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*REPORT TO THE SUBCOMMITTEE
ON FEDERAL SPENDING PRACTICES
EFFICIENCY, AND OPEN GOVERNMENT
SENATE COMMITTEE ON
GOVERNMENT OPERATIONS*

UNITED STATES
GENERAL ACCOUNTING OFFICE
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*BY THE COMPTROLLER GENERAL
OF THE UNITED STATES*



**Information Available On
Estimated Costs To Rehabilitate
The Nation's Railroad Track
And A Summary Of Federal
Assistance To The Industry**

Although there are several existing studies of the condition of railroad trackage, none is comprehensive enough to be a valid measure of conditions across the country.

For the past 5 years about three-fourths of the Federal funds for aiding railroads went for emergency assistance to bankrupt carriers.

There appears to be little assurance as yet that future Federal financial railroad assistance will be provided where needed, when needed, or in the amounts needed.

Research and development projects of the Federal Railroad Administration are increasingly addressing current technological, economic, and management problems of the railroad system.

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NOV. 21, 1975



COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-164497(5)

The Honorable Lawton Chiles
Chairman, Subcommittee on
Federal Spending Practices, Efficiency,
and Open Government
Committee on Government Operations
United States Senate

Dear Mr. Chairman:

This is our report in response to your and Senator Lowell Weicker's letter of May 15, 1975. That letter, as modified in subsequent meetings with your office, requested that we obtain information on a number of matters relating to the physical and financial condition of the Nation's railroads.

In this report, we analyze available information on railroad track conditions and estimated rehabilitation costs and summarize the Federal assistance provided to the railroad industry since 1970 and the research and development activities being undertaken by the Federal Railroad Administration.

As your office suggested, we have not obtained formal comments on the contents of this report from the various Federal and private organizations from which we obtained information. We have, however, obtained and taken into consideration the informal comments of appropriate officials.

We are sending a copy of this report to Senator Weicker. Also, we are sending copies of this report to the various House and Senate committees concerned with railroad matters; the House and Senate Committees on Appropriations and Government Operations; the Director, Office of Management and Budget; the Secretary of Transportation; the Chairman, Interstate Commerce Commission; and the Chairman, United States Railway Association.

Sincerely yours

A handwritten signature in black ink, appearing to read "Thomas R. Steitz".

Comptroller General
of the United States

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ABBREVIATIONS

AAR	Association of American Railroads
Amtrak	National Railroad Passenger Corporation
ConRail	Consolidated Rail Corporation
FRA	Federal Railroad Administration
GAO	General Accounting Office
ICC	Interstate Commerce Commission
R&D	research and development
TSC	Transportation Systems Center
TTC	Transportation Test Center
UMTA	Urban Mass Transportation Administration
USRA	United States Railway Association

COMPTROLLER GENERAL'S
REPORT TO THE SUBCOMMITTEE
ON FEDERAL SPENDING PRACTICES,
EFFICIENCY, AND OPEN GOVERNMENT
COMMITTEE ON GOVERNMENT OPERATIONS
UNITED STATES SENATE

INFORMATION AVAILABLE ON
ESTIMATED COSTS TO
REHABILITATE THE NATION'S
RAILROAD TRACK AND A SUMMARY
OF FEDERAL ASSISTANCE TO THE
INDUSTRY

D I G E S T

It is generally accepted that much of the Nation's railroad track in use today is in serious need of improvement. In recognition of the gravity of the situation in which the railroads themselves are not capable of breaking the deterioration cycle, the Congress and several of its committees have before them a number of bills providing financial assistance to the railroads.

Although attempts have been made by various organizations to determine the extent of track deterioration and what it would cost to fix it, GAO has concluded that:

- No comprehensive studies existed which objectively and quantitatively described the existing condition of track on a nationwide basis.
- None of the available cost estimates to repair or replace deteriorated track provided a complete, reliable assessment of the long-term financial resources that might be required to rehabilitate the Nation's railroad system.

In the absence of comprehensive and objective data, there appears to be little assurance that the financial assistance that may be provided will be spent where needed, when needed, and in amounts needed. (See p. 20.)

Federal assistance to the railroad industry in modern times has lagged far behind that provided to other modes of transportation. Since about 1970, however, assistance to the railroads has been increasing.

The deteriorated financial and physical condition of the railroads--marked by bankruptcies,

low return on investments, unsafe conditions, and natural disasters--has caused the Congress and the American public to take a closer look at the Nation's railroad industry. As a result, Federal dollars have started flowing to the railroads. (See p. 21.)

Since fiscal year 1970 through June 30, 1975, a total of about \$4 billion in direct Federal assistance has been authorized for buying locomotives, railcars, and passenger equipment; rehabilitating or replacing rundown, wornout, and destroyed facilities; restructuring bankrupt railroads; and in some cases just meeting weekly payrolls. In most cases, the assistance provided has been of a stop-gap nature to help alleviate immediate crises.

Despite the weakness of the industry as a whole, little assistance has been provided to help the Nation's solvent railroads to improve or to at least maintain their present conditions. (See p. 37.)

Since fiscal year 1970 a total of about \$209 million has been appropriated for the Federal Railroad Administration's research and development activities. These activities are moving away from projects in advanced technology toward projects addressing existing technological, economic, and management problems.

CHAPTER 1

INTRODUCTION

At the request of the Chairman, Subcommittee on Federal Spending Practices, Efficiency, and Open Government, Senate Committee on Government Operations and Senator Lowell Weicker, the Subcommittee's ranking minority member, we reviewed a number of matters relating to the physical and financial conditions of the Nation's railroads. This report analyzes the available information on track conditions and estimated rehabilitation costs and summarizes the Federal assistance provided to the railroad industry since 1970. It also contains information on the research and development activities of the Federal Railroad Administration (FRA), Department of Transportation, with particular emphasis on those activities directed towards solving current industry problems.

THE NATION'S RAILROAD SYSTEM

Transportation is the vital link between producers and consumers and the lifeline of economic growth. It is within this context that railroads have played and will continue to play a major role.

The first of the modern transportation technologies to develop, the railroads opened up the West and linked the regions of the country into a transcontinental economy. Through the 1920s, the railroads prospered and were the Nation's dominant form of intercity transportation. This prosperity was reflected in their financial strength and in the values of their securities.

Since that time, however, the industry has--for a variety of complex and interrelated reasons--found itself in a state of decline, measured in terms of a declining share of the transportation market as well as the deteriorating financial and physical conditions. Today, although it is still the largest carrier of intercity freight, the railroad industry no longer dominates the transportation market as it once did. Large parts of the industry--currently made up of 67 Class I railroads (those with annual operating revenues of \$5 million or more, representing 99 percent of all rail traffic and 96 percent of all rail mileage, and operating over some 326,000 miles of track) and scores of smaller carriers--face serious financial difficulties and an uncertain future.

A DECLINING INDUSTRY AND FEDERAL ASSISTANCE

Although in a state of decline for a number of years, it was the recent bankruptcies of the Penn Central and other Northeast and Midwest railroads--and the threat posed by these bankruptcies to the Nation's total transportation system, and, in turn, the Nation's economy--that focused national attention on the railroad industry and its problems.

The overriding problem--which is at times both a cause and an effect of the entire range of problems faced by the railroad industry--is that of inadequate earnings. Railroad earnings today are only three-quarters of their 1947 level after adjusting for inflation, and since 1955 (the last year a rate of return as high as .4 percent was recorded) the average rate of return for the industry has been a poor 2.86 percent. Hindered by large fixed expenses and the inability to obtain sufficient funds either internally or externally, many railroads have been forced to defer needed maintenance and capital improvement expenditures.

These continued deferrals have been costly to the railroads. On the one hand, as the railroads' physical plant has deteriorated and become obsolete, day-to-day operating costs have increased. On the other hand, as these deferrals have caused service to deteriorate, traffic and, consequently, revenues have been lost to competing modes of transportation. These increased costs and reduced revenues have further eroded railroad earnings and complicated the railroads' ability to maintain and upgrade their systems. It is this vicious, self-feeding cycle of deterioration which currently threatens the economic survival of the industry.

Although the railroad crisis has to date been most acute in the Northeast and Midwest sector of the country, many familiar with the industry feel the problems in these regions are in many cases simply more extreme manifestations of fundamental problems present throughout much of the industry. Left uncorrected, they threaten the economic viability of the highly interdependent railroad industry.

There is no single cause that can be attributed to the decline of the railroad industry, nor is there a single solution. A number of basic reforms--involving practices and policies of Government, management, and labor--have been proposed in an effort to revitalize the industry and to restore it to a competitive, efficient, and self-sustaining position.

Although these reforms may help to assure the long-term viability of the railroad industry, many knowledgeable people feel the industry, or at least large parts of it, has reached

a point where only an immediate and massive infusion of Federal assistance will enable the industry to rehabilitate and modernize its seriously deteriorated physical plant and to make a clean break in the deterioration cycle. Only then can the industry hope to reverse the steady decline it has been experiencing and to realize more fully its potential in a modern transportation system.

To date Federal assistance to the industry has been essentially in response to specific crisis situations, without the needed reforms for the survival and growth of the industry. The recent bankruptcies in the Northeast and Midwest and the threats that these bankruptcies and underlying causes pose to the total railroad and transportation system, however, have stirred considerable public interest and concern over the health of the industry. In recognition of the seriousness of the situation, a number of legislative proposals--calling for basic reforms and financial assistance--have been introduced in the Congress. As a result, it would appear probable that Federal assistance to the railroad industry will be considerably increased in the coming years. Only the amounts required and the forms and sources of funding appear to be in question.

CHAPTER 2

STUDIES ON TRACK CONDITIONS AND REPORTED COST OF REHABILITATION

The low earnings recorded by the Nation's railroads over a long period of time has had a serious effect on railroad maintenance and improvements. Faced with the reality of expenditures outpacing revenues, many railroads have found it necessary to postpone needed maintenance and improvement expenditures in the hopes that next year will be better, allowing them to make up the expenditures postponed. Unfortunately, the record shows that since World War II there have been very few good years and nothing but very minor deferral makeups have been possible. These continued shortfalls--the problems of which are compounded by the increasingly heavier loads being handled and the continuing inflationary spiral--have resulted in a large and growing backlog of deferred expenditures and a rapidly deteriorating railroad system.

Although conditions vary from railroad to railroad and from region to region, the problems are not localized, affecting only some railroads or some regions. Individual railroads make up a highly interdependent system. Traffic moves over different roads and through different regions and each railroad interchanges equipment and renders joint services to the others in the system. Under these circumstances, service inadequacies of individual carriers have a detrimental effect on the entire system and the ability of the system to meet transport competition. The collective health of the industry is dependent upon the health of its individual members.

Yet, despite the generally acknowledged seriousness of the system's deterioration, there exists no complete or reliable quantitative data which objectively describes the conditions which exist or provides a reliable estimate of the rehabilitation needs and costs on a nationwide basis. What does exist are a number of studies and compilations developed by various groups for various purposes. Although serving as the bases for current estimates of plant deterioration and rehabilitation costs, we found them subject to a number of qualifications which make questionable their usefulness as reliable, objective assessments of nationwide plant conditions and requirements. Descriptions of these studies and compilations follow.

FRA'S STUDY OF DEFERRED MAINTENANCE

Lacking reliable quantitative information on national track conditions, in early 1974 FRA contracted with a consulting engineering firm to develop an estimate of the amount of deferred maintenance on ties and rails for a selected sample of the Nation's railroad system. To get an overview of the level of deferred maintenance on a regional basis, FRA selected for study 25 geographically dispersed Class I railroads with a total of 236,348 miles of track, 71 percent of the total Class I track mileage.

The study ^{1/} involved the use of a computer-based model developed by the contractor using detailed public and proprietary information to estimate the amount of deferred railroad track maintenance. The model was modified so that it could be operated using only readily available public information--specifically, that which was contained in the railroads' annual reports to the Interstate Commerce Commission (ICC). Weight was given to such factors as age of track materials, weight of rail, percent of welded rail, and ton-miles of transportation performed.

Using the data reported to ICC for the 40-year period 1933 through 1972, the study estimated the cumulative extent to which the 25 railroads had been unable to meet their annual requirements for tie and rail replacements on the basis of average tie and rail lives. Deferred maintenance was determined to exist when the replacement of new track materials was less than that considered necessary to achieve a normalized condition. The contractor defined this condition as one in which 50 percent of the usable life of the track materials remained. An estimate of the amount of deferred maintenance was then made by estimating the cost, in 1974 dollars, of installing new track materials which would be required to achieve a normalized condition.

Study results

Using the above methodology, the contractor estimated that, as of December 31, 1972, the 25 railroads included in the study required over 78 million new cross ties and over 3.4 million tons of new rail to achieve a normalized condition. The estimated cost totaled nearly \$4 billion.

^{1/}"Estimate of Deferred Maintenance in Track Materials for Twenty-five Railroads," May 3, 1974.

The contractor subsequently updated the study through December 31, 1973. The updated study showed that, as of that date, the 25 railroads required nearly 84 million new cross ties and over 3.8 million tons of new rail to achieve a normalized condition at an estimated cost of nearly \$4.4 billion, roughly a 10-percent increase from yearend 1972. Since both years' estimates of deferred maintenance were stated in 1974 dollars, inflation was not a factor.

The contractor told us that he was currently in the process of updating the study through yearend 1974. Although the results were not available, the contractor expressed the belief that since 1974 was a relatively good year financially for the industry, the percentage increase in deferred maintenance would probably be about 6 to 7 percent. If this proves to be correct, we estimated deferred maintenance as of December 31, 1974, on the 25 railroads to be about \$4.7 billion (1974 dollars).

Although the estimates of deferred maintenance on track are those for only 25 of the Nation's Class I railroads, both the contractor and FRA officials expressed the belief that the results could be used to reasonably project the amount of estimated deferred maintenance on all Class I track. Doing so, we estimated that the deferred maintenance on track for all Class I railroads (1974 dollars) amounted to about \$5.6 billion, \$6.1 billion, and \$6.5 billion at yearends, 1972, 1973, and 1974, respectively.

The table on the next page summarizes the actual and projected estimates.

The study provides only gross estimates as to deferred maintenance on ties and rails. There are no distinctions between mainline, branch, or yard track, and there are no indications of the number of miles of deteriorated track, where this deterioration exists, or to what degree.

Comments on the study

We discussed the results and methodology used in the study with responsible officials in the Government and in the railroad industry. Reactions were mixed as to the reliability and usefulness of the study.

Those in the railroad industry generally feel that there are simply too many variables that affect tie and rail life to allow an average life to be estimated and to be used for determining the extent to which deferred maintenance exists. Furthermore, they generally feel that

BEST DOCUMENT AVAILABLE

Estimates of Deferred Maintenance

	<u>Cross ties</u>		<u>Rails (note a)</u>		<u>Total</u>		<u>1974¹ estimate</u>
	<u>1972</u>	<u>1973</u>	<u>1972</u>	<u>1973</u>	<u>1972</u>	<u>1973</u>	
Average system life of material installed (years)	33.4	33.2	54.2	53.4	\$ -	\$ -	\$ -
Required to achieve a normalized condition:							
--25 railroad study:							
Cross ties	78 million	84 million			-	-	-
Rails			3.4 million ton	3.8 million ton	-	-	-
--Projected (all Class I railroads):							
Cross ties	110 million	116 million			-	-	-
Rails			4.8 million ton	5.3 million ton	-	-	-
Estimated deferred maintenance (material/installation):							
--25 railroad study:							
Cross ties (note b)	2 billion	2.1 billion					
Rails (note c)			2 billion	2.3 billion			
Total					4	4.4	4.7
--Projected (all Class I railroads):							
Cross ties (note b)	2.8 billion	2.9 billion					
Rail (note c)			2.8 billion	3.2 billion			
Total					<u>\$5.6</u>	<u>\$6.1</u>	<u>\$6.5</u>

a/Two-position life rail (worn main line rail is often removed and reinstalled on slower speed and lighter tonnage branch lines or yard track for the remainder of its life).

b/Includes a factor for switch and bridge ties.

c/Includes track fastenings.

Notes: The contractor also developed for the Association of American Railroads (AAR) an estimate of the 25 railroads' deferred maintenance on other fixed facilities (buildings, structures, signals, etc.). According to FRA, such deferred maintenance, projected for all Class I railroads, was estimated to total approximately \$1.8 billion and \$2.5 billion at the respective yearends 1972 and 1974.

the methodology used in the study will result in inflated deferred maintenance costs, inasmuch as a study of this type gives too little weight to lightly used branch lines where, from an economic justification standpoint, conditions have consciously been allowed to deteriorate below normal maintenance standards. They also point out that some of the track included in the study will be track likely to be abandoned when the current need to maintain this track beyond certain minimum standards simply does not exist.

In defense of the study, it should be pointed out that although everyone recognized that many variables affect tie and rail lives--from climatic conditions to the maintenance policies of the individual railroads--the life formulas that were used in the study were developed on the basis of extensive observations, research, and responsible estimates developed over considerable periods of time by the contractor and the railroad industry. As such, they were averages--no more, no less--which, while not applicable to every tie and rail in every railroad system, appeared to have reasonably valid nationwide applications.

Discussions with FRA officials and with the contractor indicated that the study can be considered reasonably valid only on a total, average basis. Although the large number of variables which could not be quantified for inclusion in the study might cause serious deviations in deferred maintenance estimates on an individual railroad basis, their effect can be averaged out over the total system with much reduced and less serious effect.

FRA officials also agreed the study failed to take into consideration conscious management decisions to allow lightly used lines, or those subject to abandonment, to deteriorate below normal maintenance standards and estimates of deferred maintenance--at least from the railroads' economic justification standpoint--might therefore be somewhat inflated. They pointed out, however, that the estimates are probably reasonable since the study does not take into consideration the upgrading of track required because of the increasingly heavier and more track-demanding loads being handled on the Nation's railroad system. As one FRA official pointed out to us, expending the amounts computed in the study as deferred maintenance would provide the Nation with a good condition 1940 railroad system, not one capable of effectively and efficiently handling the demands being made on today's system.

GAO observations

Our analysis of the study would indicate that as an objective and reasonably valid estimate of the total deferred maintenance on the Nation's railroad system, it is probably as reliable as any estimate in an area lacking reliable quantitative data.

Beyond this estimate, however, serious questions exist as to the usefulness of the study. It is for example, not capable of answering, with any degree of confidence, where deferred maintenance exists; to what degree; on what systems; whether it is on mainline, branch, or yard track; where some degree of deterioration might be economically justified; or where not only rehabilitation but actual upgrading may be necessary. Until such questions are answered, it is not possible to develop a viable rehabilitation assistance program. The study is, therefore, only a starting point from which reasonable legislation can be proposed.

ICC DATA ON DEFERRED MAINTENANCE AND DELAYED CAPITAL IMPROVEMENTS

In June 1974 ICC approved a 10-percent freight rate increase for most of the Nation's Class I railroads. The order accompanying the rate increase 1/ stipulated that the revenues generated by the increase--with the exception of exclusions for resulting increased income taxes and up to 3 percent of the 10 percent for increased material and supply costs other than fuel--be used exclusively for reducing deferred maintenance and delayed capital improvements.

ICC defined deferred maintenance as:

"* * *the accrued deterioration or deficiency in the physical operating condition of railroad track structures, cars and locomotives, and other property used in the provision of transportation service resulting from the failure and/or inability to properly maintain plant and equipment, which produces an adverse effect on railroad operations to an extent that services to shippers have been rendered partially or wholly inadequate and/or has resulted in diminishing the railroads' competitive ability;* * *" (Underscoring supplied)

ICC defined delayed capital improvements as:

1/"Ex Parte No. 305, Nationwide Increase of Ten Percent in Freight Rates and Charges, 1974."

"* * *actually planned, specifically identified capital improvements necessary for the provision of adequate or improved transportation service to shippers and which had not been undertaken, scheduled, or otherwise committed because funding or financing was not, or projected to be, available through June 30, 1975. * * *These capital improvements are further identified as delayed expenditures which would (1) add to or improve the carriers' plant and/or equipment so as to increase its usefulness, capacity, durability and efficiency, and (2) which are capitalizable in the property accounts in accordance with the Commission's accounting regulations; * * *"
 (Underscoring supplied)

Under the ICC order, the railroads are required to file quarterly reports with ICC listing the amounts of their deferred maintenance and delayed capital improvements, as well as certain related information. These amounts have come to be one of the most quoted estimates of the funding required to rehabilitate and upgrade the Nation's railroad system.

Summary of data filed

The results of the railroads' June 30, 1974, and the March 31, 1975, quarterly reports are summarized in the following table.

Summary of Deferred Maintenance and Delayed Capital Improvements Reported Under Ex Parte No. 305

	<u>6/30/74</u>	<u>3/31/75</u>
	(000 omitted)	
Deferred maintenance:		
Roadway	\$2,554,629	\$2,503,096
Equipment	<u>345,582</u>	<u>325,459</u>
Total	2,900,211	2,828,555
Delayed capital improvements:		
Roadway	2,169,919	2,139,424
Equipment	<u>2,111,414</u>	<u>2,140,980</u>
Total	4,281,333	4,280,404
Total roadway	4,724,548	4,642,520
Total equipment	<u>2,456,996</u>	<u>2,466,439</u>
Total	<u>\$7,181,544</u>	<u>\$7,108,959</u>

The data shows the railroads reporting a total of about \$7 billion for both deferred maintenance and delayed capital improvements with about two-thirds of the total being ascribed to roadway accounts according to ICC's Uniform System of Accounts and the remainder to equipment.

Of the approximately \$4.7 billion in reported deferred maintenance and delayed capital improvements in roadway accounts, about \$3.1 billion can be attributed directly to track. The balance is for such nontrack items as buildings, shops, and signal equipment.

Evaluation of reported data

Although the reported amounts are being used--if for no other reason than because of the lack of other data--both in and out of Government as an estimate of the amount of funding required to rehabilitate and upgrade the Nation's railroad system, there are so many inconsistencies in the data reported that its use for these purposes may be grossly misleading.

The major problems with the reported data appear to be the result of ICC's definitions and the railroads' individual interpretations of the terms "deferred maintenance" and "delayed capital improvements," as well as the varying methods used by railroads in calculating the amounts they report. Without any definite standards to guide them, the railroads have been essentially on their own as to what they report.

Interpretation

Under ICC's definition of deferred maintenance--accrued deterioration which results in inadequate services to shippers and/or results in diminished competitive ability--and delayed capital improvements--improvements necessary for the provision of adequate or improved services but which had not been undertaken because funds were not available--it seems clear that value judgements as to the adequacy of service play a major role in determining what the railroads report. This was confirmed through our discussions with ICC officials and with officials of the railroads we visited.

The result has been that some railroads with deteriorated physical plant have reported no deferred maintenance or delayed capital improvements--at least within ICC's definitions of the terms--because, in their opinion, their maintenance and capital expenditures have been at levels consistent with the volume of their traffic and the service requirements of this traffic.

In some cases railroads have reported no deferred maintenance or delayed capital improvements as such but have reported what they consider to be desired maintenance and capital improvement programs. According to the railroads, these programs, if carried out, would improve service to their customers but, if not carried out, would not create the situations spelled out in ICC's definitions of deferred maintenance and delayed capital improvements--specifically, inadequate service or reduced competitive ability. When these amounts have been reported, ICC has included them in their statistical summaries as deferred maintenance and delayed capital improvements. In other cases, however, when railroads have reported both types of figures, ICC has included only those specifically reported as deferred maintenance or delayed capital improvements.

Additionally, we noted that in some cases railroads reported amounts based on the needs of traffic currently being handled, although other amounts were based on expected future traffic or a combination of both current and expected traffic.

Calculations

Although only a few railroads had indicated the basis for their calculations, ICC audits of the reported data and our own discussions with railroad officials have shown that there also exists a variety of methods for calculating deferred maintenance and delayed capital improvements.

Some railroads have developed their estimates of deferred maintenance in a manner similar to the approach used in the FRA study (see p. 5), that is, by using estimated service lives for ties and rails. In these cases estimates were calculated on the basis of what track materials should have been replaced according to average tie and rail life but were not.

One railroad official told us that although his company basically followed this approach for reporting under Ex Parte No. 305, they used 1973 as the base year and calculated their deferred maintenance from that point forward. The official admitted the system had been in a deteriorating state since 1960, but said he was satisfied that merely reporting what it would take to maintain the railroad at the level which existed in 1973 was responsive to the requirements of Ex Parte No. 305.

Officials of another railroad we visited told us that they arbitrarily went back 10 years in calculating deferred maintenance even though maintenance deferrals had begun closer to 20 years before.

Another method used by the railroads was to base the calculations on what would be required to reach an ideal condition. In the case of two of the railroads we visited, the ideal would permit operation of trains at predetermined speeds (e.g., 60 miles per hour for signal mainline, 49 miles per hour for nonsignal mainline, and 30 miles per hour for branch lines). This method resulted in large amounts being reported by these railroads. According to ICC officials, however, these amounts were probably closer to reality than those reported by many other railroads.

Discussions with ICC and railroad officials indicate that the method apparently most used by the railroads and probably the most responsive to the ICC criteria was based on what expenditures railroad operating departments estimated were economically justified to adequately service current or projected traffic and/or to remain competitive. The problem with this method, however, was that there is simply no firm reporting standard. Economic justification is a relative concept--relative to the needs of the shippers in the particular service areas, to the carriers' own financial and physical capabilities, and to the amount and strength of the competition in the carriers' service areas. What one railroad considers a justifiable expenditure in their own particular circumstance, another may not.

We also noted a variety of other inconsistencies in reporting by the railroads--one railroad reporting only major items deferred (since these alone exceeded expected Ex Parte No. 305 revenues), another reporting an arbitrary 50 percent of estimated needs, and another reporting currently budgeted expenditures. Some railroad officials also told us that all of their quarterly submissions were based on original June 1974 estimates--neither updated for inflation, nor for increased deferrals.

Consequently, it appears that what was or was not being reported by the railroads--and estimates varied greatly--was the result of essentially subjective management decisions further restrained by the economic realities faced by the railroads. Estimates based on such decisions may not give a clear indication of the actual physical condition or needs of the Nation's railroad system.

ICC's analysis of reported data

ICC's Bureau of Accounts has analyzed the data filed under Ex Parte No. 305. Although finding that overall compliance with accounting and reporting requirements has generally been good, the Bureau is aware of the need to establish more precise guidelines for defining deferred maintenance and delayed capital improvements. According to a Bureau official, attempts to clarify the terms are currently underway.

On the basis of some very rough calculations, as well as through comparisons with what the Association of American Railroads (AAR) indicates the railroads should be doing, the Burdau believes that the amounts reported for deferred maintenance and delayed capital improvements are greatly understated. As to how much, they have been able to do little more than guess since there is so little alternative information available that would allow them to make a reliable estimate.

Deferred maintenance

Using primarily historical tie and rail replacement data, the Bureau, for its own internal purposes, did some very rough spot analyses of selected railroads to gauge the relative reasonableness of the deferred maintenance amounts reported. These analyses showed that strictly on the basis of historical replacement data, the railroads were generally understating their deferred maintenance, perhaps by as much as \$1 billion or more on track alone. ICC officials emphasized, however, that this amount was an internal estimate and could not be supported.

Delayed capital improvements

The Bureau also attempted to determine the reasonableness of the amounts being reported as delayed capital improvements. Lacking anything better, it compared the actual capital expenditures of the railroads over the 5-year period 1970 through 1974 with what AAR claimed the industry should have been spending during those years--some \$3 billion to \$4 billion annually.

The cumulative 5-year amount for actual capital expenditures totaled about \$6.7 billion. Compared with AAR's claimed minimum capital needs of \$15 billion for the period, the Bureau estimated a minimum deficiency of over \$8 billion just in the past 5 years--double the amount claimed as delayed capital improvements by the railroads.

The practical value of these comparisons is highly questionable. They do, however, point out the information void currently faced by policy makers.

GAO observations

There appears to be so many inconsistencies in the amounts being reported as deferred maintenance and delayed capital improvements under Ex Parte No. 305 that to use these amounts as funding estimates to rehabilitate or upgrade the Nation's railroad system could be grossly misleading. Even

railroad officials said in most cases amounts reported under the highly subjective definitions for deferred maintenance and delayed capital improvements understated actual needs. Yet, either because of misunderstanding or lack of better data, or both, the amounts continue to be used both in and out of Government as representative of estimated rehabilitation and modernization costs.

In defense of the railroads, it should be emphasized that they have not been given, to date, objective definitions or standards for reporting under Ex Parte No. 305. Until they are--and ICC is currently attempting to do so--estimates provided by the railroads can be of little value in determining funding requirements of the Nation's railroad system.

AAR'S STUDY OF THE AMERICAN RAILROAD INDUSTRY

In 1970 a committee of AAR prepared a report entitled "The American Railroad Industry: A Prospectus." The report was the industry's own analysis of the importance of a strong and efficient railroad system, the decline of the industry, and the corrective measures considered necessary to restore the industry to a viable and efficient position. It depicted the railroad industry as a chronically sick industry, suffering from many years of repressive national policies which have so weakened it that only a complete re-orientation of these policies, coupled with a massive investment program, would enable the industry to recover.

The investment program recommended for the 1970s was one that the committee estimated was necessary to both catch up for subnormal past expenditures as well as to meet future service needs. It was recognized that such a program would be highly dependent on both direct Federal assistance and major changes in Government policies toward the industry.

AAR, as part of its efforts in support of the railroads' request to ICC for a freight rate increase in 1974, updated the original estimates of investment needs for the 10-year period 1974 to 1983.

Study results

To catch up with past underinvestment and to adequately meet future service needs, AAR proposed the following investment program.

Railroad Industry
10-Year Capital Needs

	<u>Original study</u> (1971 to 1980)	<u>Update study</u> (1974 to 1983)
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(millions)

Equipment:

Freight cars	\$16,947	\$19,238
Locomotives	<u>5,427</u>	<u>5,099</u>
Total	22,374	24,337

Fixed plant:

Track	5,285	9,000
Other road and structures (note a)	<u>5,550</u>	<u>4,750</u>
Total	<u>10,835</u>	<u>13,750</u>

TOTAL	<u><u>33,209</u></u>	<u><u>38,087</u></u>
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a/Includes some track-related improvements

Although the largest capital needs in absolute dollar terms are shown to be in the equipment area, AAR pointed out that the most serious underinvestment had been in the area of basic roadway and structures. Because such expenditures lacked the immediate and visible effects on increased revenues that generally accompanied equipment purchases and because such improvements generally required internal financing, AAR noted that this area has fared poorly in competing for limited railroad capital. This underinvestment, coupled with the greater stress being placed on the track because of the increasingly heavier loads, has resulted in a deteriorated system becoming more and more incapable of adequately meeting the Nation's transportation needs.

GAO observations

The primary matter that must be kept in mind in analyzing the AAR studies is that the data presented represents the railroad industry's own assessment of their problems and the corrective actions considered necessary to alleviate these problems.

With the underlying theme being that the railroad industry has for many years been the victim of unfair and repressive national treatment which has weakened it to its present state, the studies develop a proposed investment program on the basis of a variety of estimates, assumptions, and projections as to what the industry feels it will take to rehabilitate the Nation's railroad system in the face of these past inequities. The studies point out that due to the magnitude of the problem and since it was to a great extent Federal repression and indifference which caused the industry's decline, it is not only necessary but indeed appropriate that the Federal Government now come to the aid of the industry.

The AAR studies have accumulated a great deal of useful statistics and information on what the industry perceives its major problems to be and what it feels is necessary to solve these problems. The studies also provide additional insight into the magnitude of the problems the industry faces.

Since the statistics emanate from the industry itself, however, and are essentially pleas for Federal assistance in massive amounts, there appears to be room for speculation as to their complete objectivity in describing the industry's problems and needs.

U.S. RAILWAY ASSOCIATION'S STUDY OF
TRACK CONDITIONS IN THE NORTHEAST AND MIDWEST

Under the Regional Rail Reorganization Act of 1973 (Public Law 93-236), the U.S. Railway Association (USRA) is responsible for formulating plans to rehabilitate, modernize, and maintain the properties of the bankrupt railroads in the Northeast and Midwest region of the country. Lacking complete data on the conditions of the facilities for its planning decisions, USRA had an inventory and assessment study made of the railroads' fixed properties. ^{1/} The results of the study served as a basis for some of the recommendations contained in USRA's Final System Plan submitted to the Congress on July 26, 1975.

^{1/} "Inventory and Assessment Project For Rail Service in Midwest and Northeast Region," February 1975. The study included the Penn Central, Reading, Central of New Jersey, Lehigh Valley, Lehigh and Hudson River, Ann Arbor, and Pennsylvania-Reading Seashore Lines. The Erie Lackawanna was subsequently added to the reorganization planning process and is the subject of a separate study.

The general scope of the study was to inventory the facilities, to determine the general physical condition of these facilities and the required rehabilitation work, and to estimate the rehabilitation costs necessary to eliminate deferred maintenance. Conditions of the facilities studied were determined by physical inspections using sampling techniques. For example, a section of running track was inspected every two miles--a 2.6 percent sample--and 10 percent of all bridges were inspected. These inspections were supplemented by interviews with railroad personnel and by reviews of railroad records. Cost estimates for the required work were then developed using 3d quarter 1974 prices.

The study shows the estimated costs for restoring the existing railroad facilities to a formerly achieved level of service, not to a level beyond the basic design capabilities of the facilities. Upgrading of facilities, although sometimes necessary or more economical than rehabilitation of existing facilities, was not considered in the calculations.

A major and complex undertaking, the study involved six engineering firms with a peak project work force of over 400 personnel. The systems studied contained more than 35,000 miles of running track, approximately 14,000 bridges, and more than 500 yards. The study costs, although not yet final, totaled about \$7.2 million.

Study results

The table on the next page summarizes the estimated rehabilitation costs for the systems studied.

The cost estimate developed for elimination of deferred maintenance on the facilities studied--\$3.8 billion--is an instantaneous cost in 1974 dollars, that is, what it would have cost to rehabilitate the railroads' existing facilities if the work could have been done in August 1974. The estimate does not consider inflation or the many possible work constraints, such as labor or material shortages, and refers only to accumulated deferred maintenance, making no provision for normal, routine maintenance. Furthermore, as previously mentioned, the amounts are only the estimated costs to restore the facilities to their previous best level of service with no capital upgrading.

GAO observations

The inventory and assessment study, carried out under USRA auspices, although subject to a number of basic

Summary of Estimated Rehabilitation Costs

	<u>Total cost</u>
Facility:	(millions)
Trackwork	
Running	\$1,917
Yards	354
Other	17
Total	<u>2,288</u>
Yards	6
Signals	55
Bridges	592
Tunnels	56
Servicing facilities	1
Shops	5
Buildings	79
Freight terminals	(a/)
Marine terminals	9
Electric traction	18
Other electrical	7
Communications	45
Total	<u>3,161</u>
Contingency	<u>612</u>
TOTAL	<u><u>\$3,774</u></u>

a/Less than \$500,000.

assumptions and qualifications, is probably the most comprehensive and objective assessment publicly available on the conditions and requirements of existing railroad fixed plant. It points out both the magnitude of past maintenance inadequacies and the difficulty in assessing these inadequacies. It is, however, an assessment of a very small part of the Nation's railroad system--for 7 railroads comprising less than 15 percent of the system's total trackage.

Furthermore, because conditions vary so greatly from railroad to railroad and from region to region, there appears to be no valid way to use the results of the USRA study for projecting nationwide conditions or requirements.

CONCLUSIONS

Faced with a record of low earnings, many of the Nation's railroads have found it necessary to postpone

maintenance and improvement expenditures. Continued over a long period of time, the practice has resulted in a seriously deteriorated railroad system increasingly unable to adequately meet the vital transportation needs of the Nation.

The recent railroad bankruptcies in the Northeast and Midwest, and the danger of their spreading to other railroads and other areas of the Nation, have considerably increased public interest and concern over the condition of the total railroad system. With a general acceptance of the fact that much of the Nation's railroad system is in a seriously deteriorated state and that the railroads by themselves are not capable of breaking the deterioration cycle, a number of bills have been introduced in the Congress to provide financial assistance to the railroads.

There exists, however, no data which objectively and quantitatively describes the conditions which exist on the Nation's railroad system or provides a complete and reliable estimate of the long-term financial resources that may be required to rehabilitate the system.

In the absence of such data, there appears to be little assurance that the financial assistance that may be provided will be spent where needed, when needed, or in the amounts needed.

CHAPTER 3

FEDERAL ASSISTANCE TO THE RAILROAD INDUSTRY SINCE 1970

Modern-day Federal assistance to the railroad industry has lagged far behind that provided the other transportation modes, but since about 1970 this assistance has been increasing. The collapse of the Penn Central that year caused the the Congress and the American public to take a closer look at the country's deteriorated railroad industry. Consistently low return on investment; declining revenues; poor service quality relative to competing modes; deteriorated track, roadbed, and rolling stock; natural disasters; and other factors resulted in a crippled industry in need of help.

Direct Federal financial assistance to the industry has been provided by the Emergency Rail Services Act of 1970 (84 Stat. 1975); the Rail Passenger Service Act of 1970 (84 Stat. 1327), as amended; the Emergency Rail Facilities Restoration Act (86 Stat. 1304); and the Regional Rail Reorganization Act of 1973 (87 Stat. 985), as amended. Between July 1, 1969 and June 30, 1975, approximately \$4 billion in direct Federal assistance to railroads had been authorized primarily in the form of grants, loans, and loan guaranties. About \$1.5 billion had been obligated as of this date. For the most part, this financial assistance has been in response to specific crisis situations of the bankrupt railroads in the Midwest and Northeast region of the country. Relatively little assistance has been provided to the remainder of the Nation's railroad system.

The industry has also received indirect financial benefit through the Urban Mass Transportation Act of 1964 (78 Stat. 302), as amended. In addition, Federal funds have been used to repay defaulted loans guarantied prior to fiscal year 1970 by ICC under the Transportation Act of 1958 (72 Stat. 568).

The following tables summarize the Federal financial assistance provided to the railroad industry since 1970 by source of funds, recipient railroads, and general categories of use.

Federal Financial Assistance to Railroads
by Act and Type of Assistance
Fiscal Years 1970 to 1975

Act	Loan guaranties		Loans		Grants and subsidies			Net payments on defaulted loan guaranties 1970 to 1975	Agreements (note a)	
	Author- ized	Guarantied	Author- ized	Obligated	Author- ized	Appro- priated	Obli- gated		Author- ized	Obli- gated
(millions)										
Emergency Rail Services Act of 1970	\$ 125	\$106	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Rail Passenger Service Act of 1970, as amended	900	377.6	-	-	637.3	635.6	635.6	-	-	-
Emergency Rail Facilities Restoration Act	-	-	48	27.4	-	-	-	-	-	-
Regional Rail Reorganization Act of 1973, as amended	-	-	1,500	19	462	210	191.6	-	300	172.8
Urban Mass Transportation Act of 1964, as amended (note b)	-	-	-	19.5	-	-	568.3	-	-	-
Transportation Act of 1958	-	-	-	-	-	-	-	85.3	-	-
Total	<u>\$1,025</u>	<u>\$483.6</u>	<u>\$1,548</u>	<u>\$65.9</u>	<u>\$1,099.3</u>	<u>\$845.6</u>	<u>\$1,395.5</u>	<u>\$85.3</u>	<u>\$300</u>	<u>\$172.8</u>

a/Assistance provided under section 215 of the Regional Rail Reorganization Act of 1973.

b/This act does not provide separate authorizations of funds specifically for commuter railroad facilities. However, the amounts shown are grants and loans to public transit systems for commuter railroad facilities.

Federal Financial Assistance
Obligations by Railroad and Type of Assistance
Fiscal Years 1970 to 1975

<u>Railroad</u>	<u>Loan guaranties</u>	<u>Direct loans</u>	<u>Grants or subsidies</u>	<u>Agreements (note a)</u>	<u>Payments on defaulted loans</u>	<u>Indirect assistance</u>		<u>Total FY 1970 to 1975</u>
						<u>Loans</u>	<u>UMTA Grants</u>	
(millions)								
Penn Central	\$100	\$17.7	\$158	\$152	\$b/30.7	\$19.5	\$125.2	\$ 603.1
Reading	-	1.6	-	-	29.3	-	2.9	33.8
Erie Lackawanna	-	3.6	10.3	12.4	12.3	-	84.2	122.8
Lehigh Valley	-	4.5	6.3	8.4	11.8	-	-	31.0
Central of New Jersey	6	-	14.3	-	-	-	3.8	24.1
Missouri-Kansas-Texas	-	19	-	-	-	-	-	19.0
Ann Arbor	-	-	2.3	-	-	-	-	2.3
Lehigh & Hudson River	-	-	.4	-	-	-	-	.4
Boston & Maine	-	-	-	-	1.2	-	10.9	12.1
Amtrak	377.6	-	635.6	-	-	-	-	1,013.2
Long Island	-	-	-	-	-	-	120.4	120.4
Illinois Central Gulf	-	-	-	-	-	-	10.1	10.1
Chicago, Milwaukee, St. Paul & Pacific	-	-	-	-	-	-	27.3	27.3
Burlington Northern	-	-	-	-	-	-	41.1	41.1
Chicago, Rock Island and Pacific; Illinois Central Gulf; Burlington Northern; Chicago and Northwestern; and Chicago, Milwaukee, St. Paul and Pacific	-	-	-	-	-	-	c/11.3	11.3
Penn-Reading Seashore Lines	-	-	-	-	-	-	.2	.2
Reading and Penn Central	-	-	-	-	-	-	c/122.1	122.1
Long Island, Penn Central, and Erie Lackawanna	-	-	-	-	-	-	c/8.8	8.8
Total	\$483.6	\$46.4	\$827.2	\$172.8	\$ 85.3	\$19.5	\$568.3	\$2,203.1

a/ Assistance provided under section 215 of the Regional Rail Reorganization Act of 1973.

b/ Includes a \$12.9 million payment on loan guaranties to the New Haven Railroad, now part of the Penn Central.

c/ The Urban Mass Transportation Administration (UMTA) grants affecting more than one railroad. Information on the allocation of grant funds to individual railroads was not available in UMTA's project files.

Federal Financial Assistance to Railroads
Obligations by Type of Assistance and Purpose
Fiscal Years 1970 to 1975

<u>Purpose assistance</u>	<u>Type of assistance</u>					<u>Total</u>
	<u>Direct loan</u>	<u>Loan guaranties</u>	<u>Grants</u>	<u>Agreements (note a)</u>	<u>Other</u>	
	(millions)					
Repair and rehabilitation	\$43.4	\$ -	\$ -	\$ 84.9	\$ -	\$ 128.3
Capital acquisition and improvement	-	377.6	-	87.9	-	465.5
Operating capital	3	106	827.2	-	-	936.2
Payments on defaulted loan guaranties	-	-	-	-	85.3	85.3
Other (note b)	<u>19.5</u>	<u>-</u>	<u>568.3</u>	<u>-</u>	<u>-</u>	<u>587.8</u>
Total	<u>\$65.9</u>	<u>\$483.6</u>	<u>\$1,395.5</u>	<u>\$172.8</u>	<u>\$85.3</u>	<u>\$2,203.1</u>

a/Assistance provided under section 215 of the Regional Rail Reorganization Act of 1973.

b/UMTA grants and loans. Amounts cannot readily be allocated by specific purpose.

EMERGENCY RAIL SERVICES ACT OF 1970

The Emergency Rail Services Act of 1970 (Public Law 91-663) was enacted on January 8, 1971, to prevent discontinuation of essential transportation services by railroads.

The act provided that railroads in reorganization under section 77 of the Bankruptcy Act, with approval of the reorganization court may apply to the Secretary of Transportation for loan guaranties. The loans to be guaranteed were to be evidenced by the purchase of certificates by private lending institutions. After consultation with ICC, the Secretary may authorize the loan guaranties provided certain qualifications are met.

Where guaranties have been made, the Secretary was required before approval of guaranties to determine that services were essential and discontinuation was imminent. Railroads receiving guaranties had to prove that there was no other practicable means of obtaining funds other than loans. In addition, the railroads had to submit statements from private lending institutions showing that certificates could not be sold without the guaranty of the Federal Government.

The total amount guaranteed at any one time for all certificates could not exceed \$125 million. The status of this program as of June 30, 1975, follows.

<u>Railroads</u>	<u>Amount of guaranty</u>	<u>Amount of guaranties exercised</u>	<u>Balance available</u>
Penn Central	\$100,000,000	\$100,000,000	\$ -
Central of New Jersey	<u>6,000,000</u>	<u>2,400,000</u>	<u>3,600,000</u>
Total	<u>\$106,000,000</u>	<u>\$102,400,000</u>	<u>\$3,600,000</u>

Loan funds were required to be used solely for meeting payroll and other expenses necessary to continue service. However, an FRA official told us that FRA did not insist that the railroads specify how the proceeds were used, nor did the railroads do so voluntarily.

RAIL PASSENGER SERVICE ACT OF 1970

On October 30, 1970, the Rail Passenger Service Act of 1970 (Public Law 91-518) was enacted to preserve and promote intercity railroad passenger service. The act established the National Railroad Passenger Corporation (Amtrak) to fully develop the potential of modern railroad service in meeting the Nation's intercity passenger transportation requirements.

Under section 601 of the act, the Congress appropriated to the Secretary of Transportation \$635.6 million through June 30, 1975, for grants to Amtrak to meet normal operating expenses. Of this amount, Amtrak had drawdown the entire amount as of June 30, 1975.

Under section 602 of the act, the Congress authorized the Secretary to issue loan guaranties for capital acquisitions and improvements by Amtrak, not to exceed an aggregate amount outstanding at any one time of \$900 million. As of June 30, 1975, Amtrak had exercised guaranties amounting to about \$378 million of which about \$373 million had been expended.

EMERGENCY RAIL FACILITIES RESTORATION ACT

In June 1972 widespread devastation occurred along the eastern seaboard from Hurricane Agnes and from resulting severe floods. Among the railroads badly damaged by this natural disaster were three major carriers in reorganization under the Bankruptcy Act--Penn Central, Reading, and Lehigh Valley--and one in the process of entering reorganization--Erie Lackawanna.

At that time these railroads did not qualify for relief under the existing Federal disaster relief programs, and they had limited resources to invest in rehabilitation of facilities damaged by the floods. In response to this need, the Congress enacted the Emergency Rail Facilities Restoration Act (Public Law 92-591) on October 27, 1972.

Section 3 of the act authorized the Secretary of Transportation to make loans to financially distressed railroads for restoring and replacing railroad facilities, equipment, and services which the Secretary determined to be essential to the public service and which were damaged by Hurricane Agnes. In December 1972 the Secretary delegated this authority to the Administrator, FRA.

The maximum amount of loans authorized under this act was \$48 million. A summary of the total principal amounts obligated and the drawdowns as of June 30, 1975, are as follows.

<u>Railroad</u>	<u>Amount of loan</u>	<u>Amount of drawdown</u>	<u>Balance available for drawdown</u>
Penn Central	\$17,645,542	\$16,446,253	\$1,199,289
Reading	1,577,735	1,363,538	214,197
Erie Lackawanna	3,626,490	3,576,490	50,000
Lehigh Valley	<u>4,532,835</u>	<u>4,532,835</u>	<u>-</u>
Total	<u>\$27,382,602</u>	<u>\$25,919,116</u>	<u>\$1,463,486</u>

The loan agreements required that each railroad receiving a loan submit a program for restoration or replacement of essential facilities and equipment to the Administrator within 15 days after execution of each agreement. The railroads also agreed to initiate and diligently pursue actions to complete the restoration programs they had submitted.

To obtain reimbursement for expenditures incurred before execution of the loan agreement, the railroads were required to submit verified statements of restoration work. Also, the loan agreements provided that railroads could obtain advanced funds equal to estimated expenditures to be incurred during a specified period on the basis of verified statements similar in form to those submitted to obtain reimbursements after cost is incurred.

Three railroads--Reading, Penn Central, and Lehigh Valley--were required to furnish the Administrator monthly reports within 40 days after the end of each month on the progress of the restoration program and the actual costs incurred during that month. The Erie Lackawanna was required to submit monthly reports on the progress of the restoration or replacement program through December 31, 1973, and thereafter only quarterly reports were required to be furnished no later than 45 days after the end of the period in question.

The Administrator had the authority to grant deferral of principal and interest payments, based on the railroads' ability to repay the loan and the railroads' request for such deferrals. Three of the railroads--Penn Central, Lehigh Valley, and Reading--were given deferrals of both principal and interest for 2 years. Erie Lackawanna requested only that principal payments be deferred and this was given

for 2 years. After the 2-year period, the Administrator can grant further deferrals if he feels they are warranted, but the deferral period can not exceed 10 years.

The major types of essential facilities approved for restoration work under this legislation for each railroad were:

Penn Central

- Over 1,400 diesel and electric locomotives.
- About 2,150 freight cars and 14 cabooses.
- Machinery and work equipment.
- Sections of right-of-way, including roadbeds, track, culverts, bridges, signals and related facilities.

Erie Lackawanna

- Nine locomotives.
- 765 freight cars (of which 229 were later found to be damaged beyond repair and eliminated from the loan program).
- Maintenance shop facilities at two locations.
- Sections of right-of-way, including roadbeds, track, etc.

Lehigh Valley

- Five locomotives.
- About 770 freight cars.
- 11 pieces of machinery.
- Sections of right-of-way, including roadbeds, track, etc.

Reading

- Three locomotives and two multiunit cars.
- Eight trailers.
- Four cranes.
- 446 freight cars.
- Sections of right-of-way, including roadbeds, track, etc.

REGIONAL RAIL REORGANIZATION ACT OF 1973

In June 1970 Penn Central, the largest passenger and freight carrier in the country, filed a petition for reorganization under section 77 of the Bankruptcy Act. Seven additional railroads in the Midwest and Northeast region were either in reorganization or would subsequently declare

bankruptcy. The service of the bankrupt railroads could not be terminated because of its importance to the regional and national economies.

Early in 1973 Penn Central trustees reported to their reorganization court that between \$600 million and \$800 million would be needed to upgrade plant and equipment necessary for successful reorganization. In March 1973 the reorganization court ordered Penn Central trustees to file either a plan of reorganization or a proposal for liquidating the railroad. Faced with the possibility of discontinuation of essential services by the bankrupts in the region, the Congress passed the Regional Rail Reorganization Act of 1973 (Public Law 93-236) providing an innovative approach to reorganizing the bankrupt railroads. The act created USRA to develop plans for a railroad system adequate to meet the service requirements of the region. The act also authorized the creation of the Consolidated Rail Corporation (ConRail) to operate the restructured system.

The act established several individual financial assistance programs to assist (1) the railroads in reorganization, (2) Amtrak, ConRail, and solvent railroads connecting with a railroad in reorganization, and (3) State, local or regional transportation authorities. As of June 30, 1975, these programs were authorized to provide both permanent and interim financing up to a total of \$2.262 billion.

The several types of assistance under this legislation are described below.

General implementation funds

Section 211 of the act authorizes USRA to make loans to

--ConRail, Amtrak, and other railroads for purposes of carrying out the final system plan;

--State, local or regional authorities to assist in acquiring or modernizing railroad lines not in the final system plan but which the States elect to operate; and

--railroads whose lines connect with railroads in reorganization and are in need of financial assistance to prevent possible insolvency.

The act authorizes USRA to incur obligations of up to \$1.5 billion to finance section 211. No more than \$1 billion of the \$1.5 billion may be loaned to ConRail. At least half of this \$1 billion must be spent on rehabilitation and modernization of properties designated to be part of ConRail.

As of June 30, 1975, USRA had made only one loan under this authority--to the Missouri-Kansas-Texas Railroad Company in March 1975--for \$19 million. The first disbursement on this loan was made for \$8.9 million on June 27, 1975. The funds are to be used as follows.

- \$4.2 million for major rehabilitation of 110 miles of main line,
- \$3 million for working capital, and
- \$1.7 million for rehabilitation of 345 rolling stock units and 17 locomotives.

The undisbursed balance of \$10.1 million is available until March 1977 and is to be used to complete rehabilitation of the 110 miles of main line.

Emergency assistance funds

Section 213 of the act authorizes the Secretary of Transportation, pending implementation of the final system plan, to provide \$282 million in emergency assistance grants to the trustees of railroads in reorganization to insure continuation of essential transportation services. The Secretary delegated this authority to the Administrator, FRA. As of June 30, 1975, \$210 million had been appropriated for this purpose.

A summary of obligations and disbursements as of June 30, 1975, follows.

	<u>Grants made</u>	<u>Disbursements</u>	<u>Balance available under existing grants</u>
Penn Central	\$158,018,003	\$158,018,003	\$ -
Central of New Jersey	14,345,000	14,345,000	-
Lehigh Valley	6,250,000	6,250,000	-
Erie Lackawanna	10,296,956	10,296,956	-
Ann Arbor	2,250,000	2,250,000	-
Lehigh & Hudson River	<u>482,300</u>	<u>361,690</u>	<u>120,610</u>
Total	<u>\$191,642,259</u>	<u>\$191,521,649</u>	<u>\$120,610</u>

Generally, the grant agreements and amendments under this section, specified that the funds provided were to be used to meet operating expenses including utility costs, fuel costs, current interline accounts, and wages and salaries. In four cases, involving three railroads--Central of New Jersey, Erie Lackawanna, and Penn Central--the grant agreements specified that funds be earmarked for specific purposes, such as meeting installment payments for equipment or doing needed maintenance.

An FRA official told us that FRA did not require the railroads to specifically detail what the funds were actually used for. It was sufficient for the railroads to certify that the funds would be used to cover operating expenses necessary for the continuation of essential railroad services.

Maintenance and improvement funds

Section 215 of the act, as amended, authorizes the Secretary, with the approval of USRA, to enter into agreements with the bankrupt railroads in the region to assist in acquiring, maintaining, or improving facilities and equipment of those railroads. The Secretary, by delegation of authority dated November 29, 1974, delegated his authority to the Administrator, FRA, to carry out the provisions of this section.

USRA is responsible for financing section 215 agreements and is authorized, under section 215, to incur obligations up to \$300 million for this purpose.

In a June 1975 memorandum of understanding, the Administrator and USRA agreed to the designation of a program manager who would represent both agencies in the day to day administration of the section 215 program approved by both agencies. A USRA employee has been designated program manager.

Because deteriorated track is one of the most important problems of the bankrupt carriers, USRA and FRA set a high priority on improving or maintaining track conditions with 215 funds. Use of these funds will include the purchase of materials and equipment for track upgrading and repair, as well as the labor cost of the work.

Since the railroads receiving section 215 assistance are in reorganization, the reorganization courts oversee all activities of the railroads. The courts must approve all section 215 agreements before funds may be dispersed.

A summary of activity under section 215, as of June 30, 1975, follows.

<u>Executed by USRA, FRA and the railroad and approved by the reorganization courts</u>	<u>Amount of agreement</u>	<u>Amount expended as of 6/30/75</u>
Lehigh Valley--locomotive acquisition	\$ 3,400,000	\$ 3,435,096
Penn Central--maintenance equipment	16,000,000	963,753
Penn Central--material acquisition	75,000,000	9,700,000
Penn Central--track maintenance agreement	61,000,000	10,600,000
Lehigh Valley--material acquisition	<u>1,800,000</u>	<u>-</u>
Total	\$157,200,000	\$24,698,849
<u>Executed by USRA, FRA, and the railroad and awaiting approval by the reorganiza- tion courts</u>		
Erie Lackawanna--material acquisition	\$ 6,790,000	\$ -
Erie Lackawanna--track maintenance agreement	5,210,000	-
Lehigh Valley--track maintenance agreement	2,700,000	-
Erie Lackawanna--equipment acquisition	350,000	-
Lehigh Valley--equipment acquisition	<u>500,000</u>	<u>-</u>
Total	\$ 15,550,000	\$ -
Total executed	<u>\$172,750,000</u>	<u>\$24,698,849</u>
<u>Agreements being negotiated by USRA as of June 30, 1975</u>		
Central of New Jersey--material acquisition	\$ 2,400,000	\$ -
Central of New Jersey--track maintenance agreement	1,500,000	-
Reading--material acquisition	50,000	-
Reading--track maintenance agreement	3,650,000	-
Penn Central--equipment repair	57,000,000	-
Erie Lackawanna--equipment obligation	7,800,000	-
Central of New Jersey--equipment obligation	464,000	-
Erie Lackawanna--repair and rebuilding equipment	<u>2,400,000</u>	<u>-</u>
Total being negotiated	<u>\$ 75,264,000</u>	<u>\$ -</u>

Service continuation subsidies

Section 402 of the act authorizes subsidies to assist States in the Midwest and Northeast region for continuing services over railroad segments which are not included in the final system plan but which the States consider necessary. These subsidies are to cover costs of operating adequate and efficient railroad services, including improvement and maintenance of track and facilities. The Federal share of a railroad service continuation subsidy is limited to 70 percent with the State share being at least 30 percent. The act authorizes up to \$90 million for each of 2 fiscal years, including and following the effective date of the final system plan. As of June 30, 1975, no funds had been appropriated for section 402 subsidies.

Fifty percent of the total authorization for each year is designated as basic entitlement funds and the remaining 50 percent as discretionary funds. Each State in the region is allocated a percentage of the basic entitlement based on the ratio of the total trackage in the State, excluding yards and sidings, to the total trackage in the region. In no case will a State be allocated less than 3 percent or more than 10 percent of the basic entitlement funds. Any basic entitlement funds not allocated to the States automatically become discretionary funds. In the event basic entitlement funds are insufficient to cover the allocations, discretionary funds may be used to meet the deficiency.

URBAN MASS TRANSPORTATION ACT OF 1964

The Urban Mass Transportation Act of 1964, as amended, authorizes Federal financial assistance for the development of comprehensive and coordinated mass transportation systems in metropolitan and other urban areas. The assistance activities, authorized by the act, aim to:

- assist in the development of improved mass transportation facilities, equipment, techniques, and methods;
- encourage the planning and establishment of area-wide urban mass transportation systems; and
- provide assistance to State and local governments and their instrumentalities in financing such systems to be operated by public or private mass transit companies.

The following programs may assist railroads that provide commuter railroad services.

Capital facilities grants and loans

Section 3 of the act authorizes a program of grants and loans to assist public agencies in providing capital facilities and equipment for mass transportation service in urban areas. Although only public agencies are eligible as applicants for grants or loans, private transportation companies, such as railroads, may participate in and benefit from assistance projects through contractual arrangements with a public agency. For example, a grant to the Chicago South Suburban Mass Transit District provided funds to partially finance the purchase of equipment and the construction of tracks, which were to become an integral part of the Illinois Central Gulf railroad's commuter system.

Loans

UMTA is authorized to make loans to finance the acquisition of real property for use as rights-of-way, station sites, and related purposes on urban mass transportation systems.

In a case where a capital loan for the acquisition of real property has been made, and a grant is later awarded for construction of facilities under section 3, the grant agreement may provide for forgiveness of the repayment of the principal and accrued interest of the loan then outstanding in lieu of cash grant. Such amounts shall be considered as part of the grant. One such capital loan involving a commuter railroad has been made since fiscal year 1970.

The Massachusetts Bay Transportation Authority received \$19.5 million for the purchase of 145 miles of Penn Central right-of-way which will later become part of a capital grant project.

Grants

Capital grants may be made in an amount equal to 80 percent of the net project cost--that part of the cost of a project which UMTA determines cannot reasonably be financed from revenues. The remainder of the net project cost must be provided in cash, from sources other than Federal funds.

Since fiscal year 1970 UMTA has obligated approximately \$3.7 billion for capital grant projects of which about \$568 million was for commuter railroad service projects.

A summary of commuter railroad service capital grant activity from July 1, 1969, through June 30, 1975, is contained in appendix I.

Operating and capital assistance grants

In November 1974 the Urban Mass Transportation Act was amended to provide a formula for apportioning \$3.975 billion to urbanized areas over a 6-year period for use as either mass transportation capital grants or operating assistance grants.

The amendment provides for UMTA participation in up to 80 percent of the cost of capital assistance projects and up to 50 percent of the cost of operating assistance projects. Federal funds awarded for operating assistance may be used to cover direct labor, material, and overhead expenses as well as expenses for contractual services directly related to the management and operation of the transit system. A railroad operating commuter rail services, under contract with the public body could receive indirect financial benefits through such operating assistance projects.

As of June 30, 1975, UMTA had awarded 114 grants under this program totaling \$162.8 million. A listing of the grants affecting commuter railroads amounting to \$23.4 million, follows on the next page.

TRANSPORTATION ACT OF 1958

The Transportation Act of 1958, which added part V to the Interstate Commerce Act, as amended, provided for assistance to railroads in the form of loan guaranties. The purpose was to aid the railroads in acquiring, constructing, or maintaining facilities and equipment, to stimulate employment and to preserve and develop an adequate national transportation system.

The act authorized ICC to guaranty any public or private financing or refinancing obtained by the railroads for

--additions and betterments or other capital expenditures, made after January 1, 1957,

--reimbursement of the railroad's treasury for capital expenditures made out of its own funds, or

--expenditures for property maintenance.

Operating and Capital Assistance Grants
Affecting Commuter Railroads

<u>Applicant</u>	<u>Urbanized area</u>	<u>Railroad</u>	<u>Amount of grant</u>
Connecticut Department of Transportation	Statewide project	Penn Central	\$ 745,800
New Jersey Department of Transportation	New York	Penn Central	2,379,681
		Central of New Jersey	3,841,638
		Erie Lackawanna	4,449,898
New Jersey Department of Transportation	Trenton	Penn Central	368,517
New Jersey Department of Transportation	Philadelphia	Penn-Reading Seashore Lines	246,697
Metropolitan Transit Authority	New York	Long Island Railroad	<u>a/8,822,800</u>
		Penn Central	
		Erie Lackawanna	
Southeastern Pennsylvania Transportation Authority	Philadelphia	Penn Central	1,314,994
		Reading	1,176,994
Rhode Island Department of Transportation	Providence	Penn Central	<u>30,000</u>
Total			<u>\$23,377,019</u>

a/Breakdown among railroad companies involved was not included in the project files.

The act stipulated that ICC could guaranty loans only if (1) the railroad would be unable to obtain necessary funds on reasonable terms without the guaranty, (2) the interest rate was reasonable, (3) the terms of the loan required full repayment within 25 years, and (4) the prospective earning power of the railroad together with the value of any security pledged provided reasonable assurance of the railroad's ability to repay the loan within the time frame and reasonable protection to the United States.

ICC loan guaranty authority was limited by the act to \$500 million and expired June 30, 1963. At that time, 39 guaranties had been made for approximately \$244 million in loans. Fourteen railroads received loan guaranties including the now bankrupt Boston & Maine, Central of New Jersey, Erie Lackawanna, Lehigh Valley, Penn Central, and Reading. As of June 30, 1975, the railroads had defaulted on 20 of the 39 loans. As of June 30, 1975, these defaults cost the Federal Government about \$113 million of which approximately \$85 million was incurred since July 1, 1969. These costs were the total Federal payments for defaulted principal and interest, less recoveries from the railroads involved. Also, as of June 30, 1975, 11 loans had been repaid in full.

Of the eight loans still outstanding four are due in 1976, one in 1977, and three in 1978. The eight outstanding loans were to solvent railroads--Chicago & Eastern Illinois, Missouri-Kansas-Texas, Monon (Louisville & Nashville), Norfolk Southern, and Pittsburgh & West Virginia.

A listing of the loan guaranties made under part V of the Interstate Commerce Act, as amended, is contained in appendix II.

CONCLUSION

The \$4 billion in direct financial assistance authorized for the Nation's railroads since fiscal year 1970 has been provided primarily in response to crisis situations--to prevent the cessation of essential transportation services by the railroads--with virtually all of the money earmarked for bankrupt or near bankrupt railroads and Amtrak. Despite the weakness of the industry as a whole, very little assistance has been provided to help the Nation's solvent railroads to improve or to at least maintain their present conditions

CHAPTER 4

FEDERAL RAILROAD ADMINISTRATION
RESEARCH AND DEVELOPMENT ACTIVITIES

With the establishment of the Department of Transportation in 1966, FRA was created as an operating administration within the Department and charged with assuring that the Nation is provided with a safe, efficient, and progressive railroad system.

Beginning with the transfer of authority from the Department of Commerce for the High Speed Ground Transportation Act of 1965 (Public Law 89-220), FRA, among its other responsibilities, has been given overall responsibility to plan, conduct, promote, and coordinate research and development (R&D) in all aspects of intercity ground transportation and railroad safety.

Since 1970 a total of about \$209 million has been appropriated for FRA's R&D activities as shown in the following table.

Research, Development, and Demonstration Appropriations

<u>Fiscal year</u>	<u>Railroad research and development</u>	<u>High-speed ground transportation research and development</u> (millions)	<u>Total</u>
1970	\$ 0.30	\$ 11.00	\$ 11.30
1971	3.45	18.00	21.45
1972	10.35	25.00	35.35
1973	10.35	52.50	62.85
1974	10.35	20.00	30.35
1975	<u>a/47.55</u>	<u>(a)</u>	<u>47.55</u>
Total	<u>\$82.35</u>	<u>\$126.50</u>	<u>\$208.85</u>
1976 (pro- posed)	<u>a/66.55</u>	(a)	66.55

a/Starting with fiscal year 1975, these two separate appropriations were combined.

FRA's R&D efforts that have made important gains in recent years in terms of funds obligated are: (1) research to solve some of the financial, customer service, and labor utilization problems of industry which increased from \$649

thousand in 1973 to \$3 million in 1975 and (2) research to improve the quality of railroad track which increased from \$2.8 million in 1973 to \$10.7 million in 1975. Obligations for safety research declined from \$5.4 million in 1973 to \$3.6 million in 1974 but increased to \$5.3 million in 1975.

Because of changed priorities, obligations for the development of advanced high-speed rail vehicles have steadily declined from \$10.8 million in 1973 to \$3.1 million in 1975. Research on such vehicles will be virtually discontinued in 1976 with a planned budget of only \$100,000.

FRA's research programs are administered by two organizational units--the Office of Research and Development which is primarily responsible for engineering and technological R&D and the Office of Policy and Program Development which is concerned with research into the economic and management aspects of railroad transportation. Efforts of the latter include studies of manpower utilization in various railroad operations, analyses of the factors that contribute to railroad bankruptcy, development of a computer model of the U.S. railroad network, development of freight car management systems, studies of railroad passenger demand and costs, and identification of human factors affecting the safety of railroad operations.

SELECTION OF RESEARCH PROJECTS

At the present time, FRA does not have established guidelines for selecting R&D projects that it will fund. The Associate Administrator of the Office of Research and Development told us that a research policy statement is currently under development and will include criteria for selecting projects.

Officials in both FRA research units told us that in the absence of specific criteria, R&D projects are selected on the basis of those railroad problems that are most urgently in need of resolution. Priorities are established using internal task force planning sessions and by eliciting ideas from the industry--individual railroads, AAR, manufacturers of railroad equipment, and railroad unions.

In addition, other FRA program offices are consulted in the project selection process. For example, FRA's Office of Safety, one of the channels to the railroads for research findings related to track inspection, train control devices, crash worthiness of railroad cars, railroad equipment performance, and similar technology, is often consulted for projects. Also, FRA's Northeast Corridor Development

Office, established as a result of the Regional Rail Reorganization Act of 1973, has stimulated continued research and development of Metroliner trains for improved passenger service. Amtrak has been the major beneficiary of this research. Projects to improve the Metroliner accounted for \$1.1 million in fiscal year 1974.

FRA officials said that because of the many pressing problems in the railroad industry, long range programs involving high-speed transportation technology have been de-emphasized in favor of R&D with near-term payoff. For example, FRA emphasis on improved railroad freight service was begun in 1973 when the Task Force on Railroad Productivity, consisting of leading Government, academic, and industry experts, analyzed the ailing railroad industry and suggested that R&D should be directed to innovations that could help the railroads adapt to the evolving freight market and changing customer needs. ^{1/} Some of the resulting projects were oriented toward hardware and others toward research in economics and railroad operations.

In June 1975 the FRA Administrator, in his remarks at the railroad research study meeting at Woods Hole, Massachusetts, pointed out that 82 percent of FRA's proposed research spending in fiscal year 1976 would be directed toward projects resulting in useful output within 5 years, 14 percent toward projects with payoffs within 5 to 10 years, and only about 4 percent toward projects with useful output beyond 10 years.

FRA officials also told us that the FRA R&D programs were also planned with national problems, such as energy conservation, air pollution, and noise pollution, in mind. For example, UMTA has a research project underway involving development of an energy storage capability for rapid transit coaches. FRA saw an opportunity to convert this technology to yard locomotives, which also waste much energy because of frequent starts and stops. The energy used in braking would be stored in a flywheel which would reduce the energy needed to restart, thus conserving fuel, reducing air pollution, and abating noise.

FRA continually seeks opportunities for joint research with the railroad industry. According to FRA, this cooperation is urgently needed to develop what it calls a National Railroad Systems Research Program. The program aims to build a

^{1/}"Improving Railroad Productivity, Final Report of the Task Force on Railroad Productivity, 1973".

computer-based national railroad network model containing all of the data necessary for Government and industry to use in planning future consolidation, restructuring, and rehabilitation of the Nation's railroad network. At present the big problem is that many railroads are reluctant to release the proprietary information needed for the system.

R&D PROGRAMS IN PROGRESS

FRA's R&D efforts can be divided into five program areas:

- Improved rail freight service.
- Improved passenger service.
- Safety research.
- Improved track and track inspection.
- Supporting technology and facilities.

Improved rail freight service

Ways to improve freight service are being sought through (1) analyzing the problems that are generally responsible for low railroad productivity, (2) finding solutions to the delays that trains are subject to in train yards, (3) increasing the reliability of railroad car mechanical components such as brakes, wheels, and couplers, and (4) developing ways that freight services may be facilitated through intermodal cooperation between railroads and trucks. An example of a project to improve freight service is the Kansas City Southern Railway Company and FRA joint project to demonstrate a system of computerized management and control of freight cars in yards. This project, the Rail Terminal Management System, is being conducted at the Kansas City Southern's Deramus Yard in Shreveport, Louisiana. FRA plans to disseminate data to the industry on the performance and problems of the system.

FRA is also planning further studies and demonstrations in intermodal freight network management to evaluate better rail and truck coordination. The information generated by these studies will be used by FRA's Office of Freight Systems as it develops and demonstrates new freight car and freight terminal technology.

An FRA official told us that the intermodal Freight Systems Technology Program could require about \$85 million over the next 5 to 7 years if tentative plans to build 25 modified design freight cars and 2 intermodal freight terminals for demonstrations are approved. The railroad industry is expected to share 50 percent of the costs. One of the goals of the program is to allow for the elimination

of unprofitable light density railroad branch lines by developing the technology to facilitate the transfer of containerized shipments by truck between remote locations and specially designed rail terminals.

FRA attempts to stimulate the railroad industry to use its own funds for research in freight service improvement. FRA officials told us that since most railroad companies did not have the facilities for researching on their own, they were being encouraged to share costs with FRA.

Fiscal year 1975 obligations for improved freight service R&D amounted to about \$6.1 million.

Improved passenger service

According to officials in FRA's Office of Passenger Systems, because of congressional suggestions and the urgency of need for immediate improvement of railroad passenger service, FRA's emphasis in passenger systems R&D has changed so that the major goal is to help Amtrak and the few other passenger railroads in the Nation do a better job. Research efforts are being directed away from advanced systems, such as the Tracked Levitated Research Vehicle and the Linear Induction Motor Research Vehicle, the use of which are still many years away, in favor of projects which will make moderate improvement on existing conventional technology within the near future so that Amtrak and the other rail passenger lines will have the best possible system at the lowest cost.

Specific emphasis in this program area is being directed to better ride quality through studying train and rail interaction; improved suspension, braking, and propulsion; and establishment of ride quality criteria, so that equipment will be designed to give the most comfortable ride compatible with safety and efficiency of operation.

FRA-sponsored demonstrations in Northeast Corridor passenger service started in April 1969 with gas turbine-powered Turbo trains between Boston and New York City. In October 1970 demonstrations began with the new Metroliner trains on the Washington to New York route. The demonstrations were conducted under the requirement of the High Speed Ground Transportation Act of 1965 to measure and evaluate public response to new equipment, higher speeds, fare variations, improved comfort and convenience, and more frequent service.

Both demonstrations were completed in 1973. FRA concluded that the Metroliners and Turbo trains have demonstrated

that there was a continuing market for railroad passenger service and that service improvements and/or price incentives would induce increased ridership on intercity railroad trains in the existing competitive market. Officials told us FRA passenger train research personnel are considering advancement of electricity as a power source for trains to conserve energy and control pollution.

In fiscal year 1975 FRA obligated \$591,000 for research in this area.

Safety research

The FRA safety research program is aimed at making improvements in

- transportation of hazardous materials in tank cars,
- crash worthiness of rail vehicles,
- grade-crossing safety,
- human factors as causes of rail accidents, and
- specialized equipment for railroad safety.

Projects in this program accounted for approximately \$5.3 million in FY 1975.

In addition to the R&D projects specifically aimed at the above five areas, improvement in railroad safety also results from R&D in other programs. Research programs underway to reduce failures of brakes, wheels, axles, and other components; to improve track; and to develop automated track inspection techniques should all make important contributions toward improving the safety of railroad operations.

As an example of a project underway in safety research, the Railway Progress Institute 1/ and AAR are cooperating with FRA in searching for ways to prevent the catastrophic consequences of accidents involving tank cars carrying hazardous materials. In cooperation with FRA, the two groups have provided test facilities, test specimens, and consultations for this project, parts of which are being conducted at Edwards Air Force Base in California; Louisiana Technical University; the National Bureau of Standards; and FRA's Transportation Test Center near Pueblo, Colorado. According to FRA, the success of the program could do much to prevent the catastrophic consequences of tank cars fires, explosions, and

1/An association of railroad equipment suppliers.

leakage of toxic materials resulting from derailments and collisions.

Improved track and track inspection

FRA's goals in this area are to increase the efficiency and economy of track performance and to improve railroad safety. Research efforts into track improvement are geared toward reducing defects such as broken rails, rough track, cracked joints, and buckled track. Some of the projects over the past 2 years include studies and tests in the use of concrete ties, development of automated rail flaw detection vehicles, and development of techniques and a facility for studying the interaction of train wheels with the track under various conditions. In fiscal year 1975 FRA obligated \$10.7 million to R&D for track improvement.

Much of the work in track improvement and inspection is done for FRA at the Transportation Systems Center (TSC) at Cambridge, Massachusetts. TSC is a unit of the Department of Transportation set up to do research under contract for the Department. Organizationally, TSC is a part of the Office of the Secretary of Transportation and in 1974 handled more than \$500,000 in FRA track improvement and inspection R&D contracts. Other work in track improvement will be done at the Rail Dynamics Laboratory which is a part of the Transportation Test Center near Pueblo.

Supporting technology and facilities

To evaluate the concepts developed through R&D activities, FRA manages and supports the Transportation Test Center (TTC), a 52.6-square mile facility located near Pueblo, Colorado. TTC serves as an intermodal center for conducting comprehensive tests, evaluations, and associated development of ground transportation systems and their components and is available to Department of Transportation organizations, other Government agencies, and private industry. With its various test-track complexes, guideways, laboratories, and other facilities, TTC is capable of carrying out tests and evaluations to determine feasibility, operational cost, environmental impact, and safety of systems or components under study.

According to the Director, TTC, until about 2 years ago the activities carried out at TTC were mainly futuristic, involving such advanced systems as tracked, levitated, suspended, and tube vehicles. Since that time, however, increased emphasis has been placed on improving existing technology and developing new systems more appropriate to the market requirements for freight and passenger services.

Besides the test track guideways and related facilities available for carrying out the various tests on conventional, advanced, and rapid railroad vehicle systems and their components, FRA has under construction a Rail Dynamics Laboratory at TTC. Jointly sponsored by FRA and UMTA, this facility, expected to cost approximately \$32 million by the time it becomes fully operational in late 1976, will provide the capability for subjecting railroad and transit vehicles to controlled conditions that are representative of their track-related in-service environment. The capability will permit analytical and experimental studies of vehicles, subsystems, and components in a controlled and scientific manner to isolate causes of and determine the solutions to various dynamic operating problems encountered in the railroad industry. Besides the expected reduction in the number of dynamic-related accidents and derailments and their costs, it is anticipated that the studies to be conducted at the facility will lead to new means for reducing lading damage and improving passenger ride quality.

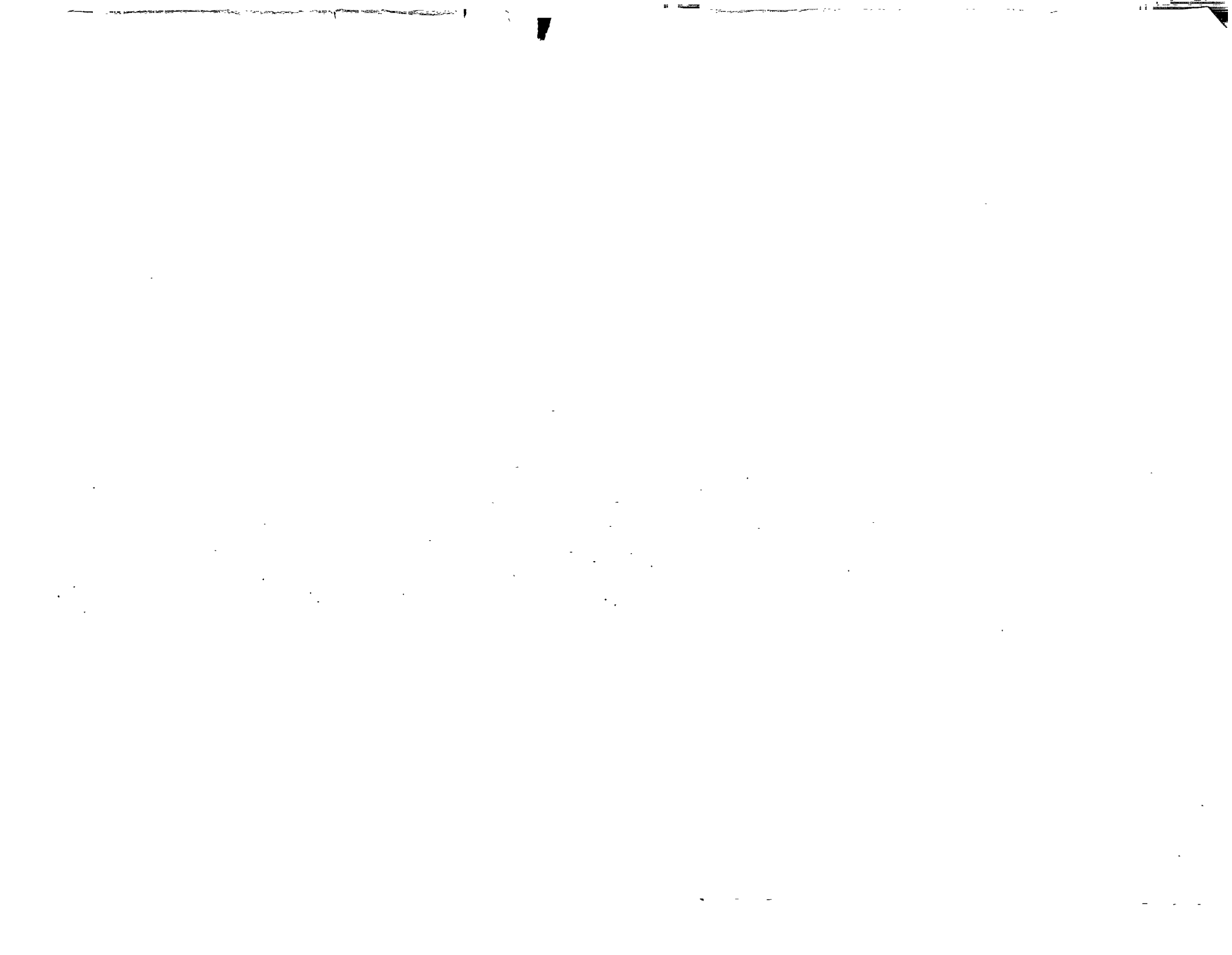
Another important activity being planned for TTC is a track loop and support facilities--Facility for Accelerated Service Testing--for the accelerated testing of track and roadbed components.

According to FRA officials, two of the problems in railroad research are the lack of controlled environments in which tests can be conducted and the length of time it takes to acquire important test data. They pointed out that with the totally dedicated facility being planned, more accurate test results on track and roadbed components will be available in less time than is currently possible.

During fiscal year 1975 FRA obligated about \$14 million, including \$3 million for advanced technology, for facilities and projects at TTC.

CONCLUSION

FRA's selection of R&D projects is moving toward addressing the technological, economic, and management problems of the Nation's railroads.



CHAPTER 5

SCOPE OF REVIEW

Our review was conducted at the Washington, D.C., headquarters of the Department of Transportation, the U.S. Railway Association, Amtrak, and the Interstate Commerce Commission. We examined pertinent records, documents, and reports regarding Federal assistance provided to the railroads and Federal railroad research being conducted and reviewed available data on the physical conditions and estimated rehabilitation costs of the Nation's railroad plant. Discussions on these and related matters were held with responsible agency officials.

We also visited the corporate offices of 14 selected railroads to discuss with responsible officials railroad plant conditions and needs. We met with others--including engineering consultants and the Association of American Railroads--familiar with information available on the overall physical conditions and requirements of the Nation's railroad system.

<u>UMTA Commuter Railroad Service Capital Grants</u>				
<u>July 1, 1969 to June 30, 1975</u>				
<u>Grants</u>	<u>Grantee</u>	<u>Railroad providing service affected by grant</u>	<u>Amount of grant</u>	<u>Purpose of grant</u>
	Connecticut Transportation Authority	Penn Central	\$ <u>a</u> /5,837,603	Purchase 72 multiple-unit commuter railcars
	Connecticut State Department of Transportation	do.	76,080,000	Modernization of New Haven line within the State of Connecticut and purchase of 100 electric multiple-unit commuter railcars
	City of Bridgeport, Connecticut	do.	2,040,000	Construction of a new railroad station and acquisition of land for commuter parking area
47	New Jersey State Department of Transportation	do.	18,733,333	Purchase 70 commuter railcars to be operated by Penn Central; retrofit 34 cars with couplers
	State of New Jersey and Borough of Metuchen	do.	1,014,106	Rebuild and relocate a suburban commuter railroad station and its approaches
	Metropolitan Transportation Authority, New York	do.	<u>b</u> /16,637,603	Purchase 72 multiple-unit commuter railcars, modernization of New Haven line in New York State; improve communication system, purchase and install centralized traffic control system
			<u>120,342,645</u>	

<u>Grantee</u>	<u>Railroad providing service affected by grant</u>	<u>Amount of grant</u>	<u>Purpose of grant</u>
Metropolitan Transportation Authority, New York	Long Island Railroad	\$ 7,709,887	Track improvement project for 50 track miles of the Long Island Railroad involving 3 sections of road totaling 30 route miles
Metropolitan Transportation Authority, New York	do.	46,477,468	Construction of two segments of the Long Island Railroad
Metropolitan Transportation Authority, New York	do.	55,708,333	Purchase 389 high-performance self-propelled, electrically powered, multiple-unit pas- senger cars
Metropolitan Transportation Authority, New York	do.	<u>c/10,500,000</u>	Extention of electrification on the Long Island Railroad and rehabilitation and supplementa- tion of existing electrification along 104 route miles
		<u>120,395,688</u>	
New Jersey Department of Transportation	Erie Lackawanna	<u>79,767,500</u>	Design and engineering of over- all Erie Lackawanna improvement program and purchase of 160 new electric multiple-unit com- muter railcars
Chicago South Suburban Mass Transit District	Illinois Cen- tral Gulf	<u>d/1,737,965</u>	Purchase of 130 new air- conditioned, self-propelled elec- tric cars for use in commuter service

<u>Grantee</u>	<u>Railroad providing service affected by grant</u>	<u>Amount of grant</u>	<u>Purpose of grant</u>
Chicago South Suburban Mass Transit District	Illinois Cen- tral Gulf	\$ 7,660,160	Purchase of 15 new bilevel elec- tric commuter railcars, purchase and install reverse signalling system and construction of a 2.14 mile-single track rail exten- sion all of which will become an integral part of the commuter system
Chicago South Suburban Mass Transit District	do.	<u>697,856</u>	Purchase of land for and construc- tion of commuter parking facility
		<u>10,095,981</u>	
49 Northwest Suburban Mass Transit District	Chicago, Mil- waukee, St. Paul & Pacific (Milwaukee Road)	20,876,702	Purchase of 62 bilevel commuter cars from Milwaukee Road, 24 new bilevel trailer cars, 12 new bilevel cab control cars, and 13 diesel locomotives
North Suburban Mass Transit Dis- trict	Chicago, Mil- waukee, St. Paul & Pacific	<u>6,373,956</u>	Purchase of new commuter railcars and locomotives; construct 6 new stations; rehabilitate and renovate right-of-way; construct third track at Chicago Union Station; purchase and install centralized traffic control system
		<u>27,249,758</u>	

<u>Grantee</u>	<u>Railroad providing service affected by grant</u>	<u>Amount of grant</u>	<u>Purpose of grant</u>
Massachusetts Bay Transportation Authority	Boston & Maine	\$ <u>10,907,200</u>	Purchase and rehabilitation of 7 rail diesel cars, 5 locomotives, 20 coaches; upgrade track
West Suburban Mass Transit District	Burlington Northern	28,689,739	Purchase of 65 bilevel commuter cars and 21 locomotives owned by Burlington Northern and 25 new bilevel commuter cars; modernization of 94 existing bilevel commuter cars and 21 diesel electric locomotives
West Suburban Mass Transit District	do.	12,431,040	Purchase of 20 new rail commuter cars and 4 new diesel electric locomotives (or, purchase and rehabilitate 4 used diesel-electric locomotives)
		<u>41,120,779</u>	
Southeastern Pennsylvania Transportation Authority	Reading	<u>1,700,146</u>	Electrification of an existing Reading freight line to extend electrified commuter railroad service
Southeastern Pennsylvania Transportation Authority	Penn Central and Reading	39,311,282	Purchase of 48 single and 96 double high-performance electric cars and installation of automatic couplers; assist in purchasing additional automatic couplers to retrofit 78 silverliners operated by the Authority

<u>Grantee</u>	<u>Railroad providing service affected by grant</u>	<u>Amount of grant</u>	<u>Purpose of grant</u>
City of Philadelphia	Penn Central and Reading	\$ 55,040,000	Construction of a 9.4-mile-high-speed rail link between downtown and the airport
Southeastern Pennsylvania Transportation Authority	do.	2,688,000	Construction and improvement of transit stations and commuter parking facilities
City of Philadelphia	do.	25,000,000	Construction of a 1.8-mile 4-track commuter rail tunnel
		<u>122,039,282</u>	
51 Illinois Department of Transportation	Chicago, Rock Island and Pacific; Illinois Central Gulf; Burlington Northern; Chicago, Milwaukee, St. Paul and Pacific; Chicago and Northwestern	<u>11,258,132</u>	Construction and equipment of commuter rail passenger parking lots
Total FY 1970 to 1975		<u>\$544,877,111</u>	

- a/\$15,974,500 of a total grant of \$21,812,103 was obligated before fiscal year 1970.
- b/\$18,263,703 of a total grant of \$29,063,103 was obligated before fiscal year 1970.
- c/\$30,292,866 of a total grant of \$40,792,866 was obligated before fiscal year 1970.
- d/\$25,219,366 of a total grant of \$26,957,331 was obligated before fiscal year 1970.

APPENDIX II

APPENDIX II

Summary of Loan Guaranties Under the
Transportation Act of 1958

<u>hailroac</u>	<u>Amount of guaranty</u>	<u>Maturity date</u>	<u>Unpaid balance as of 6/30/75</u>	<u>Cost to Government for default</u>	<u>Purpose of loan</u>
Boston & Maine	\$ 3,000,000	12/ 1/74	a/900,000		b/Reimbursement of treasury
do.	3,000,000	7/ 1/75	a/1,800,000		do.
do.	1,000,000	7/ 1/65			do.
do.	1,000,000	10/15/77	a/516,667		do.
do.	1,000,000	7/ 1/66	-	\$ 1,177,539	do.
Central of New Jersey	15,000,000	7/ 1/76	a/12,375,000		Financing acquisition of not less than 634 hopper cars and 725 box cars at a cost in excess of \$5 million and b/reimbursement of treasury \$10 million.
do.	5,000,000	12/ 1/78	a/4,620,000	c/14,173,729	b/Reimbursement of treasury
Chicago & Eastern Illinois	3,000,000	7/31/75	-		do.
do.	11,800,000	12/31/77	2,413,996	-	Refinancing certain equipment obligations incurred after 1/1/57
Erie Lackawanna	15,000,000	6/ 1/76	a/12,000,000	12,323,000	b/Reimbursement of treasury
Georgia & Florida	934,960	12/31/70	-		Acquisition of 100 new freight cars
do.	1,000,000	12/23/70	-	-	Maintenance and rehabilitation of roadway.
Lehigh Valley	5,923,000	8/ 1/74	a/2,794,343		Refinance equipment obligations \$1,167,127; finance planned capital expenditures \$1,574,609; reimburse treasury \$3,181,264
do.	5,000,000	6/15/75	a/2,664,000		b/Reimbursement of treasury
do.	2,500,000	5/17/70	a/1,125,000		do.
do.	5,000,000	11/ 1/76	a/2,531,000		do.
do.	3,400,000	5/ 1/77	a/2,165,000	11,744,639	do.
Missouri-Kansas-Texas	16,000,000	5/ 1/76	12,800,000		b/Reimbursement of treasury
do.	6,000,000	6/ 1/76	960,000		do.
do.	12,000,000	12/ 1/87	12,000,000	-	do.
Monon (Louisville & Nashville)	5,000,000	7/ 1/76	1,400,000		b/Reimbursement of treasury \$2,268,359; acquisition of 4 diesel locomotives and 116 freight cars with a total cost of \$2,731,641
oo.	5,500,000	10/ 1/78	2,000,000	-	Finance acquisition of 9 new locomotives \$2.4 million and 74 freight cars \$1.1 million; b/reimburse treasury \$2 million

<u>Railroad</u>	<u>Amount of guaranty</u>	<u>Maturity date</u>	<u>Unpaid balance as of 6/30/75</u>	<u>Cost to Government for defaults</u>	<u>Purpose of loan</u>
New Haven	\$ 8,159,400	6/ 1/75	\$ -		Acquisition of 30 new diesel electric locomotives
do.	500,000	1/ 1/65	-		Acquisition of maintenance of way equipment and machinery
do.	1,500,000	1/ 1/74	<u>a/1,375,000</u>		Construction of certain shop facilities
do.	4,500,000	11/ 3/61	<u>a/4,500,000</u>		<u>b/</u> Reimbursement of treasury
do.	3,500,000	11/ 3/61	<u>a/3,500,000</u>		do.
do.	3,500,000	11/ 3/61	<u>a/3,500,000</u>		do.
do.	1,500,000	11/ 3/61	<u>a/1,500,000</u>	<u>c/13,278,032</u>	do.
New Haven Trustees	5,000,000	8/ 4/71	<u>a/5,000,000</u>		do.
do.	7,500,000	12/31/71	<u>a/7,500,000</u>	12,922,188	do.
New York Central (Penn Central)	40,000,000	7/ 1/74	<u>a/16,900,000</u>	17,805,400	do.
New York, Susquehanna & Western	300,000	12/ 1/74	-		do.
do.	555,000	9/ 1/72	-	-	Financing acquisition of three locomotives
Norfolk Southern	2,000,000	7/ 1/74	-		<u>d/</u> Reimbursement of treasury
do.	5,400,000	5/ 1/78	3,300,000	-	Financing acquisition of 17 new locomotives \$2,975,000; <u>b/</u> reimbursement of treasury \$2,425,000
Pittsburgh & West Virginia	1,500,000	6/ 1/76	100,000		<u>b/</u> Reimbursement of treasury
do.	1,500,000	5/28/65	-	-	do.
Reading	<u>30,000,000</u>	7/ 1/78	<u>a/28,000,000</u>	29,329,611	Financing acquisition of 56 new locomotives \$11 million; and <u>d/</u> reimbursement of treasury \$ 19 million
Total	<u>\$243,972,360</u>			<u>\$112,754,138</u>	

a/Defaulted principal.

b/Reimbursement of the railroads' treasury for expenditures made from working capital for additions, betterments and other capital expenditures. Detail on what the expenditures were specifically for was not available in the project files.

c/Payments made before 1970.

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