the longer hauls between their hubs.

Benefits to LTL Companies

LTL companies have found that using intermodal rail service to supplement their over-the-road trips allows them to better manage surges in traffic. Surges in the LTL business tend to occur at the end of the week or month, and prior to seasonal peaks in the retail business. By using intermodal service, LTL companies can accommodate these surges without having to invest in new equipment and hire more drivers. In addition, some LTL markets, such as Florida, receive more goods than they send out. In these markets, LTL companies may rent the railroads' trailers for one-way trips. One LTL company told us that it initiated service between Chicago and the Pacific Northwest using intermodal rail, and does not run anything over-the-road in this corridor.

Union Contracts Constrain LTLs' Use of Intermodal Rail Service

Three of the four LTL companies we visited were unionized. Officials at these companies told us that while labor contract provisions with LTL companies vary, they generally place certain constraints on the use of

intermodal rail service. Usually, if a driver and equipment are available within a 2-hour time window, a load must travel by truck. If all drivers are working, the load may go by rail. In some cases, routes that were initiated using intermodal rail service are not subject to restrictions. One carrier's contract permits the use of rail only in unbalanced markets that have more inbound freight than outbound, and local union agreements may also restrict the use of intermodal service. The LTL officials we interviewed emphasized, however, that union contracts are not the only considerations when intermodal rail service is used; the availability of adequate rail service to meet customers' expectations is an equally important factor.

Intermodal Growth Potential From LTL Companies Is Limited

Although the structure of LTL companies creates good opportunities for using intermodal rail service, they have not approached the level of use realized by UPS. The companies we visited were using intermodal service for about 3 to 8 percent of their line-haul miles (trips between hubs). One company thought it might reach 10 percent, but generally speaking, no dramatic growth of intermodal use was expected. The constraints of union agreements and the competitive pressures for service improvement were generally viewed by LTL company officials as limiting their opportunities to expand intermodal use.

LTL companies usually pay for the fastest intermodal service, often on trains scheduled for UPS.¹ Although LTL companies may use railroads' trailers for one-way moves, the railroads are apparently able to reposition these trailers economically enough to profit from the business. The LTL business is thus viewed as a small but useful part of the intermodal traffic base.

Truckload Companies May Become Major Participants in the Intermodal Rail Business

J.B. Hunt Transport, one of the largest truckload companies, began transporting trailers by rail between Chicago and the West Coast in 1990 under a joint service agreement with the Santa Fe Railroad. J.B. Hunt has expanded its intermodal network rapidly: by April 1992, it had agreements with six railroads. Schneider National, another large truckload company, began to use double-stack service in 1991 between Chicago and Los Angeles on the Southern Pacific and between Chicago and Seattle on the Burlington Northern. Also in 1991, the May Trucking Company and the Southern Pacific began operating a dedicated intermodal service between Portland, Oregon, and Los Angeles. MNX, a truckload company, acquired a

¹It is perhaps worth noting that peak volume for LTL companies occurs in September and October, when stores are stocking for the Christmas season. For UPS, the largest volume occurs in November and December.

third-party intermodal-marketing company and is combining its trucking and intermodal operations. In 1992 KLLM Co. began putting its refrigerated vans on rail cars between California and Chicago.

Benefits to Truckload Companies

As truckload companies have been faced with increased costs for fuel, taxes, and driver training resulting from turnover, they have searched for ways to control costs and improve profitability. By putting trailers on railcars, some companies may be able to expand their market share without increasing their tractor and driver fleet. A J.B. Hunt official told us that the use of intermodal service has enabled the company to increase its ratio of trailers to tractors, thus increasing the leverage of its tractor fleet.

Unlike UPS and the LTL companies, truckload companies have had difficulty in retaining qualified drivers.² American Trucking Association officials told us that demographic and other factors have contributed to a shortage of drivers nationally. One factor is drivers' pay. Truckload companies are generally not unionized, and the drivers' average earnings are lower than those of LTL companies' drivers. Another important factor has been the truckload companies' practice of keeping drivers on the road 3 or 4 weeks at a time. Under this practice, drivers take loads to various destinations before getting one back to their homes. By using intermodal rail service for long hauls, truckload companies can keep drivers in a smaller geographical area and get them home more often. A J.B. Hunt official told us that the drivers involved in intermodal service have been averaging about 3 days on the road per trip and that turnover among them has virtually disappeared. The president of May Trucking Co. said that after initial apprehension, morale among his drivers improved because they were home regularly and could plan holiday activities.

Truckload companies can increase their flexibility in competing for market share by using intermodal rail service. Because of the need to limit empty miles, truckload companies do not always accept all loads going to unbalanced markets. Since railroads are able to bring trailers back more cheaply than a trucking company can, a truckload company using intermodal service, even with its own trailers, can accept more loads into such a market. With the lower costs of using intermodal service, the company can also offer low rates to compete for the limited return loads (back-hauls). One truckload company president said that by using

²A company official told us that the annual turnover rate may approach 100 percent, although most of it occurs among half of the driver fleet. The other half are longer-term employees.

intermodal service, he has been able to handle surges in volume and has become the sole-source carrier for several of his large customers.

Benefits to Railroads and Potential Intermodal Growth

For the railroads, the truckload companies can serve as a valuable marketing resource to supplement their traditional reliance on third-party agents and steamship companies. The truckload companies that prospered after trucking deregulation in 1980 are known for their strong marketing and customer service performance. When using intermodal rail service, they continue to handle customer contacts, billing, tracking of shipments, and claims.

The evidence suggests that truckload companies will acquire and manage the trailers and containers in which their intermodal freight moves, assuring their high utilization and relieving the railroads of a considerable administrative burden. J.B. Hunt has been putting its own trailers on the trains, as has May Trucking Co. Generally, they have not had problems with damage, although May did have to reinforce its 53-foot trailers to withstand lifting. Other truckload companies have indicated that they will probably begin using their own trailers or containers. J.B. Hunt's announcement in August 1992 of a major acquisition of containers and chassis is evidence that the new container designs with 110-inch interior height may attract major interest among truckload companies.

Some in the intermodal industry are concerned that truckload companies will only invade the intermodal market to handle freight that was already moving on the rails. But there is also much optimism that truckload companies will help improve the reputation of intermodal service and bring it more service-sensitive freight, a development that could increase not only volume but also the profitability of intermodal rail service. A J.B. Hunt official told us that the company has been very satisfied with the service it has had from the railroads and that its damage claims from intermodal service have been lower than from its highway service. The company's sales force has been trained to respond to customers' concerns about intermodal service and encourage them to try it.

While J.B. Hunt has been the leader among truckload companies in the use of intermodal rail service, interest among other truckload companies has increased as Hunt's intermodal volume grew from 6,000 trailers in 1990 to 41,000 in 1991, with over 100,000 projected in 1992. Many of Hunt's loads have come from midwestern and eastern states, and have been driven to Chicago for a rail haul to the West Coast. In April 1992 the company

announced an agreement with the Consolidated Rail Corporation (Conrail) to use intermodal service between New York and Chicago. This could open the door to more rail/trucking cooperation east of the Mississippi River.

Intermodal Service May Not Be a Viable Option for All Truckload Companies

Considering the economic advantages, the truckload companies using intermodal rail service should gain a competitive advantage which may encourage more companies to consider it. However, many truckload companies may continue to operate strictly a highway service. The truckload industry has an abundance of small companies that could have difficulty with integrating intermodal service into their operations. Companies need to be large enough to have an established network of drivers and equipment at both ends of an intermodal move. Railroads may also show a preference for dealing with major high-service truckload carriers, who have electronic data interchange capabilities and can generate traffic in both directions. The growth of intermodal rail service could thus increase the competitive pressures on small truckload companies and independent operators.

Some truckload companies will continue to position themselves in the highest-service end of the intercity freight market, such as just-in-time manufacturing with 15-minute delivery windows. For them, intermodal service may still be inadequate or too slow, especially in certain corridors. Although rail service has improved considerably, reliability can still be a problem. With its complexity and need to generate trainload volumes, it is doubtful that intermodal service will ever compete for the most time-sensitive freight.

Intermodal Corporate Alliances

To be effective, intermodal transportation requires coordination and cooperation between carriers of different modes, so it is not unusual that the option of formal relationships between companies would be considered. If a trend toward horizontal integration of carriers developed (e.g., rail companies acquiring trucking companies), it could have significant consequences for intermodal growth. To date, no clear trend has emerged.

Some cross-modal acquisitions have occurred. CSX acquired Sea-Land in 1986 and in 1988 established CSX Intermodal to market and operate nationwide intermodal services for both companies. However, Sea-Land continues to operate its ocean-shipping business separately, and CSX

Transportation operates the rest of CSX's rail business. As a nationwide company, CSX Intermodal also uses other rail carriers in providing its services.

Union Pacific acquired Overnite Transportation, an LTL company, but has allowed it to operate independently. Overnite uses intermodal rail service much as other LTL companies do, and it is not limited to using the Union Pacific Railroad. Norfolk Southern acquired North American Van Lines in 1985, but only in 1992 did North American begin to actively use intermodal service. Some divestitures have also occurred: Burlington Northern sold its truckload carrier, Burlington Motor Carriers, and Conrail sold Pennsylvania Truck Lines.

Conrail has created an intermodal trucking subsidiary, Conrail Mercury, to demonstrate the potential of closely managing an intermodal business. (See app. II.) Steamship companies have also created subsidiaries or divisions to manage their landside transportation, including the organization of dedicated trains. Examples are APL Land Transport and K-Line's Railbridge Corp.

Corporate alliances between trucking companies and railroads may be a more significant trend. Truckload companies have shown a preference for working with single rail carriers in specific markets. J.B. Hunt and Santa Fe actually formed a joint venture in 1989, initially called Quantum, in which they have used formulas to share revenues. J.B. Hunt agreed not to provide business to other rail carriers in areas served by Santa Fe, and Santa Fe agreed not to solicit business from other truckload carriers. However, these agreements were relaxed somewhat in 1992 as opportunities expanded for both partners.

Other alliances have been based on long-term contracts. Schneider National committed its Chicago-Los Angeles intermodal business to Southern Pacific for 10 years. In return, Southern Pacific offered an attractive double-stack schedule and acquired containers and chassis. Southern Pacific also added new train service for May Trucking Co. between Los Angeles and Portland, and agreed to service guarantees. In return, May guaranteed two-thirds of the train's volume. May has actually provided close to 90 percent of the loads, partly by marketing the service to other truckload companies.

Arrangements such as these have enabled the rail carriers to make investments in equipment and new service, and provided the truckload

Chapter 3
Trucking Companies' Use of Intermodal Rail
Service Is Selective but Growing

companies a level of comfort needed to market the service. Some agreements have carried understandings that the rail carriers would not solicit business from other truckload companies, and have been perceived as exclusive partnerships. However, with interest in intermodal service growing, the nature of rail-trucking alliances is likely to continue evolving.

Intermodal Growth Has Been Uneven and Has Aggravated Some Highway Congestion Problems

The effect of intermodal rail transportation on the nation's highway system has been uneven. It has had its greatest success on long east-west lines, especially between Chicago and the West Coast. Its role east of the Mississippi River, where 61 percent of the U.S. population lives, has been much smaller because of the more fragmented, shorter-haul markets. Moreover, the effect of intermodal growth has not been entirely positive for the public. The linkages between ships, railroads, and trucks have added a strain to the infrastructures of cities that serve as major intermodal hubs. In some areas, such as Los Angeles, Chicago, and New York, intermodal activity has contributed to urban traffic congestion and pollution.

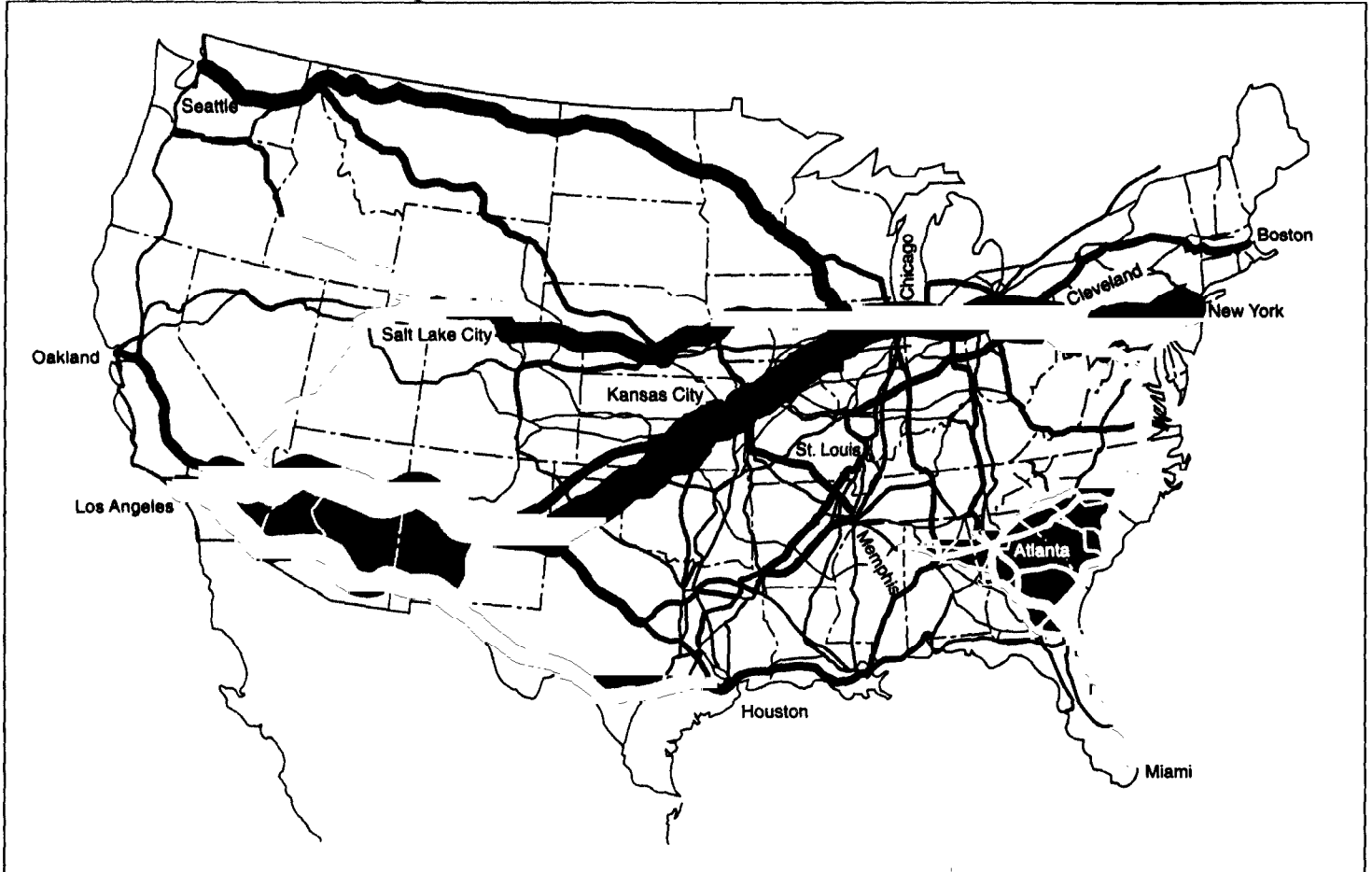
Intermodal Rail Service Has Had Limited Success East of the Mississippi River

Despite its gains, intermodal rail service has had difficulty in the shorter-haul markets of the eastern United States. The rail hauls are often too short to compensate for the cost and time of getting loads to and from rail terminals, and loading and unloading trains. Several efforts are underway to improve intermodal service in the East, but their ultimate impact is not yet clear.

According to a study published by DOT in 1990, intermodal rail traffic in 1987 was heaviest on the New York-Chicago-Kansas City-Los Angeles lines, with heavy flows also occurring on the Chicago-Salt Lake City, Chicago-Seattle, and Los Angeles-Houston lines. Excluding the Chicago-New York corridor, traffic on lines east of the Mississippi River was generally light, with some modest volume between Boston and Chicago and between Jacksonville, Florida, and Miami. (See fig. 4.1.) Our discussions with industry officials indicated that most of the growth in recent years has occurred on the major long-haul lines, especially Chicago-Los Angeles, although the Detroit-Chicago-Texas-Mexico lines have assumed more importance. The Association of American Railroads estimated recently that much of the intermodal growth from 1986 to 1990 was on the major double-stack lines shown in fig. 4.1, and that the limited growth in other areas came mostly at the expense of boxcar traffic.

**Chapter 4
Intermodal Growth Has Been Uneven and
Has Aggravated Some Highway Congestion
Problems**

Figure 4.1: Railroad Mainlines Showing Intermodal Volume in 1987



Note: Line thickness corresponds to intermodal volume.

Source: Double Stack Container Systems: Implications for U.S. Railroads and Ports (Washington: U.S. Dept. of Transportation, 1990).

The fundamental problem for intermodal service in the eastern United States is the length of haul. Many observers believe that because of terminal and drayage costs, intermodal service is competitive only if the rail haul is at least 700 miles. For example, in a typical TOFC scenario, drayage could cost \$100 and terminal handling \$40 at each end, a total of \$280 per trailer. The railroad may need 70 cents per trailer per mile to make money on the rail haul, thus \$490 for 700 miles. This adds up to \$770,

but the customer may also have to pay a shipper agent's fee plus a trailer rental charge. A truckload company might move the load for \$1.15 per mile, or about \$800. (Depending on the location of the pickup and destination points, the highway trip might be more or less than 700 miles.) When intermodal terminal time is added to the rail haul, the intermodal delivery might be later than the truckload company's delivery.

To understand the implications of the length-of-haul problem, one need only look at the geography of the eastern United States. (See fig. 4.1.) The East and Midwest have many industrial cities and significant metropolitan markets, but few have a 700-mile rail haul between them. Chicago to Atlanta is just over 700 highway miles, while Chicago to New York City is about 800. But Chicago is only about 350 miles from Cleveland, 540 from Buffalo, and 475 from Pittsburgh.

There are also many cities of moderate size east of the Mississippi River, such as Indianapolis, Indiana; Cincinnati, Ohio; Louisville, Kentucky; Memphis, Tennessee; Charlotte, North Carolina; and Birmingham, Alabama. Metropolitan areas like these can generate a certain amount of intermodal traffic, but their capacity to provide adequate volumes for regular train service may be limited to one or two destinations.

Although intermodal rail service has had its greatest difficulty in competing with highway alternatives in the eastern United States, several efforts are underway to overcome the obstacles to serving these shorter-haul markets. (App. II provides a summary of these efforts.)

Intermodal Success Has Aggravated Traffic Problems for Some Areas

Despite the railroad mergers and line abandonments that have taken place, the United States still has a somewhat fragmented rail network. Eastern and western railroads must link up at gateway cities: New Orleans; Memphis; St. Louis; Kansas City; and most of all, Chicago. For intermodal rail service, these linkages have been one more obstacle in competing with the simpler highway option. Their complexity has contributed to the practice whereby drivers carry loads to the gateway cities to take advantage of the rail hauls to the West Coast. Moreover, intermodal rail terminals have often been located on former switching yards close to city centers, while much of the freight loaded in trailers or containers comes from suburban locations or the surrounding regions. As intermodal service has grown, these factors have aggravated truck congestion problems in some areas, especially Chicago and Los Angeles.

Interchange Drayage and
Load-Centering in Chicago

Chicago is the railroad capital of the United States, so it is hardly surprising that intermodal service has had its greatest impact there. Using data from the railroads, we calculated that nearly half of all intermodal rail shipments either originate, terminate, or connect in Chicago. All major railroads serve the city, each at its own location. Interchanging traffic between them has been a laborious process, often requiring the use of local switching railroads that sort cars between the different rail terminals. The system proved too time-consuming for intermodal traffic, so the railroads adopted the practice of unloading trailers from incoming trains and driving them to each other's terminals over city streets and highways.¹ This crosstown drayage has probably declined somewhat as double-stack service has displaced some of the TOFC traffic, but we estimated from available data that it still generates about 220,000 trips annually.

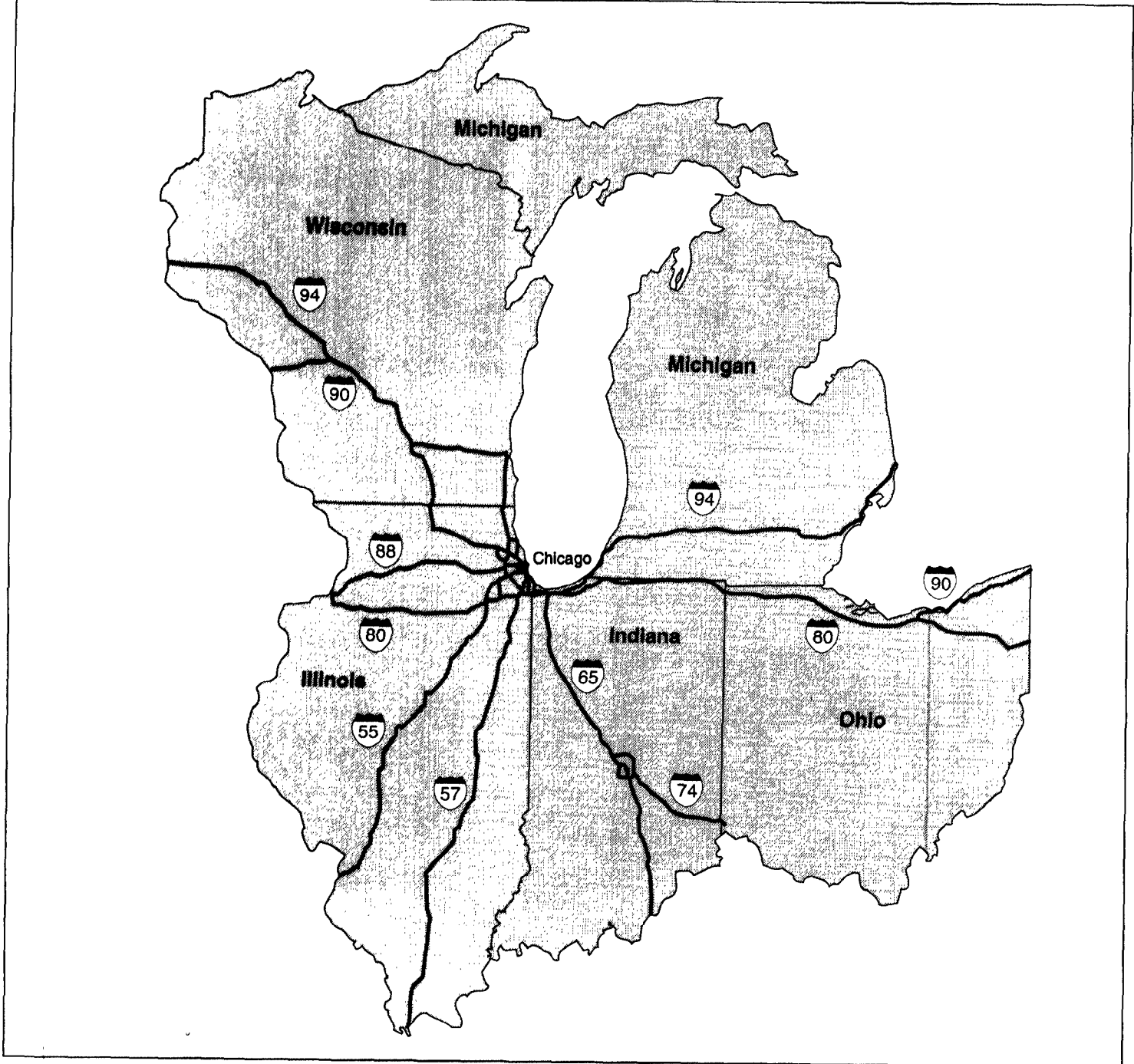
A more serious problem of truck congestion comes from the intermodal load-centering occurring in Chicago. With the growing success of the Chicago-to-West Coast rail hauls, trailers and containers are being drayed in and out of Chicago from increasingly longer distances. Using data from rail carriers on intermodal terminal volumes, we estimated that over 2 million trailers and containers began or ended rail trips in Chicago in 1991. Many of these loads were brought to Chicago from Indiana, Ohio, Michigan, Pennsylvania, and the East Coast. They contributed to heavy truck traffic on the highways leading to Chicago and, because of the historic location of Chicago's rail terminals, were commingled with Chicago commuter traffic deep into the city. (See figs. 4.2 and 4.3.) As truckload companies become more involved with intermodal service, they are likely to expand the radius of drayage around Chicago, and the load-centering is likely to increase.²

¹In the early 1980s, the Federal Railroad Administration sponsored a feasibility study for a truck-only roadway that would link up the railyards.

²Trucking companies tend to locate their terminals on the fringe of metropolitan areas and to enter the central city only when necessary to pick up or deliver a load. But to use intermodal service, they must often drive into the city to a rail terminal.

Chapter 4
Intermodal Growth Has Been Uneven and
Has Aggravated Some Highway Congestion
Problems

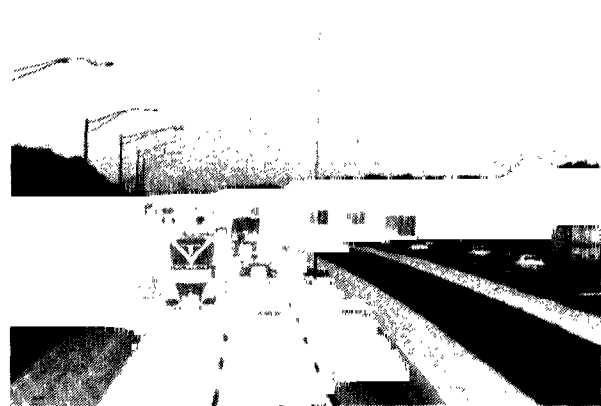
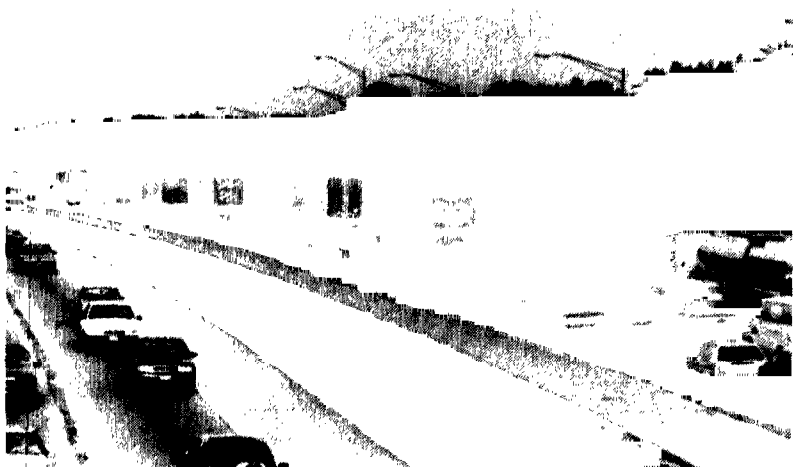
Figure 4.2: Interstate Highways Affected by Intermodal Load-Centering in Chicago



Source: Federal Highway Administration.

**Chapter 4
Intermodal Growth Has Been Uneven and
Has Aggravated Some Highway Congestion
Problems**

Figure 4.3: Truck Traffic on Chicago Area Interstate Highways



**Chapter 4
Intermodal Growth Has Been Uneven and
Has Aggravated Some Highway Congestion
Problems**

In total, we estimated that intermodal activity generated at least 3 million trips in 1991 (over 8,000 per day) on Chicago area highways. This included over 2 million loads originating or terminating in the Chicago area or surrounding states, over 200,000 drays between rail terminals, and an unknown but substantial number of trips to and from depots where empty trailers and containers awaiting loads are stored. We estimated that intermodal trips account for almost 5 percent of heavy truck traffic in the Chicago area.

In our view, there is no easy answer to the problem of intermodal rail service's impact on the Chicago area. The metropolitan area is itself a huge center of consumption and distribution, as well as a hub from which a large consuming and producing region is served. Because four railroads run intermodal rail hauls to the West Coast, Chicago is a powerful magnet as an originating point for westbound domestic freight. It is also a logical center from which to distribute international containers arriving on double-stack trains.

Midwestern highways would get some relief if shipments to and from the West Coast could begin or end their rail journeys at locations east of Chicago. There are some current examples of such connections. The Chicago-New York rail corridor carries substantial connecting traffic between the Northeast and the West Coast, and rail traffic also originates at ports like Baltimore and Norfolk. The Grand Trunk Western has operated a successful intermodal rail connection through Chicago to Detroit with several western railroads. Japanese auto companies use double-stack train service from the West Coast to their assembly plants in Ohio and Kentucky.

It might be possible to increase intermodal rail service from eastern locations if the connections to western railroads were less costly and time-consuming. Intermodal participants need to study alternative ways of accomplishing this, in consultation with state and regional planning officials. One answer might be a multiuser intermodal terminal inside or outside the city of Chicago where containers and trailers on arriving trains could be sorted by destination and interchanged directly to connecting railroads. This could eliminate crosstown drayage within the city, and also encourage the use of intermodal rail service east of Chicago because the connections would work better. Such a solution, however, might need a

contribution of federal funds along with private investment.³ As explained in chapter 5, DOT has yet to determine whether the federal trust funds authorized by ISTEA can be used for intermodal freight facilities.

Los Angeles: Intermodal Drayage From the Port

Intermodal activity in Los Angeles, including the linkage of the ports to rail terminals, contributes significantly to traffic congestion. Blessed with a large, virtually silt-free natural harbor, the adjacent ports of Los Angeles and Long Beach handle more containers than any other port in the United States. Out of approximately 2.2 million containers handled there in 1991, about 1 million left or returned by rail. Most of the containers traveling by rail are transferred between the ports and rail terminals by truck. One of the railroads operates out of a terminal 4 miles from the port, a terminal that was developed as a joint project with the two port authorities. The other two rail terminals are near downtown Los Angeles, about 22 and 25 miles from the ports. An estimated 500,000 containers a year are going to and from those terminals over two heavily traveled freeways.

The port authorities have proposed a project involving a consolidated rail corridor to the ports, where double-stack trains can be loaded in or near marine terminals. Major intersecting streets would pass over the rail corridor, thus expediting both vehicle and rail traffic flows. If successfully coordinated, the proposed corridor would allow the railroads to move their international traffic to and from the ports by rail after discharging their domestic intermodal traffic closer to major distribution facilities east of Los Angeles. The project has been under consideration for some time. At the time of our visit, the ports were still trying to secure agreement between the affected parties and achieve a workable financial plan.⁴

The problems of rail and truck access to ports are not limited to Los Angeles, but they have perhaps their greatest impact there because of the scale of operations and the amount of vehicle traffic in Southern California. A number of other ports have implemented on-or near-dock loading of double-stack trains, with benefits both in cost savings and less traffic congestion. The ideal situation would be one in which intermodal volumes are large enough to permit domestic loads to be separated from

³UPS has actually begun construction of a less ambitious facility in Willow Springs, Ill. In conjunction with a planned major sorting facility, UPS is building an intermodal terminal adjacent to the Santa Fe mainline. The company hopes that several railroads will use it for their UPS traffic. This would eliminate drayage from one terminal to another, and it would also reduce the number of trips that UPS trucks have to make into the city.

⁴Total cost was estimated in 1992 at \$1.6 billion to \$2.2 billion, but this also included reconstruction of an arterial highway for truck traffic along part of the rail corridor.

Chapter 4
Intermodal Growth Has Been Uneven and
Has Aggravated Some Highway Congestion
Problems

international loads and handled at a remote facility away from the urban congestion. In the New York metropolitan area, another type of problem is created by the location of intermodal terminals on the New Jersey side of the Hudson River. This results in much truck traffic on the bridges between the city and the terminals.

Primary Reliance on Market Forces Does Not Rule Out a Role for the Federal Government

In its 1991 enactment of ISTEA, the Congress indicated its interest in encouraging intermodal approaches to transportation problems. Most representatives of the intermodal industry told us that they preferred to let market forces largely determine the course of intermodal development. Many, however, did suggest activities that could be undertaken by the new Office of Intermodalism. A related question to be resolved is whether intermodal freight facilities, which could help alleviate congestion, pollution, and highway deterioration, are eligible for federal funding under ISTEA.

Industry Representatives Prefer to Rely on Market Forces

Many participants in the intermodal industry told us they would prefer to see market forces determine the course of intermodal development rather than government incentives or regulations. They believed that deregulation was a stimulant to intermodal growth and improved service. We have reported on the effects of deregulation in the rail industry, concluding that it permitted railroads to improve their competitiveness and financial condition, and to provide improved service and lower average freight rates to shippers.¹ Intermodal shipments were among the first to be deregulated by the Interstate Commerce Commission under the Staggers Rail Act of 1980. Many observers believe that the freedom to negotiate rates and service contracts with customers was an important factor contributing to intermodal growth in the 1980s.

Many Believe the Office of Intermodalism Could Play a Useful Role

Notwithstanding their preference for market forces, many industry participants made suggestions for an active role for the Office of Intermodalism which was authorized by ISTEA. Several expressed a desire to see the new office assume a role of facilitator to assist in resolving specific intermodal problems. For example, although the burden caused by intermodal traffic in the Chicago area is recognized, company officials told us that agreement on a comprehensive solution would be difficult and that the cost may be beyond the means of the individual companies. A neutral facilitator who could bring the parties together, articulate the public interest, and encourage agreement might be able to bring about a mutually beneficial solution, especially if some federal funding participation were possible.

We also heard the view that intermodal transportation was poorly understood in government. One concern was that intermodalism may be

¹Railroad Regulation: Economic and Financial Impacts of the Staggers Rail Act of 1980 (GAO/RCED-90-80, May 16, 1990).

viewed as involving only the linkage of modes for passenger transportation, leaving the intermodal freight industry largely overlooked. Several industry participants suggested that the new Office could be a source of education for public officials and legislators involved in transportation.

ISTEA authorized funding for state intermodal planning grants, and DOT officials told us that the Office of Intermodalism would serve a coordinating role in DOT's review of state proposals for these grants. The Office will also work with the Bureau of Transportation Statistics, established by ISTEA, to compile useful intermodal data. DOT officials said that the Office would review state transportation plans and would coordinate intermodal planning between the agencies within DOT. They also said that the Office would try to identify regulatory impediments to effective intermodal transportation.

In announcing the appointment of a director for the Office in July 1992, the Secretary indicated that the person would have the rank of Associate Deputy Secretary. This would seem to give the Office a reasonably substantial base from which to operate. DOT officials told us in October 1992 that the Office was dependent on staff detailed from other DOT agencies, but that the Office would be funded at \$750,000 for fiscal year 1993. The Office will need adequate resources if it is to play an active role outside of DOT in addition to its coordinating and advocacy role within the Department.

DOT Determination Needed on Funding Eligibility of Intermodal Projects

ISTEA, which reauthorized the use of federal highway trust funds, permitted states greater flexibility in using their allocations and also emphasized the need for intermodal planning in solving transportation problems. However, nothing in the act specifically authorized the use of trust funds for intermodal rail freight facilities. ISTEA does specify that the new National Highway System shall include access routes to connect it with intermodal facilities.

DOT officials told us that while ISTEA funds could be used for intermodal planning and access roads to intermodal facilities, there were differing opinions in the Department on whether funds could be used for intermodal freight facilities. In one case, however, a FHWA District Engineer has approved the use of ISTEA funds to relocate rail lines at a port. The rail lines were causing congestion on a port access road, and relocating them was less costly than putting the highway over the rail

lines. Also, the section of the act on congestion mitigation and air quality improvement authorizes funds for transportation projects that are expected to contribute to meeting air quality standards. An intermodal freight facility that helped reduce pollution from trucks on urban highways might qualify under this section. In October 1992 the Office of Intermodalism convened an interagency working group to address the question of ISTEA funding eligibility for intermodal freight projects.

The ISTEA trust funds are generated by taxes on motor vehicle fuel, so their use has been normally related to accommodating and managing traffic on the highways. An intermodal freight project such as a multiuser terminal (open to multiple rail and trucking companies) or rail access to a port might reduce truck traffic in an urban area, improve highway safety, reduce highway damage, and help the area meet its air quality goals. To the extent that such a project made intermodal freight operations more efficient, cooperation between rail, truck, and maritime companies should increase. The public would benefit from a more effective use of the total transportation infrastructure rather than depending increasingly on the highways to carry freight.

Another concern about the use of ISTEA funds for intermodal projects, voiced by an official of the American Association of State Highway and Transportation Officials, is the traditional inclination of state agencies to use federal highway trust funds for highway projects only. ISTEA does, however, require states to include intermodal facilities and systems in their transportation planning. ISTEA emphasizes the role of metropolitan planning organizations in approving the use of federal funds. DOT officials pointed out that these organizations have in the past been largely preoccupied with commuter issues. This was true of the planning organizations we visited; they had only recently made freight transportation a part of their planning concerns. DOT is encouraging metropolitan planning organizations to incorporate freight transportation in their planning efforts.

Conclusions

After more than two decades of sporadic progress, intermodal rail service established itself in the 1980s as a viable component of the nation's freight transportation system. The greatest success has been realized for transcontinental shipments and for service between Chicago and the West Coast. It is reasonable to expect that intermodal growth will result in a modest slowing of highway deterioration, a more cost-effective movement of goods, and improved fuel-efficiency. A reduction in transcontinental

driving should benefit highway safety by improving drivers' morale and lessening fatigue.

The recently growing cooperation between railroads and truckload companies could open the door to a significantly greater use of intermodal combinations with broader benefits. But it remains to be seen whether intermodal rail service can relieve freight traffic on the heavily traveled highways east of the Mississippi River. Although efforts are being made to better serve this shorter-haul, more fragmented market, they have so far had only minor impact.

Intermodal progress in the 1980s occurred in a deregulated environment that stimulated competition in the transportation industry. In that environment, railroads had both an incentive to improve their service and an opportunity to regain their market share in the general freight business. Pushed by aggressive truckload companies, railroads have become more sensitive to the needs of customers. In our view, it would be unwise to introduce government incentives or regulatory measures that would lessen the competitive influences that have led to improved intermodal service.

This does not mean that there is no role for the federal government in encouraging intermodal freight activities. Some problems, such as those affecting Chicago, Los Angeles, and New York, may be beyond the capacity of industry participants to resolve. Their efforts to cope individually with situations can have adverse effects on the public. DOT's new Office of Intermodalism could play a useful role by bringing private and public parties together, articulating the public interest, and facilitating agreement on a comprehensive solution. If a multiuser intermodal facility were needed, the potential availability of federal funding to supplement private investment might be the catalyst that could bring about agreement. However, DOT needs to determine whether ISTEA authorized the use of trust funds for projects such as intermodal freight facilities.

Recommendations

We recommend that the Secretary of Transportation ensure that the new Office of Intermodalism has the resources and direction to assume an active role outside DOT in addition to its coordinating role within the Department. The Office should interact with industry, state, regional, and local officials to identify intermodal problems and help achieve solutions. It should facilitate communication and encourage agreement between the various parties, help identify funding sources, and ensure that the larger public interest is also taken into account.

Chapter 5
Primary Reliance on Market Forces Does
Not Rule Out a Role for the Federal
Government

We also recommend that the Secretary determine whether intermodal freight facilities are eligible for federal funding under ISTEA, provided that they would relieve highway congestion and deterioration, and help improve safety and air quality. If DOT decides it cannot resolve the uncertainty over funding eligibility, the Secretary should notify the Congress, in a timely manner, that a clarification of ISTEA may be necessary to resolve the funding issue.

Agency Comments

DOT officials, including the Deputy Director of the Office of Intermodalism, responsible for intermodal policy reviewed a draft of this report and made suggestions for clarification. They agreed with the report's content and said it would be very helpful in their efforts to increase awareness of intermodal issues. They agreed that the Office of Intermodalism should play an active role in helping industry and public officials identify and solve intermodal problems. They also said the Office of Intermodalism is convening an interagency working group to address the issue of ISTEA funding eligibility for intermodal freight projects.

Organizations Contacted for This Report

Trade Organizations	American Association of Port Authorities American Association of State Highway and Transportation Officials American Trucking Associations Association of American Railroads Intermodal Association of North America
Department of Transportation	Federal Highway Administration Federal Maritime Administration Federal Railroad Administration Office of Intermodalism
Rail Carriers	Burlington Northern Chicago and Northwestern Conrail CSX Intermodal Norfolk Southern Santa Fe Southern Pacific Union Pacific
Truckload Companies	Contract Freighters, Inc. J.B. Hunt May Trucking Company MNX Schneider National
Less-Than-Truckload Companies	Consolidated Freightways Overnite Transportation Company Roadway Express Yellow Freight System
Package Trucking Company	United Parcel Service
Ports	Baltimore, Md. Norfolk, Va. Los Angeles/Long Beach, Calif.

**Appendix I
Organizations Contacted for This Report**

Oakland, Calif.
Seattle, Wash.
Tacoma, Wash.

**Transportation Planning
Agencies**

Chicago Area Transportation Study
Los Angeles County Transportation Commission
Southern California Association of Governments

Other Organizations

Alex Brown and Company—investment bankers with expertise in the trucking industry
American President Lines—steamship company that also owns railcars and markets domestic intermodal service
Conrail Mercury—intermodal subsidiary of Conrail
Conway Intermodal—intermodal marketing company
Greenbriar Intermodal—a manufacturer of intermodal railcars
HUB Group, Inc.—the largest intermodal shipping agent
TTX Company (Trailer Train)—a leasing company that supplies 82 percent of the nation's intermodal railcars.
Triple Crown—RoadRailer division of Norfolk Southern

Some Efforts to Increase Intermodal Rail Service in Shorter-Haul Eastern Markets

Norfolk Southern's Roadrailer Division

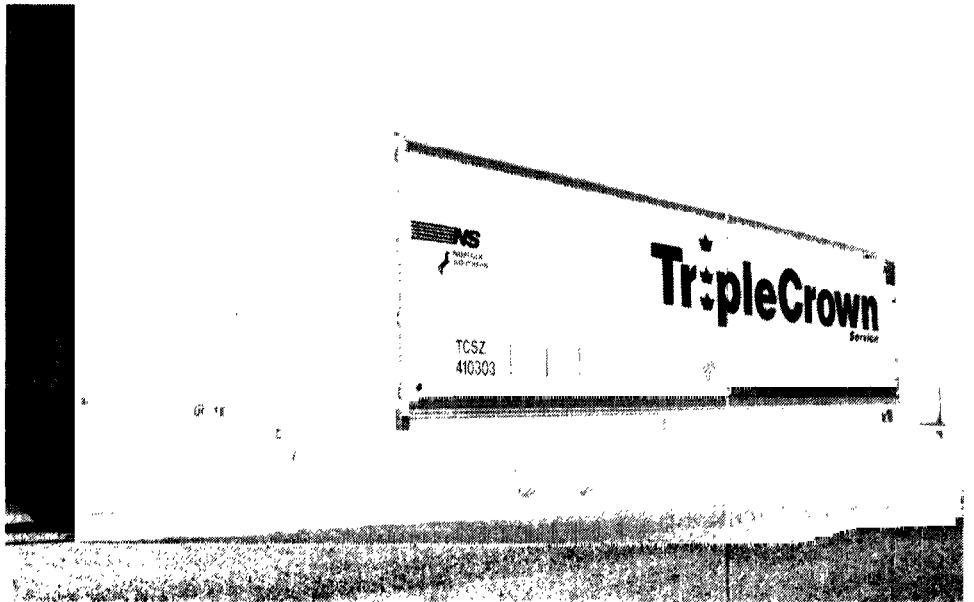
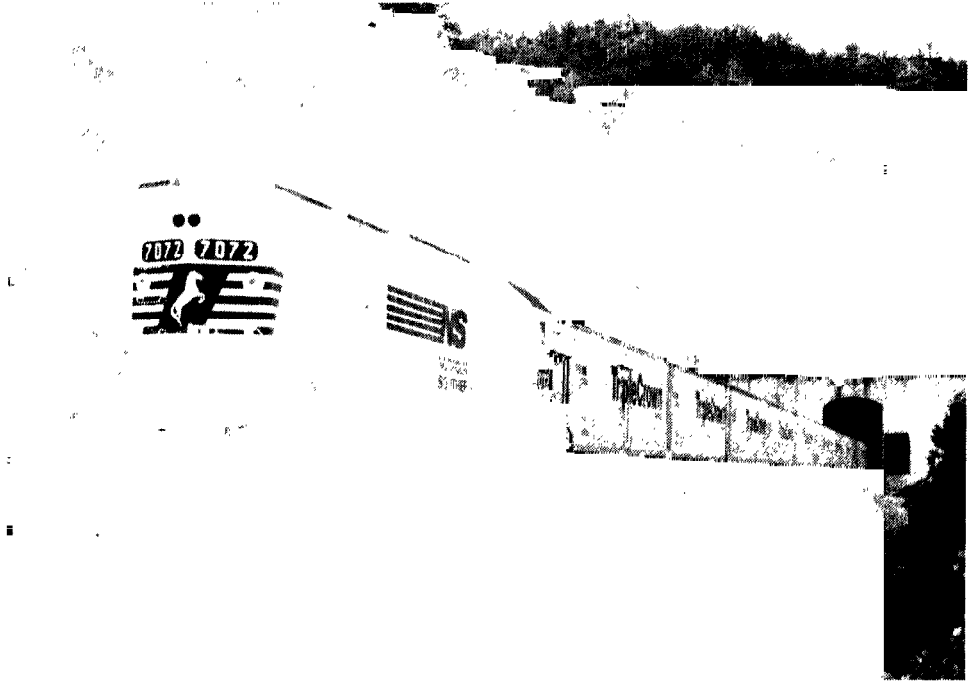
RoadRailer is the trade name¹ of a structurally reinforced trailer that can operate on both rails and highways. The earlier Mark IV version carries its rail wheels (retracted) when in highway service, while the Mark V uses detachable rail wheels (bogies) that are stored at rail terminals. (See fig. II.1.) Several railroads experimented with RoadRailers during the 1980s, but only the Norfolk Southern has made a sustained effort to offer the service. Its Triple Crown Division operates RoadRailer trains over a network intersecting in Ft. Wayne, Indiana, and extending to St. Louis and Kansas City, Missouri; Chicago, Illinois; Detroit, Michigan; Toronto, Ontario; Bellevue, Ohio; Buffalo, New York; Atlanta, Georgia; and Jacksonville, Florida. In 1992 Triple Crown was negotiating with the Consolidated Rail Corporation (Conrail) to establish triangular service linking Chicago with Harrisburg, Pennsylvania, and Newark, New Jersey, in the east and Atlanta and Jacksonville in the south.

The Mark IV RoadRailer has had operational problems involving its rail suspension system, as well as a tendency to derail when operating over jointed rails. But transition to the Mark V and the completion of welded rail lines has largely resolved these problems. Triple Crown has grown impressively, from 25,000 loads in 1987 to 112,000 in 1991. Its trains are operated by two-man road crews, who also handle the minimal switching required at terminals. Its average rail haul is 732 miles, but the division's president believes the service is competitive even at 400 miles.

¹The RoadRailer name and technology are now owned by trailer manufacturer Wabash National Corp. of LaFayette, Indiana.

**Appendix II
Some Efforts to Increase Intermodal Rail
Service in Shorter-Haul Eastern Markets**

**Figure II.1: Roadrailer Train and Rail
Wheels Positioned to Accept Trailer**



Source: Triple Crown Division of Norfolk Southern Railroad.

Among Triple Crown's advantages are simplified terminal operations. No lift equipment is needed, keeping capital costs low, nor is extra space needed for switching and loading railcars. Trailers can be accepted and added to trains up to 30 minutes before departure, compared with 2-hour cutoff times common to other intermodal operations. The train is lighter than a regular intermodal train, thus usually requiring only a single locomotive. The smooth ride from an absence of slack minimizes damage claims, and the light weight helps the trains keep their schedules. Among the drawbacks for RoadRailers have been their higher price and heavier weight than highway trailers.² They have also not yet been added to regular intermodal trains, which limits their flexibility from a customer's point of view.³ However, the growth of Norfolk Southern's RoadRailer service and its willingness to expand suggest that RoadRailers may be a viable form of intermodal service for the eastern United States.

Double-Stack Service in Smaller Markets

The RoadRailer approach to making shorter hauls viable is to minimize terminal time and costs; the double-stack approach is to minimize rail haul costs. In the long transcontinental lines, the cost savings of double-stack hauls easily offset the cost and time of assembling big trains at either end. As the rail haul shortens, the cost advantage of the double-stack approach shrinks, and the time that can be committed to loading and unloading diminishes. Opinions differ on whether double-stack technology can be adapted to the service-sensitive, shorter-haul markets of the eastern United States.

One obstacle to double-stack use in eastern markets has been the prevalence of double-stack cars built as five-packs, with space for 10 containers. On the long-haul routes, these are efficient and provide the smooth ride of articulated cars. But they limit flexibility in lower-volume markets in which containers do not often travel between two cities in lots of 10. To address this dilemma, manufacturers have begun marketing stand-alone double-stack cars. To compensate for the loss of articulation, the couplings are made with very little cushioning, meaning that switching must be done carefully. An advantage of these cars is that trains can be organized for smaller, more fragmented markets without moving a lot of excess capacity. One manufacturer told us he believes that railroads can

²Wabash National Corp. has unveiled a Mark VI version which it hopes to market to trucking companies. The version is designed to be comparable in weight, door opening, and interior capacity to a 53-foot highway trailer. Wabash believes it can operate in trains of 100-125 units if the Federal Railroad Administration lifts its current restriction of 75 RoadRailers per train.

³AMTRAK has recently been considering the acquisition of RoadRailers to carry mail behind passenger trains.

achieve double-stack economies with smaller trains, keeping terminal times down to acceptable levels. A disadvantage of these cars is that they are more expensive and heavier, relative to their payload.

At least one railroad has been acquiring the stand-alone cars along with domestic containers to determine whether a double-stack network can succeed in the East. Norfolk Southern began a double-stack service in 1992 between Kansas City and Jacksonville, with stops in St. Louis and Memphis. If successful, its longer-range plan envisages a potential network anchored by Norfolk, Jacksonville, New Orleans, Kansas City, Chicago, and Buffalo, with service to various intermediate points. The company will try to sell hauls as short as 500 miles.

CSX'S Iron Highway

In another attempt to deal with the short-haul eastern markets, CSX and New York Air Brake Corp. are developing a flexible, low-capital, approach called the Iron Highway. It would consist of flatcars in short unit trains powered by locomotives at both ends. In the center of the train would be a long platform with a plate that would flip over to form a ramp. Trailers would be driven onto the train using this center ramp. A small parking area along a rail siding would be all that would be needed as a terminal. The trains would run frequently, fast, and with low operating costs. They could be used to serve markets that were relatively close to each other, or as feeder lines into intermodal hubs.

Conrail Mercury: an Attempt to Better Manage Trailer Utilization and Drayage

Intermodal growth in the East might also come through closer management of equipment and drayage. Low rates of trailer utilization may have contributed to low profitability in traditional trailer on flatcar (TOFC) operations. Intermodal trailers have been owned by railroads and leasing companies, and have earned per diem charges when in use. Until recently, there was an apparent surplus of intermodal trailers relative to the available business, perhaps aggravated by competition from backhauls in international containers. To encourage draymen and third-party agents to find loads, railroads have been generous in allowing free time with trailers. As a result, railroads have often averaged as few as one revenue load per trailer every 18 days.

In trying to find a solution to the trailer utilization problem, Conrail formed a subsidiary, Conrail Mercury, to operate as an intermodal trucking company. Conrail Mercury owns its trailers and schedules them very closely using computer software designed for truckload companies. It sets high

**Appendix II
Some Efforts to Increase Intermodal Rail
Service in Shorter-Haul Eastern Markets**

standards for its draymen, and often hires them by the day in order to maximize their productivity. Using Conrail's trains between the Midwest and Northeast, Conrail Mercury has been averaging a revenue load every 6 trailer-days, comparable to a truckload company. Its average rail linehaul is about 650 miles, and the company has grown rapidly by offering truckload-style service at slightly lower prices.

Drayage has traditionally been dominated by small companies working under agreements with railroads and third-party shippers' agents. The drayage business has had a reputation for having poorly maintained tractors and less-reliable drivers. In 1990 and 1991 surveys, commercial transportation managers and plant managers rated intermodal pickup and delivery lower than that from truckload companies. The two categories showing the greatest gaps were the appearance of the tractor and the driver's knowledge of the shipment's needs and requirements. For the intermodal industry, the quality of drayage is important because it is the point of direct contact with customers. A dilemma is that drayage costs must also be kept low if intermodal service is going to compete with the highway alternative.

The drayage situation appears to be improving. Railroads and intermodal companies are setting higher standards and reducing the number of draymen they are working with. There are ongoing relationships in which the draymen are familiar with customers and do a good job of representing the carriers. There are also situations in which intermodal companies are doing their own drayage to control costs and quality.

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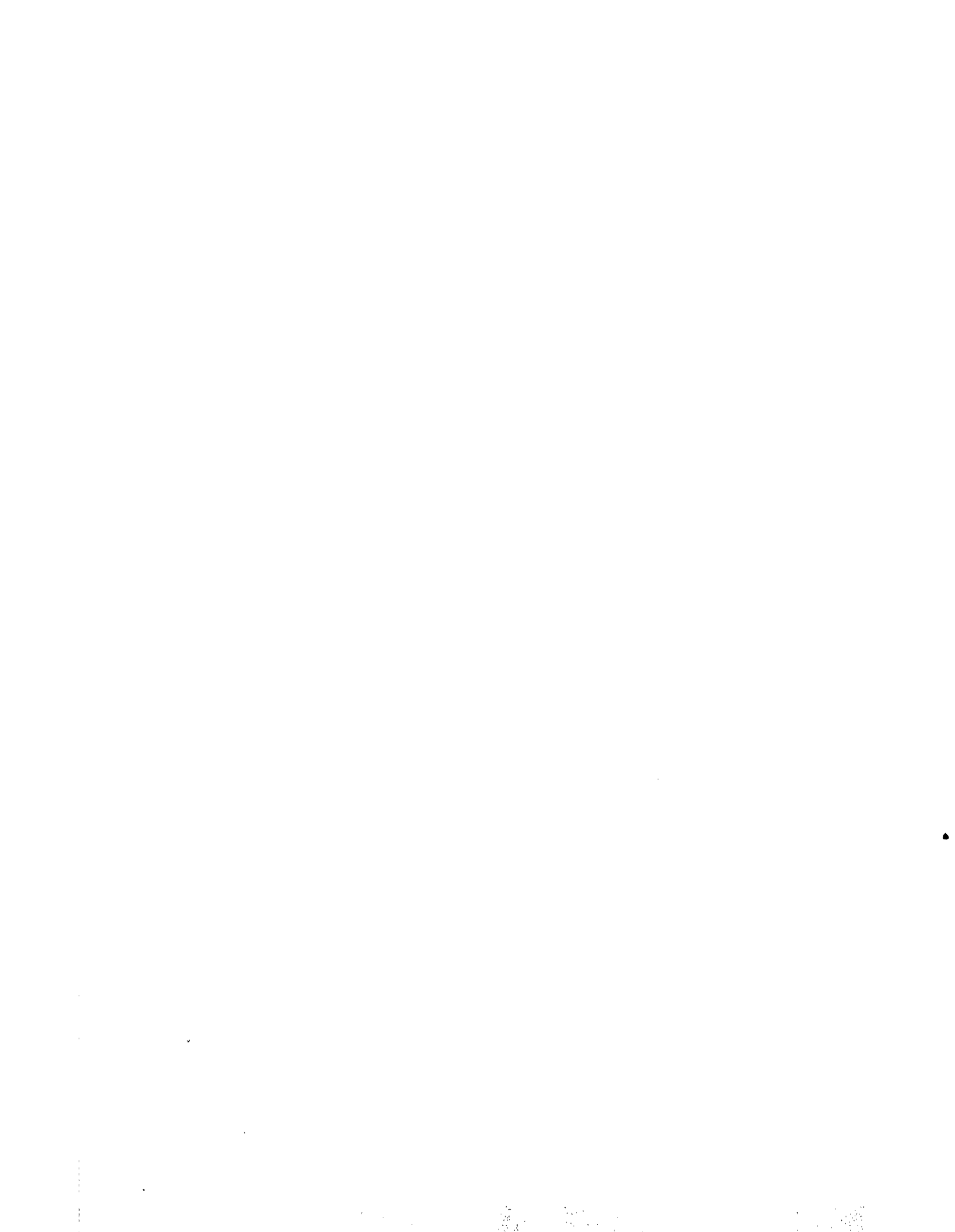
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