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TRAILER-ON-FLAT-CAR SERVICE IN THE PERSPECTIVE  
OF COMPETITION FOR FREIGHT TRAFFIC

by

John Christy Davis

B. S. M. E., Purdue University

(1941)

SUBMITTED IN PARTIAL FULFILLMENT OF THE  
REQUIREMENTS FOR THE DEGREE OF  
MASTER OF SCIENCE

at the

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1956

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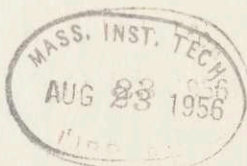
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DEWEY

32 Grantland Road  
 Wellesley Hills 82, Mass.  
 May 11, 1956

Professor L. F. Hamilton  
 Secretary of the Faculty  
 Massachusetts Institute of Technology  
 Cambridge 39, Massachusetts

Dear Professor Hamilton:

In accordance with the requirements for graduation, I herewith submit a thesis entitled "Trailer-On-Flat-Car Service in the Perspective of Competition for Freight Traffic."

I would like at this time to express my sincere appreciation to my senior advisor, Professor G. B. Tallman and the members of the committee, Professors M. A. Adelman and T. V. V. Atwater, Jr. for their thoughtful appraisal of the rough drafts and constructive suggestions that were of immeasurable assistance.

The author also wishes to thank those railroad executives who permitted him to impose on their time during the field interviews.

The original questionnaire data from Railway Freight Traffic was particularly helpful. The writer is especially grateful to Mr. Gardner C. Hudson, editor of the magazine, for the use of these data.

Sincerely yours,

Signature redacted

John C. Davis

Sewey (And. Mgm. T) Aug. 23. 1956



Abstract

TRAILER-ON-FLAT-CAR SERVICE IN THE PERSPECTIVE  
OF COMPETITION FOR FREIGHT TRAFFIC

by  
John Christy Davis

Submitted to the School of Industrial Management  
on May 11, 1956 in partial fulfillment of the  
requirements for the degree of Master of Science

At the conclusion of World War I, the railroads were a virtual monopoly. Only in those areas where water transportation was available did they face any competition, except among themselves.

Thirty-five years later, transportation has become a highly competitive industry. Travelers no longer depend solely on trains; many choose to drive their own automobiles and those that prefer not to drive have the additional choice of bus or airplane service. Shippers of freight are no longer obligated to patronize the railroads. Commercial motor carriers are available to transport many commodities that formerly moved exclusively by rail. In addition, the shipper may, if he so elects, purchase a truck and perform his own transportation service. If time in transit is of paramount importance, he may prefer to utilize the small, but growing, air freight services.

Inasmuch as 85 per cent of railroad operating revenues are derived from freight service, the writer has chosen to confine his study to an appraisal of competitive conditions in this area. Motor transportation, by virtue of its spectacular growth during the past ten years, has demonstrated that it is by far the most formidable of the railroads' competitors for freight traffic.

The railroads have sought to minimize the diversion of traffic to motor carriers by improvements in service and technological development. To the extent that regulatory policy will permit, railroad rates have responded to competitive pressures.

The most recently developed railroad service provides for the transportation of highway trailers on railroad flat car in lieu of conventional over-the-road transportation of the trailers between cities. Trailer-on-flat-car service has received increasing attention from all segments of the



transportation industry and is still in a state of development. The writer has elected to direct his particular attention to this aspect of railroad-motor carrier competition.

Although the thesis is essentially an appraisal of trailer-on-flat-car service, related aspects of rail-truck competition, particularly the regulatory policies of the Interstate Commerce Commission, have been discussed.

Data for the thesis were obtained from books, business and trade publications, and public documents. The original replies to a questionnaire sent to shippers by a business publication were also made available to the author. Additional data were obtained from field interviews with representatives of railroad management.

Based on his appraisal of available data, the writer has reached the conclusion that trailer-on-flat-car service will continue to grow and will ultimately make a significant contribution to the general profitability of railroad freight service. This conclusion is predicated on the assumption that regulatory policy will permit the economic advantages of trailer-on-flat-car service to be realized by the shipping public. This same assumption forms the basis for the writer's second conclusion that maximum attention will be directed toward the development of services that are provided by the railroads in their own trailers at rates that are competitive with those of motor carriers. The higher revenue potential of this type of service and the demonstrated apathy of truck operators toward contemporary cooperative rail-truck services are the principal reasons for these conclusions. A change in public policy that imposed higher charges for use of the highways by motor carriers would, however, make cooperative services more attractive to the trucking industry.

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## CHAPTER I

### THE PROBLEM

Transportation is the movement of persons or property from one place to another. The significance of distance is measured, not by mileage, but by the time and cost that must be expended in overcoming it. Through improvements in transportation mechanisms man has constantly sought to minimize both the cost and the time required to overcome the obstacle of distance.

The history of the various forms of transportation is characterized by a never ending struggle. The early railroads demonstrated their superiority as a less expensive and/or less time consuming method of transportation than the existing stage coach and canal companies. As the older methods of transportation declined in importance, the railroads enjoyed both the privileges and attendant restrictions of a monopolistic public utility.

The railroads' position as the primary medium of transportation has been challenged by the development of both the automobile and the airplane. With the exception of the period during World War II when rationing of gasoline and tires restricted the use of private automobiles and commercial motor vehicles, the railroads have been faced with a relative decrease in demand for their passenger services. Present traffic, which is well above the pre-war levels,

represents a smaller proportion of the total intercity passenger travel. The rapid development of commercial aviation in the post-war period has attracted an increasing number of patrons away from rail service.

The decline of the railroads' share of the total volume of intercity freight traffic is of greater concern to railroad management because approximately 85 per cent of railroad revenue is derived from this source. The railroads' share of intercity freight transportation service has declined from 68.6 per cent in 1946 to 49.5 per cent in 1954.

Objectives

In this thesis the writer has directed his attention to the growth of motor truck transportation, its effect on railway freight traffic, and the competitive action that has been taken by the railroads to meet this competition. Particular attention has been directed to the development of trailer-on-flat-car service and the potential contribution that it may make to the aggregate competitive effort.

The development of motor truck transportation enabled industries to grow and prosper in areas that were not served by railroads. Even in areas where railroad service was available, shippers were quick to recognize the inherent



advantages of the motor truck as a vehicle ideally suited to the transportation of small quantities of goods for short distances.

Railroads believed that their ability to produce transportation in quantity at a minimum cost would assure their continued predominant position as a freight carrier. Truck operators, apparently less impressed with economic theory than with their ability to provide a service for which there proved to be a growing demand, ultimately extended their operations to include commodities that had not been considered amenable to transportation by truck. At the same time the scope of truck operations was enlarged to provide long distance transportation in addition to short haul service.

Competitive actions taken by the railroad industry to minimize the diversion of traffic to motor carriers include improvements in service, technological developments, and competitive pricing of transportation service. One type of service improvement has been the use of motor trucks as a supplement to basic rail services. This method of coordination of the two types of transportation requires the transfer of freight between truck trailers and freight cars at major terminals.

Trailer-on-flat-car service, the most recently developed method of integration of rail and motor carrier

freight service, has received increasing attention from the transportation industry, shippers, and the general public. This coordinated service, which provides for the transportation of the entire highway trailer on a railroad flat car in lieu of the conventional method of over-the-road haulage, eliminates the need for transfer of freight between railroad cars and highway trailers.

This service has been adopted in varying forms by approximately 35 railroads and is currently available in most major cities except in the Southeastern part of the country. By whatever name it has been called, "Piggy-back," "Trailer-On-Flat-Car," "TrucTrain," "Trailiner," Tofcee, to name a few, this practice has apparently captured the imagination of writers, investors, labor groups, the transportation industry and the public.

The purpose of this thesis is not only to recount the history of this service as chronicled in business and popular publications, but to attempt an objective analysis of the potential contribution of trailer-on-flat-car service to the competitive position of the railroads.

### Scope

This thesis is directed toward an appraisal of trailer-on-flat-car service, but related aspects of rail-truck



competition have, of necessity, received at least passing attention.

Many of the interpretations of the National Transportation Policy by the Interstate Commerce Commission have been considered by the railroad industry to show undue concern for the effect of proposed railroad rate reductions on the financial success of competing forms of transportation. No attempt will be made in this thesis to resolve this dispute; however, a brief summary of the recommendations of the President's Advisory Committee on Transport Policy And Organization has been included. The report of this committee recommended a modification of regulatory statutes to reduce the economic regulation of transportation to a minimum consistent with public interest and to endorse greater reliance on competitive forces in transportation pricing.

The passenger service deficit has been a source of controversy and growing concern for many years. A thorough analysis of this problem, particularly in regard to its effect on the level of freight rates, is beyond the scope of this thesis.

#### Sources of Thesis Information

The rapid growth of trailer-on-flat-car service has occurred during the past two years. Consequently, published



data on this subject is unavailable except in business and popular publications.

An insight into the thinking of industrial traffic managers was made possible through the courtesy of Mr. Gardner C. Hudson, Editor, Railway Freight Traffic. Original data that were used by Mr. Hudson in the preparation of a magazine article were made available to the writer. These data consisted of questionnaires that were sent to a group of industrial traffic managers for the purpose of determining their reaction to trailer-on-flat-car service.

In addition, interviews were arranged with a number of executives of Eastern railroads who made a substantial contribution to the writer's understanding of the "growth pains" of trailer-on-flat-car service.

#### Thesis Material Presentation

Chapter II of the thesis is devoted to a brief chronology of the development of railway freight traffic competition. Graphs to indicate the relative and absolute growth of the various modes of transportation are included in this chapter.

Chapter III is a review of the action that has been taken by railroad management to meet the competition of

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motor trucks. This chapter also includes a brief discussion of the effect of Interstate Commerce Commission interpretations of regulatory statutes on the growth patterns of railroad and truck transportation.

In Chapter IV, the reader is introduced to the most recently developed competitive service, the transportation of highway trailers via railroad flat cars. Technological developments are described and the impressions of industrial traffic managers and railroad executives as to the present and future role of trailer-on-flat-car service are included.

The concluding remarks, contained in Chapter V, reflect the author's impression of the potential value of trailer-on-flat-car service to the railroad industry. Its value in terms of the railroads' share of revenue and volume of traffic is presented to show the effect of varying rates of diversion of present or future motor carrier traffic to piggy-back service. It is hoped that this thesis, by attempting to determine the theoretical share of revenue potential of trailer-on-flat-car service, will be of assistance in evaluating the desirability of further development of this service by the railroad industry.



## CHAPTER II

### RAILWAY FREIGHT TRAFFIC COMPETITION

#### The Development of Railroads and Railroad Regulation

The introduction to the United States of railroad transportation that was dependent on steam locomotives rather than horses as a source of power established the foundation of our present system of railways. Inland transportation had previously been provided by canal boats, river boats, and, in areas inaccessible to navigable rivers and canals, by stage coaches and wagons. Cities located along the Atlantic seaboard enjoyed the advantages of transportation offered by sailing vessels.

During the years 1830 to 1850 development of railroads was confined to lines that were intended to serve a limited area, providing transportation between nearby towns that had developed strong commercial relations. In other instances they served as feeders to the canals and other waterways, since it was supposed for some years after the first railroads were established that they would develop as a supplementary means of transport rather than a competitive mode of transportation.<sup>1</sup>

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<sup>1</sup>Marvin L. Fair and Ernest M. Williams, Jr., Economics of Transportation, (New York: Harper and Brothers Publishers, 1950), p. 39.



By 1850 the technical success of the railroad was evident and a bright future was assured. Public skepticism, fear, and suspicion that had confronted the early projects had been dispelled. Opposition from established transportation enterprises had been overcome when the railroad proved to be a superior mode of transport. Capital to finance the expansion and development of railroads was forthcoming from both domestic and European investors. During the next forty years America was the scene of the most rapid and enterprising expansion of railroads that the world has ever seen. The decade of greatest expansion was during the 1880's, but new lines were constructed and existing systems expanded until a peak mileage of 254,037 was reached in 1916.<sup>2</sup>

During the period of expansion, 1850 to 1890, the railroads enjoyed a period of comparative freedom from regulation. They were hailed as great benefactors as their expansion brought much needed transportation service to isolated communities and areas. Public support was forthcoming in the form of grants of land, terminal properties and other facilities, and tax exemption privileges.

Except for some early attempts to enact legislation to protect canal systems from railroad competition,

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<sup>2</sup>D. Philip Locklin, Economics of Transportation, (3d. ed.; Chicago: Richard D. Irwin, Inc., 1947), pp. 89-90.

few attempts were made to control railroad rates. Commissions had been established in a number of the New England states during the 1830's and 1840's, but their powers had had been confined to the enforcement of safety regulations and the investigation of the affairs of railroad corporations to determine whether charters had been violated. They had no power over rates.<sup>3</sup>

The decade of the seventies saw the beginning of public activity to establish positive control over the railroads, first by states and then by the federal government. Farmers, resentful over the worthlessness of investments that some of them had made in railroad securities and over the high rates that they were compelled to pay in order to ship their crops to market, joined in a popular uprising known as the "granger movement." As a result of their efforts, regulatory legislation was passed by some of the agricultural states that became known as the "Granger Laws."

As a result of the panic of 1873 and a vigorous campaign waged by the railroads to convince the public that the Granger legislation was a mistake and was harmful to business and agricultural interests, all of the laws, except in Illinois, were repealed. However, the Granger legislation

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<sup>3</sup>Ibid., p. 203.



and accompanying litigation established the basis for effective positive control of railroads in the United States.

After the period of distress of the seventies had passed, a number of states, including the granger states, set up mandatory control of the railroads which the state commissions extended to include interstate as well as intrastate commerce. However, the Supreme Court, in the Wabash case of 1886, ruled that the commerce clause in the constitution granted Congress the exclusive right to regulate interstate commerce.<sup>4</sup>

The first major act to regulate commerce was signed by the President in 1887 and has remained the foundation statute of what is now the Interstate Commerce Act, which defines the jurisdiction of the Interstate Commerce Commission over domestic surface transportation. This is particularly true of Part I of the Act relating to railroads and pipelines. Part II relating to motor carriers was added in 1935; Part III relating to water carriers was added in 1940; and Part IV relating to freight forwarders was added in 1942.

Subsequent legislation such as the Hepburn Act of 1906 and the Mann-Elkins Act of 1910 made the Interstate

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<sup>4</sup>Fair and Williams, op. cit., pp. 457-62.



Commerce Commission a powerful agency. Until December, 1917, when, by proclamation of President Wilson, private operation ceased and the government took over the railroads for the duration of World War I, regulation of the railroads by the Commission had been largely restrictive. The object of laws passed during the 1900's had been to protect the public by adequate restriction of railroad earnings and discriminatory practices. The larger objective of an adequate and efficient transportation system was pushed into the background.<sup>5</sup>

When the railroads were returned to private management on March 1, 1920, the deficiencies in the railroad system that had become evident during the war time emergency awakened the interest of Congress and the public to the realization of the necessity for an adequate transportation system.

The Transportation Act of 1920 discarded the restrictive philosophy of regulation and adopted one which gave primary consideration to the development of an adequate and efficient transportation system. This new legislation recognized the need of adequate earnings by the carriers if they were to continue to attract capital to finance improvements. Economies inherent in many of the cooperative

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<sup>5</sup>Ibid., pp. 458-73.

agreements that had been forbidden by the Act of 1887 were recognized and permitted, subject to Commission approval.

For the first time the Commission was given an affirmative and tangible criterion in rate determinations. This rule stated in effect that "the Commission shall initiate, modify, establish or adjust such rates so that the carriers as a whole will, under honest, efficient and economical management and reasonable expenditures for maintenance of way, structures and equipment, earn a net railway income equal, as nearly as may be, to a fair return upon the aggregate value of the railway property .... used in the service of transportation." To implement this directive the Act provided that the federal government would recapture one-half of all net income above a fair rate of return on a value to be determined by the commission.<sup>6</sup>

Had the railroads continued to enjoy a relatively inelastic demand for their services, such protection might well have been necessary. That this provision was superfluous is indicated by the fact that in no single year since 1920, except for the war years of 1942 and 1943, have the railroads as a whole approximated the rate of return of 5-3/4 per cent to which the commission declared them to be entitled.<sup>7</sup>

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<sup>6</sup>Ibid., pp. 474-80.

<sup>7</sup>Ibid., pp. 600-01.



Development of the Motor Transport Industry

As railroads developed during the first half of the nineteenth century, public interest in highways and canals diminished. Access to a railroad was considered vital to the growth of communities, and farm acreage that was not located within a few miles of a railroad was of little value. For over fifty years the public floundered in mud roads, but the growth of population and increase in commerce that had occurred demonstrated the need for adequate roads in the vicinity of the growing cities. Bicycle manufacturers and farmers anxious to secure better access to market centers and railroad stations gave added impetus to the renewed interest in adequate highways.

The development of the automobile in the early years of the twentieth century and its growing popularity and use by families of moderate incomes emphasized the inadequacy of the national system of highways. The Federal Aid Road Act of 1916 marked the beginning of federal grants-in-aid to states that was to lay the foundations of a new and great transportation mechanism that would rival the railroads in capital investment and commercial importance.

After a number of years of improvement of the private automobile, the bus and truck appeared. The small four wheel truck of World War I was a crude and slow vehicle



compared to the present seven axle, 26 wheel tractor-truck, semitrailer and trailer combinations that are currently operated by motor carriers in Western states where vehicles of this size are sanctioned by state laws.

There are three basic types of motor carriers of property, namely, (1) common carriers, (2) contract carriers, and (3) private carriers.

The motor common carrier is defined by statute as any person which holds himself out to the general public to engage in the transportation of property by motor vehicle over regular or irregular routes in interstate or foreign commerce. A common carrier is granted a certificate of public convenience and necessity by the Interstate Commerce Commission which constitutes its operating authority.<sup>8</sup> It is required to publish rates or tariffs and must charge all customers identical rates for identical services. With the exception that motor common carriers may exclude certain commodities from their tariffs, the service that they perform is similar to that provided by railroads.

The contract carrier may be defined as any person that, under individual contract, engages in transportation for compensation by motor vehicle over any route in interstate

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<sup>8</sup>Charles A. Taff, Commercial Motor Transportation, (Revised edition; Homewood: Richard D. Irwin, Inc., 1955), pp. 107-8.

or foreign commerce. The interstate contract carrier's operating authority is contained in a permit issued by the Interstate Commerce Commission.<sup>9</sup> The actual charges that are made for contract carrier service are a matter of individual contract and are established by agreement between the carrier and its customers. It is, however, required to file minimum rates with the Interstate Commerce Commission and is not permitted to charge less than the published minimum rates for its services.

A private motor carrier is one that operates vehicles in the manufacture, distribution or storage of goods. Since the operation is confined to the transportation of goods of the owner, compensation is not in the form of rates or charges for transportation but in the contribution of the service to the general profitability of the business. A private carrier requires no operating authority from the Interstate Commerce Commission, since it is not subject to economic regulation.<sup>10</sup>

In addition to the exemption of private carriers from economic regulation, the Interstate Commerce Act exercises no authority over the rates of for-hire motor carriers that confine their operations to the transportation of

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<sup>9</sup>Ibid., pp. 109-14.

<sup>10</sup>Fair and Williams, op. cit., p. 75.



commodities that are exempted from such regulation by law. Exempt commodities include fish, livestock, agricultural products, and the exemption extends to vehicles used in the distribution of newspapers or in the collection and delivery of goods incidental to transportation by aircraft or railroad.<sup>11</sup>

The development of all forms of motor transportation is dependent on the availability of a highway system of ample capacity to accommodate the traffic. Commercial motor vehicles make payment for their use of the public highways through license fees, fuel taxes, certificate fees, mileage taxes, and the like. Sharp controversy has arisen in regard to the adequacy of the payments that heavy motor vehicles make for their use of the public highways as a place of business. Railroads and many highway authorities contend that the damage that heavy motor vehicles inflict on highways exceeds the contribution that their tax payments make toward the maintenance and expansion of the highway system.<sup>12</sup> Many theories on the equitable distribution of highway user costs have been developed, but no single solution has been advanced that has met with universal approval. Congestion that results from slower commercial vehicles has become an ever increasing source of irritation to private

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<sup>11</sup>Taff, op. cit., pp. 114-20.

<sup>12</sup>David I. Mackie, The Highway Freighter Problem, (Washington: Association of American Railroads, 1950), pp. 22-29.



motorists, since the highway system is, in many cases, inadequate for traffic that has been increasing rapidly since the end of World War II. A study of the various theories of equitable distribution of highway user charges between commercial and private vehicles and an analysis of the present inadequacy and future requirements of our highway system is beyond the scope of this thesis.

#### Development of the Inland Waterway Transportation System

Development and improvement of the inland waterways lay dormant during the latter half of the nineteenth century. The revival of public interest and the development of federal activity in the improvement of waterways has been attributed to: (1) a general belief that waterways constitute a vital resource and that water transportation is inherently cheap transportation; (2) aid to local industry in getting favorable access to markets; (3) restraint of railroad rate practices; and (4) political advantage to Congressional representatives who obtained appropriations for their districts. Each congress, after 1905, with the exception of the years during World Wars I and II, outdid its predecessor in voting appropriations for waterway improvements.

Most vessels operating on inland waterways, the Great Lakes and in coastwise shipping are private carriers transporting the products or raw materials of their owners. Some operate as private carriers in one direction and as contract carriers on the return movement. Most inter-coastal vessels and about ten per cent of those operating on the Great Lakes are common carriers.

The economic advantage of improvements made on the Great Lakes, at seaboard harbors, and in the short coastwise and inter-coastal canals is seldom questioned. However, sharp controversy has arisen over the expenditures for inland waterways. The railroads contend that not only do they construct and maintain their own right-of-way, but the taxes that they pay into the general fund are a contribution to the subsidy to inland water carriers. Efforts to have tolls charged to users of inland waterways have been in vain.<sup>13</sup>

#### Development of Petroleum Pipe-Line Transportation

Petroleum pipe-lines were introduced in 1872 as gathering lines from the oil wells of Western Pennsylvania to nearby storage tanks. Improvements of technology and expansion of the petroleum industry stimulated the development of modern pipe-line systems that have demonstrated their

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<sup>13</sup>Ibid., pp. 88-102.



greatest growth in the last thirty years. Pipe-lines are no longer confined to gathering lines in the oil fields, but, as of 1947, extended 149,700 miles and include gathering lines, crude trunk lines and finished product trunk lines. In addition, there are over 32,000 miles of natural gas pipe-lines that do not compete directly with other forms of transportation. Indirectly they do compete because the gas that they transport is used as substitute fuel for oil or coal that could have been transported by other methods.

Some pipe-lines are common carriers, taking shipments of petroleum and petroleum products from the public at large. However, most of the large systems are owned by petroleum producing and refining companies and transport the products of competing companies as well as those of the parent company.<sup>14</sup> Natural gas pipe-lines are not carriers for any account but their own, since they purchase the gas that they transport, and re-sell at or near the point of use.

#### Development of Air Freight Transportation

Commercial Airlines developed as carriers of air mail, passengers and air express. Until very recent post-war years, air freight service (except air express) was not

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<sup>14</sup>Ibid., pp. 103-07.



offered. Since the end of World War II, all certificated trunk line carriers, some feeder lines and many contract and private carriers have conducted air freight operations.

Air freight has been utilized for shipment of products that demand more rapid delivery than that available by surface carriers. Style goods, flowers, choice fruits and vegetables have been among those items shipped by air. Although current volume represents less than one per cent of intercity freight traffic, the potential impact of air freight competition on the revenues of surface carriers has not been fully realized. The potential economic effect on the inventory practices of manufacturers and merchants that use it should be substantial.<sup>15</sup>

#### Growth Patterns of the Freight Carrier Industry

During the 17 year period since 1939, the pattern of growth of the freight carrier industry has varied with the general economy of the nation. As the principal methods of transportation of raw materials, railroads and water carriers have experienced greater declines in traffic during periods of reduced industrial activity than have motor carriers. For example, in 1954 the dip in industrial activity hit rail and water carriers rather sharply.

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<sup>15</sup>Ibid., pp. 273-275.

Railway ton-miles showed a decrease as compared to the previous year of 9.93 per cent; water carrier carriers showed a decrease in ton-miles of 14.3 per cent during the same period. Motor carriers, on the other hand, showed a decrease of but 1.17 per cent during the same period, since retail and wholesale consumption remained fairly stable and did not reflect the reduction in heavy industrial production.<sup>16</sup>

During World War II, the railroads were called upon to handle the major share of the additional traffic burden. During 1944 railroad freight traffic reached a peak volume of 747 billion gross ton-miles, more than double their pre-war volume. Since that time, rail freight volume has been gradually decreasing, although it is still well above the 1939 level. As illustrated in Figure 1, truck traffic levelled off during the war, largely as a result of the rationing of gasoline and tires. During the last nine years truck traffic has expanded to the point that motor carriers have become the second largest carrier of freight. The volume of traffic handled by water carriers and pipe lines increased during the war and has expanded during the post-war period.

Since 1939, the volume of intercity freight traffic has more than doubled. Although the railroads received

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<sup>16</sup>U.S. Interstate Commerce Commission, 69th Annual Report, (Washington: Government Printing Office, 1956), p. 29.



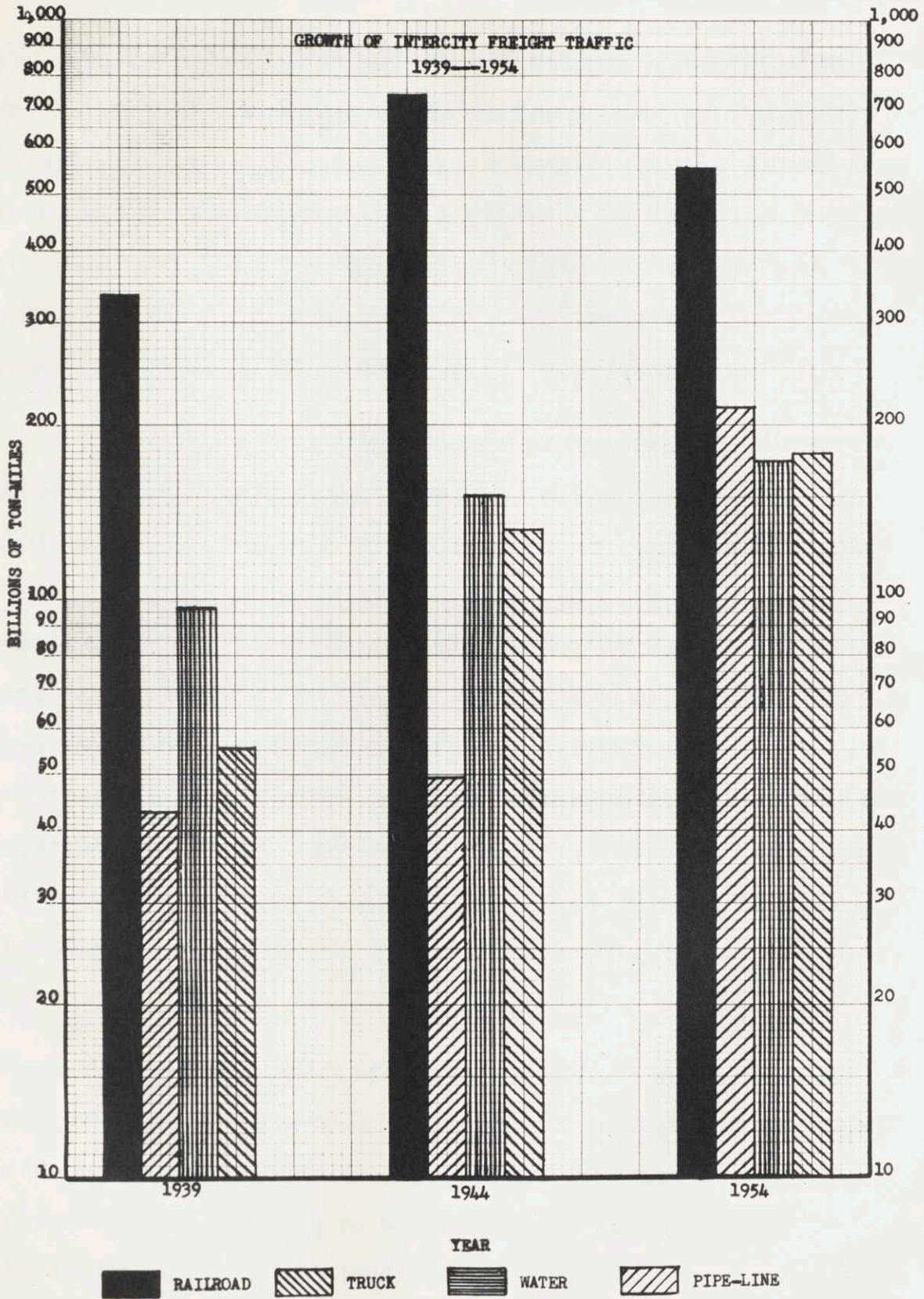


FIGURE 1

the largest share of the increased volume of traffic, the development of competing forms of transportation, particularly motor trucks, has limited their relative growth to a 63 per cent increase over 1939. The relative growth of motor trucks at 293 per cent, pipe-lines at 200 per cent and water carriers at 86 per cent reflects the increasing importance of these methods of transportation.<sup>17</sup>

One measure of the overall effectiveness of the marketing and sales activities, the technological development and the production efficiency of an individual company is the extent to which the company shares in the market available for its product. Railroads, as individual companies within an industry, may improve the quality of their service to attract traffic to their lines from other railroads and from other means of transportation. However, regardless of their competitive effectiveness as individual companies, their record as an industry indicates that a declining portion of the intercity freight traffic has been transported by rail in each of the post-war years.

A comparison of the relative shares of intercity freight traffic, as distributed between the major carriers, is found in Table I in the appendix. The railroads' share of the traffic since 1946 has decreased at an average annual rate of 1.9 per cent. There is some indication

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<sup>17</sup>George P. Baker and Frank A. Smith, "A New Era In Competitive Transportation," Modern Railroads, November, 1955.



that the downward trend has tended to flatten out since 1953. Whether this apparent levelling off is a temporary phenomena or is an indication that the period of major adjustment has been completed cannot be determined from available data. An eventual stabilization is anticipated when each type of carrier is being utilized for the type of traffic to which it is best adapted.

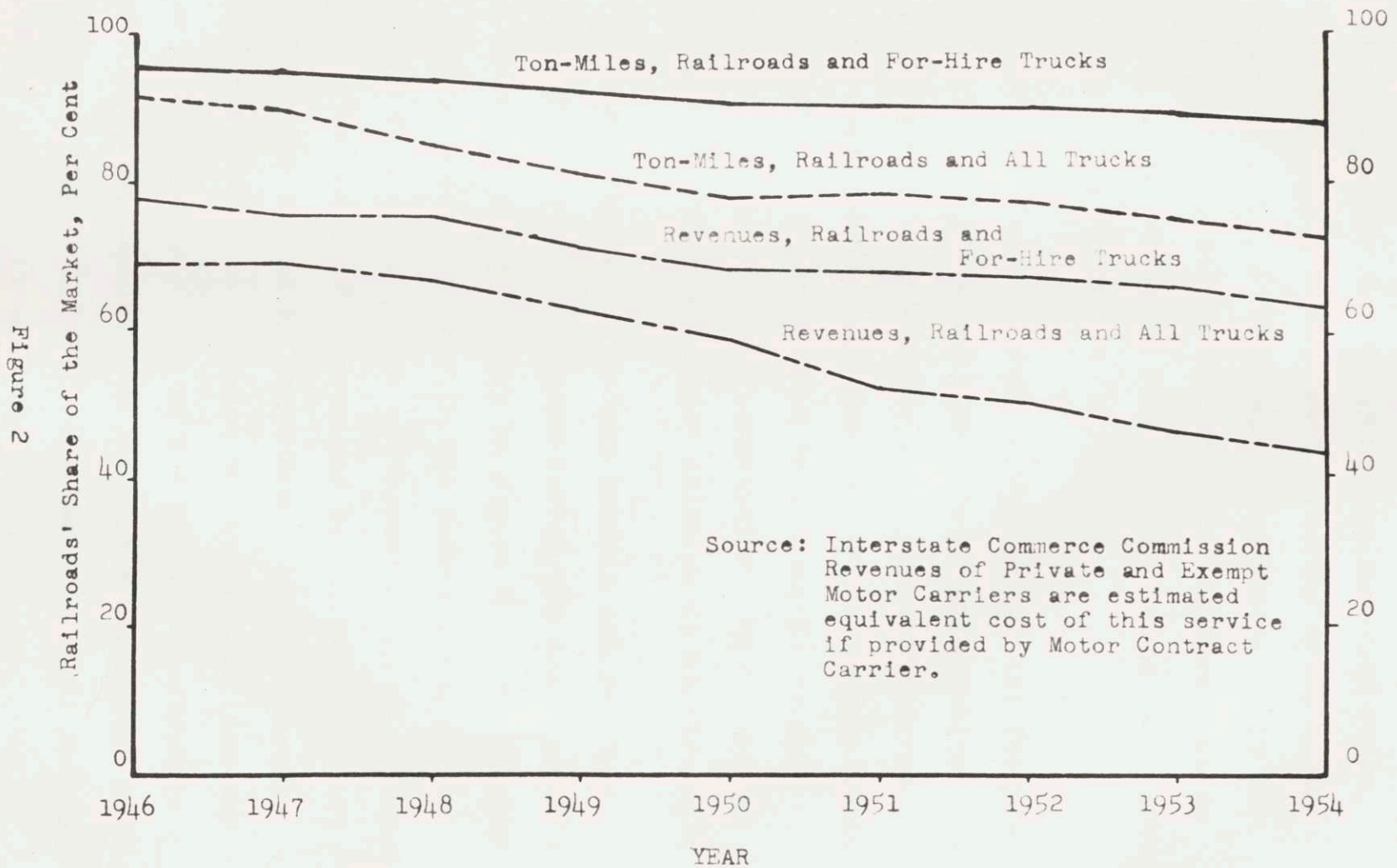
In this thesis, primary attention has been focussed on the development of motor carriers as competitors for freight traffic. The effect of truck competition on the railroad industry is not limited to a comparison of total ton-miles transported by each type of carriage, but must include an appraisal of the average revenue that each carrier receives for performing its services. During 1954, the average revenue per ton-mile was 5.6 cents for class I motor common carriers and 1.4 cents for railroads.<sup>18</sup>

The disparity in revenues is not an indication of the average rates of the two types of carriers, but is an indication of the type of traffic that each has been able to attract. This loss of better paying traffic to competitors, and the threat that the trend will continue, is particularly significant when one examines the existing railroad rate structure. Railroad rates were generally based on the "value of service" concept, which in practical application provided lower rates for raw materials and higher rates

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<sup>18</sup>I.C.C., 69th Annual Report, op. cit., pp. 27-30.

DISTRIBUTION OF FREIGHT TRAFFIC AND REVENUES  
BETWEEN RAILROADS AND TRUCKS





for the finished product. In addition, railroad rates, measured on a ton-mile basis, were lower for goods moving a long distance than for identical commodities moving a shorter distance. These rates minimize the disadvantage that distant producers faced in competing in the same market with goods produced in the vicinity.

Therefore, the rate structure, through its failure to reflect the actual cost of providing transportation service, encouraged the diversion of higher rated items or those moving comparatively short distances from railroad to motor truck. The lower rated bulk commodities have been more susceptible to water competition, which, unlike motor truck transportation, is not universally available.

The distribution of freight traffic and revenues between motor trucks and railroads during the post-war years is illustrated graphically in figure 2. The importance of private motor carriers in the post-war era is revealed by the comparison of the railroads' share of combined ton-miles of freight service provided by railroads and all motor carriers and a similar comparison that excludes the contribution of private and exempt carriers. In 1946 the railroads provided 91 per cent of the total rail-for-hire motor carrier ton-miles and 77.8 per cent of the total rail-all truck ton-miles. By 1954 railroads were still hauling

almost 87 per cent of the for-hire traffic but handled only slightly in excess of 72 per cent of the total when private and exempt carriers were included.

The decline in the railroads' share of freight revenue of land surface carriage has been more severe than the decline in traffic, a reflection of the diversion of higher rated commodities to trucks. The decline in railroad share of traffic between railroads and for-hire trucks has averaged approximately 1 per cent annually since 1946, but the railroads' share of the revenue has declined at almost twice that rate.

The motor truck has made possible the development of areas that were served by no other means of transportation. Locations along railroad tracks or waterfronts are no longer essential to many industries that are now largely dependent upon motor carriers.

The competitive action that has been taken by the railroad industry is examined in chapter III of this thesis. Advances in technology, improvement of service, and competitive pricing of transportation service and the effectiveness of these efforts are analyzed therein.

The heart of the thesis, chapter IV, examines the potential effectiveness of the most recently developed competitive tool of railroad management, trailer-on-flat-car



service. Whether provided by railroad owned trailers or through cooperative arrangements with motor carriers, this service has provided railroad management with a means of serving the customer, who, because of his location away from rail facilities, had come to rely almost entirely on motor truck service.

## CHAPTER III

DEVELOPMENTS WITHIN THE RAILROAD INDUSTRY  
TO MEET MOTOR TRUCK COMPETITION

In this chapter, the writer will attempt to review the steps that have been taken by the railroad industry to meet the competition of motor trucks. These efforts have been directed toward technological development, service improvement and competitive pricing of transportation service. Coordination of railroad and highway services is discussed in this chapter as one aspect of service improvement. The more recently developed integration of truck and rail service, the transportation of highway trailers on railroad flat cars in lieu of the conventional over-the-road haulage between cities is discussed in Chapter IV.

This analysis will attempt no study of competitive actions that have been directed toward water carriers and petroleum pipe-line transportation. These services are limited to either those areas that are contiguous to navigable waterways or to the transportation of liquid petroleum products. Motor trucks, on the other hand, provide service to every city and industry, many of which, because of location away from rail lines, must rely on trucks for all transportation service. It has been estimated that approximately one-half of the tonnage currently moving by truck would have



moved by rail, if distribution of traffic between trucks and trains had remained at pre-World War II levels.<sup>1</sup>

### Service Improvements

Two reasons for shipper preference for motor carrier as opposed to railroad freight service are the completeness and speed of the service. Motor trucks, from their inception, offered shippers a service that began at the shipper's dock and terminated at the place of business of the consignee. Time in transit, particularly where distances were comparatively short, was less than that obtainable by rail shipment.

Railroad service was traditionally a station-to-station or siding-to-siding service. Delivery and pick-up of less-than-carload shipments was made by local drayage companies at the expense of the shipper. Carload freight was, and still is, loaded or unloaded by the shipper and the consignee at private industrial sidings or at public "team tracks" that are accessible to motor vehicles.

Pick-up and delivery of less-than-carload shipments was not generally provided by the railroads prior to the 1930's. Shippers and consignees that had private sidings

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<sup>1</sup>Jervis Langdon, Jr., "Competitive Rate Making Under The Interstate Commerce Act," Public Utilities Fortnightly, September 29, 1955.

adjacent to their places of business, however, were afforded a service that was comparable to pick-up and delivery through "trap car" or "ferry car" service. These cars were placed on industrial sidings, loaded by the shipper, and transferred to the railroad freight house where the contents were transferred to freight cars that were being loaded with l.c.l. shipments for various destinations. Delivery to the consignee was accomplished in a like manner if a private siding was available. In the absence of such facilities, the receiver of the shipment was required to provide transfer from the freight house to his place of business.

"Trap car" service was time consuming, but, although it afforded the customer a saving in local drayage charges, was not particularly effective as an alternative to the faster motor carrier services. About  $12\frac{1}{2}$  per cent of all l.c.l. tonnage was given collection and delivery by "trap cars" in 1932.<sup>2</sup>

Limited pick-up and delivery of certain classes of merchandise had been provided by the railroads serving Baltimore in 1867. Other similar services were inaugurated in 1883 at Washington, D.C., in 1916 at St. Louis and in 1918 in New York City.<sup>3</sup>

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<sup>2</sup>Locklin, op. cit., p. 929.

<sup>3</sup>Fair and Williams, op. cit., pp. 267-68.



It was not until 1931, that pick-up and delivery service, as an experiment conducted by Southern and Western railroads, was utilized as a competitive effort to regain traffic lost to motor trucks. Initial success of these early services foreshadowed general adoption by the railroads in 1936. The service was provided for l.c.l. shipments without additional charge, regardless of length of haul. However, Eastern railroads established a system of charges in 1938 ranging from 5 to 10 cents per hundred pounds when the service was provided.<sup>4</sup>

With pick-up and delivery service available from either truck lines or railroads, the time in transit afforded small shipments became comparable. The greater advantage of the motor carrier in this respect was most evident where distances involved were less than 500 miles. Most of the longer time in transit for rail shipments was a result of the time required to switch merchandise cars from freight yards to station platforms rather than from a lower over-the-line speed. Instances of delay in handling of less-than-trailerload shipments by motor carrier are not uncommon and are a mutual problem confronting both rail and motor carrier managements.<sup>5</sup>

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<sup>4</sup>Locklin, op. cit., p. 630.

<sup>5</sup>Rogers, R. F., Freight Movement And Its Control In The Trucking Industry, M.I.T. Thesis, 1948, pp. 262-83.

Railroad pick-up and delivery service for l.c.l. shipments did not provide an adequate substitute for truck service if the size of the shipment was equivalent to a full load for a highway trailer. If shipped by rail such a shipment would be a less-than-carload shipment and would require the same time consuming rehandling as a shipment of much smaller size. On the other hand, a motor carrier could depart from the shippers dock and move directly onto the highway. Many shippers that had found railroad carload service to be adequate for their needs were attracted to truck service in order to obtain trailer load rates on shipments that were not large enough to meet the minimum weight requirements that were applicable to carload rates. Minimum weights that apply to trailerload shipments vary from 40 per cent to 100 per cent of the rail carload minimum, depending on the density of the commodity and the capacity of trailers in use by individual motor truck lines.<sup>6</sup>

Concurrent with the introduction of pick-up and delivery service by the railroads was the inauguration of high speed merchandise freight trains. These trains frequently handle carload as well as less-than-carload merchandise shipments and provide overnight service over routes up to 500 miles in length. The trend toward faster freight

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<sup>6</sup>Taff, op. cit., pp. 393-95.



service has continued; a recent sampling of major railroads indicated contemporary schedule changes that have reduced time in transit of freight trains from 15 to 30 per cent.<sup>7</sup>

In addition to those freight schedules that have been reduced for particular train movements, a general acceleration of freight service has occurred, largely as a result of the replacement of steam locomotives with diesel-electric locomotives that require less servicing enroute. The average speed of freight trains has increased from 16.0 m.p.h. in 1946 to 18.6 m.p.h. in 1955. During this same period, utilization of diesel-electric locomotives has increased from 7 per cent to approximately 85 per cent of freight service gross ton-miles.<sup>8</sup>

Some railroad managements recognized the advantages of motor trucks as a complement to their rail freight services and organized motor carrier subsidiaries. Those lines that had the foresight to engage in motor truck operations prior to the passage of the Motor Carrier Act of 1935 were permitted to continue their operations under the "grandfather clause" of the Act. Permission for railroads to expand truck services in existence prior to the Act or to purchase existing truck lines has been granted by the Interstate

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<sup>7</sup>Railway Age, January 23, 1956, pp. 32-36.

<sup>8</sup>Railway Age, January 9, 1956, pp. 162-63.

Commerce Commission if the Commission has felt that such authority would enable the railroads to use service by motor vehicle to public advantage in their operations and would not unduly restrain competition.<sup>9</sup>

In order to prevent railroads from extending into common carrier truck service in competition with their own rail lines, with motor common carriers as a straight motor line haul service, or into territory served by other railroads, the Commission required that freight transported by railroad owned trucking subsidiaries must receive a prior or subsequent rail haul. It was also required that such traffic be routed through designated key points on the railroad where goods could be transferred between trucks and railroad freight cars. Freight could not be handled by truck between these key points.

The requirement of prior or subsequent rail haul was abandoned in 1941, but relaxation of restrictions has not been extended to permit railroad motor carrier subsidiaries to provide service not directly related to the rail operations of the parent company.<sup>10</sup>

Although generally limited to operations that are co-ordinated with and supplementary to rail service, railroad controlled motor carrier subsidiaries have grown until

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<sup>9</sup>Taff, op. cit., p. 518.

<sup>10</sup>Fair and Williams, op. cit., pp. 523-24.



the route miles operated by many of them approaches the rail line mileage of the parent company. Motor carrier subsidiaries of the Atchison, Topeka and Santa Fe Railway Company conducted trucking operations over a total of 12,382 route miles during 1955. The rail mileage operated by the parent company on December 31, 1955 was 13,147.<sup>11</sup> In 1948 operations by railroad motor carrier subsidiaries constituted 2.3 per cent of the intercity vehicle miles of all Class I motor carriers of property.<sup>12</sup>

The development of the present day "piggy-back" or trailer-on-flat-car service that is currently provided by some 35 railroads will be discussed in Chapter IV of this thesis. Trailer-on-flat-car service, unlike railroad subsidiary motor carrier service, requires no motor carrier certificate since the Commission has ruled it to be a rail freight service that is governed by Part I of the Act, rather than Part II, the motor carrier section.

Since most of the activities of the early motor truck operators were limited to the transportation of small shipments of merchandise freight, railroad competitive actions were confined to those areas rather than to the car-load freight business that did not feel the effects of the competition until a later date.

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<sup>11</sup>The Atchison, Topeka and Santa Fe Railway Company, 61st. Annual Report, Chicago, March 2, 1956.

<sup>12</sup>Taff, op. cit., p. 517.

In addition to the pick-up and delivery services that were ultimately provided by the railroads as well as the truck lines, some of the railroads introduced a large steel container for the purpose of transporting l.c.l. shipments. These containers were of such a size that they could be transported via truck between the rail yard and the customers' place of business. They were loaded in quantities of three or more to a flat car or gondola car for rail shipment. Container services did not become general because (1) most l.c.l. shipments are either too small or contain products which cannot be moved in containers, (2) loading and unloading cranes are required, (3) customers' limited dock space frequently precludes the unloading of an entire container unless the empty container can be removed immediately after unloading, and (4) container rates, which usually were set well below first class l.c.l. rates have been bitterly contested by carriers not offering the service.<sup>13</sup>

Two large Eastern railroads, that at one time offered container service, advised the writer that the service is not currently provided and the container equipment is in storage. Some revival of interest in the container theory has been evidenced by proposals of demountable truck bodies to be utilized in piggy-back service.<sup>14</sup>

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<sup>13</sup>Fair and Williams, op. cit., pp. 269-271.

<sup>14</sup>Railway Age, December 5, 1955, pp. 51-53.



Much of the improvement of railroad service has been accomplished by the adoption of better methods for utilization of existing equipment and facilities. However, most of the advancements have been made possible through the application of technological developments that will be discussed in the following portion of this chapter.

### Technological Developments

The railroad industry, like industry in general, has been confronted with rising costs for labor and materials. Since 1939, wage rates in the railroad industry have risen 163 per cent and prices paid for materials and supplies have increased 150 per cent. During this same period, the total increase in rail freight rates authorized by the Interstate Commerce Commission has been 79 per cent. Wholesale commodity prices have increased 123 per cent and the cost of living index has risen 93 per cent during this same period.<sup>15</sup>

The pressure of increasing costs, alone, would have stimulated technological development and improvements in railway operating methods. The presence of a dynamic competitive transportation medium gave added impetus to a program of capital improvements of locomotives, rolling

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<sup>15</sup>Fred G. Gurley, President, Atchison, Topeka and Santa Fe Railway Company, "Tomorrow's Railroad," an address before the California State Chamber of Commerce, Los Angeles, December 1, 1955.

stock and physical property that entailed an expenditure of nearly 11 billion dollars by the nation's railroads since 1945.<sup>16</sup> This expenditure for capital improvements is equivalent to approximately 11 per cent of revenues received from railway operations during this period.

The separation of technological developments between those that arose for the sole purpose of meeting motor carrier competition and those that were developed to improve general operating efficiency is difficult to accomplish. No attempt will be made to do so in this thesis, although some of the innovations, such as box cars especially designed to minimize packaging requirements, are an obvious effort to make rail freight service less expensive to the shipper.

The most spectacular and most complete modernization has been in the field of motive power. In the early 1930's diesel-electric locomotives were introduced to provide power for the light-weight streamlined trains that were built for the Burlington and Union Pacific railroads. These locomotives were an evolution of the self-propelled rail motor cars that had been built during the 1920's to replace steam powered passenger trains on lightly travelled branch lines.

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<sup>16</sup>Railway Age, January 9, 1956, p. 159.



The first diesel-electric freight locomotive was placed in service by the Santa Fe System in December, 1940, the first of eighty 5,400 horsepower locomotives to be acquired by that carrier during the ensuing three years. The economies realized through reduction of fuel, water, and maintenance expenses and the improved operating efficiency of these and similar locomotives delivered to other railroads during the war years assured the diesel-electric locomotive a prominent place in post-war railroad development. Today, diesel-electric locomotives provide 85 per cent of the gross ton-miles in freight service, 88 per cent of the car miles in passenger service and 91 per cent of all locomotive hours in yard service.<sup>17</sup>

Motive power development has not been limited to application of the diesel engine as a prime mover. Twenty-five oil burning, gas turbine-electric locomotives are in service on the Union Pacific Railroad and an additional fifteen locomotives of similar design are under construction. Research is now being conducted to explore the possibilities of the application of nuclear energy as a source of railroad motive power.

A less complete and less dramatic development has been the modernization of the freight car fleet which is comprised of some 1,700,000 units. With few exceptions,

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<sup>17</sup>Railway Age, January 9, 1956, p. 162.

modern freight cars differ little in external appearance from their obsolescent counterparts. The improvements that have been made in braking systems, bearings, underframes and other components are not readily discernible to the lay observer.

Many of the newer freight cars incorporate special equipment designed for the loading of particular products such as automobile parts or aircraft engines. Special racks are provided to afford maximum protection for the lading. Other box cars, available for general all-purpose service, are equipped with improved cushioned underframes and integral movable bulkheads to minimize packaging requirements for general freight.

The familiar hopper car that formerly was used almost exclusively for coal, ore, or gravel has, by the addition of a roof that permits top loading, and other refinements of construction, been adapted to the transportation of such bulk commodities as cement, potash, sugar and flour that formerly required packaging for shipment in box cars.

The greatest deterrent to a more aggressive freight car modernization program is the interline movement of cars. The benefits derived from the acquisition of a new locomotive or from the reduction of grade or elimination of a



curve in the track accrue to the railroad that has made the investment. An identical expenditure for modernization of freight cars, such as the application of roller bearings, does not provide a full return to the owner since the car, unless restricted for some reason, is apt to be on the lines of other railroads as much of the time as it is on its "home" rails. During the time that it is on a "foreign" line it is earning its owner a per diem charge of \$2.40 per day regardless of its age, condition, or degree of modernization.

It seems doubtful that accelerated modernization of the freight car fleet can be accomplished if the financial burden must be borne by a few of the leading carriers. A reasonable approach to this writer seems to be a premium per diem charge for the use of cars equipped with roller bearings or other improved appurtenances. Such a premium charge would encourage railroads to expedite the return of these cars to the owning line and might stimulate construction of cars that would command the premium payment to the owner by other lines.

Indications that a premium charge for modern cars might be acceptable to the industry is suggested from a review of the evidence presented in I.C.C. proceeding No. 31358, conducted for the purpose of establishing the

reasonableness of the current \$2.40 per diem charge. Some of the carriers protesting the charge offered to make payment on the basis of a graduated scale based on the age of the car.<sup>18</sup>

The competitive position of railroad freight service has been enhanced by the improvements that have been made to railroad physical properties. Relocation of trackage to eliminate curvature and steep grades and the expanded installations of centralized traffic control and train radio have contributed to the optimum utilization of railroad facilities.

Yard modernization, including radio communications, and construction of fully mechanized "hump" yards, has helped to relieve congestion that has been a prolific cause of undue delay and slow movement of traffic.

Enlarged communications facilities expedite the movement of trains and provide the shipper with information relative to the location of his shipment and its expected time of arrival. It may also be utilized to advise him of any extraordinary delay that may have been encountered.

In the field of technological development to improve their competitive position the railroads have enjoyed the same freedom as their competitors or other forms of business.

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<sup>18</sup>Railway Age, December 19, 1955, pp. 8-9.



The pricing of railroad transportation services has responded to the changed competitive conditions, but, as will be discussed in the following paragraphs, the railroads have enjoyed neither the same freedom of action nor the same success as in the areas of technological development and service improvements.

#### Competitive Pricing of Railroad Service

Competition is expected to serve the consumer in several ways. Its pressure will insure that the customer will receive a product at a price that approximates cost as nearly as it may be known. Price is a major competitive weapon and price competition will attract business to the most efficient concerns, those able to produce a product of quality at minimum cost.

Users of transportation have not enjoyed the full benefits of competitive pricing of transportation services. The presence of competing forms of transportation has tended to hold rates at a level that is quite probably lower than would have been the case in the absence of competition. However, the existing structure of freight rates and the regulatory powers of the Interstate Commerce Commission inhibit the free movement of rates, in response to competitive forces.

A system of rates predicated on the actual costs of providing the transportation service would anticipate a division of traffic between the various media of transportation that reflected the economic advantages of each agency. That such a division does not prevail stems from the existing structure of freight rates. Railroad rates (motor common carrier rates follow the same pattern) were generally based on the "value of service" principle, which dictated higher rates for commodities of high intrinsic value. Lower rates are provided for the lower value raw materials based on the expectation that the carrier will ultimately handle the more valuable finished product at a correspondingly higher rate.

This type of rate structure, in which cost of service has not been a dominant factor in establishing rates, has rendered the railroads particularly vulnerable to highway competition. The ad valorem method of rate making has provided most favorable terms for motor trucks to compete with the railroads; the more desirable items of traffic, moving at rates that were far in excess of railroad costs, were most susceptible to diversion to motor carriers. Frequently the rates of the truck line were identical with the railroad rates, but traffic was diverted to the motor carrier because of superior services that motor trucks could provide in respect to smaller units of loading, free pick-up



and delivery and help from the truck driver in loading and unloading.

Price competition between railroads and trucks can be divided into two phases; the era during which the Interstate Commerce Commission had no jurisdiction over motor trucks, and the period subsequent to passage of the Motor Carrier Act of 1935.

Motor truck competition first affected the merchandise l.c.l. traffic of the railroads. Less-than-carload rates, in most cases, were higher than carload rates for the same commodities, a not unreasonable policy when costs of providing the two services were considered. Motor carriers, through selective rate cutting, were able to attract that portion of rail traffic that moved at the higher rates. Rate reductions proposed by the railroads in an attempt to meet this competition were subject to approval of the Interstate Commerce Commission. In the exercise of its minimum rate authority the Commission frequently disallowed competitive rate reductions on the basis that such reductions would disrupt the existing rate structure.<sup>19</sup> The railroads introduced "all-commodity" or "all-freight" rates in 1932 in an attempt to meet motor carrier competition on high-grade carload traffic. Under these rates specific commodities are accorded a rate that

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<sup>19</sup>Fair and Williams, op. cit., p. 647.

commonly ranges from 36 to 50 per cent of the first class rate.<sup>20</sup> Less-than-carload traffic, with some exceptions, moves on class rates, but the greater proportion of carload traffic moves at commodity rates.<sup>21</sup>

The long-term effect of motor carrier competition has been a reduction of railroad rates applicable to the higher rated traffic that is subject to diversion to motor carriers. As these rates approach the cost of providing the service, an upward pressure is exerted on rates applicable to non-competitive traffic.

During the period that motor carriers were unregulated truck rates were often unpublished and were frequently discriminatory. Charges to various shippers using the same carrier were often different, and the service was neither stable nor reliable.<sup>22</sup> The railroad clamor for regulation of motor carriers was prompted by their desire to restore what to them seemed to be fair competition. An industry that had but a few years previously been depicted as a monopoly that sought to extort exorbitant rates from industry and agriculture found little sympathy for its plight. To many observers, the attempts of the railroads to have their competitors brought under the same or similar regulatory

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<sup>20</sup>Locklin, op. cit., p. 693.

<sup>21</sup>Fair and Williams, op. cit., p. 391.

<sup>22</sup>Ibid., p. 510.



statutes was considered to be an attempt to exterminate competition.

As the depression of the thirties became more severe, the railroads began to receive support in their efforts to have motor transportation regulated by the federal government. During this period when a surplus of all kinds of transportation existed, competition became destructive; large numbers of small operators were engaging in motor trucking and were beginning to undercut the rates of the established common carrier truck lines. Among the host of small truck operators there was little uniformity of rates or services. Shippers found it increasingly difficult to do business with motor carriers because of the unreliability of service, the lack of financial responsibility to make equitable adjustments for loss and damage of goods in transit, and the continually fluctuating rates and differential treatment. With this state of affairs the larger shippers and shipper organizations joined with the railroads and better organized motor carriers in their demand for regulation.

The eventual outcome of efforts to obtain legislation to regulate motor transportation was the Motor Carrier Act of 1935, which became Part II of the Interstate Commerce Act. Under this legislation common and contract motor

carriers came within the jurisdiction of a comprehensive framework of regulation.

The extent of regulation of the different types of motor freight carriers differs considerably and is predicated on the varying degrees of public interest involved. Motor common carriers are subject to the same general restrictions as to uniformity of rates and service as are the railroads, but there is no long-and-short-haul clause corresponding to the fourth section of Part I, the portion of the Act that applies to railroads.

Contract carriers do not require a certificate of public convenience and necessity as do motor common carriers but must secure a permit from the Commission to conduct operations. Contract carriers are required to file minimum rates with the Commission but the actual charges that they make for their services may exceed the minimum and are established by contract with individual shippers. Their responsibility for loss and damage to shipments is also established by agreement with individual customers. Motor common carriers have the same responsibility as railroads in that they may be held liable for shipments lost or damaged in transit.<sup>23</sup>

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<sup>23</sup>Locklin, op. cit., pp. 709-11.



Private carriers and for-hire carriers of exempt commodities were exempted from all regulation except as pertains to the observance of safety regulations established to assure proper standards of maintenance and operation. Two-thirds of the total intercity freight ton-miles of freight service performed by trucks are accumulated by exempt or private carriers.<sup>24</sup>

Subsequent legislation included domestic water carriers (1940) and freight forwarders (1942) as forms of transportation subject to regulation by the Interstate Commerce Commission. Common carrier petroleum pipe-lines had been brought within the jurisdiction of the Commission by the Hepburn Act of 1906. Private water carriers and contract water carriers handling bulk commodities are exempted from federal regulations. Since these exempt carriers handle an estimated 90 per cent of all inland water tonnage, effective regulation of water transportation has been impossible.<sup>25</sup>

The Transportation Act of 1940, in addition to providing for the regulation of water carriers, reflected the changed circumstances confronting the railroads. The competitive conditions together with the effects of the

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<sup>24</sup>American Trucking Trends, American Trucking Associations, Inc., Washington, D.C., 1955, p. 5.

<sup>25</sup>U.S. Interstate Commerce Commission, 68th Annual Report, (Washington; Government Printing Office, 1955), p. 20.

depression on traffic volume caused general concern for the then present and future financial status of the railroads. The Act also included a declaration of national transportation policy which directed the Interstate Commerce Commission to administer all regulation of the several modes of transportation under its jurisdiction in an equitable manner to the end of preserving the inherent cost and service advantages of each and of fostering a coordinated transportation system that would be adequate to meet the needs of commerce, the Postal Service and National Defense.<sup>26</sup>

A detailed analysis of the policies and practices of the Interstate Commerce Commission as they affect the administration of its authority to fix reasonable minimum rates is not within the scope of this thesis. However, a brief description will be attempted to establish the perspective of the railroads' objections to some of the contemporary minimum rate decisions.

If a railroad seeks to establish a reduced rate on a particular commodity in order to regain traffic that has been diverted to competing forms of transportation, the proposed rate is filed in the form of a tariff and is posted

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<sup>26</sup>Fair and Williams, op. cit., pp. 485-87.



for public inspection. Thirty days notice is required before any rate may become effective except as the Commission at its own discretion may permit.

If the rate is not protested by other carriers or by shipper groups and the Commission does not suspend the rate on its own initiative, it becomes effective at the end of the thirty day period. As would be reasonable to expect, few objections are raised by shippers unless the proposed rate represents an increase rather than a decrease in rates. Rate reductions are frequently protested by motor carriers or barge lines if the proposed rate is considered to be an incentive for shippers to divert shipments from trucks or barges to the railroads. If a request is filed that a proposed rate be suspended and the Board of Suspension of the Commission feels that evidence indicates that the proposed rate may be unlawful, the rate is suspended for an initial period of ninety days. During this period of suspension, evidence from all interested parties may be submitted and a decision rendered as to the lawfulness of a proposed rate. The period of suspension may be extended to 180 days from the initial date of suspension if the Commission is unable to conclude its investigation within the shorter period.<sup>27</sup>

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<sup>27</sup>Ibid., pp. 513-14.

The Commission, after all evidence has been heard, may render judgment that conforms to one of the following patterns.<sup>28</sup>

First. The judgment of the railroad management that the proposed rate is a wise competitive move will be respected and the inquiry of the Commission will be limited to the reasonably compensatory character of the rate. It will hold that the effect of the rate on the competing forms of transportation is beside the point and, in any event, not controlling.

Second. The inquiry of the Commission will be enlarged to include both the reasonably compensatory character of the rate and a critical analysis of the rate from a management standpoint. At the conclusion of the investigation it will accept the decision of the railroad management and will find that the effect of the proposed rate on the trucks or barges, while highly relevant, will not be harmful.

Third. The management decision may be reversed by the Commission because the proposed rate, while reasonably compensatory, is considered to be lower than necessary to meet competition and promises to attract more than a "fair share" of the available traffic. Therefore, the proposed rate will be found unjustified by the competitive situation and its effect, direct or indirect, upon competing forms of transportation will be controlling.

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<sup>28</sup>Langdon, Cornell Law Quarterly, op. cit., p. 60.



The above discussion should not be interpreted to indicate that all proposed rate reductions are protested or suspended. During the first six months of 1954, approximately 25,000 tariffs were filed with the Interstate Commerce Commission. Of these tariffs, most of which represented rate reductions, 1199 were protested. Significantly, 90 per cent of these protests were by carriers against rates proposed by other carriers; 68 per cent of the protested tariffs were suspended.<sup>29</sup>

Railroad efforts to obtain modification of present regulatory policy received some encouragement when the findings of the "President's Advisory Committee on Transport Policy and Organization" were made public in April, 1955. A detailed analysis of the recommendations of this Committee will not be attempted by this writer. Those recommendations that, if enacted into law, would affect rail-truck competition will be noted since any revision of Federal regulatory powers would present new problems to both railroad and motor carrier management.

Of the eleven basic recommendations of the Committee, four are most relevant to the railroad-motor carrier competitive situation. Trucking interests have rejected the

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<sup>29</sup>Anthony F. Arpaia, Chairman, Interstate Commerce Commission, "Does the I.C.C. 'Manage' the Railroads?", an address delivered before the New York Society of Security Analysts, New York, N.Y., December 3, 1954, as cited by Langdon, Cornell Law Quarterly, op. cit., p. 60

entire report, but their most bitter criticism has been directed toward these four provisions.<sup>30</sup>

Legislation to implement the recommendations of the Committee would limit the regulatory authority of the Interstate Commerce Commission to a determination of reasonable maximum and minimum rates, but would retain existing provisions of the law that prohibit undue discrimination and preference. Reasonable minimum rates are defined by the Committee as those which cover the "direct ascertainable cost of producing the service to which the rates apply." The Committee's recommendation in regard to Commission authority over maximum rates would prevent the carriers from charging "excessive or unreasonable rates on traffic which is noncompetitive." Carriers would be free to set rates between the prescribed minima and maxima according to competitive conditions.<sup>31</sup>

The authority of the Commission to suspend proposed changes of rates would be retained, but the maximum period of suspension would be shortened from seven months

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<sup>30</sup>James F. Pinkney, General Counsel, American Trucking Associations, Inc., Statement before Subcommittee on Transportation and Communication, Committee on Interstate and Foreign Commerce, House of Representatives, Washington, D. C., September 20, 1955.

<sup>31</sup>U.S. Presidential Advisory Committee on Transport Policy and Organization, Revision of Federal Transportation Policy, (Washington: Government Printing Office, 1955), pp. 8-9.



to three months. The burden of proof that a proposed rate is just and reasonable would rest with the carrier proposing the rate, unless the protestant was also a carrier. This proposal would anticipate less use of the suspension privilege by competing carriers for the purpose of postponing the date that a proposed rate would become effective.<sup>32</sup>

Permission would be granted to rail and water carriers to depart from the long-and-short haul provisions of the Act, without securing prior approval of the Commission, if such departure was for the purpose of meeting actual competition with reasonable minimum rates. Part II of the Act contains no long-and-short haul clause to curtail this practice by motor carriers.<sup>33</sup>

Reduced rates for volume shipments would be permitted. In effect this would authorize a reduced rate for regular shipments of more than one carload and would permit the railroads to reflect reductions in operating costs in their rate structure.<sup>34</sup> Although the same privilege would be available to motor carriers, it would have little effect on their rate structure. Approximately 90 per cent of motor carrier costs are direct costs and do

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<sup>32</sup>Ibid., pp. 11-12.

<sup>33</sup>Ibid., p. 13.

<sup>34</sup>Ibid., p. 14.

not decline in proportion to the volume of traffic as do railroad costs.<sup>35</sup>

In addition to the above provisions, it was also recommended that contract motor carriers publish actual rather than minimum rates and that private carriage be redefined to minimize abuses by those using their status as private carriers as a subterfuge for providing transportation for hire.<sup>36</sup>

The provisions of the Cabinet Committee's recommendations have been incorporated into bills now before the Congress; some hearings have been conducted, but, at the time of this writing, there is no immediate prospect of a vote on the bills in either the Senate or the House of Representatives.

Regardless of the ultimate disposition of the pending legislation, the Cabinet Committee Report has served to bring the issue to the floor of Congress. In the absence of action on the current bills, which will expire when the present Congress adjourns if no action has been taken by that time, the hearings on the bills may serve to give the Interstate Commerce Commission cause to examine their rate-making policies. Such a review could

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<sup>35</sup>Locklin, op. cit., p. 685

<sup>36</sup>Presidential Advisory Committee, op. cit., pp. 15-16.



conceivably result in a Commission attitude that would grant the carriers greater competitive rate-making freedom within the framework of existing statutes.

Effectiveness of Competitive Action  
Taken by the Railroads

The effectiveness of action taken by railroad management to meet changing competitive conditions is difficult to evaluate. In the absence of adequate data to support the efficacy of alternate approaches to the problem, evaluation is largely speculative.

The introduction of striking technical developments like the airplane, pipe-line or motor truck would have resulted in diversion of traffic from the established form of transportation to the new, regardless of the most vigorous competitive action by the railroads. To the extent that railroad management failed to provide services that met the changing demands of shippers or failed to make use of the new forms of transportation to supplement their basic rail services, the diversion of traffic was encouraged rather than deterred.

The ownership or control of competing forms of transportation by railroads has been subject to numerous legal restrictions. The limitations that have been placed

upon the operation of railroad owned motor carrier subsidiaries have been described at an earlier point in this chapter.

Railroads demonstrated a growing interest in the development of commercial air carrier services at the conclusion of World War II. However, the Civil Aeronautics Board has refused to certify surface carriers or their subsidiaries to operate in domestic or foreign air commerce. Those services that were initiated on an experimental basis or that had been established prior to the war have been discontinued or divorced from the parent railroad company.<sup>37</sup>

Operation of marine services by railroads range from ferry services at seaport terminals such as New York or San Francisco to overnight steamer service between Baltimore and Norfolk or the extensive car ferry operations on Lake Michigan.

Southern Pacific Pipe Lines, Inc., a wholly owned subsidiary of the Southern Pacific Railroad began operations in January, 1956. This common carrier pipe-line, laid contiguous to the El Paso-Los Angeles rail line of the parent company, is said to be the first operation of this type by a railroad subsidiary.<sup>38</sup>

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<sup>37</sup>Fair and Williams, op. cit., p. 545.

<sup>38</sup>Railway Age, February 20, 1956, pp. 22-23.



One measure of the value of subsidiary motor carrier service is the contribution that is made to the overall profitability of the parent railroad company. The published income statements of the motor carrier subsidiaries do not reflect the savings that have accrued to the railroads through the substitution of motor truck service for unprofitable local freight trains nor do they reflect the savings in box car miles that result from diversion of railroad merchandise l.c.l. traffic to motor subsidiaries. Neither is there an effective measure of the volume of traffic that would otherwise have been diverted from rail to motor carrier service if the railroads had failed to improve their merchandise service through the utilization of motor trucks.

Since railroad rates were subject to the approval of regulatory authorities, the initial efforts of railroad management to combat the erratic pricing of competitive truck services was to campaign to have the regulatory framework expanded to include these competitors. Although all principal forms of transportation are now regulated to some extent, the practical application of the law extends regulation to approximately 30 per cent of motor transportation and 10 per cent of waterway transportation.

Inasmuch as railroad efforts to have regulatory obligations extended to all of their competitors have been only partially successful, the current trend has been to support legislation that would place greater emphasis on competitive forces in the field of rate making. The effectiveness of railroad managements' rate making decisions in a less regulated environment are, of course, impossible to evaluate at this time.

Another development that poses a threat to all for-hire transportation services has been the continued growth of private carriage. The "value of service" theory of rate making that predicated rates on the intrinsic value of the commodity has been rendered obsolete by the opportunity that the shipper now has to perform his own transportation service. The "value of service" to the shipper may no longer be established by transportation companies since rates that exceed or approach the cost to the shipper of performing his own private carriage result in further diversion of traffic from for-hire carriers.

The railroad "problem" has been a favorite subject of the press and of financial writers for many years. Some writers have been more critical of management decisions than others, but, in any event, the preponderance of the comments have been opinionated and lack the perspective of critical investigation.



A Senate Committee on Interstate and Foreign Commerce that conducted extensive hearings to determine, in part, the extent to which the objectives of the national transportation policy had been achieved recorded the following comments relative to the causes for the growth of the railroads' competitors:

The growth of railroad competitors is a result of two factors. Primarily, the success of motor, water and air operations in competition with the rails must be attributed to their individual advantages in specific situations for specific shippers. These carriers, by and large, have grown to meet the needs of an expanding economy. They perform services which the railroads could not offer, or refused to offer, or could not perform as well or as cheaply. While exact measurement is impossible, it is safe to say that the major part of the development of competition to the rails, particularly in the past 20 years, is attributable to their inherent advantage over the rails as determined by the shipping public.

On the other hand, a substantial factor in the growth of railroad competitors has been Government promotion and subsidy. In some cases this has been negligible, in others, most significant. In addition, there is the factor of inequitable regulation and archaic rate-making practices, which already have been discussed.<sup>39</sup>

The ability of commercial motor trucks to compete with the railroads for the more remunerative traffic is attributable to a number of underlying factors. By no

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<sup>39</sup>U.S. Congress, Senate, Committee on Interstate and Foreign Commerce, Domestic Land and Water Transportation Subcommittee, Progress Report, Sen. Report 1039, 82nd Cong., 1st Sess. (Washington: Government Printing Office, 1951), p. 68.

means the least of these is the system of public highways that is at their disposal. No attempt will be made in this thesis to resolve the controversy that has arisen in regard to the extent that commercial motor vehicles do or do not pay their full share of the expense of construction and maintenance of the highway system. The inadequacy of the present highway system is evident to every motorist. Without attempting to discount the desirability or the need of an improved system of highways, this writer feels that a partial solution to the problem of inadequate highways would be utilization of the unused capacity of the railroads.

The inherent advantages of railroad and motor truck transportation determines, to an extent, what traffic each shall carry. However, in both quality and cost of service, the areas of economic fitness seem to overlap. The present direction of railroad competitive efforts is to retain or regain that portion of traffic which they feel they are better adapted to carry than are their competitors. The ultimate success of their efforts depends, to a considerable extent, on the future course of public policy in the areas of transportation regulation and highway development.



## CHAPTER IV

## DEVELOPMENT OF TRAILER-ON-FLAT-CAR SERVICE

Early Developments of Trailer-on-Flat-Car Service

The most recently introduced service, provided by the railroads in their attempt to regain some of the traffic lost to motor trucks, is the "trailer-on-flat-car" service, generally referred to as "Piggy-Back." A shipper utilizing this service loads his freight in a conventional highway semi-trailer which, instead of moving over public highways to its destination, is delivered to a rail terminal and loaded on a railroad flat car. The flat car is then handled in either a regular freight train, or, in some instances, in a train consisting entirely of flat cars loaded with trailers, to the rail terminal most convenient to the trailer's final destination. The trailer is then unloaded from the flat car and is hauled by a conventional truck-tractor to the consignee's place of business where the freight is unloaded from the trailer. The basic service is the same whether the trailers are owned by the railway, a commercial motor carrier or a private shipper.

This service has experienced its greatest growth since 1953, but the movement of freight loaded in the vehicles of one medium of transportation, then carried aboard railroad

cars, has been practiced for more than a century. From 1834 to 1854 sectionalized canal boats were hauled on railroad cars of the Portage Railroad of the Pennsylvania Public Works between Philadelphia and Columbia and between Hollidaysburg and Johnstown. The balance of the movement between Philadelphia and Pittsburgh was accomplished by assembling the boats at the railheads and utilizing a combination of canals and navigable rivers.<sup>1</sup>

The Long Island Railroad, beginning in 1885 and for several years thereafter, operated so-called "Farmer's Trains" between Long Island points and the East River at New York, carrying four loaded produce wagons per car. There also has been mention of other "wagon-on-flat-car" services in the years before the motor truck, such as in the West on the Santa Fe and in the Eastern part of Canada on what is now the Canadian National Railway.<sup>2</sup>

Other examples of transportation of vehicles of one type of transportation via those of another are the ferries utilized to transport freight cars in the harbors of New York, Baltimore and San Francisco and across the Great Lakes. Extensive coastwise car ferry service is operated by

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<sup>1</sup>Fair and Williams, op. cit., pp. 32-33.

<sup>2</sup>"Piggy-Back" Is Here To Stay," The Lackawanna Magazine, D. L. & W. Railroad, New York, November, 1954.



Seatrains, Inc. between New York-Savannah, New York-New Orleans and New York-Texas City. Highway trailers are transported via ship between New York and Albany and sea-going service has been offered between the United States and points in the Caribbean area.<sup>3</sup>

The first motor vehicle trailer-on-flat-car service was inaugurated by the Chicago, North Shore and Milwaukee Railroad in 1926 for the purpose of handling its own less-than-carload shipments. Trailer-on-flat-car services were instituted by a number of railroads during the thirties.

Most of these were services made available to motor common carriers, but some were for the purpose of hauling trailers of railroad motor carrier subsidiaries as an alternative to transferring freight from trailers to freight cars at certain terminals. The motor common carrier services offered the truckers a rate for movement of their trailers that was lower than over-the-road operating expenses, but high enough to be compensatory to the railroad. With two significant exceptions, these services were discontinued.<sup>4</sup>

Two reasons advanced for the discontinuance of early piggy-back operations were insufficient volume of traffic to

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<sup>3</sup>L. K. Sillcox, Trains, Trailers And Towboats, A Presentation at the Graduate School of Business Administration, Harvard University, March 17, 1955., pp. 18-19.

<sup>4</sup>American Railway Engineering Association, Economics of "Highway Trailers on Flat Cars" Service, Bulletin 518 (Chicago: American Railway Engineering Association, November, 1954) p. 334.

warrant continuation of the service and the absence of a balanced movement of traffic to provide loaded trailers in each direction. Truck operators did not feel that the rates represented sufficient savings as compared to normal operating expenses to induce them to forego the flexibility of highway operation.<sup>5</sup>

The service initiated by the Chicago Great Western Railroad in 1936 survived the experimental period and has expanded to an average monthly volume of approximately 1,300 trailers, including both empty and loaded movements. C.G.W. service is extended to motor common carriers, only.<sup>6</sup>

The other pioneer in piggy-back operation, The New York, New Haven and Hartford Railroad, instituted service, known as "Trailer," in 1937. This service is available to motor common carriers and private carriers and for movement of trailers of its own subsidiary handling less-than-carload shipments. Four hundred specially constructed flat cars are assigned to this service and an additional 500 cars, especially designed to facilitate loading and unloading of trailers, are on order. During the first nine months of 1955, approximately 30,000 trailers were handled.

On December 20, 1955, The New Haven, through inter-line arrangements with connecting railroads, inaugurated

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<sup>5</sup>L. K. Sillcox, Trailers on Trains, A Presentation at Pratt Institute, May 5, 1953.

<sup>6</sup>Railway Freight Traffic, Vol. IV, No. 1, January, 1956, pp. 27-28.



piggy-back service between New England and Midwestern cities. This latest service is limited to rail-solicited freight moving in railroad owned trailers and is offered in direct competition with motor common carriers.<sup>7</sup>

#### Accelerated Growth Period of Trailer-on-Flat-Car Service

For approximately sixteen years little interest was evidenced by other railroads in the experiences of the New Haven and the Chicago Great Western. The Burlington, since 1937, had provided a service limited to trailers of its own motor subsidiary for a distance of 162 miles from Chicago to Galesburg, Illinois and the Chicago and Eastern Illinois Railroad, in 1950, established a service for motor common carriers between Chicago and St. Louis.<sup>8</sup>

Renewed interest in trailer-on-flat-car service became evident in 1953. The continued growth of motor carrier competition emphasized the inability of the railroads to retain some types of traffic that heretofore had moved almost entirely by rail. Truck lines no longer limited their services to merchandise shipments but were now competing successfully for such traffic as finished steel products and building materials.<sup>9</sup> The growth of

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<sup>7</sup>Ibid., pp. 32-39.

<sup>8</sup>American Railway Engineering Association Bulletin 510, op. cit., p. 336.

<sup>9</sup>Fair and Williams, op. cit., p. 282-83.

motor carrier services was also emphasizing the inadequacy of the existing system of highways, which, despite the post-war improvements made in most areas, failed to keep pace with the expansion of private automobile and commercial automotive transportation.

Industry, no longer limited in its choice of plant location by the availability of rail service, chose, in some cases, to locate new factories in areas served only by highways. This seems to be particularly true in cases where both the raw material and the finished product are light in weights and are of high dollar value.

The railroads were in the position of being unable to offer a service to these industries that was comparable to that available from motor carriers. In many cases where rail sidings were available, finished goods, which command higher rates, were being diverted to motor carriers.

The railroads, in order to attract trailer traffic to their lines, were confronted with the problem of how best to exploit their inherent advantage as a low-cost medium of transportation. Cost studies conducted by the New York Central Railroad indicated that the out-of-pocket costs of transporting a single trailer with a payload of approximately 15 tons would be 21.2 cents per mile via flat car as compared to motor carrier out-of-pocket costs of



from 23 to 25 cents per mile for highway transportation of the same trailer. However, if two trailers were loaded to a flat car, the out-of-pocket cost to the railroad was estimated to be 26.5 cents per car mile or  $13\frac{1}{4}$  cents per trailer mile.<sup>10</sup>

Proponents of trailer-on-flat-car service were divided into two camps. One group advocated a service for trailers of motor common carriers similar to those already in existence on the New Haven and Chicago Great Western railroads. The other group believed that such a service should be provided by the railroads in their own trailers in direct competition with motor carriers.

The carriage of semitrailers of established motor carriers did offer the potential advantage of a larger initial volume of traffic than the truck competitive service. Traffic obtained for railroad owned and operated trailer services would have to be diverted from truck lines or, as some opponents of the plan feared, from traffic currently moving via conventional carload shipment.

One advantage of cooperative railroad-motor carrier services was the transfer of responsibility from the railroad to the motor carrier of the expensive pick-up, delivery,

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<sup>10</sup>"Carriage of Highway Semitrailers on Railroad Flat Cars on the New York Central Railroad," Case Material of the Harvard Graduate School of Business Administration, 1954, pp. 9-10.

and terminal loading functions. The responsibility for loss and damage to shipments would rest with the motor carrier unless caused by a railroad accident. By use of railroad service to avoid passing over some state highways where load restrictions were severe, the truck operators could increase their own payloads and revenues. An indirect advantage of more favorable public reaction to large trucks was claimed as a result of diverting these heavy vehicles from the public highways. Motor carriers participating in this service would be charged a rate that would be high enough to more than cover the direct expenses incurred by the railroad, but one that would be lower than their actual over-the-road operating expenses.

Objections to this "marriage of convenience" stemmed from a number of factors. Initial resistance to such an arrangement was anticipated from more conservative and skeptical railroad and trucking managements and from labor organizations representing over-the-road truck drivers.

One of the strongest objections to the plan came from those rail carriers that felt that by charging a flat rate, predicated on the weight of the loaded trailer but ignoring the nature of its contents, the established railroad rate structure would be weakened. Some railroad



traffic executives expressed a fear that such a rate would draw protests from railroad patrons who believed that they should be afforded a rate that was more nearly comparable to that offered to the truck lines for transporting identical commodities in their trailers.<sup>11</sup>

Initial antagonism toward trailer-on-flat-car service by the Teamsters Union has subsided. However, contracts between the Teamsters and motor carriers utilizing rail flat car service forbid reductions in employment of truck drivers as a consequence of use of the railroad service. The growth of these services during a period of increasing business activity has had little effect on truck driver employment. Further expansion of the various services would anticipate increased employment of drivers for local delivery of trailers.

Advantages claimed by advocates of railroad trailer service in direct competition with motor carriers are that the entire service remains within the control of the railroad and produces larger gross revenue return per trailer as compared with fixed unit charges per trailer under the plan of hauling motor carrier trailers. Against this latter claim must be balanced the expense of investment in trailers and the maintenance and operation of the trailers

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<sup>11</sup>Ibid., pp. 6-7.

and truck tractors in terminal areas. Under the railroad trailer plan the responsibility for solicitation of traffic, collection and delivery at terminals and any loss and damage to lading accrue, as do the benefits, to the railroad.

Experience of the first year and a half of operation of railroad owned trailers in piggy-back service demonstrated that a lower daily volume of trailer movements has been developed than by those railroads offering service to truck lines. The service to motor common carriers has been most successful, in terms of volume of trailers handled, on railroads such as the New Haven and Pennsylvania that have operated trains hauling nothing but trailers on flat cars. Railroad owned trailers have, in most cases, moved in regular freight trains.

From a theoretical standpoint the railways might appear to benefit most from operating their own trailers. Such a service provides the railroads with a service to sell to shippers, who, by virtue of location away from rail siding or through preference for smaller units of shipment, have been utilizing motor carrier service to supply their transportation requirements. The problems of "bearding the lion in his den" are manifold; motor carriers are loathe to allow a business that has been developed over a period of twenty-five years to return to the rails by default. Shippers, finding, in most cases, no difference



between truck and rail-trailer rates, have not been eagerly disposed to change their habits until positive benefits are evident in the railroads' new service.

The short-run effect of the general increase in railroad freight rates that became effective on March 7, 1956 has been a diversion of traffic from piggy-back to all-highway movement, except in areas where rates of motor common carriers have also been raised. Reductions in volume of traffic of from 25 to 40 per cent have been attributed to this 6 per cent increase in rates.<sup>12</sup> Unless motor common carrier rates are raised by a comparable amount, individual rate reductions will have to be proposed by the railroads in order to reestablish their competitive position.

Initial attempts to publish tariffs covering proposed railroad piggy-back services were opposed by motor carrier interests and the tariffs were suspended by the Interstate Commerce Commission. The motor carriers contended that such a service was, in fact, truck service for which a motor carrier certificate was required. Had the Commission agreed with this thinking, service could not have been inaugurated unless the railroads were able to prove that public convenience and necessity would be served.

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<sup>12</sup>Railway Age, April 23, 1956, pp. 7-8.

The difficulty of providing such proof under present conditions, with motor common carrier service universally available, is self evident.

On September 30, 1953, the New Haven Railroad petitioned the Interstate Commerce Commission for a declaratory order under the Administrative Procedure Act, to provide answers to questions relating to its obligations to avoid any operation in connection with its piggy-back service that might directly or indirectly violate the provisions of the Interstate Commerce Act. The I.C.C. issued notice on January 6, 1954, initiating a procedure to be known as "Movement of Highway Trailers by Rail," Docket No. 31375.

The report of the findings of the Commission, which were released July 30, 1954, formed the basis for disposition of the suspension proceedings in the case of the railroad tariffs that had been published for this service.

The Commission found that transportation of freight in trailers on rail flat cars is transportation by railroad for which a motor carrier certificate is not required. It was also determined that the collection and delivery of trailers at terminals was subject to regulation under Part I, the rail section, and not under Part II, the motor carrier section of the Interstate Commerce Act.



It was also determined that railroads may transport the trailers of private shippers and freight forwarders under their open tariffs.

The availability of service to contract motor carriers was restricted to territories beyond the limits of their operating permits. In other words, a contract carrier could haul a shipment over the highway to the geographical limit of his operating authority and could then, acting as agent for his customer, arrange to ship the loaded trailer to its destination via railroad flat car.

Motor common carriers were permitted to ship trailers under rail tariffs open to the general public or, if through route and joint rate arrangements were made with participating railroads, shipment of trailers could be made under division of revenue arrangements. Railroads were granted the option of establishing agreements with motor carriers of their own choice and of refusing the service to others. The decision of a railroad to limit its service to motor common carriers was subject to circumstances in particular cases, the nature of the operation and the reasonableness of the request by others for like service.<sup>13</sup>

The Interstate Commerce Commission, by its findings in this proceeding, permitted railroads to serve shippers

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<sup>13</sup>American Railway Engineering Association, Bulletin 518, op. cit., pp. 340-41

desiring highway trailer service. It did not, by subsequent action, permit railroads to quote rates that were less than truck rates for the same service. There have been exceptions, but most rates for railroad trailer-on-flat-car service are identical with the motor common carrier rates.<sup>14</sup>

At the close of 1955, 35 major railroads were offering trailer-on-flat-car service in the United States and Canada. The practice of limiting the service to the transportation of railroad owned trailers, or those owned by railroad motor carrier subsidiaries, was followed by 26 carriers. Of the remaining 9 railroads, 3 confined their operations to the hauling of motor carrier trailers; 4 offered service to motor carriers and also hauled trailers of railroad ownership; 1 line, in addition to transporting its own trailers, had established a service for a private carrier, and 1 railroad limited its operations to an experimental service in cooperation with a private carrier.<sup>15</sup>

#### Terminals and Equipment Design

It is not the purpose of this thesis to encompass a detailed analysis of technological developments that have

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<sup>14</sup>L. K. Sillcox, Fast-Freight-on-Flats, A Presentation at the Car Foremen's Association of Chicago, May 9, 1955, p. 13.

<sup>15</sup>Railway Freight Traffic, Vol. IV, No. 1, January, 1956, pp. 24-44.



accompanied the growth of piggy-back nor to become embroiled in an analysis of terminal operations. On the other hand, neither can be completely divorced from an investigation of the competitive potentialities of a new service. Traffic attracted to the rails is of little value if its contribution is only to the prestige of the carrier, leaving little if any contribution to the general profitability of the service.

Railroads, particularly those adhering to the railroad owned trailer plan, minimized costs of inaugurating the new service by utilizing flat cars in general service that had been modified by adding such special devices as were necessary to secure the trailer to the car.

Although specially designed cars were available at the outset of revived interest in piggy-backing, railroads were cool to the idea of investing in equipment that might prove to be of doubtful value.

A depressed-center flat car, having supports for securing the "fifth wheel" of trailers at the ends, has been designed for the loading of two trailers to a car. The loading operation would be performed by especially designed tractors that would handle the "fifth wheel" of the trailer by a modified fork lift arrangement. Loading would be accomplished by backing the trailer onto the car from the side and swinging the "fifth wheel" onto the support.

This type of car has not been placed in service, largely because of the terminal investment required. Cost of a side loading terminal has been estimated to be \$1,000,000.<sup>16</sup> Special docks would be required, built to the level of the car floor and tractors would have to be purchased that would be useless except for this loading and unloading operation. An additional drawback would be the restriction of service to those terminals having ramps and equipment to load and unload the trailers.

The railroads have, instead of adopting side loading, turned to end or "circus" loading of trailers on the flat cars. The investment required for this type of service is minimal; virtually every railroad terminal has a ramp for the unloading of shipments from flat cars that can, in emergency, be utilized for unloading or loading trailers. This is of particular importance if service is to be offered to intermediate stations. The larger terminals that have been especially constructed for the loading and unloading of trailers have retained the end loading principle. The cost of these terminals is estimated to be about one-half that of a side loading terminal of equivalent capacity.<sup>17</sup>

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<sup>16</sup>Harvard Business School, Case Material, op.cit., p.11.

<sup>17</sup>American Railway Engineering Association, Bulletin 518, op. cit., p. 339.



A specially designed car, conceived in France and first ordered in quantity in this country by the New Haven, embodies center guide rails of I-beams and improved tie-down devices. Detachable steel guide wheels are attached to the axle of the trailer and the theory of rigid tie-down of the trailer is completely reversed by the use of absorbing devices and clamps. The I-beams serve as a guide to facilitate more rapid movement of the trailers over a string of cars during loading or unloading. The manufacturer's claims of reductions in time for both loading the trailer and securing it to the car have been substantiated by tests conducted by several railroads.<sup>18</sup>

Other developments include a container unit that can be secured to either a railroad flat car or a truck chassis. Transfer of the container between flat car and truck bed is accomplished by a specially designed fork lift truck.<sup>19</sup>

The Missouri Pacific Railroad has inaugurated an experimental service which utilizes a 32 foot container that may be hauled in a railroad gondola car or on a special trailer chassis. Gantry cranes at terminal cities are used to transfer the containers from freight cars to highway carriers.<sup>20</sup>

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<sup>18</sup> Railway Age, December 5, 1955, pp. 54-55.

<sup>19</sup> Railway Age, February 21, 1955, p. 53.

<sup>20</sup> Railway Age, December 5, 1955, p. 53.

Another application of the container concept is the recently developed "Adapto" car which is essentially a light weight flat car with a demountable body. The car is equipped with four wheels and fixed axles instead of the conventional eight wheels and swivel trucks. Its 35 foot length is roughly equivalent to that of a highway trailer and the van type body may be transferred to a flat bed truck for delivery to an off-track industry.<sup>21</sup>

All of these container ideas seem to share one disadvantage that inhibits their acceptance by the railroad industry: high terminal costs that limit the service to major terminals.

This same disadvantage contributed to the demise of container services that were offered by some of the Eastern railroads for the shipment of less-than-carload freight during the period preceding World War II.

#### Shipper Reaction to Trailer-On-Flat-Car Service

The magazine Railway Freight Traffic features a "monthly traffic poll" that reflects the opinions of industrial traffic managers in regard to various aspects of railroad freight service.

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<sup>21</sup>Railway Age, December 26, 1955, p. 7.



The "monthly traffic poll" of the January, 1956 issue of this magazine recorded the results of a survey of customer reaction to piggy-back services. The questions referred to trailer-on-flat-car services offered by those railroads adhering to the plan of operating their own trailers at truck-competitive rates or providing a similar service through motor carrier subsidiaries. Shippers were asked if they had been solicited by a railroad, or a railroad motor carrier subsidiary, to ship freight via piggy-back service. If the answer to this question was affirmative they were asked to evaluate the effectiveness of the traffic representatives' sales efforts and make suggestions for improvement of either the selling methods or the service provided to the public. In addition, the shippers were asked to compare the effectiveness of efforts to sell piggy-back service versus conventional carload freight service.

The original data, consisting of 106 replies, were made available to the writer through the courtesy of Mr. Gardner C. Hudson, Editor of the magazine.

Questionnaires were sent to shippers of a variety of products, but an attempt was made to restrict inquiries to those industries whose product or raw material appeared to be amenable to motor truck or piggy-back shipment.

Locations of the industries questioned appeared to be well distributed throughout the United States and included a few Canadian shippers.

In reply to the first question, 82 traffic managers reported that they had been approached by railroad traffic representatives who had attempted to sell them trailer-on-flat-car services. Of the 24 negative replies, 11 explained that the service was either not available in their locality or that the nature of their product precluded use of truck or piggy-back shipments. These figures indicate that more than 85 per cent of potential trailer-on-flat-car customers that received questionnaires had been contacted by railroads attempting to secure their patronage.

The size of the sample appears to be too small and is not sufficiently random to warrant a conclusion that 85 per cent of all shippers have been contacted in regard to diverting present truck shipments to piggy-back service. However, the remarks relative to the effectiveness of railroad sales efforts and comments in regard to the service versus conventional motor carrier shipment reflect the opinions of 106 shippers who appear to represent an adequate diversity of product lines.

Most of the replies were limited to a few brief remarks in the space provided for that purpose on the



questionnaire, but a few of the respondents prepared lengthy critical evaluations that indicated thoughtful appraisals by the writers.

Shipper reaction to the effectiveness of railroad sales efforts indicated that 49 out of 77 respondents had been favorably impressed. Of those who attempted to evaluate sales techniques, 21 found them to be more effective, 39 less effective and 11 the same as the sales efforts of the railroad representatives in regard to conventional carload freight service. Most of these answers appeared to be an appraisal of the personality of the salesmen. However, some answers reflected an objective evaluation of sales approach, knowledge of rates and service, and knowledge of the customers' transportation requirements.

Those criticizing the service cited disadvantages of piggy-back, as compared to conventional motor truck shipments, to be: earlier afternoon deadlines for accepting freight, longer time in transit on short hauls, limitation of the service to large metropolitan centers, and failure to file rates that were lower than motor carrier rates for comparable service. None of those who criticized the failure of railroads to price their service below that of motor common carriers took cognizance of the role of the Interstate Commerce Commission in respect to rate

reductions that would result in diversion of traffic from trucks to piggy-back trailers.

Those shippers that commented favorably in regard to both sales efforts and service seemed most impressed by the aspects of combined advantages of rail and truck shipment that are available through use of piggy-back service. Some noted that the salesmen who represented piggy-back services seemed to be imbued with the enthusiasm that accompanies a new development, an enthusiasm that they had found lacking in salesmen of carload freight service.

#### Reaction Of Railroad Executives to the Effectiveness and Potential of Trailer-On-Flat-Car Services

The interviews with railroad executives followed an established list of questions that was expanded during the later interviews to incorporate suggestions obtained during the earlier conversations. The responses to the various questions have been consolidated, but, if divergent viewpoints were expressed, the conflicting opinions have been recorded.

Hesitancy on the part of some railroads to engage in trailer-on-flat-car operations was prompted by the concern that the volume of business generated would be at the expense of traffic that would have moved by rail in the



absence of piggy-back and would not be freight that would otherwise have moved via motor carrier. In response to inquiry relative to the source of traffic moving in railroad-owned trailers at truck competitive rates, railroad spokesmen were of the opinion that most, if not all, of the traffic was freight that would not have moved by rail if trailer-on-flat-car service had not been available. No definite figures were presented to reflect the percentage of the traffic that emanated from industries without rail siding or that was destined to industries served only by highway. One railroad did indicate that a substantial portion of its piggy-back traffic has been received from industries having rail sidings and has been consigned to industries or warehouses which are served by rail. These industries had been shipping by truck prior to the availability of railroad trailer service. Most of them had been rail customers in the past but had turned to trucks for various reasons, such as smaller unit of shipment (trailerload versus carload), less stringent packaging requirements, lower rates, and/or reduced time in transit.

The Traffic Executive Association - Eastern Railroads while making a study during 1953 of proposals to inaugurate piggy-back service expressed concern over the possible reactions of freight forwarder customers and rail carload shippers.<sup>22</sup> The latter group were not expected to be

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<sup>22</sup>Harvard Business School, Case Material, op. cit., pp. 13-17.

concerned over the service when provided by the railroads at truck competitive rates but were considered to be a possible source of opposition to proposals to haul trailers of motor common carriers at rates that took no cognizance of the value of the commodity in the trailer. Since most of the railroads that were contacted during the interviews provide the service in trailers of railroad ownership, the latter problem has not arisen. It was also reported that freight forwarder customers have taken no stand, as a group, in regard to piggy-back activities. Railroads and motor carriers have always competed with freight forwarders who are also their customers. The freight forwarder consolidates l.c.l. or l.t.l. shipments and, taking advantage of the carload or trailerload rate, collects his profit from the difference between the carload rate that he pays and the rate that he charges the customer.

The use of a container as a means of transporting an l.c.l. shipment appears to have many advantages. However, as previously discussed, the original container services were abandoned and little interest was evidenced until modified applications of the theory were offered as an alternative to hauling the conventional highway trailer on the flat car. Of the railroads interviewed, only one showed interest in the container concept and in this case it was a motor carrier customer of its trailer train



service that was undertaking the operation. The other lines were acquainted with container developments, but were of the general opinion that the loss in flexibility that would result from adoption of container service would more than offset the advantages. By transporting conventional highway trailers it is felt that the shipper will be afforded a conveyance with which he is familiar and for which his service facilities have been constructed. Limited dock space precludes the deposit of containers at the customers' places of business for loading or unloading. Customers whose businesses are geared to trailer shipments have shown little disposition to change their habits unless such a change can be translated into an immediate saving for them. Savings that might accrue to the carrier as a result of reduction in tare weight of the trailer (by leaving the entire undercarriage and wheels behind) are of no interest to them unless such savings are reflected in reduced rates. Trailer-on-flat-car services are being extended to smaller cities where docks are already available for the unloading of the trailers. Such stations frequently lack the necessary facilities for loading and unloading of van-size or smaller containers.

Transportation of trailers of private carriers has received little attention from the railroads. The service is provided between New York and New England points by the

New Haven Railroad, but a rate that is somewhat higher than that charged motor common carriers has not encouraged this type of business. The basis for the higher rate is the irregularity and one-way loaded movement of private carrier trailers; motor common carriers have provided loaded movements in both directions. None of the railroads interviewed indicated that any plans were being made for extending piggy-back service to private carriers. One traffic executive did, however, express an opinion that the carriage of private trailers was a source of revenue that merited careful consideration.

The existing rate structure again seems to be an important obstacle to the expansion of trailer-on-flat-car service. A rate afforded a private shipper for transportation of his goods when loaded in his own trailer, if lower than that applicable to conventional rail shipment of the same merchandise, is certain to draw some protests from shippers who do not have trailers. However, if the present carload rate is so high that shippers are apt to be attracted to private carriage as a means of reducing expenses, shipment of his trailer via flat car may be the only way in which the railroads may hope to derive any revenue from that source, unless the carload rate can be reduced.

One aspect of trailer-on-flat-car service that has been of particular interest to both shippers and railroad



management is the low incidence of loss and damage to goods in transit. There is no unanimous opinion as to the principal reason for reduced loss and damage to piggy-back shipments as compared to freight loaded in conventional railroad cars.

Most of the traffic officers interviewed expressed an opinion that primary reasons for reduced damage claims are the cushioning effect of the load riding on rubber tires which, with the springs of the trailer, provide better riding qualities than a conventional freight car. Reduced handling of lading and more careful switching of piggy-back flat cars were also cited as factors contributing to minimized damage. Damage resulting from careless switching is reduced because the piggy-back cars are subjected to less switching than conventional freight cars. At terminals they are usually switched directly to unloading docks as compared to conventional cars that are switched to industrial sidings, frequently at considerable distance from the classification yard.

One executive advanced the opinion that a trailer riding on a flat car presented a psychological challenge to the switchmen. The prospect of a 35 foot trailer being torn loose from its moorings seems to have the effect of promoting careful switching habits.

Lack of adequate data precludes a thorough evaluation of dollar savings resulting from reduced damage claims. However, the Pennsylvania Railroad reported a damage claim ratio of \$0.448 per \$100.00 revenue in piggy-back service as compared to \$1.68 per \$100.00 revenue for ordinary freight shipments. If a single large claim of approximately \$1,200.00 which resulted from water damage to a shipment of sheet steel had been excluded, the piggy-back damage ratio would have been \$0.108 per \$100.00 revenue. The aforementioned figures represent 16 damage claims on a total volume of 1913 loaded trailers. At the time that these figures were reported, the Pennsylvania was handling trailers of their ownership at motor common carrier competitive rates and had not extended the service to motor common carriers.<sup>23</sup> Data were not available to provide a similar comparison for other railroads.

Since most rates for railroad operated piggy-back services are at a parity with motor carrier rates for comparable service, the problem of selling the service to shippers becomes immediately restricted to a matter of comparative quality of the services. In response to inquiry as to what selling points were stressed to convince a shipper that railroad piggy-back was superior to motor carrier service, the following were mentioned by traffic executives.

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<sup>23</sup>Railway Age, April 11, 1955, pp. 17-18.



Most frequently mentioned was consistently faster over-the-road service, without regard to weather, weekends or holidays, and superior communications systems that enable the railroad to provide the shipper with more accurate information in regard to delays or expected time of arrival. Several carriers mentioned that it was their policy to schedule delivery of loaded trailers to the customers' docks at a time that was prearranged to suit the customers' business habits. This practice, they asserted, was not followed by motor common carriers. The reasons for this being a service available exclusively from the railroads seems somewhat obscure; it seems more properly to be a shortcoming of motor carrier management in failing to provide similar service.

Other selling points that are being stressed by railroad freight traffic representatives are: advantages of dealing with a large transportation system, rapid processing of damage claims, and protection from "hijacking." Trailers can be loaded more heavily than would be the case if over-the-highway movement involved passing through states that prohibited loads of the desired magnitude. Although most rail tariffs permit them to do so, the railroads have refrained from the usual motor common carrier practice of loading l.t.l. shipments into a trailer containing a partial load that is an overflow from another trailer containing a full load from the same customer. This practice eliminates

delay to the partial load while l.t.l. shipments are loaded and unloaded.

All railroad officers contacted seemed optimistic about the future possibilities of trailer-on-flat-car services. One executive observed that piggy-back has permitted the railroads to obtain business from accounts that had previously been closed with the notation "shipper now using truck service." Another expressed the opinion that highway trailers and piggy-back flat cars would ultimately replace a substantial portion of the present fleet of box cars. Although some box car shipments may be diverted to trailers, most of those interviewed believed that only that business that would have ultimately been diverted to truck shipment would be affected. They pointed out that the railroad was now in a position to retain business that would have been automatically forfeited prior to the inauguration of piggy-back services.

Representatives of two railroads that transport motor common carrier trailers seemed enthusiastic about the long-term prospects of the cooperative service. However, the New Haven service which has been available for approximately nineteen years has been able to attract a volume of traffic that at its maximum density has been estimated to represent only 10 per cent of the traffic passing through the Greenwich, Connecticut gateway between New York and New England.



The 1953 studies of New York-Chicago motor truck traffic indicated a daily trailer volume of approximately 540 in each direction. If, as was anticipated, 15 per cent of this volume were diverted to rail flat car shipment, a monthly volume of 3,200 trailers would be handled, assuming that there were 20 shipping days per month.<sup>24</sup>

The maximum volume of motor carrier trailers handled by the Pennsylvania Railroad was 3,389 trailers during October, 1955. This traffic included trailers originating in or destined to Philadelphia, Pittsburgh and St. Louis in addition to New York and Chicago.<sup>25</sup> Assuming that most of this volume was traffic between New York and Chicago, the above figures indicate that the Pennsylvania was handling no more than 10 per cent of the New York-Chicago motor common carrier traffic.

The Pennsylvania service is most heavily patronized on weekends when motor common carriers are obligated to pay overtime rates or suspend operations.

While the above figures are indications that the initial volume of traffic from motor carrier customers has fallen short of original estimates, there is also evidence

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<sup>24</sup>Harvard Business School Case Material, op. cit., p. 12.

<sup>25</sup>Railway Age, December 5, 1955, p. 42.

to indicate that the traffic generated by railroad owned trailer services has, in some cases, exceeded anticipated volume.

During the course of the interviews, it was revealed that there have been several instances of inadequate supply of railroad owned trailers to fulfill the requirements of customers. It was also stated that railroad trailer fleets, in many cases, did not include the specialized types of trailers required by some shippers.

The best forecasts are frequently incorrect, but the writer was left with the impression that piggy-back, like Topsy, had just "grewed." Most plans for trailer-on-flat-car services were formulated during 1954, a year of reduced traffic volume for most railroads. Lack of tangible evidence that trailer-on-flat-car service would be a profitable venture discouraged expenditures for trailers or specially equipped flat cars for a service that might prove to be of doubtful value.

However, the embarrassing experience of being unable to accommodate all customers gives cause to consider means to more closely estimate the future demand for trailer-on-flat-car service. A market survey of those industries that utilize trailer shipments should provide some indication of the potential volume of traffic. Railroads already engaging



in extensive motor carrier operations through subsidiary companies should be in a particularly advantageous position to contact shippers that patronize truck service.

Representatives of railroads offering service to motor carriers were also questioned about the service that they also offer at truck competitive rates. The Pennsylvania Railroad's competitive trailer service antedates the motor carrier cooperative service by approximately one year. Motor common carrier trailer volume during October, 1955 was more than double the volume of trailer traffic generated by their own truck competitive service.<sup>26</sup> Since similar data are unavailable for prior or subsequent months, it does not necessarily follow that this ratio is representative. Pennsylvania executives expressed the opinion that the two services are compatible. They believe that motor carriers will continue to be attracted to their service as long as it affords them an opportunity to reduce their own costs of operation.

The New Haven truck competitive service was initiated in December, 1955 in cooperation with connecting railroads to provide service between New England points and the Middle-West. It does not compete directly with the motor common carrier service between New York and Boston. It is felt that the growth of New Haven trailer-on-flat-car service depends upon

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<sup>26</sup>Railway Age, December 5, 1955, p. 47.

future interchange arrangements. The comparatively short haul of approximately 230 miles between New York and Boston has limited its growth since motor carriers are able to make the trip between the two cities in a shorter time than the railroad when trailer loading and unloading times are considered.

The majority of the railroads interviewed have adopted the more universally accepted practice of offering trailer-on-flat-car service via their own trailers at truck competitive rates. Most of the executives of these railroads looked upon the motor common carrier service as a means of strengthening a competitor by reducing his operating expenses. They also had misgivings about its ultimate effect on the box car rate structure.

All of the traffic executives interviewed were of the opinion that growth trends of the present services justified optimistic predictions that trailer-on-flat-car service will ultimately make a substantial contribution to the overall profitability of railroad freight service.

The conclusions of the author, based on the extensive reading that preceded this thesis and on data obtained during the field interviews, are expressed in the following chapter.



CHAPTER V

CONCLUSIONS

Most observers envision a long-term growth of trailer-on-flat-car service. However, the same unanimity of opinion does not prevail in regard to the type of service that will experience the greater development. Services that have been available since the mid-1930's provide rail transportation for trailers of motor common carriers and, to a limited extent, for trailers of contract carriers and private shippers. Most services that have been inaugurated during the past three years have been provided with railroad owned trailers at rates that are directly competitive with those of motor carriers.

Two principal advantages of trailer-on-flat-car service justify the conclusion that the service will continue to grow. First, it incorporates the economy of mass transportation that is the railroads' greatest advantage and the inherent flexibility of motor truck transportation that permits performance of the entire transportation function in one vehicle, irrespective of the lack of rail siding at the customer's place of business. The cost studies conducted by the New York Central Railroad demonstrated that costs for transportation of a trailer by railroad flat car are lower than by highway.<sup>1</sup> However, present regulatory

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<sup>1</sup>Harvard Business School Case Material, op. cit., pp. 9-10.

policy has prevented the greater economy of trailer-on-flat-car service from being reflected in the rates that shippers are charged for the service. Motor carriers that utilize cooperative trailer-on-flat-car service charge their customers rates that are identical with those for over-the-road shipment. The rates for the railroad competitive services have, in most cases, been at a parity with motor carrier rates.

Therefore, the writer's conclusion that further growth of trailer-on-flat-car service may be anticipated is tempered with the qualification that maximum development will not occur unless regulatory policy is modified so that rates may reflect the economic advantages of the service.

Another consideration, favorable to further development of piggy-back service, is the opportunity that it presents to the railroad industry to provide service to off-track industry. Competitive services are comparable to those offered by motor carriers, or, if cooperative service is provided, the railroad shares in the revenue of traffic that otherwise would not have moved by rail.

The writer is also of the opinion that, while current developments indicate growth of both types of service, there are important economic considerations that point overwhelmingly toward maximum development in the area of railroad services that are directly competitive with motor carriers.



This conclusion is predicated on two basic assumptions. Of primary importance is the assumption that railroads ultimately will be permitted to offer shippers a rate that reflects the inherent economy of rail transportation. It is also assumed that public policy in regard to use of the highways by heavy motor trucks will remain substantially unchanged and will therefore offer no greater incentive for truck operators to patronize cooperative trailer-on-flat-car services.

Speed of service from the platform of the shipper to the receiver of freight has always been one of the important advantages possessed by the trucking industry. Even the most expeditious handling of trailer-on-flat-car shipments by the railroads will not overcome this superiority when shipping distances are comparatively short. In this area, especially, it is evident that development of trailer-on-flat-car service will be limited unless the shipper can be offered a lower rate as an inducement to patronize the service.

That price is the controlling consideration to many patrons of trailer-on-flat-car service was made evident by the diversion of a substantial portion of this traffic to motor carriers when rates for this service were increased on March 7, 1956.<sup>2</sup>

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<sup>2</sup>Railway Age, April 23, 1956, pp. 7-8.

Limited growth of cooperative trailer-on-flat-car services indicates that most truck operators do not consider the reduction in operating expenses, made possible by patronage of these services, to be sufficient incentive to divert a substantial portion of their traffic to the railroad. Available data indicate that cooperative railroad-motor common carrier piggy-back services have been able to attract no more than approximately 10 per cent of the available traffic.

If the charges assessed motor carriers for use of the highways were increased, it seems reasonable to assume that a greater proportion of the motor carrier traffic would utilize the cooperative piggy-back services. However, it is more realistic, in view of past developments, to anticipate an environment that will foster further development of motor carrier transportation.

A competitive trailer-on-flat-car service offers potentially higher revenue return to the railroads than the cooperative plan. The rates for the cooperative service must be held at a minimum to offer the trucker any incentive to forsake the highway. In effect, the difference between the rate that he charges his customer and the cost of piggy-back service to him is a payment by the railroad to the trucker for originating the shipment and providing the trailer.



Railroads have the organization and the personnel to perform the functions of soliciting the business, processing claims, and transporting the shipment. All that is needed to inaugurate a competitive trailer-on-flat-car service are trailers, loading ramps and suitable flat cars. Arrangements for delivery and pick-up of trailers in terminal areas must also be made. Since loading ramps and flat cars would be required for either service, the additional investment required for competitive service is that necessary to acquire the trailers. Transportation of trailers at terminals may be accomplished by railroad-owned tractor or through arrangements with local transfer companies.

Few services that provide transportation for the trailers of private shippers have been offered by the railroads. Reasons advanced for this limited development include: absence of regular movement in volume, and the potential disruptive effect of private trailer rates on the prevailing rate structure for conventional railroad shipment of identical commodities. A large portion of private and exempt for-hire motor transportation is not considered amenable to trailer-on-flat-car service because users of these types of transportation demand greater flexibility of operation than is obtainable from scheduled railroad service. On the other hand, most of the commodities shipped by motor common carrier are shipments that require evening departure

and morning delivery, a requirement that permits consolidation of a number of trailers into a single train movement.

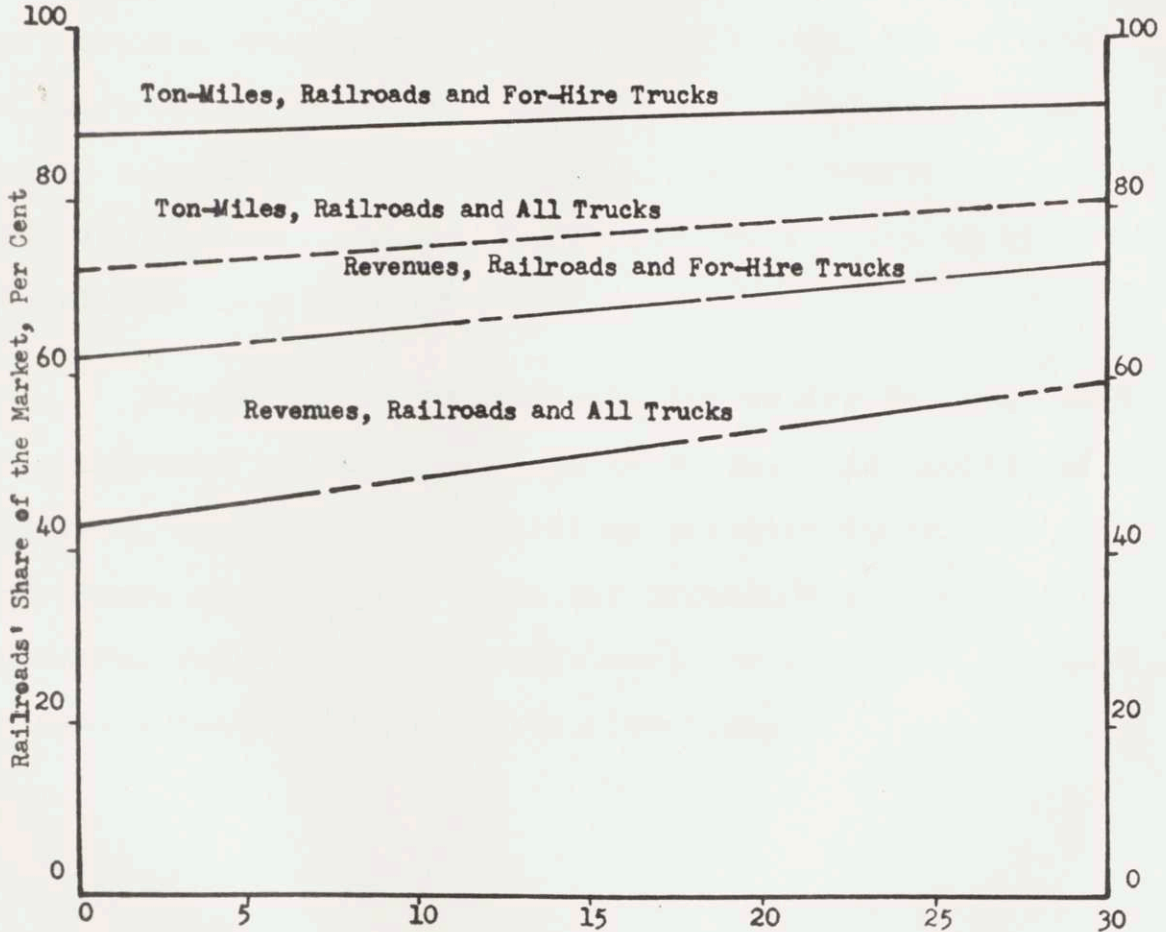
However, if regulatory policy eventually will permit adjustment in rates to reflect changed competitive conditions, the railroads will be in a position to quote rates for shipment via their competitive trailer service that will be low enough to make private carriage less attractive.

In estimating the potential contribution of trailer-on-flat-car service to railroad operating revenues, the writer has made no attempt to determine the extent to which this type of traffic will be distributed between trailers of railroad ownership, commercial motor carriers, and private shippers. In line with the basic assumption that railroad sponsored competitive service will predominate, the potential effect of diversion of trailer traffic to this type of service is presented in figure 3. This graph shows the effect of varying percentages of diversion on the railroads' share of freight traffic and revenues.

A comparison of figure 2, page 26, and figure 3 indicates that realization of a maximum diversion of 30 per cent of potential truck traffic to trailer-on-flat-car service would result in distribution of traffic and revenues at levels approximately equivalent to 1948-49.



DISTRIBUTION OF FREIGHT TRAFFIC AND REVENUES  
 BETWEEN RAILROADS AND ALL TRUCKS AS AFFECTED  
 BY GROWTH OF TRAILER-ON-FLAT-CAR SERVICE



DIVERSION FROM TRUCK TO TRAILER-ON-FLAT-CAR SERVICE, PER CENT  
 ZERO DIVERSION FROM 1954 DISTRIBUTION, FIGURE 2, CHAPTER II

FIGURE 3

The effect of the growth of trailer-on-flat-car service, as shown in figure 3, is deliberately oversimplified. No cognizance is taken of the potential diversion of traffic now moving by box car to piggy-back service, nor is the potential effect of the so-called "fishy-back" trailer-on-ship service considered. On the other hand, the effects of improvements in conventional railroad equipment, accelerated schedules for freight trains, and a regulatory policy that would permit the pricing of box car service to be fully competitive have been ignored.

Despite these limitations, the writer believes that this approach to the problem is of value. An individual railroad, familiar with conditions peculiar to its own territory, might employ a similar procedure to evaluate the potential return from any investment for equipment designed to meet a specific competitive situation.



## APPENDIX

TABLE I

RELATIVE SHARES OF INTERCITY FREIGHT TRAFFIC, PUBLIC AND  
PRIVATE BY KINDS OF TRANSPORTATION  
(PER CENT OF TOTAL TON-MILES)

| <u>Year</u> | <u>Railways*</u> | <u>Highways</u> | <u>Inland<br/>Waterways**</u> | <u>Pipe-lines</u> |
|-------------|------------------|-----------------|-------------------------------|-------------------|
| 1916        | 77.2             | ----            | 18.4                          | 4.4               |
| 1930        | 75.2             | 3.9             | 15.5                          | 5.4               |
| 1939        | 64.3             | 8.3             | 16.9                          | 10.5              |
| 1940        | 63.3             | 8.4             | 18.4                          | 9.9               |
| 1941        | 64.7             | 8.5             | 17.6                          | 9.2               |
| 1942        | 71.1             | 5.4             | 15.3                          | 8.2               |
| 1943        | 72.8             | 4.6             | 12.9                          | 9.7               |
| 1944        | 70.2             | 4.5             | 12.9                          | 12.4              |
| 1945        | 68.9             | 5.3             | 13.1                          | 12.7              |
| 1946        | 68.6             | 7.3             | 13.1                          | 11.0              |
| 1947        | 67.6             | 7.9             | 13.8                          | 10.7              |
| 1948        | 64.4             | 8.7             | 15.0                          | 11.9              |
| 1949        | 60.6             | 10.6            | 15.8                          | 13.0              |
| 1950        | 58.8             | 12.4            | 16.1                          | 12.7              |
| 1951        | 55.9             | 15.6            | 15.5                          | 13.0              |
| 1952        | 54.9             | 16.3            | 14.9                          | 13.9              |
| 1953        | 51.0             | 18.0            | 16.8                          | 14.2              |
| 1954        | 49.5             | 19.1            | 15.5                          | 15.9              |

\* Steam and Electric, including mail and express.

\*\* Including Great Lakes.

Air Freight is not shown. Despite noticeable growth, it still represents less than .1 per cent of total traffic.

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Source: Annual Reports, Interstate Commerce Commission, Washington, D.C. The 1954 figures are estimates of the Commission.



TABLE II

RELATIVE SHARES OF INTERCITY FREIGHT TRAFFIC, PUBLIC AND  
PRIVATE BY KINDS OF TRANSPORTATION  
(PER CENT OF TOTAL TON-MILES)  
EXCLUDING PIPE-LINES AND AIR FREIGHT

| <u>Year</u> | <u>Railways*</u> | <u>Highways</u> | <u>Inland<br/>Waterways**</u> |
|-------------|------------------|-----------------|-------------------------------|
| 1916        | 80.7             | ----            | 19.3                          |
| 1930        | 79.5             | 4.1             | 16.4                          |
| 1939        | 72.0             | 9.2             | 18.8                          |
| 1940        | 70.4             | 9.3             | 20.3                          |
| 1941        | 71.2             | 9.4             | 19.4                          |
| 1942        | 77.5             | 5.9             | 16.6                          |
| 1943        | 80.6             | 5.1             | 14.3                          |
| 1944        | 80.3             | 5.0             | 14.7                          |
| 1945        | 78.8             | 6.1             | 15.1                          |
| 1946        | 77.1             | 8.2             | 14.7                          |
| 1947        | 75.6             | 8.9             | 15.5                          |
| 1948        | 73.0             | 9.9             | 17.1                          |
| 1949        | 69.7             | 12.2            | 18.1                          |
| 1950        | 67.3             | 14.3            | 18.4                          |
| 1951        | 64.2             | 18.0            | 17.8                          |
| 1952        | 63.9             | 18.8            | 17.3                          |
| 1953        | 59.4             | 21.0            | 19.6                          |
| 1954        | 59.0             | 22.8            | 18.2                          |

\* Steam and Electric, including mail and express.

\*\* Including Great Lakes

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Source: Annual Reports, Interstate Commerce Commission,  
Washington, D.C. The 1954 figures are estimates of the  
Commission.

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