

# Regulation

## From Economic Deregulation to Safety Regulation<sup>1</sup>

### ■ Executive Summary

This paper traces the shift in the focus of federal government regulation of freight transportation from economic deregulation to safety regulation; discusses the implications of this trend; and identifies issues to be considered in discussing options for a national freight productivity program.

### Economic Regulation

The federal government began to regulate the railroad industry in 1887 with the enactment of the Interstate Commerce Act. The federal action was a response to concerns that unfettered competition was bankrupting some railroads while unregulated pricing was permitting others to charge monopoly prices. In the early 1900s, Congress gave the Interstate Commerce Commission broad powers to control entry and exit in the industry, oversee services, assign routes, and set shipping rates. In the 1930s, Congress established similar regulatory regimes for the emerging motor carrier and air carrier industries.

Economic regulation stabilized the freight transportation industry, but at the cost of dampening competition and sapping long-term profitability. By the 1970s, bankruptcies in the rail industry; high prices in the motor carrier, airline, and ocean carrier industries; and inefficient services across all modes plagued the industry. One hundred years after the Interstate Commerce Act, the federal government reversed its policies and began deregulating to revitalize the industry and improve productivity.

Economic deregulation was a success. Today, the freight transportation industry is viable, competitive, and profitable. Productivity has increased, and the industry is reorganizing to compete in North American and global markets. But the trends suggest that the gains in productivity achieved through economic deregulation have been largely realized. There are relatively few opportunities remaining to increase the productivity of freight transportation through economic deregulation.

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Deregulation triggered a massive restructuring of the transportation industry that may create new regulatory challenges. The industry is still working its way through a period of intense market-driven mergers as carriers search for economies of scale and scope that will allow them to compete and survive in the larger national, North American, and global markets. The broad characteristics of the new business models parallel the transformations taking place in the automobile, banking, and telecommunications industries. The new business models are likely to be consolidated (through another round of mergers), international, asset-based, and information driven.

These changes set up two possible issues for the future:

- Influence of mergers and e-commerce on competition. The ownership, control, and technology of freight transportation will change significantly in the next decades. Today's mergers and e-commerce technology may concentrate market power in a limited number of carrier groups and could undo the competition resulting from economic deregulation. This might spur calls for re-regulation to preserve competition under the new regime.
- Government investment in freight infrastructure and the negotiable-access debate. Railroads have made a spectacular comeback, but are not yet recovering their cost of capital. Mergers may allow the railroads to achieve the economies of scale necessary to earn their cost of capital, but the railroads also are beginning to look to state and local government to help finance rail infrastructure as is done with ports, airports, and highways. If the public sector invests in the infrastructure, what regulations will govern who has access to the rail lines?

## Safety Regulation

Economic deregulation has been accompanied by an increased emphasis on safety regulation. Fatality rates have decreased across the freight transportation industry under deregulation, but the number of trucks, trains, and planes and the number of miles they travel are increasing. Unless safety rates improve, the absolute number of fatalities and injuries will increase substantially in the next decades.

The public is pushing the freight transportation industry, especially motor carriers, to further reduce crashes and fatalities. The pressure comes from changing social values, expectations, and growth. But federal and state governments no longer have the resources to set, monitor, and enforce detailed rules governing equipment and operations. To reduce fatalities, government regulators and industry safety managers are betting on technology and performance-based, rather than rule-based, safety standards.

The key issue facing the freight industry under this new approach will be the cost and productivity impacts of safety regulation. New safety technology and higher safety standards will be costly, but the issue is to what degree. Complicating the debates will be the lack of consistent measures of safety and safety impacts across modes.

## ■ Introduction

In 1800, the cost to move a ton of goods 30 miles inland was comparable to moving it across the Atlantic. By mid-century, the railroads had reduced the cost of delivering goods by as much as 80-90 percent.<sup>2</sup> But by 1900, a combination of cutthroat competition among the railroads (where there was competition), and abuses of market power (where there was no competition), had driven some railroads to the brink of financial collapse and allowed others to charge monopolists' prices for unsatisfactory levels of service.<sup>3</sup> Public and shipper outrage triggered a process of government regulation. Not until the 1970s did support for government intervention begin to wane and the process of deregulation of the railroads and freight transportation prices begin. A similar pattern would repeat with respect to the motor carriers, ocean carriers, and aviation/air cargo carriers.

By most accounts, the process of regulation and deregulation has come full circle. The days of legislation designed to alter market-driven outcomes are over, as are the days when frequent injuries and generous levels of air, water, and noise pollution are accepted as "the cost of doing business." A shift away from regulation of industry toward regulation of impacts is underway - there is less focus on economic regulation, and more focus on safety and environmental regulation. This paper discusses the history of freight transportation regulation and deregulation, examines current work on safety regulation, and discusses the implications of these trends for freight transportation.<sup>4</sup>

## ■ Trends

### Economic Deregulation

Economic regulation stabilized the transportation industry, but at the cost of dampening competition and the long-term viability of the industry. By the 1970s, bankruptcies, high prices, and inefficient services plagued the freight sector. The federal government began deregulating to revitalize the industry and improve productivity. The major deregulatory legislation is listed in Figure 1.

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<sup>2</sup>James M. McPherson, *Battle Cry of Freedom: The Civil War Era* (New York, Oxford University Press, 1988), 11.

<sup>3</sup>For a more detailed summary of the history of rail and motor carrier regulation, see C. Gregory Bereskin, "Regulation, Deregulation, and Reregulation in the Surface Transportation Industry," Millennium Papers, Transportation Research Board. Available at <http://www.nationalacademies.org/trb>, as of December 2000.

<sup>4</sup>The information and analysis in this paper are based on a literature scan that was conducted in the spring of 2000 and a series of informal interviews that were conducted in the summer and fall of 2000 with federal, state, and freight industry officials. The interviews were not for attribution in order to encourage candor. The objective of the paper is to explore and organize initial ideas on freight trends, implications, and issues. The paper is not intended to be a definitive treatment of the topic.

## Figure 1. Major Federal Legislation Deregulating Commercial Transportation

- Aviation Deregulation Act of 1978
- Motor Carrier Act of 1980
- Staggers Rail Act of 1980
- Ocean Shipping Act of 1984
- Ocean Shipping Reform Act of 1998

Deregulation was successful. Today, the freight transportation industry is viable, competitive, and profitable. Productivity has increased, and the industry is reorganizing to compete in North American and global markets. But the trends suggest that economic deregulation will yield diminishing returns in the future. Government and industry must look beyond deregulation to maintain and improve productivity while ensuring equity and public safety in the coming decades.

### *Rail Carriers*

The federal government began to regulate the railroad industry in 1887, with the enactment of the Interstate Commerce Act. Regulation was a response to concerns of unfettered competition bankrupting railroads while unregulated pricing was permitting others to charge monopoly prices and inviting collusion. The Supreme Court had confirmed earlier the rights of states to regulate the railroads, but the states found it difficult to regulate consistently and effectively across state borders. This is a pattern repeated today on a different scale as the federal government considers the regulation of truck, rail, and air traffic across international borders.

Under the Interstate Commerce Act, railroad rates were to be “reasonable and just,” but the new Interstate Commerce Commission (ICC) found the concept difficult to define and enforce, as had the states. Congress amended the ICC’s powers in the early 1900s, giving it broad powers to set rates and control entry and exit in the industry. Through the 1950s, railroads, shippers, the ICC, and Congress struggled to set equitable rates. The railroads argued for higher, value-pricing rates based on supply and demand, while shippers pushed for lower, cost-of-service rates. The ICC struggled to determine cost-of-service rates, but usually opted for more easily enforceable, standardized base rates that generally under-priced rail service and sapped railroad profitability. Congress reinforced the ICC decisions by responding to public and business pressures to keep transportation costs low through World War I, the Great Depression, and World War II.

By the 1960s, the railroad industry was replete with bankrupt or financially weak carriers. Deteriorating capital stock, intense competition from motor carriers, changing markets, and poor management had brought much of the industry to the edge of collapse. In 1976,

more than 47,000 route-miles, approximately 25 percent of the nation's total, were operated at reduced speeds due to dangerous conditions.<sup>5</sup>

In the 1970s, Congress and the ICC began to ease railroad rate regulation, and permitted the railroads to abandon unprofitable passenger service in order to salvage freight services. The ICC allowed, then encouraged, mergers to rationalize the rail system.

In 1973, the Regional Rail Reorganization Act (3-R Act) merged seven large, bankrupt eastern railroads to form Conrail. The mergers kept the railroads alive, and marked the beginning of the end of efforts by the ICC and Congress to manage the railroads' route structures and rate making.

Four years after the creation of Conrail, the Rail Revitalization and Regulatory Reform Act (4-R Act) was passed, giving the ICC the power to deregulate rates and approve market-based tariffs. In 1980, Congress, responding to the slow moving ICC, completed the intended, partial economic deregulation of the railroad market. The Staggers Act of 1980 allowed railroads to write contracts directly with shippers for rail service, and, while keeping controls on the maximum rail rates charged to captive shippers, liberalized railroads' ability to set prices and enter and exit markets.

In 1996 the ICC was abolished and the remaining regulatory controls transferred to the U.S. Department of Transportation's new Surface Transportation Board.

The impact of deregulation on the railroad industry is difficult to overstate. The industry went from being the "sick man" of the transportation world to being a lean, productive, and relatively profitable industry. The following changes have come about largely due to deregulation:

- **The industry consolidated through mergers and acquisitions.** Conrail was privatized in 1987, and purchased by CSX and Norfolk Southern in 1999. Today, there are seven Class I railroads in the United States, down from 36 in 1980.<sup>6</sup> The big four – Burlington Northern, Union Pacific, CSX, and the Norfolk Southern – are jousting to see who will lead the next round of mergers that will form transcontinental railroads.
- **Ninety-one thousand miles of rail line were abandoned** or sold by major railroads. The Class I railroads now own approximately 100,000 miles of road (route-miles), a decrease from 192,000 in 1975. Many of the lines were sold to new regional and short-line railroads. In 1998, regional and short-line railroads operated 50,000 miles

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<sup>5</sup>United States Department of Transportation, Bureau of Transportation Statistics (BTS), "The Changing Face of Transportation," Final Edition, 2000. Available at <http://www.bts.gov/transtu/cft>, as of December 2000.

<sup>6</sup>Surface Transportation Board, STB Ex Parte No. 552 (Sub-No. 4), Railroad Revenue Adequacy 1999 Determination, 26 July 2000.

of road, some of it owned by state governments anxious to preserve rail access to rail-dependent manufacturers and shippers.<sup>7</sup>

- **Rail rates declined.** Average rail rates, adjusted for inflation, for Class I railroads decreased 46 percent between 1982 and 1996.<sup>8</sup>
- **The amount of freight hauled by the railroads increased.** Compared to 1980, railroad tonnage in 1999 increased 15 percent and ton-miles increased 56 percent.<sup>9</sup> In the future, rail tonnage is expected to rise an average of 1.0 to 1.5 percent per year.<sup>10</sup>
- **Railroads established connections with trucking and ocean-shipping companies.** Intermodal traffic expanded from 3.1 million trailers and containers in 1980 to 8.8 million in 1998.<sup>11</sup> Intermodal traffic is expected to double in the next decades.
- **Labor productivity increased significantly.** Revenue-ton-miles per employee are approximately four times higher today than in 1980. Railroad productivity growth has outpaced the U.S. economy as a whole.<sup>12</sup>

Despite these positive changes, rail freight revenues have remained flat and profits low. The rate of return on net investment has increased from less than two percent in the mid-1970s to approximately seven percent today. Even so, this has not been enough to sustain interest from Wall Street. The industry continues to earn less than its cost of capital, which the Surface Transportation Board estimated at 10.8 percent for 1999. The railroads' struggle to finance their operations under a deregulated market will dominate their business over the next several years.

### *Motor Carriers*

The motor carrier industry has followed a similar pattern of regulation and deregulation. In the mid-1930s, trucking began displacing the railroads as the dominant mode of domestic freight transportation, just as the railroads had displaced the riverboats and barges a century earlier. Trucking captured first local freight, then regional freight, and eventually most of the higher-value national freight traffic. Trucking was more flexible and time-sensitive than rail support, and could provide customized support to manufacturers and distributors. Well before the Interstate era, trucking was capturing a growing

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<sup>7</sup> BTS, "The Changing Face of Transportation."

<sup>8</sup> "Railroad Regulation: Changes in Railroad Rates and Service Quality Since 1990." GAO/RCED-99-93, Washington, DC: General Accounting Office, 1999.

<sup>9</sup> Association of American Railroads, "Analysis of Class I Railroads, 1980" (Washington DC, 1981); "Analysis of Class I Railroads, 1999" (Washington DC, 2000).

<sup>10</sup> U.S. Business Reporter Industry Analysis, 17 October 2000. Available at <http://activemedia-guide.com/transportation.htm>, as of December 2000.

<sup>11</sup> Association of American Railroads, 2000c .

<sup>12</sup> Association of American Railroads, "The Impact of the Staggers Act." Available at <http://www.aar.org>, as of December 2000.

portion of the nation's total freight shipments by value, although railroads would dominate the freight industry through the 1950s.<sup>13</sup>

As with the railroads, the growth of the motor carrier industry initiated cutthroat competition among trucking companies, which threatened to destabilize the industry, as well as abuse of market power by both carriers and shippers. In 1935, Congress applied the regulatory framework that it had developed for the railroad industry to the motor carrier industry. The Motor Carrier Act gave the ICC authority to control entry and exit in the industry, regulate prices through uniform tariff rates, specify the types of commodities to be hauled, and determine the routes to be served by each carrier. Carriers had to demonstrate the public convenience and necessity of their proposed services before the ICC would issue a certificate of operating authority. Once issued, carriers jealously guarded their operating authority rights against would-be competitors.

Unlike the railroads, the trucking industry prospered under the ICC's regulation. The market for truck services was growing. The states in the 1950s and the federal government in the 1960s subsidized the construction of a national highway system that both expanded the trucking market and increased trucking productivity. But the ICC's regulations imposed a cost on business and the economy. Regulation kept trucking prices relatively high and the number of carriers competing for work relatively low.

Calls by shippers for reform peaked in the mid-1970s. The U.S. economy was transitioning from a nationally focused manufacturing economy to a internationally focused and service economy.<sup>14</sup> It was recovering from the economic and social impacts of the Vietnam War, but growth alternated with periods of sharp recessions. Unstable fuel supplies and prices sent shock waves through the economy, dampening domestic and international trade. Jobs were lost to the booming, low-wage Asian economies. Traditional manufacturing jobs were replaced by jobs in the growing service industries and in the technology sector. The resultant economic pressures resulted in a massive restructuring of businesses. By 1975, businesses were lobbying intensively for lower transportation costs to help compete in domestic and international markets.

Congress took action in 1980, passing the Motor Carrier Act, which deregulated interstate trucking. The Act effectively erased barriers to entry, permitted price competition, and lifted anti-trust laws that permitted collective rate setting. But motor carriers were given only partial satisfaction; the Act did nothing to loosen restrictions on intrastate commerce, and as time passed the costs associated with shipping across state borders and shipping within state borders widened dramatically. In 1994, 41 states still maintained some form of economic regulation over intrastate trucking, and intrastate rates were an average of 40 percent higher than rates for interstate moves of the same distance. Not until 1995, and the passage of the Interstate Commerce Commission Termination Act, was economic regulation of intrastate trucking lifted and the ICC itself broken up.

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<sup>13</sup> See also related theme papers in the series, "Freight Carriers: From Modal Fragmentation to Coordinated Logistics," available at <http://www.ops.fhwa.dot.gov/freight/adfrmwrk/index.htm>.

<sup>14</sup> See related theme papers, "Economy: Rapid Change in Manufacturing and Service Sectors," available at <http://www.ops.fhwa.dot.gov/freight/adfrmwrk/index.htm>.

As with the deregulation of the railroads, the impact of deregulation on the trucking industry was significant:

- **The number of trucking companies increased dramatically.** Existing carriers expanded into new services with new routes, and new smaller carriers entered the business. The number of interstate motor carriers increased from 18,000 in 1975 to over 500,000 in 2000.
- **The industry restructured itself.** Truckload (TL) carriers, no longer restricted to set routes and commodities, merged and consolidated to provide national coverage. Less-than-truckload carriers (LTL), under attack from TL carriers intent on carving off large-lot shipments, shrank and streamlined their operations. And the use of private carriers (i.e., company-owned or “in-house” trucking fleets) declined as companies chose to take advantage of the lower rates and improved services offered by newly competitive for-hire carriers.<sup>15</sup>
- **Lower trucking prices benefited the U.S. economy as a whole.** Prior to deregulation, trucking expenditures were 5.7 percent of GDP, while in 1997 they were less than 5.0 percent. This is the equivalent of \$60 billion saved in national income.<sup>16</sup>
- **Trucking’s share of the freight market expanded.** Today, the trucking industry has 80 percent of the U.S. freight transportation market by revenue although the railroads still carry the largest share by tonnage.

The trucking industry – at least those firms that survived the transition from the regulated to the deregulated market – is lean, competitive, and profitable. But the future is less certain. Fuel costs are up; drivers, especially in the long-distance truckload sector, are increasingly difficult to find and retain at current wage levels; and highway congestion threatens to erode the industry’s ability to deliver fast and predictable service.

### *Ocean Carriers*

Ocean carriers are regulated through laws governing conferences and cabotage. Carrier conferences, typically associations of carriers serving similar markets and sea-lane, were established in the 19<sup>th</sup> century to protect national and carrier interests. The conferences set rates and managed competition among carriers. The Shipping Act of 1916 endorsed anti-trust immunity for the ocean carrier conferences in exchange for “common carriage” (e.g., agreements by the ocean carriers that all shippers, small or large, would be treated equally by carriers). The 1916 Act required the conferences to file these agreements with the Federal Maritime Commission (FMC). The agreements were reviewed and approved for antitrust purposes under a “public interest” test. To protect against monopolistic price gouging, the carriers were obliged to share this information with all other shippers, which could then demand similar rates from ocean carriers. This law regulated the ocean shipping industry for the next 68 years.

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<sup>15</sup> Lawdog.com Publishing, Inc., “History of Trucking Regulation at Lawdog.” Available at <http://www.lawdog.com/transport/tp1.htm>, as of December 2000.

<sup>16</sup> Cass Annual Session of Logistics Management, 13 October 1998. Available at [http://www.cassinfo.com/bob\\_clm\\_annual.html](http://www.cassinfo.com/bob_clm_annual.html), as of December 2000.

After World War I, Congress enacted the Merchant Marine Act of 1920, now known as the Jones Act. The Jones Act mandated that only vessels built, owned, and registered in the United States could be used in waterborne commerce along inland waterways and the eastern seaboard, across the Great Lakes, and between the U.S. mainland and noncontiguous states and territories. The purpose of the Jones Act was to protect domestic shipping services from foreign competition (a practice known as cabotage) and to ensure that domestic merchant marine vessels and crews would be available to America's armed forces in times of national emergency.

The Jones Act remains in force today, but the regime of carrier conferences began to weaken in the 1960s and 1970s. Shippers wanted lower prices to compete in foreign markets, and containerization forced a restructuring of industry. By building larger container ships, carriers could drive down unit costs for shippers and capture larger market shares, but only by rationalizing their services. This meant giving carriers the flexibility to build new alliances, abandon less profitable routes and ports of call, contract with railroads and motor carriers for feeder and distribution services, and focus on profitable, high-volume, international routes.

The Shipping Act of 1984 responded to these needs. The Act reaffirmed the function of conferences, giving shippers expanded immunity from antitrust actions, and eliminating the requirement that the FMC approve conference agreements. Carriers were free to rebuild their alliances. The Act required that conferences file their tariffs with the FMC, and that the FMC make the tariffs public. However, the Act also authorized "independent action." Upon 10-days' notice, any conference member could offer lower rates or better services than the conference standard. In effect, shippers and carriers gained the ability to negotiate competitive service and price contracts. These contract negotiations were not confidential.

The Act also opened the door to other players in the ocean shipping industry. Freight forwarders were authorized to consolidate cargoes from small shippers in order to achieve the same benefits and economies of scale as large shippers. Non-vessel-operating common carriers (NVOCC), companies that provide common carrier service by renting space on ships owned and operated by a vessel owner, were allowed to operate under the same rules as the ocean carriers.<sup>17</sup>

Responding to these changes, the shipping industry underwent a major consolidation during the 1990s in an effort to improve efficiency and productivity. The largest carriers (e.g., P&O, NedLloyd, Neptune Orient, APL, Sealand, and Maersk) merged and re-merged seeking competitive and profitable configurations. Routes and services were restructured, and new equipment and technologies were introduced to improve productivity.

Congress took the last step toward deregulation of the ocean shipping industry in October 1998, passing the Ocean Shipping Reform Act (OSRA). OSRA allowed shippers and ocean

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<sup>17</sup> Testimony Presented to the Subcommittee on Coast Guard and Maritime Transportation's Hearing on the Ocean Shipping Reform Act, 3 May 2000. Available at <http://www.house.gov/transportation/cgmt/05-03-00/joint.html>, as of December 2000.

carriers to enter into confidential service contracts negotiated on a case-by-case, one-to-one basis between a shipper and a carrier. The shipper and carrier were required to file the contract with the Federal Maritime Commission, but were not obliged to share the contract terms with conference members and other shippers.

To date, the benefits of OSRA have been mixed. In May 2000, Timothy J. Rhein, Chairman of American President Lines, Ltd. and John P. Clancey, Chairman of Maersk Inc., testified that:

*“OSRA is fulfilling the purposes for which it was intended, the primary one being to create an atmosphere in which the liner industry becomes even more responsive to market forces and to the commercial needs of shippers and carriers.”<sup>18</sup>*

The FMC, in a June 2000 report, agreed and argued that the new law is having “positive effects on the business of ocean shipping,” citing strong growth in the use of individual service contracts between shippers and carriers.<sup>19</sup>

On the other hand, some carriers appear to be taking advantage of a loophole in the law by charging steep fees for online access to ocean shipping tariffs. Under the provisions of OSRA, carriers are no longer required to file general rate tariffs with the FMC, but must make this information public via the Internet. The FMC expected the carriers to charge a “reasonable” access fee, enough to cover the costs of posting information online, but as industry observer Michael Fabey noted wryly, “greed got in the way.” One tariff publisher charges 90 cents per minute to view its site. Another charges \$450 per month, with a three month minimum, meaning that a shipper seeking only a single price quote would be forced to spend \$1,350. As a result of such practices, many small shippers have suffered from OSRA. Fabey believes that unless carriers take steps to voluntarily reduce their Internet access fees, the FMC will move to impose fines or other penalties.<sup>20</sup>

### ***Aviation/Air Cargo Carriers***

Until two decades ago, the Civil Aeronautics Board (CAB) regulated air carriers in the United States. The CAB determined flight routes and prices for the airlines. These restrictions caused market distortions and inefficiencies, driving up ticket prices and skewing the demand for air travel. The cost of an unregulated intrastate flight, from Los Angeles to San Francisco, for example, was often less expensive than a regulated interstate flight of equal distance.

This situation persisted until the late 1960s, when aircraft manufacturers began rolling out the first wide-body aircraft. The Boeing 747, capable of transporting 400 passengers, twice as many as its 707 predecessor, offered airlines the opportunity to dramatically increase capacity, particularly on longer transcontinental flights. But in 1973, the Arab oil embargo caused the price of oil to triple in a matter of months. As energy costs skyrocketed, so did

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<sup>18</sup> *Ibid.*

<sup>19</sup> Jianfeng Pei, “OSRA Credited With Positive Effects On Ocean Shipping,” *Purchasing: The Magazine of Total Supply Chain Management*, 24 August 2000.

<sup>20</sup> Michael Fabey, “Tariffs and Tribulations,” *Traffic World*, 16 October 2000.

inflation and unemployment, and the world economy slid into recession. Air carriers were particularly hard-hit.

With seating capacity rising, demand falling, and costs spiraling upward, the CAB sought a reasonable rate of return for airline carriers. In 1974, it approved a series of fare increases, mandated a four-year freeze on new services, and agreed to allow carriers to limit capacity on major routes. The measures were unpopular among travelers and did not solve the carriers' financial problems. The CAB recognized the ineffectualness of its policies and reversed their stand abruptly. In 1975, the CAB issued a report declaring that air carriers were "naturally competitive, not monopolistic," and began to loosen pricing and route controls.<sup>21</sup>

Congress took the first steps toward formally deregulating the airline industry in 1977, when it gave air cargo carriers the freedom to operate on any domestic route and charge according to the market. The CAB was authorized to approve new cargo services, not on the usual basis of "public need and convenience," but on the basis of whether the carrier was "fit, willing, and able."<sup>22</sup> Deregulation of the passenger industry followed deregulation of the cargo industry. In 1978 Congress passed the Airline Deregulation Act, which led to a phase-out over four years of all scheduling, route, and fare restrictions. The CAB was disbanded in 1985.

The federal government continues to regulate two important areas in air cargo transportation, including the review and approval of airline mergers, and the awarding of international landing rights. In reviewing mergers, the government attempts to determine whether the proposed merger will improve or degrade service, whether competition will be heightened or reduced, and whether the interests of consumers will be served. International landing rights are negotiated on a bilateral basis between countries, with the State Department representing the interests of the United States abroad. These negotiations have led to "Open Skies" agreements between the U.S. and 51 other countries. Open Skies agreements allow market conditions to dictate routes, frequencies, and prices for passenger and cargo flights.

Over the past two decades, deregulation, along with expanding markets and new technologies, created significant growth opportunities in the aviation and air cargo industries:

- **Passenger volumes tripled.** Passenger enplanements increased from 200 million in 1975 to nearly 600 million in 1999.

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<sup>21</sup> Air Transport Association of America, *Airline Handbook*, Chapter 2, "Deregulation." Available at <http://www.air-transport.org/public/Handbook>, as of December 2000.

<sup>22</sup> *Ibid.*

- **Fares declined.** Between 1978 and 1998, real airfares declined by more than 30 percent in domestic markets and by 43 percent in international markets, contributing to the development of a mass market in air travel.<sup>23</sup>
- **The industry returned to profitability.** As a result of declining fares, the industry yield (revenues per revenue-passenger-mile) has declined, but the airlines remain profitable.
- **The air cargo segment of the industry expanded rapidly.** After deregulation in 1978, the air cargo industry experienced 500 percent growth, increasing from five billion revenue-ton-miles in 1975 to 25 billion revenue-ton-miles in 1999. The air cargo sector's growth eclipsed passenger sector growth. The growth of all-cargo air carriers is responsible for most industry growth. All-cargo carriers moved more than two-thirds of domestic freight revenue-ton-miles in 1999.<sup>24</sup> Overall, the air cargo industry is projected to triple in the next two decades.
- **Labor productivity of the air cargo sector increased.** The ratio of revenue-ton-miles per employee increased 89 percent between 1975 and 1999.<sup>25</sup>

Another significant impact of deregulation was the rapid expansion of overnight air delivery of documents and small packages. Overnight delivery of high value and time sensitive packages and documents began in the early 1970s; however, deregulation gave express carriers the operating freedom to develop high-quality services. The result was outstanding growth. In 1994, Congress further deregulated this part of the airline industry by preempting state efforts to regulate intrastate air/truck freight and express package shipments.<sup>26</sup>

## Safety Regulation

Economic deregulation has been accompanied by an increased emphasis on safety regulation. Despite the positive safety improvements since deregulation, the public and government are pushing the freight transportation industry, especially motor carriers, to further reduce crashes and fatalities. The pressure comes from changing social values, expectations, and growth. Fatality rates are decreasing across the freight transportation industry, but the number of trucks, trains, and planes and the number of miles they travel are increasing. Unless safety improves, the absolute number of fatalities and injuries will increase substantially in the next decades. To counter this trend, government regulators and industry safety managers are betting on technology and performance-based, rather than rule-based, safety standards. This section examines crash trends and emerging safety strategies.

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<sup>23</sup> USDOT BTS OAI n.d.(b). United States Department of Transportation, Bureau of Transportation Statistics (BTS), Office of Airline Information, Data Administration Division, Form 41, 1978-1998.

<sup>24</sup> *Ibid.*

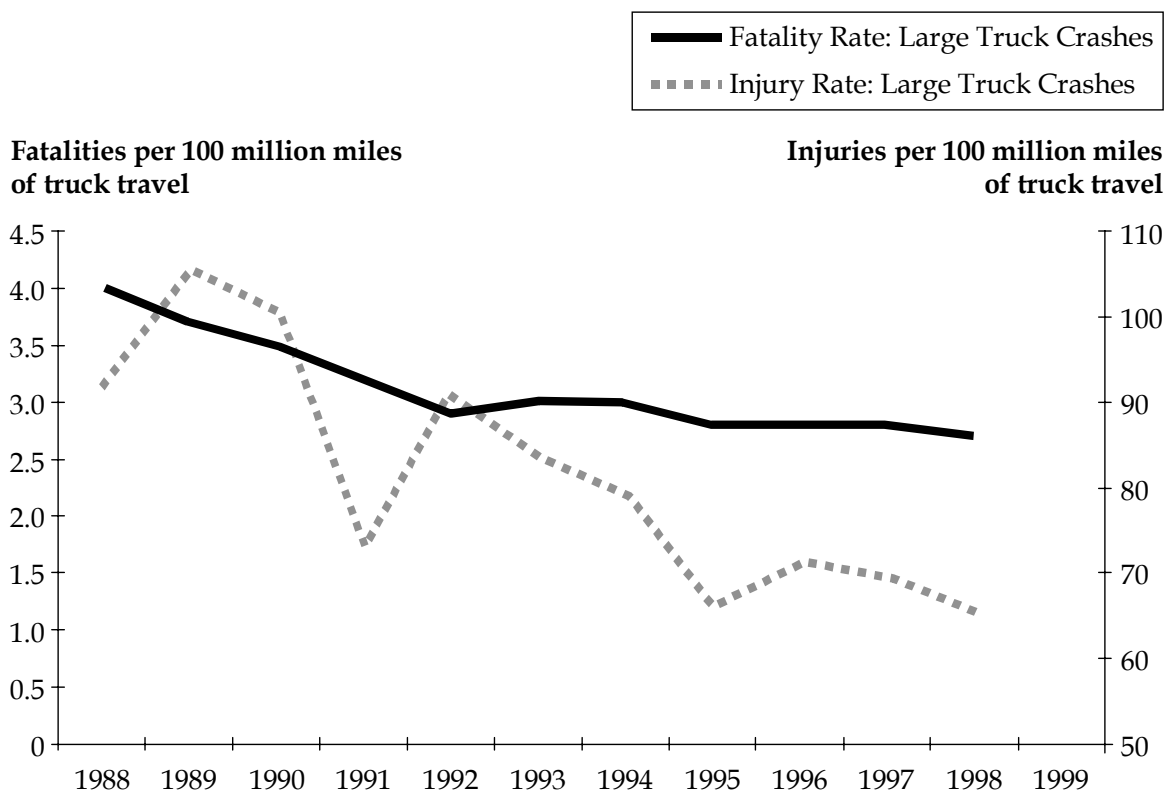
<sup>25</sup> BTS, "The Changing Face of Transportation."

<sup>26</sup> *Ibid.*

### Motor Carriers

Highway crashes, fatalities, and injuries have declined steadily over the past decade (see Figure 2).<sup>27</sup> From 1988 to 1998 (the last year for which comparative fatality and injury rates are available), the fatality rate for passenger vehicle crashes declined 30 percent and the rate for large-truck-involved crashes decreased 33 percent. But there has been less progress in recent years. Overall fatality and injury rates have declined only slightly, and the absolute numbers remain unacceptably high. More than 41,000 people died on highways in 1998, down only eight percent compared to 1988. Almost 3.2 million people were injured in 1998, a number virtually unchanged from a decade earlier. Of the 41,000 people who died in 1998 in highway crashes, 5,395 were killed in traffic crashes involving large trucks.

**Figure 2. Truck-Involved Fatalities and Injuries**



Source: Federal Motor Carrier Safety Administration, *Safety Action Plan, 1999*; and *Monthly Progress Report, September 2000*.

Trucks are involved in a disproportionately high number of fatal crashes. Although they make up just three percent of all registered vehicles and seven percent of all vehicle miles traveled, large trucks were involved in 13 percent of the fatalities in 1998. The numbers being tabulated and reported for 1999 are similar, with truck-involved fatalities declining by a modest 0.6 percent from 5,395 to 5,362.

<sup>27</sup> Federal Motor Carrier Safety Administration, "Safety Action Plan: 2000-2003," February 2000; and "Safety Data Systems Program," November 2000.

The Secretary of Transportation and the Federal Motor Carrier Safety Administration (FMCSA) have set a goal to significantly reduce the number of truck-related deaths and injuries over the next 10 years. Using 1998 as the baseline, their goal is a 50 percent reduction in the number of people killed in large-truck-involved crashes by 2010, and a 50 percent reduction in the number of people injured in large-truck-involved crashes by 2010. These goals indicate that the FMCSA must reduce the number of people killed from 5,400 to 2,700 and the number injured from 127,000 to 63,500.<sup>28</sup>

Halving the number of truck-involved fatalities in a decade is a major challenge. The number of interstate motor carriers within the FMCSA's jurisdiction has more than doubled in the last decade, growing from approximately 200,000 in 1990 to more than 500,000 in 1998. In 1999 alone, between 55,000 and 60,000 new carriers registered with the FMCSA, most of which are small businesses. Seventy percent of these carriers have six or fewer trucks. Of the 500,000 interstate motor carriers registered with the FMCSA, only about 25 percent have been reviewed and given a safety rating by federal or state inspectors; 75 percent have never been reviewed or rated. Although the FMCSA and the states are hiring more inspectors and enforcement officers, the resources for federal and state motor-carrier safety programs have not kept pace with the growth in motor carriers and the corresponding increases in vehicles and drivers.<sup>29</sup>

A number of regulatory strategies are being pursued today to reduce truck crashes which include:

- **Targeting safety enforcement.** The federal government has systematically collected data on motor carrier crashes and safety inspections. Because research has shown that past safety records are the best predictors of future behavior, this data can be used to identify high-safety risk carriers. Once these carriers have been identified, their management and safety procedures can be targeted for review, and their vehicles and drivers targeted for more frequent weigh-station and roadside inspections. The data can also be used to screen carriers applying for permits or re-registering trucks to prevent carriers with the worst safety records from obtaining credentials.
- **Revising the hours of service (HOS) regulations.** Truck technology has improved significantly in recent years. While mechanical problems such as brake failures can still cause crashes, such problems are becoming increasingly rare. As a result, safety managers have begun to look more carefully at the role that driver behavior, fatigue in particular, plays in crashes. The motor carrier industry has chafed for years about hours of service (HOS) regulations. The existing regulations, established in the 1930s, limit a driver to a 10-hour shift followed by eight hours' rest, and restrict the cumulative number of hours a driver may work in successive days throughout a week. The U.S. Department of Transportation (DOT) recently proposed new rules that would allow drivers to work (either driving, or loading and unloading) for 12 hours every 24-hour period. Each work shift would be followed by 10-12 consecutive hours of off-duty time. The new rules governing cumulative hours

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<sup>28</sup> *Ibid.*

<sup>29</sup> *Ibid.*

would discourage shifts that rotate around the clock, which are thought to disrupt a driver's circadian rhythms and contribute to fatigue-related crashes. The proposal triggered an intense debate in which the FMCSA argued that new HOS regulations would significantly reduce crashes, fatalities, and injuries, and the motor carrier industry argued that the safety benefits were overestimated and the cost to industry ignored or underestimated. Congress imposed a one-year moratorium on implementation of these rules in the 2001 U.S. DOT Appropriation budget to let FMCSA and the industry reconsider the issues.

- **Mandating the use of on-board recorders.** Most modern trucks are equipped with on-board computers that monitor in precise detail the performance of the vehicle's engine, transmission, brakes, and other mechanical components. The technology is well established, and is used to provide information to improve maintenance. The FMCSA has proposed mandating this technology to gather data about crashes and is debating extending its use to monitor drivers' hours-of-service and record their driving behavior. Equipping trucks with "black boxes," an on-board trip recorder, would make it more difficult for drivers to falsify their hours. (It is a common, but illegal, practice to maintain two sets of logbooks: one for the motor carrier inspectors and one for the driver's own billing records.)
- **Introducing safety-warning systems.** The FMCSA and the U.S. DOT's Intelligent Transportation Systems (ITS) Joint Program Office have launched the Intelligent Vehicle Initiative (IVI), a program to advance the application of computers, advanced electronic sensors, and communications technologies to heavy trucks and buses. The IVI program is exploring several truck applications of this technology. The most promising include: proximity warning devices to minimize the risk of trucks backing into cars accidentally; rollover warning systems that assess the risk of a rollover and warn the driver to take emergency action; brake warning systems that provide earlier and more reliable predictions of imminent brake failure than traditional visual inspections; and fatigue warning devices that monitor a driver's steering behavior or eye motion and trigger alarms if a driver begins to nod off at the wheel.

The focus today is on truck drivers, but the focus may soon expand to include automobile drivers. In crashes involving a large truck and a passenger vehicle, officers at the scene cited truck drivers for driver-related errors (e.g., failing to yield right-of-way, driving too fast, etc.) 26 percent of the time and passenger-vehicle drivers 82 percent of the time.<sup>30</sup> Future safety research will examine strategies that change the behavior of both truck and car drivers.

### ***Rail Carriers***

The responsibility of safety regulation, which originally fell under the jurisdiction of the ICC, was moved to the Federal Railroad Administration (FRA) when the U.S. DOT was created in 1966. The FRA enforces minimum standards in a range of areas, such as track,

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<sup>30</sup> Federal Motor Carrier Safety Administration, Analysis Division, "Large Truck Crash Profile: The 1998 National Picture," Washington, DC, January 2000. Percentages do not add to 100 because citations may be issued to none, one, or all of the drivers involved in multi-vehicle accidents.

signals, and equipment. Until a few years ago, FRA's enforcement approach depended heavily on aggressive enforcement of the standards, with threats of fines as the primary means of ensuring compliance. In recent years, the FRA has adopted a more cooperative approach and set about transforming the federal railroad safety program. The goal is a safety program that is more inclusive of the agency's customers, more fact-based, and ultimately more effective, while also less intrusive, less hierarchical, and less adversarial. Since 1995, FRA announced and implemented three new safety programs:

- Safety Assurance and Compliance Program (SACP), a new approach to safety inspection and encouraging compliance. The cornerstone of the SACP is its methodology for detecting and focusing on the root causes of systemic safety problems, especially on large railroad systems;
- Rail Safety Advisory committee (RSAC) to provide the agency with advice and recommendations from the industry on a range of regulatory issues; and
- Technical Resolution Committee (TRCs) in each of its technical disciplines (track, signal, hazardous materials, equipment, and operating practices). TRCs address inconsistent application of established policy or law, and unanswered questions of policy or law.

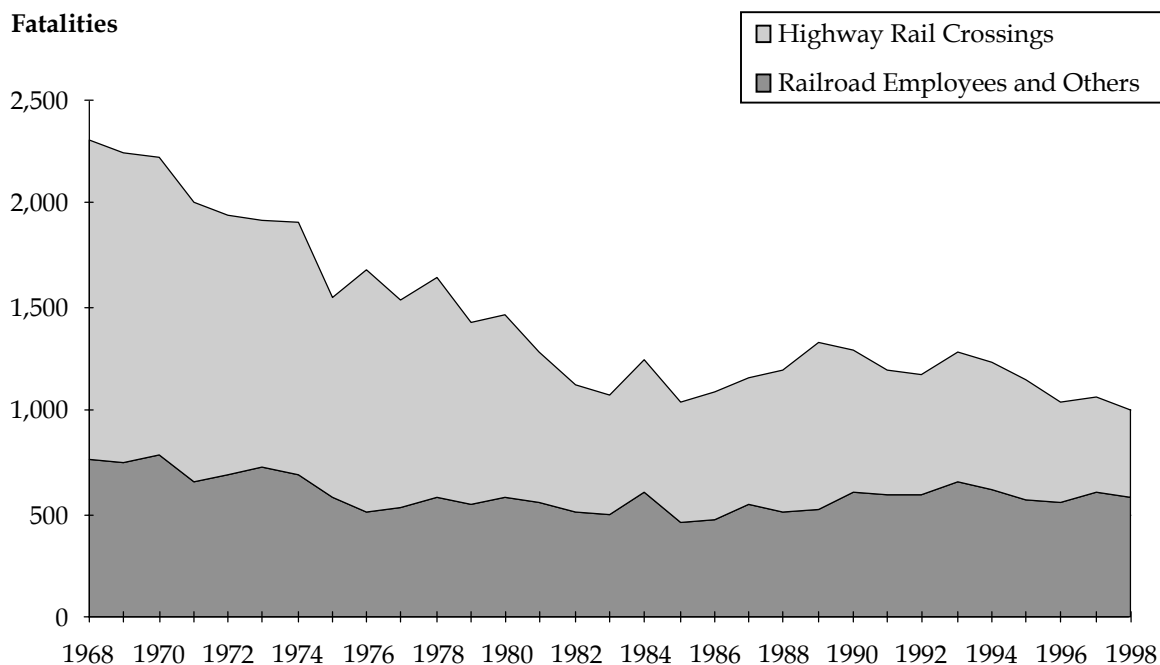
These approaches, in conjunction with routine inspections, have prevailed in recent years, and the rail industry's safety record has continued to improve.

Railroad safety initiatives are currently focused on the following areas:

- **Eliminating grade crossings and increasing public awareness of trains.** The majority of fatalities in railroad crashes are not railroad employees, but drivers and passengers of motor vehicles at grade crossings, and trespassers on railroad property (See Figure 3). Education and enforcement are helping to reduce fatalities in both categories. In the first category, the FRA is encouraging better grade crossing technology, abolition of whistle bans, and the closure of redundant grade crossings.
- **Introducing Positive Train Control (PTC) systems.** Historically, the movement of trains was controlled by a timetable, overridden by orders from a dispatcher. As traffic increased, this was supplemented by visual signals along the right-of-way. For most of the last century, a variety of electro-mechanical systems (such as Automatic Train Control [ATC] and Automatic Train Stop [ATS]), which at minimum require train crews to acknowledge restrictive signals, were implemented where passenger trains operated at speeds generally in excess of 79 mph. With the reduction in passenger service since World War II, many of these systems were removed. However, planned growth in train speeds and density and a need to lower costs and improve performance over the traditional train control technology have led to a new kind of system, Positive Train Control (PTC). Using the Global Positioning System (GPS) and wireless data links, PTC can track train movements and enable a dispatcher to send orders directly to a locomotive's crew. Because PTC systems can monitor and enforce operating authority in a more refined and

continuous manner than older technologies such as ATS, trains can be operated more safely at much closer headways.<sup>31</sup>

**Figure 3. Railroad Fatalities**



Source: *National Transportation Statistics Annual Report, September 1993, (Bureau of Transportation Statistics) and Railroad Safety Statistics 1998 Annual Report (Federal Railroad Administration Office of Safety Analysis).*

- **Strengthening environmental legislation.** Railroads are subject to environmental regulations. New limitations on nitrogen oxide exhaust emissions were recently put in place. The regulation involves some grandfathering of old equipment, but may lead to limitations in the availability of older locomotives. This will improve safety because new locomotives incorporate better safety features and are less prone to failure, but will impact the costs and productivity of smaller railroads.

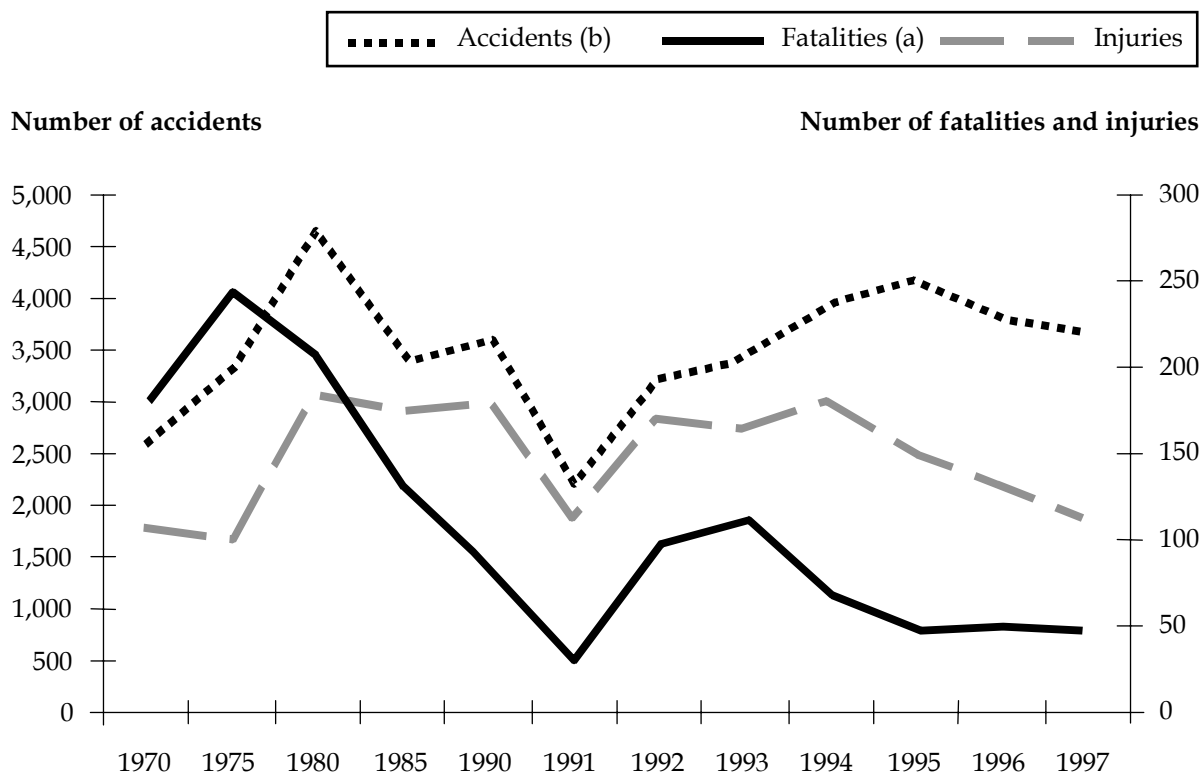
### ***Ocean Carriers***

The number of fatalities and injuries caused by marine collisions and other crashes is down significantly; however, the number of collisions and crashes remains high (See Figure 4). The Coast Guard and the Merchant Marine Administration are focused on navigation technologies to reduce collisions and on stronger enforcement of environment safety rules to protect public health and safety.

<sup>31</sup> Peter A. Hansen, "Positive Train Control," *Trains*, January 2001.

- Deploying navigation technologies.** The widespread use of the GPS in maritime navigation has greatly improved the safety and efficiency of waterborne freight movements. Differential GPS, operated by the U.S. Coast Guard, covers coastal and inland waterways and further enhances accuracy of positioning to within five to 10 meters. Vessel Traffic Service has been established at nine major U.S. ports and functions much like an air traffic control system, alerting and advising ship movements in and near the port. Other systems, including the Automated Identification System and Physical Oceanographic Real-Time Systems, assist vessels by providing a steady stream of information to land and navigating around oceanographic obstacles, respectively.<sup>32</sup>

**Figure 4. Marine Safety Trends**



Source: U.S. Department of Transportation, U.S. Coast Guard, Office of Investigations and Analysis, Compliance Analysis Division, G-MOA-2.

The key strategies being pursued to reduce marine crashes are:

- Adopting new vessel standards.** The International Maritime Organization (IMO) has imposed new standards that govern the construction of new vessels. The new standards incorporate better safety design features. For example, the new IMO and United State vessel standards mandate the phase-out of older single-hull tankers and the construction of new double-hull tankers.

<sup>32</sup> BTS, “The Changing Face of Transportation.”

- **Enforcing stronger environmental safety regulations.** The U.S. maritime cargo industry must comply with a number of federal statutes established in the last 25 years. These address various safety and environmental concerns, including air and water pollution generated by ships and facilities, spills of oil and other hazardous substances, shrinking wetlands, and disappearing marine life. Stricter environmental regulation has caused an increase in foreign vessel detentions for non-compliance in U.S. Ports, from eight in 1990 to 70 in 1997.<sup>33</sup>

### *Aviation/Air Cargo Carriers*

The safety record of U.S. airlines has been improving steadily despite concerns that deregulation might induce poorer safety performance. In the 15 years prior to deregulation, the major U.S. carriers averaged one fatal crash per 830,000 flights. In the 15 years following deregulation, they averaged one fatal crash per 1,400,000 flights.<sup>34</sup> The number of air fatalities is quite small compared to the number of traffic deaths on an annual basis, but the future is problematic because the number of planes in the sky is increasing rapidly. Boeing estimates that by 2015 there will be one plane crash per week worldwide.<sup>35</sup>

Air cargo carriers constitute a relatively small portion of the total air fleet, and large volumes of air cargo are carried in the cargo holds of passenger planes, so data on freight-related safety trends are difficult to separate from general aviation safety trends. However, a number of strategies being discussed by the Federal Aviation Administration (FAA) and the aviation industry are targeted at reducing air cargo crashes:

- **Coordinating aviation regulations on a global scale.** The FAA is harmonizing U.S. civil aviation regulations, practices, and procedures with those of the Joint Aviation Authorities of Europe, and with certification authorities in the Former Soviet Union, China, and other countries that manufacture aircraft. In addition, safety-related technical assistance are being provided to authorities around the world.
- **Monitoring hazardous materials.** The FAA estimates there were 50,000 daily shipments of hazardous materials on domestic passenger and cargo aircraft. Following the May 1996 ValuJet crash that killed 109 passengers and crew, the FAA reexamined its safety monitoring of “new entrant” carriers. It found no connection between the crash and a lack of agency oversight; however, the FAA has increased oversight of hazardous material shipments.<sup>36</sup>
- **Strengthening the requirements regarding collision avoidance equipment.** The FAA does not require aircraft carrying fewer than 10 passengers to have high-tech collision avoidance equipment, making most cargo planes exempt. The FAA and the air cargo industry are exploring the costs and benefits of extending the requirements to cover a larger proportion of the air cargo fleet.

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<sup>33</sup> *Ibid.*

<sup>34</sup> Air Transport Association, *Airline Handbook*.

<sup>35</sup> Don Phillips, “Aviation Group to Push Safety Agenda,” *Washington Post*, 12 February 1998.

<sup>36</sup> Barry Valentine, “FAA Works Hard to Improve Air Travel Safety,” *Miami Herald*, 9 May 1997. Available at <http://www.faa.gov/apa/intercom/1997/jun10/op-ed.htm> as of December 2000.

## ■ Implications for Freight Transportation Systems

The deregulation and safety trends suggest that the freight industry may observe several changes in the future.

### *Diminishing Returns from Economic Deregulation*

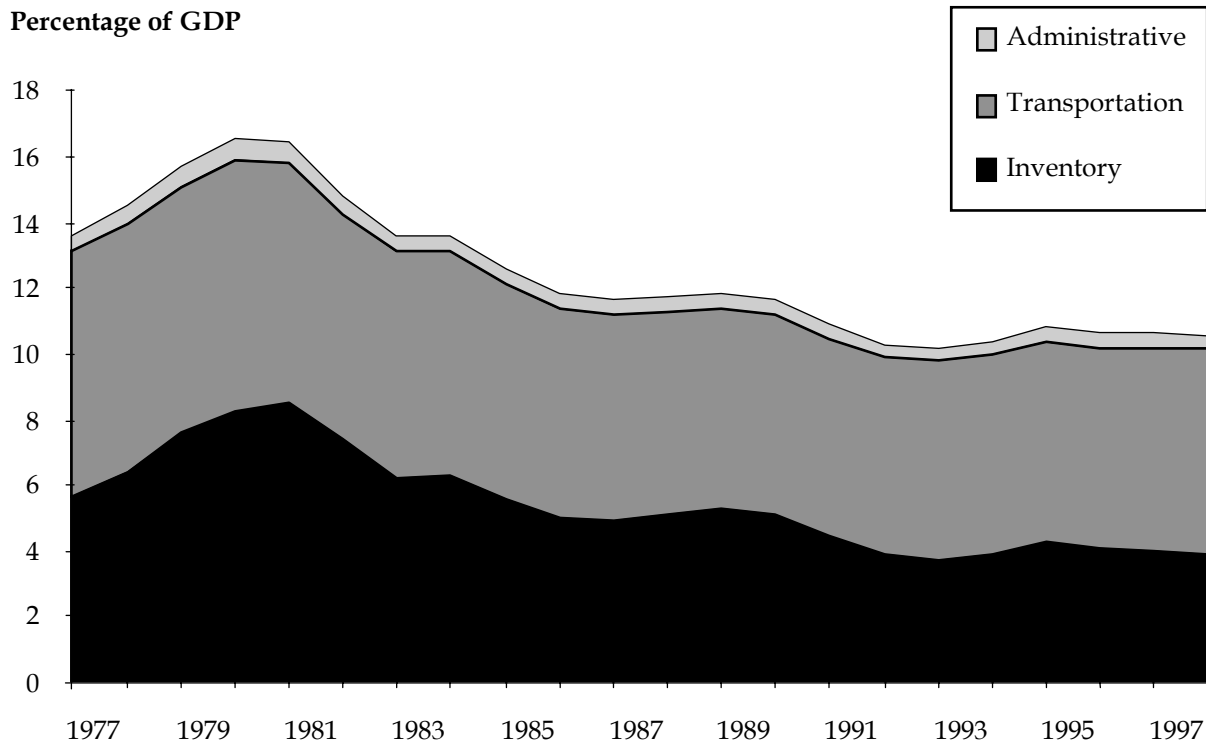
The freight transportation industry may see diminishing returns from economic deregulation over the next decade. The trends suggest, and many industry managers and observers agree, that transportation in the U.S. has reached the end of a regulatory cycle and realized most of the productivity gains from economic deregulation. There appear to be few opportunities to stimulate major improvements in freight transportation productivity through additional modal deregulation.

This observation appears to be borne out by the statistics tracking total logistics cost as a percentage of the Gross Domestic Product (GDP). Total logistics cost is the sum of business and industry expenditures for the movement of goods through supply chains and distribution networks and includes administration, transportation, and inventory carrying costs. These costs peaked at about 16 to 17 percent of GDP in the late 1970s and early 1980s, then dropped steadily through the early 1990s as shippers and carriers took advantage of deregulation to reduce costs (See Figure 5).

In recent years, total logistics costs have stalled at about 10 percent of GDP. The flattening of the curve suggests that the shippers and carriers have wrung most of the cost savings out of deregulation. Shippers are spending, proportionally, more on transportation today compared to 20 years ago. However, they are getting much more transportation for their dollar. Deregulation lowered transportation prices and improved quality, allowing shippers to substitute low-cost transportation (in the form of frequent, just-in-time deliveries) for high-cost inventory. The combination of lower transportation costs and reduced inventory carrying costs saved businesses and consumers billions of dollars.

If this interpretation of the logistics-cost trend is correct, then the deregulation well is dry, and the freight transportation industry must look beyond deregulation to maintain and improve its productivity.

**Figure 5. Logistics Expenditures and Gross Domestic Product**



Source: Cass/ProLogis 10<sup>th</sup> Annual State of Logistics Report, 1998.

### *Emergence of New Business Models*

New business models for the organization and operation of freight transportation services are emerging.<sup>37</sup> The new business models will constitute a significant change in the ownership, control, and technology of freight transportation. Deregulation triggered a massive restructuring of the transportation industry. The industry is still working its way through a period of intense market-driven mergers as carriers search for economies of scale and scope that will allow them to compete and survive in the larger national, North American, and global markets. The broad characteristics of the new business models that are emerging parallel the transformations taking place in the global automobile, banking, and telecommunications industries. The new business models are likely to be:

- **Consolidated.** The freight transportation firms or consortia that emerge from deregulation to compete in tomorrow's markets will be consolidated. The motor carrier industry has gone through several waves of mergers and reorganization and is relatively stable at the moment; but the capital-intensive railroads and the globally oriented ocean and air-cargo carrier sectors are still evolving. The railroads and

<sup>37</sup> See related theme papers in this series, especially "Freight Carriers: From Modal Fragmentation to Coordinated Logistics," and "Freight Systems: From System Construction to System Optimization," available at <http://www.ops.fhwa.dot.gov/freight/adfrmwrk/index.htm>.

ocean carriers appear headed for at least one more round of mergers within the next three to five years.

- **International.** The major freight transportation players will be international. U.S. firms have been slowly exploring international alliances. The emergence of strong European competitors such as Deutsche Post (the German postal service) as major integrated freight players will likely accelerate the formation of international mega-firms.
- **Asset-based.** Most of the firms will be asset-based. The trend toward gray ships and boxes – that is, toward use of shared containers and truck chassis, vessel-space chartering agreements, and expanded use of independent owner-operators in trucking world – will continue. Third-party logistics companies (3PL) – firms that match shippers and carriers – will play a significant role, but the major players will likely maintain control of critical assets to ensure control of costs and service quality.
- **Information-driven.** The dominant freight transportation consortia will be those that control the information systems. The successful business models will be determined more by who controls access to information regarding the availability of assets and the pricing of transportation services and less by who controls the assets. An initial competition between new dot-com companies, which have the technological knowledge to build e-business processes and e-commerce marketplaces, and established carriers, which have the industry experience, is underway now. Carriers are coming to realize that the firms or consortia that control information concerning freight demand and flows will likely control the allocation of business within the freight market.

### *Pressure for Fewer Crashes and Fatalities*

The freight transportation industry of the future will be safer. Despite the positive safety improvements since deregulation, public and government pressure will push the industry to further reduce crashes and fatalities. The pressure will come from changing social values, expectations, and growth. About 40,000 people will die on the highways this year. The FHWA and the National Highway Transportation Safety Administration estimate that if the current fatality rate is not reduced and vehicle-miles of travel increase at the current rate of 1.96 percent annually, approximately 60,000 people will die in 2015 – a 50 percent increase in fatalities.<sup>38</sup>

To reduce crashes and fatalities, government safety regulation will shift toward performance-based safety regulation. The federal and state governments no longer have the resources to set, monitor, and enforce detailed rules on equipment and operations. The growth in the numbers of carriers, equipment, and trips has far outstripped the government's enforcement budget and staff resources. To compensate, regulators are slowly moving away from rule-based safety enforcement toward performance-based safety regulation. Federal and state governments will continue to conduct inspections and enforce equipment and procedural rules to maintain a level playing field among carriers.

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<sup>38</sup> BTS, "The Changing Face of Transportation."

However, the outlook is for a safety regulatory regime that measures safety performance (focusing on crash, injury and fatality rates) and targets enforcement (increased inspections, progressive fines, and withdrawal of operating permits) at carriers with poor safety performance records.

To improve safety performance, carriers and the government will rely increasingly on technology. Carriers will apply technology to improve vehicle performance, diagnose system failures, and help drivers stay alert behind the wheel. Regulators will apply technology to monitor safety performance by expanding the airline flight recorder “black box” approach model to trucking and rail operations.

## ■ Issues for the Future

Deregulation has created a highly efficient, market-driven freight system with lower costs and increased responsiveness to shippers and consumers. But the diminishing returns from economic deregulation, the emergence of new business models, and the increasing pressure to reduce crashes and fatalities will generate a new set of issues.

### *Influence of Mergers and E-Commerce on Competition*

The ownership, control, and technology of freight transportation will change significantly in the next decades. A new era in freight transportation is beginning. The changes may rival those experienced with the emergence of the railroad industry in the mid-1800s, the trucking industry in the 1930s, and the aviation industry in the 1950s. Today’s mergers and e-technology may concentrate market power in a limited number of carrier alliances, 3PLs, or dot-com marketplaces, and could undo the competition resulting from economic deregulation. Several questions come to bear in light of these observations. Will cutthroat competition once again destabilize the freight transportation industry? Will abuses of market power where competition is absent open the door to price gouging and corruption? Will there be a need for new regulation to preserve competition under the new regime?

### *Government Role in Rail Productivity*

Railroads have made a spectacular comeback, but are not yet recovering their cost of capital. Solutions to achieving this goal are not at all obvious. Mergers, one of the primary tools used by the industry and policy makers to improving financial performance over the last three decades have become increasingly controversial. This controversy culminated with the recent issuance of new rules governing mergers by the Surface Transportation Board. It argued that mergers are no longer needed to improve the efficiency of the railroad system, and raised the bar needed for approval of new mergers. While the previous standard was one of “maintaining competition,” the new standard is “enhancing competition.”

Shippers, especially those who do most of their shipping by rail and those who became enmeshed in the dramatic service failures surrounding other mergers in recent years, cite the lack of direct or potential competition as the cause of poor service and excessively “high” rates. One potential remedy advanced by some shipper groups is “open access,” an

arrangement whereby another carrier or the shipper itself is granted authority to provide service over a line or to an industry served by only one carrier. The railroads regard the blanket application of open access – forced access from their point of view – with abhorrence, but many have used negotiated trackage rights agreements (e.g., business-to-business “open access” agreements) to solve specific problems, relieve bottlenecks, and meet specific regulatory requirements to preserve competition.

Recent discussions have opened regarding the possible need for public investment to address capacity and operational concerns in the nation’s rail system. After a hundred-year cycle of regulation and deregulation, the accepted wisdom is to allow the market to sort out railroad financing. But the traditional role of the federal government has been to finance freight improvements such as ports, canals, transcontinental railroads, interstate highways, and major airports. Between 1981 and 1995, the federal government increased funding to the states for rail freight planning and acquisition, rail facility construction, and rehabilitation. The Railroad Rehabilitation and Improvement Financing (RRIF) Program, under TEA-21, authorizes loans and loan guarantees for railroad capital improvements to state and local governments, corporations, railroads, and joint ventures that include at least one railroad. Many states now have made significant investments in short-line railroads. Congress and the states may be asked to consider capital investments to upgrade lines and eliminate bottlenecks on congested rail and highway corridors (possible candidates are the Mid-Atlantic Corridor between New York and Virginia, and the Chicago intermodal hub). Still an issue is the federal role in financing future rail freight improvements.

### ***Cost Impacts of Safety Regulation***

New safety technology and higher safety standards will be costly, but the issue is to what degree. The trucking industry sought changes to federal hours-of-service regulations to improve productivity, but the U.S. DOT’s initial proposal was rebuffed by the industry as being too expensive. Senior managers at J. B. Hunt Transportation, one of the nation’s largest and most innovative truckload carriers, calculate that the proposed hours-of-service regulations would cause a nine percent loss in driver productivity and a 13 percent loss in transit time. There are also concerns that regulations discouraging nighttime and weekend driving will expose more drivers and trucks to weekday traffic congestion thereby increasing the risk of truck-car crashes.

In today’s competitive and highly differentiated trucking industry, it will take considerable time and effort to sort out the economic costs and benefits of new safety regulations. The railroad and air cargo industries will soon debate similar but less extensive changes to hours-of-service regulations in their respective industries. More charged debates face industry and government efforts to advance positive train control systems, at-grade crossing protection systems, weigh-station electronic screening systems, and on-board driver-alertness monitors. Complicating the debates will be the lack of consistent measures of safety and safety impacts across modes.