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STUDY OF FEDERAL AID TO RAIL TRANSPORTATION

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JANUARY 1977

Report of the Secretary of Transportation
to the United States Congress pursuant
to Section 902 of the Railroad Revitalization
and Regulatory Reform Act of 1976

U.S. DEPARTMENT OF TRANSPORTATION

WASHINGTON, D.C.

THE SECRETARY OF TRANSPORTATION
WASHINGTON, D.C. 20590

January 19, 1977

Honorable Nelson A. Rockefeller
President of the Senate
Washington, D. C. 20510

Dear Mr. President:

I am pleased to submit to you the Study of Federal Aid to Rail Transportation prepared in response to Section 902 of the Railroad Revitalization and Regulatory Reform Act of 1976.

This Report presents an analysis of the effects on the railroads of past and present policies and methods for providing Federal aid to the rail and non-rail modes of transportation, together with recommendations for future policy for providing Federal aid to rail transportation. The analysis of Federal actions includes direct Federal aid, tax policies, and economic regulation of each of the major modes of domestic intercity transportation (i.e., air, highway, pipeline, rail and water transportation). The Report also includes an assessment of the impacts of socio-economic forces on the railroads in order to provide a framework for the analysis of the effects of Federal actions on rail transportation.

Sincerely,

William T. Coleman, Jr.

Enclosure

THE SECRETARY OF TRANSPORTATION
WASHINGTON, D.C. 20590

January 19, 1977

Honorable Thomas P. O'Neill, Jr.
Speaker of the House of
Representatives
Washington, D. C. 20515

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This Report presents an analysis of the effects on the railroads of past and present policies and methods for providing Federal aid to the rail and non-rail modes of transportation, together with recommendations for future policy for providing Federal aid to rail transportation. The analysis of Federal actions includes direct Federal aid, tax policies, and economic regulation of each of the major modes of domestic intercity transportation (i.e., air, highway, pipeline, rail and water transportation). The Report also includes an assessment of the impacts of socio-economic forces on the railroads in order to provide a framework for the analysis of the effects of Federal actions on rail transportation.

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EXECUTIVE SUMMARY

Introduction

This Report to the Congress was prepared in response to Section 902 of the Railroad Revitalization and Regulatory Reform (RRRR) Act of 1976 (P.L. 94-210). Section 902 directs the Secretary of Transportation to analyze the effects on the railroads of past and present policies and methods for providing Federal aid to the rail and non-rail modes of transportation and to recommend to Congress future policy for providing Federal aid to rail transportation.

The Section 902 Study analyzes the history of Federal actions with respect to each of the major modes of domestic intercity transportation (i.e., air, highway, pipeline, rail and water transportation) in order to assess the impacts on the railroads of Federal actions toward the rail and non-rail modes. In addition to direct Federal aid, this Report examines Federal tax and regulatory policies toward the various modes of transportation in recognition that such policies may have a significant effect on market shares and financial viability. The impacts of Federal safety and environmental regulation are not treated in this Report inasmuch as public policy has determined that such regulation be applicable to all the modes and the variability of the impacts of such regulation depends largely upon the peculiar operating characteristics of each mode.

As a perspective on the Section 902 Study's focus on Federal aid to transportation, it should be noted that Federal transportation expenditures are only a part of total transportation expenditures by all levels of government. For example, in 1974 total Federal transportation expenditures of approximately $11.3 billion represented 33.2 percent of the total of $34.1 billion spent for transportation that year by Federal, state and local governments. Thus the focus of the Section 902 Study on Federal aid to the various modes of transportation should not obscure the fact that Federal transportation expenditures, while large in terms of both absolute size and influence, account for only about one-third of total transportation expenditures by the public sector.

The Impact of Socioeconomic Forces on the Railroads

The Nation's rail system is largely a 19th century phenomenon, designed and constructed to serve the freight and passenger transportation needs of an era when railroads were the dominant mode of intercity transportation. The rail system peaked in size in the 1920's at approximately 250,000 route miles (compared to 200,000 today). Of this peak mileage, slightly more than three-quarters was in place by 1900. The rail system in the Northeast and Midwest is, of course, even older. In the Granger

states,[1] 88 percent of the peak 1920 mileage had already been constructed by 1900, while over 92 percent of the rail network in the Eastern states[2] was in place by that date.

The Nation's economy at the turn of the century was, of course, radically different from today's economy, and fundamental economic changes have had a major impact on rail transportation. In 1900, farming accounted for a fifth of the gross national product (GNP), compared to its share of only 3 percent in 1975. The largest proportion of the labor force (40 percent) was employed in 1900 in the agriculture, forestry or fisheries industries, industries that accounted for only 4 percent of national employment in 1975.

The manufacturing sector of the economy has also changed dramatically since the beginning of this century. While this sector continues to account for about one-fourth of GNP, manufacturing has gradually shifted from the production of heavier-weight, lower-valued goods to lighter, more expensive products, a shift that has changed the type of transportation services demanded by the manufacturing sector. For example, the production of chemicals, rubber, plastics, electrical machinery and instruments accounted for a total of 24 percent of value added by manufacture in 1972, compared to only 7 percent in 1899. The Nation has also shifted from the use of coal as a major source of energy (71 percent of energy consumption in 1900) to a heavy reliance upon oil and natural gas (combined 74 percent of 1975 energy consumption).

The regional distribution of both population and manufacturing activity has also changed significantly since the construction of much of the Nation's rail system. In 1900, almost half the population lived in the Eastern states and this region accounted for 80 percent of value added by manufacture. By the 1970's, this dominance of the Eastern states had declined to the point where this region represented 42 percent of the national population and slightly less than 55 percent of value added by manufacture. In addition to the Eastern states' loss of both population and manufacturing activity to the southern and western regions during the 20th century, the rural areas of the U.S. during this time have lost population to the cities. In 1900, 60 out of every 100 Americans lived in rural areas; in 1970 that figure was 26 out of every 100.

As might be expected, these sweeping changes in the structure of the Nation's economy and in the location of both population and economic activity had a profound impact on a fixed rail system designed to serve the transportation needs of the 19th century. The railroads' share of domestic intercity freight traffic fell from 79.7 percent in 1925, the decade of peak railroad mileage, to 36.8 percent by 1975. The railroads

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[1] Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska and Wisconsin.

[2] The Eastern states include the New England, Middle Atlantic, and East North Central Census Bureau regions.

also saw their 1926 share of 22.5 percent of the domestic intercity passenger travel market dwindle to less than one percent by 1975.

The railroads' competitors--the auto, truck, airplane, pipeline and modern barge--proved to be technologically superior to the railroads in responding to the growing demands for speed, convenience and high service quality that characterized the evolving economy of the 20th century, and these newer transportation technologies swiftly made inroads into the freight and passenger traffic of the railroads. During the 50-year span between 1926 and 1975, the trucking industry moved from an almost negligible share of the domestic intercity freight market to a share of 21.3 percent, and the pipeline share grew from 3.4 to 24.6 percent. Of the 112 manufacturing commodity groups reported in the 1972 Census of Transportation, non-rail carriers (regulated and unregulated) moved half or more of the traffic in 95 of the groups (which accounted for 80 percent of the total Census tonnage).

During this 1926-1975 period, the air transportation share of the domestic intercity passenger travel market grew from nothing to 10.9 percent, while the automobile increased its share from 73.2 to 86.1 percent.

The traffic losses of the railroads have had a strongly negative impact on the financial position of the rail industry. The decade of the 1970's has seen the bankruptcies of seven Class I carriers[1] which operated in the Eastern and Granger states and the need for Federal assistance to reorganize five of these carriers into ConRail. In 1974, the best earnings year in almost a decade for the railroads, the rate of return on net worth for all Class I rail carriers was only 4.3 percent, compared to a return that year of 19.6 percent for common carrier trucking and a 15.2 percent average return for all manufacturing industries. By 1974, the railroads' share of intercity freight transport revenues had fallen to 23.7 percent (compared with their 38.8 percent share of the traffic that year).

The absence in the foreseeable future of any major new transportation technologies on the order of importance of the diesel and jet engines, when coupled with the apparent slowdown in the rate of structural change that has characterized the economy during much of the 20th century, would seem to signal a stabilization in railroad traffic and revenues. The most promising area for increases in rail freight traffic lies in the projected increases in coal consumption. However, even if such projections are realized, the railroad share of the domestic intercity freight market in the 1980's will show only a modest increase over the current 37 percent share (i.e., a 40 percent share). Such a stabilization in the railroads' market share will not in and of itself, however, overcome the serious long-term erosion that has occurred in the physical and financial condition of much of the Nation's railroad industry.

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[1]Boston and Maine, Central of New Jersey, Erie Lackawanna, Lehigh Valley, Penn Central, Reading, and Rock Island railroads.

The Impact of Federal Actions on the Railroads

Direct Aid

The history of direct Federal aid to transportation goes back to 1789 when Congress authorized the construction of the first Federally provided aid to navigation, a lighthouse at Cape Henry, Virginia. Since that time, the Federal Government has disbursed large amounts of financial assistance for transportation in a variety of forms for the purpose of improving access to the various regions of the country and promoting economic growth and development. With the exception of the pipeline mode, which has been largely designed, constructed and operated by the private sector, each of the major modes of intercity transportation has had a period of direct Federal promotion and financial assistance.

From 1789 through the end of World War II, direct Federal aid (in current dollars) to transportation has approximated $7.3 billion for highway transportation, $1.1 billion for air, $4.0 billion for domestic water and $0.5 billion for rail transportation. During this same time period, the Federal Government received approximately $5.8 billion in the form of highway user charges and $1 billion from the railroads in the form of reduced rates on the Federal Government's freight and passenger traffic. (These rate reductions were given by the railroads in return for the large Federal land grants which constituted most of the pre-World War II Federal aid to rail transportation.) There were no significant Federal receipts during this time from users of the Federally funded air or water transportation systems. This consideration of "returns to the Federal Government" should not be so narrow, however, as to fail to recognize the vast but unquantifiable public benefits that Federal aid to the various transport modes provided during this period for the economic growth and development of the Nation.

Federal aid to transportation changed in both size and scope in the post-World War II period. Federal aid (in current dollars) to the air, highway, rail and water modes during the 30-year period from fiscal year (FY) 1946 through FY 1975 totaled approximately $118.4 billion, compared with the total of $12.9 billion during the 156-year period from 1789 through 1945. That $118.4 billion breaks down to $81.5 billion for highway transportation, $24.9 billion for air, $10.7 billion for domestic water, and $1.3 billion for rail transportation.

Whereas Federal aid to transportation during the 1789-1945 period was given primarily to provide access to the vast unsettled regions of the country and to promote general economic development goals, Federal aid in the post-World War II period has been given for more transportation-specific purposes, such as the construction of the Interstate Highway System or the provision of emergency operating assistance to the bankrupt Northeast railroads prior to their reorganization into ConRail. While such transportation-specific goals quite

obviously have major significance for the Nation's economy, it is nevertheless true that the maintenance of an efficient multi-modal nationwide transportation system has been much more of an explicit public policy goal of Federal direct aid to transportation in the post-World War II period than in the 1789-1945 period.

Cost recovery for direct Federal aid to transportation has also become an important Federal objective in the post-World War II period. From FY 46 through FY 75, the Federal Government collected approximately $90.5 billion in highway user taxes and $3.9 billion in airport and airway user taxes. The largest shortfalls in Federal cost recovery during this period were in the air and water modes. Airport and airway user taxes recovered about 42 percent of the Federal cost of the air system in FY 75, while users of the Federally provided inland, coastal and Great Lakes waterways do not pay any fees for their use of these systems. (It should be recognized that a portion of the cost of the airport and airway system is directly attributable to defense and governmental use and thus is not appropriate for user charge recovery.)

The effect on the railroads of the major post-World War II direct Federal aid programs for the air, highway and water modes was to significantly shorten the time frame in which the railroads had to adjust to new competition from these modes. Private capital alone could not have transformed these newer modes into mature transportation systems in such a relatively brief time span and the rail industry, with its 19th century system, found itself struggling to compete with these 20th century technologies which, through Federal aid, had grown into strong competitors for both the freight and passenger transportation dollar.

Tax Policies

Federal tax treatment of the major modes of intercity transportation has not been uniform in its application to the various modes. As noted in the previous section on direct aid, Federal user taxes recover all Federal highway costs (although not equally from all classes of highway users) but only 42 percent of the cost of the airport and airway system (with the primary shortfall in the general aviation user class). There is no cost recovery for direct Federal aid to the inland waterway system, nor for Federal aids to certain rail transportation services such as intercity rail passenger and local rail services.

The intercity transport modes also benefit disproportionately from their use of Federal investment tax credits. While such credits are available to all the modes (and to industry in general), the more capital-intensive modes, such as the railroads with their privately owned rights-of-way, are able to utilize the investment tax credit provisions to a greater extent than the less capital-intensive modes, such as the waterways with their publicly provided facilities. The

Section 902 Study has not been able to quantify the use of such tax credits by the various modes since many transportation firms are either subsidiaries of larger conglomerates or parents of non-transportation subsidiaries and the annual reports of these firms do not provide separate data for their transportation operations.

In addition to the investment tax credit, Federal tax legislation has provided certain tax concessions specifically tailored to benefit certain transportation industries. While such benefits vary substantially from year to year, for the period 1970-1980 the average yearly benefit from such specialized Federal tax concessions is expected to be approximately $35 million for domestic water carriers and $64 million for the railroad industry. For the period 1977-1980, the airline industry is expected to receive an average annual Federal tax benefit of approximately $37 million.

The railroad industry was burdened from 1942 to 1958 by a Federal excise tax on freight waybills and from 1941 through 1962 by another Federal tax on passenger tickets. While all regulated carriers had to pay these taxes, the excises fell particularly heavily on the railroads since rail freight revenues accounted for 58 percent of total regulated freight revenues from 1942 to 1958, while rail passenger revenues accounted for 44 percent of total regulated passenger revenues during the 1941-1962 period. An estimated $5.1 billion was collected from the railroads by these two Federal taxes for the purpose of raising general tax revenues.

The rail industry is also burdened with certain tax policies that do not affect the other modes. Discriminatory tax treatment of railroad rights-of-way by state and local governments has been estimated to cost the industry $60 to $70 million annually. (Such discriminatory treatment will be prohibited by 1979 by the RRRR Act.) The railroads have also experienced payroll tax inequities vis-a-vis their non-rail competitors as a result of the specialized Federal unemployment insurance and retirement programs for railroad employees. At the present time, the railroad retirement tax per employee is about 17 percent higher than the combined Social Security and estimated private pension plan retirement benefit per employee paid by motor carriers.

Such tax burdens on the railroads have undoubtedly served to further depress the financial viability of an industry already suffering from declining traffic and revenues and a rate of return far below the cost of capital.

Economic and Non-Safety-Related Labor Regulation

As in the case of Federal tax policies, the impacts of Federal economic regulation fall disproportionately on the various modes of intercity transportation. On the freight side, as measured in 1974 ton-miles, all rail freight traffic is subject to Federal economic

regulation, while the proportion of traffic so regulated is 85 percent for pipelines, 44 percent for trucks, 16.5 percent for inland waterway traffic, and 6.3 percent for domestic deep-draft traffic. On the passenger side, air and bus traffic is fully regulated while Amtrak-operated intercity rail passenger services are subject only to service standards prescribed by the ICC, and auto traffic is, of course, not regulated.

Federal regulation of the railroads has been the most pervasive of all the modes. The railroads came under Federal regulatory controls with the passage of the Interstate Commerce Act in 1887 and are subject to Federal controls on rates, services, entry into new markets and exit from existing ones, and the corporate structure of the industry.

There is substantial evidence that the railroad industry benefited from Federal regulation from its inception in 1887 until the Depression of the 1930's. Such regulation is generally credited with bringing a fair measure of stability to an industry characterized in the 19th century by cut-throat intra-industry competition and discriminatory pricing. There is also substantial evidence that Federal regulation later handicapped the railroad industry, particularly in the period following World War II, in its efforts to respond to strong competition from the newer modes. Federal economic regulation hindered the railroads in their attempts to adjust rates to meet competition from the trucking and waterway industries, and in their efforts to abandon unprofitable light-density rail services. Proposals for railroad mergers that were potentially helpful to the industry took up to ten years for the Federal Government to decide, thereby delaying or dissipating whatever benefits might have accrued to the rail industry from such restructuring. While much of the traffic of the railroads' competitors was unregulated, railroad rates were often maintained at artificially high levels to "fair share" traffic among the major modes of intercity freight transportation. On the passenger side, the rail industry was forced to continue money-losing intercity rail passenger services until the creation of Amtrak in 1970.

The railroad industry has also been subject to a substantial amount of specialized Federal railroad labor legislation, but the effects of such legislation on the competitive position of the railroad industry are not readily discernible.

Combined Impact: Socioeconomic Forces and Federal Actions

The tremendous changes that have taken place during the 20th century in the composition and location of economic activity, in the country's demographic makeup, and in manufacturing and transportation technologies have had a much greater impact on the viability of rail transportation than have Federal direct aid, tax and regulatory actions toward the rail and non-rail modes. The strong competition that the 20th century modes presented to the 19th century rail system antedated the major post-World War II Federal aid programs for the air, highway and water modes.

Motor carriers, for example, were able to achieve their present 21 percent share of the intercity freight market as early as 1958, before the construction of the Federally funded Interstate Highway System. Similarly, the automobile had captured 80 percent of the intercity passenger market as early as 1930. The major share of Federal aid to the non-rail modes in the post-World War II period occurred after 1960, by which time the railroad industry had already suffered three-quarters of the 28 percentage point drop in its share of the intercity freight market that took place between 1947 and 1975. The major structural changes in the population and the economy that have characterized the 20th century provided powerful market advantages to the railroads' modal competitors, advantages which would have existed regardless of the Federal aid given to the non-rail modes.

This accent on socioeconomic forces as the prime determinants of the fortunes of the railroads should not, however, obscure the role of Federal actions in compounding the problems which the railroads were already facing from such forces. Direct Federal aid to the non-rail modes significantly shortened the time frame for the development of these modes from new technologies to mature intercity transportation systems. At the same time, Federal economic regulation of the railroads interfered with changes in railroad rates and services, and in the physical and corporate structure of the rail industry, changes which might have helped the railroads reduce their traffic and revenue losses to other modes.

Thus the net effect of these Federal actions has been to exacerbate the many market problems that the railroads were already encountering as a result of socioeconomic changes.

The RRRR Act

The Railroad Revitalization and Regulatory Reform Act of 1976 represents a major initiative on the part of the Federal government to assist the railroad industry in its long-overdue transition from a 19th century network into a viable private sector component of a 20th century multi-modal transportation program. The RRRR Act, as amended, contains over $6.5 billion in authorizations for Federal assistance to rail transportation, and the numerous provisions of the Act represent several years of deliberation and negotiation among the Congress, the Executive Branch, state and local governments, railroad management and labor, and rail users over the future of Federal policy toward rail transportation.

The Act can be divided into the following six major subject areas:

(1) Reform of Federal regulatory control of the railroads through the provision of a certain degree of rate-making flexibility for the railroads and through streamlined procedures for Federal consideration

of applications for railroad mergers, consolidations and other such reorganizations (Titles II, III, and IV of the Act);

(2) Provision of authorizations for $600 million in Redeemable Preference Share financing and $1 billion in the principal amount of loan guarantees to give Federal financial assistance to the railroad industry for the rehabilitation and improvement of rail facilities and equipment (Title V);

(3) Implementation, by means of $2.1 billion in Federal financial assistance, of the Final System Plan which provided for the takeover on April 1, 1976, of the essential rail services of six bankrupt carriers in the Northeast and Midwest by ConRail (Title VI);

(4) Implementation, by means of $1.75 billion in Federal funding, of the Northeast Corridor Project which provides for improved intercity rail passenger services between Boston and Washington, D.C., the Nation's most densely populated travel corridor (Title VII);

(5) Provision of new authorizations of $360 million for a five-year, nationwide program of Federal financial assistance for the interim continuation of rail service on uneconomic light density lines and for the development of subsidy-free local freight transportation alternatives to such uneconomic rail services (Title VIII);

(6) Conduct of eight major railroad research efforts by the U.S. Department of Transportation and two additional studies by the Interstate Commerce Commission to explore virtually every area of the physical and corporate structure, operations and financial needs of rail transportation (Titles II, V, VII, VIII, and IX).

The RRRR Act provides a sound basis for beginning a much-needed revitalization of the Nation's railroads because of its multi-faceted approach to the complex problems plaguing rail transportation. The Act contains the essential two-phased approach of: (1) providing interim Federal financial assistance to help the rail industry meet its immediate physical and financial crises; and (2) providing for a comprehensive Federal research program into the problems and prospects facing rail transportation.

That the Act not only contains this combination of interim assistance and new research, but also tackles the long-standing dilemmas surrounding Federal regulation of railroads, intercity rail passenger service in the Northeast Corridor, and uneconomic light-density rail lines is an indication of the desire on the part of those who helped shape the Act to give the Federal Government a strong, unequivocal mandate to help the railroad industry begin its long-overdue revitalization in order to remain a viable private-sector mode of transportation.

Study Conclusions and Policy Recommendations

The Section 902 Study has demonstrated that the relative advantage or disadvantage to the railroads flowing from the totality of Federal policies and programs is: (1) enormously complex and difficult to trace and quantify; (2) almost infinitely arguable; and (3) far more than simply an aggregation of the measurable financial assistance, direct and indirect, given by the Federal Government to the various transportation modes.

The Study leads to the following general conclusions:

(1) Just as socioeconomic forces were chiefly responsible for the rise of the railroads as the dominant mode of transportation in the 19th century, so too were such forces primarily responsible for the railroads' decline in the post-World War II period.

(2) Socioeconomic forces have been far more important determinants of the fortunes of the rail mode than has direct Federal aid to the non-rail modes.

(3) Federal aid should not be given to the rail industry for the purpose of redressing any historical inequity in the amounts of aid given to the railroads and the other modes of transportation.

(4) Federal actions during the post-World War II period, including direct financial assistance, served to heighten and accelerate the competitive pressures from other modes which already confronted the rail industry, and which were manifested in the railroads' loss of market share and inadequate profit margins.

(5) The Railroad Revitalization and Regulatory Reform Act of 1976 offers a sound framework for providing transitional Federal assistance to the railroads and a comprehensive assessment of the problems and prospects facing rail transportation to guide future Federal action in this area.

The following policy recommendations emerge from the foregoing conclusions:

(1) The intermodal impacts of Federal actions and policies, particularly Federally aided transportation investments, affecting the rail and non-rail modes should become an explicit consideration in the Government's decision-making process.

(2) The maintenance of an open and competitive market among mature modal competitors requires the elimination of most, if not all, Federal subsidies to transportation. Where circumstances require long-term Federal financial involvement in the operations of a mode of transportation, such Federal involvement should be based upon the appropriate form of cost sharing or cost recovery.

(3) Federal economic regulation of the various modes of transportation should be reduced or otherwise modified to permit, consistent with other public policy objectives, the greatest possible degree of intermodal and intramodal competition.

(4) Where it becomes clear that the public interest requires Federal involvement in the financial affairs of a mode in order to ease the mode's adjustment to a new economic environment, transitional assistance should be the preferred approach in lieu of any long-term commitment of Federal funds.

Chapter I

INTRODUCTION

Purpose of the Study

This Report to the Congress was prepared in response to Section 902 of the Railroad Revitalization and Regulatory Reform (RRRR) Act of 1976 (Public Law 94-210) which directs the Secretary of Transportation to conduct a Study of Federal Aid to Rail Transportation:

> Within 30 days after the date of the enactment of this Act, the Secretary shall initiate a comprehensive study and analysis of (1) past and present policies and methods of providing Federal aid for the construction, improvement, operation, and maintenance of rail transportation facilities and services, (2) the relationship of such policies and methods to the policies and methods of providing Federal aid for other modes of transportation, and (3) whether common carriers by railroad have been or are disadvantaged by reason of such policies and methods and, if such carriers have been or are disadvantaged, the extent of such disadvantage. The Secretary shall examine ways and means by which future policy respecting Federal aid to rail transportation may be so determined and developed as to encourage the establishment and maintenance of an open and competitive market in which rail transportation competes on equal terms with other modes of transportation, and in which market shares are governed by customer preference based upon the service and full economic costs.

Section 902 further provides that, not later than February 5, 1977, the Secretary is to report his Study findings to Congress, along with his recommendations for a "sound and rational policy with respect to Federal aid to rail transportation."

Background of the Study

Congressional interest in a study of Federal aid policies with respect to rail and competing modes of transportation developed at an early stage in the drafting of the omnibus railroad legislation in the Fall of 1975, and both the House and Senate committee reports on the bill evidenced support for such a study.

The Report of the House Committee on Interstate and Foreign Commerce stated:

> The Committee has become concerned that Federal assistance programs for rail transportation have not been adequately coordinated...Obviously, the reported bill is designed to meet many of the defects presently existing in Federal

> law and policy. Nevertheless, the Committee feels that a study of all Federal assistance programs for rail transportation by the Secretary of Transportation to include recommendations for future action would be helpful. Of particular importance is the part of the study and analysis which will examine the methods by which future policy respecting Federal aid to rail transportation can encourage the development of a climate in which rail transportation can compete equally with other modes of transportation and in which market shares are governed by customer preference based upon the service and full economic costs.[1]

The Report of the Senate Committee on Commerce concluded:

> ...serious anomalies and perhaps inequities have developed as a result of Federal investments in transportation... No attempt has been made to evaluate the effect of Federal investments from the point of view of all users of transportation or the best means of utilizing or integrating the various modes to serve transportation demands... The Act would require the Secretary of Transportation to make definitive studies of past and present financial assistance ...The Secretary would be required to recommend changes that produce more equitable transportation decisions based on user preferences and economic cost.[2]

Scope of the Study

This Study of Federal Aid to Rail Transportation examines Federal transportation policy toward air, highway, pipeline, rail, and water transportation in order to carry out the Congressional requirement that the Secretary analyze the relationship of Federal rail policy to the "policies and methods of providing Federal aid for other modes of transportation." For purposes of the Study, rail transportation has been defined as the domestic intercity transportation of freight and passengers by railroad. Excluded by this definition are all forms of local rail passenger services, such as commuter rail and rail rapid transit, which differ markedly in both physical structure and function from the intercity railroad network which is the focus of the RRRR Act.

In addition to direct Federal aid to the various modes of transportation, the Study has examined the effects of Federal tax policies and Federal economic and non-safety related labor regulation on the modes in recognition that the Federal Government's control of the tax and

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[1] Report of the Committee on Interstate and Foreign Commerce on H.R. 10979 (Report No. 94-725) December 12, 1975, page 79.

[2] Report of the Senate Committee on Commerce on S. 2718 (Report 94-499) November 26, 1975, page 17.

regulatory environments of the railroads and their modal competitors may have a significant effect on the market shares and financial viability of these modes. Federal safety and environmental regulation have not been treated in the Section 902 Study since sound public policy dictates that such regulation be applicable to all the modes and the variability of the impact of such regulation depends largely upon the particular operating characteristics of each mode.

While this Study covers a time span from the first Federal aid to transportation in the late 18th century up to the present time, the research effort has focused upon the 30-year post-World War II period, the period in which the decline in the railroad industry has largely occurred.

Organization of this Report

Chapter II presents an analysis of the impact of socioeconomic forces on rail transportation in the United States. This analysis was included in the Section 902 Study in recognition of the fact that the Federal role in transportation is by no means the sole or even most significant determinant of the infrastructure and service characteristics of the Nation's railroads. Trends in technology, economic activity and population distribution have exerted great influence on the viability of rail transportation in the United States.

Chapters III through V present analyses of the effects of the three distinct types of Federal actions on the viability of rail transportation: (1) direct Federal financial assistance to rail and the competing modes of air, highway, pipeline and water transportation; (2) Federal tax treatment of each of these five modes; and (3) Federal economic and non-safety-related labor regulation of these modes.

Chapter VI presents a summary analysis of the combined effects on the viability of rail transportation of Federal transportation aid, tax and regulatory treatment of rail and its modal competitors, within the context of the effects of socioeconomic forces on the railroads. This summary analysis attempts to answer a complex and often-debated question that is critical to the Study: To what extent have Federal actions been responsible for the decline of the railroad industry during the post-World War II period, and to what extent can responsibility be laid to rest on the host of socioeconomic trends that were simultaneously exerting strong pressures on the industry?

Chapter VII offers an assessment of the RRRR Act, a major legislative initiative for beginning the nationwide revitalization of the railroads. Containing 87 sections in nine titles, and $6.4 billion in authorizations for Federal aid to rail transportation, the Act: (1) begins the reform of Federal regulation of the railroads; (2) provides Federal financial assistance for the nationwide rehabilitation and improvement of rail facilities and equipment; (3) implements the Final System Plan for the takeover of essential rail services in the Northeast and Midwest

by ConRail; (4) implements the Northeast Corridor Project for improved intercity rail passenger service in the travel corridor from Washington, D.C. to Boston; (5) provides Federal financial assistance for the transitional continuation of service on light density rail lines that would otherwise be abandoned; and (6) directs the Department of Transportation and the Interstate Commerce Commission to conduct research and report to Congress on virtually every area of the physical and corporate structure, operations and financial needs of rail transportation. The RRRR Act thus deals with almost all of the problems that have troubled the railroad industry, and this chapter analyzes the Act's potential impact on the viability of rail transportation in the United States.

Chapter VIII presents the Study conclusions and recommendations to Congress for a "sound and rational policy with respect to Federal aid to rail transportation." These recommendations represent an attempt to ensure equitable Federal treatment of the modes which comprise the Nation's intercity transportation system.

As a supplement to the analysis in chapters II through VI, the Appendix to the report provides data on some of the major trends in socio-economic forces and Federal actions which have affected transportation by rail and its modal competitors.

A Note on Federal Aid to Transportation

Given the vast amount of publicity which surrounds Federal aid to transportation, the significant contribution of state and local governments to total public sector transportation expenditures is often overlooked. The U.S. General Accounting Office (GAO) has compiled the following data for 1974 which show the Federal dollars that are spent on transportation relative to the combined transportation expenditures of all levels of government:

PUBLIC EXPENDITURES ON TRANSPORTATION MODES, 1974

Modal System	Federal Expenditures (millions of dollars)	Federal, State & Local Expenditures (millions of dollars)	Federal (Percent)
Highway	$4,893	$24,760	20%
Air	2,471	3,837	64
Rail	664	664	100
Water	1,942	2,627	74
Pipeline	86	86	100
Transit	1,259	2,096	60
TOTAL	$11,315	$34,070	33%

As can be seen from the table, total Federal transportation expenditures in 1974 amounted to approximately $11.3 billion, 33.2 percent of the total of $34.1 billion spent for transportation that year by all levels of government. If transit is removed from consideration, leaving the five modes of interest to the Section 902 Study, the Federal expenditure share drops to 31.4 percent.[1]

It must be recognized that Federal expenditures for transportation, concentrated as they are in infrastructure investment, system operation, and transportation grants to state and local governments, serve as a catalyst for other public sector transportation expenditures. These Federal expenditures thus exert an influence on the amount and types of non-Federal expenditures that is much greater than the Federal dollar share of the annual transportation budget for all levels of government. Nevertheless, the focus of the Section 902 Study on Federal aid to the various modes of transportation should not obscure the fact that these Federal transportation dollars, while large in terms of absolute size and influence, are actually only one-third of total public sector expenditures for transportation.

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[1] U.S. General Accounting Office, U.S. Transportation System--Federal Government's Role and Current Policy Issues (Staff Paper) October 22, 1975, pp. 32-37. These Federal expenditures reported by GAO for 1974 for the highway, air, rail and water modes are greater than 1974 obligations for these modes as shown in Appendix Tables 10 through 13 of this Report because the GAO data include Federal expenditures for international, environmental and safety-related programs for these modes, whereas the data in the Appendix tables do not.

Chapter II

THE IMPACT OF SOCIOECONOMIC FORCES ON RAIL TRANSPORTATION IN THE UNITED STATES

Because transportation enterprises in essence respond to the demands created by others, those demands at the aggregative or macro level are of great consequence in understanding the record of growth and change experienced by the transportation industry as a whole. Of particular interest are how the patterns of economic growth, demographic change, and technological improvement have exerted powerful stresses on the railroads whose fixed plant characteristics often contrast vividly with the changing markets they can serve. This chapter explores the many ways in which these forces have impacted on the various transport modes generally and -- more specifically -- how they have influenced the viability of rail transportation itself.

Economic Growth and Transportation Demand: An Overview

Transportation is a service function. Elemental as this proposition may be, its significance cannot be overstated. In fulfilling the need to move goods and persons, the various transport modes are inextricably tied to the demands which the society and the economy thrust upon them. Changes in the mix of the economy, shifts in the location of the population, and developments in the technological environment represent major shaping forces from which no transport mode is sheltered. The record of any particular mode of transportation, therefore, depends to a large extent on its ability to adjust to changing circumstances over which it often has little direct control.

Over extended periods of time, experience reveals a high degree of interdependence between the demand for intercity freight transportation (measured in ton-miles) and growth in the real (deflated) Gross National Product (GNP). This linkage has held remarkably constant over the years despite the dramatic changes which have taken place in the U. S. population, in the scale and mix of the economy, and in the many other variables that embody the dynamism of American society. As the table on page II-2 indicates, over a thirty year period commencing in 1925 both the real GNP and total intercity ton-miles grew by about 140 per cent. In more recent years, a similar parallelism can be identified.

Like all economic relationships, of course, the linkage between GNP and ton-miles will fluctuate over certain periods of time. Over some time cycles, freight transport may grow slower or faster than the economy, but over the long-run the "fit" between GNP and ton-miles is remarkably

close. While some components may diminish their demand for transportation, others -- including complex inputs for new products -- expand in a fashion

GROWTH AND CORRELATION OF REAL GROSS NATIONAL PRODUCT AND INTERCITY FREIGHT TRAFFIC

	Increase In Real GNP (per cent)	Increase In Ton-Miles (per cent)	R^2 Correlation
1925-1955	138	144	.973
1960-1970	46	47	.993
1970-1974	13	15	.964
1970-1975	11	7	.906
1960-1974	65	69	.994
1960-1975	62	58	.992

Source: Appendix Tables 1 and 3.

that reflects changes in technology, patterns of use, and other ingredients. Overall, economic growth remains a reliable long-term indicator of intercity freight transport demand.[1]

In spite of the impressive growth of the transport sector as a whole, the railroad industry over the last 50 years has suffered a long-term decline in its relative position. Except for the World War II period (when the rail share of total intercity ton-miles surged close to 70 per cent), the railroads' portion of the transportation pie has consistently diminished. As Figure 1 reveals, in 1925, for example, the 417 billion ton-miles accounted for by the railroads represented nearly 80 per cent of total intercity freight traffic (the bulk of the remainder constituted movements by water, much of it on the Great Lakes). By 1935 the rail share had been reduced to 70 per cent and by the mid-1950's to less than 50 per cent. In the last ten years, however, the rate of decline has slowed such that the rail portion of intercity ton-miles slipped by only six and a half percentage points from 43.3 per cent in 1965 to 36.8 per cent in 1975.

Aside from physical measures, the relatively slower growth of the rail industry is also reflected -- even more dramatically -- in freight revenue. Between 1958 and 1974, as Figure 2 indicates, truck revenue nearly tripled while over the same time period rail freight revenue did not quite double. Over the last decade and a half, therefore, the rail share of the Nation's freight revenues has declined by a fourth from 31.2 per cent to 23.7 per cent. At the same time, the truck portion has grown from 59.2 per cent to 68.2 per cent. To a substantial extent, these figures represent the diversion of more lucrative manufactured goods traffic away from the railroads by both regulated and unregulated motor

[1] Intercity passenger travel likewise parallels the growth behavior of the economy. While population grows more slowly than the economy, other factors (increasing disposable income, for instance) combine in such a way as to keep travel and economic trends quite closely in line.

Figure 1

INTERCITY FREIGHT TRANSPORT BY MODE,
SELECTED YEARS, 1925-1975
(per cent of ton-miles)

Year	Rail	Truck	Oil Pipeline	Inland Water	Air
1925	79.7	0.8	3.3	16.3	-
1935	70.0	5.7	9.1	15.3	-
1945	67.2	6.5	12.4	13.9	.01
1955	49.5	17.5	15.9	17.0	.04
1965	43.3	21.9	18.7	16.0	.12
1974	38.8	22.3	22.8	16.0	.20
1975[p]	36.8	21.3	24.6	17.1	.20

p = preliminary

Source: Appendix Table 1.

Figure 2

INTERCITY FREIGHT TRANSPORT REVENUES
BY MODE, 1958 AND 1974

	1958		1974		Per Cent Change, 1958-1974
	Dollars (millions)	Per Cent of Total	Dollars (millions)	Per Cent of Total	
Truck	$16,965	59.2	$48,774	68.2	187.5
Bus	31	0.1	144	0.2	364.5
Railroads	8,951	31.2	16,927	23.7	89.1
Water	1,190	4.1	2,243	3.1	88.5
Oil Pipeline	838	2.9	1,861	2.6	122.1
Air	191	0.7	1,043	1.5	446.1
Other	515	1.8	481	0.7	(6.6)
Total	$28,681	100.0	$71,473	100.0	149.2

Source: Transportation Association of America, Facts and Trends (Seventh Edition, April 1970) p. 4 and (Twelfth Edition, October 1976) p. 4.

carriers and by water carriers transporting higher-valued commodities (e.g., chemicals).

In terms of personal travel, the railroads suffered huge losses. As early as 1935 the Federal Coordinator reported simply that: "The automobile has slaughtered the railroad-passenger business."[1] During World War II, when private travel was constrained, heavy reliance was placed on commercial carriers and the railroads temporarily assumed a large role. In 1943, as an illustration, the rail mode accounted for 75 per cent of all non-auto intercity travel. But the decline experienced by the railroad industry in the early post-war years was even steeper than in the case of intercity freight transportation. By 1955 there had been a pronounced and swift return to the private car, and shortly thereafter the airlines -- capitalizing on the development of the jet engine -- experienced rapid growth. Thus between 1947 and 1955, the rail share of total passenger-miles had dropped by more than half (from 11 per cent to four per cent). Today the approximately ten billion rail passenger-miles, mostly commuter-oriented, amounts to less than one per cent of the total (see Figure 3).

However measured, the diminished position of the railroads stands in vivid contrast to the quantum gains achieved by the other modes. Many factors combine to explain this, including the differentiated impacts of regulation and the large-scale public investments in non-rail transportation (see Chapters III and V). What is perhaps less apparent is that the decline in the industry's fortunes also reflects profound changes in those fundamental shaping forces that help to define transport demand. Chief among these are the transformations which have occurred in the location of economic activity and in the mix of economic output. Nevertheless, in spite of these momentous shifts in the underlying structure of the economy, the Nation's aging railroad network has remained comparatively fixed. It is instructive to recall that the main contours of today's complex web of rail lines and yards is largely a phenomenon of the nineteenth century -- an era whose commercial and demographic features were radically different from those that characterize the contemporary economy. In the context of large-scale transmutations in both the composition and spatial distribution of the economy, the burden of a nearly century-old rail infrastructure has impacted heavily on the present-day status of the rail industry.

Economic Patterns During the Age of Railroad Construction

By World War I, the Nation's rail system was, as Figure 4 shows, at its peak with over 250,000 miles of line in service. Although on an overall basis the mileage now is some 20 per cent smaller than it was in 1920, it remains true that the basic configuration of the rail plant a half century ago still characterizes the network today.

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[1] Report of the Federal Coordinator of Transportation, 1935 (January 21, 1936) p. 52.

Figure 3

INTERCITY PASSENGER TRAVEL BY MODE,
SELECTED YEARS, 1943-1975
(per cent of passenger-miles)

Year	Rail	Auto	Bus	Air	Water
1943	30.4	59.5	8.8	0.7	0.6
1947	10.9	81.1	5.8	1.8	0.4
1950	6.5	86.8	4.5	2.0	0.2
1955	4.0	89.5	3.1	3.2	0.2
1960	2.8	90.1	2.5	4.3	0.3
1965	1.9	88.8	2.6	6.4	0.3
1970	0.9	86.6	2.1	10.0	0.3
1974	0.8	85.9	2.1	11.0	0.3
1975[p]	0.7	86.1	1.9	10.9	0.3

p = preliminary

Source: Appendix Table 2.

Figure 4

MILES OF RAIL LINE IN THE U. S.,
SELECTED YEARS, 1830-1975

Year	Mileage
1830	23
1840	2,808
1850	9,021
1860	30,626
1870	52,922
1880	93,267
1890	163,597
1900	193,346
1910	240,293
1920	252,845
1930	249,052
1940	233,670
1945	226,696
1950	223,779
1955	220,670
1960	217,552
1965	211,925
1970	206,265
1975p	200,000

p = preliminary

Source: Association of American Railroads, A Chronology of American Railroads (Washington, D. C., 1962) p. 8 and Yearbook of Railroad Facts (1976 edition) p. 48.

That the national rail system was complete by 1920 -- and remains largely unchanged today -- is of paramount significance for it points to the remarkable age of this infrastructure. To put it succinctly, the U. S. railroad system is a nineteenth century phenomenon. The last three columns of Figure 5 reveal that by 1870 about 53,000 cumulative miles of line, about a fifth of the system's peak 1920 mileage, had already been put in place. The great surge in railway construction, though, came in the last three decades of the nineteenth century. In the 1870's an additional 40,000 miles of line was constructed, meaning that more than a third of the system was finished by 1880. Over the next ten years, the 70,000 miles of construction boosted the system to almost 164,000 miles or nearly two-thirds of the 1920 plant. With another 30,000 miles added in the 1890's, by the turn of the century the total system amounted to 193,000 miles. Thus by 1900 slightly more than three-fourths of the network was finished and in service.

The development of the Eastern portion of this rail system is of particular interest both because of its size and because compared to the rest of the network outside of the East it is even older than the previous national statistics would suggest. Construction of an intercity rail network commenced in the 1820's as lines were installed in New England and other states along the Atlantic seaboard. (As early as the 1830's, the Baltimore and Ohio Railroad had instituted commercial freight and passenger operations on some 120 miles of line stretching west and south of Baltimore.)[1] From these beginnings, construction over various routes proceeded rapidly with about 20,000 miles completed before the Civil War in an area roughly denominated as east of the Mississippi and north of the Ohio (i.e., the New England, Middle Atlantic and East North Central Census Bureau regions). The early concentration of railroad activity in the Northeast is underscored by the fact that of the some 31,000 miles of rail line in the Nation as a whole on the eve of the Civil War, more than three-fifths was located in 14 northeastern states. Even as late as 1880, this region accounted for about half of total U. S. rail mileage.

Again utilizing 1920 as a benchmark date, further reference to Figure 5 illustrates how much older the Eastern rail network is compared to that in the rest of the country. As of 1870, for example, nearly 40 per cent of the Eastern system was completed or almost three times the proportion in service outside of the East. By 1900 over 90 per cent of the plant in the East was in place compared with just under 70 per cent in the rest of the Nation.

Paralleling evolutionary trends in the development of the rail system in the East are very similar patterns in the Granger states. Here, as in the Northeast, construction of a web of railroad lines both took place earlier than in other parts of the country and resulted in a density of rail lines that now leaves an excess of capacity.[2] Figure 6 shows that

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[1] William Prescott Smith, A History and Description of the Baltimore and Ohio Railroad (Baltimore: John Murphy and Company, 1853) p. 98.

[2] See Department of Transportation, Preliminary Standards, Classification and Designation of Lines of Class I Railroads in the United States (August 3, 1976).

Figure 5

MILES OF RAILROAD LINE ADDED BY DECADE, 1820-1920

Years	Eastern States*			Rest of U. S.			Total U. S.		
		Share of 1920 Mileage			Share of 1920 Mileage			Share of 1920 Mileage	
	Miles Added	Per Cent	Cumulative Per Cent	Miles Added	Per Cent	Cumulative Per Cent	Miles Added	Per Cent	Cumulative Per Cent
1820-1830	0	0.0	0.0	23	0.0	0.0	23	0.0	0.0
1830-1840	1,920	2.6	2.6	865	0.5	0.5	2,785	1.1	1.1
1840-1850	4,670	6.2	8.8	1,543	0.9	1.4	6,213	2.5	3.6
1850-1860	12,493	16.6	25.4	9,112	5.1	6.5	21,605	8.5	12.1
1860-1870	9,821	13.1	38.5	12,475	7.0	13.5	22,296	8.8	20.9
1870-1880	16,019	21.3	59.8	24,326	13.7	27.2	40,345	16.0	36.9
1880-1890	16,880	22.5	82.3	53,450	30.1	57.3	70,330	27.8	64.7
1890-1900	7,434	9.9	92.2	22,315	12.5	69.8	29,749	11.8	76.5
1900-1910	5,592	7.4	99.6	41,501	23.4	93.2	47,093	18.6	95.1
1910-1920	310	0.4	100.0	12,096	6.8	100.0	12,406	4.9	100.0
Total Mileage Added	75,139			177,706			252,845		

* Eastern States include those in New England (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut), in the Middle Atlantic region (New York, New Jersey, and Pennsylvania), and in the East North Central area (Ohio, Indiana, Illinois, Michigan, and Wisconsin) as defined by the Bureau of the Census.

Source: Association of American Railroads, Chronology of American Railroads (Washington, D. C., 1962) p. 7.

Figure 6

GRANGER STATE RAIL MILEAGE, 1870-1920

	1870		1880		1890		1900		1920	
	Total Mileage	Per Cent of 1920 Mileage	Total Mileage	Per Cent of 1920 Mileage	Total Mileage	Per Cent of 1920 Mileage	Total Mileage	Per Cent of 1920 Mileage	Total Mileage	Per Cent of 1920 Mileage
Illinois	4,823	39.6	7,851	64.4	10,214	83.8	11,003	90.3	12,188	100.0
Indiana	3,177	42.8	4,373	58.9	5,971	80.4	6,471	87.1	7,426	100.0
Iowa	2,683	27.4	5,400	55.1	8,366	85.3	9,185	93.6	9,808	100.0
Kansas	1,501	16.0	3,400	36.2	8,806	93.8	8,719	92.9	9,388	100.0
Minnesota	1,092	12.0	3,151	34.6	5,466	60.0	6,943	76.2	9,114	100.0
Missouri	2,000	24.6	3,965	48.8	6,004	74.0	6,875	84.7	8,117	100.0
Nebraska	705	11.4	1,953	31.7	5,295	85.9	5,685	92.2	6,166	100.0
Wisconsin	1,525	20.2	3,155	41.8	5,584	73.9	6,531	86.5	7,554	100.0
Total	17,506	25.1	33,248	47.7	55,706	79.9	61,412	88.0	69,761	100.0

Source: Association of American Railroads, Chronology of American Railroads (Washington, D. C., 1962) p. 7.

by 1890, nearly 80 per cent of 1920 rail line mileage in eight Granger states had been built (this compares with less than 65 per cent for the country as a whole).

The development of the rail system largely reflects the dominant demographic and economic developments of the nineteenth century. Despite the growing size of the nation's larger cities and the steady advances of the Industrial Revolution, the United States during this period was still largely a country of farms and small towns. As of 1900 -- when over 75 per cent of the rail system was in place -- three out of every five persons resided in rural areas and a fifth of the gross national product was accounted for by the farm sector. Nearly 40 per cent of the labor force -- far and away the largest proportion -- was employed in the agriculture, forestry, or fisheries industries.[1] Even in the Nation's urban areas over half the population lived in places of 100,000 population or less with only 20 per cent residing in cities of one million or more.[2]

In addition to the agricultural orientation of the economy, changing sources of energy supply marks a second important structural feature of nineteenth century commerce. During the late 1800's the nation turned from wood, which had supplied over 90 per cent of our energy as late as 1850, to coal. By 1890 more than half of our energy requirements were satisfied by coal with most of the rest still coming from wood. This point has several implications. First, it reveals that what we have recently regarded as the main sources of energy (petroleum and natural gas) were not then of consequence. Second, it depicts how much the economy has changed. In 1975, as an illustration, coal provides about a fifth of our energy, roughly the same proportion as supplied by wood in 1900.[3] Finally -- as will be shown later in this study -- the rise and decline of coal usage dramatically demonstrates how changes in a major techno-economic sector, like energy, have vitally affected the railroads.

In this largely rural and small town environment of the late nineteenth century, the railroads provided the only effective means of transportation except in those few instances where there was access to water. With the horse-and-wagon having its obvious limits, the railroad was literally the only way of moving goods to market or enabling people to travel from one place to another. With few telephones (there were only 1.4 million in service in 1900)[4] and no radios, communication was by mail. The railroads were absolutely crucial to the economic and social fabric of the country, a fact that spurred the interest of investors in the large-scale rail building program highlighted earlier. This construction activity not only encompassed main line routes between the

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[1] Appendix Tables 4 and 8.

[2] Department of Commerce, Bureau of the Census, Historical Statistics of the United States, Colonial Times to 1970 (September 1975) Series A57-72.

[3] Appendix Table 5.

[4] Department of Commerce, Bureau of Census, Historical Statistics of the United States Colonial Times to 1970 (September 1975) Series R1-12.

larger concentrations of population and to the various port facilities, but a complex web of secondary and branch line trackage to service the thousands of smaller residential areas, farms, and mines that then characterized the economy.

Viewed in regional terms, the significance of the northeastern part of the nation is strikingly apparent. As of 1920 (at the peak of the rail network building program), the New England, Middle Atlantic, and East North Central states -- in spite of migration to and settlement of western territories -- still represented almost half of the country's population and more than three-fourths of the value added by manufacturing. In comparison, the states in the South Atlantic and Pacific regions combined accounted for less than a fifth of the national population and only ten per cent of manufacturing value added.[1] With respect to the geographical location of coal production, the role of Pennsylvania predominated. Including both anthracite and bituminous output, Pennsylvania provided about 40 per cent of the national supply in 1920; Kentucky's share, by contrast was only five per cent, Wyoming's less than two per cent.[2]

Reflecting the importance of the Northeast in the economy, the railroads serving this region accounted for the bulk of total national rail traffic. As of 1920, carriers located in Official Territory -- that area generally east of the Mississippi River and north of the Ohio River (see Figure 7) -- originated 48 per cent of total rail tonnage, 53 per cent of all mining products carried by rail, and 62 per cent of total rail manufactured goods traffic. About 45 per cent of national railroad operating revenues were earned by eastern lines with about one out of every five revenue dollars stemming from passenger service.[3]

With virtually no competition from other modes, the railroads -- led by the systems in the East -- dominated the transportation scene at the close of the rail building era. After nearly a century of right-of-way design and construction, the industry was well-positioned to serve the economy of the period. Over the next half century, however, fundamental structural changes would occur in both the mix and location of American economic activity. This, in combination with the emergence of non-rail carriers, would take its toll on what was, in effect, a fully stable transport mode. It is to these developments that we next turn.

The Changing Structure of the U. S. Economy

Since the end of World War I, the nation's economy has experienced impressive growth. The country's population has doubled from just under 106 million in 1920 to 214 million today. Over the last half century,

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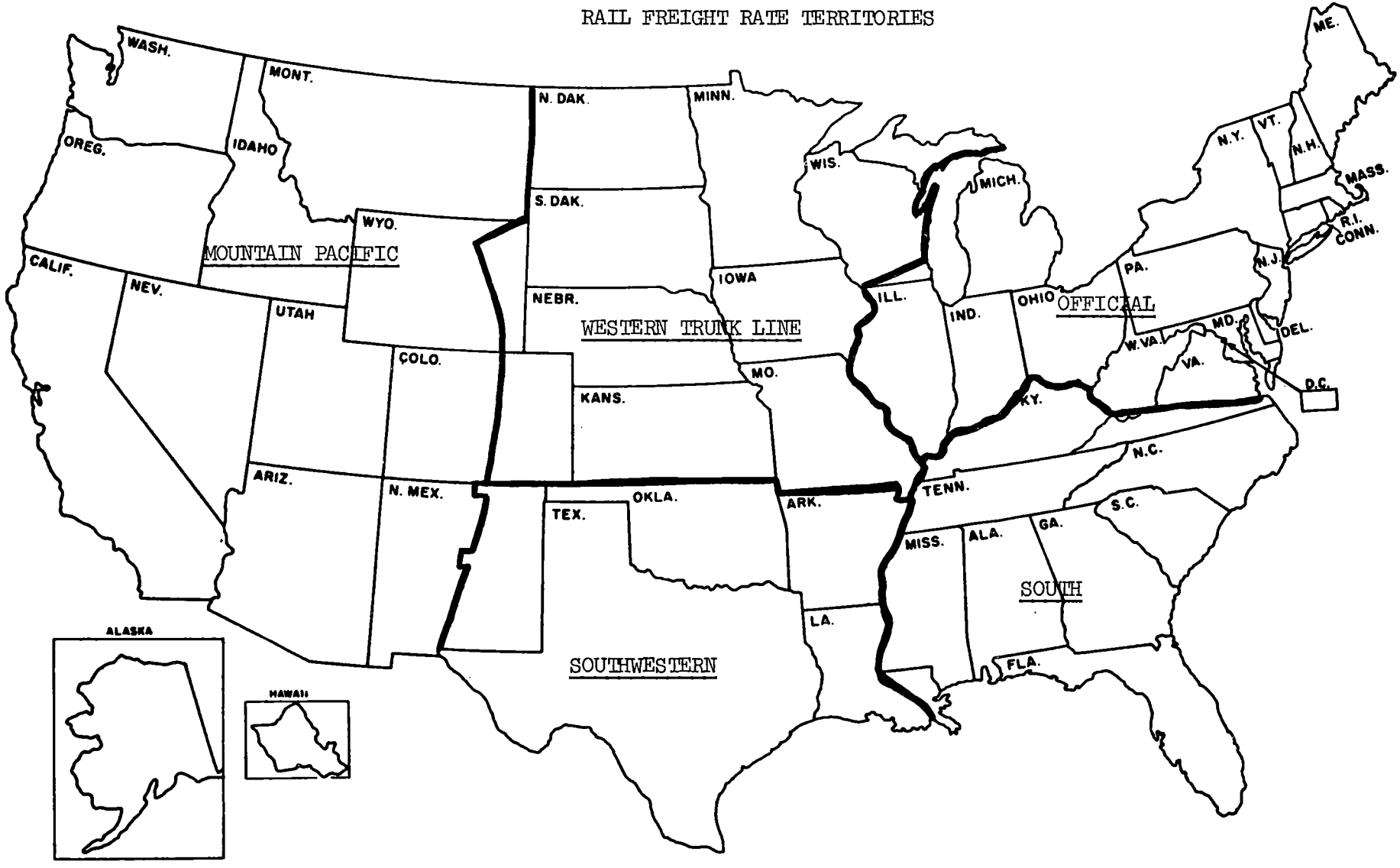
[1] Appendix Tables 6 and 7.

[2] Department of the Interior, Bureau of Mines, Minerals Yearbook (1920), p. 477.

[3] Interstate Commerce Commission, Statistics of Railways in the United States (1920) Statements 28, 33, and 34.

Figure 7

RAIL FREIGHT RATE TERRITORIES



the gross national product in real terms is up over five and a half times and the industrial production index has experienced a seven-fold increase.[1] Impressive as these indicia of growth are, they fail to convey the great changes that have occurred in the structure and mix of the economy. Certain key sectors have contributed disproportionately to this growth while others have lagged behind. In geographical terms, regional expansion has been similarly disparate. These factors -- along with the development of other modes of transportation -- have come together in a way that has undermined the dominant position the railroads enjoyed at the beginning of the twentieth century.

The Shifting Composition of the Economy. While the agricultural and mining sectors remain elements of consequence in the national economic picture, their relative decline stands out as one of the key structural changes over the last 50 years. As of 1929, for example, these two segments of the economy together accounted for 12.5 per cent of total GNP. By the close of World War II, their combined share had fallen to just over eight per cent and in 1974 they represented only 4.5 per cent of total output -- a decline of about two-thirds since 1929 (see Figure 8).

As noted earlier, about half of the total population resided in rural areas in 1920 but especially since World War II migration away from the farm has increased to such an extent that today only a quarter of the population claims rural residency (since 1970, Census Bureau data indicate that within the "rural" category, farm population has continued to decline while non-farm, non-metropolitan residency has grown).[2] Although productivity gains have been substantial, the nature of agricultural demand has served to limit physical output. Compared to the more than five-fold increase in overall economic output, for example, wheat production since 1920 has only doubled while corn output is only half again as large today as it was in 1920.[3] It is this relatively slower growth that accounts for the fact that the farm sector today accounts for only three per cent of gross national product, down from the 11 per cent level of 50 years ago.[4]

Over the course of the last half century the place of agricultural products in the composition of rail freight has been remarkably stable. In 1920 originated tonnage of this commodity group represented 8.8 per cent of total rail traffic; by 1974, farm products accounted for a virtually identical 9.3 per cent of all railroad originated tonnage. Measured in terms of absolute growth, however, agricultural traffic on the railroads has been extremely sluggish. Between 1920 and 1963 (the

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1 Department of Commerce, unpublished data and Council of Economic Advisers, Economic Report of the President (1976) Table B-32.

2 Appendix Table 8 and Department of Commerce, Bureau of the Census, Current Population Reports: Population Characteristics (Series P-20, No. 292 (March 1976) p. 21.

3 Department of Agriculture, Agricultural Statistics (1975) Tables 1 and 35 and Department of Commerce, Bureau of Census, Historical Statistics of the United States Colonial Times to 1970 (September 1975) Series K502-516.

4 Department of Commerce, Bureau of Economic Analysis, Long Term Economic Growth 1860-1970 (June 1973) Series A1 and A21 and Council of Economic Advisers, Economic Report of the President (1976) Table B-7.

Figure 8

GROSS NATIONAL PRODUCT BY SECTOR, 1929 AND 1947-1975
(per cent)

Year	Agriculture, Forestry, & Fisheries	Mining	Contract Construction	Manufacturing	Transportation, Communications, and Utilities	Wholesale & Retail Trade	Finance, Insurance & Real Estate	Services	Government	Rest of World and Residual
1929	8.6	3.9	5.8	25.4	6.3	19.4	11.6	11.1	7.2	0.7
1947	5.7	2.4	4.8	24.5	8.1	16.3	11.9	11.8	14.6	(0.1)
1948	5.8	2.4	5.4	24.9	7.9	16.2	11.7	11.6	14.1	0.0
1949	5.7	2.1	5.3	23.4	7.3	16.3	12.4	11.7	14.9	0.8
1950	5.7	2.2	5.4	24.6	7.2	16.4	12.1	11.1	14.1	1.1
1951	5.1	2.2	5.6	25.3	7.5	15.3	11.6	10.5	15.6	1.3
1952	5.0	2.1	5.6	25.1	7.3	15.2	11.9	10.3	16.1	1.2
1953	5.0	2.1	5.5	25.9	7.2	15.1	12.0	10.1	15.5	1.5
1954	5.2	2.1	5.8	24.4	7.3	15.4	12.7	10.3	15.5	1.4
1955	5.0	2.1	5.8	25.3	7.5	15.8	12.6	10.3	14.6	1.1
1956	4.8	2.2	6.0	25.0	7.7	15.9	12.9	10.6	14.6	0.3
1957	4.6	2.2	5.9	24.6	7.8	15.9	13.2	10.8	14.7	0.3
1958	4.8	2.0	6.1	22.6	7.6	15.9	13.8	11.2	15.0	1.1
1959	4.4	2.0	6.2	23.7	7.7	16.1	13.7	11.1	14.4	0.8
1960	4.5	2.0	6.2	23.3	7.8	16.0	13.9	11.2	14.5	0.7
1961	4.4	1.9	6.1	22.7	7.7	15.8	14.2	11.3	14.7	1.2
1962	4.1	1.9	6.0	23.3	7.7	15.9	14.3	11.1	14.2	1.2
1963	4.0	1.9	5.9	24.2	7.8	15.9	14.0	11.1	14.2	1.0
1964	3.8	1.8	6.1	24.7	7.8	16.0	13.7	11.1	14.0	1.1
1965	3.7	1.8	6.1	25.4	7.9	16.0	13.8	10.9	13.8	0.6
1966	3.3	1.8	6.0	25.9	8.0	16.0	13.5	10.9	13.9	0.8
1967	3.3	1.7	5.8	25.2	8.1	15.9	13.6	11.2	14.2	0.8
1968	3.1	1.7	5.9	25.5	8.4	16.2	13.7	11.1	14.1	0.4
1969	3.1	1.7	5.6	25.6	8.6	16.2	13.9	11.3	14.0	0.0
1970	3.2	1.8	5.2	24.2	8.8	16.6	14.3	11.6	14.1	0.1
1971	3.3	1.7	5.1	23.8	8.8	16.9	14.6	11.4	13.8	0.6
1972	3.0	1.6	4.8	24.7	8.8	17.2	14.4	11.5	13.2	0.7
1973	2.9	1.6	4.6	25.3	9.1	17.2	14.0	11.6	12.7	1.0
1974	2.9	1.6	4.3	24.4	9.3	17.1	14.3	11.8	13.2	1.2
1975	3.2	1.6	4.1	22.7	9.4	17.7	15.1	12.1	13.6	0.6

Source: National Planning Association, National Economic Projections to 1976/1977 (report No. 66-N-1). p. 62, Department of Commerce, unpublished data, and Survey of Current Business (July 1976) p. 49.

latest year for which comparable data are available), products of agriculture originating on the Nation's rail system grew at an average annual rate of only 0.9 per cent. Little change has occurred since that time as the average yearly growth in farm products traffic between 1964 and 1974 amounts to a comparable 0.8 per cent.[1]

To some extent, of course, the modest pace of rail traffic growth in the agricultural sector stems from inroads made by competitive modes. Contributing to these gains by non-rail carriers were a combination of governmental infrastructure investments (waterways, highways) and regulatory exemptions, both of which are discussed in more detail in Chapters III and V. Although comprehensive data are not available, it is known that particularly in the late 1950's and early 1960's, during the period of sharpest declines in railroad traffic, both trucks and water carriers diverted substantial amounts of grain traffic from the railroads. In the North Central region (an area stretching from the Dakotas and Kansas to Michigan and Ohio) the rail share of non-government grain moving from country elevators declined from 68 per cent in 1958 to 57 per cent in 1963, with trucks accounting for virtually all of the diversion. Grain deliveries by rail to terminal markets in the Northwest dropped from 79 per cent in the late 1950's to 76 per cent in the early 1960's while barge receipts jumped from ten per cent to almost 15 per cent. In the Southwest, a 15 percentage point drop in the rail share between 1960 and 1962 was matched by a similar rise in the truck share.[2] Tabulations of the Chicago Board of Trade indicate that in its market, diversion from the railroads has continued, principally to the trucks. In 1964, for example, railroads accounted for 53 per cent of grain receipts at Chicago compared to 25 per cent for motor carriers. By 1974, the rail share dropped to 43 per cent while over the same time period the truck proportion had soared to 49 per cent -- or almost twice the 1964 share.

Of even greater consequence for the railroads, important shifts occurred within the mining sector, particularly with respect to energy. Chief among them was the development of relatively cheap oil and natural gas and the long-term decline of coal. Petroleum and natural gas combined accounted for only 16 per cent of national energy consumption in 1920 compared with the 72.5 per cent share enjoyed by coal. Today the picture is sharply reversed: petroleum and natural gas fulfill 74 per cent of the Nation's energy needs whereas coal's 19 per cent share about equals the position of its chief competitors 50 years ago.[3] In this setting gas is of special importance for it is not even counted in intercity transportation statistics (in effect "weightless" gas has been substituted for coal or other energy products which "count" in transportation).

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[1] Interstate Commerce Commission, Statistics of Railways in the United States (1920) Statement 28 and Freight Commodity Statistics (1963, 1964, and 1974 editions).

[2] I.C.C. decision in Ex Parte No. 281 (1972) as cited in Investigation of Railroad Freight Rate Structure -- Grain and Grain Products, Ex Parte No. 270 (Sub-No. 9) Appendix A (May 19, 1975) at 2.

[3] Appendix Table 5.

Developments on two general fronts explain this shift away from coal. With the introduction of the diesel engine, railroad demand for coal diminished to the point that by 1952 less than ten per cent of coal consumption was accounted for by the railroads (see Figure 9). At the same time, oil and natural gas were taking over the residential and commercial space heating market. (In 1933 retail deliveries represented a fourth of U. S. coal usage; today retail sales account for only one per cent of coal demand.) To some extent, of course, the increasing use of coal by electric utilities has compensated for the loss of these other markets. Even so, only in 1975 did coal production reach and exceed the previous record output of 631 million tons recorded in 1947.[1]

For years coal has been the single most important commodity to the rail industry (in 1930, for example, it accounted for 28 per cent of rail originated tonnage and 17 per cent of rail freight revenues).[2] Thus the long-term trends in the nation's energy picture have been particularly adverse for the railroads. First, the shift from coal to natural gas and petroleum denied to the railroads traffic it was well-equipped to handle and, at the same time, created a demand which pipelines were uniquely positioned to serve. Aside from this, the other transport modes -- especially barge carriers, but trucks as well -- asserted themselves as serious competitors for the coal traffic that remained. Today, as shown in Figure 10, nearly half of all coal produced for electrical generation moves in whole or in part by non-rail modes. Finally, technological developments have supplanted longstanding coal transport methods. According to data from the Bureau of Mines, the technique of "shipping" electricity generated at the minehead via long distance transmission lines now accounts for 17 per cent of total coal "transportation" to electric utilities.[3] Thus moving coal "by wire" has served to divert coal traffic away from rail carriers as effectively as if the commodity moved by traditional non-rail modes.[4]

Matched against the relative declines of the agricultural and mining sectors are the long-term gains recorded by the services portion of the economy. Between 1929 and 1974, the share of GNP accounted for by the finance, insurance, and real estate industries has climbed from 11.6 per cent to 14.3 per cent, while the government sector has nearly doubled its contribution to the GNP from 7.2 per cent to 13.2 per cent. What is of particular significance here is that for the most part the output of these groups generate relatively small amounts of freight transportation demand. According to one estimate, as an illustration, the finance and

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[1] Appendix Table 9.

[2] Interstate Commerce Commission, Freight Commodity Statistics (1930).

[3] Department of the Interior, Bureau of Mines, "Coal -- Bituminous and Lignite in 1974," Mineral Industry Surveys (January 27, 1976) Tables 10 and 42.

[4] The prospect of coal slurry pipelines represents another technological development in the transportation of coal. Commencing service in 1970, a 273 mile line now links coal fields at Black Mesa, Arizona to the Mohave power plant in southern Nevada.

Figure 9

DOMESTIC BITUMINOUS COAL CONSUMPTION BY MAJOR MARKETS, 1933 AND 1938-1975
(per cent)

Year	Electric Power Utilities	Railroads (Class I)	Manufacturing and Mining*	Retail Deliveries
1933	8.5	22.8	44.3	24.4
1938	10.8	22.0	47.4	19.8
1939	11.2	21.0	49.4	18.3
1940	11.4	19.8	49.2	19.7
1941	12.2	19.8	48.9	19.2
1942	11.8	21.4	48.0	18.9
1943	12.5	21.9	45.4	20.2
1944	13.0	22.4	43.9	20.7
1945	12.8	22.4	43.5	21.3
1946	13.7	22.0	44.5	19.7
1947	15.8	20.0	46.5	17.7
1948	18.4	18.2	46.7	16.7
1949	18.1	15.3	46.8	19.8
1950	19.4	13.4	48.6	18.6
1951	21.7	11.5	50.9	15.9
1952	24.7	9.1	50.3	16.0
1953	26.3	6.5	53.1	14.1
1954	31.7	4.8	49.2	14.3
1955	33.2	3.7	50.6	12.5
1956	35.8	2.8	50.1	11.2
1957	38.0	2.0	51.3	8.6
1958	41.7	1.0	47.6	9.7
1959	45.3	0.7	46.1	8.0
1960	45.7	0.6	45.7	8.0
1961	48.0	**	44.6	7.4
1962	49.2	**	43.5	7.3
1963	51.1	**	43.2	5.8
1964	51.7	**	43.7	4.5
1965	52.9	**	43.0	4.1
1966	54.3	**	41.6	4.1
1967	56.6	**	39.9	3.6
1968	59.1	**	37.9	3.1
1969	60.8	**	36.3	2.9
1970	61.9	**	35.8	2.3
1971	65.9	**	31.8	2.3
1972	67.5	**	30.8	1.7
1973	69.6	**	28.9	1.5
1974	70.6	**	27.8	1.6
1975	72.7	**	26.3	1.0

* Includes Bunker Fuel.
** Included with Manufacturing and Mining.

Source: National Coal Association, Bituminous Coal Facts: 1970, p. 54, Department of the Interior, Bureau of Mines, "Coal -- Bituminous and Lignite" Minerals Yearbook (1972) Table 31, "Coal -- Bituminous and Lignite in 1974," Mineral Industry Survey (January 27, 1976) Table 40, and Mineral Industry Surveys, Weekly Coal Report No. 3060 (May 7, 1976) p. 5.

Figure 10

TRANSPORTATION OF COAL BY MODE FOR ELECTRICITY GENERATION, 1975

	Tons (thousands)	Per Cent
All Rail	235,576	53.7
River and Ex-River	81,378	18.6
Great Lakes	17,340	4.0
Tidewater	1,693	0.4
Truck*	51,056	11.6
Tramway, Conveyor, and Private Railroad*	51,515	11.7
All Modes	438,558	100.0

* Includes some coal tonnage used at mine-mouth electric generating plants.

Source: Department of the Interior, Bureau of Mines, Bituminous Coal and Lignite Distribution (1975) Table I.

insurance sector's demand for transportation is less than a third of that required by the iron and steel industry.[1]

With the services sector experiencing gains at the expense of the agriculture and mining groups, the share of GNP represented by manufacturing has remained about the same. In 1974 manufacturing accounted for 24 per cent of total output -- the single largest proportion of GNP. This represents only about a one percentage point decline in its position since 1929.[2] In spite of this appearance of consistency, however, there have been important shifts within the manufacturing group that have had direct consequences for transportation generally and for the railroads in particular.

What stands out most distinctly is the contrast between the rapid growth of newer industries and the continual decline of the older, more mature industries. Figure 11 tells the story. Viewed in terms of their proportion of value added by manufacture, the rise of the chemicals, electrical machinery, and instruments groups is outstanding. These three industries alone accounted for 8.8 per cent of value added in 1919 as compared with 20.8 per cent in 1972 -- appreciably more than a two fold increase. On the other hand, the share of value added represented by the textile, apparel, and lumber industries has shrunk by more than half -- from a fifth to less than a tenth.

On the aggregated basis displayed in Figure 11, certain basic industries like primary and fabricated metals or rubber and plastics appear to have held their own in terms of the economy as a whole. Examined more closely, however, the component industries in these larger groupings exhibit quite varied rates of growth. For example, in the metals category, industrial production data supplied by the Federal Reserve Board (see Figure 12), shows the rapid expansion of the aluminum industry in comparison with the steel industry. Over the 20 year period 1954 to 1974, for example, the industrial production index for aluminum has grown at an average annual rate of 6.5 per cent or two and a half times faster than the 2.6 per cent rate of the basic steel group. The growth in the plastics industry has been even more spectacular. Whereas the industrial production index for all industries displayed an average annual growth rate of 4.5 per cent between 1954 and 1974, various segments of the plastics manufacturing complex posted rates of from 11.5 per cent to 13.8 per cent annually or as much as three times the rate of all industry as a whole.

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[1] Department of Commerce, Summary Input-Output Tables of the U. S. Economy: 1968, 1969, 1970 (Bureau of Economic Analysis Staff Paper No. 27: September 1975) Table 3-70. While recognizing that service industries ship little of their output, it should also be remembered that the physical inputs required -- paper, office equipment and the like -- do stimulate a need for transportation.

[2] Figure 8.

Figure 11

VALUE ADDED BY MANUFACTURE, BY INDUSTRY, 1899-1972
(per cent)

Year	Food Prod.	Tobacco Prod.	Textile Prod.	Apparel Prod.	Lumber, Wood Prod.	Furniture, Fixtures	Paper Prod.	Printing, Publish.	Chemical Prod.	Petroleum, Coal Prod.	Rubber Plastics	Leather Prod.	Stone, Clay, Glass	Primary Metals	Fabricated Metals	Machinery Exc. Elec.	Elec. Mach.	Trans. Equip.	Instruments
1899	9.0	3.7	9.5	6.6	9.4	1.8	1.9	6.5	4.6	0.8	0.9	4.0	4.0	NA		NA	0.9	5.1	0.7
1909	9.2	2.9	9.2	7.5	8.7	1.9	2.1	6.4	4.9	0.9	0.9	4.0	4.3	NA		NA	1.5	5.9	0.9
1919	10.5	2.2	9.6	6.8	5.4	1.5	2.2	4.6	5.0	2.1	2.3	3.8	2.9	13.6		9.3	2.8	13.6	1.0
1929	10.9	2.7	7.6	6.3	4.3	2.0	2.6	7.3	5.7	2.7	1.8	2.5	3.4	14.4		10.0	4.5	10.1	1.0
1939	14.2	1.4	7.4	5.7	3.0	1.7	3.6	7.2	7.4	2.8	1.7	2.4	3.5	8.9	5.7	8.3	3.8	7.2	1.4
1950	11.3	0.9	6.3	4.7	3.5	1.9	3.8	5.5	8.1	2.4	1.8	1.7	3.5	8.9	6.9	9.8	5.4	9.5	1.5
1960	12.0	0.9	3.4	4.0	2.1	1.6	4.0	5.7	8.8	2.0	2.3	1.2	3.9	8.1	6.3	8.8	8.2	11.2	2.2
1970	10.7	0.8	3.1	3.9	2.0	1.6	3.9	5.8	9.4	1.8	2.8	0.9	3.3	7.2	6.9	10.6	9.3	9.7	2.6
1972	10.0	0.7	3.3	3.7	2.9	1.7	3.7	5.7	9.2	1.6	3.4	0.8	3.6	6.6	7.6	10.6	8.6	11.4	3.0

Source: Department of Commerce, Bureau of Economic Analysis, Long Term Economic Growth, 1860-1970 (June 1973) Series C278-297, and p. 81 and Bureau of the Census, Statistical Abstract of the United States (1973) Table 1188 and (1976) Table 1260.

Figure 12

INDUSTRIAL PRODUCTION INDEX FOR SELECTED INDUSTRIES, 1954 AND 1974
(1967 = 100)

Industry	1954	1974	Average Annual Rate of Growth, 1954-1974 (per cent)
Plastics Products	16.3	214.6	13.8
Plastics Materials	23.6	219.4	11.8
Synthetic Materials	24.6	215.7	11.5
Aluminum	42.9	150.0	6.5
Basic Steel and Mill Products	72.3	121.0	2.6
All Industries	51.9	124.8	4.5

Source: Federal Reserve Board, Industrial Production (1971) Tables A4 and A9 and Statistical Release G. 12.3. (February 13, 1975).

These patterns of industrial development have had particularly negative consequences for the railroads. To begin with, much of the output of the newer and more rapidly growing industries has been substituted for the products of the older firms. In many cases (aluminum for steel, plastics for metals generally) the newer products are lighter in weight. For a mode like the railroads whose competitive advantage rests in part on large volume movements of goods, the trend toward lighter weight substitutes represented an adverse marketing development. Aside from being lighter in weight, the products of the fast-growth industries also tend to be higher valued. With shippers placing greater stress on inventory costs and other aspects of physical distribution that include but go beyond transportation per se, the shift toward higher valued products places a premium on rapid and reliable freight service. This, too, has exposed growing portions of manufactured goods traffic to intense intermodal competition, with trucking being the chief beneficiary.

The most recent Census of Transportation helps to provide insight into how the truck mode in particular dominates the intercity transport of manufactures -- especially the higher-valued, lighter-weight products. Figure 13 highlights the modal split as of 1972 for three of the most rapidly growing industrial products: plastics, office and accounting machines, and electronic components. As can be seen, motor carriers account for three-fourths or more of total tonnage in each case, with the rail share no higher than 16 per cent. More generally, of the 112 three-digit manufacturing commodity groups reported in the 1972 Census, non-rail carriers moved half or more of the traffic in 95 of the groups. These commodities blanket the industrial landscape, including both durable and nondurable goods. Taken together the tonnage moving by all modes in these 95 groups represents about 80 per cent of the Census total.[1]

In certain cases, of course, the railroads have met with success in their attempts to counteract these trends. Shortly after World War II, the railroads enjoyed a 41 per cent market share in the transportation of motor vehicles. By 1959, however, their position had been eroded to the point that less than ten per cent of this traffic was moving by rail. Through a combination of innovative rate schedules, new rolling stock, and more reliable service, the industry reversed the downward slide and in less than a decade not only restored but improved upon its postwar share. As of 1974, over half of all new motor vehicles were being shipped by the railroads.[2] In a similar vein, the institution and development of TOFC/COFC service has aided the railroads in obtaining some of the more remunerative merchandise traffic earlier lost to other carriers. Notable as these examples are, it is still the case that the ubiquity and flexibility of truck transportation has been better suited to serve the changing demand patterns exhibited within the manufacturing sector. As a result, the railroads have not been able to attract this more lucrative traffic in sufficient quantities. This clearly stands as a major explanation of the diminished posture of the industry vis-a-vis the other modes.

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[1] Department of Commerce, Bureau of the Census, 1972 Census of Transportation (Area Report 8).

[2] Motor Vehicle Manufacturers Association.

Figure 13

MODAL SHARE OF TRAFFIC FOR
GOODS ORIGINATING IN FAST GROWING
SECTORS OF THE ECONOMY

	Average Annual Growth Rate, 1958-1972 (per cent)	1972 Modal Share of Tons (per cent)		
		Rail	Truck	Other
Plastics Products	13.1	16.0	83.0	1.0
Office, Computing and Accounting Machines	9.4	2.6	84.2	13.2
Electronic Components and Accessories	11.6	8.3	76.7	15.0
Real GNP (1972 dollars)	4.0			

Source: Appendix Table 3, Department of Labor, Bureau of Labor Statistics, The Structure of the U. S. Economy in 1980 and 1985, Bulletin 1831 (1975) and Department of Commerce, Bureau of the Census, 1972 Census of Transportation (Area Report 8).

In coping with these difficult competitive conditions, railroad management has suffered from certain institutional constraints, some of which are of its own making. Too frequently, for example, the "balkanized" character of the industry has prevented a uniform approach to a wide spectrum of problems ranging from achieving agreement on better utilization of equipment to procedures designed to reach a speedier consensus on rates and divisions. On other fronts as well rail management has been notably conservative despite continued evidence of mounting traffic losses to the other modes. Innovative marketing approaches have been the exception rather than the norm. As another illustration, the industry has justifiably been critical of the ICC's methods of determining railroad costs, but only recently have the railroads themselves commenced efforts to develop procedures permitting more realistic calculations. In short, though the massive changes in the economic fabric of the Nation over the last fifty years have taken their toll on the rail industry, a number of the negative consequences might have been reduced and, in some cases, perhaps eliminated, had more aggressive responses been adopted. That the railroads have been too passive in adjusting to a half century of economic change is an important, if unquantifiable, element in explaining the industry's current posture.[1]

Regional Growth and Decline. It was noted above that during the period of rail right-of-way design and construction, the Northeastern portion of the country dominated the nation's economy. Since that time -- as measured by a variety of indicia -- the preeminent position of the Northeast has given way to other regions, notably the South and Far West. Yet in spite of these patterns of growth and decline, it remains true that the Northeast still can be characterized as the nation's industrial heartland and thus continues to rank as a key center of transport activity.

Spurred by the growth of California and to a lesser extent the migration to Florida and other Southern states, the Pacific and South Atlantic regions of the country saw their share of the Nation's population climb from just under 19 per cent to 29 per cent over the last 50 years. Aside from modest relative gains in the Mountain and West South Central areas, all other regions of the country have experienced declines in their portion of total national population. The most precipitous fall has occurred in the Northeast (New England, Middle Atlantic, and East North Central states) whose share has diminished from 48.4 per cent in 1920 to 42.5 per cent today. The bulk of this decline, at least in recent years, can be attributed to the Middle Atlantic states of New York, New Jersey, and Pennsylvania.[2]

A similar pattern is exhibited with respect to manufacturing output. Led by the South and Pacific regions, all areas outside of the Northeast

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[1] For a discussion of the issue of rail management and innovation, see The National Commission on Productivity and the Council of Economic Advisers, Improving Railroad Productivity: Final Report of the Task Force on Railroad Productivity (November 1973) pp. 282-320.

[2] Appendix Table 6.

have a higher share of value added by manufacture today than they did in 1920. Compared with their 13 per cent share in 1919, the South Atlantic and Pacific regions today represent just under 24 per cent of the national total. By contrast, the Northeastern states' share has fallen dramatically -- from 78.5 per cent in 1919 to 54.6 per cent in 1972. Once again, the Middle Atlantic states are chiefly responsible; the three states in this region alone accounted for more than 60 per cent of the decline in the Northeastern share, with most of the remaining loss attributable to New England.[1]

One major consequence of these simultaneous movements of growth and decline is that the great differences in regional economic activity which characterized the earlier period have gradually diminished. The diffusion of the economy outside of the Northeast has had the effect of placing the nation's various regions on a more equal footing. In 1919, for example, New England's share of value added -- over 13 per cent -- was more than twice as large as the 5.8 per cent of the West North Central region and almost five times as great as the three per cent share held by both the East South Central and West South Central areas. Today, by contrast, these four regions are virtually identical in that they individually account for between six and seven per cent of value added. Similarly, 50 years ago the Middle Atlantic States' share of value added was seven times larger than that of the Pacific group, but today that disparity has been greatly narrowed to less than a two-fold margin. Fifty years ago no region outside of the Northeast could claim more than ten per cent of the nation's manufacturing output; today both the South Atlantic and Pacific states have reached this level while the New England group has fallen below.[2]

Along with these regional shifts in manufacturing activity, other types of locational changes also were occurring. An emphasis on relocation of manufacturing establishments within the country's urban areas was evident. Faced with mounting congestion in the central city, industry focused its new investments in less dense suburban locations where comparatively inexpensive land facilitated the construction of so-called "ranch style" manufacturing plants and warehouses. Often sited close to Interstate Highway System links, these new facilities frequently were not adjacent to rail facilities -- certainly not to those concentrated in the older central city areas.

The rise of the South and Far West at the expense of the Northeast has had a differentiated impact on the rail industry. As might be expected, carriers serving these regions have markedly different traffic

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[1] Appendix Table 7.

[2] The same conclusion emerges from an analysis of employment patterns by region. Particularly in the last three decades there has been a rather dramatic narrowing of regional differences in types of employment. See, for instance, Paul C. Mathis, "Long-Run Regional Employment Changes in Nine U. S. Industries," Annals of Regional Science (March 1975).

and earnings histories. The data in Figure 14 are indicative. Over the nearly 50-year period between 1929 and 1974 freight revenues (in current dollars) of Southern and Western railroads have more than quadrupled while those of Eastern District roads have merely doubled. As a consequence, Western District roads today account for the same share of total industry freight revenues as did Eastern roads a half century ago.

Physical measures confirm the relatively poor performance of the Eastern carriers. With originated tonnage down by 25 per cent and revenue ton-miles virtually unchanged, railroads making up the Eastern District have seen their share of traffic fall from over half in 1929 to about a third today. In distinct contrast is the traffic record of Southern District roads where originated tonnage has more than doubled and revenue ton-miles have nearly tripled. Although the originated tonnage of Western roads is up only marginally, their revenue ton-mile improvement (due largely to gains in average length of haul) compares with that achieved by Southern carriers.

Not all of the traffic declines sustained by the Eastern District roads, of course, can be attributed to regional economic conditions. Another powerful factor of extreme relevance relates to the increasing diversion of rail traffic to other modes. Although no complete intermodal comparisons on a regional basis are possible, some indication of what has occurred can be gleaned from existing data. The phenomenal growth of barge traffic on the Ohio River system, for example, is illustrated in Figure 15. Between 1947 and 1974, inland waterway traffic on the Ohio has increased by 236 per cent -- more than three times faster than for all U. S. barge traffic as a whole. Over the same time frame, Eastern District railroads experienced a traffic decline of 33 per cent. A similar picture emerges with respect to motor carriers. The tonnage of the largest class of regulated trucks nearly doubled in the East between 1955 and 1972 and their revenues more than tripled. For the Eastern District railroads, however, tonnage dropped by 25 per cent, with revenues up by less than a fifth.[1]

The relative decline of rail carriers in the East is also mirrored in more disaggregated form in Figure 16. Here, in percentage terms, the distribution of rail freight tonnage to and from the five major rail freight regions for the years 1966 and 1974 are shown. In line with what we have already seen, the share of total rail traffic originated by Official Territory roads has declined from nearly 45 per cent to just over 36 per cent. A similar decline in terminations can be discerned: down from 47 per cent of all rail terminations in 1966 to about 39 per cent in 1974. At the same time, all other rail regions (led by the South) have experienced commensurate gains, whether measured in terms of traffic generation or termination.

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[1] Interstate Commerce Commission, Transport Statistics in the United States (1955) Part 1, Table 50 and Part 7, Table 1; (1972) Part 7, Table 2 and Freight Commodity Statistics, Class I Railroads (1972) p. 17.

Figure 14

RAILROAD PERFORMANCE, BY REGION,
1929 AND 1974

	Total U. S.	Eastern District	Southern District	Western District
Freight Revenues (thousands of dollars):				
1929	$ 4,825,622	$2,348,321 (48.7)	$ 600,109 (12.4)	$1,877,192 (38.9)
1974	15,766,710	5,306,205 (33.7)	2,758,811 (17.5)	7,701,694 (48.8)
Per Cent Change	227	126	360	310
Originated Tonnage (thousands):				
1929	1,339,091	697,894 (52.1)	174,202 (13.0)	466,905 (34.9)
1974	1,530,148	520,654 (34.0)	387,527 (25.3)	621,968 (40.6)
Per Cent Change	14	-25	122	33
Revenue Ton-Miles (millions)				
1929	447,322	231,420 (51.7)	55,163 (12.3)	160,738 (35.9)
1974	850,961	248,398 (29.2)	160,668 (18.9)	441,895 (51.9)
Per Cent Change	90	7	191	175

Source: Association of American Railroads, Yearbook of Railroad Facts (1976 edition), pp. 13, 28, and 29.

Figure 15

OHIO RIVER AND UNITED STATES
WATERBORNE COMMERCE, 1947-1974

Year	Ohio River (Pittsburgh to Mouth of River)	United States (Domestic)	Ohio River Share of United States (per cent)
	Tons	Tons	
1947	41,396,738	578,560,615	7.16
1948	42,792,487	630,228,874	6.79
1949	41,300,455	575,362,690	7.18
1950	48,597,810	651,358,876	7.46
1951	56,540,863	692,072,579	8.17
1952	55,957,367	660,395,707	8.47
1953	62,034,303	706,151,204	8.78
1954	55,076,677	653,795,917	8.42
1955	71,461,178	745,032,853	9.59
1956	76,376,633	766,223,135	9.97
1957	81,567,152	772,861,884	10.55
1958	73,476,894	695,664,978	10.56
1959	80,801,017	726,732,163	11.12
1960	79,477,596	760,573,156	10.45
1961	80,137,815	732,825,364	10.94
1962	85,306,058	770,805,345	11.07
1963	88,828,291	788,107,965	11.27
1964	96,371,713	816,168,440	11.81
1965	103,173,852	829,169,434	12.44
1966	109,618,779	862,724,995	12.71
1967	113,492,423	870,633,840	13.04
1968	120,204,227	887,889,448	13.54
1969	126,253,599	927,399,179	13.61
1970	129,584,668	950,727,374	13.63
1971	133,363,905	946,598,106	14.09
1972	138,877,692	986,811,761	14.07
1973	136,934,374	994,158,107	13.77
1974	139,294,213	982,699,639	14.17

Source: Department of the Army, Corps of Engineers, Waterborne Commerce in the United States, Parts 2 and 5 (various editions).

Figure 16

TERRITORIAL* DISTRIBUTION OF TOTAL RAIL TRAFFIC, 1966 & 1974
(Per Cent of U. S. Total Tons)

Top: 1966
Bottom: 1974

	to Official	to Southern	to Western Trunk Line	to South-western	to Mountain-Pacific	to United States
from Official	41.1	2.0	0.6	0.4	0.6	44.7
	31.9	2.9	0.5	0.6	0.5	36.4
from Southern	3.3	14.9	0.2	0.5	0.2	19.1
	4.0	18.5	0.3	0.7	0.2	23.7
from Western Trunk Line	1.1	0.2	13.2	0.6	0.7	15.8
	0.9	0.2	13.0	1.3	0.9	16.3
from South-western	0.7	0.9	0.5	6.9	0.4	9.4
	0.8	1.0	0.6	7.9	0.4	10.7
from Mountain-Pacific	1.1	0.3	1.0	0.3	8.3	11.0
	1.0	0.3	2.2	0.4	8.9	12.8
from United States	47.3	18.3	15.5	8.7	10.2	100.0
	38.6	22.9	16.6	10.9	10.9	100.0

* See Figure 7 for a map of the rail freight rate territories.

Source: Interstate Commerce Commission and Department of Transportation, Carload Waybill Statistics (1966 and 1974 editions).

In spite of this relative decline in Official Territory traffic, it deserves to be emphasized that the region still represents the single largest area of rail transportation activity. With more than 36 per cent of all rail tonnage originating in the East and over 38 per cent of all traffic terminating in this sector, its significance is comparable to that of the Southern and Western Trunk Line regions combined. Thus even considering the sizable traffic losses of the last decade, the Eastern region continues to dominate the national rail transportation scene.

Further examination of Figure 16 also reveals that the great preponderance of rail traffic continues to move within rather than between rail territories. As of 1974, four out of every five rail tons traveled intraregionally, down only slightly from the proportions evidenced in 1966. Here the importance of the East is readily apparent, with more than a third of all intraregional traffic moving within this region -- a share equal to that of the South and Western Trunk Line regions together. For the remaining 20 per cent of the traffic that was interregional in character, again the role of the East is predominant. With movements from and to the South being the most significant, Official Territory tonnage (either in terms of originations or terminations) accounted for more than half of all interregional rail tonnage. Notwithstanding the largely regionalized nature of rail traffic, therefore, the importance of the Official rail region to carriers outside of the East is clear.

In turning to the performance record of individual rail carriers over the recent past, several points are worthy of note. First, it is important to recognize the overwhelming weight of the Penn Central (PC) in aggregate national rail data. In spite of the traffic declines experienced by this carrier in the wake of an unsuccessful merger and ultimate bankruptcy, the PC (now ConRail) in 1974 still accounted for over ten per cent of total rail ton-miles and more than 12 per cent of all railroad freight revenues. The poor performance of this single railroad, therefore, depressed the 1966-1974 average annual rate of growth of total rail industry ton-miles from 2.2 per cent to 1.8 per cent.

What a study of specific carriers also reveals is the widely divergent records of roads operating in the same rail region. As can be seen in Figure 17, in the South the ICG's traffic and revenue performance is far below that of the District as a whole. Similarly, both the Milwaukee and Southern Pacific have failed to match the average for all Western roads taken as a group. (Note, however, that carriers like the B&O and N&W which outperform the averages for all Eastern roads exhibit traffic and revenue gains comparable only to the subpar Southern and Western lines.)

Finally, the substantial growth records of certain other carriers must be set against the depressed character of the rail industry overall. Of the 14 roads shown in Figure 17, five saw their traffic increase by a third or twice the rate of the industry as a whole and at a more rapid pace than the real growth in GNP. Of these lines, three (the L&N, Southern, and Missouri Pacific) each also doubled their freight

Figure 17

PERFORMANCE OF SELECTED RAILROADS, 1966 AND 1974

	Revenue Ton-Miles (millions)		1974 Index	Freight Revenues (thousands)		1974 Index
	1966	1974	(1966 = 100)	1966	1974	(1966 = 100)
All Class I Railroads	738,395	850,961	115	9,280,613	15,766,710	170
Eastern District	265,504	248,398	94	3,524,555	5,306,205	151
Baltimore & Ohio	29,662	29,729	100	379,882	624,133	164
Chesapeake & Ohio	35,808	29,643	83	368,967	541,220	147
Norfolk & Western	50,194	53,005	106	579,304	945,831	163
Penn Central[1]	95,201	87,382	92	1,314,824	1,939,364	147
Southern District	125,462	160,668	128	1,441,503	2,758,811	191
Illinois Central Gulf[2]	30,844	32,122	104	334,904	535,983	160
Louisville & Nashville	26,680	38,103	143	269,035	590,221	219
Seaboard Coast Line[3]	28,961	35,151	121	352,424	654,906	186
Southern[4]	33,635	47,955	143	425,290	871,995	205
Western District	347,429	441,895	127	4,314,554	7,701,694	179
Atchison, Topeka and Santa Fe	46,798	56,858	121	599,288	1,023,042	171
Burlington Northern[5]	56,899	76,286	134	719,901	1,233,450	171
Chicago, Milwaukee, St. Paul and Pacific	16,776	18,745	112	220,208	362,903	165
Missouri Pacific	25,982	37,730	145	293,141	607,031	207
Southern Pacific	61,002	70,008	115	764,168	1,287,454	168
Union Pacific	41,766	55,626	133	522,036	958,520	184

[1] For 1966, includes Pennsylvania, New York Central, and New Haven.

[2] For 1966, includes Illinois Central and Gulf, Mobile & Ohio.

[3] For 1966, includes Atlantic Coast Line, Piedmont & Northern, and Seaboard Airlines.

[4] For 1966, includes Alabama Great Southern, Central of Georgia, Cincinnati, New Orleans and Texas & Pacific, Georgia, Southern & Florida, New Orleans and Northeastern, Norfolk & Southern, and Southern.

[5] For 1966, includes Chicago, Burlington & Quincy, Great Northern, Northern Pacific, and Spokane, Portland & Seattle.

Source: Association of American Railroads, Revenues, Expenses and Freight Traffic (1966 and 1974 editions).

revenues -- a record all the more impressive when compared to the 88 per cent increase in current dollar GNP over the same time frame. Traffic gains of this magnitude demonstrate the hazards of over generalizing about the variegated experience of the rail industry.

Future Economic Patterns

As the nation enters the last quarter of the twentieth century, the prospects are that the economy will continue to grow but that the rate of expansion will taper as we move into the 1980's and beyond. The most recent (1976) estimates by the Bureau of Labor Statistics, for example, indicate that for the rest of the 1970's real GNP will expand at over 6.0 per cent per year, but that in the early 1980's growth will decline to about 3.6 per cent annually.[1] Similarly, the longer-range OBERS projections (compiled by the Departments of Commerce and Agriculture) point to a gradually reduced rate of real GNP growth. In the 1980's, OBERS projects growth of 3.3 per cent per year or about one percentage point lower than that forecast for the 1970's.[2] As in the past, though, the mix and composition of the economy will play a crucial role in determining the impact of the economy on the various transport modes.

Composition. Over the period of the next decade, little change in the trends which have typified the recent past are expected. Thus in relation to the economy as a whole, it is anticipated that the agricultural and mining sectors will continue to see their share of output decline, though gains in grain exports and in coal production can be expected. At the same time the finance, insurance, and real estate group will continue to account for a growing proportion of GNP.

In the aggregate, the manufacturing sector will still represent about a fourth of total output, but the gap between the faster and slower growth industries will narrow. Figure 18 presents projected growth rates for key industries making up the manufacturing group. (These data are based on constant dollar projections of earnings -- a measure which facilitates the regional analysis which follows.) As can be seen, industries such as electrical machinery and chemicals which grew most rapidly in the past are projected to maintain their leading position in the future. At the same time, primary metals, lumber, and textiles will continue to represent lagging industries. Note, however, the gap between the fastest growing group, electrical machinery, and the slowest, primary metals. Between 1974 and 1980, over six percentage points separate these industries while in the 1980's, the margin is reduced to less than three points. What this convergence of growth rates implies is that compared to the past, growth in the manufacturing sector will be more evenly distributed among component industries.

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[1] Department of Labor, Bureau of Labor Statistics, "Revised BLS Projections to 1980 and 1985: An Overview," Monthly Labor Review (March 1976).

[2] Water Resources Council, 1972 OBERS Projections: Regional Economic Activity in the United States (April 1974).

Figure 18

PROJECTED GROWTH IN CONSTANT DOLLAR EARNINGS
BY MANUFACTURING INDUSTRY, 1974, 1980, AND 1985

	Likely Average Annual Growth Rates		
	1974-1980	1980-1985	1974-1985
Total Manufacturing	4.4	2.9	3.7
Electrical Machinery	7.1	4.0	5.7
Chemicals	6.1	3.7	5.0
Printing and Publishing	6.5	3.3	5.0
Paper	5.7	3.0	4.5
Fabricated Metals	5.1	3.0	4.2
Apparel	5.7	2.4	4.2
Transportation Equipment Excluding Motor Vehicles	4.3	2.0	3.3
Motor Vehicles	3.3	3.0	3.2
Non-Electrical Machinery	2.8	2.8	2.8
Food	3.5	1.7	2.7
Textile Mill Products	3.4	1.9	2.7
Petroleum Refining	3.2	2.2	2.7
Lumber and Furniture	2.8	2.4	2.6
Primary Metals	1.0	1.4	1.1

Source: Water Resources Council, 1972 OBERS Projections: Regional Economic Activity in the United States (April 1974) and Department of Commerce, unpublished data.

In the agricultural sector, export markets offer the greatest potential for growth. With domestic demand expected to remain stable, international trade in grains -- especially corn and soybeans -- could boost U. S. farm output by substantial margins. Assuming a continuation of recent high export trends, the Agriculture Department's latest projections for 1985 show that from a 1974 base corn output is likely to increase at an average annual rate of 4.5 per cent and soybean production could rise at a rate equal to 6.0 per cent per year (see Figure 19). By contrast, less rapid expansion of wheat shipments abroad will result in only a 1.8 per cent average yearly gain in production.

Perhaps the most significant new economic development of consequence to the transport industries will revolve around the energy question. Concern about the nation's long-term supply of petroleum and natural gas, along with delays in the construction of nuclear facilities (as well as other uncertainties associated with enrichment policy, the commercial feasibility of fuel reprocessing and plutonium recycling, waste management and storage, and nuclear power plant reliability) have combined to alter sharply the prospects for coal production. The latest estimates of both private industry and government indicate that, spurred by its new role as a substitute fuel, coal output will nearly double by 1985 to about one billion tons with the bulk of this gain occurring in the 1980's. Electric utilities will account for most of this increase as this sector's share of total coal consumption rises to about 75 per cent by 1985 (this compares with just over half of the U. S. coal market in 1965). Beyond the mid-80's the outlook is less clear, but the most likely prospect is that in comparison with the near-term, rates of gain in coal output will decline as consumption more closely tracks overall electrical demand. What this scenario implies is that the sharp increases in coal consumption will be highly telescoped, with the bulk of the substitution phenomenon having occurred by about 1985.

Regional Patterns. As with the mix of the economy, the regional picture of commercial activity in the 1980's is expected to mirror past trends. What can be anticipated is that the differences between regions will continue to narrow and that the Northeast, though growing more slowly than the rest of the nation, will still occupy a position of critical importance.

Looking first at the manufacturing sector, government projections show that states in the South, Southwest, and Far West will experience rates of growth in excess of the national average (see the shaded states in Figure 20). To some extent, however, this picture is misleading for it fails to acknowledge that many of these states account for relatively small portions of total manufacturing activity. Adjusting for this factor, Figure 21 depicts the 16 states that in 1985 are forecast to account for at least two per cent of total national manufacturing activity (the Figure also indicates which of those states will grow faster than the average national rate). All of the Middle Atlantic and East North Central states, as well as two in New England, are included among those 16 states. This representation indicates that although there will be important pockets of growth outside of the Northeast, this quadrant of the nation will continue to constitute the country's industrial heartland.

Figure 19

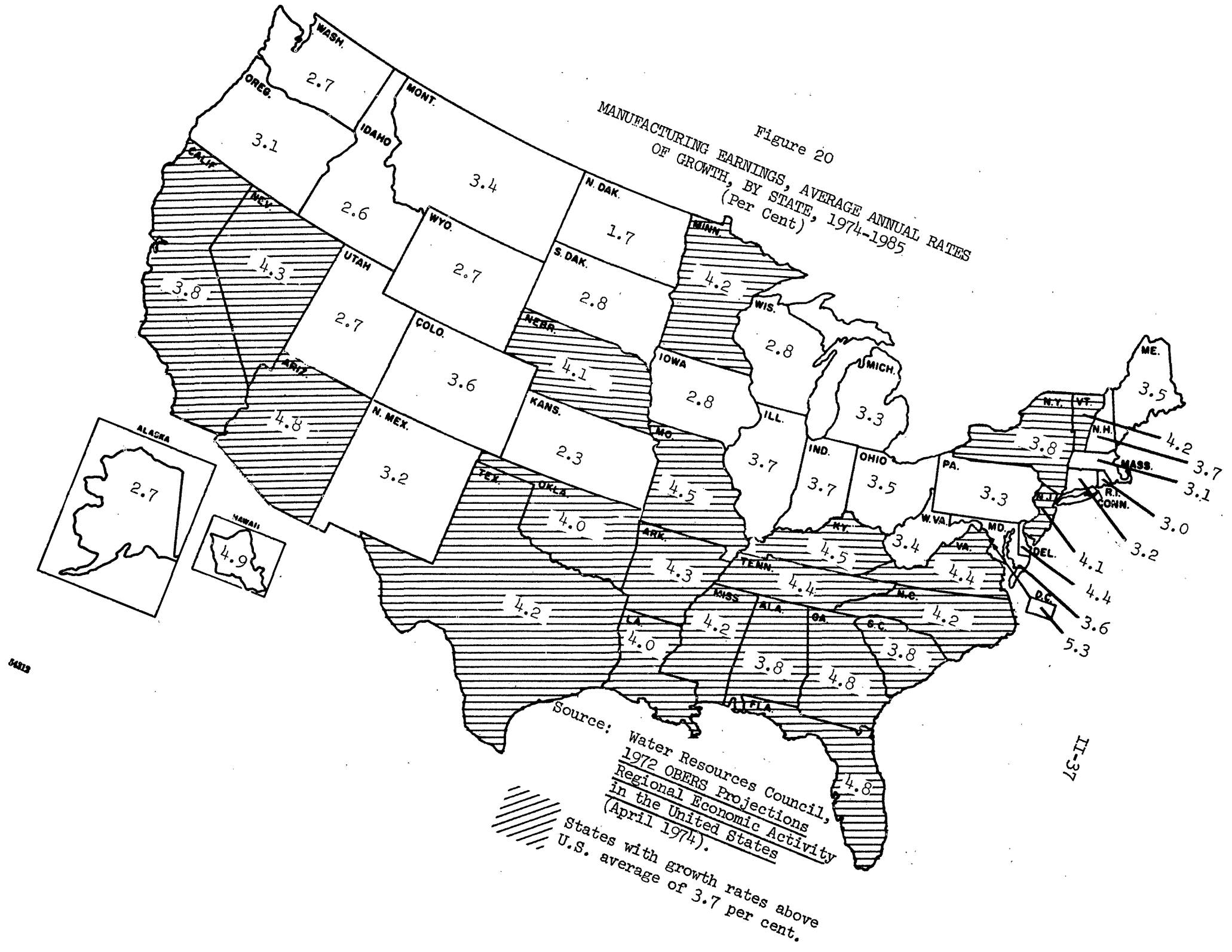
U. S. PRODUCTION OF MAJOR GRAINS, 1974 AND 1985 ESTIMATES (in thousands of tons)

	1974	1985		Average Annual Rates of Growth, 1974-1985 (per cent)	
		Moderate Exports	High Exports	Moderate Exports	High Exports
Corn	130,582	185,292	211,910	3.2	4.5
Soybeans	36,444	33,946	68,980	(0.7)	6.0
Wheat	53,886	52,920	65,234	(0.2)	1.8

Source: Department of Agriculture, Crop Production, 1975 Annual Summary (January 15, 1976) p. A-3 and National-International Agricultural Projections (NIRAP) System (unpublished).

Figure 20

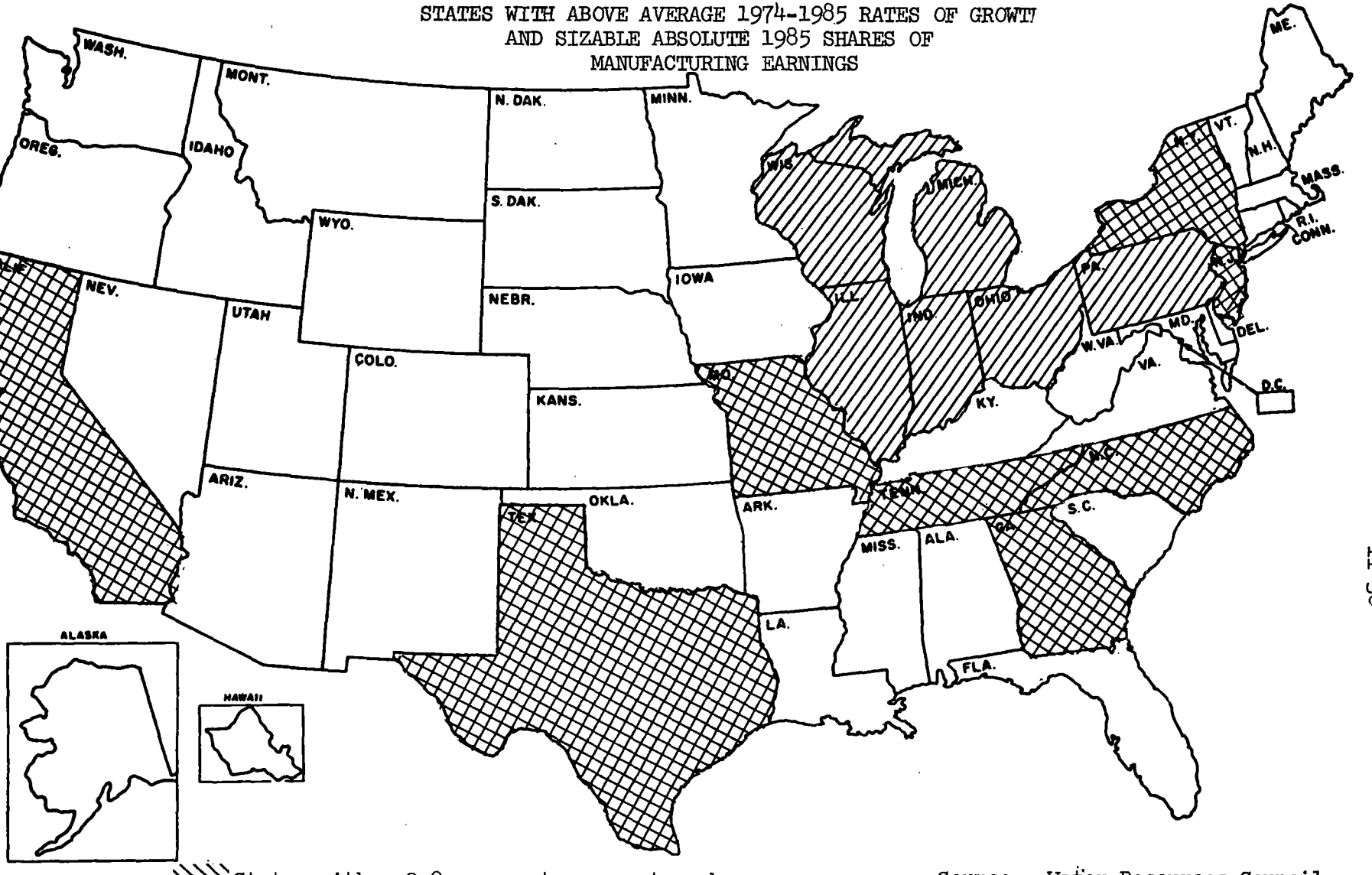
MANUFACTURING EARNINGS, AVERAGE ANNUAL RATES OF GROWTH, BY STATE, 1974-1985
(Per Cent)



Source: Water Resources Council, 1972 OBERS Projections, Regional Economic Activity in the United States (April 1974).

Figure 21

STATES WITH ABOVE AVERAGE 1974-1985 RATES OF GROWTH AND SIZABLE ABSOLUTE 1985 SHARES OF MANUFACTURING EARNINGS



States with a 2.0 per cent or greater share of 1985 U.S. manufacturing earnings.

States with a 2.0 per cent or greater share of 1985 U.S. manufacturing earnings and with an annual rate of growth in 1971-1985 manufacturing earnings greater than the 3.7 per cent 1974-1985 U.S. manufacturing earnings growth rate.

Source: Water Resources Council, 1972 OBERS Projections: Regional Economic Activity in the United States (April 1974).

In contrast to what is envisioned for the manufacturing segment of the economy, the regional implications of anticipated gains in coal consumption are far more profound. As noted earlier, electrical generation will represent the chief stimulus to greater coal usage and it is in this sector where the regional consequences are most dramatic. Figure 22 portrays the Regional Electric Reliability Council (RERC) areas and indicates estimated 1975 and projected 1984 consumption of coal (in tons) for electricity. Focusing on those areas west of the Mississippi River (WSCC, MARCA, SWPP, and ERCOT on the map), it becomes clear that these regions will account for about 80 per cent of the increase in utility coal consumption. The more than four-fold gain in western coal usage will mean that this region will consume nearly 44 per cent of total utility coal compared with less than 18 per cent today. What the RERC projections imply, therefore, is that in contrast to today's concentrated pattern of coal demand in the midwest and southeast, a much broader geographical diffusion of coal consumption will characterize the mid-1980's.

Consequences for Transportation. Assuming that the long-term relationship characterizing economic growth and transportation demand is maintained in the future, the outlook for tapered economic expansion presented earlier signals a commensurate reduction in the growth rate for intercity transportation service. For the railroads in particular, however, the future -- while far from rosy -- holds some distinctly positive traffic prospects.

To begin with, the reduced rate of expansion anticipated in the manufacturing sector, combined with the diminishing gap between the faster and slower growth industries, indicates that the forces of change which so materially exacerbated the diversion of traffic away from the railroads will ameliorate. Indeed there is evidence to suggest that the major diversionary thrust of the non-rail modes has already occurred. Examination of the intercity transport market since World War II (Figure 23) shows that between 1947 and 1975, the railroads lost about 28 percentage points in their share of total ton-miles (from 65.3 per cent to 36.8 per cent). About three-fourths of this decline, however, had occurred by 1960 -- a time by which the motor carriers and inland waterway operators had picked up virtually all of their post-war gains. The market share decline experienced by the railroads since 1960 is mostly attributable to the oil pipelines, a mode against which the railroads cannot generally compete. (Of the nearly 785 million ton increase in crude petroleum and petroleum products traffic between 1960 and 1974, pipelines account for more than half, motor carriers for more than a third, and water carriers for just over ten per cent. Over the same time period, rail traffic in these products has remained virtually unchanged.)[1] Thus based on the recent past as well as the prospects over the next decade or more, there would seem to be little reason to anticipate any large-scale change in the relative position of the various modes insofar as manufactures traffic is concerned.

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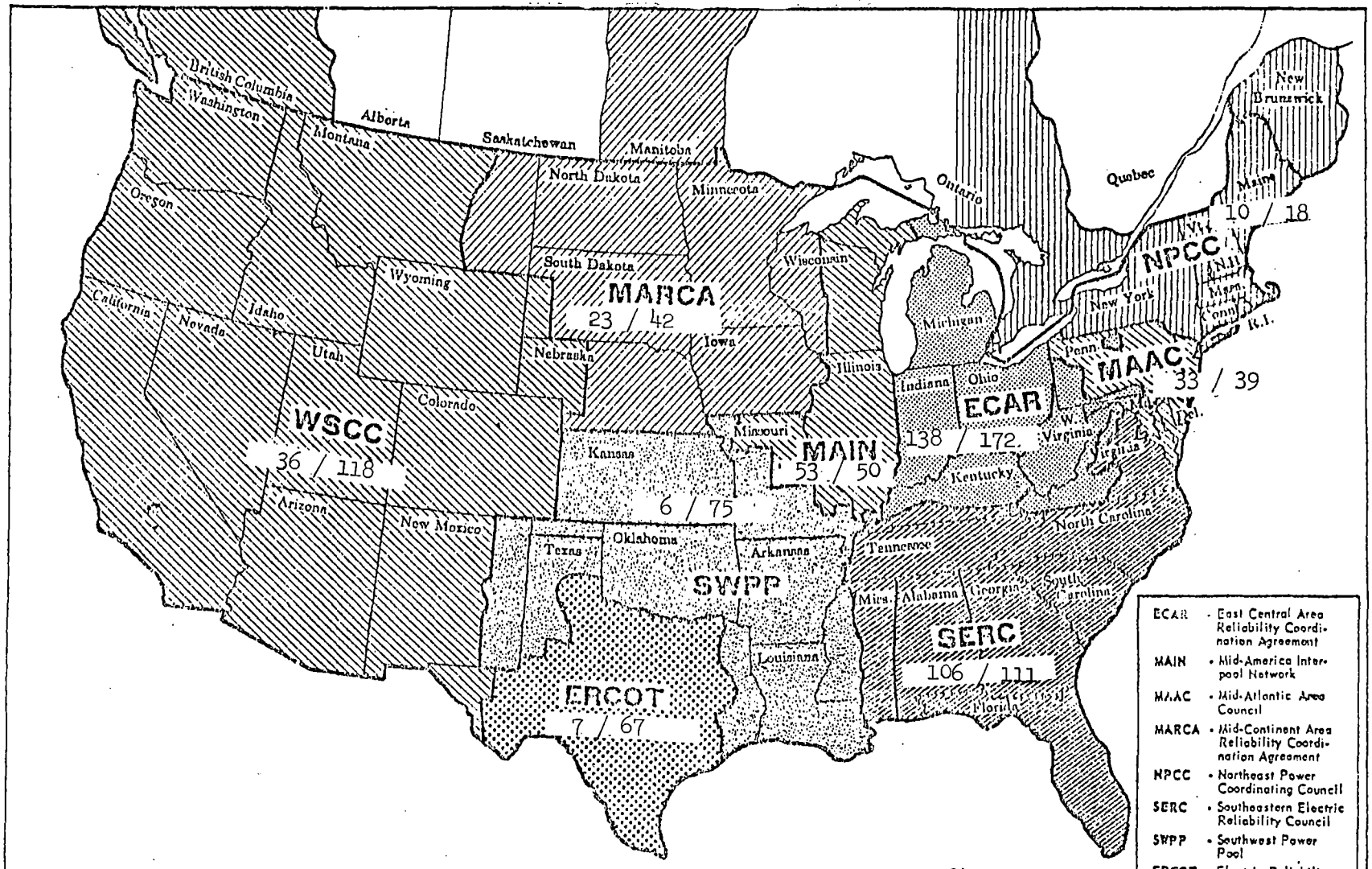
[1] Department of Transportation, Office of the Secretary, Energy Statistics: A Supplement to the Summary of National Transportation Statistics (August 1976) Table 1-12.

Figure 22

ELECTRIC UTILITY COAL CONSUMPTION
1975 ESTIMATE/1984 PROJECTED
(Million Short Tons)



Source: ICF, Inc. Demand for Coal for Electricity Generation, 1975-1984 (Prepared for the Federal Energy Administration, August 1975).

REGIONAL ELECTRIC RELIABILITY COUNCILS

Figure 23

CHANGE IN THE MODAL SHARE OF INTERCITY FREIGHT TRANSPORTATION, 1947-1975
(per cent of ton-miles)

Year	Rail	Truck	Oil Pipeline	Water
1947	65.3	10.0	10.3	14.4
1960	44.1	21.8	17.4	16.7
1975	36.8	21.3	24.6	17.1
percentage point change:				
1947-1960	-21.2	11.8	7.1	2.3
1960-1975	- 7.3	- 0.5	7.2	0.4
1947-1975	-28.5	11.3	14.3	2.7

Source: Appendix Table 1.

Looking beyond manufactured goods traffic, the shift to coal for meeting national energy requirements opens up distinctly favorable opportunities for the railroads. With the bulk of the increase in coal production and consumption anticipated to occur in the West, the impact on carriers in this region is likely to be especially beneficial. Of particular importance, the low BTU content of western coal, combined with the long distances between minehead and power plant, means that large ton-mile gains for certain carriers in this region are in prospect. While Eastern roads are not likely to benefit as dramatically, it still remains true that 40 per cent of all utility coal is projected to be consumed in an area roughly identical to Official Territory. Furthermore, this region will continue to serve as the key source for export traffic and as the principal consumption area for industrial coal.[1]

In the agricultural sector, growth in the export trades for certain commodities (corn and soybeans especially) holds out the prospect of a favorable rail market, but set against this possibility is the likelihood of strong modal competition from both barges and trucks whose ratemaking exemptions offer counter-advantages. With relatively little expansion anticipated in domestic consumption, the most likely outcome is that agricultural commodities will continue to account for just under ten per cent of total rail tonnage in the 1980's.

Putting together these basic elements of rail freight, it is reasonable to anticipate that as a group the railroads should experience at least a modest reversal of their half century record of decline. If the railroads can maintain their share of merchandise traffic, the forecast gains in coal should enable the industry to lift its share of intercity ton-miles from a current level of approximately 37 per cent back to a point above the 40 per cent mark. As has been true in the past, of course, specific regions and individual carriers will be especially well-positioned to benefit from the unfolding patterns of economic and regional change while other areas and roads will be less favorably situated. Contributing to the relative ability of carriers to hold and attract traffic will be the geographical layout and physical condition of their lines and yards. Only the most fortuitous (and unlikely) of economic and demographic circumstances can be expected to compensate for a rail network layout that is now a century old.

At the same time, the likelihood of a more slowly growing economy means that competition among the various modes for the less rapidly expanding transportation pie will be exceptionally keen. Shippers will continue to seek out those carriers and those modes that can provide the most reliable and efficient transportation service at the lowest possible cost.

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[1] While the outlook for rail coal traffic is generally an optimistic one, it should be recognized that the construction of slurry pipelines as well as the installation of new minemouth generating plants could well have a negative impact for certain specifically situated railroads.

In the intensely competitive atmosphere of the future, no carrier can afford to neglect these basic characteristics of transport demand.

If, on balance, the freight traffic outlook for the railroads clearly presents favorable opportunities,[1] realistically these prospects must be set in the context of the industry's deteriorating financial posture. Precipitated by bankruptcy of the Penn Central, five other railroads in the Northeast have entered into reorganization proceedings since 1970. In three of the last six years, Eastern District railroads as a group have reported deficit net railway operating income (the remainder of operating revenues after deduction of operating expenses, taxes, and rental payments) with the $224 million loss shown in 1975 being the most massive to date.[2]

Serious as conditions are in the Northeast, mounting signs of financial trouble also are appearing in the Midwest. Operating with a spaghetti-like maze of duplicative yards and track whose physical condition continues to worsen, carriers have not succeeded in earning sufficient income to redress the decay of this overbuilt plant. In 1975 alone, for example, the Rock Island declared bankruptcy and it, along with the Chicago & Northwestern and the Milwaukee Road, accumulated $62 million in deficit net railway operating income -- a sum equal to 28 per cent of the comparable Eastern District negative amount.[3] With other railroads in the region hovering close to financial insolvency, the possibility of large-scale collapse spreading into this area as well cannot be ignored.

Given the massive failures in the Northeast as well as the marginal operations in the Midwest, the rail industry's overall financial performance does not compare favorably with the other modes or with the economy as a whole. Figure 24 shows annual rates of return for railroads, common carrier trucks and aviation in recent years. Note that in 1974 (their best earnings year in almost a decade), the railroads' rate of return amounted to only 4.3 per cent. Common carrier trucks, by contrast, reported a return of 19.6 per cent -- more than four and a half times larger -- and airlines almost twice as much (8.2 per cent). All manufacturing industries combined earned 15.2 per cent or a rate three and a half times that of the railroads.[4]

Ultimately, of course, the industry's dismal earnings record feeds upon itself. With investors tending to favor other, more profitable sectors, the railroad industry as a whole has been unable to attract sufficient amounts of private capital to rehabilitate its obsolete physical plant. Further decay of this system, in turn, has led to higher railroad costs without commensurate revenue yields, deterioration in service quality, and in a spiraling vicious circle, to even lower reported earnings.

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[1] In contrast to freight operations, the future of rail passenger service is extremely bleak except for a limited number of high population density corridors (e.g., between New York City and Washington, D. C.).

[2] Association of American Railroads, Yearbook of Railroad Facts (1976) p. 19.

[3] Association of American Railroads, Railroad Revenues, Expenses, and Income, No. 684 (April 26, 1976).

[4] First National City Bank, Monthly Economic Letter (April 1976) pp. 6-7.

Figure 24

ANNUAL RATES OF RETURN, BY MODE,* 1960-1975
(Net Income After Taxes as a
Per Cent of Net Worth**)

	Class I Railroads	Common Carrier Trucking	Air Transport
1960	2.6	6.3	4.1
1961	2.2	10.4	(3.1)
1962	3.3	16.8	5.1
1963	3.7	16.6	12.4
1964	3.9	20.2	20.3
1965	4.6	19.7	29.5
1966	5.1	22.6	23.5
1967	3.0	15.7	18.5
1968	3.2	19.5	9.0
1969	2.9	15.0	5.6
1970	1.3	9.6	***
1971	2.0	20.0	2.6
1972	2.9	18.8	7.6
1973	3.5	14.1	5.2
1974	4.3	19.6	8.2
1975	0.8	13.5	0.3

* Data for non-common carrier trucking, water carriers, and oil pipelines are not available.

** Net worth at the beginning of each year; equivalent to "book net assets" or stockholders' equity. Due to the large proportion of capital investment in the form of funded debt, rate of return on total property investment would be lower than that shown on net assets only.

*** Not calculated because of deficit.

Source: First National City Bank, FNCB Corporate Profits Tabulations, Historical Summary, 1925-1972 (June 1973) and Monthly Economic Letter (April Editions, 1973-1976).

Conclusion

Over the last 75 years powerful forces of change have virtually reshaped the structure of the American economy. These forces -- impacting on both the composition and regional character of the economic system -- have had a revolutionary effect on national transportation both in terms of supply and demand. Paralleling the growing need for the transportation of higher-valued, time-sensitive merchandise, the trucking industry proliferated into a major intercity carrier. As petroleum and natural gas displaced coal as the nation's major energy source, the network of pipelines required to move these newer fuels was put in place.

Each of these developments has had serious adverse consequences for the railroads generally but most especially for those in the Northeast. Recognizing that most of these changing forces came to fruition only after the railroad physical plant was at its zenith, the relative decline of the railroads since World War I must in large measure be attributable to the mode's inability to meet the transport demands of newer industries and economic regions experiencing more recent growth and development. Caught in the vise of economic change on the one hand and the rise of non-rail transport competition on the other, the railroads were especially handicapped by a right-of-way network ill-adapted to shifting locational patterns. Railroad "infrastructure," however, is not portable; it is fixed. With industries along its tracks moving to new locations and with new manufacturing plants frequently sited away from rail facilities altogether, this century-old rail line system became increasingly obsolete.

Looking to the future, the shaping forces of transportation demand offer the railroads both the prospect of new markets (chiefly coal and other bulks) as well as a decline in the erosion of old ones (mainly merchandise traffic). While these anticipated marketing developments are encouraging, they must be weighed against the burden of excessive physical plant and (with some notable exceptions) serious industrywide financial deterioration. The railroads cannot be expected to reverse their long-term decline unless these problems are addressed.

Chapter III

THE IMPACT OF FEDERAL AID ON RAIL TRANSPORTATION

This chapter discusses the provision of direct Federal financial assistance to rail and the four competing intercity transport modes -- air, highway, water and pipeline transportation. The chapter is organized into two time periods, pre and post-World War II.

From its earliest days the Federal government has provided aid to each intercity transport mode at one time or another. Amounts, methods, timing, and purposes have varied extensively over the years, but the basic principle that transportation was deserving of public support has been a policy constant for two hundred years. In virtually every instance the minimum objective has been to achieve results deemed to be in the public interest through Federal support of transport projects that either would have been delayed or remained undeveloped absent Federal involvement.

FEDERAL AID TO TRANSPORTATION, 1789-1945

Federal aid to transportation began in 1789 with the first public works project authorized by Congress, construction of a lighthouse at Cape Henry, Virginia.[1] From this beginning it was soon clear that Congress would provide the necessary inducements to transportation in order to bind the growing nation together into a cohesive political and economic unit in which the resources produced in every geographic area could be shared by all.

As a rule, Federal assistance has been provided only when some necessary resource could not be obtained from established private market sources. As will be shown in this chapter, it is estimated that during the 1789-1945 period all of the aid provided for the development of railroads and pipelines, and approximately 80 per cent of highway aid was recouped by the Federal government. Assistance provided for waterway and airport and airway development during this period, on the other hand, has constituted a total or near total public subsidy as no payback obligations were imposed on system carriers, shippers, or passengers. This pattern prevailed until 1970 for aviation and remains intact for the inland waterways.

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[1] 1 Stat. 53 (1789).

The dollar value of the aid provided to transportation through 1945 does not appear large compared with that of the post-World War II period. However, when compared with resources expended on other programs during the country's early history, it becomes clear that development of a nation-wide multi-modal transportation network was a primary Federal Government objective during the period.

In this review of Federal assistance to transportation, no effort is made to equate a dollar of aid today with a dollar of aid provided 50, 75 or 100 years ago. Even if undertaken, an exercise to express all dollars in constant terms would be complicated by the fact that recoupment of Federal assistance sometimes has occurred several decades after the aid was provided.[1] In addition, aid for each means of transport was typically extended during different historical periods as Federal priorities shifted and transport technologies developed. A comparison of the cost of building a half mile section of airport runway in 1940 with the cost of building a half mile section of the Cumberland Road in 1808, obviously would produce a meaningless comparison from which no conclusions could be drawn.

Federal Assistance to Rail Transportation

In the period up through 1945, the Federal Government extended assistance for railroad expansion in four separate actions from 1824 through the 1930's. The aid provided included technical assistance through the General Survey Act of 1824, remission of customs duties on imported railway iron from 1830 to 1843, land grants to western railroads from 1850 to 1871, and on three separate occasions, direct loans. (See Figure 25) A consolidated view of all Federal aid to rail transportation through 1945 reveals that the Federal government has been a net beneficiary of its railway aid programs since the rail rate reductions pursuant to the Land Grant Acts have exceeded the value of the aid provided.

General Survey Act (1824-1838). Well before the advent of the railroad land grant period, but after territorial acquisitions that had tripled the total area of the Republic only thirty-seven years after its founding,[2] Congress passed the General Survey Act. This Act authorized the government to employ civilian and military engineers to conduct surveys and prepare plans and estimates for roads and canals of national importance.[3] The sale and development of the newly acquired lands, most of which were beyond the Mississippi River, became a national priority, in part to relieve the

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[1] In the case of the railroads, the government was still receiving the benefit of freight and passenger rate reductions in the mid-1940's as stipulated by the Land Grant Acts, more than 90 years after the first Land Grant Act was enacted.

[2] The Louisiana Purchase in 1803 and the Florida Purchase in 1819 added 576 million acres to the original 13 state total area of 259 million acres.

[3] Forrest G. Hill, Roads, Rails and Waterways (Norman, Okla.: University of Oklahoma Press, 1957) p. 37.

Figure 25

FEDERAL AID TO RAIL TRANSPORTATION
1824-1945
(In Current Dollars)

Program or Project	Federal Cost Or Value
General Survey Act (1824-1838)	Unknown
Remission Of Duties On Railway Iron (1830-1843)	$ 5,996,840
Railroad Rights Of Way and Use of Natural Materials	Unknown
Value of Land Grants (1850-1871)*	495,000,000
Federal Losses Through Default On:	
Land Grant Loans (1862, 1864).	11,015,000
Post World War I Loans (1920), and Depression Period RFC and PWA Loans (1932) (range is between $1,978,000 and $21,483,665. Actual value is unknown).	21,500,000
Known Total	$533,511,840

* In payment for these land grants, the Federal Government received rail rate reductions (through September 1946, when the rate reductions were terminated) of approximately $1,000.000,000.

Source: Lewis H. Haney, A Congressional History of Railways in the United States (Madison, Wisc.: Democrat Publishing Co., 1968) Vol. I, p. 123; Board of Investigation and Research, Public Aids to Domestic Transportation, Report to the Committee on Interstate and Foreign Commerce (79th Cong., 1st Sess., House Doc. No. 159, September 19, 1944) pp. 119, 137, 157, 162; U. S. Treasury Department, Office of Defense Lending.

financial burden of the Revolutionary War debt and the near $20 million acquisition cost of the new lands. Congress recognized that development of the Western territories was dependent upon transportation and communications links with the rest of the country. Due to a scarcity of civilian civil engineers and the unwillingness of private capital to invest in highly speculative western ventures, the responsibility of inducing transport segments to new lands fell on the Federal government.

Although railroad surveys were not specifically mentioned as eligible projects under the Act, such planning and survey projects were undertaken for the railroads beginning in 1825. During the fourteen year life of the Survey Act, 102 railroad related surveys and plans were prepared. The total cost of these railroad projects has been estimated at between $40,000 and $75,000. According to the Act the cost was to be repaid by the beneficiaries of the surveys. Whether the government, in fact, was repaid in full is unknown.[1]

Remission of Duties on Railway Iron (1830-1843). In the 1820's rapid railroad development of lands beyond the Appalachians was being impeded by low domestic iron production and a high tariff on imported iron products. After enactment of a $37 per ton duty on iron products in 1828 -- the highest such charge levied to that date -- the Baltimore & Ohio Railroad petitioned Congress for a remission of the duty. Congress had to choose between eliminating an important source of tax revenue and lifting the protection provided the country's infant iron industry, on the one hand, and fostering western expansion on the other. Allowance of a 25 per cent remission of duties on imported iron used for rails in 1830 and full remission in 1832 is evidence of the priority placed on westward expansion, especially since customs duties provided more than 90 per cent of total Federal receipts at that time.[2]

This period of duty-free importation of railway iron products continued until 1843 when arguments citing the unfair advantage given to English iron manufacturers and the state of the Treasury's balance of funds led to a reimposition of a 20 per cent tariff. While in effect, the remission of duties on railway iron products had saved the railroad industry a total of $5,996,840.[3]

Railroad Rights of Way and Use of Natural Materials (1835-1875). Fifteen years before the railroad land grant program Congress authorized for the first time a grant of land to be used as a rail right of way.[4]

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[1] Lewis H. Haney, A Congressional History of Railways in the United States (Madison, Wisc.: Democrat Publishing Co., 1968) Vol. I, p. 123.

[2] Ott and Ott, Federal Budget Policy (Washington, D. C.: The Brookings Institution, 1969) p. 56.

[3] Board of Investigation and Research, Public Aids to Domestic Transportation, Report to the Committee on Interstate and Foreign Commerce (79th Cong., 1st Sess., House Doc. No. 159, September 19, 1944) p. 157.

[4] This right of way grant was made to the Tallahassee Railroad Co. in Florida in 1835. See D. Philip Locklin, Economics of Transportation, 6th Ed. (Homewood, Ill.: Irwin, 1966) p. 107.

Unlike the later land grants, no public lands adjacent to the right-of-way were included in the grant. The railroad was, however, permitted to use timber, stone, and other materials from nearby public lands to construct its railroad. In 1850 these rights were extended to all Federally chartered railroads, plank-roads, and turnpike companies with the width of the right-of-way grants gradually increased to 200 feet. Approximately 150 railroads obtained rights of way through public lands through these statutes.[1]

The value of rights-of-way and the natural materials obtained by railroads from public lands is unknown. For reasons of economy the railroads undoubtedly used natural materials from their rights-of-way before using timber, earth, and stone from adjacent public lands. However, it is generally believed that natural materials on granted land were insufficient for rail construction purposes especially in the West.[2]

Railroad Land Grants (1850-1871). By 1850 the United States had indeed become a land-rich Republic. In a four year period from 1845 to 1848 the Federal government had added land holdings equal to one and a half times the size of the Louisiana Purchase.[3] All together the Federal Government owned over 1.5 billion acres of undeveloped land, which for lack of efficient transportation facilities remained isolated, unused, and unwanted. Much of the eastern portion of this land had been available for sale for 15 to 30 years at a price of $1.25 per acre, but proved to be unmarketable because of its inaccessibility to markets and population centers.

To hasten development of these vast land holdings Congress adopted a policy used earlier in the century, development through transportation land grants, but applied it to railroads, using the transport technology then thought to provide the most efficient transport service. Federal land grants to states for construction of highways and canals had been a common method of providing incentives for development of "internal improvements" since the early 1800's.[4] Because the newly acquired territories were so vast and had few navigable waterways, it was recognized that only the railroads could provide the transportation services needed to induce settlement in the shortest span of time.

Direct dollar assistance was beyond the Treasury's reach -- the total Federal budget in 1850 only $39 million[5] -- and higher taxes were unaccept-

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[1] Ibid., p. 107.

[2] Board of Investigation and Research, op. cit., p. 157.

[3] Through the Texas Annexation, the Oregon Compromise, and the Mexican Cession, a total of 768 million acres.

[4] Land grants had been used by the Federal Government to promote construction of the Cumberland Road, a road from Washington to New Orleans, the Illinois-Michigan canal and other roads and canals.

[5] Department of Commerce, Bureau of the Census, Historical Statistics of the United States, Colonial Times to 1970 (September 1975) Series Y 457-465. The estimated costs of building the six Pacific railroads was $634 million. See Federal Coordinator of Transportation, Public Aids to Transportation, Vol. II (1938) pp. 15-26.

able. Moreover many in Congress believed that dollar aid would be unconstitutional.[1] Being land rich and dollar poor, the government turned to the device of making land grants to the railroads. Federal law specified the termini of the roads but left route selection and detailed planning to the states, which in turn relied on private investors to design, promote and operate the systems. Since the railroads were having great difficulty attracting capital for expansion -- and much of that had to be raised in Europe[2] -- the basic concept was that the railroads could sell off the land grants to raise the money for construction, or use it as collateral for loans.

Dispensation of land granted to railroads was made in alternate sections along the proposed rights-of-way. The alternate sections not granted were retained by the Federal government, which doubled its asking price on this property to $2.50 per acre from the $1.25 per acre price that had been sought, largely unsuccessfully, by the government in prior years. The doubling of the price was an attempt on the part of the government to recoup the value of the land grants with valuation based on the asking price of the land. The actual market value obtained for land in the government's alternate sections fell below the $2.50 per acre asking price due to continued sluggish land sales and because some land was donated for school and other public purposes.[3]

To further assure that the government received a return on its donation, the land grant railroads were required to carry all government passengers and freight at reduced rates. These rates were 50 per cent below rates charged by non-land grant railroads for similar service, and 20 per cent below competitive rates for mail. Although the land transfers were made from 1850 to 1871, most of the mandated rate reductions remained in effect from 1854 to 1940, a period of almost 90 years. Rate reductions for travel by military personnel continued to 1946. Compelled by competitive pressures almost all non-land grant railroads in the land grant regions of the country voluntarily entered into equalization agreements with the government stipulating that they too would carry government traffic at reduced rates.[4]

The purpose of land donations in excess of the needed rights of way was to provide the railroads an asset base upon which the capital needed to construct the roads could be borrowed and, most of it in fact was used for that

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[1] Constitutional questions focused on several issues one of which was whether the government had the power to donate land to railroads while doubling land prices for others. See Carter Goodrich, Government Promotion of American Canals and Railroads 1800-1890 (New York: Columbia University Press, 1960) p. 172.

[2] In 1876, over 85 per cent of the stock of the Illinois Central was foreign held. At various times, the Louisville and Nashville was 75 per cent foreign-owned, the Reading and Pennsylvania over 50 per cent, and the New York Central, Great Northern, B&O, and Milwaukee fell in a range from 20-40 per cent. See Locklin, op. cit., p. 100.

[3] Locklin, op. cit., p. 109.

[4] David M. Ellis, "The Railroads and their Federal Land Grants: A Critical Review," in Gerald D. Nash (ed.) Issues in American Economic History, 2nd Ed. (Boston: Heath, 1964) p. 291.

purpose. The land within the railroad's alternate sections was usually sold for whatever price the market would bear, with the proceeds used to retire the bonded debt. The first railroad land grant in 1850 for a road between the Great Lakes and the Gulf of Mexico provided for a 200 foot right-of-way and six alternating sections of land per mile of line on either side of the right-of-way.[1] In later land grants through less inviting western regions, the grants had to be enlarged to 400 foot rights-of-way and 10, 20, and 40 alternating sections of land per mile of line in order to attract the required capital.[2]

During the 21 year life of the land grant program, a total of 179 million acres of Federal and state lands equivalent to 10 per cent of the area of the contiguous 48 states were donated to railroads.[3] While the land granted was vast, only a relatively few western and southern railroads benefited from the program. Fourteen railroads received over 90 per cent of the land grants. On all of the land granted to the railroads only a total of 18,738 miles of railroad line were built or less than eight per cent of the total mileage of railroads built in the U. S.[4]

Nor did all the land grant railroads prosper. Despite the potential resource represented by its huge land grant, the Northern Pacific went bankrupt in 1875 and did not complete its line to the Pacific until 1883, almost two decades after its original 1864 grant.[5] Financial difficulties also forced the Atlantic and Pacific Railroad into receivership in 1875.[6] While the land grants did provide the foundation upon which several highly successful railroads were built, the land donations for other railroads led to overexpansion in sparsely settled areas and contributed to an "epidemic of railroad failures" in the mid-1870's.[7]

Slow land sales at prices below expectations coupled with high land promotional costs were major reasons why the land grant roads never obtained the profits anticipated. The railroads had also incurred a considerable

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[1] Paul W. Gates, The Illinois Central Railroad and Its Colonization Work (Cambridge, Mass.: Harvard University Press, 1934) pp. 21-43.

[2] Locklin, op. cit., p. 108.

[3] Of the 179 million acres, 49 million were granted by states. For much of the state share, states served merely as transfer agents for the Federal government. See Board of Investigation and Research, op. cit., pp. 110-111.

[4] Robert S. Henry, "The Railroad Land Grant Legend in the American History Texts," in Gerald D. Nash (ed.), Issues in American Economic History, 2nd Ed. (Boston: Heath, 1964) p. 287.

[5] Carter Goodrich, op. cit. p. 194.

[6] L. L. Waters, Steel Trails to Santa Fe (Lawrence, Kan.: University of Kansas Press, 1950) p. 65.

[7] Locklin, op. cit., p. 112.

amount of debt. Principal and interest payments on this debt came due throughout the land grant period with the earliest falling due in 1857, only seven years after the first land grant act.[1] Proceeds from land sales, of course, were to be used to retire the debt. Intense competition with other land grant roads, the Federal Government, and the states to sell land to settlers moving into the vast heartland region all served to keep land prices and profits below anticipated levels.

The task of selling land fast enough to retire the bonded debt was most acute for the railroads stretching to the Pacific. West of the Mississippi River and especially west of the 100th meridian, the poor fertility of the land caused many settlers to seek lands in more hospitable areas. In the five state area of Nebraska, Kansas, Wyoming, Colorado, and Utah, for instance, population had reached only 623,000 by 1870.[2] At this time and shortly thereafter railroads were offering 27 million acres for sale in this five state area at an average price of between $4 and $5 per acre. In the same area the Federal Government and the states had over 250 million additional acres either for sale or ready to be given away.[3] Compared with the price per acre sought by the land grant railroads, prices of land in the government's sections along the rail rights of way were generally priced at $2.50 per acre while public land beyond land grant corridors was offered for sale at $1.25 per acre. The actual average price realized by the Federal Government on all public lands sold from 1851 through 1871 in land grant states was only 97.2 cents per acre, however.[4]

The actual prices realized by the railroads on land sales were also held down by a number of factors including a series of military bounty land acts enacted from 1811 to 1855 (the last was the most extensive of all) through which Federal land was given to veterans of the Mexican War, the War of 1812, and other wars. By 1856 warrants for land granted by the military bounty land acts, but not claimed by veterans, were selling at prices ranging from 50 cents to $1.15 per acre. The Graduation Act of 1854, a measure designed to dispose of land that had gone unsold for between 10 and 20 years, also served to depress prices by putting another 26 million acres on the market ranging in price from 12-1/2 cents to $1 per acre.[5]

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[1] Gates, op. cit., p. 270.

[2] Many settlers chose to homestead beyond the Great Plains. By 1870 the population of California and Oregon was higher than the combined population of Nebraska, Kansas, Wyoming, Colorado and Utah.

[3] Department of the Interior, Bureau of Land Management, Report of the Commission of General Land Office (June 30, 1943) Tables 1, 76, and 77; and Robert G. Athearn, Union Pacific Country (Lincoln, Neb.: University of Nebraska Press, 1971) pp. 148-149.

[4] Federal Coordinator of Transportation, Vol. II, op. cit., p. 36.

[5] Gates, op. cit., pp. 99-103.

Enticed by the availability of cheap land and a transportation system that had bound the East and West together in less than a generation, the wave of settlers from the East and immigrants from Europe began arriving in the western states and territories in great numbers in the late 1870's and 1880's. In spite of the intense competition to sell land (which pushed the average price received by railroads below $4.00 per acre) [1] most of the land grant railroads were able to sell their land and pay off their debt obligations. By 1942 the land grant railroads had sold 91 per cent of the land originally granted. The government's first priority objective of settling and bringing the new territories into cultivation in the shortest space of time had been achieved. And as discussed below, the government also achieved its second priority, a financial return at least equal to the value of the land donated to the western railroads.

While the exact valuation of the railroad land grants is a matter of considerable controversy, the consensus of most historians and Federal studies is that the savings accorded the Government through freight and passenger rate reductions exceeded the value of the land grants, regardless of the valuation methodology used. The Board of Investigation and Research estimated the value of the land grants at $495 million, based on the net proceeds realized from the sale of the donated land.[2] This figure almost equals the $500-$600 million estimates made by others who based their calculations on the average sale price received per acre.[3]

The Board's estimate of the value of the land grants, $495 million, generally falls below estimates of the benefits received subsequently by the government through railroad rate reductions.[4] According to the Board

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[1] Through 1941 railroads had received gross proceeds of $602,445,137 from sales of 163,023,214 acres of land granted them between 1850 and 1871, or an average gross sale price of $3.70 per acre. See Board of Investigation and Research, op. cit., pp. 118-119.

[2] Of this total, $440 million is attributable to Federal land grants and $55 million is attributable to grants made by states. States served as transfer agents for the Federal Government for much of the land they granted to railroads. The Board's estimate also accounts for some, though not all, of the sales made by railroad subsidiaries or affiliates to whom land was transferred for disposition. See Board of Investigation and Research, op. cit., pp. 115-119.

[3] Robert E. Riegel, The Story of the Western Railroads (New York: Macmillan, 1926) p. 42, and Ellis, op. cit., p. 292.

[4] It is generally conceded that the Government did not realize major gains from sale of the alternate sections of land that it held along the railroad rights of way, for many of the same reasons that affected sale of the railroad sections.

of Investigation and Research, these reductions were worth $580 million through June 1943.[1] At that time due to the War effort, the rate reductions were accruing at a rapid rate of about $20 million a month. Thus, it is probable that the total benefits recieved by the government through September 1946, when the rate reductions ended, approached and possibly exceeded $1 billion.

Any comparison of the respective estimates of rate reductions and land grant values must recognize that the costs and benefits derived from them were concentrated at opposite ends of a 90 year continuum. The railroads received the majority of their benefits in the years during and immediately following the original grant period. The government, on the other hand, received the majority of its benefits from the rate reductions in the years immediately prior to and during World War II. Judgments about the comparability of these figures also poses a major question, one that perhaps cannot be resolved without also estimating the public benefit of the rapid settlement, economic development, and political unification of the areas through which the land grant railroads were built.

Direct Federal Loan Programs for Railroads: 1862, 1920, 1932. Prior to 1946, the Federal Government provided direct loans to railroads in 1862 in conjunction with the land grant program for construction of railways to the Pacific coast; in 1920, for rail rehabilitation following the World War I period during which operation of the railroads was nationalized; and during the Depression for operating and financial stabilization assistance. With respect to the land grant loans, 97.5 per cent of the principal borrowed and interest due was repaid by the rail industry. Unpaid principal and interest liabilities, however, amounted to $11 million. As for the post-World War I and Depression period loan programs, Federal records show that at least 98.8 per cent of the principal borrowed has been repaid by the rail industry. A final accounting of the unpaid principal and interest liabilities accruing under these two programs is not possible at this time from available data. Sufficient evidence is in hand, however, to conclude that the unpaid principal obligations resulting from these two loan programs fall within a range of between $2.0 and $21.5 million.

The first railroad loan program was authorized by the Pacific Railroad Act of 1862, as amended in 1864, which designated six beneficiary railroads as recipients of 30-year, six per cent bonds. In total $64,623,512 in bonds were issued, with the majority coming to maturity between 1895 and 1898. During that period the railroads repaid $63,023,512 of the principal and

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[1] Board of Investigation and Research, op. cit., p. 137. The American Association of Railroads updating the Board's estimate through June 30, 1945, has placed the Federal benefit at over $1 billion. See C. S. Duncan, A Review of "A Report From the Board of Investigation and Research" (Washington, D. C: Association of American Railroads, 1946) p. 11.

$104,722,978 in interest, which was $11,014,783 less than the total amount of principal and interest due.[1] This unpaid liability represents the unfunded cost to the government of administrating the land grant loan program or the amount of direct Federal assistance provided the railroad industry.

During World War I the Federal government nationalized the railroads and operated them for a period of 27 months. After the war, when the system was returned to private management, the government loaned the railroads $1,080,575,463 at 6 per cent interest for rehabilitation purposes. By 1958 railroad repayments totalled $1,287,403,601, of which $1,063,326,776 was repayment of principal and $224,076,825 was for payment of interest.[2]

In 1932, the Federal government created the Reconstruction Finance Corporation (RFC) and the Public Works Administration (PWA) which were authorized, among other things, to make loans to manufacturers, banks, and other businesses, including railroads. During the Depression period railroads borrowed $1,142,501,375 from these agencies at interest rates ranging from 4 to 6 per cent. By 1958 railroad repayments of RFC and PWA loans totalled $1,403,333,011, of which $1,131,879,037 was repayment of principal and $271,453,974 was for payment of interest.[3] Thus, in 1958 a total of $17,248,687 in principal remained outstanding on post World War I loans while the remaining outstanding Depression period railroad loans totalled $10,622,338.

When these loan programs were terminated, liquidation of the loan portfolios was assigned to the Office of Defense Lending (ODL) in the Treasury Department. Since assuming this responsibility ODL has collected principal and interest payments from some railroads, disposed of some railroad obligations through public and private sales of railroad securities held as collateral, and written off some loan obligations as uncollectible.[4]

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[1] Board of Investigation and Research, op. cit., pp. 159-162.

[2] Letter from W. Meade Fletcher, Assistant Chief Counsel, Department of Treasury to Vernon V. Baker, Director Bureau of Finance, Interstate Commerce Commission, April 30, 1958. (This letter provides the most recent available documentation of the full extent of the post-World War I and Depression period railroad loans and repayments).

[3] Ibid.

[4] By law all of the railroad loans were required to have been "fully and adequately secured" or made upon "full and adequate security." Uncollected loans were typically secured by securities of railroads that subsequently became insolvent.

At the present time ODL cannot provide a detailed accounting of its disposition of all of the railroad loans it assumed from other government agencies (e.g., no information is available on the disposition of any of the post-World War I railroad loans).[1]

An ODL review of its current files does reveal, however, that all but $4,234,978 of the Depression period loans were disposed of either through payments by railroads or through indirect payments (loan obligations purchased by third parties). Of this $4,234,978 in loan obligations for which no record of payment is currently available from ODL, $1,978,000 have been written off as uncollectible, $1,694,512 remain outstanding today, and $562,466 represents the loan amounts for which ODL has no record of disposition.[2]

Clearly, it is not possible from available evidence to estimate precisely the total cost of the post-World War I and Depression period railroad loan programs to the government. The actual cost falls somewhere between the $1,978,000 which is known to have been written off as uncollectible and the $21,483,665 principal amount for which ODL has not been able to provide an actual record of payment. These unpaid loan obligations represent a form of direct Federal assistance to the railroad industry. Of course, only a few railroads benefitted from this type of Federal aid and it is believed that most if not all of the beneficiaries are no longer in operation.

Federal Assistance to Highway Transportation (1803-1945)

From the earliest years of the Republic the Federal Government provided funds, land, and technical assistance to tie major cities and smaller communities together with a network of trails, roads, and highways. Through 1945 more than $7.3 billion had been spent by the Federal Government in this pursuit. The bulk of these expenditures occurred between 1920 and 1945, or after the development of the automobile (see Figure 26).

While taxes on highway users were not specifically allocated to highway construction until 1957, the Federal Government from 1917 through 1945 collected $5.8 billion[3] from motorists in the form of taxes on fuels, oil,

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[1] ODL representatives report that its files are either destroyed or placed in Federal Records Centers after loan obligations are sold, paid, or written off.

[2] U. S. Treasury Department, Office of Defense Lending.

[3] Federal Highway Administration, Highway Statistics 1974, (1975) pp. 75-76 (excludes excise taxes on automobiles).

Figure 26

FEDERAL AID TO HIGHWAY TRANSPORTATION
1803-1945
(In Current Dollars)

Program or Project	Federal Government Cost
2/3/5 Per Cent Funds (1803-1910)	Unknown
Cumberland Road (1808-1838)	$ 6,800,000
Highway Land Grants (1823-1869)	Unknown
Road Surveys: General Survey Act (1824-1838)	Unknown
Bureau of Public Roads (1894-1941)	3,242,852,000
Forest Service (1894-1941)	381,983,000
Office of Indian Affairs (1922-1941)	26,594,000
National Park Service (1925-1941)	113,847,000
Work Projects Adm. (1933-1941)	2,948,415,000
Public Works Adm. (1933-1941)	255,897,000
Other Federal Agencies (1928-1941)	29,443,000
Primary and Secondary Highways (1942-1945)	309,000,000*
Known Total	$ 7,314,831,000

* Budget authorizations (all other dollar amounts represent expenditures).

Source: Caroline E. Macgill, History of Transportation in the United States Before 1860 (Washington, D.C.: Carnegie Institution of Washington, 1917) p. 16; Ellis Armstrong (ed.), History of Public Works in the United States, 1776-1976 (Washington, D.C.: American Public Works Association, 1976) p. 61; Board of Investigation and Research, Public Aids to Domestic Transportation, Report to Committee on Interstate and Foreign Commerce (79th Cong., 1st Sess. House Doc. 159, September 19, 1944) pp. 108,542; Special Study Group on Transportation Policies in the United States, National Transportation Policy, Report of Senate Commerce Committee (87th Cong., 1st Sess. January 3, 1961) p. 173.

tires, parts, and heavy vehicles and trailers.[1] Thus, prior to 1945 the Federal government had provided about $1.5 billion more for highway development than revenues collected from highway users.

Prior to 1893 when the first Federal agency was established to assist highway development, Federal assistance for this purpose was provided through a number of special Congressional actions. The dollar value of such assistance is for the most part unknown. While it is not the purpose of this review to provide a complete inventory of every Congressionally authorized highway project, a discussion of the most significant Federal-aid projects provides insight into the early Federal role in road development.

As previously described in the discussion of railroad land grants, the nation's major asset after its founding was land. Without major tax sources of revenue, land became the leverage for financing an internal road system throughout most of the nineteenth century and into the first decade of the twentieth century. The first example of this policy occurred in 1803 when Congress established a "2 per cent fund" for construction of roads in Ohio. Under this plan two per cent of the proceeds derived from the sale of Federal lands were to be used by the state to build a network of roads. This funding concept was extended to the states of Louisiana, Indiana, Mississippi, Illinois, Alabama, and Missouri when they were admitted to the Union, but with the rate increased to 3 per cent. Later, the rate was increased again to 5 per cent and was applied to each of the 24 states which entered the Union between 1820 and 1910.[2] The total amount of Federal aid provided through these 2, 3 and 5 per cent funds is unknown.

Land and direct assistance were both provided for the first Federally assisted interstate road project undertaken in the United States. This project, construction of the Cumberland Road or National Road, was authorized by Congress in 1806, completed in 1838, and cost the Federal

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[1] Prior to 1946 state and local governments had spent more than $40 billion on roads, streets, and highways while collecting about $20 billion in motor fuel and motor vehicle and carrier taxes. See Board of Investigation and Research, op. cit., 543; and Department of Commerce, Bureau of the Census, Historical Statistics of the U.S.: Colonial Times to 1970, (September 1975) Series Q82-96 and Y682-709.

[2] Illinois, Indiana, and Ohio continued to receive 2 per cent funding. Texas and West Virginia received no "percentage funds" because neither contained any Federal lands. See Ellis Armstrong (ed.), History of Public Works in the United States 1776-1976 (Washington, D.C.: American Public Works Association, 1976) p. 61.

government approximately $6.8 million.[1] The road was maintained by Federal appropriations until it was transferred to the states during the Jackson Administration.

In 1823 the Federal Government initiated a continuing program of land grants to states for road construction. The first of these highway land grants was for the construction of a road from Miami, Ohio, to Western Reserve, Ohio. The project provided a right of way of 120 feet in width, and the state was granted sections of land along each side of the road for internal development. These land grants also permitted canal development. In total, 3,359,188 acres were granted to states for construction of roads.[2] The value of these lands, at the time of their transfer, is not known.[3]

While the amount of land involved in the road and canal land grant program was comparatively small, it did establish the precedent for the much larger railroad land grant programs that followed three decades later. Indeed it is generally thought that the road and canal land grant programs would have continued on a much larger scale had not railroads become the preferred mode for rapid development of western lands. With the development of the railroad, Federal transportation priorities shifted away from highway assistance programs until the latter part of the nineteenth century.

In 1893 the first Federal administrative agency with highway development responsibilities was established in the form of the Office of Road Inquiry. Initially, the mission of the Office, which became part of the Department of Agriculture, was to encourage the development of state highway departments, and to improve the standards which governed road construction and maintenance. In 1916, its name was changed to the Office of Public Roads and Bridge Engineering, and its technical mission was expanded to include financial powers.

It was at this time that the potential for rapid growth in motor transportation became apparent. The Federal Aid Roads Act of 1916 appropriated $75 million for highway construction to be distributed over five years, and two subsequent Acts, in 1919 and 1921, increased the appropriations by $275 million through 1922. In addition, the Bureau of Public Roads (after another name change in 1919) was empowered to coordinate the designation and development of the Federal Aid Highway System, which was established in the 1921 Federal Highway Act. Additional authorizations for highway construction were enacted annually through 1938, with increases in the use of funds to include secondary roads and elimination

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[1] Caroline E. MacGill and Others, History of Transportation in the United States before 1860 (Washington: Carnegie Institution of Washington, 1917) pp. 16 and 36. In addition to the Cumberland Road, Congress authorized eight military road projects between 1806 and 1817, at a total cost of approximately $35,000. MacGill, op. cit., p. 36.

[2] Land grants to states for canal construction and river improvements totalled 6,340,340 acres. See Federal Coordinator of Transportation, Public Aids to Transportation, Vol. II (1938) pp. 8-9.

[3] Board of Investigation and Research, op. cit., p. 108.

of grade crossing hazards (both in 1938). In total, in the period 1894-1941, the Bureau of Public Roads provided $3.2 billion in expenditures on highways, roads, and streets.[1]

During the Depression, road construction and maintenance and grade crossing elimination were among the primary uses to which emergency Federal aid was directed. In total, the Work Projects Administration and the Public Works Administration provided more than $3.2 billion for highway and road purposes between 1933 and 1941. More than a half a billion dollars of aid to highways and roads was also spent by other Government agencies such as the Forest Service and the National Park Service prior to 1941. During the war years, 1942 through 1945, an additional $309 million in Federal aid to highways was authorized. In total, during the period 1803-1945, Federal aid for the development and maintenance of the nation's highways, roads, and streets totalled approximately $7.3 billion (See Figure 26).

Federal Assistance to Domestic Water Transportation (1791-1945)

Federal direct aid to water transportation includes projects for improvements to harbors, navigable rivers and lakes, construction and operation of canals, and the construction, operation, and maintenance of navigational aids and harbor facilities. Federal aid to domestic shipping was first provided when the Congress was only one month old.[2] From that time through 1945 approximately $4 billion of Federal assistance to water transportation was provided at no cost to waterway users.

The Federal policy of providing waterway facilities and services was formulated at the beginning of the nineteenth century, when plans were first being prepared for national systems of roads and waterways. Initially, Federal aid was to be channeled through chartered corporations which would construct and operate canals, and which would charge tolls. However, for natural water courses, the concept of "forever free" was adopted, (i.e., such waterways were public highways and that no tolls should be charged regardless of the costs of their improvement). This policy was formalized in 1802 in legislation authorizing statehood for Ohio and continued to 1859, appearing in enabling acts for the admission to the Union of eleven other states. Each such act forbade the states from levying any kind of charge on river transportation. Federal tolls on canal use continued, however, until 1881 when the last of these was removed. In 1882 legislation was enacted to prohibit future collection of payments for the use of any Federal waterway.[3] Thus, early acceptance

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[1] Board of Investigation and Research, op. cit., p. 542.

[2] Stat. 53 (1789).

[3] The Panama Canal and the U. S. portion of the Saint Lawrence Seaway are the only exceptions.

of this "forever free" concept has served to exempt all domestic water carriers from payment of waterway user charges.[1]

The amount of Federal assistance provided to water transportation cannot be estimated with precision. A rough estimate of assistance provided from 1791 to 1945 can be made, however, by combining -- from public sources -- early appropriations data with more recent expenditure data. Through this process, it can be estimated that approximately $4.0 billion was spent by the Federal Government to aid the growth of water transportation through 1945 (See Figure 27). As with Federal aid to highways, most water transport assistance -- more than 90 per cent -- has occurred since 1900. Cumulative appropriations for the 109 years from 1791 to 1900 for navigational aids and for improvement of rivers and harbors were $333.9 million. During the next 45 years total Federal waterway commitments rose to over $3.7 billion.

Another form of Federal assistance to waterway development was the waterway land grant program. Through this program, in effect between 1827 and 1866, Congress granted 4.6 million acres of public lands to aid canal development and 1.7 million acres for river improvements. The value of the Federal aid represented by these land grants is unknown, but is presumed to be small relative to other forms of Federal aid to water transportation and relative to the size of the railroad land grants. As with land grants for highway construction, the primary significance of the waterway land grants is that they were a precedent-setting Federal action for the 1850-1871 land grants to railroads.[2]

During World War I, the Federal government started a barge line which operated on the Mississippi, Illinois, Missouri, and Warrior Rivers. In 1924 it was transformed into the Inland Waterways Corporation with all stock owned by the Federal government. Allegedly the line's purpose was to demonstrate the feasibility of barge service. It was not a financial success and the corporation was sold to private interests for $9 million in 1953.[3]

Federal Assistance to Air Transportation (1911-1945)

The Federal government expressed interest in the potential uses of the airplane almost immediately after the first flights. This interest was transformed into a financial commitment of just over one billion dollars during the early history of aviation through 1945. The only taxes paid by airport and airway users during this period which were related to the use of these facilities were gasoline, lubricating oil, and tire taxes initially imposed in 1932. Such tax revenues were not allocated specifically to airport and airway development until 1971. Although the total amount of

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[1] Board of Investigation and Research, op. cit., p. 327.

[2] Federal Coordinator of Transportation, Vol. II, op. cit., pp. 8-9.

[3] Locklin, op. cit., pp. 721-722 and Charles L. Dearing and Wilfred Owen, National Transportation Policy (Washington, D.C.: The Brookings Institution, 1949) pp. 89-94.

Figure 27

FEDERAL AID TO DOMESTIC WATER TRANSPORTATION
1791-1945
(In Current Dollars)

Program or Project		Federal Government Cost
Waterway Land Grants	(1827-1866)	Unknown
Lighthouse Service	(1791-1900)	$ 125,271,000*
	(1901-1940)	318,026,000*
Rivers and Harbors	(1801-1900)	208,579,000*
	(1901-1940)	2,514,645,000*
Terminal Facilities	(1919-1936)	236,552,445**
Corps of Engineers	(1941-1945)	391,100,000**
Tennessee Valley Authority	(1935-1945)	150,200,000**
Coast and Geodetic Survey	(1917-1945)	68,800,000**
Known Total		$ 4,013,173,445

* Appropriations

** Expenditures

Sources: Board of Investigation and Research, Public Aids to Domestic Transportation, Report to Committee on Interstate and Foreign Commerce (79th Cong., 1st Sess. House Doc. 159, September 19, 1944) p. 326; Special Study Group on Transportation Policies in the United States, National Transportation Policy, Report of Senate Commerce Committee (87th Cong., 1st Sess., January 3, 1961) pp. 175, 176 and 178; Federal Coordinator of Transportation, Public Aids to Transportation, 1940, Vol. III, pp. 13-14.

airport and airways use taxes paid prior to 1946 are unknown, they most assuredly represented only a very small percentage of the Federal Government's billion dollar commitment to the air transportation system up through 1945.

During this period Federal assistance to air transportation was provided through the development of an air mail route system by the Post Office Department, mail subsidies to air carriers, and development of a nationwide airport and airway system by the Civil Aeronautics Administration and a number of other Federal agencies. The Post Office Department showed the first Federal interest in the possible use of the airplane for the delivery of the mails by conducting experimental mail flights prior to World War I. After the war, airmail service expanded rapidly under the direction of the Post Office Department, which had obtained its own pilots and planes as well as maintenance and navigational ground facilities.

The Kelly Act of 1925 (Air Mail Act), the first legislation recognizing the viability of civil air transportation, provided that the Government contract with the newly organized private operators to carry air mail. In 1926, twelve airmail route contracts were awarded, marking the end of the government transport service. Also in 1926 the Air Commerce Act was enacted, charging the Federal Government, under the direction of the Secretary of Commerce, with responsibility for the operation and maintenance of the airway system and all aids to air navigation and for the maintenance of safety in air commerce through a system of regulations.[1] The Act also directed the Post Office Department to transfer its control over airways,[2] emergency landing fields, and air navigation aids to the Commerce Department, and to transfer all of its established airports and terminals to the municipalities in which they were located. A partial estimate of the value of these facilities prepared after a 1927 property inventory totalled $3.3 million.[3]

In 1930, as a response to the dual problems of increasing government deficits from airmail service and serious airline operating losses, the Post Office Department lobbied for rate changes to ensure that the contract

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[1] R. M. Kane and A. D. Vose, Air Transportation, 5th Ed. (Dubuque, Ia.: Kendall/Hunt, 1975) p. 28, and Federal Coordinator, op. cit., p. 122.

[2] An airway was defined as consisting of the following: rotating beacon lights at intervals of approximately 15 miles; intermediate landing fields, generally 50 to 100 miles apart; local radio service; radio marker beacons or low power transmitters giving directional guidance over short distances; radio communications stations; and radio range beacons. Board of Investigation and Research, op. cit., pp. 460-467.

[3] Federal Coordinator of Transportation, Vol. I, op. cit., p. 123.

mail rates would cover the carriers' costs of transporting the mails and proposed that the rate adjustments be extended to cover deficits incurred on passenger service. The Post Office Department believed that a great potential for passenger service existed, which ultimately could make the airlines self-sufficient without mail revenues, and it argued that government assistance to the non-mail passenger carriers -- in the form of airmail subsidies -- was a wise investment. Thus, through enactment of the Airmail Acts of 1930 and 1934, air carriers began receiving airmail subsidies, which by 1945 had totalled $166.8 million.[1]

The Federal Government has provided virtually all of the funds necessary to construct, operate, and maintain the Nation's airway and air navigation facilities. Prior to the Air Commerce Act of 1926, the facilities were used primarily by the Post Office Department's airmail flights, but with that Act, the Secretary of Commerce was directed to provide civil airways and encourage the establishment of air navigation facilities. By the early 1940's the Federal government was responsible for the operation and maintenance of more than 32,000 miles of airways, 311 airports and fields, 97 radio stations, 446 weather reporting stations, and thousands of other navigational aids. The cost of these airways facilities to the Federal Government had risen to $439.2 million by 1945.[2]

The Federal Government also invested a roughly equivalent sum, $476.3 million, in the construction of airports. Prior to 1933, local governments had borne the major costs of construction, operation and maintenance of airports, but the combined effects of the Depression and the expansion of commercial aviation led to a surge in airport construction which was financed by the Federal Government. Beginning in 1933, the Civil Works Administration, and later the Federal Emergency Relief Administration and the Work Projects Administration, became the predominant factors in airport construction. In 1938, the Civil Aeronautics Act directed the Administrator of Civil Aeronautics to formalize the work programs into a plan for a national system of airports and airways, the first time Federal funds were to be deployed primarily for airport construction for its own sake, as compared to the employment objectives of the work relief programs previously cited. In total, through 1942, the Civil Aeronautics Administration had provided $147.3 million and the work relief agencies $329.0 million for airport construction.[3]

Combining the total Federal assistance provided by each of the major programs -- Post Office Department investment in air transportation, airmail subsidies, and construction and operation of airways facilities and airports--it is possible to estimate the total Federal aid provided to air transportation between 1911 and 1945. As shown in Figure 28 this figure was approximately $1,085.7 million.

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1 Special Study Group on Transportation Policies in the United States, National Transportation Policy, Report of Senate Commerce Committee, (87th Cong., 1st Sess., January 3, 1961) p. 182 (hereinafter cited as Doyle Report).

2 Ibid.

3 Board of Investigation and Research, op. cit., pp. 474, 488-493.

Figure 28

FEDERAL AID TO AIR TRANSPORTATION, 1911-1945
(in current dollars)*

Program or Project	Federal Government Cost
Post Office Department (1911-1926) (Equipment and facilities transferred to Commerce Department in 1926)	$ 3,345,641
Air Mail Subsidies (1929-1945)	166,800,000
Airways Facilities (1927-1945)	439,200,000
Airport Facilities (1933-1942)	
Civil Works Administration Federal Emergency Relief Administration Works Projects Administration	329,026,898
Civil Aeronautics Administration	147,325,467
Total	$ 1,085,698,006

* Expenditures

Sources: Federal Coordinator of Transportation, Public Aids to Transportation, 1940, Vol. I, p. 123; Special Study Group on Transportation Policies in the United States, National Transportation Policy, Report of Senate Commerce Committee (87th Cong., 1st Sess., January 3, 1961) pp. 182; Board of Investigation and Research, Public Aids to Domestic Transportation, Report to the Committee on Interstate and Foreign Commerce (79th Cong., 1st Sess., House Doc. 159, September 19, 1944) pp. 488-493.

Federal Assistance to Pipeline Transportation 1941-1946

Of all the major transport modes, pipelines have received the least amount of direct Federal assistance. Except during a brief period during the Second World War and immediately thereafter, the private sector has designed, constructed, and operated the more than 200,000 miles of oil pipelines in the United States today. While the Federal Government did invest about $150 million in pipelines in the 1940's, its investment was more than fully recovered when the six pipelines constructed with Federal aid were sold to oil and gas companies following the war.[1]

Several events combined to put the Federal Government in the pipeline building business during World War II. In the early 1940's, a number of large oil companies, in an effort to reduce their railroad shipment costs and expand their northern markets, initiated construction of two separate pipeline projects -- one from the Gulf Coast of Florida to Tennessee (the Southeastern Pipe Line) and the other from Louisiana to North Carolina (the Plantation Pipe Line). Both of these pipelines were to go through Georgia, but the railroads there, seeing their share of oil shipments steadily declining, refused to grant rights of way for pipeline construction. With no state law permitting the companies to exercise right of eminent domain, further progress was blocked. To eliminate this problem, Congress passed the Cole Act of 1941.[2] Among its provisions the Act authorized construction of emergency pipelines by the Federal Government -- in locations where private firms could not do so -- and provided Federal financial assistance to private firms for pipeline construction.

Shortly after the passage of the Cole Act, Axis submarines sank 48 tankers during a four-month period in early 1942. The tankers had been bound for the East Coast from Gulf Coast ports. Since the eastern seaboard was almost totally dependent upon tanker-delivered Texas oil, the Federal Government almost immediately exercised the authority granted it by the Cole Act.

Six pipeline projects substantially, although not completely, financed by the Reconstruction Finance Corporation were undertaken. By far the largest of these were the Big Inch and Little Big Inch lines, costing a total of $145.8 million. Following the War these two pipelines were sold for $143.1 million to Texas Eastern Transmission Corporation. Each of the other smaller pipelines was also sold to private industry either for continued use or for salvage. These sales enabled the Government to recover its full investment in the emergency pipelines.[3]

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[1] Arthur N. Johnson, Petroleum Pipelines and Public Policy, 1906-1959 (Cambridge: Harvard University Press, 1967) p. 347 and Locklin, op. cit., p. 603.

[2] Johnson, op. cit., pp. 308-311.

[3] Ibid., pp. 347-475.

Summary of Direct Federal Aid to Transportation, 1789-1945

As with the Federal Government's transportation policy during the last three decades, the overriding transportation goal sought by the Federal Government prior to 1946 was development of a safe and efficient nationwide transportation system. Sometimes this was achieved by extending existing transportation systems into undeveloped or underdeveloped areas of the nation. At other times Federal aid was used to accelerate the growth and utilization of emerging transport technologies.

During this early period various methods were used by the Federal Government to develop the country's transport systems. The form of aid undertaken depended as much upon private sector capabilities as upon the government's own resources at the time the aid was provided. Throughout much of the nineteenth century the U. S. Government used its major asset -- land -- to foster the growth of water, highway, and especially rail transport systems. Later, with the growth of the nation's economic base and the government's taxing authority, direct Federal expenditures and loan programs became the predominant form of Federal assistance to transportation.

Each of the intercity transport modes benefitted from the Government's assistance programs, although the timing of the assistance provided to each mode has varied considerably. Federal aid to water transportation has been extended on a regular basis since the beginning of the Republic. Most rail assistance was provided during the latter half of the nineteenth century and during two emergency situations in the first third of the twentieth century. Federal aid to highway and air transportation followed the application of the combustion engine to motor vehicle and aviation transport while aid to pipelines was extended only during World War II to alleviate a particular crisis situation. Through its support of each transport mode, the government sought primarily to benefit the public interest. Since World War II the government has continued to support transportation, with some modes, as described below, participating more than others.

DIRECT FEDERAL AID IN THE POST-WAR PERIOD

The foregoing outline of Federal direct aid to transportation from 1789 through World War II leaves no doubt that Federal involvement has been significant. The government has repeatedly sought to accelerate the development of transportation infrastructure in all modes by authorizing the right of eminent domain and investing funds. Each of the modes, pipelines excepted, benefited substantially from direct Federal aid during their "infant industry" or early developmental stages, although their respective starting points were widely separated in time.

The post-war period represents a continuation and expansion of this basic policy, with the modification that aid has been used to accelerate modal fortunes at points further along their respective development paths and to provide stable long-term funding for the completion of nationwide

systems of highways, waterways, and airports and airways. Not surprisingly, the modes with public rights-of-way -- highways, airways, and waterways -- accessible to all were generously endowed with Federal support. As technological breakthroughs materialized (such as jet aircraft, diesel engines and mass-produced low-cost automobiles), the public sought and received large-scale assistance programs. Railroads and pipelines, which use private rights-of-way, were not similarly treated. Nor did those industries demand such programs. During the post-war period construction of transportation facilities accounted for the majority of Federal direct aid expenditures, but the range of assistance has expanded into such activities as research and development, provision of planning grants and training assistance, continuation of operating subsidies, and special purpose emergency aid programs.

During the 1970's it has become evident that the great Federal aid infrastructure programs of the post-war period -- when the vast majority of public funds have been spent -- have succeeded. The Interstate Highway system, for instance, is 88 per cent open to traffic. Highly effective airport and airways and inland waterway systems are now in place. All the modes have achieved a measure of maturity and stability which serves the Nation well. This section discusses the role of direct Federal aid in this achievement, from the end of World War II to the present.

Figure 29 displays the total direct Federal aid to domestic modes of transportation. Figure 30 shows annual Federal financing assistance since World War II, while Figure 31 shows the cumulative Federal assistance to each of the transport modes since 1789. These summary Figures are supported in Appendix Tables 10 through 13 which explain the detailed make-up of the funding amounts shown for each mode. Broadly speaking, the modal expenditure categories are defined as follows:

> Highways includes obligations for expenditures by the Federal Highway Administration (and its predecessors), Bureau of Land Management, National Park Service, Bureau of Indian Affairs, Office of the Territories (Alaska highways prior to establishment of FHWA), and the Forestry Service, all for the purpose of developing and improving highway transportation. The amounts shown represent total highway obligations. No separation has been attempted here relating to auto versus truck use, passenger versus freight use or common carrier as opposed to private usage. See Appendix Table 10 for further details.
>
> Air includes obligations by the CAB for operating subsidies, by FAA (and predecessors) for operations, air navigation facilities, research and development (exclusive of the SST program), National Capital Airports, airport Grants-in-Aid, and other purposes, and by NASA (and predecessors) all for purposes of developing civil aviation. It also includes post-World War II grants of Federal properties for civil airport use. As was the case for highway

Figure 29

TOTAL DIRECT FEDERAL AID TO TRANSPORTATION MODES: OBLIGATIONS[a] (Millions of Dollars)[b]

Fiscal Years	Highways	Air	Domestic Water	Railroads	Total
WW II and Prior	7,314.8	1,085.7	4,013.2	533.5	12,947.2
1946	261.9	135.0	127.6	-	524.5
1947	407.4	153.9	104.3	-	665.6
1948	516.4	220.2	109.5	-	846.1
1949	450.9	273.3	196.3	-	920.5
1950	509.5	413.2	153.0	-	1,075.7
1951	557.7	283.9	141.3	-	982.9
1952	613.0	260.4	140.0	-	1,013.4
1953	624.8	248.6	147.8	-	1,021.2
1954	705.0	223.3	134.4	-	1,062.7
1955	818.7	215.4	168.9	-	1,203.0
1956	1,017.0	226.3	202.4	-	1,445.7
1957	2,326.3	340.7	264.2	-	2,931.2
1958	3,096.8	497.8	297.1	-	3,891.7
1959	3,609.2	626.7	331.2	-	4,567.1
1960	2,719.8	714.0	364.5	-	3,798.3
1961	2,882.6	797.8	378.5	-	4,058.9
1962	3,018.5	762.6	402.2	13.3	4,196.6
1963	3,185.5	845.1	400.0	-	4,430.6
1964	3,707.4	882.2	441.7	-	5,031.3
1965	4,134.9	854.9	529.0	-	5,518.8
1966	4,195.6	943.7	556.3	11.7	5,707.3
1967	4,294.2	1,056.9	517.0	28.3	5,896.4
1968	4,277.4	1,138.5	523.0	13.5	5,952.4
1969	4,219.8	1,221.9	449.0	13.8	5,904.5
1970	4,545.7	1,397.6	464.3	17.5	6,425.1
1971	5,014.9	1,969.3	523.3	91.2	7,598.7
1972	4,922.9	1,855.2	572.3	151.6	7,502.0
1973	4,862.8	1,833.7	614.9	158.9	7,470.3
1974	4,755.1	1,977.2	696.5	215.6	7,644.4
1975	5,255.5	2,543.8	716.6	549.1	9,065.0
Total Post WW II	81,507.2	24,913.1	10,667.1	1,264.5	118,351.9
Total, All Years	88,822.0	25,998.8	14,680.3	1,798.0	131,299.1

Source: Appendix Tables 10, 11, 12, and 13.

[a] All figures are Fiscal Year Obligations except as noted on Appendix Tables 10, 11, 12, and 13.

[b] See Appendix Table 14 for Federal use and mode-related revenues.

Figure 30

POSTWAR ANNUAL DIRECT FEDERAL AID
TO TRANSPORTATION MODES: OBLIGATIONS
(Millions of Dollars)

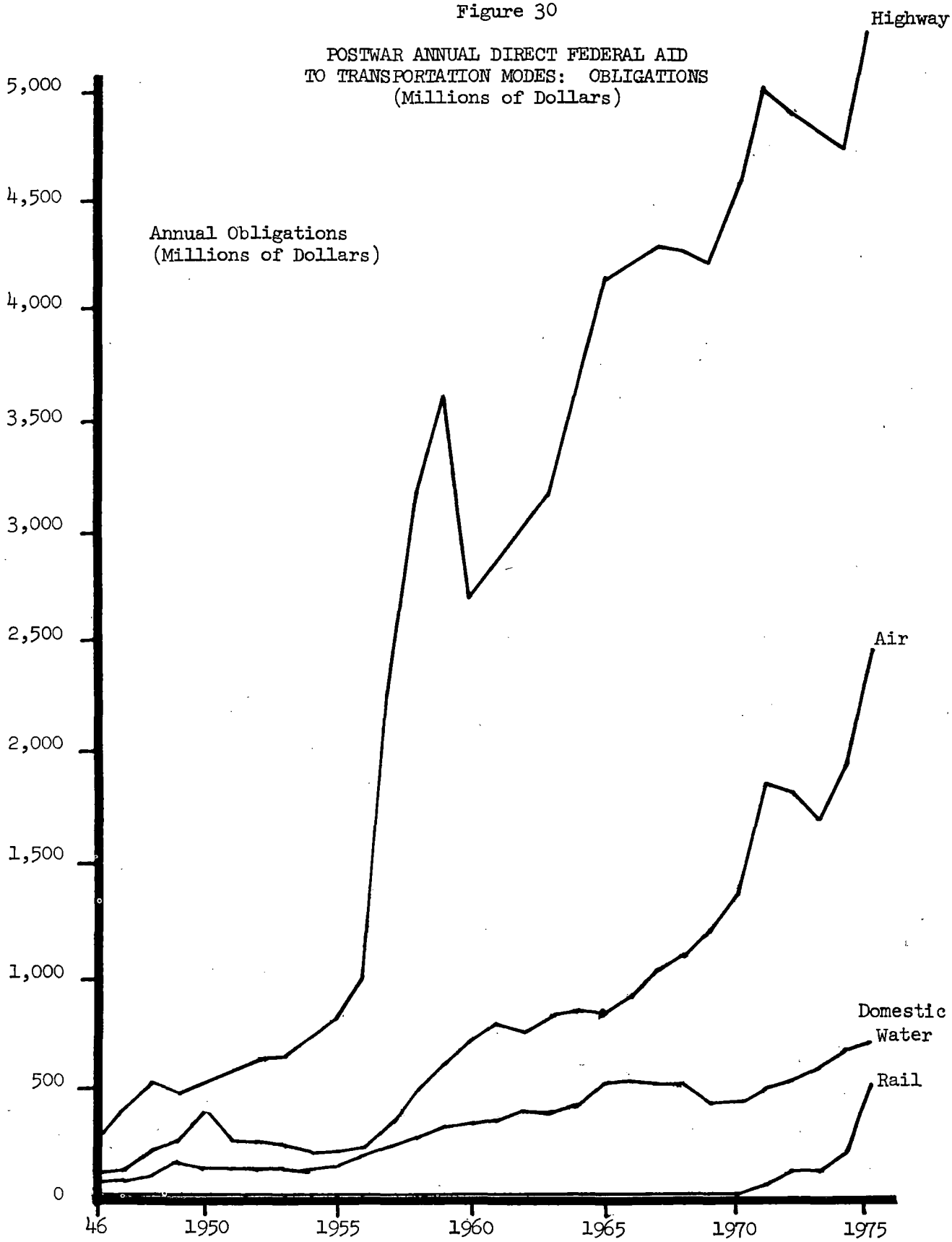
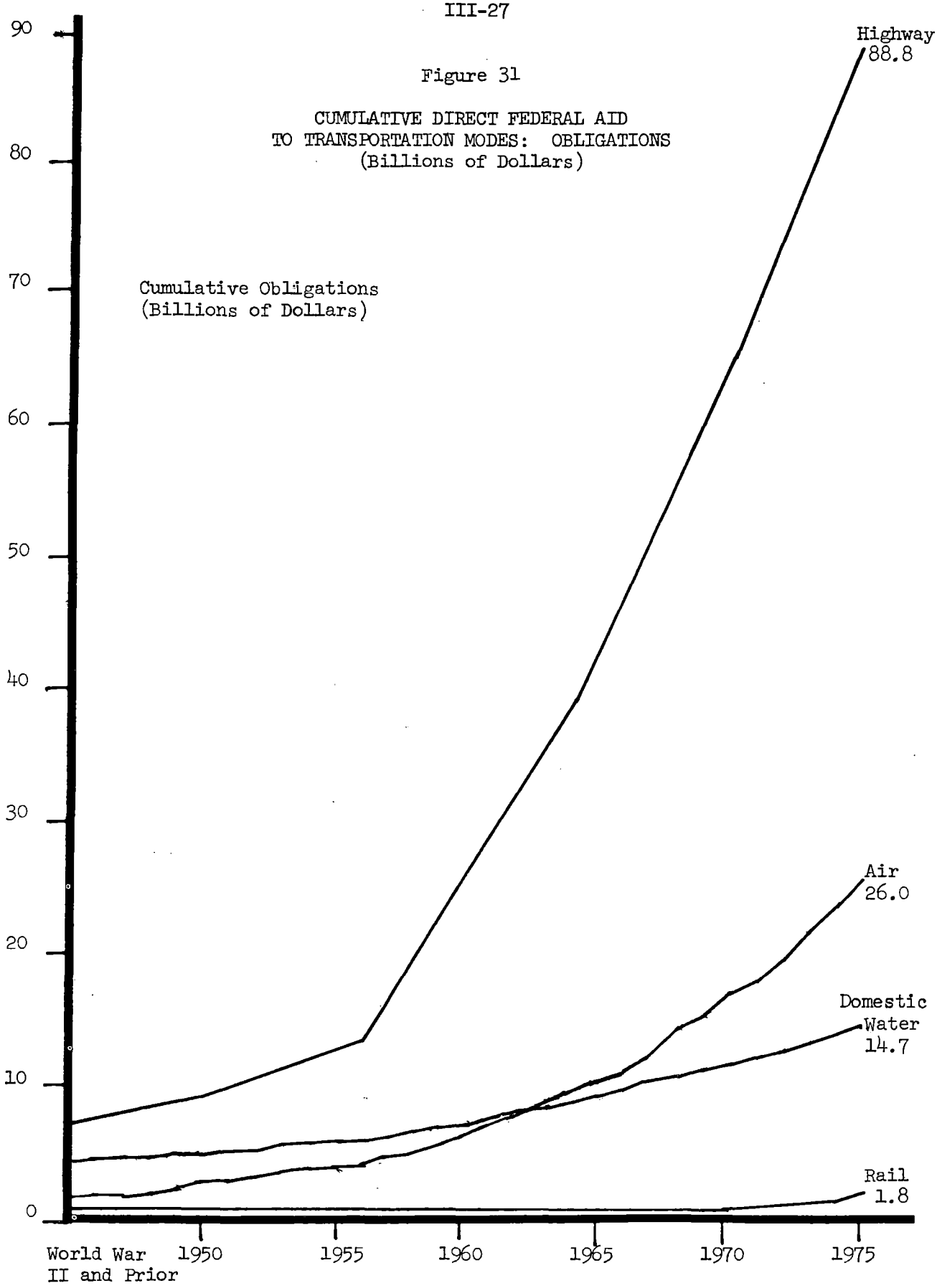


Figure 31

CUMULATIVE DIRECT FEDERAL AID
TO TRANSPORTATION MODES: OBLIGATIONS
(Billions of Dollars)



obligations, no separation between passenger versus freight or common carrier versus private usage has been made here. See Appendix Table 11 for further discussion.

Water includes obligations for the development of domestic, primarily inland, waterway transport navigation by the Corps of Engineers, mostly for construction, and operation and maintenance, and by the TVA and the U. S. Coast Guard. Because the passenger component of inland waterway transport is essentially nil, water expenditures for navigation are wholly freight oriented. Water expenditures are mostly in support of unregulated carriage, as only 16.5 per cent of waterway ton-miles in 1974 was traffic regulated by the ICC.[1] Much of the waterway funding is done in conjunction with "multi-purpose" projects which may involve irrigation, flood control, and recreational purposes in addition to the promotion of navigation. This makes precise allocation of costs for transport as opposed to other uses extremely difficult. As a result, the obligation figures given are estimates, provided by the Corps of Engineers, of the cost of the navigation component of the Corps' activities, and are inevitably based on broad assumptions as to the allocation of expenditures among the multiple objectives involved. Data for the U.S. Coast Guard have been subject to allocations to remove the international and recreational components of USCG expenditures. See Appendix Table 12 for additional details.

Rail includes obligations by the Federal Railroad Administration (and predecessor components) for operating expenses, research and development, Amtrak grants, Emergency Rail Restoration (repairing damage from Hurricane Agnes in 1972), and rail service assistance to bankrupt railroads resulting from the Northeast rail crisis; USRA expenses; and includes Federal expenditures on ICC loan guarantees (under provisions of Part V of the Interstate Commerce Act) which were defaulted by the railroads involved. See Appendix Table 13 for detailed explanation.

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[1] In 1974, of the 183.2 billion "internal" domestic waterway ton-miles, 16.5 per cent was regulated, 73.2 per cent was exempt-for hire, and 10.3 per cent was private. See Corps of Engineers, Waterborne Commerce of the United States, Calendar Year 1974, Part 5, pp. 101, 104 and 107.

Federal direct aid finances a very wide range of transport activities which are difficult to characterize simply. Nevertheless, a few significant generalizations can be made. Federal highway spending is, for example, overwhelmingly used to finance design and construction of roads and road-related facilities. The Federal Government plays essentially no role in funding the operation and maintenance of the highway system; instead, operation and maintenance costs of highways are completely a state or local responsibility.

A very different Federal strategy emerges in the air mode, where construction, operation, and maintenance of the airways system is considered to be an exclusively Federal responsibility. The Federal role has even been extended, via NASA, into research and development supporting solution of design problems of aircraft to be built and sold by private airframe manufacturers. Although not included in expenditure figures (because the program was never completed and because it contained a nominal payback provision) $863 million were obligated by the FAA toward the design, construction and testing of a prototype civil Supersonic Transport (SST) aircraft.[1] The roughly equal sharing of costs for airport construction between the Federal and state/local governments began to shift more into Federal hands with the advent of the Airport and Airway Development Act of 1970. The FAA also supports a substantial airport planning program and some research and development related to airways. The Civil Aeronautics Board presides over an operating subsidy program for local service air carriers, the successor to the previously described airmail subsidy program.

Federal activity in the waterway mode remains pervasive. With no significant exceptions, every major waterway approved for improvement has been built, operated, maintained and supplied with navigation aids by Federal programs.

Forms of important institutional support evolved in each of the major Federal transportation aid programs, particularly the system planning and research-oriented activities pioneered by the Federal Highway Administration with State Highway Departments, the Federal Aviation Administration with airport authorities, and the Corps of Engineers with various state, municipal and port agencies. To some extent, these arrangements were related to the Federal Government's need to insure accountability for, and the most effective use of, tax dollars by recipients. In most instances such arrangements were established with some form of public agency at the state or local levels.

In contrast, Federal involvement in the rail industry has, until very recently, been very limited and highly specific. For example, as Appendix Table 13 shows, the largest single item of Federal rail funding has been

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[1] The data in the Figures also exclude all Government research and development on military aircraft and other military aviation equipment and techniques, which has been of immense value to civil aviation. The Boeing 707, for example, emerged essentially full-blown as a civilian variant of an Air Force tanker aircraft, yet the costs of development of the military aircraft were not included as an aid to civil aviation because it was developed and financed purely for military purposes.

the $635.6 million in operating grants to Amtrak. (This figure does not include the Federal guarantee of $900 million in Amtrak loans.)[1] Land grant assistance aside, the second largest item, Federal Railroad Administration research and development, has until recently been very heavily tilted toward passenger-oriented, futuristic high speed ground systems such as Tracked Air Cushion Vehicles (TACV), Magnetically Levitated Vehicles (Maglev), etc. These rail passenger-oriented expenditures clearly represent Congressionally-sanctioned public policy decisions; however, they are not, strictly speaking, direct aid to the railroad industry except in the sense that the Government has relieved many of the railroads of their previously existing common carrier passenger obligation.[2] In fact, only the payments for Rail Service Assistance (payments to the bankrupt Northeast railroads to keep them in operation while they were being restructured by USRA), Emergency Rail Restoration (primarily payments to Northeast railroads to repair damage by Hurricane Agnes in 1972), and Federal expenditures to make good on defaulted rail loans guaranteed under provisions of the Transportation Act of 1958 (so called "Part V" loans) reflect twentieth century direct Federal payments for rail freight purposes, and even these payments represent traditional emergency-oriented actions to alleviate a crisis or maintain or restore the status quo.

Only very recently has this policy undergone any significant change. The Regional Rail Reorganization Act of 1973 authorized branch line continuation subsidies to railroads for assistance in implementing the Final System Plan. The RRRR Act of 1976 provided a very wide range of rail financing instruments including redeemable preference shares, loan guarantees,[3] financial assistance to branch line operations, etc. Both Acts provided authority and funding to establish and finance ConRail and to assume the financial risks involved in intervening in the bankruptcy proceedings of its predecessor railroads. These programs represent a much more direct and positive commitment to improving the capability and competitive position of the railroad freight mode vis-a-vis other modes.

The railroads, until creation of the Federal Railroad Administration in 1967, had no base of institutional support at the Federal level comparable to the other modes. On the other hand, not being a user of public rights-of-way and not being sympathetic to Federally-guided system planning, the

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[1] If Amtrak does not repay any of these loans, Federal repayment would constitute direct aid, just as in the case of the defaults on ICC Part V loans.

[2] Railroads electing to have Amtrak assume their rail passenger responsibilities paid so-called "entry fees" to Amtrak totalling $197 million.

[3] These loan guarantees, if repaid at market rates, will not be considered financial aid as the term "aid" is defined in this study. Loans guarantees provided under the Emergency Rail Services Act of 1970 also fall in this category.

railroads failed to acknowledge the need for or seek such institutional relationships. In retrospect, it can be said that the Federal Government was remiss in not addressing this deficiency more promptly and more forthrightly.

Just as Federal spending has taken a different form among the modes, so has it differed in absolute amounts. Figures 29, 30, and 31, taken together, outline the general shape and scope of the Federal role in financing the development of transportation. First, with regard to total obligations, Federal aid has been overwhelmingly devoted to support of the highway system, with large and significant amounts allocated to the air and waterway systems, and relatively miniscule amounts for the rail system. Over the entire history of Federal transport programs, total direct obligations have been about:

Mode	Obligations
Highways	$88.8 billion
Air	$26.0 billion
Domestic Water	$14.7 billion
Rail	$ 1.8 billion

Thus, Federal highway spending has been almost fifty times greater than rail funding, air spending almost fifteen times that of rail, and waterway spending more than eight times rail obligations.

Secondly, the Federal financing role in transport in terms of magnitude is very much a post-war phenomenon. Over 90 per cent of the obligations shown in Figure 29 has been incurred in the thirty year period since 1945, a trend which is roughly similar for each mode as shown below:

Mode	Per Cent Since World War II
Highway	91.8
Air	95.8
Domestic Water	72.7
Rail	70.3
All Modes	90.1

Use of a World War II cutoff may, however, be somewhat misleading in assessing recent trends in Federal transport promotion. In fact, the timing disparity with respect to rail, highway and air is greater than the above numbers would appear to suggest. Appendix Table 13 shows that over 92 per cent of the post-war rail funding assistance has occurred since 1970.

As Figure 30 shows, only the water mode has enjoyed relatively stable annual Federal assistance, possibly because the long time period involved in waterway project completion, the multi-purpose nature of these projects, and the relative maturity of the waterway system have all militated against

surges in funding. By comparison, highway spending underwent explosive growth beginning with the start of the Interstate program in 1956, and efforts to complete the Interstate system in the face of rapid cost inflation have required high and increasing highway funding levels. Appendix Table 10 shows that about $75 billion (or 92 per cent) of the $81.5 billion post-war highway obligations occurred after 1956. Of this $75 billion, over $48 billion -- about two-thirds -- was spent on the Interstate system alone.

Federal spending on air transportation also experienced dramatic acceleration in 1956 as the impact of the passenger jet aircraft (introduced in 1954) began to be felt both in the form of tremendous growth in air passenger travel demand and as an aircraft imposing much more stringent requirements on the air traffic control system, runway length, terminal facilities, etc. Aviation spending experienced another dramatic surge beginning in 1970 with passage of the Airport and Airway Development Act of 1970.

Federal User Charges and Mode-Related Taxes

Gross direct aid figures do not, however, necessarily establish that Federal spending has actually benefited one mode over another, at least not in the relative proportions which total spending seems to suggest. The question of which mode has actually received a relative competitive advantage from Federal financing requires a comparison of Federal modal-related revenues ("user charges") with modal spending, and warrants some discussion of the function which each mode performs in the transport system.

It is important to introduce this "user charge" concept in order to develop a balanced understanding of the degree to which one mode has been "subsidized" over another. The term "subsidy" does not rest on the amount of outlays alone, but rather on whether the outlay will be (or was) repaid on reasonable terms, including an allowance for the opportunity cost of the invested capital. A mortgage loan, for example, is not a subsidy (assuming it is repaid on commercial terms); it simply facilitates a transaction. By the same token, a Federal outlay for building a transport facility is not a subsidy if the outlay is recovered through charges imposed on the users of that facility. Federal loans or loan guarantees are likewise not a subsidy unless the loan is not repaid or unless the rate paid by the borrower is significantly below comparable market rates.

Subsidies granted to one mode obviously promote that mode's competitive position. Where Federal assistance has been fully recovered through user charges, however, it is difficult to argue that the mode involved has received an unfair advantage.

It should also be emphasized that Federal and state income, payroll, and property taxes are not "user taxes." These types of taxes are imposed to raise general revenues or for social purposes and are not related to reimbursement for facility usage or specific services rendered. Such taxes can, however, still have a non-uniform impact on intermodal competition as will be discussed in Chapter IV.

In fact, neither the gross outlay nor net outlay ("subsidy") measures furnish a complete description of the impact which a Federal financial role can have. There are at least two other ways in which Federal participation can indirectly alter costs, even where no direct subsidy payment is involved. First, the size of the Federal budget and tax base permit the Federal government to underwrite transactions far larger than any private company could undertake. Second, and in some ways most important, user charges vary with activity whereas interest costs do not. Consequently, when a Federally financed facility is repaid by user charges, the user can adjust his payments to his business activity and his ability to pay. The financial risk of fixed interest payments, which must be paid in all years, profitable or unprofitable, is assumed by the Federal government.

Although there have been very large sums of Federal money obligated in developing the present transport system, large amounts of money have also been collected from system users by the imposition of a series of Federal taxes. Appendix Table 14 shows the amounts, and timing, of Federal use-related tax revenues received from each of the modes. In summary, total revenues for all years from each mode have been:

Mode	Federal Use-Related Tax Revenues Collected (Billions of Dollars)
Highway	$ 99.1
Air	7.1
Domestic Water	0.2
Rail	6.1
Total	$112.5

These amounts must, of course, be interpreted with considerable caution. It is, for example, difficult to reach a fully satisfactory definition of the term "user charge." An ideal user charge is one which directly and accurately varies with degree of usage of the system and which causes each user to pay for the costs which his use imposes. None of the charges reported in Appendix Table 14 fully meets these criteria. For example, the consumption of one gallon of gasoline by a 4,000 pound passenger auto primarily on urban streets represents a very different type and degree of usage of the highway system than does the consumption of a gallon of diesel fuel by one intercity truck weighing more than 50,000 pounds. Yet both would yield the same user-tax revenue. Also, the highway user charges shown are partly inconsistent in their inclusion of excise taxes on trucks and buses while excluding excise revenues on autos. Although the latter exclusion can be justified because the truck and bus taxes are paid into the highway trust fund, whereas the auto excise tax was not,[1] it is a significant qualification as more than $30 billion in auto excise taxes were collected over the forty year pendency of the tax. Similar theoretical

[1] The auto excise tax was allowed to lapse after 1971.

objections could be applied to many of the air, water, or rail related "user" charges.[1]

Albeit only rough estimates, a comparison of Figure 29 with Appendix Table 14 suggests that the largest net gap ("subsidy") between Federal obligations and modal or use-related revenues has occurred in the air system, where obligations have exceeded revenues by nearly $19 billion (although, under current conditions, overall air user charges have increased to about 42 per cent of obligations). The air funding "gap" is about 30 per cent greater than the waterway "gap" ($14.5 billion), which far exceeds the negative rail "gap." In toto, there is no highway gap, as user revenues have actually exceeded Federal obligations by over $10 billion.[2] Thus, judged solely in terms of net direct Federal expenditures (obligations minus user tax revenues) it would appear that the preferential impact of Federal financial promotion has been centered primarily in the air and water modes.

Even this generalization can be deceptive when the differing functions of the various modes are taken into account. Specifically, as the table below shows, the modes differ radically in their usage for freight versus passenger purposes.[3]

Mode	Per Cent of 1974 Total Revenues (or Operating Costs of Private Operation) Passenger	Freight
Highway	56.9	43.1
Air	93.5	6.5
Domestic Water	0.6	99.4
Rail	3.1	96.9

Because of these differences, a Federal gross or net (of user charges) dollar spent on one mode, depending on how it is spent, may have little or no competitive impact on other modes, and certainly will not affect them

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[1] In fact, of the $6.1 billion in rail user charges, $5.1 billion were raised from rail waybill and passenger ticket imposts. Though these taxes were "use-related," they did not represent cost recovery as no facilities were provided from Federal sources. These taxes in effect constituted a general revenue tax.

[2] The negative "gap", if any, is much smaller than would appear because of the lag -- accentuated by highway aid "impoundments" -- between income and outlays. The money collected presumably will be spent eventually.

[3] Transportation Association of America, Transportation Facts & Trends, Twelfth Edition (Washington, D.C., July 1976) pp. 4, 5. Includes domestic common carrier and private transportation expenditures or revenues.

all equally. This observation may be further qualified by the fact that the modes are not equal in their service quality (primarily speed) and cost characteristics, either for passenger or freight service.

In very general terms, for passenger service over short travel distances (less than 150 miles) auto and air are the fastest, with rail (if available) and bus somewhat slower; as to cost, auto and bus are the cheapest, with rail occupying a medium position, and air the most expensive. Over longer distance passenger movements, air is by far the fastest, with rail, auto and bus somewhat slower; considering cost, air is nominally the most expensive, but, taking all costs into account (travel, food, overnight accommodations, value of time spent en route, etc.), air costs may be equal to or actually cheaper than rail, and only marginally more expensive than bus or auto. Also important for rail passenger service is the fact that rail service either does not exist between many points or exists only over routes so circuitous as to be unacceptable (e.g., Little Rock to New Orleans). Auto and bus are, by comparison, ubiquitous, and air service is essentially so.

For freight haulage, a somewhat different pattern emerges. For all distances, air shipment time is equal to or much faster than other modes and is also much more expensive. At all distances, water service is slower and tends to be less expensive than all other modes. In the middle range, highway service is faster than rail but is usually more costly except at very short shipment distances. As in the case of passenger service, trucking freight service is available from essentially every shipper to every destination because of the pervasiveness of the highway network and the flexibility of the technology. Rail service, while broadly distributed, is often limited to shippers and receivers located on rail lines (although "piggyback" service has extended access to the rail network to shippers not located on rail lines). Few shippers are located at an airport, so almost all air freight requires usage of trucks to pick up the shipment and to deliver it. Although most shippers are located within driving distance of some airports, effective and intensive use of the air freight system is probably confined to shippers located within easy access to the Nation's major airport hubs. Barge service is, of course, generally restricted to shippers and receiving points located on or near the water -- a requirement which cannot effectively be met for many major transport markets (e.g., Chicago to Los Angeles).

Taking relative usage, cost, service and availability all into account, it is clear that each transport mode has a characteristic role to play and that such roles may not necessarily be upset by promotional assistance to another mode. For example, a Federal subsidy for the air mode is likely to have its impact primarily in the passenger area where, at most, it might have a slight influence on the competition between air and certain short distance rail (and bus) routes. By comparison, a Federal dollar spent in the waterway area would have no impact at all on passenger transport, but for freight haulage, could have a significant impact on rail versus water competition in certain geographic markets. A Federal dollar spent on

a central city highway link might solely improve intra-city freight and passenger transport (which moves by auto or motor carrier only) and have no competitive impact on any other mode. With these considerations in mind, it seems fair to conclude from the pattern of net Federal obligations, less user revenues, discussed above that Federal spending on one mode cannot but help that mode in competition with others,[1] but the degree to which modally unbalanced Federal spending actually helps or hinders one mode vis-a-vis others can only be found after very careful examination.

It is highly questionable, for example, whether Federal aviation subsidies have had any significant impact on the freight carried by other modes. Nor, probably, has net air passenger assistance done any more than accelerate a loss of rail passenger traffic which would have occurred in any event. Because aviation spending simply facilitated the emergence of a technologically superior mode of rapid long distance passenger transport, Federal spending has in fact amounted to a subsidy designed to accelerate the installation and use of a service (that probaby did not need subsidizing) earlier than otherwise would have occurred (although the special concerns about safety in aviation undoubtedly also provided particular impetus to Federal involvement in airway system development). The narrowing of the net outlay gap, at least with respect to the trunk-line air passenger, by the user charge policy instituted in 1970 has had essentially no effect on demand and confirms that this mode's relatively high income clientele does not require subsidization.

Whatever its actual effects, the purpose of much of the post-war highway spending has been oriented toward regional and urban connectivity, primarily related to private auto travel, although the interests of the motor carrier industry were often identical with those of private automobile users. Given this auto-related orientation, it is doubtful that the shape of today's highway system would be much (if any) different, even if Federal highway planners initially had been fully cognizant of the potential impact of highway development on rail freight traffic.

As reference to Appendix Table 1 illustrates, the major post-war loss of freight traffic by rail and the gain of freight traffic by trucks was virtually accomplished before Interstate Highway System spending had

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[1] This is even true where, as is the case with highways, the primary impact of Federal spending has been to promote financial flexibility and security by converting a fixed charge (cost of highways) into a user charge which varies with actual use and thus need not be paid when traffic does not move.

passed its infancy.[1] By 1960, when the Interstate System was only about twenty-five per cent complete, the modal share gain by trucking was essentially complete. Rail modal share losses since 1960, while significant, appear to be chiefly related to the rapidly growing market for oil pipeline products as well as to continuing truck and barge competition.

These rather surprising facts strongly support an argument that caution must be employed in assuming a necessary or direct cause-and-effect connection between Federal funding and modal advantage or disadvantage. In the air passenger area, Federal subsidies facilitated and increased an already sizable competitive advantage. For highway freight, Federal spending may have had a similar effect -- it primarily permitted the motor carriers to maintain a market share which they had already captured without overwhelming Federal assistance.

In the rail area, removal of Federal spending for Amtrak and rail research and development (largely passenger-oriented) and the nineteenth century land grant assistance from the totals shown in Appendix Table 13 reveals that only about one-fifth of Federal rail obligations have been directed toward improving U. S. rail freight operations. The net result is a miniscule Federal role in promoting rail freight vis-a-vis any other freight mode.

Probably the most direct competitive impact of Federal modal spending has been felt in water-rail competition due to the large net Federal expenditures on waterway construction and maintenance, and it is likely that a reversal of Federal waterway subsidy policy would have some positive impact on rail, and possibly truck traffic, particularly if segment tolls were charged on water traffic which now moves on the very high cost waterway links such as the Allegheny River, the Missouri River, and the Arkansas River, among others. The degree of the modal shift caused by imposing waterway user charges could well be limited, however, by factors similar to those observed in the highway and air modes. As noted earlier, the water mode increased its modal share between 1947 and 1960 (from 14.4 to 16.7 per cent), but has experienced a slight loss in share (0.7 per cent by 1974) since 1960 despite massive net Federal waterway spending after that date

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[1] There was, of course, substantial state and local government highway funding prior to the Interstate program. From 1921 through 1960, for example, state and local highway spending was over 5 times Federal highway outlays; since 1960, state and local highway spending has been about 3 times Federal spending. State and local spending figures also include expenditures on city streets, rural roads, etc., most of which has no competitive impact on non-highway modes.

($7.8 billion). The explanation may lie in the fact that most of the major natural waterways (Mississippi River, Ohio River, Gulf Intracoastal Waterway, etc.) were well developed by 1960 whereas waterway construction outlays since then have had a relatively larger proportion invested in higher cost new links where transportation demand was limited.

On balance, direct Federal aid to transportation has played a major role in providing the United States with the finest transportation system in the world. It has had less "anti-competitive" effect between modes than commonly asserted because the purposes of so many transportation functions and services are not interchangeable. In most instances, Federal aid has served to reinforce the strengths of particular transport technologies -- this is especially true for the private automobile, trucking and aviation. The water carrier mode has often been the beneficiary of improvements stemming from multi-purpose projects ostensibly undertaken for both navigation and non-navigation purposes. As a Board of Investigation and Research report put it over thirty years ago, direct Federal aid principally has been extended "to reach more quickly than would otherwise have been likely certain objectives which were deemed to be in the public interest."[1] In most instances the transportation improvements assisted by Federal funding would have occurred anyway, in time. Federal involvement, which enables mobilization of resources on a scale that cannot be matched by the private sector and the states, permits the compression of time. The great disadvantage of Federal direct aid policy vis-a-vis the railroads is not so much that this industry received no Federal assistance, but that the Federal aid provided to the competitive modes vastly accelerated and increased the adjustment problems which the railroads had to face from the new technologies, further compounded by the deaf Federal ear turned to the notion of simultaneously providing the railroads any form of transitional assistance and allowing the railroads to adjust their facilities and services to meet the new competitive environment they were encountering.

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[1] Board of Investigation and Research, op. cit., p. 25.

Chapter IV

THE IMPACT OF TAX POLICIES ON RAIL TRANSPORTATION

The power to levy taxes and grant differential tax preferences has provided the Federal government with a significant means of directing and influencing the growth, viability, and competitiveness of the domestic intercity transport industries. Together with direct financial assistance, economic regulation, and labor regulation, the Federal Government's tax policies affecting the railroads and their modal competitors have provided both incentives and disincentives for the construction, improvement, operation, and maintenance of transport facilities and services.

Tax treatment has not been uniformly applied either to one mode over time or to all modes at any point in time. Rather, the Government's transportation tax policies have from time to time been revised in light of pressures to raise revenues to fund new priority programs or to provide incentives for achieving specific industry-wide economic goals.

Just as the formulation of transportation tax policies has focused more or less discretely on specific types of taxes or on individual modes, most studies of transportation taxation have been directed at specific issues. The only comprehensive Federally-sponsored survey of carrier taxation was conducted over a four year period by the Board of Investigation and Research which submitted its conclusions and recommendations to Congress in 1944.[1] Since then, however, efforts to determine if Federal as well as state and local transport tax treatment has been fair and equitable have concentrated on specific tax problems of individual modes. The Doyle Report in 1961 focused attention on the differential tax treatment accorded privately developed and publicly provided facilities and rights-of-way and the alleged discriminatory taxation of railroad-owned rights-of-way. These user and property tax issues have been the subject of additional studies by executive agencies, Congressional committees, and special commissions.[2]

Rather than attempt to duplicate the monumental effort of the Board of Investigation and Research or some of the most recent "one mode/one tax" studies, this analysis of transportation taxation identifies and assesses the major types of taxes and tax credits that have been and are

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[1] Board of Investigation and Research, Carrier Taxation, Report to the Committee on Interstate and Foreign Commerce (79th Cong., 1st Sess. House Doc. No. 160, September 19, 1944).

[2] For instance, U. S. Department of Transportation, Advisory Commission on Intergovernmental Relations, U. S. Bureau of the Census, and Senate Committee on Interstate and Foreign Commerce.

affecting each of the intercity transport modes. Particular attention is given to those types of taxes and tax policies where differential treatment has been accorded the various modes.

The Mix of Tax Accruals by Mode

The mix of taxes paid by the intercity transport modes varies considerably. While all transportation companies pay income taxes, payroll taxes, and property taxes, the bases upon which each of these types of taxes are assessed differ by mode, depending upon a number of factors including profitability, labor intensiveness, capital structure, and investment in taxable property. In addition, motor carriers and airline passengers and shippers are assessed special excise taxes and charges for use of publicly built and maintained facilities, while some carriers have been accorded special tax credits against earned income that have served to reduce income tax payments.

Figure 32 summarizes the mix of tax accruals for major regulated intercity freight carriers for selected years from 1940 to 1973, the latter being the latest year for which tax data are publicly available for all modes. It must be emphasized that the data shown are neither complete nor uniform for all modes. Only carriers regulated by the ICC and the CAB are required to report tax data in the detail presented. The approximate portion of each transport sector represented by the data is indicated in Figure 32, based on 1973 intercity ton-miles of traffic.

Tax treatment is generally unaffected by whether a particular transport company is regulated or unregulated. Two important exceptions, however, warrant mention. First, private or exempt carriers owned by parent industrial corporations are exceptions when they are able to reduce income tax payments by passing tax credits between subsidiaries of consolidated corporations. As shown in Figure 33, Internal Revenue Service data reveal that Federal income tax accruals as a per cent of operating revenues for all regulated and unregulated rail, truck and air transportation companies filing corporate returns with the IRS are approximately the same as the percentage of Federal taxes paid on operating revenues by the regulated rail, truck, and air carriers as recorded by the ICC and CAB. Although the IRS and ICC figures for both water and pipeline transport companies differ by substantial margins, much of the difference appears to be due to the fact that many water carriers and pipelines are owned by parent industrial corporations that are able to pass tax credits between consolidated subsidiaries. Data from both sources, nevertheless, show that pipelines and water carriers generally pay a higher percentage of Federal income taxes on operating revenues than do other carriers.

Second, during the period from 1941 through 1962 all common and contract carriers of freight and passengers were assessed Federal excise taxes. Private and exempt carriers, however, did not have to bear the burden of these taxes. The excise tax on passenger ticket sales was initially set at five per cent in 1941, increased to 15 per cent during World War II, and reduced to 10 per cent in 1954. The passenger excise

Figure 32

MIX OF TAX ACCRUALS, BY TYPE OF TAX FOR MAJOR REGULATED INTERCITY TRANSPORT CARRIER GROUPS, 1940, 1960, 1970, 1973
(dollars in thousands)

	Per Cent Of Industry Sector Intercity Ton-Miles Federally Regulated 1973[1]	1973 Amount	1973 Per Cent	1970 Amount	1970 Per Cent	1960 Amount	1960 Per Cent	1940 Amount	1940 Per Cent
Railroads (Class I)	100.0								
Federal Income Taxes		$ 130,326	9.5	$ 88,350	8.3	$ 202,903	20.3	$ 59,900	15.1
Payroll Taxes		826,471	60.3	575,911	53.9	394,156	39.5	116,400	29.4
State and Local Taxes		413,294	30.1	403,237	37.7	400,162	40.1	214,900	54.2
Other Taxes		1,145	0.1	1,020	0.1	1,578	0.2	5,200	1.3
Total Tax Accruals		$ 1,371,236	100.0	$ 1,068,518	100.0	$ 998,799	100.0	$396,400	100.0
No. of Reporting Carriers		70		73		106		n.a.	
Reported Operating Revenues		$14,989,573		$11,991,658		$ 9,514,294		n.a.	
Motor Carriers (Class I)[2]	43.8								
Federal Income Taxes		$ 175,840	19.1	$ 85,642	14.2	$ 23,162	9.7	$ 2,373	11.1
Payroll Taxes		308,237	33.5	165,683	28.3	52,858	22.2	3,662	17.1
Gasoline, Other Fuel and Oil Taxes		207,488	22.6	155,825	26.6	82,884	34.7	8,584	40.0
Vehicle Licenses and Reg. Fees		154,538	16.8	133,043	22.7	64,299	27.0	5,918	27.6
Real Estate and Personal Property Taxes		36,865	4.0	29,860	5.1	10,595	4.4	536	2.5
State and Local Income Taxes		22,146	2.5	7,826	1.3	1,273	0.5	(389	1.8
Other Taxes		13,955	1.5	7,829	1.3	3,507	1.5	(	
Total Tax Accruals		$ 919,670	100.0	$ 585,708	100.0	$ 238,578	100.0	$ 21,460	100.0
No. of Reporting Carriers		614		632		564		509	
Reported Operating Revenues		$11,083,175		$ 7,448,216		$ 3,288,020		$218,963	
Water Carriers (Class A)[3]	8.7								
Income Taxes		$ 11,083	60.7	$ 15,488	76.8	$ 9,401	72.1	$ 16,349	66.0
Payroll Taxes		5,619	30.8	3,578	17.7	2,601	20.0	2,930	11.8
Other Taxes		1,567	8.6	1,104	5.5	1,031	7.9	5,507[4]	22.2
Total Tax Accruals		$ 18,269	100.0	$ 20,170	100.0	$ 13,033	100.0	$ 24,786	100.0
No. of Reporting Carriers		55		58		73		402	
Reported Water-Line Operating Revenues		$ 464,210		$ 366,089		$ 247,271		n.a.	
Oil Pipelines[5]	84.5								
Federal Income Taxes		$ 141,219	59.9	$ 136,110	62.9	$ 114,412	74.4	$ 20,145	46.5
State and Local Taxes		86,094	36.5	75,014	34.7	38,631	25.1	10,194	23.6
Other Taxes		8,596	3.6	5,365	2.5	823	0.5	12,985[6]	30.9
Total Tax Accruals		$ 235,909	100.0	$ 216,489	100.0	$ 153,866	100.0	$ 43,324	100.0
No. of Reporting Companies		100		101		87		n.a.	
Reported Operating Revenues		$ 1,445,826		$ 1,188,254		$ 770,417		n.a.	
Airlines (Certificated)[7]	100.0								
Federal Income Taxes		$ 143,841	30.7	$ (48,970)	(31.7)	n.a.	-	$ 1,349	32.5
Payroll Taxes		195,623	41.8	118,678	76.7	n.a.	-	1,056	25.4
Property Taxes		76,994	16.4	52,746	34.1	n.a.	-	181	4.4
Fuel and Oil		16,961	3.6	12,293	7.9	n.a.	-	1,373	33.1
Other (Ex. Foreign)		34,787	7.4	19,904	12.9	n.a.	-	192	4.6
Total Tax Accruals		$ 468,206	100.0	$ 154,653	100.0	n.a.	-	$ 4,151	100.0
No. of Reporting Companies		31		31				n.a.	
Reported Operating Revenues		$ 9,605,000		$ 7,131,000				n.a.	

1 Interstate Commerce Commission, Annual Report, 1975, Table 4; Transportation Association of America, Facts and Trends, July, 1976, p. 8.

2 Class I common carriers of general freight engaged in intercity service.

3 Class A inland and coastal common carriers (1960, 1970, 1973); respondent water carriers (1940).

4 Includes excess profits taxes, $2,829,000, and capital stock taxes, $1,282,000.

5 ICC regulated (1960, 1970, 1973); respondent pipelines (1940).

6 Includes gross earnings taxes, $9,328,000, excess profits taxes, $1,686,000, and capital stock taxes, $1,308,000.

7 CAB certificated (1970, 1973); scheduled domestic airlines (1940).

Sources: Interstate Commerce Commission, Transport Statistics in the U. S., Parts 1, 5, 6 and 7, 1960, 1970, 1973.
Civil Aeronautics Board, "Summary of Airline Taxes by Classification of Tax for All Certificated Route Carriers, 1969-1973," Aug. 8, 1974; and Board of Investigation and Research, "Carrier Taxation," Report to Committee on Interstate and Foreign Commerce, Sept. 19, 1944, Table 1.

Figure 33

FEDERAL INCOME TAX ACCRUALS
AS PER CENT OF TOTAL OPERATING REVENUES,
SELECTED TRANSPORTATION INDUSTRIES, 1971*

Industry Classification	Data Source	Per Cent
Oil Pipelines	ICC	10.8
Pipeline Transportation	IRS	4.2
Water Carriers, Class A	ICC	3.8
Water Transportation	IRS	1.2
Motor Carriers, Class I	ICC	2.3
Trucking and Warehousing	IRS	1.7
Railroads, Class I	ICC	0.8
Railroad Transportation	IRS	0.9
Airlines, Certificated	CAB	0.3
Air Transportation	IRS	0.4

* 1971 is most recent year data is available from all sources.

Source: Interstate Commerce Commission, Transport Statistics in the U. S., Parts 1, 5, 6 and 7 (1971); Civil Aeronautics Board, "Summary of Airline Taxes by Classification of Tax for All Certificated Route Carriers, 1969-1973" (August 8, 1974); Federal Aviation Administration, FAA Statistical Handbook of Aviation; Internal Revenue Service, Statistics of Income-1971, Corporate Income Tax Returns (U. S. Government Printing Office, Washington, D. C., 1975).

tax was dropped for all modes except airlines in 1962, one year after the Doyle Report recommended its repeal for all modes because it unduly favored private transport carriers.[1] The tax that remained on air travel generated between $100 and $250 million annually between 1963 and 1970 and later became the main user tax component fed into the Airport and Airway Trust Fund. Freight excise taxes were collected from all common and contract carriers between 1943 and 1959. In 1971 a freight excise tax was reimposed on air transport waybills as an additional user tax component of the Airport and Airway Trust Fund. During the 1943 to 1959 period the freight excise tax was set at three per cent (except for coal which was taxed at the rate of four cents per short ton). From 1942 through 1970 the passenger and freight excise taxes together have imposed on common and contract carriers a total additional tax burden of $11.4 billion. (See Appendix Table 14.)

Payroll, property, and excise (since 1962) tax accruals are direct tax liabilities and are not affected by either a carrier's regulatory status or corporate structure. It appears reasonable, therefore, to consider the mix of tax accruals presented in Figure 32 as representative of each transport mode.

Because reporting requirements vary even for modes regulated by and reporting to the same authority, the available data by type of tax are not readily comparable. For example, regulated intercity truck lines separately identify state and local ad valorem property taxes and income taxes in reports filed with the ICC. In reports filed with the Commission by the railroads, all state and local tax accruals are lumped together. The ICC formats prescribed for reporting tax expenses by regulated water carriers and oil pipelines do not conform with either of those required for rails or trucks and provide even less definitive information by type of tax.

While it would be desirable to have comprehensive and uniform tax data for a thorough analysis of transportation tax policy, the tax data reported and presented in Figure 32 suffice nevertheless to distinguish the major taxes paid by each mode and to assess trends over time. Some highlights of these data are worth noting. First, the changing share of income taxes paid are primarily a function of modal profitability, income tax credits allowed, and changes in the shares of other tax liabilities. The interaction of each of these forces has resulted in wide fluctuations in the proportion of income taxes paid by each of the modes since 1940.

Non-income, direct taxes, on the other hand, have tended steadily to increase or decrease over time in proportion to total tax accruals, for

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[1] Special Study Group on Transportation Policies in the United States, National Transportation Policy, Report of the Senate Committee on Commerce (87th Cong., 1st Sess., Report No. 445) p. 370, hereafter cited as the Doyle Report.

each of the modes. For example, with the dramatic rise in national priority for social welfare and income stabilization, payroll taxes for each of the carrier groups have increased in importance relative to all corporate tax liabilities. For railroads and airlines, payroll taxes in recent years have become the largest single tax liability.

The relative size of a mode's property tax burden obviously varies with the amount of taxable property owned. Such taxes for the airline industry, which to a large extent leases rather than owns terminal facilities, and truck and water carriers, which own little real property, tend to be low relative to property taxes paid by railroads and oil pipelines, which own their rights of way. The largest share of motor carrier taxes is accounted for by Federal and state fuel taxes and vehicle license and registration fees which are primarily designated for highway construction purposes. It should be noted that user charges paid for airport development are not fully reflected in the airlines tax accruals shown in Figure 32. Most of these charges are treated as "pass through" taxes paid by air passengers and shippers -- they are levied on tickets and bills of lading -- rather than as airline tax liabilities.

When assessing differential transportation tax policies, it is important to keep in mind the mix of tax liabilities paid by each mode because the tax burden imposed on one mode by a particular type of tax may be quite different from that of another mode. In the analysis that follows these differential tax policies have been grouped into three main categories: (1) Federal income tax credit provisions, (2) user charge or right-of-way tax treatment, and (3) payroll tax treatment.

Federal Income Tax Credits

Federal income tax liabilities for all corporations are determined by applying the corporate tax rate to residual income available to contributors of equity capital after payment of all expenses and all contractual obligations to creditors and lessors, and after deductions for special credits. The tax rate imposed is and has been uniformly applied to all corporations; however, provision of special credits and the tax regulations concerning certain depreciation expenses of railroads have raised issues regarding just and equitable tax treatment of all modes. (Railway right-of-way depreciation tax policies are discussed on pages IV-13 and IV-14.)

With respect to special credits, the tax laws as written and interpreted by the Internal Revenue Service and the courts have always permitted numerous special credits and exclusions. Many of these, such as accelerated depreciation and investment tax credits, have applied to all corporate taxpayers.

The ability to utilize special credits generally applicable to all industry depends to a large extent on the asset and cost characteristics of particular business enterprises. Within the transportation industry, for instance, motor, water and air carriers are able to treat almost all investment costs as capitalized expenses since depreciable transportation

equipment accounts for the bulk of these carriers' assets. Railroads, however, have large investments in land, which, of course, is not a depreciable asset. Railroads must also apply replacement and betterment accounting for track and track structures, a procedure which causes rail asset depreciation practices to differ significantly from methods employed by other modes.[1] Pipelines represent a unique case. Most land investments for pipelines are in the form of easements, and based on the facts presented in two 1971 cases, certain oil and gas pipelines have been permitted to depreciate the cost of those easements.[2] Thus, while many special credits against earned income appear to treat all corporate taxpayers equitably, the actual advantages obtained vary considerably depending upon the nature of the business and interpretation of the Tax Code by IRS and the courts.

It has not been possible in this Study to quantify the use of Federal income tax credits by the various modes since many transportation firms are either subsidiaries of larger conglomerates or parents of non-transportation subsidiaries and the annual reports of these firms do not provide separate data for their transportation operations.

Some special credits have been specifically tailored to benefit certain industries. It was not until passage of the Revenue Act of 1971, however, that annual estimates of the tax benefits accorded specific industries were required and made publicly available. The Treasury Department's Office of Tax Analysis (OTA) and the Joint Committee on Internal Revenue Taxation now have the shared responsibility to estimate Federal "tax expenditures," which are defined as "... the amount of tax reductions which occur because of the allowance of an exclusion, deduction, preferential rate of tax, or deferral of tax liability."[3] By this definition a tax expenditure represents revenue foregone by the government as well as a tax benefit or increase in after tax earnings to the taxpayer.

Estimates of Federal tax benefits specifically accorded domestic transport industries since 1970 and extending through 1980 are shown in Figure 34.[4] These benefits have been extended to certain domestic water

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[1] Replacement and betterment accounting is a complex method of depreciation used only by railroads, and then only for track structure assets. It prescribes, for example, that if an existing 80-pound rail is replaced with a 100-pound rail, only the cost attributable to the 20-pound betterment is capitalized and the balance of the cost less the salvage value of the replaced rail is expensed.

[2] Revenue Rulings 71-120, C.B. 1971-1, 79 and 71-448, C.B. 1971-2, 130.

[3] Committee on Ways and Means, "Estimates of Federal Tax Expenditures," prepared by the Treasury Department and Joint Committee on Internal Revenue Taxation (June 1, 1973) p. 1.

[4] It has not been possible to catalogue in detail specific tax benefits made available in the past for particular modes, which are no longer in effect. They do not appear to have been widespread or long-lasting, e.g., during World War II the cost of government-approved pipelines were permitted to be depreciated over five years, or when the War ended, whichever came first.

Figure 34

ESTIMATES OF FEDERAL TAX BENEFITS SPECIFICALLY ACCORDED DOMESTIC TRANSPORT INDUSTRIES, FY 1970-FY 1980
(Millions of Dollars)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Deferral of Tax on Shipping Companies, Domestic Share[1]	6	6	9	24	36	42	63	54	45	36	30
Investment Credit in the Case of Certain Ships, Domestic Share[1]	-	-	-	-	-	-	-	8	7	9	11
Railroad Rolling Stock: 5-Year Amortization	105	78	61	75	68	55	30	10	5	-	-
Investment Credit Provision for Railroads and Railroad Tie Provision	-	-	-	-	-	-	-	29	66	65	53
Investment Credit Provision for Airlines	-	-	-	-	-	-	-	32	55	35	27

[1] Prior to 1970 applied only to ship construction for U. S. foreign trade. After 1970 Great Lakes trade and non-contiguous domestic trade included. Estimates are for Great Lakes trade only, based on 60 per cent of 1971 - June 1975 withdrawals from Capital Construction Fund for construction of ships for Great Lakes trade.

Sources: Committee on Ways and Means, "Estimates of Federal Tax Expenditures "(June 1, 1973 and March 15, 1976); U. S. Treasury Department, Office of Tax Analysis, unpublished revised estimates for 1971-1980; U. S. Maritime Administration, Division of Subsidy Contracts; and Conference Report to Accompany H.R. 10612, Tax Reform Act of 1976 (94th Cong., 2nd Sess., Senate Report No. 94-1236, September 14, 1976) Appendix B.

carriers, railroads, and starting in 1977, to airlines. Since OTA and the Joint Committee first began estimating tax benefits, no tax credits specifically designed to benefit the other major carrier groups -- motor carriers and oil pipelines -- have been enacted.

The fact that the tax benefits presented in Figure 34 are estimates cannot be over-emphasized. OTA and the Joint Committee regularly revise their tax expenditure estimates, sometimes with dramatic results. For instance, estimates of the deferral of tax on shipping companies (for setting aside earnings into capital construction funds) published in the 1977 Special Analysis of the Budget were more than double the estimates released in the 1976 Special Analysis of the Budget. In recent months tax expenditure estimates for water carriers have again been revised, this time downward due to sluggish ship building activity.[1] Only shipping companies engaged in U. S. foreign trade, non-contiguous domestic trade (e.g., U. S. mainland to Hawaii), and Great Lakes trade are eligible for this tax benefit. Water carriers operating on U. S. rivers and canals or in coastal trade are not eligible. The estimates shown in Figure 34 have been adjusted to account for only that portion accruing to Great Lakes shipping companies.

Estimates of tax benefits accorded railroads accruing from the five year amortization tax provisions for rolling stock also have been revised periodically by OTA. The benefits of this provision, while substantial relative to tax benefits accorded other domestic carrier groups, have declined since 1970 due to reinstatement of the investment tax credit for all corporations in 1971 (it was deleted in 1969). OTA advises that since the investment tax credit provides greater benefits than the rapid amortization provision, and railroads cannot use both, no railroad since 1971 has used the special railroad amortization provision.[2]

Rather than buy rolling stock, railroads often lease rail cars from financial institutions. In such situations, the benefits of the five year amortization provision accrue to the lessor banks or insurance companies. Because of these benefits to lessors, the leasing railroads typically are able to benefit indirectly through lower lease payments.

Clearly the two modes that have benefited most through provision of special credits or deductions from taxable income have been water carriers and railroads. Of the domestic water carriers, however, only Great Lakes shipping companies have been beneficiaries of the deferred tax on income deposited in capital construction funds. Carriers operating on the Nation's inland waterway system or in the coastal trade have been excluded from

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[1] Based on discussions with Office of Tax Analysis representatives.

[2] Ibid.

using this tax credit provision. Railroads received a large after-tax earnings boost when Congress authorized rapid five-year amortization of rolling stock in 1970. This, of course, was a year when railroad earnings were lower than at any time since 1939 as well as the year of the Penn Central collapse.

With many of the nation's airlines reporting poor financial results in recent years, much of the railroad industry unable to generate needed internal or external capital for modernizing and expanding facilities, and a downturn in water carrier orders for new vessels, new tax provisions have been authorized that are expected to improve each industry's financial and competitive position. These provisions permit railroads and airlines to apply investment credits against up to 100 per cent of their tax liability. Heretofore, investment credits had generally been limited to 50 per cent of a company's tax liability (public utilities, with a 100 per cent limitation, had been an exception). The new tax law now grants the same tax treatment to railroads and airlines -- but not to lessors of rail or airline equipment -- as had previously been given to public utilities. The additional benefits of these provisions expire gradually over an eight year period. The 1976 tax law also permits railroads to deduct as a current expense -- rather than as a capitalized expense -- the cost of replacing old rail ties with a new type of tie.

Finally the Tax Reform Act of 1976 provides water carriers an investment tax credit of one-half the regular credit on amounts withdrawn from capital construction funds to purchase new vessels. No such credit had been allowed prior to enactment of the 1976 tax law.

The past and future annual Federal tax benefits permitted for domestic water, rail, and air carriers vary from year to year. Taking 1970-1980 as a representative period, the average yearly benefit to domestic water carriers is approximately $35 million, while the average annual benefit to the railroad industry is about $64 million. Over the next four years the airline industry is expected to receive an average tax benefit of approximately $37 million a year.[1]

Right-of-Way Tax Treatment

Perhaps no area of transportation taxation policy has received as much attention as taxation of carrier rights-of-way. For motor carriers, airlines, and water carriers the costs of providing rights-of-way and related facilities have been borne initially by the government. As discussed earlier, the taxes imposed to recoup these costs from the users of the facilities are classified as user charges. User charges have never been imposed on domestic water carriers. Users of the Nation's

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[1] Conference Report to accompany H. R. 10612, Tax Reform Act of 1976 (94th Cong., 2nd Sess., Senate Report No. 94-1236, September 14, 1976) and Figure 34.

highways and airways have paid Federal and state user charges since the early part of this century. It has only been in recent years, however, that these charges have been specifically allocated to transport system development. The Highway Revenue Act of 1956 and the Airport and Airways Development Act of 1970 established trust funds, fed by user charges, to finance construction and improvement of the Interstate highway system and the nation's airport and airways system, respectively.

The Department of Transportation has conducted extensive cost allocation studies to determine whether charges imposed on and paid by highway users and users of airports and airways cover their portion of the costs of constructing and operating the Nation's Interstate highway and airport/airway systems. Precise allocation of costs among user groups is acknowledged to be an exceptionally difficult analytical problem by transportation scholars and practioners alike. The 1969 Highway Cost Allocation Study found that while highway users as a whole were covering their costs, combination trucks -- those principally operated by interstate trucking companies -- were paying approximately 76 per cent of their fair share of the Federal aid spent on the Interstate highway system.[1] However, taking into account both Federal and state highway systems, combination trucks were found to be paying about 90 per cent of their share of Federal and state aid to highways.[2] The results and underlying assumptions of this cost allocation study have been challenged by the trucking industry, thereby prompting further analysis of the issue. In an effort to seek a more definitive answer to the question of whether heavy trucks and other users of the highway system are paying their fair share of the Interstate highway system, the Department of Transportation has contracted a major two year study of strategies and procedures for conducting highway cost allocation studies. This methodology study will not be completed until mid-1977 and the actual cost allocation study sometime thereafter.

The largest proportion of user charges that flow into the Airport and Airway Trust Fund are levied directly on air carrier passengers and shippers through eight per cent and five per cent taxes added, respectively, to passenger ticket and freight waybill prices. To the extent that these taxes increase the passengers' and shippers' cost of using the airport/airway system, these charges can be considered user charges to the air carriers. The 1973 Airport and Airway Cost Allocation Study sought to determine if the users of the nation's airport and airway system were paying their fair share of the costs of construction and operation. It concluded that the commercial air carrier sector was paying approximately 95 per cent of the costs properly allocable to commercial carriers.[3] Thus,

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[1] U. S. Department of Transportation, Allocation of Highway Cost Responsibility and Tax Payments, 1969 (May 1970) Table 25.

[2] Ibid., Table 27.

[3] U. S. Department of Transportation, Airport and Airway Cost Allocation Study, Part 1 (September 1973) Table 11.

while continuing study of whether motor and air carriers are paying their fair share of the publicly provided highway and airport/airway system costs is desirable, the best available evidence points to the conclusion that much of these costs are being financed by system users.

The domestic water carrier situation is different. As shown on page III-25, the Federal Government has spent $14.7 billion on river and harbor developments and other navigational aids to provide a useable and efficient right-of-way for domestic water carriers. The public investment in the waterway system has amounted to a total subsidy since a waterway user charge has never been imposed on either commercial or private users of the system.[1]

Railroads and oil pipelines, which unlike the other major transport modes have exclusive use of their rights-of-way and related facilities, have financed construction and improvement of their systems internally without government assistance. One could contend that the costs represented by the construction and maintenance accounts of these two modes are essentially equivalent to the fully allocated highway and airway costs assigned to motor and air carriers; however, there are important differences.

First, airport and airway development costs incurred prior to the assessment of user charges in 1971 have been treated as sunk costs, none of which have been or will be paid for by air carriers and other system users.[2] As shown in Figure 29 on page III-25, these sunk costs total $15.8 billion. For highway users, Federal taxes have been imposed on motorists since 1917, and as shown in Figure 29 and Appendix Table 14, these revenues have actually exceeded Federal highway development costs.[3]

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[1] Water carriers have paid a small although indeterminable amount of Federal fuel and oil excise taxes since 1932 (on gasoline and lubricating oil) and 1951 (on diesel fuel). One-third to one-half of the gasoline taxes paid have been refundable while the entire tax on lubricating oil has been refundable to water carriers. These taxes have been treated as general revenues. See Department of Transportation, Federal Highway Administration, Highway Statistics 1974, Table FE-101.

[2] Fuel and oil Federal excise taxes have been collected from airways users since 1932. One-third to one-half of the fuel taxes paid have been refundable while the entire tax on lubricating oil has been refundable to air carriers and other system users. Prior to 1971 these taxes were treated as general revenues. See Department of Transportation, Federal Highway Administration, Highway Statistics, 1974, Table FE-101.

[3] Prior to the Highway Revenue Act of 1956, Federal highway user taxes were treated as general revenues and were not used specifically to finance highway construction.

Aside from the advantages to certain modes from direct Federal subsidies, other beneficial aspects of the Federal role come into play, including the ability to mobilize funds on a massive scale and the conversion of fixed costs into user charges. For instance a critical difference between the rail and pipeline industries' private sector investment in rights-of-way and the public financing of highway, air and water transportation facilities is that such investments represent fixed obligations for rails and pipelines whereas they are transformed by Federal agency involvement into variable costs for highway and airway users.[1] In essence, public financing of highways and air facilities has allowed trucking companies and airlines to finance their right-of-way costs as they are needed and used. During slack business periods their right-of-way user payments fall off; in good periods, their payments rise. Railroads and pipelines are not permitted that luxury, however. Amortization of right-of-way investments for these carriers require fixed annual payments to finance systems that must be built to handle peak traffic loads; these charges have to be met in bad business years as well as in prosperous years. The risk of interest default is thus much higher for rails and pipelines -- barges, motor carriers and airlines are spared this debt burden.

Finally, one of the costs associated with the financing of a mode's right-of-way is the cost of capital. Railroads and pipelines secure their investment funds in the market place and must pay commercial rates. The Federal aid to highway and airport/airway programs are, however, essentially financed on a pay-as-you-go basis and are effectively interest free for users of these systems. Government debt is also used to finance deficiencies in user tax receipts, but at rates well below those charged commercial borrowers. The sheer size of the post-war highway, airport and waterway development programs has been such that they could not have been undertaken on a similar scale by the states and/or the private sector.

Thus motor carriers, airlines and water carriers have their business risks reduced when the Federal Government in effect serves as their banker in arranging for the financing of investment in their respective rights-of-way. Highway, airport/airway and waterway projects have been charged with very little, or none, of the opportunity cost of Federal capital, whereas the railroads and pipelines customarily have been required to raise money on commercial terms (allowing for periodic government loan guarantee programs for bankrupt and financially distressed railroads). Moreover, carriers who pay user charges in lieu of fixed charges, or no user charges in the waterway case, enhance their industry's financial security in comparison with the fixed interest and debt retirement costs paid by railroads and pipelines.

Discriminatory Federal Income Tax Treatment of Certain Cost of Constructing Railway Rights-of-Way. While all the costs of building the Nation's railroads have been incurred by the users of these systems, questions have arisen over the fair and equitable tax treatment of some of these

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[1] And no cost to waterway users.

incurred costs. Whereas pipelines depreciate all pipeline construction costs, motor carriers deduct highway user charges from their before tax earnings, and airline user charges are passed through directly to passengers and shippers, railroads until very recently were prohibited from deducting from before tax earnings certain of the grading and tunneling costs involved in building their rights-of-way. For years the IRS has contended that such improvements to land properties did not have a determinable life and therefore could not be depreciated. A recent key decision by the U. S. Tax Court held that improvements to land do have a definite life and that the costs incurred to make these alterations should be capitalized.[1] This ruling accorded tax relief to only one railroad, however. The effect on the rail industry has been to deny it a depreciation charge and thus to require railroads to pay higher Federal income taxes than they would have been liable for had all right-of-way construction costs been allowed as capitalized expenses.

Provisions of the Tax Reform Acts of 1969 and 1976 have finally resolved this issue by permitting railroads to depreciate all of these disputed investment costs. This issue, which has been contested by the railroads for many years, has been estimated to have cost the Nation's railroads about $20 million annually, based on the Government's estimated revenue effect of lifting the tax inequity.[2]

Ad Valorem Property Taxation of Railroad and Pipeline Rights-of-Way. Railroads and pipelines have long contended that state and local taxes on their rights-of-way constitute a unique tax burden which is not equalized by the user charges paid by competing motor, water, and air carriers.[3] The Doyle Report concurred in this opinion, but recognized the difficulty of developing a rational formula wherein carriers using government-provided transportation facilities would pay a true pro rata share of the costs of construction, maintenance, and taxation on their rights of way.[4] Instead the Doyle Report recommended a Federal law exempting railroad and pipeline right-of-way property from state and local taxation. Cognizant of the fiscal impact of losing roughly $150 to $200 million in railroad property tax revenues and $1.5 million in pipeline property tax revenues annually, state and local governments have vehemently opposed such a recommendation.[5]

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[1] Chesapeake & Ohio Ry. Co., 64 TC 352 (1975).

[2] Conference Report to Accompany H.R. 10612, Tax Reform Act of 1976 (94th Cong., 2nd Sess., Senate Report No. 94-1236, September 14, 1976) Appendix B.

[3] In most states all private carriers are subject to state and/or local ad valorem property taxes levied on real property including terminals, office buildings, etc. The focus herein is on taxation of rights-of-way only.

[4] See Doyle Report, p. 450.

[5] Ibid., pp. 461, 464.

The issue of whether ad valorem taxes on rail and pipeline right-of-way property are fair and equitable remains unresolved. From a strict financial accounting standpoint, it cannot be denied that such taxes do place a special burden on railroads and pipelines vis-a-vis other transport modes. On the other hand, such taxes can reasonably be considered the price a mode must pay to have free and unrestricted use of its right-of-way. Water, air and motor carriers must, of course, share the sometimes congested locks, air terminals, and highways with other carriers as well as with the general public (and in some instances, the military).

Some transportation economists opposed to a property tax exemption for railroads and pipelines advance the theory that such taxes are, in a sense, social costs imposed on systems that, absent their current utilization, would have little or no alternative transportation demand for their right-of-way.[1] According to this argument, publicly provided highway, waterway, and airway rights-of-way do have alternative uses for the general public, yield social benefits to large segments of society, and therefore should not be subject to taxation by local jurisdictions. The proponents of this theory concede that carriers using publicly provided rights-of-way derive special tax benefits. They feel, however, that these benefits should be perceived as a basic difference in providing transport services over public versus private rights-of-way, rather than as an unfair advantage specifically granted to motor, water, and air carriers.

Complete resolution of this issue is likely to be impeded by practical and administrative problems, such as the historic dependence of many local jurisdictions on rail property tax revenue and the administrative impossibility of imposing local property tax levies on all carrier and public users of highway, waterway and airway rights-of-way. Partial alleviation of the ad valorem property tax burden imposed on railroads and pipelines has nevertheless occurred due to the gradual shift in the overall tax burden toward the income tax and away from the property tax. This shift has been especially evident since Congress enacted revenue sharing in 1972, in part to reduce state and local taxes. A Brookings study published in 1976 reveals that between 1955 and 1974 Federal grants-in-aid as a per cent of total state and local government revenue have doubled from 10.0 to 20.1 per cent while state and local dependence on property taxes has dropped from 34.3 to 20.9 per cent of total revenues.[2] Other state and local tax revenue sources not tied to property values such as general sales and gross receipts taxes and individual income taxes have also increased sharply. The Brookings study found that the rate of growth in state and local expenditures from their own sources of revenue has

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[1] See Ann F. Friedlaender, The Dilemma of Freight Transport Regulation, (Washington, D.C.: The Brookings Institution, 1969) pp. 37-38.

[2] Henry Owen and Charles Schultze (eds.), Setting National Priorities, The Next Ten Years, (Washington, D.C.: The Brookings Institution, 1976) pp. 371-409.

slowed considerably from about 4.7 per cent before revenue sharing to less than one per cent after revenue sharing, as shown in the following Table:

RATE OF GROWTH IN STATE AND LOCAL EXPENDITURES FROM OWN SOURCES OF REVENUE
(Per Cent in Constant Dollars)

1972-1974	0.8
1970-1972	4.6
1965-1970	5.3
1960-1965	4.7
1955-1960	4.5

While state and local governments may choose to use the additional funds provided through revenue sharing either to undertake additional expenditures or to avoid tax increases, evidence shows that about 60 per cent of revenue sharing funds have been used to reduce local taxes or avoid local tax increases.[1]

For the Nation's railroads this shift in the tax burden away from the property tax is evident from state and local tax data reported by Class I roads and from the results of 1957 and 1975 surveys of ad valorem taxes levied on railroads. As shown in Figure 32, total railroad state and local tax accruals (in current dollars) increased by only 3.3 per cent from $400.2 million in 1960 to $413.3 million in 1973. The Association of American Railroads estimates total 1975 state and local tax accruals at $441.2 million, which is still only a 10.3 per cent increase on a current dollar basis in the last 15 years.

While the portions attributable to state and local income, property and other taxes cannot be differentiated from these data, the results of two AAR surveys (based on 1957 and 1975 tax accruals of Class I railroads) reveal that ad valorem or equivalent taxes on railroad rights-of-way have actually declined from $182.7 million in 1957 to $167.4 million in 1975. This decline is, of course, in part attributable to the 10.2 per cent drop in total miles of railroad line haul, switching, and terminal track.

The major reason, however, for the reduced railroad ad valorem tax burden on right-of-way properties has been the state and local government shift away from the property tax to other sources of tax revenue. For the railroads this trend has been most evident in the Northeast where, after the Penn Central and other rail bankruptcies, state and local jurisdictions were forced to seek tax revenues from other than railroad sources. Nevertheless, even when all states showing a dollar decline in ad valorem property taxes from 1957 to 1975 are excluded, the AAR survey data show

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[1] Edward M. Gramlich and Henry Galper, "State and Local Fiscal Behavior and Federal Grant Policy," Brookings Papers on Economic Activity (1:1973) pp. 42-46.

Figure 35

COMPARISON OF RATES OF GROWTH IN CLASS I RAILROAD AD VALOREM TAXES AND STATE AND LOCAL GOVERNMENT REVENUE, BY SOURCE, 1957-1975
(Millions of Current Dollars)

	Ad Valorem or Equivalent Taxes Levied on Railway and Track Properties, Class I Line-Haul Railroads		State and Local Government Revenue, By Source		
	Total U. S.	For States with an Increase From 1957 to 1975, Only	Total Property Taxes	Total Taxes	Total Revenue All Sources
1957	$183	$ 74	$ 12,864	$ 28,817	$ 45,929
1975	167	107	54,300	149,177	275,635
1957-1975:					
Percentage Change	- 8.4%	44.1%	322 %	418 %	500 %
Annual Average Per Cent Change	- 0.5%	2.1%	8.3%	9.6%	10.5%

Source: Doyle Report, p. 461; Association of American Railroads, "Ad Valorem, or Equivalent Taxes, Levied For the Year 1975 on Class I Line Haul Railroads in the United States," October 8, 1976; U. S. Bureau of the Census, "Property Values Subject to Local General Property Taxation in the United States; 1975," Series: GSS No. 80, September 1976, p. 1; U. S. Bureau of the Census, Historical Statistics of the United States, Colonial Times to 1970 (September 1975) Series Y 652, 656, and 657.

that tax revenues generated from rail roadway and track property in the other states increased by only 44 per cent compared with a 322 per cent increase in total state and local property tax revenues during the period. As shown in Figure 35 total state and local taxes over this same 18 year span increased by 418 per cent while revenues from all sources (including revenue sharing funds) rose by 500 per cent. Thus recent trends in the sources of state and local tax revenues point towards at least partial alleviation of the tax burden imposed on transport modes that own their rights-of-way.

State and Local Government Tax Discrimination. Even though the rail industry's total property tax bill on right-of-way and other property has fallen from $348 million in 1957 to $336 million in 1975,[1] considerable evidence exists to show that the taxes levied are discriminatory. Over-assessments vis-a-vis those made on similar industrial and commercial property in the same jurisdictions and discriminatory application of tax rates have been estimated to cost the Nation's Class I railroads between $60 and $70 million annually and close to $1 billion[2] since the Doyle Report concluded in 1961 "that relative discrimination, of considerable magnitude, does, in fact, exist against the railroads in the assessment procedures of State and local governments for ad valorem taxation purposes."[3]

After weighing the evidence pertaining to state and local tax discrimination of rail property submitted by the rail industry and like evidence provided by a number of governmental investigative committees since the Board of Investigation and Research first surfaced this problem in 1944, Congress recently took action to eliminate inequitable tax treatment of rail property through enactment of § 306 of the Railroad Revitalization and Regulatory Reform Act of 1976. This section declares it unlawful after February 1979 for a state or political subdivision of a state to levy or collect ad valorem property taxes on railroad property on an assessment or tax rate basis higher than that generally applicable to commercial and industrial property in the same jurisdiction. As an enforcement mechanism, § 306 provides that U. S. district courts will have jurisdiction over disputes and that these courts will have the power to grant injunctive relief, interim equitable relief, and declaratory judgments to prevent further tax discrimination. Railroads have long contended that state courts had blocked or delayed prior efforts by railroads to get relief from property tax discrimination. While resolution of the problem of tax discrimination of rail property appears to be at hand, the extent of relief granted remains to be seen. At least the railroads now have the backing of a specific statute reflecting the intent of Congress to lift this inequitable tax burden.

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[1] Doyle Report, p. 461; and Association of American Railroads, "Ad Valorem, or Equivalent Taxes, Levied For the Year 1975 on Class I Line Haul Railroads in the United States," October 8, 1976.

[2] Estimates from statement of Philip M. Lanier, on behalf of the Association of American Railroads, "Hearings on Common and Contract Carrier State Property Tax Discrimination Before House Committee on Interstate and Foreign Commerce" (91st Cong., 1st Sess., June 9, 1970) p. 15.

[3] Doyle Report, p. 487.

Payroll Taxes

As previously described, payroll taxes for legislated old-age, survivors, disability, health, and unemployment insurance programs have increasingly accounted for a larger share of each transport mode's total tax bill. The payroll tax is now the largest single tax paid by both railroads and airlines, representing 60.3 and 41.8 per cent of their respective 1973 total tax accruals. For motor carriers payroll taxes in 1973 accounted for 33.5 per cent of the total tax bill, compared with 39.4 per cent for all motor carrier fuel, oil, license, and registration taxes and fees (see Figure 32).

For the over 40 years during which employers have been charged payroll taxes for legislated employee benefit programs, not all modes have been treated equally. In the mid to late 1930's, in the aftermath of the Great Depression, special legislation was enacted to cover railroad retirement and unemployment insurance benefit programs. That legislation remains in effect today. Employees of all other modes are covered by programs administered by the Social Security Administration. As measured by the employer contribution rates required by both the special legislation covering railroad employees and Social Security programs covering other transportation employees, the railroads have clearly had to bear a heavier payroll tax burden than the other modes. Per hourly wage earner, the railroads have been required to pay approximately twice as much as other modes for Federally-enacted employee benefit programs. Figures 36 and 37, viewed together, show the total payroll tax liability for two employers, a railroad and a typical non-rail carrier, for an employee starting his career in 1937 and retiring in 1975 and earning no more than the average annual transportation industry salary. For the railroad, payroll taxes per employee total $20,463. Payroll taxes for the other carrier over the same period total $9,966 per employee.

The first national unemployment insurance law went into effect in 1936. Initially this provision of the Social Security Act applied to carriers with eight or more employees, excluding pilots and crew members of water carriers. Administration of the Federal unemployment program has been a state function with the states empowered to set variable payroll tax rates depending upon each employer's record of employment stability.[1] The average unemployment payroll tax rate applying to all non-rail employers has never risen above the initial rate set during the Depression years although the unemployment tax per employee has increased due to rising earnings base levels.

Railroad employees were covered by the unemployment provision of the Social Security Act for the first three years of the program. In 1939 a separate unemployment compensation plan was enacted to cover only rail industry employees. Payroll tax rates and taxes per employee under this

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[1] The Federal Government funds the administrative costs of the state unemployment programs. The Federal portion of the total unemployment payroll tax -- for administrative costs -- has generally remained less than 20 per cent of the total unemployment payroll tax rate.

Figure 36

CARRIER COSTS OF LEGISLATED UNEMPLOYMENT INSURANCE PROGRAMS, PER EMPLOYEE, 1938-1975

Lower of: Transport Industry Avg. Annual Employee Wage, or Annualized Earnings Base		Railroads (RUIA) Employers Contribution Rate (Per Cent)	Railroads (RUIA) Tax Per Employee	Estimate For Other Modes (State and Federal Unemployment) Average U.S. Employers Contribution Rate (Per Cent)	Estimate For Other Modes (State and Federal Unemployment) Tax Per Employee
1938	$1,676	3.05	$ 51	3.05	$ 51
1939	1,723	3.02	52	3.02	52
1940	1,756	3.00	57	3.00	57
1941	1,885	3.00	57	2.88	54
1942	2,183	3.00	65	2.48	54
1943	2,493	3.00	75	2.38	59
1944	2,679	3.00	80	2.20	59
1945	2,734	3.00	82	2.01	55
1946	2,973	3.00	89	1.73	51
1947	3,169	3.00	95	1.71	54
1948	3,468	0.50	17	1.54	53
1949	3,568	0.50	18	1.61	57
1950	3,600	0.50	18	1.80	65
1951	3,600	0.50	18	1.88	68
1952	3,600	0.50	18	1.75	63
1953	3,600	0.50	18	1.60	58
1954	3,900	0.50	20	1.42	55
1955	4,200	0.50	21	1.48	62
1956	4,200	1.50	63	1.62	68
1957	4,200	2.00	84	1.61	68
1958	4,200	2.50	105	1.62	68
1959	4,550	3.44	157	2.01	91
1960	4,800	3.75	180	2.18	105
1961	4,800	3.75	180	2.46	118
1962	4,800	4.00	192	2.76	132
1963	4,800	4.00	192	2.71	130
1964	4,800	4.00	192	2.61	125
1965	4,800	4.00	192	2.52	121
1966	4,800	4.00	192	2.31	111
1967	4,800	4.00	192	2.01	96
1968	4,800	4.00	192	1.87	90
1969	4,800	4.00	192	1.78	85
1970	4,800	4.00	192	1.84	88
1971	4,800	4.00	192	1.91	92
1972	4,800	4.00	192	2.20	106
1973	4,800	4.00	192	2.49	120
1974	4,800	4.00	192	2.50	120
1975	4,800	4.00	192	2.50[e]	120
1938-1975 Total			$4,308		$3,081

e = estimate.

Source: U. S. Railroad Retirement Board, Bureau of Research, "Tax Rates Under Railroad Retirement, Social Security, and Railroad Unemployment Insurance Acts" (January 1976); U. S. Department of Labor, Manpower Administration, Handbook of Unemployment Insurance Financial Data, 1938-1970 (1971) p. 145 and statistical supplements for calendar years 1971-1974; U. S. Department of Commerce, Bureau of Census, Historical Statistics of the United States, Colonial Times to 1970 (September 1975) Series D 746.

Figure 37

CARRIER COSTS OF LEGISLATED RETIREMENT PROGRAMS,[1] PER EMPLOYEE, 1937-1975

	Lower of: Transport Industry Avg. Annual Employee Wage, or RRTA (FICA) Annualized Earnings Base	Railroads: (RRTA) Employer Contribution Rate (Per Cent)	Railroads: (RRTA) Tax Per Employee[2]	Other Modes: (FICA) Employer Contribution Rate (Per Cent)	Other Modes: (FICA) Tax Per Employee
1937	$ 1,644	2.75	$ 45	1.00	$ 16
1938	1,676	2.75	46	1.00	17
1939	1,723	2.75	47	1.00	17
1940	1,756	3.00	53	1.00	18
1941	1,885	3.00	57	1.00	19
1942	2,183	3.00	65	1.00	22
1943	2,493	3.25	78	1.00	25
1944	2,679	3.25	87	1.00	27
1945	2,734	3.25	89	1.00	27
1946	2,973	3.50	104	1.00	30
1947	3,169 (3,000)*	5.75	182	1.00	30
1948	3,468 (3,000)*	5.75	199	1.00	30
1949	3,568 (3,000)*	6.00	214	1.00	30
1950	3,600 (3,000)*	6.00	216	1.50	45
1951	3,600	6.00	216	1.50	54
1952	3,600	6.25	225	1.50	54
1953	3,600	6.25	225	1.50	54
1954	3,900 (3,600)*	6.25	244	2.00	72
1955	4,200	6.25	263	2.00	84
1956	4,200	6.25	263	2.00	84
1957	4,200	6.25	263	2.25	95
1958	4,200	6.25	263	2.25	95
1959	4,550 (4,800)*	6.50	296	2.50	120
1960	4,800	6.75	324	3.00	144
1961	4,800	6.75	324	3.00	144
1962	4,800	7.25	348	3.125	150
1963	4,900 (4,800)*	7.25	355	3.625	174
1964	5,400 (4,800)*	7.25	392	3.625	174
1965	5,400 (4,800)*	7.875	425	4.20	202
1966	6,600	7.95	525	4.40	290
1967	6,600	8.65	571	4.40	290
1968	7,800	8.90	694	4.80	374
1969	7,800	9.55	745	4.80	374
1970	7,800	9.55	745	5.20	406
1971	7,800	9.95	776	5.20	406
1972	9,000	9.95	896	5.85	527
1973	10,800	11.79	1,273	5.85	632
1974	12,628	15.35	1,938	5.85	739
1975	13,577	15.35	2,084	5.85	794
	1937-1975 Total		$16,155		$6,885

* FICA annualized earnings base where not equal to RRTA annualized earnings base.

1 Includes old age and survivors', disability, and hospital insurance.

2 Excludes supplemental annuity contribution based on hours for which compensation is paid. Supplemental annuity contributions began in November 1966 and were approximately $40/employee in 1967 and $175/employee in 1975.

Source: U. S. Railroad Retirement Board, Bureau of Research, "Tax Rates Under Railroad Retirement, Social Security, and Railroad Unemployment Insurance Acts," (January 1976); U. S. Bureau of Census, Historical Statistics of the United States, Colonial Times to 1970 (September 1975) Series D 746; U. S. Bureau of Economic Analysis, Survey of Current Business (July 1976) Table 6.9.

Railroad Unemployment Insurance Act program, except for a nine year period from the late 1940's to mid 1950's, have always been equal to or higher than the national average for all other employees. In recent years payroll taxes for unemployment insurance coverage have been at least 60 per cent higher for railroad employees than the average for all employees covered by the state and Federally administrated Social Security unemployment programs.

A national pension program administered by the Social Security Administration providing old-age, survivors', and disability benefits became law in 1937.[1] In the same year, after several prior attempts had been invalidated by the courts, a separate retirement system was established for railroad employees only. Thus, since 1937 the rail industry has been covered by one legislated pension plan while all other transportation employees are covered by Social Security. The major differences between these two legislated pension plans have been the level of benefits and the required payroll contributions -- both substantially higher under Railroad Retirement than under the Social Security retirement system. For instance, with respect to employer contributions, the payroll tax rates charged employers under Railroad Retirement were triple those charged other transport modes in 1940. By 1970 the gap had narrowed somewhat, but employer contributions per railroad employee were still almost double those paid by other carriers. The differential had widened again by 1975 with railroads paying a 15.35 per cent payroll tax -- compared with a 5.85 per cent payroll tax paid by other carriers -- on each employee's annual wages up to $14,100.

From the late 1930's into the 1950's the special pension legislation affecting railroads caused them to bear a much higher retirement plan financing burden per employee than was required for other transport industries. Retirees from these other industries, of course, received lower benefits than railroad pensioners. In recent years, however, non-rail transport modes have increased their contributions to private pension plans designed to supplement Social Security retirement benefits.[2] For instance, the largest private pension plan for truckers financed by employer contributions began in 1955. Because of the generous benefits provided by the Railroad Retirement program, few if any railroads have provided private pension plan coverage for hourly rate employees. One effect of the growth in private pension plan coverage has been to increase comparability between the level of benefits received by all transport industry retirees.

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[1] In 1966 coverage was extended to certain health benefits.

[2] Private pension plan coverage did not become widespread until after 1950, the year General Motors initiated a large scale retirement plan for hourly rate employees. From 2,000 private pension plans in force in 1950, the number of plans grew to 10,000 in 1951, and to over 45,000 today. See Peter F. Drucker, The Unseen Revolution, How Pension Fund Socialism Came to America, (New York: Harper and Row, 1976).

Since the mid-1950's when private pension plans started to become prevalent, no comparative analysis has been made of the costs to railroads for Railroad Retirement versus the cost to other modes for combined Social Security and private pension coverage. Available evidence suggests, however, that by the early 1970's retirement costs per employee for rail and motor carriers were about equal.[1] For instance, Figure 38 shows that in 1973, motor carriers subject to the Teamster's Central States pension plan and the railroads paid nearly equal amounts per employee for retirement coverage. Since 1973, however, rail employer contributions have increased markedly to a level 17 per cent higher than the combined payroll tax and pension costs incurred by motor carriers.

Several factors have accounted for the higher costs of providing retirement coverage for railroad employees -- especially before the mid-1950's and after 1973 -- than similar costs incurred by the railroads' modal competitors.[2] First and most obvious is that from 1937 on the railroads have been required by law to make contributions to a pension plan that provided a much higher level of benefits than the almost universal Social Security plan. Second, since 1937 the rail industry has experienced rapidly declining employment with the result that pension plan contributions made by and for a declining number of rail employees have had to finance benefits for a rapidly growing number of retirees. Third, a technical deficiency in a 1951 amendment to the Railroad Retirement Act that unintentionally enabled some railroad workers to draw simultaneous or so-called "dual benefits" from both the Social Security and Railroad Retirement systems placed excess costs amounting to $4 billion on the Railroad Retirement System. Congress has recently passed legisla-

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1 The Welfare and Pension Plans Disclosure Act of 1958, repealed by enactment of the Employee Retirement Income Security Act of 1974 (ERISA), required administrators of private employee benefit plans covering more than 100 employees to file annual financial reports with the U. S. Department of Labor. DOL representatives report that the over 45,000 retirement benefit plans on file pursuant to the former Act have never been subject to an industry-by-industry analysis. It is expected that the more rigorous ERISA reporting requirements will facilitate such an analysis.

2 For a detailed analysis of the formation, development, and funding problems of the Railroad Retirement System, see Commission on Railroad Retirement, The Railroad Retirement System: Its Coming Crisis (Committee on Interstate and Foreign Commerce, 92nd Cong., 2nd Sess., House Doc. No. 92-350, September 5, 1972).

Figure 38

RAILROAD AND MOTOR CARRIER ANNUAL COSTS
OF LEGISLATED AND PRIVATE PENSION RETIREMENT PLANS
PER EMPLOYEE, 1970-1976

	Railroads	Motor Carriers			
	Railroad Retirement Act[1,2]	Federal Insurance Contributions Act[1]		Central States SE and SW Areas Pension Plan[3]	Total
1976	$2,409	$854	+	$1,209	= $2,063
1975	2,261	794	+	1,079	= 1,873
1974	2,094	739	+	949	= 1,688
1973	1,429	632	+	806	= 1,438
1972	1,036	468	+	676	= 1,144
1971	901	406	+	624	= 1,030
1970	859	374	+	559	= 933

[1] Annualized earnings base x employers contribution rates.

[2] Includes RRA supplemental annuity contributions of 2 cents per hour (January-March, 1970), 6 cents per hour (April-June, 1970), 7 cents per hour (July-December 1970), 6 cents per hour (January 1971-June 1972), 7-1/2 cents per hour (July 1972-December 1974), 8-1/2 cents per hour (1975), and 12 cents per hour (1976).

[3] Employers' weekly contribution per employee covered by Master Freight Agreement of the Central States SW and SW Areas Pension Plan x 52.

Source: U. S. Railroad Retirement Board, Bureau of Research, "Tax Rates Under Railroad Retirement, Social Security, and Railroad Unemployment Insurance Acts," January 1976; U. S. Department of Labor, "Employee Welfare or Pension Benefit Annual Report Form D-1," submitted annually by Teamsters Central States, Southeast and Southwest Areas Pension Plan.

tion designed to correct this deficiency, but the relief was not made retroactive.[1]

Due to each of the above described factors, the Railroad Retirement Fund has often been in danger of becoming insolvent. To avoid such an event, railroad employer and employee contributions to the Fund have rapidly increased over the years. The most significant change in contribution levels was enacted as an amendment to the Railroad Retirement Act in 1973. By this amendment the railroads were not only called upon once again to increase their contributions to correct the unstable condition of the Fund, but also to take up the slack caused by a mandated reduction in employee contributions (to a level equal to those paid by non-rail employees under Social Security). Thus, whereas railroad employer and employee contributions to the Railroad Retirement Fund had always been equal up to 1973, the contribution rates per base earnings by 1975 had become 15.35 per cent for employers and 5.85 per cent for employees. Acceptance of this large step increase in railroad contributions by the railroads was facilitated by a provision in the 1973 amendment which authorized a general rail rate increase of about 2.8 per cent phased in over four and one-half months starting in October 1973.

On the surface it would appear that throughout much of the period since the government first enacted universal retirement insurance coverage, the rail industry has been at a competitive disadvantage vis-a-vis other transport modes. Especially prior to the mid 1950's -- when railroad payments for retirement coverage were about three times higher than contributions per employee by non-rail carriers -- the additional payroll

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[1] The 1951 amendment to the Railroad Retirement Act which permitted payment of "dual benefits" and the 1974 legislation designed to eliminate such overpayments (in part, through a $285 million per year contribution to the Railroad Retirement Fund by the U. S. Treasury) involves an extremely complex area of pension law. It should be emphasized, however, that upon passage of the rectifying legislation (Public Law 93-445) Congress concluded that ... "the railroads had no part in the creation of the current (dual benefit) situation. The lost reimbursement to the Railroad Retirement System arising out of individuals becoming entitled to Social Security benefits arises out of non-railroad employment performed by these individuals -- employment that has not benefited the railroad industry in any fashion. A further factor leading to lost reimbursement arises in part out of provisions contained in the Social Security Act -- again matters over which the railroad industry has no control.... It would therefore be unfair to the railroad industry to saddle the carriers with the cost of phasing out the dual benefits." See Report of the Senate Committee on Labor and Public Welfare on H.R. 15301, Restructuring of the Railroad Retirement System (93rd Cong., 2nd Sess., Report No. 93-1163, September 23, 1974) pp. 1-12.

tax burden no doubt had a cost push effect on rail rates and contributed to the rail industry's declining share of intercity freight traffic. The Federal Coordinator's Report to Congress in 1935 carried a warning that:[1]

> The railroad industry is now in severe financial straits and is also meeting widespread and intense competition from other forms of transportation. Its ability to bear additional financial burdens is very limited. There are certain measures for the protection of labor which, however meritorious they may be in abstract principle, cannot be borne by the railroad industry unless they are imposed at the same time upon competitors, or even upon industry generally. An attempt to make the railroads alone carry a burden would cripple them in the competitive struggle, and railroad labor would lose more than it would gain.

The warning went unheeded, most likely because at the time the special legislation was enacted the railroad industry, which was the largest private sector employer, had been forced by the Depression economy to reduce its level of employment drastically. The issue of deleterious competitive effects was not given full recognition perhaps because in the mid-1930's the railroads were the dominant intercity transport mode, carrying twice as much intercity freight as all other modes combined.

Later, when private pension plans for non-rail employees became more prevalent, the payroll tax disadvantage of the rail industry began to diminish and disappear. While it is difficult to substantiate without a detailed analysis of pension cost increases for the other modes, it seems safe to assume that the 1973 amendments to the Railroad Retirement Act have once again placed railroads at a cost disadvantage. As shown in Figure 38, the railroads' retirement tax per employee from 1972 to 1976 rose by 133 per cent and now is about 17 per cent higher than combined Social Security and estimated private pension plan contributions paid by motor carriers for each employee.

It is not possible to estimate what the additional cost of retirement coverage to the rail industry has been or is today. The portion of the rail industry's current $1.0 billion annual payroll tax bill which represents an additional tax burden imposed by special legislation simply cannot be calculated without a fuller understanding of the pension costs of other carriers and without making very broad assumptions about what payroll costs would be today had Congress followed the Federal Coordinator's recommendation in 1935 to include all interstate transportation in a national pension system.

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[1] Report of the Federal Coordinator of Transportation on Transportation Legislation (74th Cong., 1st Sess., House Doc. No. 89) p. 63.

Summary of Tax Policies

The preceding analysis of transportation taxation supports the conclusion that there has not been nor is there now a uniform tax policy applied to all modes. The variability in assessing user charges on modes which receive their rights-of-way through Federal programs is perhaps the most direct illustration of this fact. Since enactment of the 1956 Highway Act and the Airport and Airway Development Act of 1970, motor and air carriers have paid substantial shares of the costs of providing their respective rights-of-way. The most recent estimates indicate that the airlines, who cover roughly 95 per cent of their allocated costs, may be falling short by about $50 million annually,[1] and that trucking has a user charge advantage of roughly $200 million annually.[2] Both figures are subject to correction, especially the latter (calculated in 1969). The highway mode as a whole -- counting all users -- does pay adequate user charges. The domestic water carriers pay no user charges, thus their tax advantage is equal to the full cost of the Federal aid provided, e.g., about $717 million in 1975. (See Figure 29 on page III-25.)

Rail, water and air carriers, from time to time in recent years, have received tax advantages in the form of special Federal tax credits, usually to provide short-term relief for particular problems. While undoubtedly useful to many of the carriers concerned, both the amounts and duration of these tax advantages probably have not been so large as to constitute a serious disadvantage to other modes.

In the railroad case, any advantage from occasional tax credit legislation probably has been offset by other tax inequities such as: (1) the estimated $20 million lost annually by the railroads due to the prohibition against depreciation of grading and tunnel improvements, and (2) the estimated $65 million annual payment of discriminatory state and local taxes. Enactment of recent legislation to eliminate these inequities is an acknowledgment that the tax policies in question were disadvantageous to the railroads. The railroads have also been burdened periodically with payroll tax inequities as a result of the industry's specialized Federal rail labor welfare legislation. At the present time, the railroads apparently are paying approximately 17 percent more per employee in payroll taxes, due to deficiencies in the Railroad Retirement Fund, than firms in other industries pay for employee retirement.

In many respects the largest "disadvantage" to the railroad industry from tax policy stems from the fact that between 1942 and 1962 railroad freight and passenger traffic was assessed $5.1 billion in Federal excise

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[1] U. S. Department of Transportation, Airport and Airway Cost Allocation Study, Part 1 (September 1973) Table 11.

[2] U. S. Department of Transportation, Allocation of Highway Cost Responsibility and Tax Payments, 1969 (May 1970) Table 25.

taxes. These waybill and ticket taxes were, of course, levied for general revenue purposes and were not regarded as user charges. In effect, however, they were a tax on the users of the railroads and it is fair to say that the railroad mode received no direct Federal aid in return. The adverse competitive effect on the railroads was mitigated by the fact that other carriers were subjected to the same taxes at the same rates (and they have been retained for aviation as the primary sources of revenue for the Airport and Airway Trust Fund); however, all regulated carriers suffered a collective disadvantage from the taxes in that private and exempt carriers did not have to pay them.

Chapter V

THE IMPACT OF FEDERAL REGULATION ON RAIL TRANSPORTATION

This chapter discusses, in order, the effects of Federal economic regulation and non-safety-related labor regulation on the railroads. Economic regulation is probably the most complex and controversial subject in the field of transportation. It cannot be dealt with in a comprehensive fashion in these few pages, nor is it intended to be the focal point of the § 902 study. Nonetheless any discussion of direct Federal aid to the railroads and other transport modes which failed to acknowledge the simultaneous impacts of regulation (as well as the economic forces discussed in Chapter II) on their performance would be somewhat artificial.

As the discussion below will outline, the rail industry and the country are generally thought to have benefitted from Federal economic regulation, from its inception in 1887 until the Depression years. Thereafter, as many of the economic and demographic changes discussed in Chapter II began to gain strength and the entirely new transport technologies -- automobile, bus, truck, airplane, pipeline, and diesel barge -- began to flourish, generalizations are much harder to sustain. However, there appears to be a consensus that in the post-World War II period, when the railroads were having great trouble adjusting to the above-cited forces of economic change and competition -- and were sustaining grave traffic and revenue losses -- they were disadvantaged by the operation of the regulatory system applied to them, whereas their competitors either benefitted from regulation, were relatively unaffected by it, or were exempt from it. Although important mitigating steps were taken in Federal rail legislation enacted in 1973 and 1976, railroad regulatory system modernization remains a high priority objective today.

The railroads were the first mode to be regulated. Excepting pipelines, almost half a century passed before regulation was extended to other forms of transportation. The structure, concepts, and practices of rail regulation were transferred to the other modes more or less intact, but frequently with fewer restrictions or obligations than were applied to the railroads.

The single most significant general observation that can be made with respect to the economic regulation of the various modes is that the railroads are subject to complete economic regulation, whereas their principal competitors are not. The following table on page V-2, using 1974 ton-mile statistics as the standard, illustrates the point.

Aviation, of course, is 100 per cent regulated, but is without serious commercial intermodal competition in its passenger services (excluding

INTERCITY FREIGHT SHARES BY MODES, 1974
(Billions of Ton-Miles)

	Total Ton-Miles	Regulated Ton-Miles	Per Cent Regulated
Rail	860	860.0	100.0
Pipeline	506	430.1	85.0
Truck	495	217.8	44.0
River and Canal	183	30.2	16.5
Domestic Deep Sea	323	20.3	6.3
Great Lakes	79	0.3	0.4

Source: Transportation Association of America, Transportation Facts and Trends (Twelfth Edition, July 1976) pp. 8-9.

unregulated Northeast Corridor rail service) and its air cargo tonnage remains comparatively small (less than two-tenths of one per cent of total intercity ton-miles).

The portrayal in Chapter II of the vast economic and demographic changes which have swept the country since the Civil War serves an important contextual purpose in approaching the problem of transportation regulation. As quaint as it may sound in 1976, the two dominant influences on the transport regulatory system in place today are the rise of the giant industrial corporations in the late nineteenth century and the Great Depression of the 1930's. Perhaps no simpler illustration of the basic present-day argument about regulation can be found. It would be a minor miracle if an institutional system addressed to the economic conditions of those much earlier and highly distinctive periods in American history was well-suited to the complex and dynamic economy that challenges our ingenuity today. The regulatory system has not changed in step with the world around it and the resulting tension and friction has served to surface the substantial public debate about the future of regulation which has characterized much of the 1970's.

As noted, the railroad role in transportation regulation is particularly crucial, in part because it was the first industry to be regulated and in part because the experience with railroad regulation tended to dominate the theoretical and practical considerations which led to the subsequent partial regulation of the remaining surface modes and to aviation regulation.

Monopoly and Competition

The railroad industry qualifies as perhaps the first example of Big Business known in America. There was no extant first-hand experience in dealing with large and powerful industrial organizations in the country when the railroad industry developed. The Interstate Commerce Act of 1887 was created specifically to deal with an industry generally believed to be a major force in American economic life. Indeed, enactment of the Interstate Commerce Act, which preceded the Sherman Antitrust Act by three years, represents really the first Federal effort to constrain the behavior of a major industry.[1] The country was extremely dependent on the railroads for communication and transportation services of every description. The railroads' decisions to provide or withhold such services were, in an economic sense, matters of life or death. Abuses flourished and momentum built from several sources for some measure of public control. Isolated areas, small communities, small shippers, and especially farmers -- who ultimately achieved collective expression through the Granger movement -- demanded protection against inequitable treatment at the hands of the industry which monopolized their access to the outside world. Moreover large shippers were showing an ability to disadvantage smaller competitors by means of their power to negotiate preferential rates and services from the railroads.

Regulation, though, was not merely a reaction to public protest against what were felt to be unfair or discriminatory practices. It also reflected the desire of rail carriers who sought protection from several perceived threats. Chief among these was excessive intramodal competition -- manifested by endless rounds of rate-wars in key markets -- that consistently frustrated carrier attempts at pooling traffic and revenues.[2] Apart from this major concern, the railroad industry was also deeply disturbed about the consequences of labor unrest (especially in the aftermath of the so-called Great Strike of 1877) and by the Granger movement and efforts to establish decentralized regulatory systems at the state level in contrast to a uniform national system. Fearing an alliance between these anti-rail forces, the industry regarded Federal regulation as a much more acceptable alternative:[3]

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[1] Until 1920 the railroad industry was also subject to the antitrust legislation. The Interstate Commerce Act, of course, post-dated state regulation of the railroads in the Granger states during the 1870's.

[2] Robert M. Spann and Edward W. Erickson, "The Economics of Railroading: The Beginning of Cartelization and Regulation," Bell Journal of Economics, and Management Science (Autumn 1970) p. 229.

[3] Gabriel Kolko, Railroads and Regulation, 1877-1916 (Princeton: Princeton University Press, 1965) pp. 231-237. Cf. James C. Nelson, "The Changing Economic Case for Surface Transport Regulation," in James C. Miller, III, Perspectives on Federal Transportation Policy (Washington, D. C.: American Enterprise Institute for Public Policy Research, 1975) pp. 8-10.

> The railroads realized that they needed the protection of the federal government, and they became the leading advocates of federal railroad regulation on their own terms. The principle of federal railroad regulation per se was accepted by an important segment of the railroad community by 1880, and the relative importance of this group increased gradually over the period until, by 1916, it included the vast majority of railroad men....

Two sets of interacting forces thus gave rise to the passage of the Interstate Commerce Act and its early amendments. First, as the adoption of state rail regulation in the Granger region made clear, control over railroad pricing and related practices was politically inescapable. With the decision of the Supreme Court in the Wabash case in 1886 declaring that states could not regulate interstate rail transportation, a response at the Federal level was to be expected.[1] Second, the railroad industry itself came to see in regulation -- especially Federal regulation -- a means of securing protection from fragmented state control while bringing a degree of stability to the industry itself.

Thus the railroad industry on the eve of enactment of the Interstate Commerce Act was characterized by: (1) the ability to exert immense monopoly power in some geographic locations and against some classes of shippers or consumers, and (2) intense, uninhibited price competition -- occasionally with the water mode, but extensively between railroads -- of the most debilitating nature in other geographic and commercial settings. This "monopoly" industry clearly was not the classic pure monopoly but rather more like an oligopoly. It presented a fascinating study of contrasts and contradictions, a volatile mixture of both unbridled monopoly power and unbridled competition.

The Purposes of Regulation

Reflecting these conditions, the Interstate Commerce Act was written with two basic purposes in mind: the elimination of discrimination against commodities, persons, places, and firms desiring transportation services and the stabilization of the day-to-day operation of the rail industry, i.e., the end of cutthroat intra-industry competition. To the public, regulation thus meant a check on railroad rates (and hopefully lower rates that could benefit farmers and other interests whose ability to market their goods depended heavily on the cost of transportation) and a curtailment of discriminatory practices. To the railroad industry regulation brought the prospect of stability and some restraint of competitive warfare. Note that these quite distinct objectives imply little overt concern with questions of efficient resource allocation or of the minimization of what economists sometimes call social costs. Regulation has its roots not in economic theory or a desire to bring

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[1] 118 U.S. 557.

railroad rates in line with the competitive optimum, but rather in quite different concerns, predominantly social, political, and protective in character.

Viewed in this historical perspective it can be seen that much present day criticism of the effects of regulation -- stemming from a belief that regulation leads to a misallocation of resources and inefficiency in the provision of transport services -- is ill-adapted to the original purposes of regulation. Because regulation of transportation, and especially of rail transportation, traces to quite different and significantly non-economic origins, the application of rigorous economic evaluation is, in a sense, inappropriate. Today's values, in a technology and capital intensive industrial economy, are dominated by the issues of proper allocation of resources and the efficient use of the resources so allocated. The legal structure, procedures and rhetoric of the regulatory system created in 1887, despite periodic amendment, remains fundamentally premised on dealing with matters of discrimination, equity, stabilization of commercial activity, and the achievement of social welfare objectives. The modern criticisms and the ancient system have difficulty communicating or finding a basis for relating to each other.

Regulation and Pricing

The Interstate Commerce Act of 1887 had remarkably little to say about rates -- only that they must be "just and reasonable." It was not until: (1) the Hepburn Act in 1906 that the ICC was empowered to prescribe maximum rates (upon complaint, after the Commission had found an existing rate to be unlawful),[1] and (2) the Transportation Act of 1920 that the Commission was authorized to set minimum rates. The pricing system in effect in the railroad industry when the ICC was created was called "value of service" pricing, a formulation under which low rates, sometimes below cost, usually were charged on relatively low value bulk commodities (from the agriculture and mining sectors) and much higher rates were charged on higher value manufactured items. In effect, any losses on the bulk traffic were supposedly covered by a cross-subsidy from the profits earned on the manufactured traffic. The choice of prices charged thus was geared primarily to the demand characteristics of the product in question -- "what the market will bear" -- not to the actual cost to the railroads of transporting that item.

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[1] The Supreme Court ruled in Interstate Commerce Commission v. Cincinnati, New Orleans and Texas Pacific Railway Co., 167 U.S. 479 (1897) that the Commission could declare a rate unlawful but could not prescribe a maximum lawful rate in its place as a guide to the shipper and carrier adversaries. The Hepburn Act gave the Commission the right to prescribe a maximum rate, but not the precise rate, which then remained an issue between the railroads and shippers so long as it did not exceed the maximum. The Commission's present authority to prescribe rates has been considered in Ayrshire Colleries Corp. v. United States, 335 U.S. 573 (1949).

In economic terms, the railroads recognized that transportation charges on grains and similar bulk items accounted for a substantial portion of the final cost of those products to consumers. If the transport charges were too high, prices would rise, demand for the bulks would fall, and the railroads would lose traffic. Given their heavy investment in fixed plant, and an awareness that every incentive was needed to encourage traffic growth in the underdeveloped sections of the country where many railroads were built, any traffic that covered the direct or out-of-pocket costs of moving it and also made a contribution to overhead (however small) was desirable traffic. This traffic benefitted other traffic as well in the sense that other commodities would be relieved of some of the burden of covering fixed costs.

By the same token, manufactured goods were typically much higher-priced items and transportation accounted for a much lower proportion of their final price to consumers. In these circumstances, the railroads normally could raise their charges without undue danger of affecting the volume of traffic. Here railroads would seek to cover in the rate not only the out-of-pocket costs of providing the service but also a full share of their substantial fixed costs (and hopefully a profit beyond); thus the rate more than adequately covered their total or fully allocated costs. This was important, not only to provide a subsidy for bulk traffic but, in the days of large-scale railroad construction, to enable the roads to earn a sufficient return on their capital which, as noted previously, often had to be invested in locations well in advance of the existence of a demand for transportation that could produce adequate revenues.

In a nation with virtually no other interstate form of transportation (excepting the Great Lakes and some rivers and canals) and with national development (political and economic) a widely shared public objective, this pricing system was especially effective. It facilitated as well, in rough-justice terms, the transfer of capital from the more affluent and industrialized East and North to the less developed but highly promising South, Southwest and West. It is generally accepted that rate increases on farm commodities and raw materials would have retarded the development of the latter regions by reducing incomes there.[1] Moreover, it was good for the railroads, given the nature of the industry's cost structure. A stabilized railroad industry enabled the

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[1] See Ann F. Friedlaender, The Dilemma of Freight Transportation Regulation (Washington, D. C.: The Brookings Institution, 1969) p. 15 and James C. Nelson, "A Critique of Governmental Intervention in Transport," in Joseph S. De Salvo (ed.) Perspectives on Regional Transportation Planning (Lexington, Mass.: D. C. Heath and Co., 1973) pp. 233-234.

railroads to play their presumed central role in the economic life of the country:[1]

> The rate structure that maximized the railroad profits was also the rate structure that encouraged the development of the West. At that time, regulation unquestionably served important social goals and created few, if any, losses in terms of economic efficiency.

The ICC adopted and nurtured this system of price discrimination between low and high value commodities, while simultaneously prohibiting discrimination on the basis of person, firm, place, or commodity. Indeed it has been said that the ICC "legalized, legitimized, and systematized the value-of-service rate-making"[2] in railroading, oddly enough at a time when it was being rejected in much of the rest of the economy under antitrust legislation. The cost aspects of providing transportation services by and large were ignored by the railroads, shippers and the ICC:[3]

> It took the I.C.C. a remarkably long time to develop any interest in the absolute or relative cost of moving freight in general, or of moving one commodity as compared with other commodities, or of moving freight in one part of the country or in one direction or over one route as compared with costs elsewhere. This reticence about costs was shared, in public statements at least, by the nation's railroads. And it met with remarkably few challenges from shippers. For all three groups, the danger of rocking the boat was deemed to be more important than the danger that the boat might be badly-constructed, or sailing in the wrong direction, or sinking.

The desire to protect against discrimination was so strong that the Commission repeatedly rejected the requests of some railroads to offer lower rates on volume shipments, even when costs fully warranted the reductions. Such rates were felt to discriminate against small shippers

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[1] Friedlaender, op. cit., p. 16. See also John R. Meyer et al., The Economics of Competition in the Transportation Industries (Cambridge: Harvard, 1959) pp. 168, 173 and 186, and D. Philip Locklin, Economics of Transportation, 6th edition (Homewood, Illinois: Richard D. Irwin, 1966) pp. 149-152.

[2] Meyer et al., op. cit., p. 179.

[3] James R. Nelson, "Potential Transportation Costs of Moving to Greater Reliance on Competition in Transportation" in Allen R. Ferguson and Leonard Lee Lane (eds.) Transportation Policy Options: The Political Economy of Regulatory Reform (Washington: Public Interest Economics Foundation, 1976) p. 101.

and the law was interpreted rigorously to prohibit it. Many have seen in actions such as this one the early roots of the alleged negative influence of the regulatory system on railroad technology and railroad innovation.

On balance, however, in the decades following enactment of the Interstate Commerce Act, the country and the railroads appeared to benefit from an atmosphere of comparative stability. As noted in Chapter II, railroad expansion roared ahead and at the outbreak of World War I the railroad industry was king. Perhaps more than the land grants, government involvement in providing a "rules of the game" structure for controlling unlimited head-to-head competition between railroads contributed to the establishment of the industry as a mature, profitable and effective local, regional and transcontinental transport mode. Nevertheless, by 1920 a very significant change was in the making:[1]

> [T]he rise of new modes was changing intercity transport from an industry of many monopoly markets and cartel rate-making into one of pervasive competition, with monopoly markets gradually becoming exceptional.

The Transportation Act of 1920

As the United States emerged from World War I, the future implications of the new modes for rail transportation were not understood and the ravages of the Depression were not even imagined. Nonetheless a realization that the role of the railroads was in the process of change was embodied in the Transportation Act of 1920, which was passed coincident with the return of the railroads to private management following the end of World War I.[2] Although they were bigger than ever and many believed that they were virtually a public utility with extensive monopoly power in transportation, there was also growing recognition that unduly restrictive regulation could impair the vitality of the railroads. General price increases just prior to World War I, not matched by ICC-approved rate increases, had impaired the railroads' credit situation and several went into bankruptcy. Since no rate increases were permitted during the war, but costs had greatly increased, the railroads entered the postwar period in an unsteady position.

In recognition of these facts, Congress gave the ICC the additional responsibility to assure the railroads an opportunity to earn what was believed to be an adequate income. The first three decades of regulation had been devoted to the correction of alleged railroad abuses, with a strong tilt toward assisting transportation users. Now, through the Transportation Act of 1920, a new more or less promotional dimension focusing on the importance of carrier economic health was added.

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[1] James C. Nelson, "A Critique of Governmental Intervention in Transport," p. 233.

[2] During the war the government nationalized operation of the industry -- in part a testament to the railroads' critical value to the economy and the defense effort -- and guaranteed it against loss.

Although the 1920 legislation served to extend ICC authority significantly, it also gave the Commission a more positive, pro-carrier orientation and triggered -- for the period 1920-1933 -- what Professor Locklin has called "The Period of Affirmative Control."[1]

The Transportation Act of 1920 greatly amplified the powers of the ICC and even established a commercial barge line under the aegis of the Corps of Engineers to demonstrate the competitive potential of the waterways. According to Kolko, "The Transportation Act ... was the logical culmination of [the railroads'] more than forty years of agitation and education for comprehensive federal railroad regulation designed to provide rationalization and stability to the industry."[2] The ICC was given authority to establish minimum rates, permit pooling, exempt the railroads from the antitrust laws, oversee railroad boards of directors and the issuance of railroad securities, approve the construction and/or abandonment of trackage, produce a master plan of railroad consolidations, overrule state regulatory commissions on certain issues, and even to set rates (as in the public utility industries) so as to produce a "fair" rate of return on the railroads' investment. Many of these accretions of authority were recommended by the rail industry, which had found itself under increasing attack by state regulatory commissions while observing that regulation by the ICC up to that point had been relatively cordial.[3]

The distinguishing features of the new policy expressed by the 1920 Act were the encouragement of rail mergers and the definition of a basic rate-making standard. The railroads, for roughly seventeen years following enactment of the Interstate Commerce Act, indulged in a great deal of consolidation and merger activity. During the period 1904-1920 the government moved effectively to stop an apparent trend to monopolization of the industry by a small number of large holding companies.[4] The 1920 Act looked more favorably on railroad mergers

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[1] Locklin, op. cit., p. 259.

[2] Kolko, op. cit., p. 227.

[3] Ibid., pp. 202-207 and 224-226. The Railroad Executives' Advisory Committee was active in formulating and propagating industry views. Kolko also disputes strongly the conventional economics textbook and historians' explanation that the railroads bitterly opposed the Hepburn Act of 1906, which tightened the 1887 Act by enabling the ICC to prescribe maximum rates, require 30 days notice of rate changes, prevent the railroads from carrying products which they owned or in which they had an interest, and make its orders binding on the railroads without a court order. He cites evidence to support the notion of substantial rail industry support for the Act. Cf. Kolko, pp. 126, 131, 138-151 with Locklin, op. cit., p. 215 for contrasting views.

[4] The most renowned cases decided at the Supreme Court were Northern Securities Company v. United States 193 U.S. 197 (1904) and United States v. Union Pacific Railroad Company, 226 U.S. 61 (1912).

on the theory that the earnings capacity of the industry would be strengthened if weak roads could be consolidated in order to strengthen themselves, or if weak roads and strong roads could be combined to achieve the same purpose. The new legislation relieved the consolidating carriers of antitrust law exposure if the ICC approved their plans and it instructed the Commission to devise a master consolidation plan to guide the railroads toward a more desirable industrial structure. The guiding principle for the new structure was to be creation of a relatively small number of large railroad systems of approximately equal earning power. The ICC plan was published in 1929 and revised in 1932, but failed because the Commission could not compel its acceptance:[1]

> This rather ambitious attempt to assert a predominant Federal role in regional rail system development came to naught largely because the railroads wanted no part of it.

The railroads were not prepared to accept a Federal master plan voluntarily and the government was not prepared to impose such system planning, on a mandatory basis, over the industry's objection. The principal Federal agency concerned -- the ICC -- given "the universal nonacceptance of its proposed restructuring plans ... withdrew to a position where it did little more than pass on [subsequent] proposals on an ad hoc basis."[2] The "weak road" problem has remained to bedevil the industry, climaxing in the northeast and midwest rail bankruptcies of the 1960's and 1970's, and leading to both ConRail and the Title IV merger reform provisions of the Railroad Revitalization and Regulatory Reform Act of 1976.

The second important harbinger of the new policy was Section 15a of the Interstate Commerce Act, customarily called the Rule of Rate-Making. It provided that the ICC, in prescribing just and reasonable rates, should do so in a fashion that would enable "carriers as a whole ... [to] earn an aggregate annual net railway operating income equal, as nearly as may be, to a fair return upon the aggregate value" of their property.[3] This concern with generating carrier earnings, as opposed to lowering rates for the public, was a major breakthrough for the railroads.[4]

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[1] See George M. Stafford, Chairman, Interstate Commerce Commission, "Government's Role in the Development of a Sound Regional Rail System," (An Address to the Ozarks Regional Commission Regional Rail Freight Conference, Kansas City, Missouri, December 12, 1975) pp. 5-6. The Commission's planning authority was repealed by the Transportation Act of 1940.

[2] Ibid.

[3] In so doing Congress accepted for the railroad industry the validity of the Supreme Court's standard for determining general rate levels for public utilities, expressed in Smyth v. Ames in 1898 (169 U.S. 466).

[4] See, for instance, Locklin, op. cit., p. 346.

Congress prescribed 5-1/2 per cent as the fair rate for the first two years and the ICC later added one half of one per cent. A recapture clause required that railroads earning more than the six per cent industry average would have to contribute half of any excess to an industry contingency fund (to make loans to weak railroads for capital investment or to refinance maturing debt) or invest the same amount in equipment for lease to the weak roads. The other half of excess earnings had to be placed in a reserve fund which the carrier could use for interest, dividends and rentals only in years when its earnings fell below the six per cent target. By establishing a loan fund for weak roads and channeling funds to a reserve fund intended to stabilize interest and dividends on the strong roads, Congress hoped to support (by statutory fiat) the credit posture of the rail industry.

Section 15a, of course, was not a Federal guarantee of a "fair return" nor could it be used to justify a rate increase in years when the rate of return fell below the fair return. Since the railroads were not a true monopoly (because of intra-industry competition) and were growing increasingly less like one in the presence of truck, auto and water competition, there was no way that the government could insure a combination of passenger patronage and freight revenue sufficient to yield a six per cent return on investment. The railroad failures and bankruptcies of the Depression years underscored the absurdity of this conception; indeed, Congress repealed the fair return and recapture provisions and had to pass special bankruptcy legislation in 1933 to prevent creditors from taking over the railroads and dismantling them.[1] Traffic volume and revenue fell precipitously during the Depression years. The ICC granted a few rate increases, largely to try to forestall more bankruptcies, but the railroad outlook was desperate:[2]

> There was general recognition of the fact that the railroads could not, under the conditions of general economic depression and increased competition from other modes of transport, expect to earn a fair return upon any conventional measure of their fair value.

The Depression Trauma

The Great Depression served to reinforce and broaden one aspect of the composite of forces which had prompted creation of the regulatory system in the 1880's. It resulted in massive amounts of excess capacity in all sectors of the economy, unemployment on a scale now legendary, and the creation -- in many industries -- of the excessive competition which had in part characterized the railroads just prior to regulation.

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[1] In 1932 railroads accounting for 72 per cent of system mileage failed to earn sufficient revenue to cover their fixed charges. The new Section 77 added to the Bankruptcy Act of 1898 was designed to facilitate railroad financial reorganization. See Locklin, op. cit., pp. 244-245 and 550-555.

[2] Locklin, op. cit., p. 349.

Much of the New Deal legislation -- the National Industrial Recovery Act, Agricultural Adjustment Act, Robinson-Patman Act, and the Motor Carrier Act of 1935 -- was "based on a common desire to limit entry, to control price reductions, and to maintain discipline in an industry so that the remaining firms could enjoy adequate profits."[1]

Competition became virtually un-American in this setting, representing for millions some of the most destructive tendencies in the Nation's economic and social framework. Accordingly the ICC gradually moved from an historically dominant preoccupation with preventing discrimination, controlling maximum prices and insuring reasonable competition, in order to correct monopoly abuses against the public, to a rather serious effort to protect the common carrier against abuse, largely by attempting to limit competition both within modes and between modes. Control of entry (particularly in the motor and water carrier industries) and the regulation of minimum rates tended to become the primary regulatory instruments for this purpose.

The Depression experience cast immense doubts on the validity of competition as a workable doctrine and put a premium on achieving control of economic forces in the name of stability and reason. Ironically, in transportation -- historically troubled by problems of monopoly -- competition due to natural causes was about to intensify. In a chronological sense, the Depression conveniently marks off the initiation of the new surface transportation modes -- automobiles, buses, and trucks -- technologies (shortly to be joined by increased use of pipelines and modern inland water carriers) that were to crumble the facade of railroad dominance of the transport sector.

The fully regulated railroad industry, sensing the growing competitive significance of trucking, began an intensive campaign in the post-World War I era to bring this mode under regulation.[2] Between 1925 and 1935 thirty-seven bills to regulate interstate trucking were introduced and defeated in the Congress.[3] They were generally opposed by a coalition of truck operators, truck manufacturers, and shippers. The bitter intensification of intramodal and intermodal competition caused by the Depression led the Federal Coordinator of Transportation, supported by the ICC, state regulatory commissions, labor unions, large trucking companies and some shippers who favored rate stability, to

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[1] Friedlaender, op. cit., p. 21.

[2] There were 158,500 trucks registered in the United States in 1915, 1.1 million in 1920, and 3.7 million in 1930.

[3] Department of Transportation, "Chaos Will Not Occur - Background Paper," published in House Committee on Interstate and Foreign Commerce, Transportation Act of 1972, Hearings, Part 1, 92nd Cong., 2nd Sess., p. 247.

recommend motor carrier regulation.[1] Congress partially obliged in 1935. Continuing railroad protests about barge and other water competition and the formal recommendation of the Federal Coordinator, supported by the ICC, led to some regulation of the inland water carrier industry in the Transportation Act of 1940.

There were, however, several important exceptions in the regulatory coverage of the trucking and water carrier industries. The agrarian and mining interests, proponents of rail regulation in the 1870's and 1880's, succeeded in exempting agricultural and fishery commodities from trucking regulation and virtually all bulk commodities from barge regulation. Congress, ever sensitive to the philosophy of low rates on farm products, assented. It was also argued that leaving agricultural and other bulk products carried by trucks and barges outside the regulatory arena would insure two additional sources of downward pressure on rail rates for those commodities -- attesting to the strength of the traditional view of railroads as the dominant mode. Moreover private carriage by truck and barge were made completely exempt from regulation and both the trucking and water carrier industries were authorized to include so-called "contract carriers," a category of moderately regulated carriage with substantial degrees of flexibility vis-a-vis common carriers in all modes. The unregulated carriage is significant, accounting for 56 per cent of total intercity trucking ton-miles and 83.5 per cent of domestic water carrier ton-miles in 1974.[2] The combination of their technological advantages and freedom from regulation have made the unregulated carriers popular with shippers and potent competitors for the railroads and other common carriers.

The regulated segments of the trucking and waterway industries were given a set of legal rules and procedures directly modeled on the railroad experience. Much of the same statutory language was transferred intact, although neither mode was required to accept as many detailed obligations and restrictions as the railroads. Of particular significance, the rail rate structure became the basis for the trucking and water carrier rate structures, e.g., their rates literally were based on the existing level of railroad rates, in part because there was no time to create new rate structures from scratch and in part because barge and truck rates could not avoid relating to rail rates. This was, however, a recipe for future confusion because the cost structure of the trucking and barge industry is completely different from that of the rail industry. For both the ratio of variable costs to fully allocated

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[1] Ibid., and James C. Nelson, "The Changing Economic Case for Surface Transport Regulation," pp. 14-16. Trucking was especially amenable to easy entry because of the low capital cost of equipment. Large numbers of the unemployed were attracted to trucking during the Depression and they rapidly demonstrated this mode's ability to divert traffic from the railroads.

[2] Transportation Association of America, Transportation Facts and Trends (Twelfth Edition, July 1976) p. 9.

costs is high because they have remarkably little fixed private investment.[1] The railroads are characterized by far greater fixed costs and the need to price to cover them. Pricing disputes soon became commonplace.

Motor carrier regulation, reflecting the chaotic Depression-era conditions which spawned it, emphasized the creation of a class of common carriers. Questions pertaining to the acquisition of certificates or additional operating authority became the focus of regulatory controversy and still make up a substantial proportion of the ICC's regulatory workload.[2] To be a common carrier, a firm is required to have an operating certificate which specifies points or areas served, routes to be followed, and commodities which can be carried. Rates must be reasonable and not unjustly discriminatory and the ICC may prescribe maximum, minimum and actual rates.[3] Contract motor carriers, who operate under contract to specified shippers, are "regulated," but with more freedom because they do not have common carrier obligations. They must publish and adhere to their rates, but the Commission has power only to prescribe their minimum rates.

The structure of water carrier regulation, in law, follows the rail and truck pattern very closely, as far as it goes. Among the significant differences are that common carrier barge lines are not subject to financial regulation and need not seek approval to abandon service. Contract carriers, who operate under permit, have to publish and file their minimum rates, but need not publish their actual rates (they cannot charge below the published minimum). The ICC may prescribe minimum rates, but not maximum rates. A carrier is forbidden to hold both a common carrier certificate and a contract carriage permit unless authorized to do so by the ICC. Regulation of inland water carriers was undertaken initially to prevent development of an excess of competition, but the Commission has recently been reasonably liberal in granting certificates or authorizing existing carriers to operate more widely on the waterways.[4]

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[1] As noted above, one of the benefits of Federal right-of-way expenditure was to convert trucking fixed charges into a variable cost and to eliminate such charges for barges altogether.

[2] See William B. Saunders, "Should We have De-regulation - or Re-regulation," Traffic World (January 27, 1975) p. 65.

[3] Regulated motor carriers are free of several restrictions that apply to railroads. For instance, truckers do not seek approval to abandon service, cannot be forced to establish through routes and joint rates, and are not subject to a long and short haul clause.

[4] Locklin, op. cit., p. 755. For a remarkable string of recent cases in which the Commission overrode administrative law judge decisions not to grant expanded operating rights, and granted most of what was sought, see: 343 ICC 412 (Div. 1, April 20, 1973), 343 ICC 422 (Div. 1, April 27, 1973), 343 ICC 509 (Div. 1, July 2, 1973), 344 ICC 235 (Div. 1, August 29, 1973), and ICC No. W-406 (Sub-No. 11) granted by Div. 1, January 27, 1976.

The nature of the long-term relationship among the surface transport modes as they struggled to emerge from the disastrous Depression years was obscured by World War II. The railroads were given intensive use during the war years, achieving shares of total intercity traffic at or near the 70 per cent level which they were never to see again.[1] The war strained the rail plant and in the post-war years, as noted in Chapter II, rail traffic and rail revenues plunged to new lows.

In the post-war years the railroads were to be caught up in a radically different environment than that which had characterized their early period of growth and the relative affluence of the pre-Depression years. The economy itself would be changing in composition under the pressure of technological and other forces while the geographic distribution of population and of business activity would be reflecting new, more diffuse patterns. Accompanying these significant dimensions of change (dealt with previously in Chapter II) was a profound alteration in transportation. The railroads, which once reigned supreme, were now to be confronted with potent competition from other technologies operating in modes which were subjected to less economic regulation. Where competition in transportation once had essentially meant competition among railroads, now it was to be denominated by intermodal rivalry involving, not just regulated common carriers, but contract, exempt, and private operations making use of non-rail modes. At this juncture in the evolution of the American transportation system, then, when the railroads were confronted with an imperative need to compete with their modal rivals, especially in rates and service innovations, a scheme of regulation which had emerged in earlier and now outmoded circumstances undeniably played a role in disadvantaging the railroads.

The role of economic regulation during the post-war decline of the railroads and the post-war surge of the other modes is well illustrated by reference to two topics: rate regulation and rail system capacity.

Rate Regulation

In the years following the end of World War II there was no change in the fundamental precepts of the regulatory system. Rate regulation continued to be permeated by the value of service tradition, the historical commitment to discriminate in favor of bulk commodities and rural areas, the Depression-induced belief in stability, fear of competition, and conservation of the common carrier, and repeated reference to broader national goals such as general economic development and national defense.

At the same time it became evident that our multimodal transportation system was becoming increasingly competitive and that in a free enterprise system the preferred mechanism for achieving the most beneficial allocation of resources to transportation, and the most efficient

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[1] See Appendix Table 1.

utilization of these resources, was greater reliance on the dynamics of the marketplace. In particular, it became clear that transportation rates ought to bear a much closer relationship to the costs of the service provided. Granting the difficulties of determining costs precisely, economists argued persuasively that rates which approximated the variable costs of providing the service should be regarded as reasonable. This approach was essential to the railroads because new rail services priced to cover the direct costs of those particular services could often compete with services provided by the other modes; however, if the railroads were required to add into the rate an additional increment in order to reflect fixed costs for their often excessive rail system capacity, such fully allocated cost-based rates would frequently insure that the railroads lost out to truck or barge competition. Indeed, the sound policy, particularly for railroads, is to permit rates that are less than fully allocated cost, but higher than variable costs, in order to encourage more complete useage of rail plant. The painfully slow acceptance of this principle by the railroad regulatory system -- and it persists to some extent to this day -- was a major handicap to effective adjustment by the railroads to the major economic, demographic and competitive forces which have dominated the last three decades. A brief discussion of some of the rigidities in the economic regulation of the railroads follows.

Non-Cost Factors. The role of non-cost factors in rate-making, such as those involved in the value of service philosophy, did not attenuate over time. Rather there was a decided tendency for Congress to require the ICC to take an even broader range of non-cost -- and for that matter, non-transportation, factors -- into account in railroad rate-making. Involved here was an attempt through rate regulation to achieve a broad array of policy objectives by manipulating railroad rates -- objectives such as regional development and alleviation of the problems of distressed industries. Although, as we shall see, much of the legislation enumerating the Commission's authorities and responsibilities in this regard was enacted by 1940, the outlook which it engendered was to exert considerable influence up to the present day.

As early as 1890, for example, the Senate directed the ICC to investigate rail freight rates in connection with agricultural depression in the Midwest, following which the Commission recommended rate reductions on corn, wheat, and flour.[1] In 1921, again citing the depressed condition of the agricultural sector, the ICC asked the railroads to reduce rates on livestock and grain.[2] And in 1925 the Hoch-Smith Resolution was enacted into law formally to direct the ICC:[3]

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[1] Sec. 4, ICC 48 (1890).

[2] See Friedlaender, op. cit., pp. 13 and 16-19 and Meyer et al., op. cit., p. 183.

[3] 43 Stat. 801 (1925). Although the Supreme Court subsequently described this preferential language in behalf of agriculture as "more in the nature of a hopeful characterization of an object deemed desirable, than a rule intended to control rate making," the ICC has used it on a number of occasions to justify low rates on farm products. Ann Arbor Railroad Co. v. United States, 281 U.S. 658 (1930).

> In view of the existing depression in agriculture, ... to effect with the least practicable delay such lawful changes in the rate structure of the country as will promote the freedom of movement by common carriers of the products of agriculture affected by that depression ... at the lowest possible rates compatible with the maintenance of adequate transportation service....

Hoch-Smith, however, moved beyond the traditional preoccupation with farming to obligate the ICC to take into account in rate-making "the conditions which prevail in our several industries ... to the end that commodities may freely move" (emphasis supplied). This was an invitation to use rates, if necessary, to assist any depressed industry or depressed section of the country. The Supreme Court affirmed that "conditions in a particular industry may and should be considered along with other factors in fixing rates for that industry and in determining their reasonableness."[1] The Commission frequently prescribed low rates so that commodities would "move," rather than fail to reach the market, and if transport costs were not covered while making such moves, it was expected that somehow they would be recouped from higher valued traffic.

When the railroads represented the near-monopoly form of transportation there was some reason to believe that through selective Commission-approved rate differentiation, "losses" on certain traffic might be made-up through adjustments on other traffic. As soon as intermodal competition became a significant factor in transportation, however, railroad rates became increasingly constrained by competitive pressures. Barge (and pipeline) modes brought low-cost technologies to the market for the movement of low-valued bulks while trucking inhibited the ability of the railroads to raise rates for higher-valued commodities. No longer could it be assumed that rail rates could be readily increased to offset unremunerative (or only marginally beneficial) traffic, and even at the low-rated end of the traffic spectrum other modes were often able to quote highly favorable rates. Despite this radical change in transportation circumstances -- all traced to the rise of intense intermodal competition -- rate regulation continued during the post-war years implicitly to assume that the railroads were still in a monopoly position and could adjust rates to satisfy assorted policy goals, while still surviving as economically prosperous entities. Indeed, in 1961 it was estimated that 22 per cent of rail freight was still moving at rates that did not cover the variable cost of shipping it.[2] Interestingly, a more recent study for the year 1972 -- the so-called "Burden Study" -- produces virtually the same estimate (21.5 per cent) of traffic carried below variable cost.[3] The Burden Study also estimates that about 9.5 per cent of rail revenue is derived from such traffic.

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[1] 281 U.S. 658, 667 (1930).

[2] See Friedlaender, op. cit., p. 24.

[3] Interstate Commerce Commission, Rail Revenue Contribution by Commodity and Territory for the Year 1972 (Statement No. 153-72, April 1975).

Finally, the Hoch-Smith resolution instructed the Commission to review rates giving:

> ... due regard, among other factors, to the general and comparative levels in market value of the various classes and kinds of commodities ... over a period of years, to a natural and proper development of the country as a whole, and to the maintenance of an adequate system of transportation. [Emphasis supplied.]

This authorized the ICC to consider, according to its own judgment, what overall national development needs might be and to set transportation rates so as to serve those needs.

The capstone on this accumulation of authorities permitting the ICC to attempt to moderate or otherwise affect economic depression, uneven industrial growth and national development by means of transportation rates was the Declaration of National Transportation Policy included in the Transportation Act of 1940. Written as the worst years of the Depression were receding but with global war imminent, the declaration recognized the need to deal with the rail, water and highway modes on a related basis. It is cited below in full, with some of its key phrases underlined:

> It is hereby declared to be the national transportation policy of the Congress to provide for fair and impartial regulation of all modes of transportation subject to the provisions of the Act, so administered as to recognize and preserve the inherent advantages of each; to promote safe, adequate, economical and efficient service and foster sound economic conditions in transportation and among the several carriers; to encourage the establishment and maintenance of reasonable charges for transportation services, without unjust discriminations, undue preferences or advantages, or unfair or destructive competitive practices, to cooperate with the several States and the duly authorized officials thereof and to encourage fair wages and equitable working conditions; -- all to the end of developing, coordinating, and preserving a national transportation system by water, highway, and rail, as well as other means, adequate to meet the needs of the commerce of the United States, of the Postal Service, and of the national defense. All of the provisions of this Act shall be administered and enforced with a view to carrying out the above declaration of policy.

The phrases "to preserve inherent advantages" and to prevent "destructive competitive practices" were used to justify the Commission's often protective stance toward the water and trucking industries. In other words, even if a railroad proposed an otherwise lawful and reasonable rate, if it might serve seriously to disadvantage a water carrier (or motor carrier), the Commission could declare the rate unlawful on grounds either of preventing a "destructive practice" or of protecting another modal carrier in the name of preserving its "inherent advantages" for future public use.

The Transportation Policy's appeal to the "needs of commerce" and the "national defense" completed the ICC's armory of weapons. The Commission ruled, for instance, that certain railroad TOFC rates were unlawfully low -- although they were above rail variable costs and in some instances above rail fully allocated costs -- because, in the ICC's judgment, coastwise shipping had to be protected "to meet the needs of commerce ... and of the national defense."[1] Applying vague, non-cost standards of this type to any industry in non-war conditions is dubious, but to apply them almost exclusively to the railroad industry in its post-war period of accelerated decline can at best be said to have greatly complicated the industry's attempts to adjust to the vast changes confronting it in the economy and in its competition. The Commission's concern with economic development, the comparative well-being of industries, and other factors has not vanished, as the following statement by a current Commissioner illustrates.[2]

> [O]ne goal of regulation ... perhaps the primary goal, continues to be ... to preserve competition in non-transportation sectors of the economy -- and within reason to make that nationwide competition possible whether a business happens to be located in Georgia, Maine or Oregon.

The Rule of Rate-Making. A challenged railroad rate, aside from running the gauntlet of meeting the various standards pertaining to discrimination against persons, firms, places, and commodities, and being subjected to the various policy tests symbolized by Hoch-Smith and the National Transportation Policy Declaration, is also subject to examination by the ICC in economic and cost terms. As noted previously, the Rule of Rate-Making incorporated in the Interstate Commerce Act in 1920 as Section 15a, established the principle that the railroads should be permitted to price their services so as to insure reasonable earnings. The "fair return" standard, discredited during the Depression, was replaced in 1933 in a revised Section 15a[3] with the simple notion that the railroads should be permitted to earn "sufficient revenues" to carry on

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[1] Commodities -- Pan-Atlantic Steamship Corp., 313 I.C.C. 23 (1960). This ruling was rejected by the Supreme Court in ICC v. New York, N. H. & H. R. Co., 372 U.S. 744 (1963). See also infra, p. V-23.

[2] A. Daniel O'Neal, "Regulation Reexamination Anew -- Our 200-Year Legacy," Address before the Traffic Club of Pittsburgh, April 5, 1976, pp. 9-10.

[3] See Emergency Transportation Act of 1933, 48 Stat. 211.

their operations,[1] bearing in mind the public's need for low cost transportation and keeping an eye on the "effect(s) of rates on the movement of traffic." The latter clause became the source of considerable friction because the ICC was accused of using it, in reaching minimum rate decisions, to protect the regulated trucking and water modes. This practice became known as "umbrella rate-making" or keeping a rate high enough to protect other, higher cost carriers.

Concern with the movement of traffic also meant that the railroads could be required to lower an otherwise lawful rate in order to benefit their shippers competing in a given geographic market with competitors who had the benefit of lower water or pipeline rates in shipping to the same market.[2] This, it should be understood, represented the use of railroad rates to equalize competition among other non-transportation industries. The unstated presumption, dating back to the 1880's, was that other industries were weak and that the railroads were strong and could make up any losses or foregone revenue on other traffic. Repeated railroad protests about ICC abuse of Sec. 15a led to its modification in the Transportation Act of 1940 and again in the Transportation Act of 1958. The latter change actually confused the matter even more:

> Rates of a carrier shall not be held up to a particular level to protect the traffic of any other mode of transportation, giving due consideration to the objectives of the national transportation policy declared by this Act.

The first half of the sentence satisfied the railroads with respect to rectifying umbrella rate-making, but the second half left an escape clause for the other modes, namely, preservation of their "inherent advantages." Clearly, despite the immense loss of traffic and revenue by the railroads -- recall that 75 per cent of the rail industry's loss in traffic share, 1947-1974, had occurred by 1960 -- the Congress could not quite bring itself to accept fully that the railroads were no longer the dominating mode or that the trucking and water carrier modes were strong competitors in their own right.[3]

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[1] This is a standard similar to the credit standard used by the Supreme Court in determining whether rates set by regulatory commissions are confiscatory. Basically the Court seeks to insure that companies have sufficient earnings to maintain their credit and attract capital. See Locklin, op. cit., pp. 332-334.

[2] Ibid., p. 658.

[3] The 1958 Act did establish the railroad loan guarantee program, described earlier, and authorized the ICC to set aside unduly low intrastate rates and to facilitate discontinuance of rail passenger service, which states were impeding despite the obvious losses being sustained by the railroads.

Rate-Making in Practice. As a practical matter, there is very little intramodal rate competition in the rail industry or within the regulated segments of the trucking and water modes. This is to be expected given the authorization in Section 5a of the Interstate Commerce Act for ICC-sanctioned rate bureaus to facilitate the setting of rates. Moreover the relative ease with which instances of differential rates applied to locations or commodities have been challenged by shippers under Section 3 of the Act, on grounds of constituting some form of undue preference or advantage, has served to inhibit intramodal rail rate competition. Thus the most important regulatory proceedings involve industry-wide general rate increases or disputes between modes. The former can be useful in assisting the modes to "pass through" costs quickly, say those incurred due to rapid general inflation or caused by crisis situations such as the 1972-73 oil embargo. Because they are general across-the-board percentage increases (albeit modified by hold-downs[1] and flag-outs[2] on some commodities), they can further distort the pricing structure by penalizing commodities or services that are already highly-priced, over-priced or right at the edge of parity with other modal competitors' rates. As a rule, the trucking industry has not opposed rail general rate increases, tending instead to wait until an increase has been approved and then to "track it" with motor carrier rate increases.

The most controversy has been generated by intermodal rate disputes; that is, when carriers of one regulated mode dispute a particular rate proposed by another. Here the ICC must juggle its historic legislative commands: Section 1(5) requires that the rates be just and reasonable; Section 15a that they not be lower than a reasonable minimum, yet not be held up to protect the traffic of other modes, taking into account the National Transportation Policy's objectives. Those objectives, of course, encompass the preservation of "inherent advantages," sound economic conditions for the carriers and reasonable charges on the traffic, without engaging in "destructive practices."

In the post-war years, the Commission was dominated by the policy of assuring that the inherent advantages of each mode be preserved. That meant preventing destructive competition and the latter appeared to mean that virtually every common carrier, once certificated, should be protected. As one critic put it: "The conclusion seems to be warranted that the Commission is more concerned with protecting the competitors than it is with protecting competition."[3] Normally a rate was "just and reasonable" if it was "compensatory," a term which gradually was interpreted to mean a sum that exceeded out-of-pocket (or variable) costs.

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[1] Hold-downs refer to the setting of a maximum absolute amount of increase for selected commodities rather than the full percentage increase. Sometimes the carrier requests the hold-down; sometimes the ICC requires it.

[2] Flag-outs refer to commodities specifically excepted from a general rate increase.

[3] Dudley F. Pegrum, Transportation Economics and Public Policy (Homewood, Illinois: Richard D. Irwin, 1963) p. 341.

However, it was possible for a rate to be just and reasonable under Section 1(5), yet still be unlawful under both Section 15a and the Transportation Policy declaration because it would destroy another non-rail carrier's alleged "inherent advantage" and thus constitute a "destructive practice." In order to determine inherent advantage the Commission typically, but not always, used fully-distributed costs as the criterion, i.e., the mode with the lowest fully-distributed costs had the cost advantage.

The railroads repeatedly found themselves in situations where they had the advantage when setting a rate on the basis of covering out-of-pocket costs, but the water or truck carriers had the advantage on the basis of fully distributed costs. The ICC even disapproved minimum rail rates that exceeded rail fully distributed costs, if the water or truck carriers were forced to reduce their rates below their fully distributed costs (and the Commission was still disapproving rates on this basis in 1962).[1] Thus the Commission's policy -- until a landmark decision in 1963 -- was to declare any rail rate unlawful that forced truck or water carriers to reduce their rates below their fully distributed costs, regardless of the rate's justification from the standpoint of rail costs.[2]

The foundation for the Commission's position was the value of service ideal:[3]

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[1] See Sugar from Gulf and South Atlantic Ports to Ohio River Crossings, 315 ICC 521 (1962). In 1962 an eminent group of economists assembled under Association of American Railroads' auspices concluded "that incremental costs provide the minimum guide for minimum pricing and that 'fully distributed costs' must be rejected as an economic test of any particular rate or price." William J. Baumol, Burton N. Behling, James C. Bonbright, Yale Brozen, Joel Dean, Ford K. Edwards, Calvin B. Hoover, Dudley F. Pegrum, Merrill J. Roberts, and Ernest W. Williams, Jr., "The Role of Cost in the Minimum Pricing of Railroad Services," Journal of Business of the University of Chicago, Vol. XXXV(4)(October 1962) p. 2. Cf. Meyer et al., op. cit., pp. 242-252 and Friedlaender, op. cit., pp. 28-31, 65-75 and 175-182.

[2] For excellent discussions of Commission policy in the post-war period and detailed citation of cases and decisions see the following articles by Joseph R. Rose: "Regulation of Rates and Intermodal Transport Competition," ICC Practitioners' Journal (October 1965) pp. 1-15 and "Regulation of Intermodal Rate Competition in Transportation," Michigan Law Review, Vol. 69(6) (May 1971) pp. 1011-1027. The classic treatment of earlier ICC policies and decisions is found in I. L. Sharfman, The Interstate Commerce Commission (New York: Commonwealth Fund, 1936).

[3] Joseph R. Rose, "Regulation of Rates and Intermodal Transport Competition," p. 6.

> The reasoning in support of this policy is that water and motor carriers, unlike railroads, do not have enough noncompetitive traffic to compensate for rates below their fully-distributed costs, which they must recover in the long run to continue operations.

This outlook finally was moderated by the Supreme Court's decision in ICC v. New York, New Haven and Hartford Railroad Co. in 1963 which ruled that "something more than even hard competition must be shown before a particular rate can be deemed unfair or destructive."[1] Unfortunately for the railroads the Commission's interpretation had prevailed for almost twenty years following the end of World War II. Therefore, precisely at the time when the railroads were losing the largest segment of their traffic, and the motor and water carrier modes were making their greatest gains, the ICC was committed to protecting the latter modes and insisting that the railroads continue to perpetuate the traditional value of service pricing system. The railroads in fact were losing high value traffic to trucking throughout this period; instead of serving as available "noncompetitive" traffic generating earnings sufficient to subsidize bulk traffic, high value traffic was rapidly becoming "lost" traffic. Indeed Professor Williams reported that:[2]

> It is difficult to avoid the conclusion that regulation has consistently over the twenty years since the Motor Carrier Act, deprived the low cost carrier [rail] of its cost advantage, a result often tantamount to depriving it of all opportunity to compete for traffic.

Furthermore ICC insistence on value of service pricing and rate parity among common carriers did much to encourage the growth of private trucking (by definition totally unregulated), which developed -- sheltered by the high rates charged by regulated carriers on manufactured traffic -- to the point where today it has captured a substantial share of high value

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[1] 372 U.S. 744, 757 (1963). The Court also held in New Haven that the ICC had failed to demonstrate that the railroads' proposed rates "in themselves genuinely threaten the continued existence of a transportation service that is uniquely capable of filling a transcendent national defense or other public need," thereby nullifying the Commission's position that coastal carriers should be protected against rail competition for national security reasons. Ibid. at 762.

[2] Ernest W. Williams, Jr., The Regulation of Rail-Motor Rate Competition (New York: Harper, 1951) pp. 210-211. Also see Friedlaender, op. cit., pp. 22, 98 and 129.

traffic from both railroad and truck common carriers.[1] This phenomenon has contributed extensively to the gradual erosion of the integrity of the old rate structure. Underestimated by the ICC and the railroads alike, the trucking industry even achieved some success in moving bulk traffic. For instance, the well-known Big John rate case -- involving a dispute at the ICC between the railroads and the water carriers -- was actually triggered by the fact that unregulated motor carriers had increased their share of the traffic in grain shipped to the Southeast from 19 per cent in 1955 to over 50 per cent in 1960, at the expense of both rail and barge carriers. The following table makes the point graphically:[2]

	1955		1960	
	Tons (millions)	Per Cent	Tons (millions)	Per Cent
Rail (1956 base)	2.0	56	2.50	28 to 23
Barge	0.9	25	2.25	26 to 21
Truck	0.7	19	4 to 6	46 to 56
	3.6	100	8.75 to 10.75	100

Virtually all of the truck traffic was unregulated, hence the confusion about the exact truck tonnage figures in 1960; however, the ICC concluded that it had reached the range of 4-6 million tons, "probably nearer the latter figure."[3] Trucking was making its mark.

Congress, of course, had explicitly faced the issue of preserving or replacing the value of service rate concept in 1939 in the form of the Miller-Wadsworth Amendment to the Transportation Act of 1940, which proposed authorizing the ICC to permit all regulated carriers, regardless of mode, to reduce their rates freely, provided the rates were compensatory (taking into account all costs, including overhead). Approval of the amendment would have meant, de facto, a shift from value of service pricing toward acceptance of cost-based rates. The amendment passed the Senate once, but eventually failed, thereby reconfirming the primacy of value of service pricing in regulatory policy. The ICC simply acted accordingly thereafter.

In the mid-1960's, the Commission became more receptive to railroad rate proposals:[4]

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[1] In 1972 private trucking accounted for 37 per cent of the intercity tonnage shipped by truck from manufacturing establishments. See Department of Commerce, Bureau of the Census, 1972 Census of Transportation (Commodity Transportation Survey, Area Series, Area Report 8).

[2] See Grain in Multiple-Car Shipments -- River Crossings to the South, 321 I.C.C. 582 (1963).

[3] Ibid.

[4] Rose, "Regulation of Intermodal Rate Competition in Transportation," pp. 1018-1019.

> After New Haven, the Commission rarely found reduced railroad rates to constitute destructive competition. It upheld rates covering the railroads' fully distributed costs regardless of cost advantage and regardless of such rates' effect on competitors' traffic. Reversing earlier decisions, the Commission approved compensatory railroad rates in the absence of proof that objecting carriers had the cost advantage. The agency also approved compensatory railroad rates when they exceeded the protesting carriers' rates and fully distributed costs and when protestants failed to prove that such rates "impaired" their ability to obtain traffic at "profitable" levels.

Nonetheless in the frequently cited Ingot Molds case in 1965 the ICC rejected a rail rate where the railroad had the lowest out-of-pocket costs but the water carrier had the lowest fully distributed costs.[1] Although Ingot Molds went to the Supreme Court, the Court did not decide whether out-of-pocket (variable) or fully distributed (fully allocated) costs, or something else, ought to be the criterion for determining cost advantage.[2] Thus a certain aura of confusion remained with respect to ICC intentions. The Commission did become more receptive to rate increases aimed at non-regulated competition, but walked a middle ground in situations where a railroad, another regulated mode and non-regulated carriers were simultaneously involved. For instance, in the Big John case a substantial share of the proposed rail rate reduction was accepted because the primary competition was unregulated trucking, but the full reduction was denied because of concern for regulated water carriers. It took four years finally to settle this case.

Without pursuing the discussion of rate-making to a more technical level, and acknowledging that generalization about rate-making experience is hazardous, the preceding discussion permits certain conclusions. First, the ICC throughout much of the post-war period pursued a basic doctrine that amounted to the "fair-sharing" of traffic among modes; in the case of water carriers, this was sometimes called "umbrella rate-making" because rail minimum rates were set high to enable water carriers to get in under or at the rail rate. In the case of trucking, under a "rate parity" policy, rail rate reductions were resisted in the name of presumably preserving alleged high rail revenues from high value traffic. This also gave trucking firms an opportunity to share in markets which, according to the conventional wisdom, they might otherwise not have been able to penetrate.

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[1] Ingot Molds, Pennsylvania to Steelton, Kentucky (Ingot Molds) 326 ICC 77 (1965).

[2] American Commercial Lines, Inc. v. Louisville & N.R.R., 392 U.S. 571 (1968).

The Commission reinforced this policy by tending to discourage price competition between common carrier motor carriers, which led them to accentuate service competition instead. "Quality of service" competition is the realm where trucks usually excel vis-a-vis rail. It is not surprising that under these circumstances trucking's quality of service attributes developed to the point where shippers and receivers in many instances were prepared to pay truck rates considerably higher than rail rates to move the same traffic. And, as noted previously, this policy provided a shelter and an inducement for the establishment of private carrier trucking.

Second, the uncertainty caused by various Commission interpretations of its many statutory provisions, including major reversals or sways in opinion (as in New Haven and Ingot Molds) made the development of rapid and innovative railroad marketing decisions, at least via rate changes, most unlikely. The need in some instances to pursue a rate change all the way to the Supreme Court, let alone the normal passage of time involved in ICC suspension and/or investigation proceedings, renders the concept of a fast reaction rate change to meet competition almost a contradiction in terms. Even today there are about 8000 cases (all types) pending at the ICC, each taking an average of eleven months to decide -- hardly a pace likely to support resilience in the market.[1] "Institutional inertia" has become a serious and persistent regulatory problem in its own right.[2]

Third, the foregoing recitation of apparently weighty judgments about what is "just and reasonable," based in part on measurement of variable, out-of-pocket, marginal, fully distributed, fully allocated, etc. costs, masks the fact that the cost definitions used by the Commission were and remain matters of great dispute. They have come under increasing attack from academic specialists, government, and industry.[3] Nonetheless important decisions have been made for years on the basis of costing procedures now judged to be irrelevant, incomplete, or incorrect. Widespread dissatisfaction with this situation resulted finally in the requirement in the 1976 rail legislation that the ICC devise a new and more comprehensive uniform cost and accounting system for the rail industry no later than January 1, 1978.[4]

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[1] A. Daniel O'Neal, "Innovation vs. Inertia at the Interstate Commerce Commission: A Progress Report," Address to the Central Area Shipper-Motor Carrier Conference, Annual Meeting, Chicago, October 27, 1976, p. 10.

[2] Ibid., pp. 16-17.

[3] See, for instance, Friedlaender, op. cit., pp. 34 and 180.

[4] Public Law 94-210 § 307.

Finally, the sheer expenditure of time and resources needed to pursue a rate change, or to comply with most of the regulatory requirements, is both costly and stultifying. The sheer administrative burden alone has undoubtedly been reflected in increased costs and a gradually institutionalized resistance to attempting to make changes or innovations of almost any kind that would disrupt the otherwise smooth flow of routine activities established over time between the regulated and the regulator. The railroads themselves once estimated that they would have earned over $1 billion in additional gross revenues during the period 1946-1952 -- a key period at the start of their sharp decline -- if the ICC had only approved within sixty days all of the rate increases which it ultimately approved in those years.[1]

The inhibitions of the regulatory system have also been alleged to have a long-term effect on the quality of rail management:[2]

> Railroads have not attracted and retained quality management.... When innovation and responsiveness to changing technological and economic events is frustrated, only individuals who do not possess innovative traits will be attracted to the industry. The end result is a management that lives with the problem rather than aggressively attacking those areas of flexibility which the regulatory system does retain.

Dollar losses cannot be calculated for such institutional rigidities, but their consequences are significant.

The continuing inadequacies of Sec. 15a were acknowledged in the Railroad Revitalization and Regulatory Reform Act of 1976 (Sec. 205) by requiring that the ICC, by February 1, 1978, develop new standards for establishing railroad revenues adequate:

> to cover total operating expenses, including depreciation and obsolescence, plus a fair, reasonable and economic profit or return (or both) on capital employed in the business.... The commission shall make an adequate and continuing effort to assist [the] carriers in attaining such revenue levels. No rate of a common carrier shall

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[1] James C. Nelson, Railroad Transportation and Public Policy (Washington, D. C.: The Brookings Institution, 1959) p. 136.

[2] Donald C. Cole, "USRA's View of Transportation Economic Regulation," in Ferguson and Lane, op. cit., p. 155.

> be held up to a particular level to protect the traffic of any other carrier or mode of transportation, unless the Commission finds that such rate reduces or would reduce the going concern value of the carrier changing the rate.

The law establishes that rates cannot be held up to protect another mode's traffic if the rate exceeds variable cost.

While it would be inaccurate to assert that the rigidities of the regulatory system "caused" the post-war decline in railroad traffic and revenues, it is obvious that the system, the decades-old concepts which permeated it, and dedication to policies based on those concepts greatly hampered the railroads' ability to adjust to the radical changes in their environment from 1947 to the early 1960's. Similar sorts of problems continued into the 1970's, and persist today, but the period of maximum rate regulatory rigidity coincided with the period of maximum railroad decline and maximum truck-barge gain.

Excess Capacity

Throughout much of its history the railroad industry has been plagued by excess capacity. From the time the ICC began regulating abandonments in 1920 through 1975, for instance, it authorized the abandonment of 68,117 miles of line.[1] Despite the impressive size of this figure in absolute terms, the accumulation of increasingly uneconomic branch lines during the post-war period was a contributor to the northeast railroad bankruptcies and is going to be an important factor in determining the future health of the industry, especially in the midwest.[2] Failure to abandon more quickly in the 1950's and 1960's, in the face of accelerated diversion of traffic to other regulated and unregulated modes, was due partly to railroad reluctance to part with any line that generated traffic that might be contributing to overhead, and partly due to ICC reluctance to run the risk of accusations that it was disadvantaging shippers, industries and communities. In addition to branch lines, it is clear that the rail industry is burdened with over-capacity in main lines, subordinate lines, and yard and terminal facilities.[3]

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[1] Interstate Commerce Commission data.

[2] See Department of Transportation, Rail Service in the Midwest and North-East Region (Vols. I and II, February 1974) and Railroad Abandonments and Alternatives: A Report on Effects Outside the Northeastern Region (May 1976); and United States Railway Association, Preliminary System Plan (Vols. I and II, February 1975) and Final System Plan (Vols. I and II, July 1975).

[3] Ibid., and Department of Transportation, Preliminary Standards, Classification, and Designation of Lines of Class I Railroads in the United States, Vols. I and II (August 3, 1976).

The value of service pricing system also contributes to the maintenance of excess capacity because the various modal carriers frequently are not carrying traffic on the basis of comparative costs. The protected carriers thus represent resources allocated to transportation capacity that is not needed on rational economic grounds. There is a further tendency in these conditions for carriers to compete on the basis of quality of service -- extra frequencies or deliveries, specialized equipment, etc. -- which results in additional excess capacity. Common carrier trucking and aviation represent classic instances of quality of service rather than price competitive markets. The former, in particular, with its restrictions on commodities that can be carried, on specific points and areas that can be served, on routings that can be followed, and on the use of back-hauls, is felt to be structured to encourage this phenomenon.[1]

The railroads' excess plant capacity, however, is a more serious and costly weakness. To a large extent it perpetuates the traditional "weak road and strong road" condition in the rail industry. Merger experience in the 1950's and 1960's -- from the Penn Central debacle to the twelve-year period of non-decision which afflicted the proposed Rock Island-Union Pacific merger -- was exceptionally poor and did little to alleviate the problem. It remains with us today. The railroad industry has been unable to provide a solution, and the ICC -- ever since rejection of its previously described master consolidation plan -- has addressed rail capacity issues on a narrow and reactive basis. As the Chairman of the ICC has noted:[2]

> To reduce the plant to the size needed to meet the needs of today's economy and modern distribution methods certainly requires the development and implementation of careful State, regional and national rail system plans. The results of major changes in rail route structures and massive abandonments of light-density rail lines are too important to be left to individual railroad management decisions and too far-reaching to be handled on a case-by-case basis by even the most enlightened regulatory agencies.

The Federal Government was forced by the exigencies of the Northeast railroad crisis in the early 1970's to develop, and enact into law, the approach now represented by ConRail. Title IV of the Railroad Revitalization and Regulatory Reform Act of 1976, and other provisions in the Act, are intended further to encourage the restructuring of the railroad in something other than crisis conditions, particularly taking into account

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[1] See, for example, Norman H. Jones, Jr., "Examining the Impact of Change in Motor Carrier Regulation," in Ferguson and Lane, op. cit., pp. 107-128 and John R. Meyer et al., op. cit., pp. 218-219.

[2] Stafford, op. cit., p. 7.

the total transportation environment in the United States today. If the rail industry is to overcome its historic and financially debilitating legacy of overbuilding, the regulatory system must be streamlined procedurally and its understanding of the needs of the transportation system greatly modernized.

Regulation of Competing Modes

No regulatory system is perfect and each of the regulatory regimes applied to the railroads' competitors -- aviation, trucking, waterway and pipeline -- has its failings. Determining whether and to what extent the other transportation modes have been advantaged or disadvantaged by their respective regulatory systems vis-a-vis the railroad industry and its regulatory system is extremely complicated. The preceding pages of this chapter make it abundantly clear that the railroads have suffered, relatively speaking, from a regulatory system that has been slow and unresponsive to change, especially in recognizing the competitive strengths of the other modes. The trucking and waterway modes, conversely, benefitted from the prevailing restrictive interpretation of railroad regulation.

It seems fair to state that, by and large, regulated carriers in other modes also feel that they have benefitted from their own regulatory systems, although not necessarily at the expense of the railroads. Each of the other modes has the advantage that it is less pervasively regulated than the railroads, thereby providing wider scope for innovative and timely marketing, pricing, investment, and even disinvestment decisions. Looking at transportation regulation as a whole, across all modes, economists frequently have attempted to assess the "social costs" of transport regulation -- the misallocation of resources attributable to it -- and a net price tag of $4-5 billion annually is an order of magnitude estimate that many of them would accept.[1] In the context of considering Federal actions and socio-economic forces vis-a-vis the railroads, however, this examination suggests that the problems and deficiencies of the regulation of other modes are not per se of great consequence to the railroads.

Pipelines. The pipeline industry has been referred to only in passing in this report. Although regulation of this mode is extensive, it is conventional public utility type regulation which differs from that in the rest of the transport industries and is not particularly germane to the purposes of this study.

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[1] See George W. Wilson, "Economic Consequences of Motor Carrier Regulation" in Ferguson and Lane, op. cit., pp. 30-31, and James C. Nelson, "A Critique of Governmental Intervention in Transportation," pp. 240-241, for representative listings and summaries of such studies. Ann Friedlaender has suggested, for railroads alone, excess capacity costs in 1969 caused by regulation in the range of $2.4-$3.8 billion. "The Social Cost of Regulating the Railroads," American Economic Review, Papers and Proceedings (May 1969).

Aviation. The regulatory legislation which pertains to the airline industry is based essentially on the railroad model.[1] In recent years aviation regulation has tended to become overly protective of the regulated air carriers. Accordingly, it has been subjected increasingly to intense criticism from many quarters and pressure for its reform remains intense.[2] CAB regulation has severely limited the entry of new carriers, controlled exit, reduced the number of airlines, encouraged inordinate quality of service competition, inhibited price competition, and generally supported excess capacity. A less restrictive approach to aviation regulation could alleviate those problems and promote greater price competition, a broader range of innovative services and the elimination of excess capacity. Indeed, in the future, regulated aviation is likely to stagnate in the absence of measures designed to insure a more flexible, competitive environment. From the standpoint of this study, however, it is clear that the air carriers have not found their regulatory system as restrictive as the railroads have found regulation under the Interstate Commerce Act.

Waterways. Waterway regulation is minimal and that which occurs has led to very little complaint on the part of either the carriers or shippers. Most of the tonnage moving on the waterways is exempt from regulation and can be carried by common, contract, exempt for-hire, and private carriers. With their rates typically pegged to railroad rates, it has been customary in the post-World War II period for the water common carriers to seek and obtain the same general increases granted to railroads. As previously noted, umbrella ratemaking cushioned attempts to lower rail rates at their expense. The ICC has rarely had occasion to prescribe either maximum or minimum rates for the water mode.[3]

Given the fact that only about 16.5 per cent of total inland waterway ton-miles are regulated,[4] it is perhaps ironic that some of the most controversial and popularly discussed railroad rate controversies, e.g., New Haven, Big John, and Ingot Molds, have involved water transportation.

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[1] See the Civil Aeronautics Act of 1938 and the Federal Aviation Act of 1958, as amended.

[2] See, for instance, Richard E. Caves, Air Transport and Its Regulators: An Industry Study (Cambridge: Harvard, 1962); George C. Eads, The Local Service Airline Experiment (Washington, D. C.: The Brookings Institution, 1972); George W. Douglas and James C. Miller, III, Economic Regulation of Domestic Air Transport: Theory and Policy (Washington, D. C.: The Brookings Institution, 1974); and William A. Jordon, Airline Regulation in America, Effects and Imperfections (Baltimore: Johns Hopkins, 1970).

[3] Locklin, op. cit., pp. 756-758.

[4] Domestic deep sea carriers and Great Lakes water carriers have not been specifically addressed in this report; on an intercity ton-mile basis, 6.3 per cent of the former's traffic and 0.4 per cent of the latter's traffic were regulated in 1974. See Transportation Association of America, Transportation Facts and Trends (Twelfth Edition, July 1976).

Within that relatively small amount of regulated traffic a substantial portion is on waterways like the lower Mississippi where the water carrier has an excellent natural cost advantage on bulk cargo. An additional portion is moved by contract carriers under contract to large industrial firms who are more concerned with precise control over the movement of materials in the context of their total production and distribution processes -- and the total costs involved -- than they are in comparative transportation rates in isolation. Thus the waterway rate cases are more valuable in highlighting the significance of intensive competition between particular railroads and water carriers on particular traffic than in affecting the railroad industry as a whole.

Full exploitation of the great post-war gains in water carrier productivity, due to technological advances, may have been partially inhibited by the ICC's commodity mixing rule,[1] but recent legislation has removed that obstacle. The recent extensions of water carrier operating rights on the system, referred to earlier (see p. V-14), and the healthy financial condition of the carriers is adequate testimony that regulation has not hampered this industry.

Trucking. It is generally conceded that trucking common carriers have been exceptionally well-served by their regulatory environment. It can be seen that trucking was a beneficiary of ICC value of service rate-making policy which tended to keep rail rates on manufactured products at high levels. Motor carriers were adept at using this advantage to penetrate markets and to exploit their quality of service attributes. Moreover, the original objective of motor carrier regulation -- to sustain a stable system of common carriers by motor vehicle -- has been achieved. In fact trucking regulation, like aviation regulation, has become overprotective, given the economic and transport system changes which have occurred since the Depression. As early as 1945 the Board of Investigation and Research recognized this fact and recommended the elimination of most commodity restrictions, unusually circuitous route restrictions, gateway requirements, and backhaul restrictions.[2]

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[1] The key components of the "mixing rule" were: (1) a prohibition against mixing regulated and unregulated commodities in the same barge tow, and (2) a ruling that movement of three or more exempt commodities in the same tow would remove the exemption for each of them. The latter was never formally enforced and the former was by and large ignored. See Department of Transportation, The Barge Mixing Rule Problem, A Report to the Congress (March 1973).

[2] See James C. Nelson, "A Critique of Governmental Intervention in Transport," pp. 244-247.

Summary

The railroad experience with economic regulation is different from that of all the other modes. There is little doubt that the railroads benefitted immensely from regulation during the period from its inception in 1887 until the Depression. Thereafter, the railroad world began to disintegrate in the face of changing economic conditions and the appearance of vital transportation competitors. The regulatory system, especially in the period immediately after World War II when the railroads' traffic and revenue sharply declined, greatly impeded their ability to adjust to these changes. The industry's meager earnings, overcapacity and its recent series of crisis events seems to support this conclusion adequately. Regulation may also have reduced the industry's willingness and ability to innovate -- the railroads certainly experienced delays in introducing unit trains, multiple car shipments and large freight cars, each of which warranted cost-justified rate reductions -- but that generalization is subject to considerable qualification in view of significant advances of a technological and service nature by the railroads.[1] Legislation prohibiting railroad ownership of other modes (except under certain specialized conditions) prevented the railroads from finding outlets or relief through participation in the new transport technologies. The inflexibility which has characterized post-war railroad regulation has certainly reinforced any advantage which competing modes may have gained from the large-scale direct aid programs then launched in their behalf. We have noted previously that the direct Federal aid programs compressed or telescoped the time period for both realization of the major highway, waterway and airport/airway systems and the evolution of an appropriate railroad adjustment to the new competitive conditions. The regulatory regime applied to the railroads further aggravated this problem by itself inhibiting rapid adjustment and displaying a tendency to favor or protect those segments of the truck and water modes subsequently brought under Federal regulation. It is quite conceivable that regulatory sluggishness -- taking into account rate-making problems, the inability to shrink rail plant rapidly, and institutional and other aspects of regulation -- was even more harmful to rail interests in the long-run than the direct aid programs. Furthermore, as will be developed in Chapters VII and VIII, these same basic regulatory problems are intimately involved today in the railroad industry's continuing struggle to maintain itself as a viable element in the Nation's transportation system.

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[1] See Richard J. Barber, "Technological Change in American Transportation: The Role of Government Action" Virginia Law Review (Vol. 50, No. 5, 1964) pp. 853-874. Cf. Aaron J. Gellman, "Surface Freight Transportation," in William M. Capron (ed.), Technological Change in Regulated Industries (Washington, D. C.: The Brookings Institution, 1971) pp. 166-196; Friedlaender, op. cit., pp. 47-50 and 91-99; and Task Force on Railroad Productivity, National Commission on Productivity and Council of Economic Advisers, Improving Railroad Productivity, Final Report (November 1973) pp. 282-320.

LABOR REGULATION

The railroad industry has been subjected to a substantial amount of specialized labor regulation. Appendix Table 15 provides a summary sketch of twenty-six distinctive pieces of rail-specific legislation directed to labor questions. For the most part, the other transportation modes were not similarly regulated, or were brought under labor regulation via generalized statutes that were applicable to virtually all of the American labor force.[1]

Since the late nineteenth century major disputes between railroad management and labor have rarely been resolved without government intervention, in most instances through Federal mediation and/or arbitration mechanisms established by Congress. Even when collective bargaining on a private management-labor basis has settled a railroad labor question, the threat of resort to Federal mechanisms has exerted a powerful influence on the settlement process. The Federal presence is felt through the presence of neutral members on mediation panels, through the recommendations of emergency boards and, frequently, through Presidential persuasion and the implicit threat of drastic action such as railroad seizure to resolve a crisis.

Perhaps the most fundamental reason why elaborate legislative mechanisms exist relating to railroad labor is simply precedent. The first rail labor legislation was the Arbitration Act of 1888, enacted one year after the Interstate Commerce Act. Most subsequent legislation relating to railroad labor is not new and different, addressing new issues arising out of a changing technology, but rather represents attempts to modify and adapt the mechanisms provided in earlier laws in order to provide more effective procedures. Hence the Erdman Act of 1898 provided a Federal role in mediation to supplement the arbitration procedures established in the 1888 law; the Newlands Act of 1913 revised mediation and arbitration procedures, which were felt to be ineffective under the Erdman Act; the Federal Possession and Control Act of 1916 adopted procedures for settling disputes in a war-time setting in which the government operated the railroads (and set precedents for nation-wide labor agreements in peace time); the Transportation Act of 1920 reinstated peace-time procedures for Federal arbitration and mediation, with additional protections for the unions derived in part from the war-time arrangements made with the Federal Government; the Railway Labor Act of 1926 made numerous changes in arbitration and mediation mechanisms which had been unsatisfactory to both labor and management, and the Railway Labor Act Amendments of 1934 added still further elaborations.

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[1] Airline employees, however, were brought under the Railway Labor Act in 1936.

The Railway Labor Act is in effect today. Many of the changes from its predecessors are mechanical (e.g., covering the size, composition and names of mediation panels); many reflect jockeying for position between labor and management; and many explicitly codify general union gains for the rail industry (such as prohibiting companies from preventing employees from joining a union). In basic philosophy, however, the bulk of currently existing railroad labor legislation has its roots in the nineteenth century -- especially insistence on a regular, continuous, Federal role in mediation and arbitration to resolve disputes, while attempting to avoid directly dictated Federal solutions. Neither management nor labor have seen fit to reject this framework for settling labor problems which now dates back in concept almost ninety years.

Early History

If precedent helps explain why a rather unique framework for government involvement in railroad labor disputes has been continued, it does not account for its establishment in the first place. The principle causative force appears to be much the same as that which led to economic regulation of the railroads; namely, that in the late nineteenth century the railroads were perceived to be the most critical U. S. industry, one in which a stoppage due to strikes and related labor disruptions could not be tolerated. Railroads were regarded as the backbone of American industrialization, with obvious and profound effects on the settlement and development of the Nation. They had an enormous effect on capital formation and investment banking, with over $10 billion in railroad securities issued by 1889. They were primary markets for the coal and steel industries. The Pennsylvania Railroad was the country's largest employer, with well over one-third as many employees as the entire Federal bureaucracy in 1891. Railroad employment as a whole was approximately five times that of the Federal Government. Nearly all long distance passengers, virtually all mail and from two-thirds to three-quarters of all freight moved by rail by 1877 -- and rail mileage tripled between 1877 and 1894. In 1894 the bonded debt of the railroads was $5.36 billion, compared to a national debt of $1 billion. "When railroad construction boomed, the economy as a whole boomed too. When railroad securities dropped in value and construction slowed, the entire economy sagged."[1] Railroad labor disruptions simply could not be permitted due to the criticality of the rail industry to the economy.[2]

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[1] This quotation and the preceding data from Gerald G. Eggert, Railroad Labor Disputes: The Beginning of Federal Strike Policy (Ann Arbor: Michigan, 1967) p. 3 ff.

[2] The following quotation from the Chicago Tribune in 1877 is illustrative: "[The railways are] the very heart and life of the modern system of commercial existence.... [if] we revert to the primitive days of stage coaches and canal boats, it would be like the breaking of the mainspring of a watch." Cited in Eggert, op. cit., pp. 9-10.

Another reason for according special attention to railroad labor, closely related to the above, lay in the nineteenth century view that the railroads were vested with the public trust to a much greater extent than other industries. Despite private ownership, railroads were commonly regarded as quasi-public utilities. This attitude derived from the railroads' enormous influence on the economy as a whole; their great importance in such governmental functions as carrying the mails and transporting troops; the intimate political relationships which had been established between rail interests and state and local governments across the country; and the widely-publicized program of Federal land grants, justified in large part on grounds of unifying the nation, politically and economically.

If railroads were vested with the public interest, this also meant that railroad labor was expected to perform its tasks with the public welfare in mind -- in a sense as quasi-public servants. To strike, according to the New York Tribune in 1877 would constitute "insurrection against the laws of the states and the government of the United States."[1] In fact, the early railroad labor unions themselves accepted much of this philosophy of public responsibility, and the first "brotherhoods" of operating rail employees wrote no-strike provisions into their constitutions.

There was also another side to the "public service" image of rail labor -- namely the perception that rail workers accepted both exceptional inconveniences and physical risks in order to provide the Nation with reliable transportation. This perception was buttressed by the facts that accident rates in rail labor were indeed high compared to most industries (with mining perhaps a notable exception). In the 1888 to 1893 period, accidents injured one in ten operating employees annually and killed one of every 115.[2] Thus, if rail labor should not be permitted to strike because of the public interest, there was also the strong feeling that management should not be allowed to drive labor to the ultimate resort to strike through its intransigence. Federal arbitration and mediation could thus provide some special protection for these quasi-public servants in recognition of the sacrifices and vulnerabilities of rail employment. Beyond arbitration provisions, recognition of the special risks of rail labor eventually resulted in the Federal Employers' Liability Act of 1908, which preceded most of the state workmen's compensation laws and remains in effect today.

Offsetting the prevailing nineteenth century attitude that railroads were a form of public utility was the general laissez faire spirit of the times -- government intervention in the free enterprise system, or, increasingly, in the rights of workers, was not readily accepted as a matter of policy. Most countries faced with a dominant railroad industry simply nationalized their rail systems or placed severe legal constraints

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[1] Cited in Eggert, op. cit., p. 9.

[2] Phillip S. Foser, History of the Labor Movement in the U. S. (New York: International Pub., 1955) Vol. II, p. 248.

on their private operation and the settlement of labor disputes. "A suspension of railway service may present an emergency so great that most countries have withdrawn or placed extensive limitations on the right to strike or to lock out."[1] The U. S. Government, however, was most reluctant to take this step.

What finally precipitated the development of railroad labor legislation were the chaotic and ill-organized rail strikes of 1877 and 1894 (the latter known as the Pullman Strike). Both episodes, and particularly the latter, were extremely disruptive, resulting in serious shortages and price increases (especially in foodstuffs and in coal). Immediate Federal intervention was resorted to in order to break the strikes. In the longer term, the need for an effective mechanism to avoid the recurrence of such events was recognized. Thus the 1877 strike and subsequent threats of further rail labor disruptions eventually resulted in the Arbitration Act of 1888, and the Pullman Strike led to the Erdman Act. While the U. S. Government was not willing to go to the lengths of European governments in controlling the rail labor situation, the concept of a permanent Federal role in the mediation and arbitration of rail labor disputes was thus established. It is, in fact, perhaps less surprising that rail labor was singled out for special legislative attention than that an even more pervasive Federal role was not established.

Twentieth Century Developments

Turning from the origins of rail labor legislation to the continuation and elaboration of such legislation in the twentieth century, the mere weight of precedent was buttressed for years (and to some extent still is today) by the persistence of the twin beliefs that disruption of rail service by labor disputes would be a disaster for the economy and that railroads constituted a quasi-public utility.

A dramatic example of the fear of economic disaster may be taken from the events leading to the passage of the Adamson Act of 1916, which established the eight-hour day as the basic workday for rail labor. Existing arbitration procedures had failed to satisfy labor demands for an eight-hour day and the unions threatened a general rail strike. The National Chamber of Commerce feared a tie-up of all traffic. Though more sympathetic to management than to labor ("the public is informed of its helplessness to protect itself against certain demands"), the Chamber lobbied aggressively for passage of the Adamson Act, which reflected union demands.[2] Thus a conservative business organization took the position that the national economy took precedence over the issue of the equity of the solution, from the rail industry's standpoint, and aided greatly in the passage of special Federal legislation

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[1] Harry A. Millis and Royal E. Montgomery, Organized Labor (New York: McGraw Hill, 1945) p. 730.

[2] See P. Harvey Middleton, Railways and Organized Labor (Chicago: Railway Business Associates, 1941).

to settle the dispute on labor's terms. The Adamson Act was, and remains, exceptional in its direct and explicit use of Federal authority to resolve a rail labor dispute. If society was willing to go this far to resolve rail labor issues, however, it is hardly shocking that a central Federal role as a neutral referee in arbitration and mediation should have been widely accepted.

The argument that there is an economic imperative for continuous Federal intervention in railroad labor disputes has continued to the present. A 1953 publication by rail management provides a strong statement of this position:[1]

> [T]he national importance of the rail industry requires that disputes be settled without the ultimate resort to general strikes. It has therefore been mandatory that some means be provided to prevent mediatory conferences from ending in deadlock that could only be broken by actual stoppage of work by the employees.

This statement was made despite the general thrust of the publication's argument that labor had achieved excessive advantages through the mediation-arbitration process.

Continuation of the public utility image of the railroad industry can also be easily illustrated. This is vividly reflected in special job protection provisions for railroad labor, many of which have evolved out of the arbitration process. In 1929, for example, a Federal emergency board ruled that rail carriers must reimburse employees for losses arising from rail consolidations, a ruling resulting in individual awards of over $30,000 for workers in the case touched by that ruling. The rationale behind the board's decision was that:[2]

> [C]arriers are public service corporations ... subject to governmental regulation and control.... [it would violate public policy if] the carrier should reap the entire benefit ... and the employees be compelled to bear the entire loss. [Emphasis supplied.]

This emergency board decision, and others like it, eventually led to a considerable broadening of rail labor job security in the so-called Washington Agreement of 1936. While the Washington Agreement was formally

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[1] Harry E. Jones, Railroad Wages and Labor Relations (Bureau of Information of Eastern Railways, 1953) p. 166.

[2] Leonard A. Lecht, Experience Under Railway Labor Legislation (New York: Columbia University Press, 1955) pp. 102-103.

a purely private agreement between twenty-one union organizations and carriers representing some 85 per cent of the rail industry, it was concluded under very strong pressure from President Roosevelt and followed the precedents set by boards such as that cited. The agreement provided that employees deprived of their employment by rail reorganizations could receive 60 per cent of certain prior earnings for up to five years, in addition to such benefits as free transportation and hospitalization, or could accept an alternate lump sum settlement. This arrangement and numerous other specific provisions not addressed here have provided the core labor protection conditions to be met in almost every subsequent rail reorganization involving a potential reduction in work force. To illustrate, emergency boards convened to reach an agreement with the shopcrafts in 1964 and with other non-operating unions in 1965 (affecting some 300,000 workers) both incorporated protective provisions fundamentally based on those of the Washington Agreement.[1]

To further illustrate the Federal role in developing special labor protection arrangements for the rail industry, the Emergency Transportation Act of 1933 included numerous provisions to protect railroad workers who might be involved in railroad cooperation, consolidation, and merger actions during the Depression.[2] Indeed these measures were so comprehensive that they contributed importantly to the failure of the Federal Coordinator to structure economies in railroad operations during the emergency.[3] Moreover, even though the Washington Agreement was concluded among private parties, the ICC began in 1939 to insist that the terms of that agreement be incorporated into rail reorganizations as a condition of Commission approval, in which action it was upheld by the courts. The ICC considerably broadened the application of the Washington Agreement protective provisions through numerous rulings in the 1940's, thus undercutting any fiction that such protective measures were the result of purely private and voluntary collective bargaining.

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[1] See Fred Cattrell, Technological Change and Labor in the Railroad Industry (Lexington, Mass.: Heath Lexington Books, 1970) p. 144 ff.

[2] As a measure of the railroads' place in the economy, and the severity of the Depression impact on it, the railroads were employing 2,197,000 workers in August 1920, but had dropped to 971,000 in 1933. Transportation as a whole, however, probably was employing more labor in the Depression years than ever before -- another illustration of the tremendous impact of motor carriers. See Report of the Federal Coordinator of Transportation, 1935 (January 21, 1936) p. 50.

[3] See, for instance, Locklin, op. cit., pp. 246-247. The ICC had begun to take account of labor protection in merger cases even prior to the Emergency Transportation Act of 1933 and lobbied for greater authority to do so. The early cases are cited and discussed in Report of The Federal Coordinator of Transportation, 1935, pp. 50-52.

Rail labor's success in the job security area, modest though it may be in the light of a 75 per cent reduction in rail employment since 1920, has been considerably enhanced by the quasi-public service image of railroad employment, as well as by widespread acceptance of the notion that railroad employees have been acutely affected by rapid technological change. As a recent analysis concludes:[1]

> Innovations in the railroad industry have tended to be uncommonly labor-saving. Total output in the industry has hardly grown and, indeed, has declined by some measures ... so that growth has not been available to attenuate the [labor] adjustment problems of the industry.

Just as Congress had decided that the special dangers of the rail industry warranted a Federally-mandated workers' compensation program for job-related injuries in 1908, so it was sympathetic to what were perceived to be the special consequences of railroading, namely, that it involved unique skills that were not transferable to other industries:[2]

> Employees who have given the best years of their life to an industry are entitled to reasonable protection, so far as practicable. When displaced because of a decline in the industry and its business, there is no way in which protection can be given, unless employment or similar reserves have been set up. Labor-saving improvements, however, may produce the means whereby protection can be afforded. It is not just, in such circumstances, to throw an employee on the street without relief, especially if, as is often the case, the years which he has spent in the industry have unsuited him to other employment. This principle is more and more receiving practical recognition in industry, and its general acceptance seems a matter only of time, in view of its inherent justice.

Some of this same thinking contributed to enactment of the Railroad Retirement Act and the Railroad Unemployment Act in the aftermath of the Depression. The implications of these acts were discussed in the preceding chapter on tax policy.

A final basis for the Federal government presiding over an elaborate mediation-arbitration process dedicated to the settlement of rail disputes

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[1] Task Force on Railroad Productivity, op. cit., p. 210. Railroad employment has dropped from 1,352,000,000 in 1947 to 487,789 in 1975, a 64 per cent decline. Association of American Railroads, Yearbook of Railroad Facts (1976).

[2] Report of the Federal Coordinator of Transportation, 1935, p. 54.

is that rail labor issues are exceptionally complex, far more so than those in any other mode. This complexity derives from two primary factors: the fractionalization of rail labor unions and the complicated and frequently highly technical character of rail wage and work rule disputes. On the former point, the movement toward a unified railroad labor union was crushed with the Pullman strike of 1894. As a result there remained until 1969 four major "operating brotherhoods" (Locomotive Engineers, Trainmen, Conductors and Switchmen), each of which was independent, and nine non-operating unions affiliated with the AFL/CIO. The operating brotherhoods have long had the reputation of being parochial in their interests and, in fact, a considerable proportion of mediation-arbitration issues have dealt with disputes between unions (or even work categories within unions) rather than with labor-management questions. Only in 1969 did the affiliated four operating unions merge to form the United Transportation Union (UTU), with the AFL/CIO.

On the second point, rail labor issues are extraordinarily complex. For example, the wages of train operating employees are calculated by means of the dual basis of pay. In simplified terms, the dual basis of pay involves calculation of wages based on a combination of hours worked and mileage traveled, with negotiated minimums and equivalencies between hours and miles established. This system is so complicated and variant between work categories (as well as obsolete in many respects) that it is difficult for individuals outside of the railroad industry to understand the implications of many labor proposals. Even the 1916 eight-hour day legislation is rather misleading, because its purpose was to change the basis of hour-mile calculations and not really to standardize the rail labor working day at eight hours. The dual basis of pay, incidentally, applies only to train operating employees, not to the clerical and other non-operating categories.

In addition to the complexities introduced by such items as the dual basis of pay is the enormous body of specific work rules dividing the responsibilities of the numerous individual railway unions and specific labor categories within those unions, which affect both operating and non-operating employees. Work rule disputes are far too numerous and elaborate to be discussed here, but the outcome of negotiations over work rules are often of far greater significance to the determination of the pay ultimately received by a given category of employees than is a modest adjustment of base pay rates. Work rules per se, of course, are not matters of law, but the legally prescribed collective bargaining system does provide a framework for dealing with them. The system has come under some attack from analysts recently for being ill-equipped to deal with assessment of the economic consequences of the decisions made by management and labor.[1]

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[1]Task Force on Railroad Productivity, op. cit., p. 226.

The net result of the complex nature of railway labor issues is that the Federally established mechanisms for resolving disputes between rail unions and between rail unions and management have taken on much of the character of technical panels. The various boards are praised and condemned on the expertise and credentials of their members, with a major question frequently being the capability of the panel to understand the direct and indirect ramifications of a particular proposal. Overall, both labor and management appear to have felt that the permanent body of expertise provided for by the Railway Labor Act has been a positive asset in resolving labor issues, as evidenced by their reluctance to abandon Railway Labor Act procedures in favor of a less structured competitive bargaining approach.

In summary, railroad labor relations appear to have been the subject of particular legislative attention because of inertia and reluctance to abandon a framework established in the late nineteenth century, because of the presumed central importance of the rail industry to the economy in general, because of the quasi-public utility image of the industry and a feeling that railroad workers deserve special consideration, and because rail labor issues are technical and complex and appear to call for permanent mechanisms for resolution.

The impact of this legislative attention is difficult to judge. Railway management has often argued that the unions have consistently been able to use the arbitration-mediation process to their advantage. The claim is that the unions will couch a demand in technical terms and if they fail to receive satisfaction in direct bargaining, will appeal through the various levels of boards, often obtaining an eventually favorable "compromise" ruling. If this process fails to satisfy the unions, management claims, the unions will threaten strike, thereby calling an emergency board into existence, whereupon demands are likely to be at least partially met to avoid a shutdown. Finally, if emergency board rulings are unacceptable the unions may continue to threaten a strike, leading to Presidential intervention and another opportunity to achieve a compromise on more favorable terms. This process was perhaps carried out to its fullest during World War II and the early post-war years -- union rejections of mediators' recommendations led to Presidential intervention (often accompanied by railroad seizure) in 1941, 1943, 1946, 1948, 1949 and 1950. [1]

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[1] Harold M. Levinson, et al., Collective Bargaining and Technological Change in American Transportation (Evanston, Illinois: Northwestern University, 1971) pp. 135-136.

Management has claimed that the technical character of demands has worked to its disadvantage in that such issues are difficult to explain, in public or political terms, as worthy of the potential damage of a strike. Hence management claims that the process frequently forces it to give way at some point regardless of the merits of the union position. It might be noted, however, that airline disputes, which are also subject to RLA mediation and arbitration procedures, have tended to be appealed through the complete process with a frequency comparable to that of rail disputes and that twenty-four Presidential emergency boards were called into existence in airline disputes between 1946 and 1970.[1] Thus it appears that airline unions have been equally prone to allow labor issues to engender additional governmental involvement in hopes of achieving a more favorable settlement.

On the other hand, while rail labor may have been able to operate effectively within the Federal arbitration-mediation system, it is quite possible that an even stronger rail labor movement might have arisen in the absence of such a system. The compromise orientation of the settlement mechanisms established have safeguarded the interest of each of the separate unions and hence have probably been one major obstacle to consolidation of railway labor. The perpetuation of several separate and parochial unions may have introduced serious rigidities into the railway labor picture and inhibited the flexibility of management to adapt to technological change. Without the protection of arbitration provisions, however, it seems likely that rail unions would have merged to develop a more united front, that demands would have been sharpened and that actual strikes could have become a greater part of the rail labor scene. The development of one paramount, aggressive rail union would have introduced a quite different set of problems for railroad management. It is quite possible that wage demands of such a hypothetical unified rail labor union could have been equal to or more substantial than those that have actually emerged. Moreover, the bargaining muscle of a consolidated union could possibly have posed an equal or greater limitation to rail management flexibility than the current complex system.

Although Federal attention to rail labor matters has been considerable it should be emphasized that the primary Federal effort has been devoted to providing a workable framework for collective bargaining within the industry, and within that framework to influence the outcome of labor disputes through the participation of neutral mediators and/or arbitrators and through the recommendations of Presidentially appointed emergency boards. Considerable Federal "arm-twisting" and even implicit coercion may be involved in reaching a settlement, but this is usually indirect and difficult to measure.

The Congress has generally been reluctant to dictate the terms of a rail labor settlement by legislative fiat, a notable exception being the Adamson Act of 1916. Congressional restraint in this area is well illustrated by the history of Public Law 88-108, pushed through Congress by the Kennedy Administration in 1963 in an attempt to resolve a crisis over fireman's jobs and the consist of work crews. This legislation was

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[1] Levinson, op. cit., p. 467.

notable because it provided for compulsory arbitration of the dispute by a seven member board, the first peacetime arbitration law in our history. Even so, the Congress acted with considerable restraint. It gave the law only a two year lifetime and refused to renew it. The arbitration panel's decision and subsequent rulings were not accepted by labor and were hampered by dozens of law suits. In a 1967 appeals court ruling regarding the arbitration board's award, the court concluded that "Congress wanted to do as little as possible in solving the dispute that was before it."[1]

Also indicative of Federal restraint is the fact that the labor protection arrangements which were urged upon the contending parties in the 1930's and subsequently incorporated into ICC decisions were not interpreted and extended in a manner which prevented an enormous reduction in the railroad work force. Rail employment by 1970 was only about a quarter of that in 1920, and less than half of that in 1950. One source contends that "in many respects ICC-stipulated conditions were less liberal to employees than was the [privately negotiated] Washington Agreement."[2] It is in any case a matter of conjecture whether union resistance to work force reductions would have been more or less effective in a collective bargaining setting less influenced by Federal involvement.

The most directly traceable impact of Federal labor regulation on the industry is probably in the area of the special railroad retirement and unemployment programs discussed in the preceding chapter, where a direct comparison of rail and non-rail payroll tax rates has been undertaken. Even here, however, the analysis concluded that the additional tax burden imposed by such legislation could not be calculated without a fuller understanding of the pension costs of other modes and without broad assumptions concerning alternative policies which might have been initiated in the 1930's.

Summary

Railroad labor has been singled out for a rather considerable amount of special Federal regulation for historical reasons relating to the central role of railroads in the economy and the quasi-public service image of the industry. At the same time, the United States has not gone so far as many European and other foreign governments in direct intervention in rail labor disputes, preferring to exert influence through mediation-arbitration mechanisms superimposed on the collective bargaining process. The Federal role in the various panels and emergency boards established in the Railway Labor Act and related legislation is considerable, but it is difficult to segregate the influence of government representatives from that of labor and management in the resolution of

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[1] For a fuller review of Public Law 88-108, see Levinson, op. cit., p. 201 ff. Quotation cited on p. 207.

[2] Ibid., p. 148.

most disputes. The influence of Presidential suasion on settling labor disputes likewise appears to have been quite significant in the rail industry but is also most difficult to isolate.

It is not possible to determine the extent to which special Federal legislative attention to railroad labor has seriously advantaged or disadvantaged the railroad industry compared to other transportation modes. While special legislation has given the rail industry something of a distinct character in labor matters, airline collective bargaining has been governed by a portion of the same legislation (and separate Federal labor regulation in the maritime field is not inconsequential). The Federal presence in rail labor matters stands most in contrast to the situation in highway transportation, which is influenced primarily by those laws applicable to labor in general rather than by special legislation. On the one hand, it may be argued that the mediation-arbitration process and special labor protection provisions in the rail industry hampered its ability to adjust to technological and economic changes and that a less-regulated labor environment, similar to that in highway transportation, would have been beneficial. On the other hand, within the context of the necessity greatly to reduce the railroad work force, the case can be made that without Federal intervention rail labor might well have become more consolidated and aggressive and potentially quite disruptive. In sum, the net effect of Federal labor regulation on the viability of the railroad industry relative to other modes is largely imponderable.

Chapter VI

THE COMBINED IMPACT OF SOCIOECONOMIC FORCES AND FEDERAL ACTIONS ON RAIL TRANSPORTATION

The purpose of the preceding chapters has been to develop the foundation for a discussion of the combined effects of Federal direct aid, tax policies, and economic and labor regulation on the viability of the railroads and their modal competitors, within the context of changes in the Nation's socioeconomic structure. It will be clear from a reading of that material that no simple cause and effect formulation can be deduced from the interaction of the factors involved, but some valuable conclusions can be drawn.

There is little reason to question the dominance of railroad transportation from its appearance in this country early in the nineteenth century until the 1930's. Vastly superior to the plank road, turnpike, unimproved river, and shallow canal systems and the crude means of locomotion available for those modes, the railroad rapidly became synonymous with progress, economic development and "transportation" itself. The economic regulatory system which evolved to cope with the railroads' predatory potential vis-a-vis communities, regions, shippers, persons, and commodities also endowed the industry with a measure of stability and certainty, controlled cutthroat intra-industry competition in areas with too many railroad companies or too little traffic, and served to blunt the growing threat of organized political opposition to railroad excesses on the part of the Granger movement and state legislatures and regulatory commissions.

Likewise rail labor regulation provided a framework for resolving disputes without resort to strikes and shut-downs, events which were widely believed to be capable of crippling the transportation, communications and economic life of the country. We have seen that railroads so dominated employment and the economy that they were commonly perceived to be a form of public utility. Rail labor indeed was believed to have almost a moral duty not to strike, and was recognized to be toiling in a physically dangerous work environment, in return for which it warranted special consideration.

Few questioned as well the role of the railroads in accelerating economic and political unification of the country.[1] The rail system reached every major industrial and commercial center and extended into rural areas -- where 60 per cent of our people lived in 1900 -- and where it was hoped development would flourish. The transcontinental links, aided by the land grant program and Federal loans, were assumed to become magnets for settlements and commerce. Value of service rate-making helped

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[1] Modern scholarship has questioned the actual significance of railroads as a unifying force, but at the time their role was taken for granted. See, for instance, Robert William Fogel, Railroads and American Economic Growth: Essays in Econometric History (Baltimore: The John Hopkins Press, 1964).

the railroads meet their high fixed costs and served as the medium for subsidizing the newly developing rural areas and the agricultural and mining sectors by means of a transfer of capital from the more industrialized East and North.

Functioning in this generally hospitable environment -- one characterized by little competition from other forms of transportation and by a regulatory system that meant stability for the industry -- the railroads had constructed the sprawling U. S. rail system, much as we know it today, by the beginning of this century. Of the peak rail line mileage built (252,845 miles by 1920), 75 per cent of the national system and over 90 per cent of the eastern states' system were in place by 1900. Almost 90 per cent of the 1920 peak Granger state[1] rail mileage was completed by 1900. The railroads accounted for close to 80 per cent of the Nation's total intercity ton-miles as of 1920. Thus the match between the railroads, the regulatory system, the economy, national growth and development policy, and profits was exceptionally close.

The railroad system was fundamentally a nineteenth century creation and it served a nineteenth century pattern of economic activity and population distribution. The vast changes in the mix and structure of the economy, the size, location and activities of the population, and the availability of alternative means of transportation and communication that occurred in the twentieth century have frequently been called revolutionary. The fundamental nature of these changes and their implications for rail transportation (and much of the rest of American life) were complicated and disguised by the two world wars and the Depression years, events of great national emergency and stress. Yearnings for a "return to normalcy" after each of them and preoccupation with adjusting to the immediate consequences of their cessation masked the fact that a new norm would have to emerge -- replication or restoration of "the old days" was in each instance to prove to be a myth. The scope, depth, and pace of change was grossly underestimated by most observers. But natural economic, demographic and social forces were to transform the face of our society and certainly the manner in which people and goods were transported.

The railroad industry was especially hard hit by these changes. It coped with them with a nineteenth century rail network and a nineteenth century regulatory system. Both proved to be handicaps, frequently unable to keep pace with entirely new products, new methods of production and distribution, new locational patterns, and new competitive technologies.

The agricultural and mining sectors, long a mainstay of the economy and the railroads, represented only about 4.5 per cent of total output

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[1] Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, and Wisconsin.

in 1974. Growth is relatively slow in the farm sector and trucking and barge carriers, undoubtedly aided by publicly-provided highways and waterways and the exemption of agricultural products from regulation, have been successful in capturing substantial shares of the traffic that is available. The fundamental change, however, is that the farm sector accounts for only 3.0 per cent of gross national product, a substantial drop from 11.0 per cent 50 years ago. Population distribution too has changed, with the percentage living in rural areas (including semi-suburbia) barely one-fourth of the total in 1970. The railroad network built to serve a predominantly rural-oriented economy and a Nation of scattered small towns and farms has suffered inordinately in terms of declining traffic and revenue growth, elimination of passenger revenues (a blessing after passenger services began incurring large deficits) and retention of thousands of miles of redundant trackage. Recent studies indicate that 31,257 miles of light density railroad line are causing the railroad industry an annual deficit of about $181.8 million, a sum equivalent to roughly 30 per cent of average annual rail industry net railway operating income.[1]

Shifts in the mining sector of the economy have been even more dramatic. In 1920 coal accounted for 72.5 per cent of national energy consumption and nearly all of it moved by rail. Today oil and natural gas supply three-fourths of our energy and nearly all of it moves by non-rail modes. In 1930 coal accounted for 28 per cent of originated rail tonnage and almost a fifth of all rail freight revenues -- it was the single most important commodity in the railroad consist. The emergence of petroleum and natural gas as the fuels of choice for transportation, residential and commercial heating, much electric power generation, and many industrial purposes had nothing to do with transportation-related direct Federal-aid programs, regulatory regimes, tax policies, or labor regulation. Instead it is a classic example of product substitution on a grand scale, accompanied as well by the substitution of a new, technologically superior (for this purpose) mode of transport, namely, the pipeline.[2] This was a stunning blow to the railroads, albeit a major breakthrough for much of the rest of American industry and the economy in general.

It is no accident that the partial revitalization of the coal industry caused by the oil embargo crisis has recently benefitted the railroads.

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[1] Light density line figures of 5,757 miles and an estimated $33 million deficit for the bankrupt northeast from USRA, Final System Plan (Vol. II, Part III, July 26, 1975) p. 3; light density line figures for the 31 states outside the northeast of 25,500 miles and an estimated $148.8 million deficit from Department of Transportation, Railroad Abandonments and Alternatives: A Report on Effects Outside the Northeast Region (May 1976) p. 36. Average net railway operating income for the years 1973-1975 was $589.8 million.

[2] This sort of process continues, e.g., minehead generation of electric power accounts now for 17 per cent of total coal "transportation" to electric utilities (see p. II-17).

Nonetheless, for the coal that is shipped, railroads today exclusively carry just over one-half the tonnage, sharing the remainder with other modes.[1]

In addition to the relative declines in agriculture and mining, the finance, insurance, and real estate and government sectors of the economy grew from a combined 18.8 per cent share of GNP in 1929 to a 27.5 per cent share in 1974. The industries which compose these sectors are markedly less transport-intensive, so that their rapid growth has not generated a proportionate increment in freight traffic. While these sectors do put a premium on rapid, flexible personal communications and mobility, the airplane, automobile and modern voice, video and other communications technologies have filled this demand admirably, to the virtual exclusion of the railroads.

As we have seen, manufacturing has remained the bellwether of the economy. It accounts for the largest share of GNP -- about 24 per cent, only a percentage point below its position in 1929. The components of the manufacturing sector, however, have changed immensely. The trend to new light-weight, high value manufactured products has greatly disadvantaged the railroads. Modern theories of production cost control and physical distribution look at total costs of producing, warehousing, distributing, and marketing merchandise. Higher cost but high-speed, reliable transportation may result in lower total costs for the manufacturer and the seller. Trucking, in particular, benefits from these strategies; as a rule, the railroads do not.

Accompanying these fundamental changes in the structure of the economy, our people also spread out across the country. In the last 50 years the combined share of population of the South Atlantic and Pacific regions rose from under 19 per cent to 29 per cent. Most other regions experienced substantial decreases in share. The population and the economy diffused regionally, and at the urban level people and industry tended to abandon the old city centers, and follow the trend to area-wide dispersal. While some individual railroads were positioned to benefit from these changes, the industry as a whole was not. People and economic activity more often than not moved away from rail lines and rail yards -- to be served by other modes. The rail lines and other facilities could not literally be picked up and relocated. The eastern rail carriers suffered most acutely in this regard and their posture was further aggravated by rapid installation, under public auspices, of the infrastructure used by their competitors -- the automobile, airplane, truck, and barge.

As other regions grew and diversified -- to the point where industrialization has occurred in every region -- the old balance between industrial North and East and a rural South, Southwest and West was

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[1] Department of the Interior, Bureau of Mines, Bituminous Coal and Lignite Distribution (1975) Table I.

eroded. Simple value of service pricing based on movement of western bulks in exchange for shipment of eastern manufactures became difficult. Regionalization of so much industrial activity has provided other modes additional opportunities to gain traffic.

As if the remaking of our economy and the redistribution of our people were not enough, the railroads found that the technological revolution was producing new and profoundly effective means of transporting passengers and freight. In general, far more mobile and flexible than a railroad car operating on a fixed guideway, the new modes were intrinsically competitive in most instances with the railroads. The new modes were indeed modern technologies, just as the railroad had been roughly a century earlier, and they moved quickly to assert their technological and functional advantages.

The automobile, as the Federal Coordinator observed in 1935, began to slaughter the railroads as a passenger carrier in the 1920's. Regulatory lag and railroad industry reluctance to admit the inevitable meant that the railroads would suffer from declining passenger traffic and revenues for almost forty years before shedding the service. Aviation perhaps reinforced this decline, but expanded largely on its own technologically-based ability (underwritten substantially by Federal military and civil agency spending) to generate a demand among an increasingly affluent population for high-speed, relatively long distance travel.

Just as the automobile perfectly served our people's growing obsession with personal mobility -- and stimulated their demand for highway construction -- so the truck with its inherently attractive combination of ubiquity, flexibility and ease of operation came to serve the myriad needs of our diversifying and expanding economy. These inherent advantages probably were more rapidly exploited because local, state and Federal governments, in much the same spirit as that which motivated their support of railroad construction in the late nineteenth century, had accepted responsibility for financing a highway network. Like investment in railroads and waterways, aid for highway construction -- at least in its earlier period -- was perceived as a means for regional and national economic development. Highways, like waterways, though, were more readily utilized because these non-rail modes have been subjected to less economic regulation. Nonetheless, there has been a propensity among the railroads and some economists to underestimate the natural advantages of trucking, in particular, in the type of economy that we have. One of the railroad industry's most perceptive and candid members assessed the nature of the competition in 1954, as follows:[1]

> The inauguration of large-scale motor trucking was, at that time, viewed with equanimity by railroad men who believed the new carrier would prove

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[1] John Walker Barriger, Super-Railroads For a Dynamic American Economy (New York: Simmons-Boardman, 1956) p. 19.

> a useful auxiliary, relieving the rail lines of some of the burdens of light traffic branch lines and expensive terminal operations. It soon developed, however, that truckers had mainly interested themselves in long-haul movements over heavy density routes.... Length of operations expanded coincidentally with the technical improvement of the vehicles and the development of the national highway system.
>
> Highway transportation of freight has now reached transcontinental proportions, and no desirable class of railroad traffic is immune from diversion to the truck. Some of the principal coast-to-coast highway freighters -- by not serving intermediate points which provide no attractively concentrated reservoir of business -- have raised their average hauls per shipment to 1,400 miles, which compares with 420 miles for all freight moving by rail.

Although it has been customary to say that rails have the "cost advantage" on lengths of haul of over 100 or 200 or 300 miles, and that rate regulation has prevented railroads from reducing their rates on high-value traffic in order to recapture it from trucks, the fact remains that over half of all truck tonnage bears rates higher than rail rates. Moreover, more than half of all truck tonnage moves at distances in excess of 300 miles.[1] Modern high-speed trucking is especially well-suited to the total production and distribution costing concepts mentioned earlier, where transportation cost per se is not decisive. Private and contract carriers, in particular, benefit from those concepts, and offer as well maximum control for the producer/shipper/receiver over the flow of raw materials to the production process and finished products to markets. Quick changes in schedule, destination, consist, etc. are more readily accommodated by private and exempt carriers, and this sort of flexibility is highly prized in the modern approach to distribution.

Unregulated and regulated barge carriers benefitted from an exploding technology in the immediate post-war years, especially advanced diesel engines and radar, which permitted 24-hour and all-weather operations for the first time. Pre-war 500-800 horsepower engines and several-

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[1] Task Force on Railroad Productivity, National Commission on Productivity and the Council of Economic Advisers, Improving Railroad Productivity (1973) p. 37. Several motor carriers report average lengths of haul in excess of a thousand miles. A recent study of truck and rail competition in Canada concluded that "The effectiveness of trucking competition, even for long-hauls and relatively low value commodities, was ... of startling significance" and remarked upon the truckers' ability "to offer unexpectedly effective rate competition to the railways." See Treavor D. Heaver, "Competitive Forces Affecting Canadian Rail Rates Through Shipper Carrier Negotiations," in Transportation Research Forum, Proceedings -- Seventeenth Annual Meeting, Vol. XVII (1), 1976, p. 390.

hundred ton barges were replaced in the late 1940's and 1950's with towboats ranging up to 9,000 horsepower and barges up to 1400 tons. Towboat productivity tripled between 1950 and 1967, as a single towboat could push a fleet of barges carrying over 60,000 tons of cargo.[1] The water carrier traffic gains during the period between the end of the war and the early 1960's coincide nicely with this period of technological surge.

The rail competitive modes, technologically strong in their own right, have also benefitted from the lack of regulation. With 56 per cent of trucking intercity ton-miles moving in unregulated carriers, the railroads have not been strongly placed to compete. For many years, especially in the 1940's and 1950's, the railroads sought to bring the other modes under regulation rather than to compete aggressively with them, a self-imposed institutional obstacle that did not serve the railroads well. That posture has gradually changed. The rail industry has introduced modern equipment, new service techniques such as the unit train concept, and advanced communications systems and argues forcefully that it should be relieved of some of the regulatory inhibitions that have historically limited those railroads which wished to compete. The fact that of the 112 three-digit manufacturing commodity groups reported in the 1972 Census of Transportation, non-rail carriers (regulated and unregulated) moved half or more of the traffic in 95 of the groups (which account for 80 per cent of the total Census tonnage) is strong evidence of the potency of the non-rail modes.

Crucially important in judging the forces which have affected the railroads is the great concentration of traffic loss during the period 1947-1960. Although the rail share of intercity ton-miles dropped by 28.5 percentage points between 1947 and 1975 (from 65.3 per cent to 36.8 per cent), about 75 per cent of that loss had occurred by 1960. Likewise all of the trucking mode's increase in share of traffic as of 1975 had occurred by 1960, as had 85 per cent of the water mode's gain. Thus the principal railroad freight traffic losses (and most of the rail passenger traffic losses) had occurred prior to the massive Federal direct aid highway, waterway, and aviation spending programs. This is not to derogate the importance of the Federal funds invested in the three non-rail modes during the period 1946 through 1960 -- highways, $18,234 million; waterways, $2,833 million; and aviation $4,933 million, but nonetheless fully 77.6 per cent of post-war highway spending, 73 per cent of post-war water spending, and 80.6 per cent of post-war aviation spending occurred after 1960, when the pace of rail traffic decline had slowed.

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[1] For an excellent review of technological development in the inland water mode see the testimony of J. W. Hershey, L. P. Struble, Jr. and F. A. Mechling in Senate Commerce Committee, Water Carrier Mixing Rule Exemption, Hearings, 90th Cong., 1st Sess. (June 28 and 29, 1967) pp. 10-51.

What these figures suggest is that the combined effects of the great structural economic and population changes in the country and the intrinsic technological strengths of the new modes -- often joining in unpredictable ways, as with the example of the important advantage conferred by a new product (petroleum) on an old mode (pipeline) -- lay at the heart of the railroads' fall from dominance. The highway and waterway investment programs assisted those two modes and helped to compress or telescope the time period which the railroads' had available for working out an adjustment to the new economic and competitive environment, but they did not cause the railroads' basic problems. Indeed, the large-scale highway and waterway spending after 1960, looked at vis-a-vis intercity ton-mile shares, took place while the trucking and water carrier shares remained essentially unchanged (although these physical measures mask the important revenue gains made by trucking during this period). The railroads lost 7.3 and the pipelines gained 7.2 percentage points over the period 1960-1975.

From the end of World War II through at least 1960, the rigidities of the regulatory system undoubtedly complicated what was a very painful adjustment process for the railroads. The deep-seated fear of the railroads as monopolists still persisted, as did a paternal feeling toward the newly-regulated water and truck common carriers and the Commission's commitment to using transportation rates as a means of correcting market and regional imbalances. At a time when flexibility and quick-reaction would have most helped the railroads, the ICC moved at a very cautious pace following traditional policies. Rail minimum rates were controlled to fair-share traffic among the modes and to preserve the value of service rate structure. Delays caused by ICC suspension and investigation of rates cost the railroads hundreds of millions in revenues. Rail line abandonment became a contentious, costly, and protracted procedure.

This is not to say that changes in the regulatory system or its administration would have reversed the decline in railroad traffic and revenue and stunted or restrained the growth of trucking and the barge lines. The trucking and diesel barge technologies, matching up well with the economy's changing needs, were too strong for that to occur. But the speed at which the rail decline occurred and the considerable awkwardness with which it was handled were definitely affected by a regulatory system better suited to another century. Unfortunately the railroad industry itself was heavily influenced by the same century and, displaying some tendency to misperceive the long-term significance of many of the economic and transportation changes that were enveloping it, devoted too little energy to the complex process of making the adjustment or transition to a permanently changed competitive environment.

At the same time, from 1942 to 1960, the Federal Government was also levying $5.1 billion in excise taxes on railroad freight waybills and passenger tickets. Although other regulated carriers had to pay the same tax, it was undoubtedly burdensome for the railroads in terms of their competition with unregulated carriers who had the advantage of not

paying it. It was a highly unfavorable time to be taxing a rapidly failing mode in the name of raising general tax revenues.

The relative "evening out" in the comparative strength and position of the modes, as measured on an intercity ton-mile basis, in the 15 years since 1960 suggests that the U. S. transportation system has reached a new plateau unlike anything we have seen since the exclusive dominance of the railroads at the turn of the century. Each of the major freight modes -- highway, rail, water, and pipeline -- is now a mature technology. Each has an extensive capital-intensive and rather fully developed infrastructure. Each appears to have maximized its basic technological potential. There is no new technology on the horizon -- equivalent to the airplane, the automobile, or diesel power -- capable of disturbing that balance.

Signs of weakness in rail transport, however, still remain. In spite of the relative stability in market share as measured in physical units (ton-miles), it remains true that the railroads have continued to experience a declining share of the total transportation market assessed in terms of revenues. Since 1958 rail revenues have not quite doubled, while motor carrier revenues, on the other hand, have nearly tripled. (As a result, the truck share of transportation revenues has risen from about 59 per cent in 1958 to over 68 per cent in 1974.) Even the hopeful prospect of increased coal consumption will have a somewhat greater impact on railroad ton-miles than on railroad revenues. All of the forces discussed in the preceding chapters -- regional and compositional changes in the economy, Federal sponsorship of truck, barge, and air carrier infrastructures, tax policies, and the disparities in modal regulation -- have played a part in explaining the inability of the railroads to keep pace with their competition. What is significant today and for the future is that their combined effect has been to leave the railroads as a group in a relatively vulnerable position.

This vulnerability asserts itself in several ways. The railroads' low rate of return over the past 16 years (an average of three per cent), if not corrected, will undermine the industry. At the same time, the rail physical plant must be restructured and modernized. Moreover, it is also clear that the decades-old "weak and strong" carrier problem has not been fully resolved. Some railroads are quite successful while others are in marginal condition, a state of affairs whose practical implications have already been illustrated by the Northeast railroad crisis. Continued public toleration of crisis decision-making cannot be assumed, thus placing a premium on achieving a more deliberate and controlled process of adjustment in the railroad industry.

Given regional economic and demographic stabilization and a likely future of moderate and balanced growth, major unexpected surges in transport demand are less likely. The major rail legislation of the 1970's is intended to assist the railroads in making the transition to a more stable future, on a more equitable footing with the other modes.

Chapter VII

THE RAILROAD REVITALIZATION AND REGULATORY REFORM ACT OF 1976

Overview of the Act

The Railroad Revitalization and Regulatory Reform (RRRR) Act of 1976 (Public Law 94-210) was signed into law on February 5, 1976. Containing eighty-seven sections in nine titles, and almost $6.4 billion in new authorizations for Federal aid to rail transportation, the RRRR Act is the most comprehensive and complex piece of railroad legislation ever enacted.[1]

The 120-page Act is indeed omnibus for its provisions deal with virtually every significant problem currently facing the railroad industry. The legislation was the product of several years of extensive deliberation and negotiation among the Congress, the Executive Branch, state and local governments, railroad management and labor, and rail users over the future of Federal policy toward rail transportation.

For purposes of the analysis in this chapter, the RRRR Act will be divided into the following six key subject areas:

(1) reform of Federal regulatory control of the railroads (Titles II, III and IV);

(2) provision of Federal financial assistance for the rehabilitation and improvement of rail facilities and equipment (Title V);

(3) implementation of the Final System Plan which provides for the takeover of essential rail services in the Northeast and Midwest by the Federally-assisted rail carrier ConRail (Title VI);

(4) implementation of improved intercity rail passenger service in the Washington-to-Boston Northeast Corridor (Title VII);

(5) provision of Federal financial assistance for the interim continuation of rail service on uneconomic light-density lines and for the development of subsidy-free local freight transportation alternatives to such uneconomic rail services (Title VIII);

(6) conduct of major research in virtually every area of the physical and corporate structure, operations and financial needs of rail transportation (Titles II, V, VII, VIII and IX).

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[1] As will be mentioned at several points in this chapter, the RRRR Act has been amended by the Rail Transportation Improvement Act (Public Law 94-555) which was signed into law on October 19, 1976. Among a number of significant amendments made by this Act, the total authorizations in the RRRR Act were increased by $155 million to a new total of just over $6.5 billion.

The potential impact of each of these six key subject areas of the Act on the future of rail transportation in the United States will be discussed in the following sections of this chapter. It will be shown how the provisions of the RRRR Act in each of these six areas are a realistic attempt on the part of the Congress and the Executive Branch to deal with long-standing major problems facing rail transportation.

Rail Regulatory Reform

Chapter V identified three major problems arising from Federal economic regulation of the railroads that have continued to plague the rail industry: (1) the lack of ratemaking flexibility; (2) the existence of excess capacity in the rail system; and (3) the absence of workable procedures for the industry to restructure itself through mergers and consolidations. Titles II through IV of the RRRR Act focus on these long-standing problems of rail regulation and thus represent the first significant legislative attempt since the Transportation Act of 1920 to overhaul and update Federal railroad regulation.

The principal railroad ratemaking reforms are contained in Section 202 of the Act. These Section 202 reforms include: (1) the definition of "just and reasonable" railroad rates as rates which contribute to the "going concern value" of the carrier (usually rates which equal or exceed variable cost); (2) the provision that no rate may be found to be excessive unless the carrier has first been found to have "market dominance" over the service to which the rate applies; (3) the establishment of a trial two-year no-suspend zone for railroad rate increases or decreases up to 7 percent per year; and (4) provision for "seasonal, regional or peak-period" rates and special rates for "distinct rail services" to increase the ability of the railroads to tailor rates and services to the needs of individual shippers.

These reforms are designed to try to solve two key ratemaking problems that were mentioned in Chapter V: (1) the Interstate Commerce Commission's (ICC) use of umbrella ratemaking whereby railroad rates have often been maintained at artificially high levels in order to protect the traffic of other modes whose transportation costs were higher for the freight movements involved; and (2) the sluggishness and uncertainty inherent in the ratemaking approval process where railroad attempts to adjust rates to meet constantly changing cost and market conditions become so bogged down in the red tape of Federal review that the adjustments are often only approved by the ICC long after they are needed by the railroads.

The RRRR Act contains three additional provisions designed to facilitate the railroads' ability to establish and maintain market competitive rates. The first of these is the development of the revised railroad cost and revenue accounting system required by Section 307. The current system interferes with competitive ratemaking because it fails to provide adequate financial data for cost-based ratemaking. Section 307 requires the ICC to establish the revised accounting system by January 1, 1978.

Section 206 contains the second significant provision, one which directs the ICC to permit railroads to establish rate incentives to encourage capital investment made by a railroad, a shipper, or an interested third party. Under the terms of this provision, shippers will be able to negotiate lower rates on shipments to or from a facility, in exchange for making major capital investments in rail related facilities. This reform should stimulate new rail-related investments and a more equitable rate structure.

The third ratemaking provision is contained in Section 208 of the Act. This section reduces ICC authority to grant anti-trust immunity to railroad rate bureaus to allow the railroads to jointly set rates, a joint action which is widely believed to restrain rate competition between rail carriers moving traffic between common points. Section 208 requires that each railroad set its single-line rates independently, and that only those carriers which can practicably participate in the traffic can vote on joint-line rates applicable to that traffic. Any carrier participating in a rate bureau proceeding is accorded the right of independent action if that carrier chooses to publish a rate different from that voted on by the rate bureau members, and the rate bureaus are prohibited from protesting such independent action. Thus it will now be more difficult for rail carriers to act through their rate bureaus to prevent each other from pricing in accordance with the market conditions facing individual railroads.

Taken collectively, these ratemaking provisions of Titles II and III of the RRRR Act represent an effort to direct the ICC away from **requiring** the railroads to price their services: (1) on the basis of an inadequate and outdated accounting system; (2) in response to the anti-competitive pressures of railroad rate bureaus; and (3) under the economically inefficient burden of the ICC's attempts to "fair share" freight traffic among the highway, rail and water modes. Railroad rates are now to be based upon the cost to each individual rail carrier of providing each particular rail service, ratemaking which should allow the railroads to better compete in the freight market based upon their actual cost and service advantages and disadvantages relative to the non-rail modes.

Title IV of the Act addresses the other two key regulatory problems of excess capacity and industry restructuring identified in Chapter V. Title IV makes the Secretary of Transportation a major participant in the railroad merger process, a process which had heretofore been the exclusive concern at the Federal level of the ICC. Title IV also sets reasonably short new time limits for the ICC to act upon railroad proposals for mergers and consolidations, time limits designed to end the occurrence of merger cases which took over ten years for the Federal Government to resolve.

The Secretary's new role is established in Sections 401 and 403 of the Act where he is given the explicit authority to: (1) make railroad merger, reorganization and consolidation proposals of his own; (2) hold railroad conferences to consider his own proposals or those of the railroads; and (3) conduct his own analysis of the merits of railroad proposals under the ICC's new expedited merger procedure. While it must be admitted

that, with the possible exception of calling railroad conferences, the Secretary could have played such a role in mergers and consolidations without Title IV, this legislation transforms what would otherwise be an assumed role on the part of the Secretary of Transportation into a role with clear Congressional support.

Title IV through its focus on a restructuring of the railroad industry should help to reduce the significant excess rail capacity that continues to exist in the Nation's rail system. Mergers and consolidations among the major Class I carriers would reduce the need for each carrier to have its own main line between each of its major markets, and redundant main lines could either be downgraded for local service or abandoned, thus relieving the industry of a major portion of its non-viable capital investment.

While Titles II through IV of the RRRR Act have the potential to begin to solve several major rail regulatory problems, the extent to which this potential is realized will be largely determined by the ICC, the agency chiefly responsible for implementing the regulatory provisions of the Act.

Federal Financial Assistance to the Railroad Industry

Title V of the RRRR Act establishes two programs for providing Federal financial assistance to the railroad industry. Section 505 authorizes the Secretary of Transportation to purchase railroad securities called Redeemable Preference shares for the purpose of rehabilitating, improving or acquiring rail facilities and equipment. Section 511 authorizes the Secretary to approve Federal guarantees for railroad loans which were or will be used to acquire or to rehabilitate and improve rail facilities and equipment. A total of $1.6 billion is authorized for these two programs: $600 million for Preference Share financing and $1 billion for the principal amount of loan guarantees. The Secretary has delegated most of his powers and duties for these two programs to the Administrator of the Federal Railroad Administration (FRA).

The Redeemable Preference Share provisions of the RRRR Act, as amended by the Rail Transportation Improvement Act (RTIA), require the shares to have lives of not less than 21 years, nor more than 30, and to return to the Federal Government a minimum of 150 percent of the aggregate par value of the shares. The RRRR Act requires not less than a six-year nor more than an eleven-year postponement in railroad repayment of the principal amount of any shares issued and a ten-year deferral of dividends on the shares. The Administrator is authorized to use various combinations of: (1) length of share life; (2) total amount of the repayment (principal plus dividends); and (3) length of postponement of repayments of principal to produce varying interest rates on this Federal assistance to the railroads.

This variable interest rate set by the Administrator will essentially fall into three levels. The minimum effective interest rate which can be set for Preference Share financing is approximately 2 percent, which is achieved through a combination of 30-year shares, 150 percent total payback and 11 year postponement of redemption payments on the shares. The next interest rate level was established by Section 214 of the RTIA which limits the interest rate for projects which will reduce deferred maintenance on rail facilities to the railroad's average rate of return on total capital for the three years preceding the project application. If this average rate of return is less than 2 percent, the 2 percent rate will apply to these deferred maintenance projects. For projects other than those which will reduce deferred maintenance, FRA has established the maximum effective interest rate as the "cost of money to the government," i.e., Federal Treasury long-term borrowing rates at the time of purchase of the shares by the Administrator. These long-term Treasury borrowing rates fluctuate considerably, but have recently averaged around 8 percent.

The loan guarantee provisions of the RRRR Act, as amended by the RTIA, give the full faith and credit backing of the United States to private sector railroad loans of up to 25 years which are guaranteed by the Administrator. Interest rates for these loans will be established by agreement between the borrowing railroad and the lending institution, with these rates reflecting the virtual elimination (due to the Government guarantee) of the risk of non-repayment of the loan in the event of a default by the railroad.

The RRRR Act prescribes general public interest considerations that must be met before the Administrator can approve projects for financial assistance under either the Section 505 or 511 program. Section 505 of the Act requires the Administrator to consider the following three factors

before approving any railroad application for Preference Share financing: (1) the availability of financing from other sources at a cost which is reasonable in light of the railroad's projected rate of return for the project to be financed; (2) the public interest in supplementing any such financing with Federal funds; and (3) the relation of public benefits to public costs for the project for which Federal funds are sought. The major public interest prerequisite for the approval of a Section 511 loan guarantee is that the Administrator make a finding that "the financing or refinancing is justified by the present and probable future demand for rail services to be rendered by the applicant and will serve to meet demonstrable needs for rail services and to provide shippers with improved service."

The Section 503 rail line classifications and designations will also be a factor in the evaluation of railroad applications for Title V financial assistance. The designation of the rail line or lines involved in a given project application for facilities rehabilitation or improvement assistance will be one of the considerations in the Administrator's assessment of public benefits and costs under Section 505 and his finding of "justified by the...demand for rail services" under Section 511. The Department of Transportation intends to direct the major share of Title V assistance to those portions of the rail network which service most of the traffic. One of the findings of the preliminary report under Section 503 is that approximately 20 percent of the rail network (40,000 route miles) carries 67 percent of the rail freight traffic (measured in annual gross ton-miles per route mile), while another 33 percent of the rail network (60,000 route miles) carries only 1 percent of the traffic.[1] The Department believes it to be in the public interest to give priority to the heavy density portion of the rail network, particularly to the consolidation of facilities which would concentrate rail traffic on the most essential portions of the network. It should be noted that, while the Section 503 designations will be an important element in the review process for applications for Title V assistance, these designations are not the controlling factor governing project approval.

Many estimates have been made of the anticipated capital needs and expected capital shortfall of the railroad industry over the course of the next ten years. These estimates vary widely and, until the more definitive Capital Needs Study being conducted by the Department of

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[1] U.S. Department of Transportation, Preliminary Standards, Classification, and Designation of Lines of Class I Railroads in the United States (Washington, D.C.: August 3, 1976) Vol. I, p. 5.

Transportation under Section 504 of the RRRR Act is completed, a reliable range cannot be given for these projected needs. Nevertheless, due to the many years of poor earnings for many railroad corporations, and the resultant physical deterioration of the rail network, it can only be expected that these capital needs will be substantial. Moreover, there may be a significant capital shortfall, even for a rationalized rail system, that the railroads cannot meet on their own. The Title V Federal financial assistance programs, when coupled with the regulatory reform provisions of the Act and any additional Federal financial assistance that may be made available to the railroad industry as a result of the Capital Needs Study, offer the potential for helping the industry meet whatever capital shortfall there may be. The Section 505 and 511 programs will provide up to $1.6 billion in new funding largely for financially viable projects for an industry long caught between the problems of excess investment in redundant and unprofitable facilities and lack of private sector investment in capital improvement projects which could begin to overhaul the existing rail network. The Title V assistance, if used judiciously, could demonstrate the profit potential of a restructured rail industry through the projects approved for Federal funding and thus lead the way for a renewed stream of private sector investment to complete the revitalization of the industry.

ConRail

Title VI of the RRRR Act amends the Regional Rail Reorganization (RRR) Act of 1973 (Public Law 93-236) to implement the United States Railway Association's (USRA) Final System Plan for the reorganization of six of the bankrupt railroads in the Northeast and Midwest into the Federally-assisted carrier ConRail. The six bankrupts are the Penn Central, Erie-Lackawanna, Reading, Lehigh Valley, Central of New Jersey, and Lehigh and Hudson River railroads. The importance of the rail service formerly provided by these railroads is shown by the fact that in 1970, the year in which the Penn Central declared bankruptcy, five of these rail carriers (excluding the smaller Lehigh and Hudson River Railroad) accounted for 18 percent of the total railway operating revenues of all Class I railroads in the United States, and 14 percent of total Class I revenue freight ton-miles.[1] The Penn Central alone employed over 90,000 people, approximately 19 percent of total U.S. railroad employment.[2]

ConRail, which began rail operations on April 1, 1976, stretches east-west from the Atlantic Coast to the Mississippi River and north-south from Canada to the southern tip of Illinois, an area which

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[1] Interstate Commerce Commission, Transport Statistics in the United States, 1970 (Washington, D.C.: U.S. Government Printing Office, 1972). Percentages computed from data on various pages.

[2] United States Railway Association, Preliminary System Plan (Washington, D.C.: U.S. Government Printing Office, February 1975) Foreword, page 1.

includes 55 percent of the Nation's manufacturing plants and 60 percent of all factory workers in the United States.[1] With its 17,000-mile network, ConRail is second only to the Burlington Northern, with its 22,000-mile system. As was its principal predecessor the Penn Central, ConRail is the largest railroad in the U.S. in terms of both annual railway operating revenues and annual revenue freight ton-miles.

Section 216 of the RRR Act, as amended, authorizes USRA to purchase up to $1 billion in ConRail debentures and up to $1.1 billion in ConRail Series A preferred stock to finance ConRail's take-over and rehabilitation of the essential rail services of the bankrupts. With this Federal assistance, and additional funds projected to be available from operating revenues and private sector equipment financing, USRA estimates in the Final System Plan that ConRail will spend $6.8 billion during the ten-year period 1976-1985 in a massive capital program to improve rail service in the Northeast and Midwest. This $6.8 billion includes:

$1.5 billion for elimination of deferred maintenance
$2.0 billion for track structure replacements
$1.3 billion for improvements to yards, bridges and signal systems
$2.0 billion for additional equipment

$6.8 billion total[2]

In physical terms, ConRail's ten-year roadway improvement program is projected to install over 42 million new ties and replace over 11,000 miles of deteriorated rail.[3] ConRail's first rehabilitation priority will be 5,775 track miles which carry 20 million or more annual gross tons per track or which require a 60-mph operating speed for piggyback service. Also included in this first priority program are 2,160 additional track miles in classification yards which support the rail traffic on these high-density or high-speed routes.[4]

The large Federal investment in ConRail is not a first step in nationalizing the carrier, but rather transitional assistance designed to give the new railroad the financial resources to overcome decades of deterioration in the facilities and equipment of the bankrupt railroads in order to restore profitable rail services operated in the private sector. The Final System Plan, and Title VI of the RRRR Act which implements the Plan, provide for the Federal investment in Conrail to

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[1] Consolidated Rail Corporation, ConRail Magazine, Volume 1, Issue 1 (April 1, 1976), pages 5 and 8-9.

[2] United States Railway Association, Fact Sheet (Washington, D.C.: U.S. Government Printing Office, July 15, 1976), page 8.

[3] United States Railway Association, Final System Plan--Supplemental Report (Washington, D.C.: U.S. Government Printing Office, September 1975), page 116.

[4] Ibid., page 115.

be repaid to the Government at an interest rate of 7.5 percent. The Federal investment in ConRail is expected to reach its peak in 1979 at slightly over $2 billion and decline in later years as ConRail redeems this investment. ConRail is intended to be eventually entirely owned by the private sector.

Meeting the Final System Plan goal of keeping ConRail a private sector railroad and repaying the Federal investment is, of course, contingent upon making ConRail a profitable railroad. USRA projections forecast that ConRail's pre-tax income will increase from a loss of $295 million for its nine months of operations in 1976, to its first profit of $121 million in 1979, to a profit of $901 million in 1985. Such a favorable long-term earnings forecast is dependent upon the Final System Plan's projections of a compound annual growth rate in ConRail freight revenues (in constant dollars) of 1.2 percent through 1985, as well as decreases in real operating expenses due to economies anticipated as a result of both the merger of the six bankrupt carriers and ConRail's $6.8 billion capital improvement program. These USRA projections of ConRail's income are also based on the policy that ConRail's freight services should not have to cross-subsidize rail passenger services.

While the results from ConRail's first six months of operation (April through September 1976) are not a proven indicator of its performance over the next ten years, these two quarters did nevertheless represent a very promising start for ConRail. As shown in Figure 39, ConRail's loss for these six months was $66.4 million, a clear indication that the nine-month loss will be considerably below the figure of $295 million forecast by USRA. ConRail is also making good progress in its rehabilitation program. For the nine-month period ending December 31, 1976, ConRail had installed almost 4 million new ties, resurfaced 8,247 miles of track, and laid 727 miles of new continuous-welded rail. During this period, ConRail also completed heavy repairs on 11,916 freight cars and 779 locomotives.[1]

Reaching the actual turnaround from a loss to a profit projected by USRA for 1979 will of course be much more difficult for ConRail to achieve than the decrease in its projected first year losses, particularly if ConRail's freight revenues are depressed by downturns in the economy not foreseen in the Final System Plan. ConRail's potential for success as a profitable private sector railroad is ultimately tied to the complex intersection of a host of economic, regulatory and institutional factors which defy firm prediction over a ten-year period. As USRA emphasized and re-emphasized in the Forewords to both the Preliminary and Final System Plans:

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[1] As provided in ConRail maintenance reports to FRA.

Figure 39

CONSOLIDATED RAIL CORPORATION
CONSOLIDATED STATEMENT OF OPERATIONS
April 1 through September 30, 1976

	Quarter Ended Sept. 30, 1976	April 1, 1976 through Sept. 30, 1976
	($ in Thousands)	
Revenues:		
Freight	$684,910	$1,394,500
Passenger and Other	124,334	250,607
Total Revenue	$809,244	$1,645,107
Costs:		
Transportation	$389,530	$ 783,913
Maintenance	240,673	500,473
Equipment Rents, Taxes and Others	211,024	427,136
Total Costs	$841,227	$1,711,522
Net Income (Loss)	$(31,983)	$ (66,415)

Source: ConRail news release, November 11, 1976.

The Association can only plan a system and recommend methods of financial assistance. Others will have to share in the creation of an environment favorable to an economically viable rail system for the nation. The industry itself collectively must do those things which bring about a major improvement in utilization of cars, facilities and equipment. Future profitability of the industry also will depend in part on increases in productivity of people; organized rail labor must find a way to contribute to that increased productivity. Existing relationships of the Region's railroads to their customers and to the government will have to be altered. Shippers and passengers will have to bear a larger share of the costs of providing rail services. A smaller number of communities and shippers will have to be prepared to forego rail service where the provision of such service is no longer economical and subsidy funds are not forthcoming. In general, a vigorous effort must continue to identify those transport markets which rail serves best and to adapt rail service and operations to such optimal economic functions.

In addition to the individual and local responsibility described above, Federal, State and local governments must be prepared to change their policies toward transportation. Ultimately, economic viability for all transportation is a function of a realistic recognition of the necessity for the industry, and those who use it, to pay its costs and permit it to obtain a reasonable profit. If fundamental changes are not made in these factors, and those enumerated above, an alternative is nationalization, a solution no more desirable now than it has been in the past.

Northeast Corridor Improvement Program

Title VII of the RRRR Act authorizes the Secretary of Transportation to spend up to $1.75 billion in Federal funds to significantly upgrade intercity rail passenger service in the 457-mile Boston-to-Washington Northeast Corridor. This Federal commitment to rail passenger service in the Corridor is largely a result of the Corridor's unique combination of population size and density, linear population distribution, and heavy intra-Corridor travel. The 93 counties and the District of Columbia that comprise the core area of the Corridor had a combined 1973 population of over 40 million, some 19 percent of the Nation's total population. This 19 percent is compressed into only 40,000 square miles, or 1 percent of the Nation's land area. The Corridor's linear population distribution is reflected in the fact that its six largest cities, Boston, New York, Newark Philadelphia, Baltimore and Washington, are all located along the Corridor

spine. The SMSA's containing these six cities had a combined 1973 population of 24.6 million, or 60 percent of the total population of the core area of the Corridor.

The Northeast Corridor's huge population, limited land area, and heavy intra-Corridor travel among its major population centers have resulted in significant congestion in the auto and air modes, congestion that is expected to worsen due to projected growths in intercity passenger travel in the Corridor in the 1980's. Major new highway or airport construction is largely precluded, however, by both cost and environmental constraints. The railroad right-of-way, on the other hand, is already in place and significantly under-utilized in terms of its potential passenger-carrying capacity. Thus the rail mode became the natural choice for the concentration of Federal investment in intercity passenger facilities to meet projected travel demand in the Corridor.

Among the items included in the Northeast Corridor improvement program are: the removal of decades of deferred maintenance on 1,445 miles of Corridor track; the repair or replacement of 770 railroad bridges, 190 of which were built prior to 1895; the removal of the most severe curves on the Corridor through track realignments; the removal of the many hazardous highway grade crossings which currently dot the Corridor; and the modernizing of rail passenger stations along the route. In addition, centralized traffic control systems will be installed along the Corridor. The project will also replace the existing antiquated rail electrification system in the Corridor with a technologically up-to-date system, and extend this new electrification system from New Haven to Boston, a segment of the Corridor not previously electrified.

Total funding for the project includes not only the $1.75 billion in Federal funds, but another $150 million in funding from states and local governments in the Corridor to improve the non-operationally essential portions of rail passenger stations and provide fencing of the Corridor rail right-of-way. The breakdown of this funding by program category and by State is shown in Figure 40.

Under an agreement reached between the U.S. Department of Transportation and Amtrak, and implemented by Section 217 of the RTIA, Amtrak is the owner and operator of the Northeast Corridor rail properties. The Northeast Corridor project, however, is under the direction of FRA, with Amtrak under contract to FRA for major portions of the project, such as track improvements, that have traditionally come under the jurisdiction of rail labor.

Figure 40

NORTHEAST CORRIDOR RAIL PASSENGER SERVICE
IMPROVEMENT PROGRAM INSTALLED VALUE OF STATE
(Millions of Dollars)

	Mass.	R.I.	Conn.	N.Y.	N.J.	Pa.	Del.	Md.	D.C.	Total
1. Track Improvements	25.8	33.4	46.1	11.2	39.9	32.5	12.1	41.3	1.7	$ 244
(% of Route Miles)	(8%)	(11%)	(25%)	(6%)	(13%)	(11%)	(5%)	(20%)	(1%)	(100%)
2. Curve Realignment	6	25	66	11	74	36	19	87	2	326
3. Bridges	20.7	31.1	127.6	17.3	41.4	55.2	13.8	34.5	3.4	345
4. Tunnels				14				21		35
5. Electrification	33.2	36.1	50.7	15	35	43	8	22	2	245
6. Signaling/-Communications	18	24	26	14.5	17	14	8	46	2.5	170
7. Service Facilities	23	1	5	16	2	12	1	4	56	120
8. Stations:										
Operational	16	8	23.5	6	23	8	7	13.5	10	115
Non-Operational*	25	10	19.5	23	35	13.5	18.5	27	28.5	200
9. Fencing*	7.8	12.2	25.1	5.1	12.2	10	5.2	21.7	.7	100
TOTAL	175.5	180.8	389.5	133.1	279.5	224.2	92.6	318.0	106.8	$1,900

* Including 50% Cost Sharing of State/Local Governments.

Source: FRA, Northeast Corridor Project

Section 703 of the RRRR Act specifies the goals of the program as the establishment by 1981 of reliable trip times of 3 hours, 40 minutes between Boston and New York City and 2 hours, 40 minutes between New York City and Washington, D.C. Under current plans, these trip times include a total of 15 station stops at major cities along the Boston to Washington rail route.

Current intercity rail passenger service in the Corridor is both slower and less reliable than the service required by the Act for 1981. Amtrak's premium service, the Metroliner and Turbotrain, has trip times of 3 hours, 56 minutes in the North Corridor (Boston to New York) and 3 hours, 4 minutes in the South Corridor (New York to Washington). While these trip times are not substantially longer than those required by the Act, the deteriorating physical condition of the Northeast Corridor rail right-of-way had by 1975 reduced the on-time reliability of the Metroliners and Turbotrains to less than 70 percent (with up to 15 minutes behind schedule in each half of the Corridor defined as "on-time"). The Northeast Corridor improvement program has a planned system performance of 95 percent on-time reliability at the faster trip-times required by the Act, with only up to 5 minutes behind schedule in each half of the Corridor defined as "on-time." Amtrak's conventional service in the Corridor in 1975 was slightly more reliable (70-80 percent on-time performance) than the premium service, but had even longer trip times: 4 hours, 30 minutes North and 3 hours, 50 minutes South.

With the improved rail service, FRA currently estimates that annual rail ridership in the Corridor will increase from eight million passengers in 1973 to 26 million in 1990. If ridership does grow as projected, the infusion of $1.75 billion in Federal funds into the rail service in the Corridor will have re-established rail passenger service as a vital part of the intercity passenger transportation network in the Corridor.

As has been pointed out, the Corridor is unique in this country in terms of its population density, population distribution, and travel characteristics, and the $1.75 billion Federal investment to upgrade intercity rail passenger services in the Corridor reflects that uniqueness. At the present time, there are no other travel corridors in the country which warrant a Federal investment in intercity rail passenger services of a similar magnitude. However, continued growth in intercity passenger travel, coupled with possible energy shortages, could serve to make it in the national interest to explore the public costs and benefits of intercity rail improvement projects in other densely populated and heavily traveled intercity corridors. It is, however, not necessary that such potential rail improvement projects be as large as the Northeast Corridor project in order to make such explorations of rail project feasibility in other corridors desirable from a public policy standpoint. Such explorations would be warranted if passenger travel congestion in such corridors had made additional Federal investment in new transportation infrastructure a necessity, and a choice had to be made as to which passenger mode or modes to expand.

Transitional Continuation of Local Rail Service

Title VIII of the Act deals with the problem of light density rail line abandonment. As explained in chapters V and VI, the light density line problem has been a long-standing financial drain on the railroad industry, as restrictive Federal abandonment regulations delayed the restructuring necessary for the industry to adjust to major changes in the traditional market for rail transportation. Federal policy with respect to rail line abandonment is changing, however, with the recognition that the financially-troubled railroad industry cannot and should not be forced to continue to cross-subsidize uneconomic rail services. Both USRA and the Department of Transportation have publicly affirmed their opposition to such government-forced cross-subsidies. USRA in its Final System Plan stated:

> In the days when railroads could count on substantial revenues above the cost of providing service, there existed a pool of profits which, in effect, government regulatory policy partly used to cover losses on deficit operations. Now that pool of resources has dried up. The Association reaffirms its position that each identifiable service, except in the case of developing markets, should stand on its own. If such service is warranted for other public policy reasons, it should be subsidized directly as a part of that public policy. Cross subsidies can be justified only where the service thus supported is likely to revive and return to profitability in the near future. Prolonged cross subsidy benefits neither the carrier nor other shippers who consequently must pay higher rates. (Emphasis in the original)[1]

The Secretary of Transportation in A Statement of National Transportation Policy similarly asserted:

> Our experience with the railroads teaches us that we cannot continue to ignore the real cost of maintaining unprofitable services by prohibiting exit or abandonment and by acquiescing in, if not encouraging, cross-subsidization. One consequence of such a practice is that firms are forced to postpone capital investment necessary to keep their facilities modern, safe and efficient. Customers in profitable markets should not be forced to subsidize those in unprofitable markets. Stockholders and employees should not have to face corporate bankruptcy because their firms are forced to continue nonprofitable services.[2]

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[1] United States Railway Association, Final System Plan (Washington, D.C.: U.S. Government Printing Office, July 1975) Volume II, page 3.

[2] Secretary of Transportation, A Statement of National Transportation Policy (Washington, D.C.: U.S. Government Printing Office, September 17, 1975) page 15.

Concurrent with this change in Federal policy with respect to rail abandonments, however, is the recognition that those users of rail service who are economically dependent upon cross-subsidized light density service should not be unduly disadvantaged by this policy change, but should be entitled to receive transitional Federal assistance to enable them to convert to the use of financially-viable freight transportation alternatives.

Such transitional assistance was first provided for the Northeast and Midwest region of the country by Title IV of the RRR Act. Section 402 of that Act, as amended, authorized $180 million in Federal assistance for a local rail service program for the eighteen states in the region which runs from April 1, 1976 to April 1, 1978. The Title IV program was established to assist rail users after the implementation of the Final System Plan which excluded some 5,700 miles of light density lines from transfer to ConRail. During 1976 approximately 3,100 miles of these excluded lines received Federal assistance under the program.[1]

Title VIII of the RRRR Act established a five-year nationwide program of local rail service assistance with an authorization of $360 million. (The eighteen states in the region become eligible under this nationwide program when the regional program ends on April 1, 1978.) Section 803 of the Act provides Federal financial assistance to the states for: (1) continuation of rail service that would otherwise be abandoned; (2) acquisition of rail lines threatened with abandonment for the purposes of service continuation or rail banking; (3) rehabilitation and improvement of lines facing abandonment so that rail service on these lines may be continued; and (4) substitution of less-costly transportation alternatives for abandoned light density rail service. The states can only use the Federal assistance on lines for which the ICC has found that the public convenience and necessity permit the abandonment of the line or the discontinuance of rail service thereon. Other statutory requirements that the states must meet to be eligible for Federal assistance under Section 803 include the designation of a state agency in each state to administer the assistance program and the development of a plan for efficiently allocating the Federal assistance to rail services facing abandonment in the state.

The local rail service assistance for both the Title IV and Title VIII programs is available to the states on a formula basis, with each state's share determined by the ratio of rail mileage in the state eligible for assistance to such mileage in all of the states. There is a minimum entitlement for each state of 3 percent for the Title IV program and 1 percent for the Title VIII program. The Federal share of

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[1] States outside the region are not faced with the prospect of such massive abandonments occurring in such a short time-frame because the abandonment procedures of the Interstate Commerce Act remain in effect for railroads in these states, as well as for the solvent railroads in the Northeast and Midwest.

local rail service assistance for both programs is 100 percent during the first year of the program and 90 percent during the second and, for the Title VIII program only, 80 percent during the third, and 70 percent during the fourth and fifth years. The Title VIII program ends on June 30, 1981.

Title VIII also amends the rail abandonment provisions of the Interstate Commerce Act in two important respects. First, Section 802 requires each rail carrier to publish and update a complete diagram of its rail system, publicly identifying all lines which are "potentially subject to abandonment." A given rail line must be so identified on this sytem diagram for at least four months before a railroad can petition the ICC for abandonment of the line, if such abandonment is opposed by a significant user of the line or the state(s) or local government(s) in which the line is located. The ICC has broadly defined "potentially subject to abandonment" to include not only lines for which abandonment or service discontinuance applications are pending before the ICC, but also lines which: (1) the carrier anticipates will be the subject of such applications within the following three years; or (2) the carrier has under study and believes may be the subject of a future application because of anticipated operating losses or excessive rehabilitation costs.[1] Each carrier is responsible for keeping its system diagram up to date. This diagram should significantly increase the amount of time which rail users and state and local governments have in which to react to and plan for possible losses of rail service.

The second major change in abandonment procedures brought about by Section 802 is that the ICC, before issuing a certificate of abandonment or service discontinuance, must now delay such issuance if a responsible offer to subsidize the line has been made, and give the potential subsidizer up to six months to negotiate a subsidy agreement with the rail carrier to continue operations on the line. This provision not only makes it possible for States to provide financial assistance to the line through the rail service continuation programs, but also makes it possible for local communities, rail users or other private interests to offer a subsidy to the carrier to keep the threatened line in operation.

It must be emphasized that the local rail service assistance programs are temporary in nature, designed to ease the transition for rail users as the Nation's now-excessive rail network is trimmed to an economically viable size. A permanent public subsidy of all or even a significant portion of the uneconomic light density rail lines throughout the U.S. would place a sizeable burden on the general taxpayer and represent a serious misallocation of tax revenues. The report Railroad Abandonments and Alternatives prepared by the Department of Transportation under Section 904 of the RRRR Act (and discussed in the next section of this chapter) estimates that there are approximately 25,500 miles of uneconomic

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[1] Interstate Commerce Commission, "Abandonment of Railroad Lines and Discontinuance of Rail Service," Federal Register, Volume 41, No. 214 (November 4, 1976) page 48521.

light density line in the thirty-one states outside the Northeast and Midwest. Utilizing loss-per-carload data developed by USRA for the Northeast and Midwest region, the Section 904 Report estimated that the annual cost (in 1973 dollars) of subsidizing the mileage in these thirty-one states alone would be on the order of $140 million.[1]

The local rail service assistance program can thus best be used by the states to assist their rail users either to restore uneconomic light density service to viability on those lines where such a revitalization is possible, or to drop such unprofitable service in favor of conversion to truck-rail or non-rail modes. Such a transition will not be easily achieved, and the state rail plans developed under Section 803 of the RRRR Act will have to be carefully shaped so as to facilitate the use of the Federal assistance to encourage long-run solutions to the termination of uneconomic light density rail service, rather than the fruitless long-run public subsidy of such money-losing rail operations.

The Title IV and Title VIII programs are, in reality, after-the-fact efforts to ease the burden for the users of rail service that has already gone under financially. The real answer to the viability of individual rail lines lies in the ability of a financially healthy railroad industry to effectively compete for freight traffic and efficiently and profitably serve that traffic. To that end, the regulatory reforms in Titles II-IV of the RRRR Act and the financial assistance in Title V represent much more of an opportunity to help maintain the viability of rail lines than do the local rail service assistance programs.

Railroad Research

The RRRR Act requires the U.S. Department of Transportation (DOT) to conduct a total of eight major research efforts involving almost every aspect of the structure, operations and financial needs of rail transportation in the United States. In addition, the Interstate Commerce Commission (ICC) is required to carry out two major studies of its own. The great number of studies mandated by the Act reflects the desire of the Congress to further define the scope of national rail transportation problems as the basis for possible additional Federal efforts to assist the railroads. Many of the following studies are first-of-a-kind analyses of the Nation's railroad industry and should provide a wealth of new public information on the problems and prospects now facing rail transportation in this country.

Railroad Ratemaking Study. This study, required by Section 202(g) of the Act, directs DOT and the ICC to separately study the effects of the Section 202 ratemaking reforms on: (1) the development of an efficient and financially stable railway system in the U.S.; and (2) shippers and carriers in all modes of transportation. (These ratemaking reforms were discussed earlier in this chapter.) Both DOT and the ICC are to

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[1] U.S. Department of Transportation, Railroad Abandonments and Alternatives: A Report on Effects Outside the Northeastern Region (Washington, D.C.: May 1976) page 77.

include in their separate studies proposals for any further railroad regulatory and legislative changes which they believe are necessary. Both studies are to be sent to Congress by October 5, 1977.

Classification and Designation of Rail Lines. Section 503 of the RRRR Act requires DOT to develop standards for classifying the main and branch lines of the rail system by their degree of essentiality and to designate each of the lines of all Class I rail carriers in accordance with these standards. One of the main purposes of this classification and designation process is to assist in the development of priorities among groups of rail lines and between individual lines as potential recipients of Federal rehabilitation and improvement financing under Title V of the Act.

As required by Section 503(b), the Department published its preliminary classification and designation report on August 3, 1976. The six categories of rail lines identified in that report are shown in Figure 41.

Based upon the traffic density data submitted by the Class I railroads pursuant to Section 503(a), the distribution of rail freight traffic (measured in annual gross ton-miles per route mile) on the Class I rail system is highly skewed, with 67 percent of the traffic concentrated on only 20 percent of the route miles. Another 33 percent of the route miles carry only 1 percent of the traffic. This skewed distribution is shown in Figure 42. The 40,000 route miles that comprise the high-density 20 percent of the rail system are mostly rail lines with annual traffic densities of 20 million or more gross ton-miles per mile, and are thus designated as Category A Mainlines.[1]

Sections 503(c) and (d) required the Rail Services Planning Office (RSPO) to hold public hearings on the Secretary's preliminary report, and to issue a review of that report, which the Office did on December 1, 1976. The Department, after giving due consideration to the RSPO report, will publish the final Section 503 report. The RTIA amended Section 503(e) of the RRRR Act to require publication of this final report by April 30, 1977.

Capital Needs Study. Under Section 504 of the RRRR Act, DOT is to develop:

(1) estimates of the deferred maintenance and delayed capital expenditures as of 1975 for the Class I railroads (excluding ConRail);

(2) projections of the total maintenance and capital needs of these Class I railroads for each of the years 1976 through 1985; and

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[1] U.S. Department of Transportation, Preliminary Standards, Classification, and Designation of Lines of Class I Railroads in the United States: A Report by the Secretary of Transportation (Washington, D.C., August 3, 1976) Volume 1, page 5.

Figure 41

PRELIMINARY CLASSIFICATION AND DESIGNATIONS OF THE U.S. RAIL SYSTEM

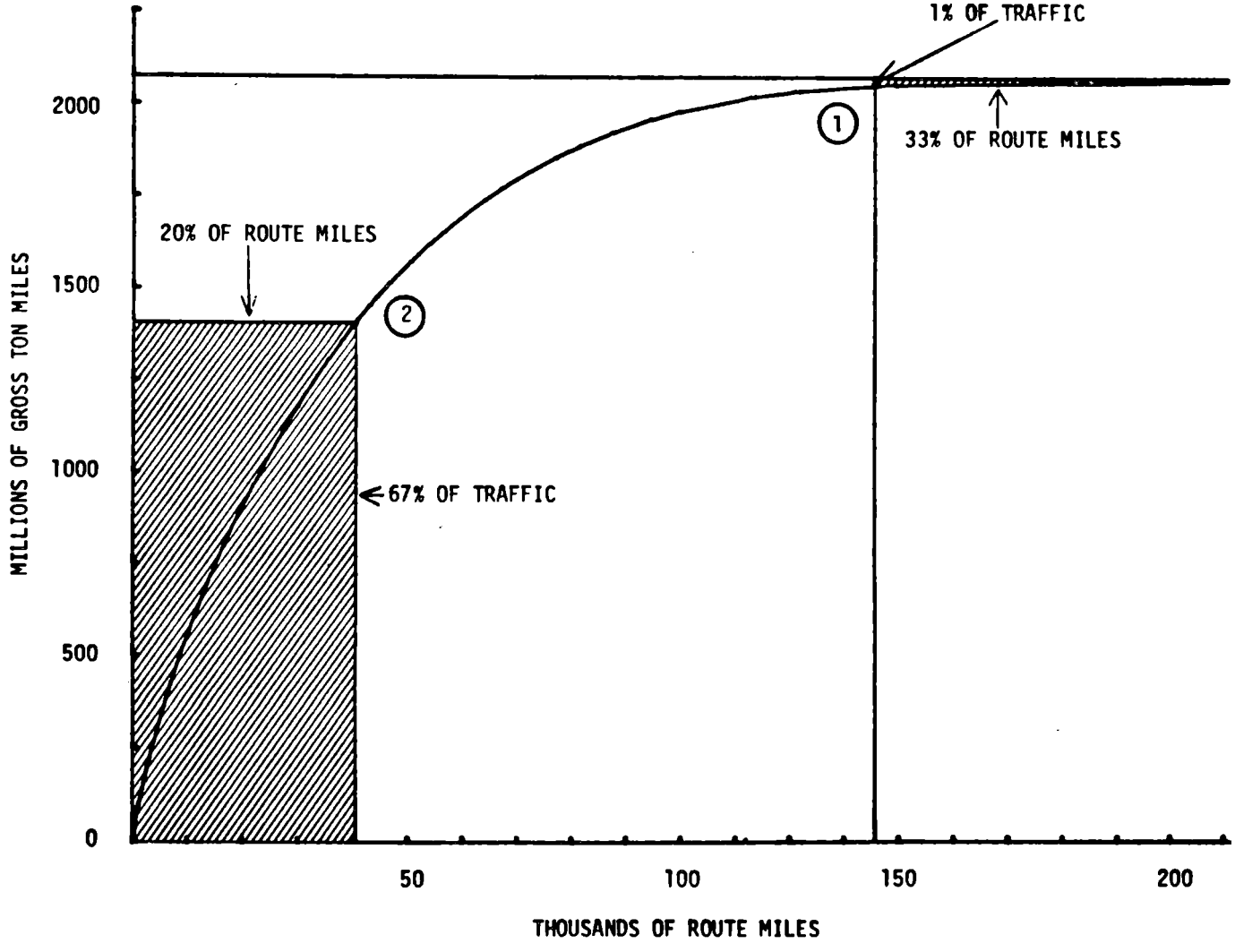
	Category Title	Category Description	Percent of Designated Route-Miles of Class I* Rail Network
1.	A Mainline	• 20 million or more gross ton-miles per mile per year ("gross tons")	15.5
		• Three or more daily passenger operations in each direction	0.8
		• Major Transportation Zone Connectivity	0.8
2.	Potential A Mainline	• A temporary status for through lines located in Corridors of Excess Capacity. They will be designated to another category upon resolution of the redundancy.	11.6
3.	B Mainline	• Less than 20 million gross tons but at least 5 million	21.7
4.	A Branchline	• Less than 5 million gross tons but at least 1 million	21.9
5.	B Branchline	• Less than 1 million gross tons	25.6
6.	Defense-Essential Branchline	• Required for access of oversized military shipments	2.1

* Based upon the 193,500-mile Class I rail system.

Source: U.S. Department of Transportation, Preliminary Standards, Classification, and Designation of Lines of Class I Railroads in the United States (August 3, 1976) Volume 1, page 6.

Figure 42

A CORRELATION OF RAIL FREIGHT CARRIED AND ROUTE MILES FOR CLASS I RAILROAD LINES IN THE UNITED STATES



Source: U.S. Department of Transportation, Preliminary Standards, Classification, and Designation of Lines of Class I Railroads in the United States, Volume I, page 6.

(3) recommendations as to the amount and type of additional Federal financial assistance, if any, to be provided to these railroads to help meet their projected needs.

In developing these estimates, projections and recommendations, DOT will utilize both financial data made available by the Class I carriers pursuant to Section 504(a) as well as the rail system final standards and designations to be published under Section 503(e). The Capital Needs Study will also contain a public cost-benefit analysis of public ownership of railroad rights-of-way as required under Section 504(b).

The RTIA amended Section 504 to increase the length of time given to the Secretary to carry out the Study, and provides for the following revised statutory deadlines: (a) submission of the Secretary's preliminary report to Congress and to the Secretary of the Treasury by July 29, 1977; (b) submission to DOT and the Congress of the Treasury Secretary's review of the preliminary report by October 27, 1977; and (c) submission of DOT's final report to Congress by January 25, 1978.

Northeast Corridor Transportation Reports. Section 703(1)(E) of the RRRR Act requires DOT to conduct two detailed analyses of the operating and financial results of the Northeast Corridor rail passenger improvement project established in Title VII of the Act. The first of these two studies must be submitted to Congress by February 5, 1978, and the second by February 5, 1982. Both of these studies will investigate intercity passenger transportation for all modes in the Northeast Corridor to determine: (1) the need, if any, for further intercity passenger transportation improvements in the Corridor; (2) the public costs and benefits of improving the various passenger modes to meet such needs; and (3) the practicability, considering engineering and financial feasibility and market demand, of further improving intercity rail passenger service in the Corridor to achieve trip times of 3 hours between Boston and New York and 2 hours, 30 minutes between New York and Washington.

These two studies are distinct from the annual progress reports on the Northeast Corridor project which both DOT and the National Railroad Passenger Corporation (Amtrak) must submit to Congress under Section 703(1)(D) of the Act.

Conversion of Abandoned Railroad Rights-of-Way. Pursuant to Section 809(a) of the Act, the Secretary is to conduct a year-long study on the potential for conversion of abandoned railroad rights-of-way to alternate public uses. The RTIA limited this study to railroad rights-of-way abandoned since 1970, approximately 11,000 miles (exclusive of abandonments as a result of the Final System Plan).[1]

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[1] U.S. Department of Transportation, Railroad Abandonments and Alternatives: A Report on Effects Outside the Northeastern Region (Washington, D.C.: May 1976) page 22.

Section 809(a) directs that the study shall include the following elements:

(1) an inventory containing the physical and ownership characteristics of all railroad rights-of-way abandoned since 1970;

(2) an evaluation of the advantages and administrative requirements of establishing a rail bank for selected rights-of-way;

(3) a survey and cost-benefit analysis of Federal, state and local programs for reutilizing abandoned railroad rights-of-way for public purposes; and

(4) recommendations, including possible legislative action, for more effective publi utilization of abandoned railroad rights-of-way.

The study is to be submitted to Congress by January 30, 1977.

American Railway System Study. Like the preceding study, the American Railway System Study has a number of Congressionally-mandated parts. This study, required by Section 901 of the RRRR Act, directs DOT to carry out the following eight sub-studies:

(1) a showing of the potential cost savings and possible service improvements which could result from restructuring railroads in the U.S.;

(2) an identification of rail economies and performance gains that could result from improving local and terminal rail operations;

(3) estimates of potential railroad rehabilitation cost savings from limiting such rehabilitation to essential portions of the rail system;

(4) an assessment of the benefits to rail transportation of common or public ownership of rail fixed facilities;

(5) an assessment of the effects of alternative rail corporate structures upon the rail system;

(6) a priortized listing by cost-benefit analysis of rail properties which should be improved to permit high-speed rail passenger or freight service;

(7) a cost-benefit evaluation of electrifying high-density rail lines; and

(8) a survey and analysis of the physical and financial condition of the railroad industry in the United States.

The Rail Transportation Improvement Act has amended Section 901 of the RRRR Act to extend submission of the Secretary's report to Congress to January 25, 1978, in order to allow an additional 180 days for this massive study. As can be noted from a comparison of the Section 901 sub-studies and the requirements for the Section 504 Capital Needs Study, there is a significant amount of overlap in the two research efforts, and DOT will interweave the two studies as much as possible to show the possible effects of improvements in the industry upon its capital needs. The Secretary's final report on the American Railway System Study is to be submitted to Congress at the same time (January 25, 1978) as his final report on the capital needs of the railroads under Section 504(d).

Study of Federal Aid to Rail Transportation. Section 902 of the RRRR Act requires the Secretary to analyze the effects on the railroads of policies and methods for providing Federal aid to the rail and non-rail modes of transportation and to recommend future policy for providing Federal aid to rail transportation. This report to Congress fulfills the Secretary's requirements under Section 902 of the Act.

Study of Conglomerates. Section 903 of the Act directs the ICC to undertake a study of conglomerates and other such corporate structures within the railroad industry. The ICC is to determine what effects, if any, such structures have on effective transportation, intermodal competition, revenue levels and other aspects of national transportation as determined by the Commission. The ICC is to submit its report to Congress by February 5, 1977.

Rail Abandonment Report. DOT was required by Section 904 of the Act to submit to Congress by May 5, 1976, a report on the effects of railroad abandonments outside the 17-state Northeast and Midwest region. (Figure 43). (Abandonments in the 17 states were already studied by the United States Railway Association in its Preliminary and Final System Plans.)

The major findings of the Secretary's report, Railroad Abandonments and Alternatives, are presented in Figures 44 and 45. As shown, approximately 18 percent, or 25,500 route miles of rail line in this 31-state continental U.S. area were determined to be potentially uneconomic light-density lines. This 18 percent carries approximately 2 percent of the total annual originating and terminating carloads in this 31-state area, or some 620,000 carloads.[1] Given the predominance of agriculture in many of these states, abandonment of these lines would affect farm products to a much greater extent than other commodities, with 10 percent of the total farm product rail carloadings for the 31-state area located on these potentially uneconomic lines.

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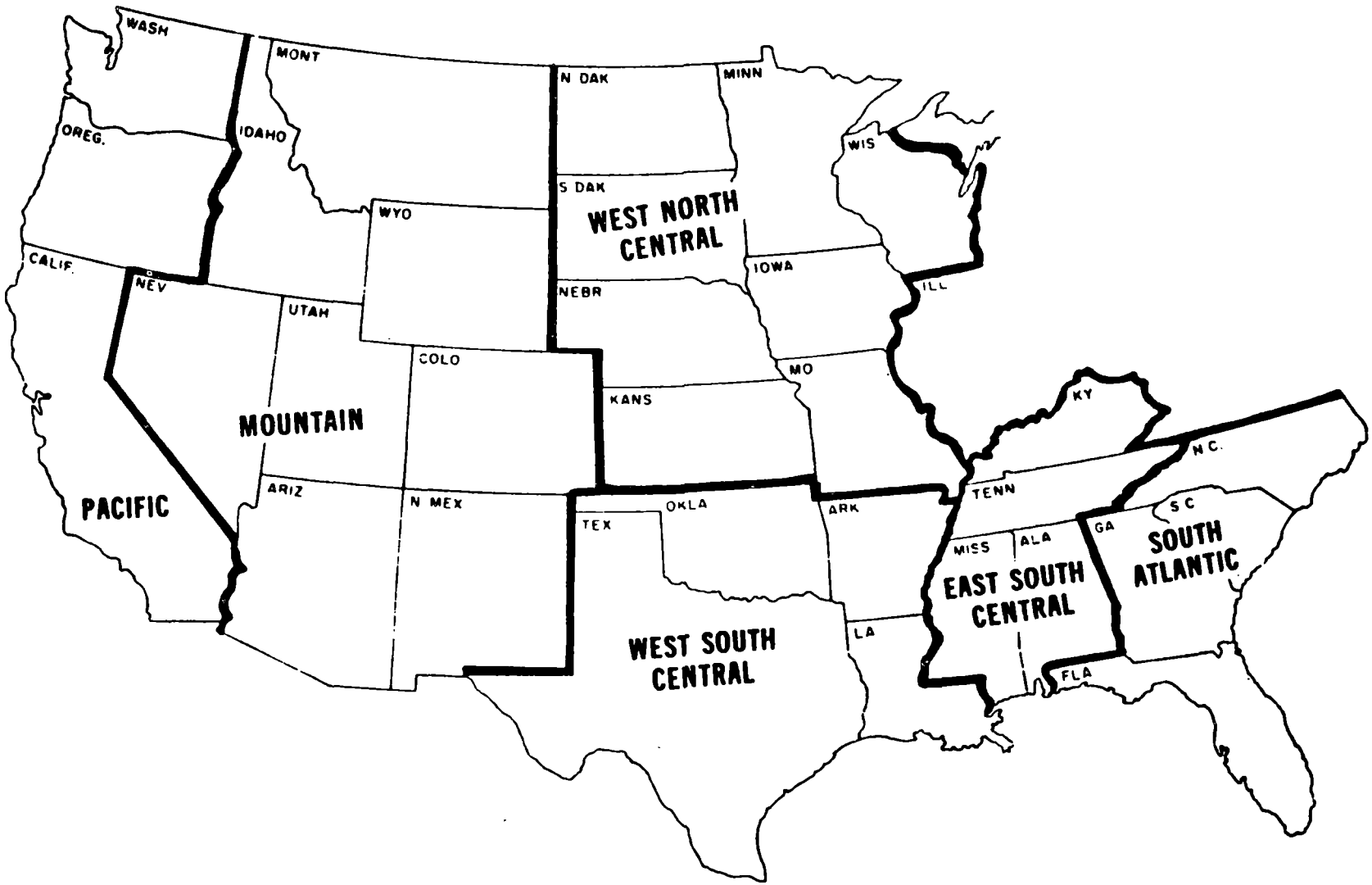
[1] 11,000 of the 631,000 carloads shown in Figure 45 are both originating and terminating carloads.

Figure 43

REGIONS AND STATES INCLUDED IN SECTION 904 THE LIGHT DENSITY LINE ANALYSIS



Source: Railroad Abandonments and Alternatives, page 32.

Figure 44

MILES OF POTENTIALLY UNECONOMIC LIGHT DENSITY LINES OUTSIDE THE NORTHEAST BY REGION

Region	Existing Miles (1974)[2]	Potentially Uneconomic Light Density Lines	
		Miles[3]	Percent of Existing Miles
South Atlantic	16,688	1,100	6.6%
East South Central	14,911	900	6.0%
West South Central	25,577	3,600	14.1%
West North Central	48,337	13,700	28.4%
Mountain	20,266	3,600	17.8%
Pacific	15,183	2,600	17.1%
Total[1]	140,962	25,500	18.1%

[1] Totals are for 31 States outside of the Northeast.
[2] Association of American Railroads, Yearbook of Railroad Facts, Washington, 1975.
[3] From computer analysis.

Source: Railroad Abandonments and Alternatives, page 30.

Figure 45

SHIPMENTS ORIGINATING OR TERMINATING ON POTENTIALLY UNECONOMIC LIGHT DENSITY LINES OUTSIDE THE NORTHEAST BY REGION

Region	Originating Carloads (thousands)			Terminating Carloads (thousands)			Overall Percent of Carloads Affected[5]
	Total[3]	On PULD Lines[4]	Percent on PULD Lines	Total[3]	On PULD Lines[4]	Percent on PULD Lines	
South Atlantic	2,188	21	1.0%	2,724	10	0.4%	0.6%
East South Central	2,490	15	0.6%	1,810	10	0.6%	0.6%
West South Central	2,045	49	2.4%	2,344	35	1.5%	1.9%
West North Central	3,427	260	7.6%	3,184	90	2.8%	5.3%
Mountain	1,296	55	4.2%	1,045	17	1.6%	3.1%
Pacific	1,651	53	3.2%	1,665	18	1.1%	2.1%
Total[1,2]	13,097	452	3.5%	12,772	179	1.4%	2.4%

[1]Totals are for 31 states outside the Northeast.
[2]Detail may not add to totals because of rounding.
[3]Federal Railroad Administration, 1972-1974 Waybill Files.
[4]From computer analysis.
[5]Carloads originating or terminating on potentially uneconomic light density lines as a percentage of all originations and terminations in the 31 states.

Source: Railroad Abandonments and Alternatives, page 31.

It must be recognized that these 25,500 miles are not now before the ICC for abandonment, nor is DOT recommending that they be abandoned. The 904 report was conducted to yield an estimate of the scope of the light-density rail line problem outside the Northeast and Midwest, and to present a number of options which can be taken by state governments, local communities, and businesses which use rail service to either improve these uneconomic rail services or to shift as easily as possible to the use of financially-viable alternate modes.

Conclusion

The foregoing treatment shows the complex, multi-faceted approach of the RRRR Act to the host of problems facing rail transportation. As discussed, the Act contains major provisions regarding rail regulatory reform, Federal financial assistance for the rail industry, implementation of the Final System Plan providing for the operation of ConRail, implementation of improved intercity rail passenger service in the Nation's most densely-populated travel corridor, transitional Federal assistance for uneconomic light-density rail lines, and a wide-ranging program of railroad research.

The multi-faceted approach of the Act provides a sound basis for beginning the revitalization of the railroads. The Act combines interim Federal assistance to the railroads with a major research effort designed to clearly identify the problems and prospects of the rail industry before the commitment of any additional Federal funds. In addition, the RRRR Act addresses the long-standing dilemmas surrounding Federal regulation of the railroads, intercity rail passenger service in the Northeast Corridor, and uneconomic light-density lines. The Act thus represents a major commitment on the part of the Federal Government to help the industry begin its long-overdue revitalization, a revitalization designed to ensure that the railroads remain a viable, private sector mode of transportation.

Chapter VIII

CONCLUSIONS AND POLICY RECOMMENDATIONS

The foregoing analysis should prove convincingly that the question of relative advantage or disadvantage to the railroads flowing from the totality of Federal policies and programs is: (1) enormously complex and difficult to trace and quantify; (2) almost infinitely arguable; and (3) far more than simply an aggregation of the measurable financial assistance, direct and indirect, given by the Federal Government to the various transportation modes. Moreover, the historical perspective inherent in the Study's analysis underscores the dynamism of the issue over the decades as the various changing social, economic, technological and political forces impacted on the fortunes of the different modes. This perspective is particularly significant in the case of the rail mode inasmuch as it now appears that it is entering an era of major change, many of whose directions have been broadly charted, but not yet clearly determined, by the legislation which called for this Study.

Earlier chapters have made a number of findings which seem to lead to the following general conclusions.

Just as socioeconomic forces were chiefly responsible for the rise of the railroads as the dominant mode of transportation in the 19th century, so too were such forces primarily responsible for the railroads' decline in the post-World War II period. Today's railroad system was largely designed and built in the 19th century to serve the freight and passenger transportation needs of that rail-dominated era. More than three-quarters of that system was already in place by 1900, a time when this country was characterized by a rural population, an economy focused on agriculture, mining and heavy industry, and a concentration of both population and economic activity in the Northeast and Midwest.

The years following World War II accelerated the shifts in population distribution and in the location and composition of economic activity that had begun before the Depression. As the Nation shifted from a rural to an urban society, the Northeast and Midwest lost both people and businesses to the rapidly growing South and West. The rail-oriented agriculture, mining and heavy industry sectors of the economy matured and rapid growth shifted to such sectors as insurance, real estate and government, activities which produced little if any demand for rail transportation. In manufacturing, production tended to shift from heavier, lower-valued products amenable to lower-cost rail transportation to lighter-weight, higher-valued goods for which the speed and reliability of delivery were usually more important than low delivery cost.

The 20th century modes of the truck, automobile and airplane proved to be technologically superior to the railroads in responding to the growing demands for speed, convenience and high service quality in both

passenger travel and freight movements. The resultant traffic and revenue gains of these newer modes, substantially at the expense of the railroads, were as natural and inevitable as the railroads' own earlier rise to dominance over the wagon and barge transportation of the 19th century.

Socioeconomic forces have been far more important determinants of the fortunes of the rail mode than has direct Federal aid to the non-rail modes. The strong competition that the 20th century modes presented to the 19th century rail system clearly antedated the major Federal aid programs for the air, highway and water modes. Motor carriers, for example, were able to achieve their present 21 percent share of the intercity freight market as early as 1958, before the construction of the Federally funded Interstate Highway System. Similarly, the automobile had captured 80 percent of the intercity passenger market as early as 1930. The bulk of Federal aid to the non-rail modes in the post-World War II period occurred after 1960, by which time the railroad industry had already suffered three-quarters of the 28 percentage point drop in its share of the intercity freight market that took place between 1947 and 1975. The major structural changes in the population and the economy that have characterized the 20th century provided powerful market advantages to the railroads' modal competitors, advantages which would have existed regardless of the Federal aid given to the non-rail modes.

Federal aid should not be given to the rail industry for the purpose of redressing any historical inequity in the amounts of aid given to the railroads and the other modes of transportation. Inasmuch as the rail industry's current problems can be seen to stem predominantly from socioeconomic and technological phenomena, sound public policy would argue against spending Federal dollars on the railroads for the sole purpose of bringing the future total of Federal aid to rail transportation into some arbitrary "balance" with the past total of aid to the other modes. Payment of such "reparations" from public funds would constitute a serious misallocation of the Federal transportation budget and would do nothing to help solve the fundamental long-range problems facing the rail industry in the future.

Federal actions during the post-World War II period, including direct financial assistance, served to heighten and accelerate the competitive pressures from other modes which already confronted the rail industry and which were manifested in the railroads' loss of market share and inadequate profit margins. The major Federal investment programs for the air, highway and water modes in the period following the War transformed these newer modes into mature intercity transportation systems far more rapidly than would otherwise have been the case, thereby significantly foreshortening the time frame in which the railroads had to adjust to this new competition. Compounding this phenomenon, the Federal Government's economic regulatory environment worked to inhibit and restrict the railroads' ability to respond to the new competitive pressures through possible changes in railroad rates and services, and in the physical and corporate structure of the industry, changes which might have helped the railroads reduce their traffic losses and improve their profitability. Federal economic regulation hindered the railroads in their attempts to adjust rates to meet competition from the trucking and waterway industries, and in their efforts to abandon unprofitable

light density rail services. Proposals for potentially helpful railroad mergers took up to ten years for the Federal Government to decide, thereby delaying or dissipating whatever benefits might have accrued to the rail industry from such restructuring. The net effect of these Federal actions was to exacerbate the market and financial problems that the railroads were already facing as a result of socioeconomic changes.

The Railroad Revitalization and Regulatory Reform Act of 1976 offers a framework for providing transitional Federal assistance to the railroads and a comprehensive assessment of the problems and prospects facing rail transportation. Despite the post-World War II decline in the railroads' role in the Nation's transportation system, there is no question about the essentiality to the economy of the mode which still carries more than one-third of the Nation's total freight. The passage of the RRRR Act reflects not only a public recognition of the essentiality of rail freight service, but also a public understanding that the industry needs transitional Federal assistance if it is to be restructured to respond effectively to the transportation needs of both the near and long-term future. The greatest strength of the RRRR Act, and the source of its potential to begin to reshape the railroad industry, lies in its multi-faceted approach to the knot of problems plaguing the railroads. The Act couples interim Federal financial assistance with the reorganization of the Northeastern rail bankrupts, the beginnings of rail regulatory reform, and the most comprehensive Federal research assessment ever attempted of the problems and prospects facing rail transportation.

These conclusions offer a reasonable framework and a logical perspective for developing the recommendations for future policy with respect to Federal aid to rail transportation (and, by implication, to non-rail transportation). This perspective suggests that each of the major intercity modes--air, highway, pipeline, rail and water--can be considered to have had its "day in the sun" in terms of direct Federal promotion and that each is now a mature transportation system with a significant, and reasonably stable, share of the intercity freight or passenger market (or both in the case of highways). The promotional ethic that underlied, appropriately, Governmental policies and programs directed to the support and encouragement of new modes of transportation now appears to be completely inappropriate for the creation and maintenance of the "open and competitive market" among mature modal systems that is called for in Section 902 of the Act.

The following policy recommendations emerge from the foregoing conclusions:

The intermodal impacts of Federal actions and policies, particularly Federally-aided transportation investments, affecting the rail and non-rail modes should become an explicit consideration in the Government's decision-making process. The absence in modern times, until recently, of any significant direct Federal financial involvement with the rail mode, coupled with the longstanding and accepted Federal financial involvement with the non-rail modes, has made it relatively easy to ignore the intermodal effects on the railroads of many past and present Federal transportation policies and programs. However, as the events of the past few

years have indicated, and this Study has confirmed, Federal actions and policies do, indeed, have significant intermodal impacts. In the future, all major transportation policy and program proposals should include an intermodal impact assessment. This assessment of intermodal impacts should not be construed to mean that the Federal Government should refrain from taking needed action with respect to one mode solely to protect the traffic and revenues of another, but rather that such an action's potential effects on other modes should be assessed as accurately as possible and explicitly considered before a decision is made.

The maintenance of an open and competitive market among mature modal competitors requires the elimination of most if not all Federal subsidies to transportation. If each of the five major modes of intercity transportation is to compete in the marketplace on the basis of whatever cost and service advantages it possesses, the distortions in the marketplace caused by Federal transportation subsidies will have to be eliminated. To this end, the Department of Transportation is currently carrying out new cost allocation studies for the aviation and highway modes to identify any subsidy of these modes from general tax revenues or any cross-subsidy among the various user groups of each mode. Where circumstances require direct Federal financial involvement, full cost recovery from users should be the policy objective. In this connection, a system of cost sharing should be introduced on a phased basis for the inland and coastal waterway systems, facilities which are currently improved and maintained at Federal expense. Waterway users do not now pay these costs.

It should be noted that this public policy goal of eliminating Federal subsidies to transportation should not be viewed as precluding the establishment or maintenance of explicit Federal subsidies where there are overriding national interest considerations (as in the Federal subsidy of urban mass transportation). Nor should it be construed as precluding direct Federal financial involvement in national transportation programs where such involvement is otherwise justified and adequate cost recovery mechanisms are in place.

Federal economic regulation of the various modes of transportation should be reduced or otherwise modified to permit, consistent with other public policy objectives, the greatest possible degree of intermodal and intramodal competition. Too often in the past Federal regulatory controls that were appropriate for a given mode at a given point in time have been kept in force long after changed circumstances have greatly diminished their usefulness. Thus, for example, Federal regulation designed for railroads as 19th century transportation monopolies was ill-suited to deal with the problems railroads encountered in adjusting to strong intermodal competition in the economic environment of the 20th century. The Federal Government should commit itself to a periodic and systematic review of its regulation of transportation with well-developed criteria for amending or dropping regulatory controls that no longer contribute to efficiency or equity in the transportation system.

Where it becomes clear that the public interest requires Federal involvement in the financial affairs of a mode in order to ease the mode's adjustment to a new economic environment, transitional assistance

should be the preferred approach in lieu of any long-term commitment of Federal funds. Such a transitional assistance approach is embodied in the RRRR Act in which the Federal response to the serious problems of the railroad industry is neither nationalization nor the establishment of a railroad trust fund but rather interim financial assistance coupled with industry reorganization, regulatory change, and research designed to define the scope of the rail problem before any additional Federal financing is considered. This flexible and comprehensive approach of the RRRR Act to the complexity of rail transportation problems will, hopefully, establish a pattern for future Federal responses to any similar problems which may affect other modes of transportation.

AAR Plans to Continue Efforts Against Subsidies To Trucks, Water Carriers

The nation's railroad industry will for the foreseeable future continue to aim the majority of its media and lobbying efforts towards the elimination of what it perceives as federal subsidies to the barge and trucking industries.

William H. Dempsey, president of the Association of American Railroads, says the major problem for railroads today "is what we regard as subsidies to our competing modes."

Mr. Dempsey and AAR public information officials met July 9 with Washington transportation reporters at an informal dinner at the International Club in Washington, D.C., to outline the rail group's plans to deal with the "primary" subsidy issue.

The AAR dinner followed a recent press conference in which Bennett C. Whitlock, Jr., president of the American Trucking Associations, charged that the railroads are conducting an "anti-truck" campaign (T.W., June 22, p. 18). Mr. Whitlock said the rails have benefited from more than $11 billion in federal subsidies in the last five years, and suggested that a fuel and equipment tax should be imposed on rail operations.

In one of several new position papers issued in conjunction with the dinner, the AAR admits that "we are attacking heavy trucks." It explains that "American railroads attack heavy trucks because heavy trucks on long distance runs are a wasteful redundancy."

The basic thrust of the rail group's argument that the trucking industry is subsidized centers around the Interstate Highway System, for which the rails say the truckers aren't paying their "fair share."

While Mr. Dempsey conceded that the "facts are subject to all kinds of circumlocutions," he said there is clear evidence that higher truck weights lead to greater highway deterioration.

"It doesn't take much of an expert to conclude that they (the truckers) are radically underpaying," Mr. Dempsey said.

What the AAR will be pushing to rectify this perceived underpayment is a formula linking state truck taxes with the weight of a truck and the distance it travels at that weight. The "weight/distance tax," in the AAR's view, is the fairest because it would shift the bulk of the tax burden from automobiles to trucks, which it says cause most of the highway damage.

The AAR will also continue to fight what it sees as subsidies provided to the barge industry through construction of waterways facilities, channel dredging, and maintenance provided by the U.S. Army Corps of Engineers.

Mr. Dempsey believes the Administration's proposal to impose waterway user charges on the barge industry would satisfy the railroads' interests. "As to water carriers, we're in pretty good shape," he said.

The long-term goal of the rail industry, Mr. Dempsey stated, is to have each mode pay its own way. "There should be no subsidy to any form of transportation," he said.

"We're not asking for a nickel," the AAR president added.

On another issue, Mr. Dempsey expressed confidence that a petition filed with the Interstate Commerce Commission by the Norfolk & Western Railway seeking deregulation of rail hauls of export coal will be successful (T.W., Apr. 20, p. 81).

Export coal rates should be completely deregulated, Mr. Dempsey said, adding that there cannot be "any serious question" that there is effective competition in the export coal transport market.

As to the N & W's petition, the AAR president said "if the ICC somehow turns that down, I can't conceive of what they would approve."

APPENDIX

Appendix Table 1

INTERCITY FREIGHT BY MODE, 1925-1975
(billions of ton-miles)

	Rail	Per Cent	Truck	Per Cent	Pipe-Line	Per Cent	Inland Water	Per Cent	Air	Per Cent	Total
1925	417	79.7	4	0.8	17	3.3	85	16.3	-		523
1926	447	79.3	5	0.9	19	3.4	93	16.5			564
1927	432	79.1	6	1.1	23	4.2	85	15.6			546
1928	436	78.4	8	1.4	26	4.7	86	15.5			556
1929	450	76.4	10	1.7	31	5.3	98	16.6			589
1930	386	75.8	12	2.4	33	6.5	78	15.3			509
1931	311	75.9	14	3.4	33	8.0	52	12.7			410
1932	235	75.3	15	4.8	34	10.9	28	9.0			312
1933	251	70.3	17	4.8	38	10.6	51	14.3			357
1934	270	70.7	20	5.2	41	10.7	51	13.4			382
1935	284	70.0	23	5.7	37	9.1	62	15.3			406
1936	341	68.9	28	5.7	40	8.1	86	17.4			495
1937	363	66.5	35	6.4	45	8.2	103	18.9			546
1938	292	67.1	40	9.2	43	9.9	60	13.8			435
1939	339	62.3	53	9.7	56	10.3	96	17.6	.01	*	544
1940	379	61.3	62	10.0	59	9.5	118	19.1	.02	*	618
1941	482	62.4	81	10.5	68	8.8	141	18.3	.02	*	772
1942	645	69.5	60	6.5	75	8.1	148	15.9	.04	*	928
1943	735	71.3	57	5.5	98	9.5	141	13.7	.05	*	1,031
1944	747	68.7	58	5.3	133	12.2	150	13.7	.07	.01	1,088
1945	691	67.2	67	6.5	127	12.4	143	13.9	.09	.01	1,028
1946	602	66.6	82	9.1	96	10.6	124	13.7	.08	.01	904
1947	665	65.3	102	10.0	105	10.3	147	14.4	.11	.01	1,019
1948	647	61.9	116	11.1	120	11.5	162	15.5	.15	.01	1,045
1949	535	58.3	127	13.8	115	12.5	140	15.3	.20	.02	917
1950	597	56.2	173	16.3	129	12.1	164	15.4	.30	.03	1,063
1951	655	55.6	188	16.0	152	12.9	182	15.5	.34	.03	1,177
1952	623	54.4	195	17.0	158	13.8	169	14.8	.34	.03	1,145
1953	614	51.0	217	18.0	170	14.1	202	16.8	.37	.03	1,203
1954	557	49.6	213	19.0	179	15.9	174	15.5	.38	.03	1,123
1955	631	49.5	223	17.5	203	15.9	217	17.0	.49	.04	1,274
1956	656	48.4	249	18.4	230	17.0	220	16.2	.58	.04	1,356
1957	626	46.9	254	19.0	223	16.7	232	17.4	.68	.05	1,336
1958	559	46.0	256	21.1	211	17.4	189	15.6	.70	.05	1,216
1959	582	45.3	279	21.7	227	17.7	297	15.3	.80	.06	1,286

Appendix Table 1 (Continued)

	Rail	Per Cent	Truck	Per Cent	Pipe-Line	Per Cent	Inland Water	Per Cent	Air	Per Cent	Total
1960	579	44.1	285	21.8	229	17.4	220	16.7	.89	.07	1,314
1961	570	43.5	296	22.7	233	17.8	210	16.0	1.01	.08	1,310
1962	600	43.8	309	22.5	238	17.3	223	16.3	1.30	.09	1,371
1963	629	43.3	336	23.1	253	17.4	234	16.1	1.30	.09	1,453
1964	666	43.2	356	23.1	269	17.4	250	16.2	1.50	.10	1,543
1965	709	43.3	359	21.9	306	18.7	262	16.0	1.91	.12	1,638
1966	751	43.0	381	21.8	333	19.1	280	16.0	2.25	.13	1,747
1967	731	41.4	389	22.0	361	20.5	281	16.0	2.59	.15	1,765
1968	757	41.2	396	21.5	391	21.3	291	15.8	2.90	.16	1,838
1969	774	40.8	404	21.3	411	21.7	303	16.0	3.20	.17	1,895
1970	771	39.7	412	21.3	431	22.3	319	16.5	3.30	.18	1,936
1971	746	38.2	445	22.8	444	22.7	315	16.1	3.50	.18	1,954
1972	784	37.7	470	22.7	476	23.0	339	16.4	3.70	.18	2,073
1973	858	38.5	505	22.6	507	22.7	358	16.0	3.95	.18	2,232
1974	860	38.8	495	22.3	506	22.8	354	16.0	3.91	.20	2,219
1975p	761	36.8	441	21.3	510	24.6	354	17.1	4.00	.20	2,070

* = Less than 0.01 per cent.

p = Preliminary.

Source: Harold Barger, The Transportation Industries: 1889-1946 (New York: National Bureau of Economic Research, 1951) pp. 184-185, 242, 251 and 254, and Transportation Association of America, Facts and Trends (Twelfth Edition, July 1976). p. 8.

Appendix Table 2

INTERCITY TRAVEL BY MODE, 1926-1975
(billions of passenger miles)

	Rail	Per Cent	Auto	Per Cent	Bus	Per Cent	Air*	Per Cent	Water	Per Cent	Total
1926	39.5	22.5	128.6	73.2	4.4	2.5	-	-	3.2	1.8	175.7
1927	37.3	20.7	134.8	74.8	4.9	2.7	-	-	3.1	1.7	180.1
1928	34.9	18.7	142.6	76.6	5.5	3.0	-	-	3.2	1.7	186.2
1929	34.0	17.1	154.3	77.8	6.8	3.4	-	-	3.3	1.7	198.4
1930	29.3	14.6	160.9	80.4	7.1	3.5	-	-	2.9	1.4	200.2
1931	23.8	11.8	168.6	83.7	6.7	3.3	-	-	2.3	1.1	201.4
1932	18.3	10.0	156.4	85.7	6.3	3.5	-	-	1.5	0.8	182.5
1933	17.3	9.5	156.5	86.1	6.4	3.5	-	-	1.6	0.9	181.8
1934	19.0	9.7	168.1	85.8	7.1	3.6	-	-	1.7	0.9	195.9
1935	19.5	9.4	178.3	86.1	7.6	3.7	-	-	1.8	0.9	207.2
1936	23.6	10.2	197.4	85.0	9.2	4.0	0.4	0.2	1.7	0.7	232.3
1937	25.7	9.7	228.4	85.8	10.3	3.9	0.4	0.2	1.3	0.5	266.1
1938	22.7	8.8	226.3	87.3	8.2	3.2	0.5	0.2	1.5	0.6	259.2
1939	23.7	7.6	275.4	88.6	9.5	3.0	0.9	0.3	1.5	0.5	311.0
1940	24.8	7.5	292.7	88.6	10.2	3.1	1.3	0.4	1.3	0.4	330.3
1941	30.6	8.2	324.0	87.2	13.5	3.6	1.8	0.5	1.8	0.5	371.7
1942	55.1	17.0	244.1	75.3	21.3	6.6	1.8	0.5	1.9	0.6	324.2
1943	89.9	30.4	176.0	59.5	25.9	8.8	2.0	0.7	1.9	0.6	295.7
1944	97.7	31.4	181.4	58.2	27.3	8.8	2.9	0.9	2.2	0.7	311.5
1945	93.5	26.9	220.3	63.4	27.4	7.9	4.3	1.2	2.1	0.6	347.6
1946	66.3	15.5	324.0	75.8	26.9	6.3	7.5	1.8	2.3	0.6	427.0
1947	46.8	10.9	347.8	81.1	24.8	5.8	7.7	1.8	1.8	0.4	428.9
1948	41.9	9.5	365.0	82.8	24.6	5.6	7.5	1.7	1.7	0.4	440.7
1949	36.0	7.5	409.4	85.4	24.0	5.0	8.6	1.8	1.4	0.3	479.4
1950	32.5	6.5	438.3	86.8	22.7	4.5	10.1	2.0	1.2	0.2	504.8
1951	35.3	6.2	498.1	87.2	23.6	4.1	12.9	2.3	1.3	0.2	571.2
1952	34.7	5.7	539.2	87.7	24.7	4.0	14.3	2.4	1.4	0.2	614.3
1953	32.3	5.0	575.8	88.4	24.4	3.7	17.4	2.7	1.5	0.2	651.4
1954	29.5	4.4	597.1	89.1	22.0	3.3	19.6	2.9	1.7	0.3	669.9
1955	28.7	4.0	637.4	89.5	21.9	3.1	22.8	3.2	1.7	0.2	712.5
1956	28.6	3.8	669.7	89.6	21.7	2.9	25.5	3.4	1.9	0.3	747.4
1957	26.3	3.5	670.5	89.6	21.5	2.9	28.1	3.7	1.9	0.3	748.3
1958	23.6	3.1	684.9	90.1	20.8	2.7	28.5	3.8	2.1	0.3	759.9
1959	22.4	2.9	687.4	89.9	20.4	2.7	32.6	4.2	2.0	0.3	764.8

Appendix Table 2 (Continued)

	Rail	Per Cent	Auto	Per Cent	Bus	Per Cent	Air*	Per Cent	Water	Per Cent	Total
1960	21.6	2.8	706.1	90.1	19.3	2.5	34.0	4.3	2.7	0.3	783.7
1961	20.5	2.6	713.6	90.2	20.3	2.6	34.6	4.3	2.3	0.3	791.3
1962	20.2	2.5	735.9	90.0	21.8	2.7	37.5	4.5	2.7	0.3	818.1
1963	18.6	2.2	765.9	89.8	22.5	2.6	42.8	5.1	2.8	0.3	852.6
1964	18.4	2.1	801.8	89.5	23.3	2.6	49.2	5.5	2.8	0.3	895.5
1965	17.6	1.9	817.7	88.8	23.8	2.6	58.1	6.4	3.1	0.3	920.3
1966	17.3	1.8	856.4	88.2	24.6	2.5	69.4	7.1	3.4	0.4	971.1
1967	15.3	1.5	889.8	87.2	24.9	2.4	87.2	8.6	3.4	0.3	1,020.6
1968	13.3	1.2	936.4	86.8	24.5	2.3	101.2	9.4	3.5	0.3	1,078.9
1969	12.3	1.1	977.0	85.8	24.9	2.2	119.9	10.6	3.8	0.3	1,137.9
1970	10.9	0.9	1,026.0	86.6	25.3	2.1	118.6	10.0	4.0	0.3	1,184.8
1971	8.9	0.7	1,071.0	87.1	25.5	2.1	119.9	9.8	4.1	0.3	1,229.4
1972	8.7	0.7	1,129.0	86.8	25.6	2.0	133.0	10.2	4.0	0.3	1,300.3
1973	9.3	0.7	1,174.0	86.5	26.4	1.9	143.1	10.5	4.0	0.3	1,356.8
1974	10.4	0.8	1,143.4	85.9	27.6	2.1	146.4	11.0	4.0	0.3	1,331.8
1975[p]	10.0	0.7	1,164.0	86.1	25.6	1.9	148.0	10.9	4.0	0.3	1,351.6

* Includes private aircraft.

p = preliminary.

Source: James C. Nelson, Railroad Transportation and Public Policy (Washington, D. C.: The Brookings Institution, 1959) pp. 443-444 and Transportation Association of America, Facts and Trends (Twelfth Edition, July 1976) p. 18.

Appendix Table 3

GROSS NATIONAL PRODUCT, 1925-1975
(billions of 1972 dollars)

Year		Year	
1925	275.2	1950	533.5
1926	290.9	1951	576.5
1927	292.3	1952	598.5
1928	295.2	1953	621.8
1929	314.7	1954	613.7
1930	285.2	1955	654.8
1931	263.3	1956	668.8
1932	226.8	1957	680.9
1933	222.1	1958	679.5
1934	239.4	1959	720.4
1935	260.8	1960	736.8
1936	296.1	1961	755.3
1937	309.8	1962	799.1
1938	297.1	1963	830.7
1939	319.7	1964	874.4
1940	343.6	1965	925.9
1941	396.6	1966	981.0
1942	454.6	1967	1007.7
1943	527.3	1968	1051.8
1944	567.0	1969	1078.8
1945	559.0	1970	1075.3
1946	475.7	1971	1107.5
1947	468.3	1972	1171.1
1948	487.7	1973	1235.0
1949	490.7	1974	1214.0
		1975p	1191.7

p = preliminary.

Source: Department of Commerce, unpublished data, Council of Economic Advisers, Economic Report of the President (January 1976) p. 172, and Survey of Current Business (September 1976), p. S-1.

Appendix Table 4

INDUSTRIAL COMPOSITION OF U. S. LABOR FORCE,
SELECTED YEARS, 1880-1975
(per cent)

Industry	1880[1]	1900[1]	1940[2]	1950[3]	1970[3]	1975[3]
Agriculture, Forestry and Fisheries	49.7	39.1	17.6	12.1	8.3	4.0
Mining	1.9	2.6	2.1	1.5	1.1	0.9
Construction	5.5	6.1	5.6	4.0	4.4	4.1
Manufacturing	13.5	14.6	23.2	25.9	25.5	21.6
Transportation and Public Utilities	4.7	6.6	6.7	6.8	6.1	5.3
Trade and Finance	9.4	12.8	19.5	19.2	21.4	25.0
Services and Public Administration	15.3	16.9	22.5	19.4	24.0	33.9
Not Reported	0.1	1.3	2.8	11.1	9.2	5.2

[1] gainful workers
[2] experienced labor force
[3] employees

Source: Simon Kuznets, Ann Ratner Miller and Richard A. Easterline, "Analyses of Economic Change," Population Redistribution and Economic Growth, 1870-1950, Vol. II (Philadelphia: The American Philosophical Society, 1960) p. 53 and Department of Labor, Bureau of Labor Statistics, Employment and Earnings (May 1976) Tables A-1 and B-1, and unpublished data.

Appendix Table 5

SOURCES OF U. S. ENERGY CONSUMPTION, 1850-1975
(per cent of Btu's)

Year	Coal	Petroleum[1]	Natural Gas	Hydropower & Nuclear	Wood
1850	9.3				90.7
1860	16.4	0.1			83.5
1870	26.5	0.3			73.2
1880	41.1	1.9			57.0
1890	57.9	2.2	3.7	0.3	35.9
1900	71.4	2.4	2.6	2.6	21.0
1910	76.8	6.1	3.3	3.3	10.7
1920	72.5	12.5	3.8	3.6	7.5
1925	65.6	19.1	5.3	3.1	6.8
1930	57.5	24.8	8.1	3.3	6.1
1940	49.7	30.7	10.6	3.6	5.4
1945	48.8	30.9	11.8	4.5	3.9
1950	36.8	38.4	17.0	4.6	3.3
1955	28.7	42.9	22.1	3.7	2.6
1960	23.2	44.6	28.2	4.0	N/A
1970	20.0	43.0	32.8	4.1	N/A
1974	18.1	45.8	29.8	6.2	N/A
1975[E]	18.8	46.0	28.4	6.8	N/A

[1] Includes natural gas liquids.
E = estimate.

Source: Sam H. Schurr and Bruce N. Netschert, Energy in the American Economy, 1830-1975 (Baltimore: Resources for the Future, Inc., Johns Hopkins Press, 1960) p. 36, Sam H. Schurr, ed., Energy, Economic Growth, and the Environment (Baltimore and London: Resources for the Future, Inc., Johns Hopkins University Press, 1972) p. 159, and Department of Interior, Bureau of Mines, Press Release (April 5, 1976) Table 2.

Appendix Table 6

REGIONAL DISTRIBUTION OF U. S. POPULATION, 1860-1975
(per cent)

Year	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific
1860	10.0	23.7	22.0	6.9	17.1	12.8	5.6	0.6	1.4
1870	9.0	22.9	23.7	10.0	15.2	11.4	5.3	0.8	1.8
1880	8.0	20.9	22.3	12.3	15.1	11.1	6.6	1.3	2.2
1890	7.5	20.2	21.4	14.2	14.1	10.2	7.5	1.9	3.0
1900	7.3	20.3	21.0	13.6	13.7	9.9	8.6	2.2	3.2
1910	7.1	21.0	19.9	12.6	13.3	9.1	9.6	2.9	4.6
1920	7.0	20.9	20.5	11.8	13.2	8.4	9.7	3.1	5.4
1930	6.6	21.4	20.6	10.8	12.9	8.0	9.9	3.0	6.7
1940	6.4	20.9	20.3	10.2	13.6	8.2	9.9	3.1	7.4
1950	6.2	20.0	20.2	9.3	14.1	7.6	9.7	3.4	9.7
1960	5.9	19.0	20.2	8.6	14.5	6.7	9.5	3.8	11.9
1970	5.8	18.3	19.8	8.0	15.1	6.3	9.5	4.1	13.0
1975	5.7	17.6	19.2	7.8	15.8	6.4	9.8	4.5	13.2

Source: Department of Commerce, Bureau of Economic Analysis, Long Term Economic Growth, 1860-1970 (June 1973) Series C71-80 and Bureau of the Census, Current Population Reports: Population Characteristics (Series P-20, No. 292, March 1976) Table 17.

Appendix Table 7

VALUE ADDED BY MANUFACTURE, BY REGION, 1899-1972
(per cent of U. S.)

Year	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific
1899*	16.3	37.9	25.9	7.0	6.8	3.2	2.1	1.6	3.0
1909*	14.6	36.5	26.7	6.9	7.2	3.6	3.0	1.7	4.3
1919*	13.5	35.2	29.8	5.8	7.7	2.8	3.0	1.3	5.3
1929*	10.6	33.3	32.6	6.1	8.0	3.0	3.1	1.2	6.3
1939	9.9	29.8	31.6	5.5	9.1	3.4	3.3	1.1	6.3
1950	8.3	26.2	33.2	5.7	9.4	3.8	4.3	1.2	7.8
1960	7.5	24.1	29.4	6.1	10.4	4.4	5.5	1.6	11.0
1970	6.8	21.4	27.5	6.9	11.8	5.7	6.7	1.9	11.1
1972	6.4	20.0	28.2	6.7	12.4	6.0	7.0	2.1	11.3

* May not add to 100 per cent because regional and total U. S. value added independently derived.

Source: Department of Commerce, Bureau of Economic Analysis, Long Term Economic Growth, 1860-1970 (June 1973) Series C81-90 and Bureau of the Census, Statistical Abstract of the United States (October 1975) Table 1259.

Appendix Table 8

U. S. URBAN AND RURAL POPULATION, 1830-1970
(thousands)

	Total U. S.	Urban	Per Cent	Rural	Per Cent
1830	12,866	1,127	8.8	11,739	91.2
1840	17,069	1,845	10.8	15,224	89.2
1850	23,192	3,544	15.3	19,648	84.7
1860	31,443	6,217	19.8	25,227	80.2
1870	38,558	9,902	25.7	28,656	74.3
1880	50,156	14,130	28.2	36,026	71.8
1890	62,948	22,106	35.1	40,841	64.9
1900	75,995	30,160	39.7	45,835	60.3
1910	91,972	41,999	45.7	49,973	54.3
1920	105,711	54,158	51.2	51,553	48.8
1930	122,775	68,955	56.2	53,820	43.8
1940	131,669	74,424	56.5	57,246	43.5
1950	150,697	96,468*	64.0	54,230	36.0
1960	179,323	125,269	69.9	54,054	30.1
1970	203,212	149,325	73.5	53,887	26.5

* Revised urban definition.

Source: Department of Commerce, Bureau of the Census, Historical Statistics of the United States, Colonial Times to 1970 (September 1975) Series A195-209.

Appendix Table 9

BITUMINOUS COAL PRODUCTION, 1933-1974
(thousand short tons)

Year		Year	
1933	333,631	1954	391,706
1934	359,368	1955	464,633
1935	372,373	1956	500,874
1936	439,088	1957	492,704
1937	445,531	1958	410,446
1938	348,545	1959	412,028
1939	394,855	1960	415,512
1940	460,772	1961	402,977
1941	514,149	1962	422,149
1942	582,693	1963	458,928
1943	590,177	1964	486,998
1944	619,576	1965	512,088
1945	577,617	1966	533,881
1946	533,922	1967	552,626
1947	630,624	1968	545,245
1948	599,518	1969	560,505
1949	437,868	1970	602,932
1950	516,311	1971	552,192
1951	533,665	1972	595,386
1952	466,841	1973	591,738
1953	457,290	1974	603,406
		1975p	640,000

p = preliminary

Source: National Coal Association, Bituminous Coal Facts: 1970, p. 46; and Department of the Interior, Bureau of Mines, Minerals and Materials (September 1976) Table 3.

Appendix Table 10

FEDERAL AID TO HIGHWAY TRANSPORTATION:
OBLIGATIONS (Millions of Dollars)

Fiscal Years	FHWA	Bureau of Land Mgt.	Nat. Park Service	Bureau of Indian Affairs	Office of the Territories (Alaska Hways)	Forest Service	Total
WW II and prior							7,314.8
1946	249.1	0.3	0.5	-	3.3	8.7	261.9
1947	369.4	0.4	6.8	1.3	3.9	25.6	407.4
1948	482.8	0.5	10.2	3.2	5.4	14.3	516.4
1949	395.7	0.5	9.5	4.2	29.0	12.0	450.9
1950	456.8	0.7	13.0	3.6	23.2	12.2	509.5
1951	495.2	0.2	15.8	3.3	28.8	14.4	557.7
1952	558.5	0.9	9.6	4.6	19.7	19.7	613.0
1953	564.4	1.1	16.1	5.5	16.1	21.6	624.8
1954	638.8	2.2	12.4	6.1	16.8	28.7	705.0
1955	739.8	3.1	22.9	8.9	15.7	28.3	818.7
1956	945.4	3.1	27.5	11.1	-	29.9	1,017.0
1957	2,248.4	4.4	30.1	9.9	-	33.5	2,326.3
1958	2,981.0	5.8	51.4	14.9	-	43.7	3,096.8
1959	3,519.1	2.5	40.7	11.6	-	35.3	3,609.2
1960	2,615.0	5.9	38.9	18.0	-	42.0	2,719.8
1961	2,767.1	8.4	40.1	21.7	-	45.3	2,882.6
1962	2,904.0	6.5	41.5	19.5	-	47.0	3,018.5
1963	3,055.1	6.5	43.0	18.3	-	62.6	3,185.5
1964	3,547.4	8.0	42.8	19.6	-	89.6	3,707.4
1965	3,936.3	9.2	47.7	22.3	-	119.4	4,134.9
1966	3,986.5	22.3	34.3	20.8	-	131.7	4,195.6
1967	4,087.2	19.2	34.0	17.7	-	136.1	4,294.2
1968	4,064.0	13.2	37.9	21.2	-	141.1	4,277.4
1969	4,013.2	12.9	35.3	22.5	-	135.9	4,219.8
1970	4,295.3	13.9	27.8	22.4	-	186.3	4,545.7
1971	4,734.6	18.8	39.8	26.4	-	195.3	5,014.9
1972	4,652.2	17.6	20.6	45.9	-	186.6	4,922.9
1973	4,557.7	16.9	16.5	58.8	-	212.9	4,862.8
1974	4,451.5	17.8	22.7	63.6	-	199.5	4,755.1
1975	4,912.3	21.5	46.8	67.6	-	207.3	5,255.5
Total Post WW II	77,223.8*	244.3	836.2	574.5	161.9	2,466.5	81,507.2
Total, All Years							88,822.0

* Interstate System: 48,690.8.

Source: U. S. Department of Transportation and National Transportation Policy, Report of the Committee on Commerce, United States Senate, by its Special Study Group on Transportation Policies in the United States, June 26, 1961, p. 173. Hereafter cited as the "Doyle Report." See also Figure 26.

Appendix Table 11

FEDERAL AID TO AIR TRANSPORTATION: OBLIGATIONS
(Millions of Dollars)

Fiscal Years	CAB	FAA				NACA/ NASA[a]	Acquisition Cost-Federal Property Converted To Civilian Use[b]	Total
		Operations	Navigation	Other	Total FAA[c]			
WW II and Prior								1,085.7
1946	21.1	30.4	10.4	49.1	89.9	24.0	-	135.0
1947	43.5	40.0	21.1	18.6	79.7	30.7	-	153.9
1948	65.0	56.0	16.1	31.9	104.0	43.4	7.8	220.2
1949	74.3	66.1	18.7	65.5	150.3	48.7	-	273.3
1950	81.9	72.8	25.5	60.1	158.4	128.0	44.9	413.2
1951	64.9	75.0	21.1	59.8	155.9	63.1	-	283.9
1952	63.1	81.3	13.5	33.5	128.3	69.0	-	260.4
1953	67.7	82.5	11.7	21.4	115.6	65.3	-	248.6
1954	65.1	90.7	7.1	5.1	102.9	55.3	-	223.3
1955	44.2	91.9	9.3	23.5	124.7	46.5	-	215.4
1956	43.2	100.8	10.1	21.2	132.1	51.0	-	226.3
1957	43.8	121.3	75.7	50.5	247.5	49.4	-	340.7
1958	46.2	187.6	120.4	98.9	406.9	44.7	-	497.8
1959	50.0	254.1	103.2	132.6	489.9	86.8	-	626.7
1960	65.4	314.1	112.3	150.4	576.8	71.8	-	714.0
1961	71.6	384.6	138.7	144.8	668.1	50.7	7.4	797.8
1962	80.0	429.4	91.2	124.7	645.3	31.1	6.2	762.6
1963	82.9	480.2	86.2	148.8	715.2	47.0	-	845.1
1964	82.6	514.5	110.8	120.9	746.2	53.4	-	882.2
1965	77.8	538.0	53.8	102.4	694.2	82.2	0.7	854.9
1966	71.3	544.5	44.7	115.9	705.1	80.7	86.6	943.7
1967	63.9	572.7	83.7	105.6	762.0	105.4	125.6	1,056.9
1968	55.2	616.5	85.7	129.6	831.8	136.3	115.2	1,138.5
1969	45.9	703.6	115.5	149.3	968.4	168.1	39.5	1,221.9
1970	40.3	844.1	160.6	103.6	1,108.3	198.8	50.2	1,397.6
1971	60.7	1,084.3	438.0	101.2	1,623.5	209.9	75.2	1,969.3
1972	66.6	1,072.5	354.2	109.2	1,535.9	235.8	16.9	1,855.2
1973	64.6	1,183.0	210.0	72.2	1,465.2	287.3	16.6	1,833.7
1974	73.0	1,294.8	217.4	86.1	1,598.3	303.3	2.6	1,977.2
1975	63.0	1,418.2	247.3	430.7	2,096.2	313.8	70.8	2,543.8
Total Post WW II	1,838.8	13,345.5	3,014.0	2,867.1	19,226.6	3,181.5	666.2	24,913.1
TOTAL, ALL YEARS								25,998.8

Source: U. S. Department of Transportation, and Doyle Report, p. 182. See also Figure 28.

a Appropriations from 1946-1958 Outlays for 1959-1962, and Obligations for 1963-1975.
b Partial listing: complete data not available.
c Excludes $863 million obligated under the Supersonic Transport development program.

Appendix Table 12

FEDERAL AID TO DOMESTIC WATER TRANSPORTATION:
OBLIGATIONS
(Millions of Dollars)

Fiscal Years	Army Corps of Engineers				TVA	US Coast Guard [b]	Total
	Construction	Operation & Maint.	Other [c]	Total Corps			
WW II and prior							4,013.2
1946	30.1	53.9	0.1	84.1	2.5	41	127.6
1947	39.4	48.3	-	87.7	2.6	14	104.3
1948	42.5	50.0	1.3	93.8	2.7	13	109.5
1949	106.4	71.1	-	177.5	2.8	16	196.3
1950	63.1	60	10.0	133.1[a]	2.9	17	153.0
1951	51.6	60	8.1	119.7[a]	0.6	21	141.3
1952	40.2	59.6	15.7	115.5	0.5	24	140.0
1953	31.5	66.0	23.9	121.4	0.4	26	147.8
1954	29.5	63.6	17.8	110.9	0.5	23	134.4
1955	41.6	67.7	40.2	149.5	0.4	19	168.9
1956	78.8	65.8	36.7	181.3	1.1	20	202.4
1957	114.6	75.8	43.4	233.8	10.4	20	264.2
1958	143.3	76.2	37.7	257.2	18.9	21	297.1
1959	179.9	80.7	36.8	297.4	11.8	22	331.2
1960	207.7	82.8	44.8	335.3	6.2	23	364.5
1961	202.6	94.5	49.3	346.4	6.1	26	378.5
1962	208.5	103.0	44.4	355.9	19.3	27	402.2
1963	212.9	108.1	42.5	363.5	6.5	30	400.0
1964	230.2	114.5	54.2	398.9	10.8	32	441.7
1965	285.0	120.3	59.4	464.7	9.3	55	529.0
1966	285.7	128.0	76.6	490.3	4.0	62	556.3
1967	264.4	121.8	67.4	453.6	3.4	60	517.0
1968	257.6	134.6	70.8	463.0	-	60	523.0
1969	194.1	146.2	57.7	398.0	-	51	449.0
1970	179.1	179.8	50.4	409.3	-	55	464.3
1971	209.7	198.3	57.6	465.6	0.7	57	523.3
1972	211.7	223.1	56.1	490.9	2.4	79	572.3
1973	237.3	247.7	55.8	540.8	4.1	70	614.9
1974	220.9	303.8	89.3	614.0	1.5	81	696.5
1975	216.6	362.1	49.3	628.0	0.6	88	716.6
Total Post WW II	4,616.5	3,567.3	1,197.3	9,381.1	133.0	1,153	10,667.1
Total, All Years							14,680.3

[a] Assumes an O&M figure of roughly $60 million based on extrapolation from later years. Actual O&M data for these two years not available.

[b] USCG expenditures for non-domestic freight traffic and for recreational boating have been removed from these data.

[c] For FY 55 through 75, includes obligations for the partly navigation-related channel improvement activity under the flood control program for the Mississippi River and tributaries, an inclusion which overstates total Corps' obligations for navigation for this period by a relatively small but unknown amount.

Source: U.S. Department of Transportation (except as noted). See also Figure 27.

Appendix Table 13

FEDERAL AID TO RAIL TRANSPORTATION: OBLIGATIONS (Millions of Dollars)

Fiscal Years	FRA Operating Expenses	FRA R&D	Rail Service Assistance[e]	Grants To Amtrak	Emergency Rail Restoration[f]	Exp. of USRA	Defaults On ICC Part V Loans[b] (Disbursements)	Total
WW II and Prior								533.5
1946	-	-	-	-	-	-	-	-
1947	-	-	-	-	-	-	-	-
1948	-	-	-	-	-	-	-	-
1949	-	-	-	-	-	-	-	-
1950	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-
1955	-	-	-	-	-	-	-	-
1956	-	-	-	-	-	-	-	-
1957	-	-	-	-	-	-	-	-
1958	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-
1961	-	-	-	-	-	-	-	-
1962	-	-	-	-	-	-	13.3	13.3
1963	-	-	-	-	-	-	-	-
1964	-	-	-	-	-	-	-	-
1965	-	-	-	-	-	-	-	-
1966	-	11.7	-	-	-	-	-	11.7
1967	-	14.6	-	-	-	-	13.7	28.3
1968	0.6	12.9	-	-	-	-	-	13.5
1969	0.9	12.9	-	-	-	-	-	13.8
1970	1.1	16.4	-	-	-	-	-	17.5
1971	1.5	25.3	-	26.0	-	-	38.4	91.2
1972	2.2	40.1	-	80.0	-	-	29.3	151.6
1973	2.5[a]	41.0	-	103.1	-	-	12.3	158.9
1974	3.2	38.5	22.5	127.5	23.9	-	-	215.6
1975	3.8	40.1	169.1	299.0	3.5	33.6	-	549.1
Total Post WW II	15.8	253.5	191.6	635.6[c]	27.4	33.6	107.0	1,264.5
Total, All Years	15.8	253.5	191.6	635.6	27.4	33.6	107.0	1,798.0

[a] Estimated.

[b] § 503 of 1958 Transportation Act. Source: ICC, Bureau of Accounts, Section of Financial Analysis.

[c] U. S. Department of Transportation is also the guarantor of $900 million in Amtrak debt. Note also that the $197 million paid to Amtrak by railroads (as "entry fees") is also excluded.

[d] FRA assistance paid to bank rupt railroads to underwrite operating losses during completion of USRA plan.

[e] FRA payments primarily to restore damage to eastern railroads damaged by hurricane Agnes in 1972.

Source: U. S. Department of Transportation. See also Figure 25.

FEDERAL USE AND MODE - RELATED TAX REVENUES
(Millions of Dollars)

Fiscal Years	Private and Commercial Highway	Air[a,b]	Domestic Water[a]	Rail[a]	Total
WW II and prior	5,750.4	-	-	1,000.0	6,750.4
1946	686.7	-	-	-	686.7
1947	795.0	-	-	-	795.0
1948	879.6	-	-	-	879.6
1949	832.5	-	-	-	832.5
1950	917.4	-	-	-	917.4
1951	969.9	-	-	-	969.9
1952	1,265.9	-	-	-	1,265.9
1953	1,278.2	-	-	-	1,278.2
1954	1,322.5	-	-	-	1,322.5
1955	1,442.4	-	-	-	1,442.4
1956	1,708.1	-	-	-	1,708.1
1957	2,240.4	-	-	-	2,240.4
1958	2,210.0	-	-	-	2,210.0
1959	2,456.9	-	-	-	2,456.9
1960	3,071.4	-	-	-	3,071.4
1961	3,104.8	-	-	-	3,104.8
1962	3,324.6	-	-	-	3,324.6
1963	3,604.5	-	-	-	3,604.5
1964	3,814.2	-	-	-	3,814.2
1965	3,935.4	-	-	-	3,935.4
1966	4,043.7	-	-	-	4,043.7
1967	4,075.2	-	-	-	4,075.2
1968	4,350.8	-	-	-	4,350.8
1969	4,854.4	-	-	-	4,854.4
1970	5,105.8	-	-	-	5,105.8
1971	5,291.5	562.8	-	-	5,854.3
1972	5,315.0	648.7	-	-	5,963.7
1973	5,948.1	758.2	-	-	6,706.3
1974	5,846.0	868.2	-	-	6,714.2
1975	5,778.8	1,058.3	-	-	6,837.1
Total Post WW II	90,469.7	3,896.2	-	-	94,365.9
Total, All Years	96,220.1	3,896.2	-	1,000.0	101,116.3
Federal Freight Waybill Tax (42-58)	2,047.6	-	186.8	3,120.7	5,355.1
Federal Passenger Ticket Tax (42-70)	839.8	3,198.6	-	2,025.6	6,064.0
Total, All Charges	99,107.5	7,094.8	186.8	6,146.3	112,535.4

See p. 2 of 2 for explanation.

[a] Total use-related taxes paid by non-highway modes are difficult to estimate, and cannot be allocated by mode. Through the end of Calendar Year 1975, the total of such taxes appears to be about $500 million.

[b] Does not include $205.4 million in revenues collected at the National Capital Airports and returned to the Federal Treasury for the period FY 46 through FY 75.

Appendix Table 14

Explanation of Federal Waybill and Passenger Ticket Taxes.

Waybill Tax:

The Revenue Act of 1942 levied a 3 per cent excise tax on charges paid for transportation of all property (except a flat amount of 4 cents per ton of coal). This tax was repealed in 1958. Total taxes collected, 42-58, were $5,355.1 million. For purposes of this study, this was apportioned among the modes in proportion to their estimated total freight revenues for the 42 to 58 period as follows: highway, 38.2%; air, 0.0%; water, 3.5%; rail, 58.3%.

Passenger Ticket Tax:

Federal ticket taxes were levied on the revenues of all passenger modes at the following rates:

1941:	5%
1942:	10%
1943-1953:	15%
1954-1962:	10%
1962-1968:	5% air only
1971:	8% air only

Total taxes of $4,614.2 were collected between 1941 through 1962 and were apportioned, on the basis of relative total revenue for the period, as follows: highway, 18.2%; air, 37.9%; water, 0.0; rail, 43.9%. After 1962, but prior to 1971 (shown separately) all taxes are allocated directly to air.

Sources: AAR, Bureau of Railway Economics, September 25, 1962, and, Statistical Appendix to Annual Report of the Secretary of the Treasury, Table 10, Issue dated June 30, 1968, and June 30, 1975.

Definitions Employed on page 1 of 2.

(1) Private and commercial highway charges are defined as the sum of taxes as follows: Gasoline, Highway Special Fuel, Lubricating Oil, Federal Use Tax, Trucks, Buses and Trailer excise tax, Parts and Accessories excise tax, Tires and Tubes excise tax, and Tread Rubber excise tax. Source: U. S. Department of Transportation, Highway Statistics 1974, pp. 75, 76. Note: automobile excise taxes are not included (a total of $30.3 billion).
(2) There are no Federal waterway use charges.
(3) Air charges are made up of all payments to the FAA Airport and Airway Trust Fund. Source: The Budget of the United States, various annual Appendices.
(4) Rail collections for World War II and prior ($1 billion) are the value of rail rate reductions given to the Federal government from 1854 through September 1946. See discussion on pages III-5 to III-10.

Appendix Table 15

MAJOR LEGISLATIVE PROVISIONS
DIRECTED TOWARD RAILWAY LABOR

Legislation	Provisions
Arbitration Act of 1888	Voluntary arbitration panels established on mutual agreement of opposing parties; President could establish investigating commission to recommend solution if no settlement reached; no enforcement mechanisms.
Erdman Act of 1898	Chairman of ICC and Commissioner of Labor could be invited by parties to mediate disputes; three-man voluntary arbitration panels could be established by mutual agreement, arbitration panel solution binding for one year; investigating commission eliminated; various employee rights guaranteed (declared unconstitutional in 1908); applicable to operation of trains only (e.g., not clerical unions).
Federal Employers' Liability Act of 1908	Various workman's compensation type provisions, elaborated by 1939 and 1948 amendments; arose out of very high incidents of accidental injuries and deaths in rail industry.
Newlands Act of 1913	Revised Erdman Act to provide for permanent 3-man Board of Mediation and Conciliation, mediation and arbitration voluntary as in previous legislation; Board given role in interpreting technical meaning of settlements.
Adamson Act of 1916	Legislative enactment of 8-hour day as basis for calculation of rail labor pay; labor demands met to prevent strike.

Legislation	Provisions
Federal Possession and Control Act of 1916	Provided for Government operation of railroads during World War I under U. S. Railroad Administration; USRA established three Adjustment Boards to settle grievances and Board of Railroad Wages and Working Conditions to recommend improvement in wages and working conditions; system viewed as highly favorable to labor, particularly in setting precedents for nation-wide agreements.
Transportation Act of 1920	Supplemented peace-time (Newlands Act) arbitration and mediation procedures by providing for establishment of "boards of adjustment" by mutual agreement; created Railroad Labor Board to handle appeals from adjustment boards or to intervene on own initiative to promote settlements; no enforcement procedures. Union demands for nation-wide agreements, resisted by carriers, overburdened RLB with disputes; Act eventually repealed on initiative of both labor and management.
Railway Labor Act of 1926	Replaced Newlands Act and Transportation Act of 1920. Encouraged collective bargaining prior to mediation and/or arbitration; for appeal of grievances in existing agreements and for new agreements created National Board of Mediation, provided for arbitration by mutual agreement if mediation fails; permitted President to create emergency board if arbitration failed in order to recommend terms of settlement. Adjustment Boards created by mutual agreement on local or regional basis.
Bankruptcy Act of 1933	Prohibited judge or trustee in railway bankruptcy proceeding from changing wages or working conditions except under terms of RLA; prohibited "yellow dog" contracts.

Legislation	Provisions
Emergency Transportation Act of 1933	In addition to other measures to cope with disastrous railroad conditions during the Depression, prohibited reduction in total railroad employment from levels of May 1933 except for retirement or resignation. Provided that labor must be compensated if transfer to another location required. (Severely limited railroad consolidation while in effect.)
Railway Labor Act Amendments of 1934	Retained basic structure of Railway Labor Act of 1926; extended workers covered by Act; limited company influence on unions through various restrictions; removed grievance cases from NBM jurisdiction and gave to new National Railroad Adjustment Board (provided mechanism for adjustment of grievances on nation-wide basis); permitted enforcement of awards by civil court action. Many other technical changes.
Railroad Retirement Acts of 1935 and 1937	Federal program replacing individual carrier retirement plans; labor had lobbied for such legislation since the early 1930's and a 1934 act providing for a national retirement program was ruled unconstitutional. Revised legislation was passed in 1935 and management objections were met by 1937 revisions. The 1937 Act has been amended on numerous occasions, but still provides the basis for railroad retirement provisions in the 1970's.
Railroad Unemployment Act of 1938	Federal legislation replacing state unemployment compensation programs for railway labor; rail unions had lobbied for such a uniform national program since 1931.
Transportation Act of 1940	Among other provisions, provided for a series of job protection measures for labor before railroad consolidations could be approved.

Legislation	Provisions
Price Control Act of 1944	Wartime legislation with amendments specifying separate treatment for settlement of railroad disputes; resulted from union threat of nation-wide strike and Federal seizure of the railroads to settle labor dispute; enabled RLA mechanisms to arbitrate final wage settlements without separate action by the wartime Office of Economic Stabilization.
Railway Labor Act Amendments of 1951	Permitted union shop and checkoff for deduction of union dues. Retained basic RLA framework as amended in 1934.
1951 Amendments to the Railroad Retirement Act of 1937	Provided for financial interchange program between the Social Security System and Railroad Retirement System. Prevented bankruptcy of Railroad Retirement Fund, but permitted certain dual benefits to workers corrected by 1974 legislation.
Public Law 88-108 (1963)	Established first peacetime compulsory arbitration board in U. S. history to arbitrate firemen's jobs and consist of work crew disputes.
Urban Mass Transportation Act of 1964	Contained labor protection provisions to minimize effects of automation and mass transit reorganization in implementing mass transit improvement programs (still in effect). Provisions included collective bargaining guarantees, protection against transfer to lower paying jobs, retaining projects, and reemployment priority for terminated or laid-off employees.
High Speed Ground Transportation Act of 1965	Act dealing with intercity transportation in densely populated corridors contained labor protection provisions similar to above.

Legislation	Provisions
Railway Labor Act Amendments of 1966	Provided for special adjustment boards on motion of either carriers or employees, intended to reduce backlog of grievances. All National Adjustment Board awards made final, subject to judicial review.
Rail Passenger Service Act of 1970	Act created quasi-public corporation to take over passenger service from private roads; continued labor protection provisions as in above acts and continued policy of free or reduced rate transportation for railroad employees.
1973 Amendments to the Railroad Retirement Act of 1937	Amendments designed in part to refinance the Railroad Retirement Fund; employee contributions reduced to Social Security levels while railroad contribution increased substantially.
Regional Rail Reorganization Act of 1973	Provided that newly-formed ConRail must offer employment to those already employed by railroads in reorganization; similar provision for other acquiring railroads; various protective provisions incorporated regarding relocation, severance, etc.
Railroad Retirement Act of 1974	Designed in part to eliminate dual benefits between the Railroad Retirement and Social Security System; U. S. Treasury assumed costs of phasing out dual benefits, providing relief to the Railroad Retirement Fund.
Railroad Revitalization and Regulatory Reform Act of 1976	Maintained labor protection provisions of previous acts and provided that ConRail must offer employment to each employee of reorganized railroads and assume responsibility for settlement of labor claims.

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