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REPORT TO THE CONGRESS

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BY THE COMPTROLLER GENERAL OF THE UNITED STATES

Industry Capability To Produce Rail And Crossties For Nationwide Railroad Track Rehabilitation

This report discusses industry's capability to produce rail and crossties needed to rehabilitate all the Nation's railroad track over 10-, 15-, and 20-year periods. The computation of industry's capability considers its current output and plans for expansion of production.

Whether or not there will be enough rail and crossties depends upon how much substandard track actually is rehabilitated and the duration of the program.

GAO concluded if the rehabilitation time frame is short and the need for rails and crossties large enough, the Congress will have to encourage private industry to produce a greater volume of rail and crossties.

CED-76-150 ~~707520~~ SEPT. 23, 1976

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

B-164497(5)

To the President of the Senate and the
Speaker of the House of Representatives

This report discusses industry's capability to produce rail and crossties needed to rehabilitate the Nation's railroad track. This report was requested by 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, and is being sent to the Congress because of its interest in the rehabilitation of the Nation's rail lines. The Subcommittee asked us to address such issues as the industry's current output, plans for expansion or curtailment of production, and projected time frames that would be needed if a major effort was undertaken to rehabilitate all the Nation's tracks.

Our review was made pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

We are sending copies of this report to the Director, Office of Management and Budget; the Secretaries of Agriculture, Commerce, and Transportation; and the Chairman, Interstate Commerce Commission.

Comptroller General
of the United States

Contents

ABBREVIATIONS

Amtrak	National Railroad Passenger Corporation
ConRail	Consolidated Rail Corporation
FRA	Federal Railroad Administration
GAO	General Accounting Office
ICC	Interstate Commerce Commission
USRA	United States Railway Association

COMPTROLLER GENERAL'S
REPORT TO THE CONGRESS

INDUSTRY CAPABILITY TO PRODUCE RAIL AND CROSSTIES FOR NATIONWIDE RAILROAD TRACK REHABILITATION

D I G E S T

Although it is generally accepted that the Nation's railroad track is in need of rehabilitation, no complete or reliable studies exist providing estimates of the quantity of rail and crossties required to accomplish this.

If a nationwide rail rehabilitation program is undertaken, either by providing direct Federal financial assistance to the railroads or, as has been proposed, by the Government taking over control of the rail roadbed, it will be necessary to determine whether sufficient rails and crossties will be available.

Because reliable information is not at hand as to the extent of track deterioration and the amount of rehabilitation required, specific rail and tie needs will depend on how much track is rehabilitated and on the duration of the program.

If the rehabilitation time frame is short and the need for rails and crossties large, the Congress could encourage production by:

--Expressing its intent to rehabilitate a specific amount of track in a stated time.

--Making a commitment to rehabilitate the Nation's railroads by a certain date, thereby guaranteeing the purchase of minimum orders of rail and crossties. (See p. 30.)

In order to illustrate industry's capacity, GAO projected data from a Federal Railroad Administration study of 25 Class I railroads to estimate the amount of rail and crossties required to put the Nation's track in a secure condition over 10-, 15-, and 20-year periods.

AVAILABILITY OF RAIL

Under present industry conditions, unless only the most important lines of the rail system in the United States are rehabilitated on a priority basis, shortages in the supply of rail could occur. Because the present level of rail production (see p. 9) is not sufficient for normal maintenance, there could be a shortfall of about 6 million tons or over 26,000 miles of track at the end of 10, 15, and 20 years if a massive rehabilitation program was undertaken.

Assuming that steel rail producers could manufacture additional tonnage at peak capacity, shortages may still occur over 10- and 15-year periods. However, GAO estimates that over a 20-year period the railmaking capacity existing at March 1976 would be more than sufficient. (See p. 10.)

The U.S. steel industry must increase its overall capacity to produce raw steel to satisfy future projected demands for all steel products. However, doubts have been raised as to whether the industry can provide financing for expanding and modernizing facilities to increase capacity and also install required environmental control equipment.

If a Federal program was started today to rehabilitate all the Nation's railroad track it would be at least 10 years before the steel industry could provide the rails needed to complete the job even if additional capacity was provided by expanding and modernizing facilities. Two of the three companies that manufacture rail said they would need assurances of an increased rail purchasing pattern before they would expand because of the erratic procurement of rail in the past.

Officials of the three rail producing companies said that it would be unlikely that anybody else would start making rail.

While GAO has focused primarily on the domestic capability of the steel industry to

provide rails, imports could become a source to meet shortages during a rehabilitation program. However, steel rail imports have been insignificant in the past.

AVAILABILITY OF CROSSTIES

GAO's study has shown that the supply of hardwood timber used in the manufacture of crossties and both sawmill and woodtreating capacity will be adequate to meet the needs of the railroads; especially if there are firm commitments from the railroads and delivery dates are scheduled uniformly throughout the calendar year. At the same time, an increase in demand from industries which compete for the timber with crossties could result in higher prices. (See p. 19.)

PLANNED RAIL REHABILITATION STUDIES

The Railroad Revitalization and Regulatory Reform Act of 1976 requires the Secretary of Transportation to obtain information from all the Class I railroads on their deferred maintenance, delayed capital expenditures, and their projections through 1985 for maintenance to be performed and capital expenditures to be made.

It is anticipated that this data will be thoroughly analyzed by the Secretary and will serve as the basis for making recommendations to the Congress pursuant to the act on the amount of rehabilitation work needed and how it should be financed. Although this work was recently started, it should result in better measures of the quantities of rail and crossties needed across the country.

A number of other studies are also to be done by the Secretary of Transportation under the same 1976 law. The mandate for these studies reveals the deep concern of the Congress for restoring the Nation's railroads, possibly through a restructuring of the system.

The Secretary is to consider the economic and environmental costs involved in a restructured

rail system. In another study, he is to compare the methods and policies of providing past aid to the railroads with those of other modes of transportation.

GAO RECOMMENDATION

The Secretary also should study industry's capability to provide the materials needed for a nationwide track rehabilitation program.

AGENCY AND INDUSTRY COMMENTS

The Department of Transportation said GAO's findings, in general, are consistent with its understanding of the situation and that a great deal of economic analyses would be performed on this subject in the near future by the Federal Railroad Administration. A Department official said that the Department agrees with GAO's recommendation and will study the problem soon.

The United States Railway Association told GAO that it believes the steel and tie industries have the capacity to supply the Nation's rail and crosstie needs because some trackage will probably be retired over the next 10 years and some will probably be programed for a holding maintenance level. The Association believes, however, that metallurgical improvements to rail processing should be introduced at the mills because of increasing track loadings and in addition a stabilized level of purchasing should be obtained so that the industries involved could gear up for the long-term program requirements.

Bethlehem Steel Corporation commented that the demand forecast for rail was too high. It pointed out the possibility that the U.S. rail system will be consolidated in the future, thus decreasing the amount of rail required for normal annual maintenance.

While GAO agrees that its estimates do not allow for the possibility that quantities of branch lines will be abandoned, the estimates

also do not take into consideration any upgrading of track required because of the increasingly heavier and more track demanding loads being handled on the Nation's railroad system. GAO believes the estimates are useful only to illustrate the present rail and crossties industries' production capacity and implications for the future. Actual rail and tie needs will depend upon the nature of the track rehabilitation program and how long the rehabilitation program takes.

The Consolidated Rail Corporation informed GAO that it does not forsee a rail shortage because plant expansions and installations of some entirely new facilities will increase railmaking capacity, and because only a small percentage of total steel production is devoted to rail manufacture.

The United States Steel Corporation, questioned the railroad's ability to finance a total rehabilitation of the track within a 10-year period even with governmental assistance. The corporation concluded that with proper guidance and firm commitments from the railroads the corporation would take the steps to meet their demands.

GAO agrees that with expansion the domestic steel industry could produce more than enough rail to meet projected needs. As far as the railroads' financial ability to undertake a total rehabilitation program within a 10-year period, this report only addressed this issue in the context of estimating the cost of a massive rehabilitation program without regard to the railroad's ability or the extent of Government assistance.

Both the industry and agency comments are included in appendix I.

CHAPTER 1

INTRODUCTION

During the last 30 years the railroad industry in the United States has declined. Once the dominant form of intercity transportation, large parts of the railroad industry now face financial difficulties. The problems of the railroads were most severe in the Northeast and Midwest region of the country and on June 21, 1970, the Nation's largest transportation company, the Penn Central, filed for bankruptcy.

Seven additional railroads in the Midwest and Northeast region were either reorganizing or would subsequently delcare bankruptcy. Faced with a possible cessation of essential rail service, the Congress, on January 2, 1974, passed the Regional Rail Reorganization Act of 1973, 45 U.S.C. 701 (Supp. V, 1975). A basic goal of the act was to reorganize and consolidate the essential rail properties of the bankrupt railroads into a financially self-sustaining company. The United States Railway Association (USRA) was created to develop plans for a railroad system adequate to meet the service requirements of the region.

On February 5, 1976, the Railroad Revitalization and Regulatory Reform Act of 1976, Public Law 94-210, was enacted to implement USRA's final plan for restructuring the system in the Midwest and Northeast. A total of $6.4 billion of Federal funds were authorized for the Consolidated Rail Corporation (ConRail), National Railroad Passenger Corporation (AMTRAK) and other railroads for upgrading rail facilities including replacement of rail, ties and other track material needed to eliminate the slowdowns, derailments, and other problems caused by deteriorating track.

On April 1, 1976, assets of the bankrupt railroads were conveyed to the newly created ConRail.

The 1976 act also declared that part of its purpose was:

> "To provide the means to rehabilitate and maintain the physical facilities, improve the operations and structure, and restore the financial stability of the railway system of the United States, and to promote the revitalization of such railway system, so that this mode of transportation will remain viable in the private sector of the economy * * *."

To help accomplish this purpose various financing mechanisms were established. One was the establishment of a Railroad Rehabilitation and Improvement Fund to provide financial assistance to railroads throughout the Nation to help fix up their rail facilities. The Congress authorized $600 million to be spent before September 30, 1978; however, as of May 31, 1976, the funds had not been appropriated.

Because of these funds, the possibility that additional funds may be provided in the future, and the possibility that the Federal Government may take control of the existing track and roadbeds, the Chairman, Subcommittee on Federal Spending Practices, Efficiency, and Open Government, Senate Committee on Government Operations, asked us to study industry's capability to produce needed track and crossties, addressing such issues as the industry's current output, plans for expansion and the projected time frame needed to carry out various levels of rehabilitation.

Future funding for the railroads depends upon the results of a Capital Needs Study to be completed by the Secretary of Transportation in January 1977. Under the 1976 act, the Secretary is required to categorize main and branch lines of all Class I railroads (railroads having $5 million or more in operating revenues) based upon their level of use and economic viability. The Secretary is required to recommend to the Congress the amount and type of financing needed, based upon submissions from these railroads as to their total deferred maintenance and delayed capital expenditures as of December 31, 1975, and their projections through 1985 for maintenance and capital expenditures to be made. In addition, the Secretary is required to specifically consider and evaluate the public benefits and costs which would result from public ownership of the railroads' rights of way.

Depending on the outcome of the Secretary's studies and the deliberations of the Congress, it is quite possible that additional Federal funds will be provided to the railroads in the coming years to rehabilitate their facilities, especially track. This could be accomplished either through the Railroad Rehabilitation and Improvement Fund already established or by the Government taking control of the existing track and roadbed.

Regardless of the mechanism finally approved, the issue of industry's capability to provide the needed materials for track rehabilitation will be a factor in setting a time frame for completing the rehabilitation project.

CHAPTER 2

ESTIMATES OF TRACK REHABILITATION NEEDS

A number of studies have been prepared by various groups concerning the extent of rehabilitation needed on some of the Nation's railroad track. In our previous review of these studies, 1/ we concluded that none contained an accurate estimate of the quantity of rails and crossties needed to rehabilitate the Nation's railroad system.

One study, however, the Federal Railroad Administration's (FRA's) 1974 study entitled, "Estimate of Deferred Maintenance in Track Materials for Twenty-five Railroads", provided a basis for projecting a nationwide estimate of track needs, and our projections of the study data indicate that about 77,750 track miles 2/ of rail and about 402 million crossties will be needed to get the Nation's track in a normalized condition over the next 10 years.

This estimate includes rails and ties needed to carry on normal maintenance as well as those needed to rehabilitate track for which regular maintenance has been deferred, but does not include materials needed to upgrade track which must carry heavier weights and more demanding loads than in the past. The estimate also makes no distinction between main line and lightly used branch line track and does not allow for the possibility that appreciable quantities of track may be abandoned.

Therefore, the estimate is useful only as an illustrative measure and not as an actual target figure. Actual rail and tie needs will depend on the nature of the rail rehabilitation program, the form the rail system takes, and the time over which these events occur. To show how such variables affect rail and tie production requirements, we have projected needs over 10-, 15-, and 20-year periods.

1/GAO report RED-76-44, Nov. 21, 1975, entitled, "Information Available On Estimated Costs To Rehabilitate The Nation's Railroad Track And A Summary Of Federal Assistance To The Industry."

2/Track-mile refers to two parallel rails which extend the length of 1 mile.

On August 3, 1976, the Secretary of Transportation issued the first report of a series of studies mandated by the Railroad Revitalization and Regulatory Reform Act of 1976 entitled, "Preliminary Standards, Classification, and Designation of Lines of Class I Railroads in the United States." The report designates all rail lines of the Nation according to the degree to which they are considered essential to the rail transportation system and will be subjected to public review and comment prior to establishment of final categories and designations by January 30, 1977.

The report showed that one-third of the entire U.S. rail network carries only 1 percent of the total traffic and one-fifth of the same system carries nearly two-thirds of the traffic. Of the total 193,500 route miles 1/ of the Class I rail system, 17.1 percent was listed as Class A with another 11.6 percent potentially in that category. Class A mainline was so designated primarily if it handled 20 million ton-miles or more annually. Most of the remaining track was placed in a Class B mainline category or in two branchline categories depending on the volume of freight handled yearly.

Once completed, the categorization of rail lines should serve as a guideline for rehabilitating the Nation's railroad track.

FRA STUDY OF DEFERRED MAINTENANCE

In early 1974, the FRA contracted with a consulting engineering firm to develop an estimate of the amount of deferred maintenance on ties and rails as of December 31, 1972, for a selected sample of 25 geographically dispersed Class I railroads 2/. The firm updated the estimate through 1973 for the 25 railroads representing a total of 236,664 miles of track--72 percent of the total track mileage.

1/A route mile represents the aggregate length of roadway of all line haul railroads. It does not reflect the fact that a mile of railroad may include two or more parallel tracks.

2/Effective January 1, 1965, the Interstate Commerce Commission (ICC) classified any railroad having operating revenues of $5,000,000 or more as Class I. There were 74 Class I railroads in December 1975 which operated 96 percent of the rail mileage in the United States.

The study involved the use of a computer-based model developed by the contractor using data reported to the ICC by the railroads for the 40-year period 1934 through 1973. 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 existed when the replacement of new track materials was less than that considered necessary to achieve a normalized condition. The contractor defined normalized condition as one in which 50 percent of the usable life of the track materials remained.

Using the above methodology, the contractor estimated that, as of December 31, 1973, the 25 railroads required about 84 million new crossties and over 3.8 million tons of new rail for a normalized condition. The contractor also computed the annual new requirement for rail needed to maintain the system in a normalized condition, referred to as normalized maintenance. This computation showed that about 20 million new crossties and over 867,000 tons of new rail will be needed by these 25 railroads annually for normalized maintenance.

OUR ESTIMATES OF RAIL AND CROSSTIE NEEDS

Using the estimates of deferred maintenance for the 25 Class I railroads included in the FRA study as a basis, we projected the data to all 67 Class I railroads. Both the contractor and FRA officials believed that the results of the study could be used to reasonably project an estimated amount of deferred maintenance on all Class I track.

Our projection was based on the assumption that deferred maintenance existed on the lines of the 42 railroads not included in the contractor's study in the same proportion to that which existed for the 25 railroads which were analyzed. The results of our projections of deferred maintenance existing at December 31, 1973, for the Nation's Class I railroads are summarized below.

Total deferred maintenance as of December 31, 1973	Rail		Number of crossties
	Tons	Track-miles	
Contractor estimate of 25 Class I railroads	3,842,835	16,708	83,801,000
Our projection to include all Class I railroads	5,337,271	23,206	116,390,270

In addition to determining the track material requirement necessary to eliminate deferred maintenance which existed at December 31, 1973, we also projected the contractor's estimate of the annual new rail needed to maintain the system in a normalized condition to all track of Class I railroads.

Although no estimate of the annual normal crosstie requirement had been developed by the contractor, the contractor said that the data in the study provided a good basis for computing a reasonably valid estimate and for projecting it to include all Class I track.

The contractor's original estimates and the results of our projections of the annual normal new rail and crosstie requirement are summarized below.

Annual normalized maintenance	Rail		Number of crossties
	Tons	Track-miles	
Contractor estimate of 25 Class I railroads	867,528	3,772	20,045,154
Our projection to include all Class I railroads	1,204,900	5,239	27,840,491

Comparing the estimated annual normalized maintenance figures above to the number of new rail and wood crossties actually installed during 1974 (the latest information available as reported to ICC by the railroads) we computed the total deferred maintenance existing at December 31, 1974, as shown below.

	Rail		Number of crossties
	Tons	Track-miles	
Estimated annual normalized maintenance	1,204,900	5,239	27,840,491
Actual maintenance installed during 1974	708,518	3,081	20,838,401
Deferred maintenance at December 31, 1974	496,382	2,158	7,002,090
Deferred maintenance at December 31, 1973	5,337,271	23,206	116,390,270
Total deferred maintenance December 31, 1974	5,833,653	25,364	123,392,360

The tables below summarize the total replacement needs based on a 10-, 15-, and 20-year period.

Our projected estimates based on 10-year period	Rail		Number of crossties
	Tons	Track-miles	
Annual deferred maintenance	583,365	2,536	12,339,236
Annual normalized maintenance	1,204,900	5,239	27,840,491
Total annual	1,788,265	7,775	40,179,727
Total for 10-year period	17,882,650	77,750	401,797,270

Our projected estimates based on 15-year period	Rail		Number of crossties
	Tons	Track-miles	
Annual deferred maintenance	388,910	1,691	8,226,157
Annual normalized maintenance	1,204,900	5,239	27,840,491
Total annual	1,593,810	6,930	36,066,648
Total for 15-year period	23,907,150	103,950	540,999,720

Our projected estimates based on 20-year period	Rail		Number of crossties
	Tons	Track-miles	
Annual deferred maintenance	291,683	1,268	6,169,618
Annual normalized maintenance	1,204,900	5,239	27,840,491
Total annual	1,496,583	6,507	34,010,109
Total for 20-year period	29,931,660	130,140	680,202,180

Cost to install needed rail and crossties

We estimate that it would require about $16.7 billion to install 402 million crossties and 77,750 track-miles of rail over a 10-year period. Our computation was based upon average third-quarter 1974 costs, the latest available, for material, equipment and labor included in a USRA study made of seven railroads in the Midwest and Northeast regions and did not include any factors for inflation.

In a letter dated August 9, 1976, (see app. I) the Department of Transportation said it had some doubts that the bases we used to estimate the total costs of a national rail rehabilitation program were thorough enough. We agree that our computation of total costs should not be considered a realistic estimate of what the actual cost of a rehabilitation program actually will be, but simply an attempt to give the reader a feeling for what a massive rehabilitation program would cost in current dollars. As with all the other estimates in this report, the actual cost will depend upon how much track is rehabilitated and how soon it is done.

CHAPTER 3

AVAILABILITY OF RAIL

The iron and steel industry of the United States is composed of about 200 companies which produce a wide range of steel mill products; 90 have their own steel making furnaces, and the others purchase semifinished steel for fabrication into consumer goods. Steel production worldwide has continued to grow, but the U.S. output as a percent of the total has dropped by 30 percent since 1950.

EXISTING CAPACITY TO PRODUCE RAIL

At the height of the great railroad expansion period in 1874, 69 mills were making rails in the United States. At present, five mills, which are owned by three steel companies, are producing rail. Four mills are located in the Eastern and Midwest regions where most railroads are located and one is in the West. 1/

In 1975 about 1,180,000 tons of rail or enough for 5,130 miles of track were shipped by the steel companies to railroads and others. According to the steel companies, this level of shipments is about 320,000 tons below their capacity existing at March 1976. Comparing these figures to our estimates of need, as discussed in chapter 2, we estimate that the present level of rail shipments is not adequate to sustain normal maintenance and correct deferred maintenance on all the Nation's railroad track. The following schedule shows shipments at last year's level and our estimates of needs over 10-, 15-, and 20-year periods.

1/The steel mills located at Steelton, Pennsylvania, and Lackawanna, New York, are owned by the Bethlehem Steel Corporation; the mills located at Gary, Indiana, and Birmingham, Alabama, are owned by the U.S. Steel Corporation; and the mill at Pueblo, Colorado, is owned by the Colorado Fuel and Iron Corporation.

	Rail					
	10-year period		15-year period		20-year period	
	Tons	Track-miles	Tons	Track-miles	Tons	Track-miles
Present (1975) annual level of shipments	1,180,000	5,130	1,180,000	5,130	1,180,000	5,130
Projected shipments	11,800,000	51,300	17,700,000	76,950	23,600,000	102,600
Our estimate of need	17,882,650	77,750	23,907,150	103,950	29,931,660	130,140
Shortfall	6,082,650	26,450	6,207,150	27,000	6,331,660	27,540

Even if steel rail producers could manufacture additional tonnage at peak capacity with present facilities, there may not be enough rail to rehabilitate the Nation's track in much less than 20 years. Our estimate shows that railroads would need some 2,882,650 tons or 12,530 miles of track more than could be produced if the rehabilitation target was 10 years, and 1,407,150 tons or 6,120 miles of track more than could be produced if the target were 15 years. However, we estimate that the railmaking capacity existing at March 1976 would be more than sufficient to meet projected demands over a 20-year period. This information is summarized in the table below.

	Rail					
	10-year period		15-year period		20-year period	
	Tons	Track-miles	Tons	Track-miles	Tons	Track-miles
Existing annual capacity as of March 1976	1,500,000	6,522	1,500,000	6,522	1,500,000	6,522
Projected capacity	15,000,000	65,220	22,500,000	97,830	30,000,000	130,440
Our estimate of need	17,882,650	77,750	23,907,150	103,950	29,931,660	130,140
Shortfall (surplus)	2,882,650	12,530	1,407,150	6,120	(68,340)	(300)

The above estimates show that if a massive rehabilitation program were attempted, over periods of 10 or 15 years, additional railmaking capacity probably would be needed to complete the job. However, two of the three companies that currently manufacture rail told us that before they would add capacity, a definite commitment to buy the rail would be needed because of the considerable investment required to expand.

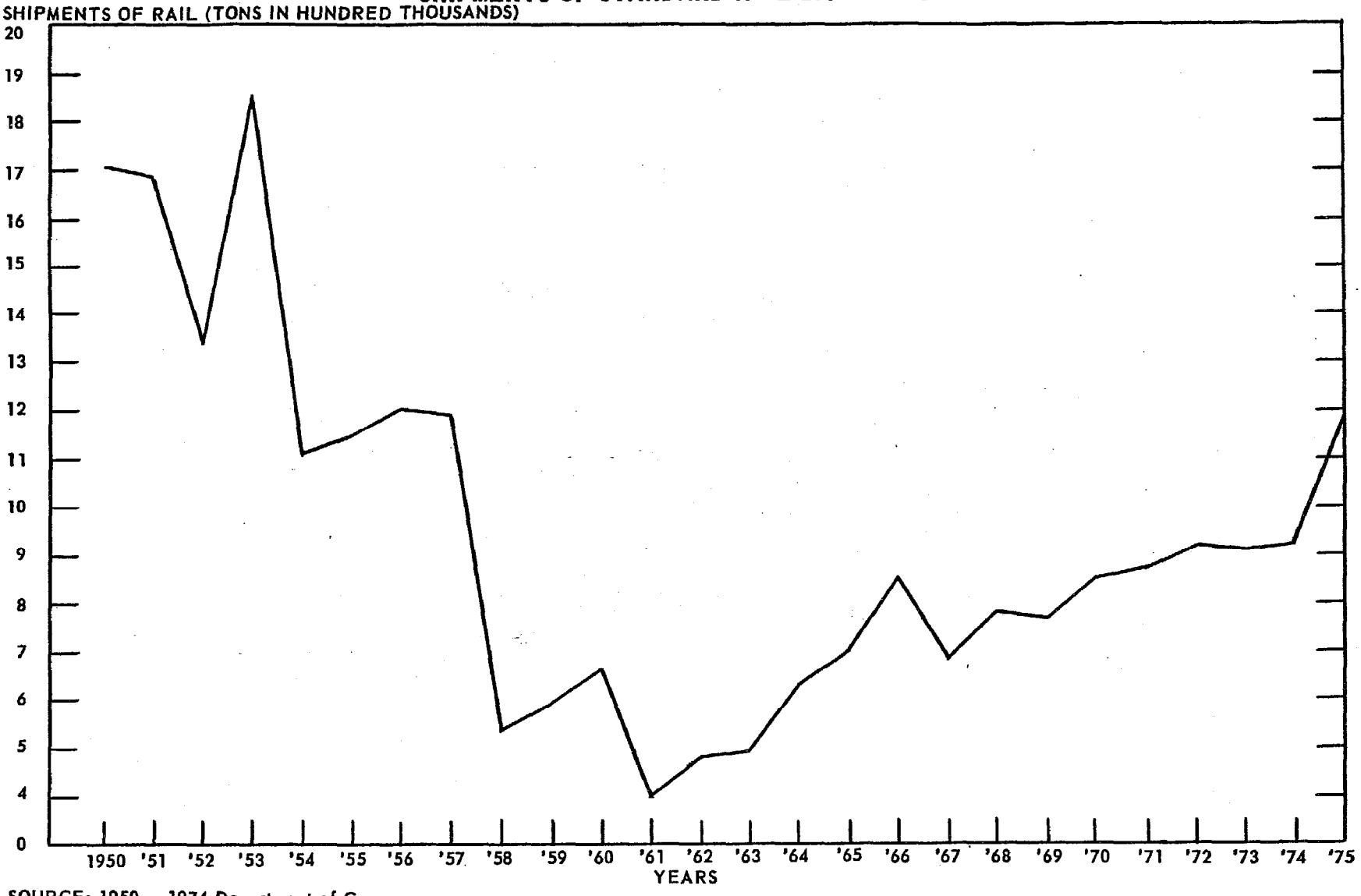
The steel companies told us that they are extremely reluctant to expand because of the erratic procurement of rail in the past. Although the companies meet with railroad purchasing officials each fall to determine the demand for rail for the upcoming year, railroads often cancel orders because of low revenues.

Shipments of rail generally declined in the 1950s from a high of 1,867,000 tons in 1953 to 590,000 tons in 1959. Following one of the lowest shipments ever, 407,000 tons in 1961, rail shipments have steadily increased. The upward trend has continued through the 1970s with 1,180,000 tons shipped in 1975. The graph on the following page illustrates the fluctuations in shipments over a 25-year period.

Despite historical sharp changes in the rail market, one of the three railmaking companies recently announced a $60 million modernization of its existing rail mill facilities which the company expects will increase its rail capacity by about 50 percent. A company official emphasized that the modernization was undertaken in light of the potential foreign rail market, the domestic rail market, and the possibility of producing other steel products.

With assurances of increased rail purchases, the steel companies estimated they could expand to produce about 1,850,000 tons of rail or 8,000 track miles a year. As shown on page 13, this amount would be more than enough to meet our projection of the rail needed for the next 10, 15, and 20 years assuming rail producing facilities were already constructed. Construction of necessary facilities, however, could take up to 3 years to complete.

SHIPMENTS OF STANDARD RAIL 1950 – 1975

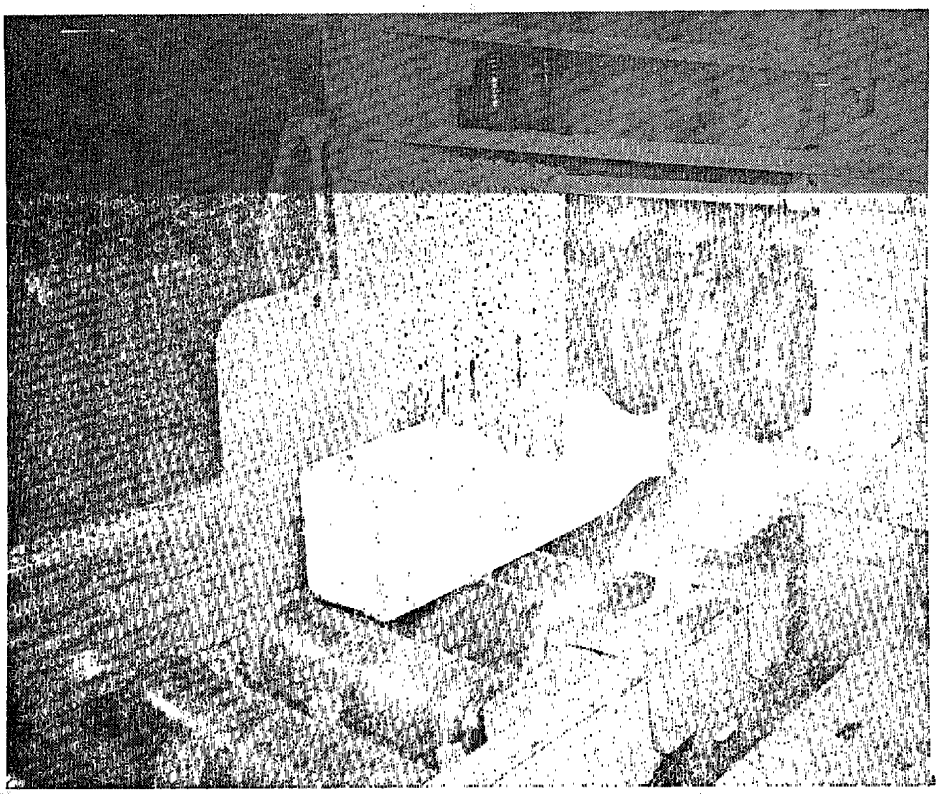


SOURCE: 1950 – 1974 Department of Commerce
1975 American Iron and Steel Institute

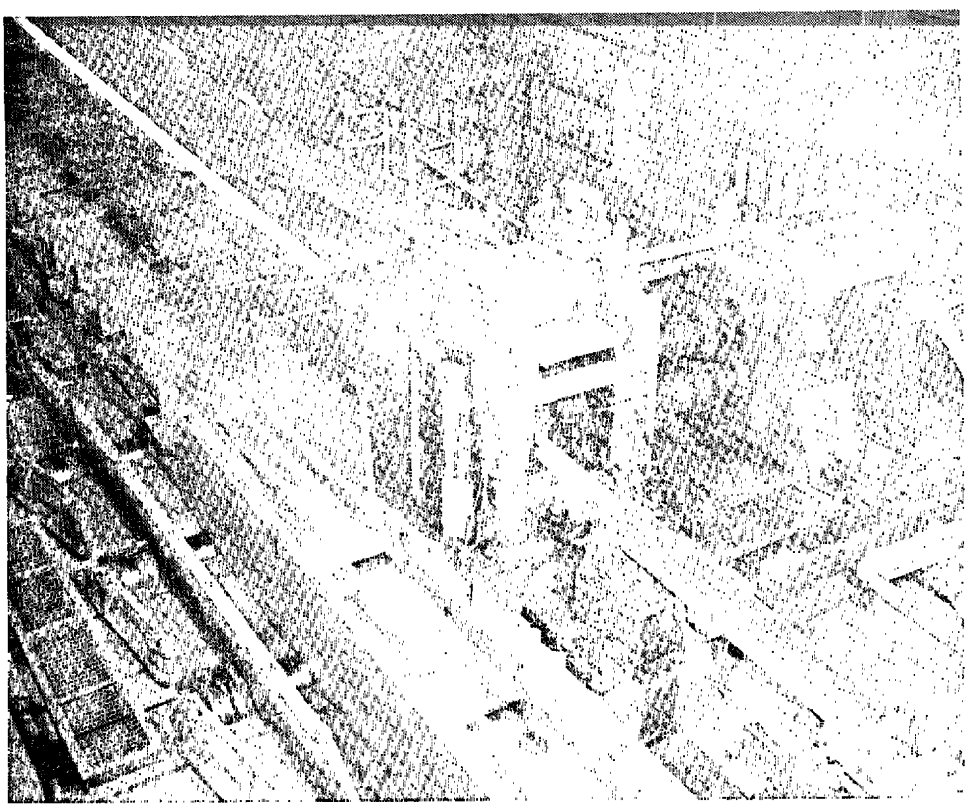
	Rail					
	10-year period		15-year period		20-year period	
	Tons	Track-miles	Tons	Track-miles	Tons	Track-miles
Expanding annual capacity	1,850,000	8,043	1,850,000	8,043	1,850,000	8,043
Projected capacity	18,500,000	80,430	27,750,000	120,645	37,000,000	160,860
Our estimate of need	17,882,650	77,750	23,907,150	103,950	29,931,660	130,140
Surplus	617,350	2,680	3,842,850	16,695	7,068,340	30,720

Officials of the three rail producing companies said that other steel companies are unlikely to enter the rail production market because of the large capital investment required, particularly for the finishing phase of the rail producing process. According to these officials most steel companies would be reluctant to invest large sums of money to develop new or additional capability knowing that (1) the rail market has historically been erratic and (2) the railroads will not guarantee or make firm commitments to purchase a specific tonnage of rail. Not only must the necessary funds be available to invest in converting any existing facilities to railmaking facilities but skilled labor must also be located to do many phases of the finishing process.

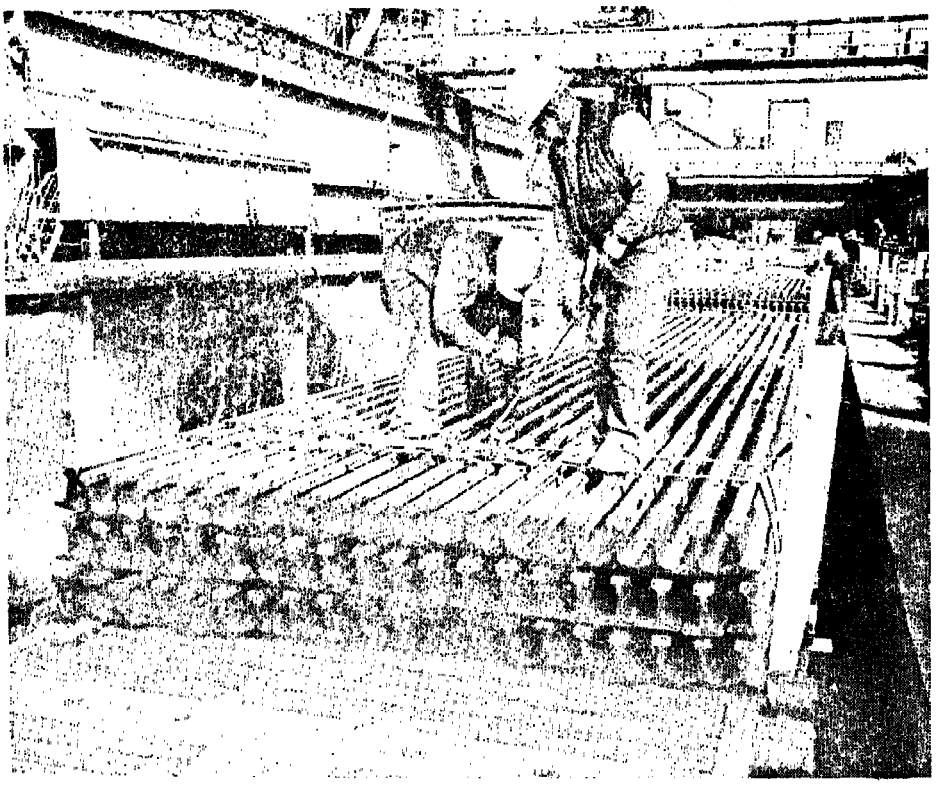
The pictures on the following pages show various phases of the rail making process.



HOT INGOT BEING PASSED THROUGH SET OF PRIMARY ROLLS.
Source: Colorado Fuel and Iron Corporation.



RAIL BEING PASSED THROUGH FINISHING STAND.
Source: Colorado Fuel and Iron Corporation.



RAIL BEING PREPARED FOR SHIPPING.
Source: Colorado Fuel and Iron Corporation.

OUTLOOK FOR RAIL IN THE STEEL INDUSTRY

Shipments of steel-railroad products to railroads and other users, such as the mining and construction industries as well as mass-transit systems, presently represent a relatively small share of the total steel market. However, our study has shown that the steel industry must increase its capacity to produce raw steel overall to satisfy future projected demands for all steel products.

In the years 1964 to 1974 the steel industry shipped an average of 3.3 million tons of steel railroad products. As a share of the market for all steel products, railroad products declined from about 4.1 percent in 1964 to 3.1 percent in 1974.

The Department of Transportation stated (see app. I) that when demand for steel products is high, individual steel companies allocate hot steel to steel product lines. Large tonnage products and customers tend to get better treatment than small customers and as a result hot steel would be allocated away from steel rails because railroad products constitute a

small percentage of total steel products and have a low profit margin. The Department also stated, however that the recent Energy Policy and Conservation Act, 42 U.S.C. 6201 (Supp. V, 1975), could be invoked to give this transportation-oriented item preferential treatment.

USRA also informed us that in times of general steel shortage, producers would have a problem meeting rail rolling requirements in excess of 5,000 miles annually.

Rails and related steel accessories represent about one-third of the steel used by the rail transportation industry and the remainder goes into freight cars, passenger cars, locomotives and other uses. By 1980 steel shipments to consumers of railroad products are projected by the Department of Commerce to be 4.7 million tons or 3.7 percent of total domestic shipments. By the year 2000 the rail transportation industry is projected, according to the Bureau of Mines, to have a demand of 14 million tons of steel or 7.2 percent of all steel markets. The table below shows the rankings of the steel consuming industries for 1964, 1974, and projections for 1980.

	1964 (note a)		1974 (note a)		1980 (note a)	
Market classification	Tons	Percent	Tons	Percent	Tons	Percent
	(000 omitted)		(000 omitted)		(000 omitted)	
Automotive	18,387	21.6	18,928	17.3	23,596	18.4
Construction	15,638	18.4	18,519	16.9	15,987	12.5
Containers	6,552	7.7	8,218	7.5	9,198	7.2
Machinery	5,338	6.3	6,440	5.9	9,095	7.1
Converting and processing	2,687	3.2	4,486	4.1	5,188	4.0
Export	2,749	3.2	3,961	3.6	5,380	4.2
Rail transportation (note b)	3,469	4.1	3,417	3.1	4,714	3.7
Electrical equipment and machinery	2,654	3.1	3,242	3.0	4,996	3.9
Appliances	2,168	2.6	2,412	2.2	3,036	2.4
Domestic and commercial equipment	2,034	2.4	1,941	1.8	3,036	2.4
Agriculture	1,369	1.6	1,859	1.7	2,050	1.6
Shipbuilding	805	.9	1,339	1.2	2,152	1.7
Other	21,095	24.9	34,710	31.7	39,672	30.9
Total shipments	84,945	100	109,472	100	128,100	100

a/1964 and 1974 data from statistical reports of the American Iron and Steel Institute and 1980 projection from the Department of Commerce.

b/This classification includes shipments to the railroads, mass-transit system, mining industry and the construction industry. Rails and related accessories such as spikes and joint bars accounted for 836,000, 1,285,000, and 1,558,000 tons of steel shipments for 1964, 1974, and 1980, respectively. The remaining tonnage shipped was used in the manufacture of locomotives and passenger and freight cars and other uses.

Although the U.S. raw steel output as a percent of the world's production has dropped considerably since 1950, the average raw steel produced in U.S. steel mills increased during 1965 to 1975 compared to the period 1955 to 1965 by some 25 million tons as shown below.

Average annual raw steel production 1955 to 1965	107,920,000 tons
Average annual raw steel production 1965 to 1975	133,073,000 tons
Increase	25,153,000 tons

To satisfy the future projected demands for steel products in the United States, the American Iron and Steel Institute 1/ estimated that domestic raw steel production must increase by about 30 million tons to achieve a raw steel production capacity of 185 million tons by 1983. Such an increase in capacity would require expansion and modernization of facilities at a cost of over $5 billion annually through 1983. According to a Department of Commerce study, the steel industry will have a hard time financing an expansion program. To compound the issue, the consulting firm of Arthur D. Little, Inc., in a study done for the American Iron and Steel Institute, estimated that an additional $12 to $14 billion will be needed to install required environmental control equipment. Investments for this type of equipment are almost as costly as planned expansion programs but contribute no additional steel production capacity.

In response to industry projections of increased demand for steel products, many steel companies announced planned expansion programs during 1974 and 1975. Under these expansion plans, funds would be invested to build new steelmaking facilities or to modernize existing facilities in order to increase steel production; however, the projected increased demands did not materialize and there was instead a strain on the funds available for expansion projects. Domestic raw steel production in 1975 was the lowest in 12 years. Steel industry leaders have said that considerable

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1/A nonprofit association of the iron and steel industry. Institute activities include research, technology and engineering, collection and dissemination of statistics, public distribution of information about the industry and its products, public affairs, and discussions of industrial relations including health, safety and hygiene.

increases in operations and profitability will be needed to complete the announced expansion projects and to undertake the additional projects required to increase the capacity needed by the 1980s.

IMPORT POSSIBILITIES

Steel company officials told us that until recently supplies of rail from foreign markets, particularly those markets outside the North American continent, had not been actively sought by the railroads because of the freight costs involved in transporting the products. From 1966 through 1975, rail imports have averaged only about 5 percent of domestic shipments.

During this period, most of the rail imported to the United States came from Canada except in 1975 when over half the rail imported into the United States came from Japan--a country heretofore supplying the United States with a very nominal tonnage of rails. The tremendous increase in rail shipments from Japan to the United States was attributed to the excellent quality of the Japanese rails and a carryover of the commitments made by railroads with foreign producers during the 1974 period of extremely tight steel supply.

CHAPTER 4

AVAILABILITY OF CROSSTIES

Railroad crossties are the parallel crossbeams which connect the rails and hold them securely in place. Although some experimentation is currently underway with concrete and steel ties, railroad crossties are primarily made from hardwood timber. The average crosstie is about 8-1/2 feet long, 7 inches thick, 9 inches wide and has an average life span of 35 years following treatment with a wood preservative.

EXISTING CROSSTIE PRODUCTION CAPACITY

As of June 1976 no organization or individual either within or outside of the tie industry has determined the total industry's production capability. A tie industry official told us that crosstie production capacity can not be precisely quantified because of the variability of the factors which determine capacity. For example, the officials cited the number of sawmills across the country, the size of these mills, the type of equipment used, constraints imposed by the weather, and the availability of treating facilities and treating solution as factors which make estimating production capability difficult.

Industry officials told us that entry into the sawmill business could be accomplished within a 6-month period, requiring little in the way of capital investment when compared with investments required to operate a rail mill. Because of the ease of entering and leaving the sawmill business, it is difficult to keep an accurate record of all sawmill locations in the United States and almost impossible to determine exactly what kind of equipment is being used and whether it is being used only to cut crossties or for other wood products. Weather also affects sawmill capacity because much of the related sawmill activity is done outdoors.

An official of the Marketing Committee of the Railway Tie Association 1/ told us that it plans to start the first

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1/Represents over 250 crosstie producers, sawmill owners, wood preservation companies, railroad purchasing officials and maintenance engineers. The association cooperates with Government agencies in the conservation of forests and forest products, disseminates statistics to members on crosstie production, maintains up to date standards for the production of wood ties, initiates research concerning tie design, manufacture and usage, and disseminates information to members and others concerning performance of ties in various types of service.

study of the tie industry's production capacity during the latter part of calendar year 1976. However, until such a study is completed, the best existing measure of the industry's production capability is its past levels of production.

The number of crossties produced since 1953 has varied from a high of 38.5 million in that year to a low of 13 million in 1962. The number of crossties produced has increased above the 1962 level and in every year since 1966 exceeded 20 million as shown below.

Production of Treated Crossties

Selected Years 1953-74 (note a)

Year	Number
	(000 omitted)
1953	38,450
1955	26,040
1960	17,320
1961	16,900
1962	13,000
1963	14,360
1964	16,870
1965	19,290
1966	21,350
1967	24,350
1968	23,800
1969	21,620
1970	24,060
1971	26,370
1972	26,020
1973	20,490
1974	22,990

a/American Wood-Preservers' Association Wood Preservation Statistics 1974.

From 1965 to 1974 the production has averaged about 23 million crossties a year. Comparing this figure to our estimate of need as discussed in chapter 2 shows that between 172 and 220 million more crossties than the past annual average would be needed over the next 10 to 20 years as shown on the next page.

	Crossties		
	10-year period	15-year period	20-year period
Average annual production	23,000,000	23,000,000	23,000,000
Projected production	230,000,000	345,000,000	460,000,000
Our estimate of need	401,797,270	540,999,720	680,202,180
Shortfall	171,797,270	195,999,720	220,202,180

A Railway Tie Association official told us that during a 4-month period in 1974, 85 percent of the industry produced about 3 million crossties monthly, or 3.5 million for the entire industry, or a possible annual output of 42 million ties for 100 percent of the industry. If the industry could consistently produce at this level, there would be enough crossties to meet our projected demand as shown below. The association claims the high production level could be sustained.

	Crossties		
	10-year period	15-year period	20-year period
Annual capacity estimated by Railway Tie Association	42,000,000	42,000,000	42,000,000
Projected capacity	420,000,000	630,000,000	840,000,000
Our estimate of need	401,797,270	540,999,720	680,202,180
Surplus	18,202,730	89,000,280	159,797,820

In addition to lumbering, crossties must undergo a drying process to remove excess moisture content. The drying process involves a vapor-drying method or an air-drying process. The attractive feature of the vapor-drying method is that it requires approximately 14 hours while air drying may stretch over a 6- to 12-month period, depending upon the type of wood. During our discussions with the industry officials, however, we were told that air drying is the most popular and cost effective means of drying. According to the Department of Transportation vapor drying is energy intensive and the capacity to use this process is limited. Vapor drying also uses up a considerable amount of treating cylinder time.

Virtually all crossties produced are treated with either solutions of creosote and coal tar or creosote and petroleum. Each tie retains about 2.75 gallons of the preservative so that in 1974 the 23 million crossties produced used about 63 million gallons of preservative. However, based upon information from the American Wood Preservers Institute 1/ there has never been a shortage of the preservative and there is an ample supply of the preservative for future use.

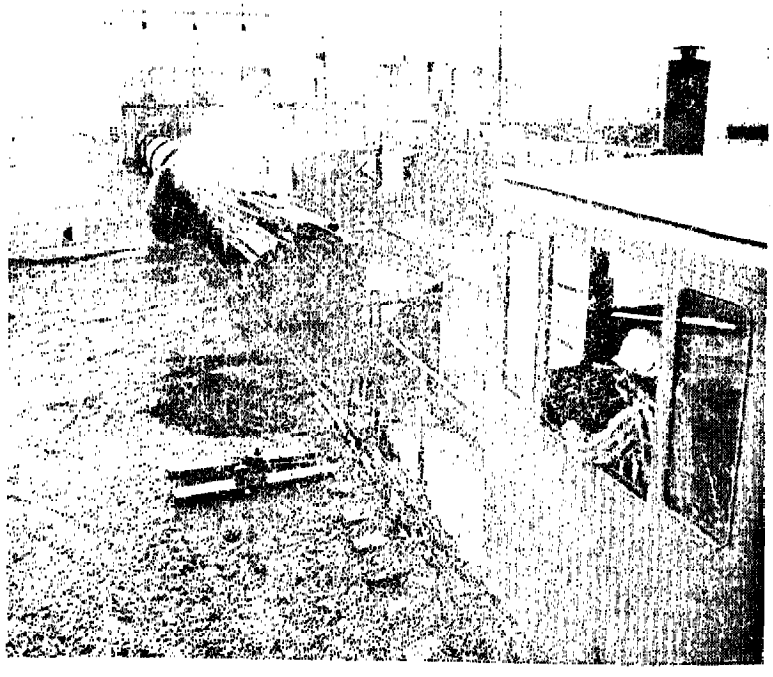
There are about 270 companies that operate pressure treating plants in the United States capable of treating crossties. Based on one treating cylinder loading a day for 300 days a year and assuming only crossties are treated, the total annual tie treating capacity has been estimated by one of the largest treating companies to be 262 million cubic feet or 3.1 billion board feet--the equivalent of 80 million crossties. If treating cylinders were loaded 365 days a year, 24 hours a day and no other wood products other than crossties were treated, the total annual treating capacity would be 290 million crossties or 956 million cubic feet. However, from 1953 to 1974 the total wood materials treated, which includes crossties and all other treated wood products, never approached the crosstie industry's theoretical capability.

Crosstie industry officials stated that they have been plagued historically by a "feast or famine" cycle and that when railroad business is on an upswing, railroad purchasers place orders for more ties than can be produced. Under these circumstances, producers often work around the clock in an effort to fill the orders, but shortages do occur.

On the other hand, according to the industry officials, when railroad business is on a downturn, orders for crossties immediately diminish. Just as quickly as the orders for large quantities of crossties are made, the railroads reduce, defer or completely cancel orders for crossties. It is under these circumstances that a surplus of ties occurs.

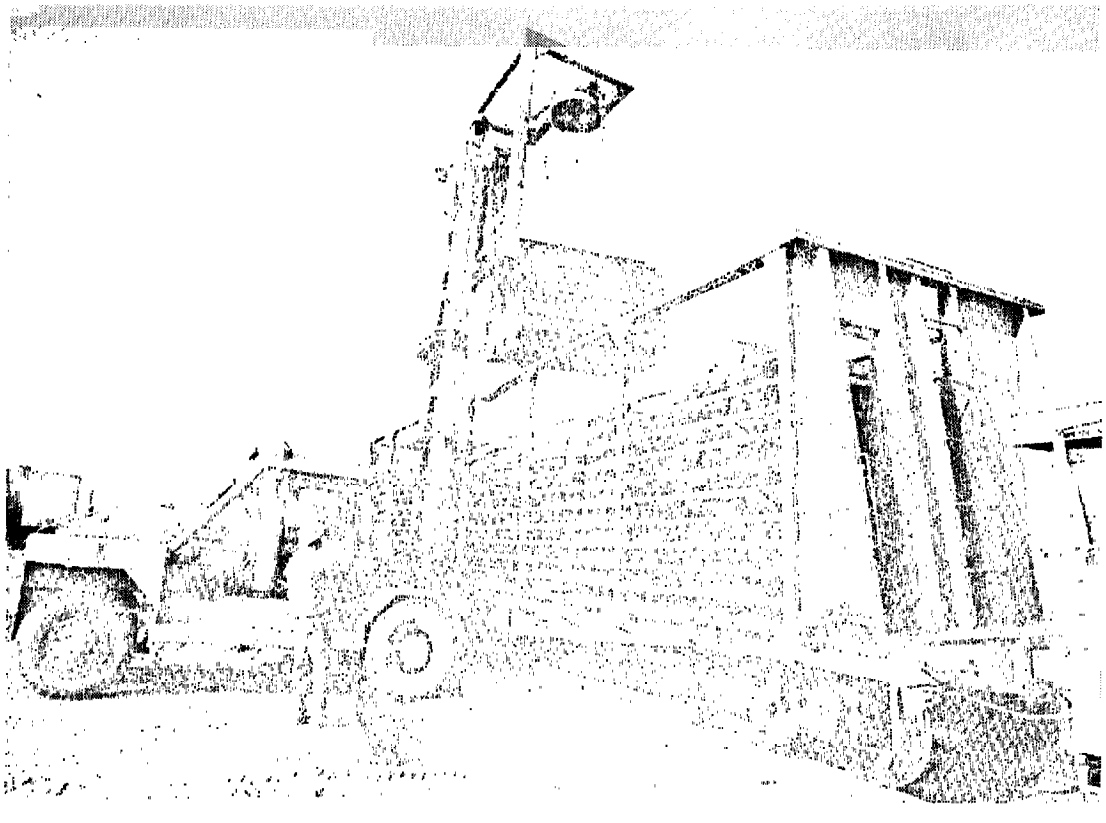
The pictures on the following page show treated crossties being removed from the treating cylinders and treated crossties being loaded into special railroad tie carrier cars for shipment to track construction and maintenance projects.

1/A nonprofit association dedicated to giving information about the proper use of pressure-treated wood and also provides essential technical services. Members of the institute represent about two-thirds of the industry's capacity to pressure-treat wood products.



PRESSURE-CREOSOTED TIES ARE SHOWN AS THEY ARE REMOVED FROM A TREATING CYLINDER.

urce: American Wood Preservers Institute.



PRESSURE-TREATED TIES ARE SHOWN BEING LOADED INTO SPECIAL RAILROAD TIE CARRIER CARS FOR SHIPMENT TO TRACK CONSTRUCTION AND MAINTENANCE PROJECTS.

Source: American Wood Preservers Institute.

SUPPLY OF TIMBER FOR CROSSTIES

Forests occupy about 28 percent of the land area of the world representing 9.2 billion acres. About two-thirds of this area are hardwood forests and one-third softwood, however, only 5.6 billion acres are available for wood production. World production of timber products in 1969 amounted to 75.6 billion cubic feet. The U.S. Department of Agriculture's Forest Service estimates that consumption of industrial timber products rose by 70 percent between 1950 and 1969. Although details on the extent of increases in world demand in the next few decades have not been formulated, the Department believes "substantial increases" lie ahead and questions whether such demands can be supplied in the absence of a substantial improvement in forest management.

However, for the immediate years ahead, the Department expects both U.S. imports and exports of timber products to increase. As reported by the Department, from 1900 to 1950, the United states changed gradually from a net exporting country to a net importer. By 1972 net imports represented 11 percent of the timber products consumed in the United States.

During America's early settlement almost one-half of our land was forest or woodland. Although this has been reduced by extensive clearing for agriculture, urban areas, highways, and other uses, about 754 million acres remain forested or one-third of the land surface of the United States. Of this amount about 500 million acres are considered suitable and available for timber harvests in the future.

Softwoods predominate in the Nation's timber inventory, accounting for about 64 percent of the total volume while hardwoods represent the remaining 36 percent of timber. Softwoods generally are used for the housing and pulp industries whereas hardwoods are used in shipping, furniture, and crossties. Only about 10 percent of crossties produced are made from softwoods.

The Department of Agriculture has compared supply and demand projections for hardwood timber products. The Department projections for hardwood, from which most crossties are made, show that supplies of hardwood will exceed demand throughout the 1980 to 2000 period. However, the Department cautions that wide differences in timber quality and availability could result in higher prices for certain hardwood timber products.

Some wood products complement each other while other wood products compete for the timber supply. Wood needed to make furniture for example, complements wood needed to make ties because the wood sawed away to make a crosstie can be used to make furniture. Wood products such as pallet, wood pulp and crossties compete with each other for timber supply because each of these products uses the center of the log. In recent years, the tie industry's greatest competition has been with the pallet industry. When demand for both of these products is great, price determines whether sawmills will cut the timber for use as crossties or pallet lumber.

The Department of Transportation, in an August 9, 1976, letter stated that we had ignored the possibility of using concrete ties, which in the context of the time frames mentioned in the report, would be ignoring a substitute commodity with a high potential for application. The Department mentioned that although research is being sponsored which will involve testing concrete ties under operating conditions, it is doubtful that test results will be complete in time to permit concrete ties to be used to a large degree in the Northeast Corridor Improvement Program.

We did not include the possibility of using concrete ties in our estimates because, during our study, we found that although experimentation with concrete ties had been underway since 1970, test results are inconclusive for broad-scale application.

Although ConRail and USRA in letters dated July 27, 1976, both agreed that there is enough hardwood timber to meet tie demand, they pointed out that treating capacity may be a limiting factor. ConRail said some existing treating facilities could shut down because of environmental problems caused by antiquated equipment. However, an official of the American Wood Preservers Institute told us that any capacity loss, as a result of shut downs, probably would involve smaller companies and thus have only a minimal effect on overall treating capacity.

CHAPTER 5

CONCLUSIONS, RECOMMENDATION, AGENCY AND INDUSTRY COMMENTS, AND OBSERVATIONS

CONCLUSIONS

Although it is generally accepted that the Nation's railroad track is in need of rehabilitation, no complete or reliable studies exist to date which provide estimates of the quantity of rail and crossties needed to rehabilitate the Nation's track. Whether or not there will be enough rail and crossties depends upon how much substandard track is actually rehabilitated and how long the rehabilitation program takes. But in order to illustrate industry's capacity, we projected data from a Federal Railroad Administration study of 25 Class I railroads to estimate the amount of rail and crossties needed to get all of the Nation's track in a normalized condition over 10-, 15-, and 20-year periods.

Availability of rail

We believe that, under present industry conditions, unless only the most important lines of the rail system in the United States are rehabilitated on a priority basis, shortages in the supply of rail could occur.

We found that because the present level of rail shipments is not sufficient to provide for normal maintenance alone, there would be a shortfall of about 6 million tons or over 26,000 miles of track at the end of 10, 15, and 20 years if a massive rehabilitation program was undertaken on all of the Nation's railroad track. Assuming the steel rail producers could manufacture additional tonnage at peak capacity, shortages may still occur over 10- and 15-year periods. However, we estimate that over a 20-year period the rail-making capacity existing at March 1976 would be more than sufficient to meet projected demands.

Overall, the U.S. steel industry must increase its capacity to produce raw steel to satisfy future projected demands for all steel products. However, doubts have been raised as to whether the industry can come up with the financing needed for expanding and modernizing facilities to increase capacity and also install required environmental control equipment.

We estimate that if a Federal program was started today to rehabilitate all the Nation's railroad track, it would be at least 10 years before the steel industry could provide the rails needed to complete the job even if additional capacity was provided by expanding and modernizing facilities. Two of the three companies that manufacture rail said they would need assurances of an increased rail purchasing pattern before they would expand, because of the erratic procurement of rail in the past. Officials of the three rail producing companies said that it would be unlikely that anybody else would start making rail.

Although this study has focused primarily on the domestic capability of the steel industry to provide rails, imports could become a source to meet shortages during a rehabilitation program. However, steel rail imports have been insignificant in the past.

Availability of crossties

Our study has shown that the supply of hardwood timber used in the manufacture of crossties will be adequate to meet the needs of the railroads; however, an increase in demand from certain industries which compete for timber with crossties, could result in higher prices.

Although we were unable to quantify sawmill capacity because of the number of companies involved and the variability of factors which affect the production of the industry, it appears that the required number of crossties could be produced with firm commitments from the railroads and delivery dates scheduled more uniformly throughout the calendar year.

As mentioned in chapter 1 of this report, the Railroad Revitalization and Regulatory Reform Act of 1976 requires the Secretary of Transportation to obtain information from all the Class I railroads on their deferred maintenance, delayed capital expenditures and their projections through 1985 of maintenance to be performed and capital expenditures. It is anticipated that this data will be thoroughly analyzed by the Secretary and will serve as the basis for making recommendations to the Congress pursuant to the act on the amount of rehabilitation work needed and how it should be financed. Although this effort was recently started, it should result in better measures of the quantities of rail and crossties needed across the country.

A number of other studies are also to be done by the Secretary of Transportation under the Railroad Revitalization and Regulatory Reform Act of 1976. The mandate for these studies reveals the deep concern of the Congress for restoring the Nation's railroads, possibly through a restructuring of the system. For example, the Secretary, is to consider the economic and environmental costs involved in a restructured rail system. In another study, the Secretary is to compare the methods and policies of providing past aid to the railroads with those of other modes of transportation. We believe the Secretary should also study industry's capability to provide the materials needed for a nationwide track rehabilitation program.

RECOMMENDATION

Therefore, we recommend that the Secretary of Transportation direct that one of the studies called for by the Railroad Revitalization and Regulatory Reform Act of 1976 address the issue of industry's capability to provide needed materials for a nationwide track rehabilitation program.

AGENCY AND INDUSTRY COMMENTS

The Department of Transportation stated in an August 9, 1976, letter that in general the findings contained in this report are consistent with their understanding of the situation. The Department also stated that a great deal of economic analyses would be done on this subject in the near future by FRA. On August 10, 1976, a Department official told us that the Department agrees with our recommendation and assured us that the Department, as part of its responsibilities under the Railroad Revitalization and Regulatory Reform Act of 1976, will study the problem soon.

The Department also stated that comparing crosstie production figures included in this report with consumption statistics resulted in extensive variations. We agree that variations do exist between the numbers because production statistics represent all crossties made while consumption statistics only indicate the number of crossties actually installed. Therefore, it is conceivable that the number of crossties produced could exceed the number of crossties consumed. However, we believe that production statistics are a better indication of capacity.

The United States Railway Association informed us in a letter of July 27, 1976, that they think the steel and tie industries have the capacity to supply the Nation's rail and crosstie needs because some trackage will probably be retired

over the next 10 years and some will probably be programed for a holding maintenance level. However, USRA felt that metallurgical improvements to rail processing should be introduced at the mills because of increasing track loadings, and in addition, a stabilized level of purchasing be obtained so that the industries involved could gear up for the long-term program requirements.

Bethlehem Steel Corporation commented in a letter dated July 19, 1976, that it believes the demand forecast for rail in this report is too high. It pointed out the possibility that the U.S. rail system will be consolidated in the future, thus decreasing the amount of rail required for normal annual maintenance. Bethlehem emphasized, however, that their confidence of the capability of the domestic rail industry to meet demand is based on the assumption that orders would be forthcoming on a uniform basis.

While we agree that our estimates do not allow for the possibility that quantities of branch lines may be abandoned, the estimates also do 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. We believe the estimates are useful only to illustrate the present rail and crosstie industries' production capacity and implications for the future. Reliable quantitative data is not now available as to the extent of rail deterioration and the amount of rehabilitation needed; but it appears that unless something less than the total existing rail trackage is rehabilitated, shortages in the supply of rail could occur.

ConRail informed us in a July 27, 1976, letter, that it does not foresee a rail shortage because plant expansions and installations of some entirely new facilities will increase railmaking capacity, and because only a small percentage of total steel production is devoted to rail manufacture. We agree that rail producing companies could expand to meet demand, but they told us definite commitments for rail orders would be needed before they would do so. Concerning the small fraction of total steel production which rail represents, our estimates of capacity are not solely based upon the competition for steel between rail and other steel users but also the capacity to roll and finish rail. It is our understanding that using rolling capacity presently used for making other products is counterproductive because of the shortages that would occur in those product lines.

The United States Steel Corporation, in an August 27, 1976, letter, questioned the railroad's ability to finance a total rehabilitation of the track within a 10-year period

even with governmental assistance. The corporation concluded that with proper guidance and firm commitments from the railroads the corporation would take the steps to meet their demands.

We agree that with expansion the domestic steel industry could produce more than enough rail to meet projected needs. As far as the railroads' financial ability to undertake a total rehabilitation program within a 10-year period, our study only addressed this issue in the context of estimating the cost of a massive rehabilitation program without regard to the railroad's ability or the extent of Government assistance.

OBSERVATIONS

If a nationwide rail rehabilitation program is undertaken, by either providing direct Federal financial assistance to the railroads or, as has been proposed, the Government taking over control of the rail roadbed, it will be necessary to consider whether the rails and crossties needed for the program would be available. Because reliable quantitative data is not now available as to the extent of track deterioration and the amount of rehabilitation needed, actual rail and tie needs will depend on how much track is rehabilitated and the duration of the program. But if the rehabilitation time frame is short and the need for rails and crossties large enough, the Congress could encourage production by:

--Expressing its intent to rehabilitate a specific amount of track in a specific time.

--Making a commitment to rehabilitate the Nation's railroads by a certain date and guaranteeing the purchase of minimum orders of rail and crossties if the railroads are unable to do so.

CHAPTER 6

SCOPE OF REVIEW

We made our review to determine (1) if estimates of the quantity of rail and crossties needed to rehabilitate the Nation's railroads had been made and (2) the capability of the suppliers to provide the needed quantities. Our review was made at the Washington, D.C., headquarters of the Department of Transportation, U.S. Railway Association, Amtrak, Departments of Commerce, Agriculture, the Interior, and the Interstate Commerce Commission and the National Commission on Supplies and Shortages.

We also met with representatives from the American Iron and Steel Institute, American Wood-Preservers' Association, American Wood Preservers Institute, Association of American Railroads, National Forest Products Association, and the Railway Tie Association.

We visited the corporate offices of the three rail producers in the United States to discuss the overall availability of steel, and the production capacity of the rail industry as well as future expansion plans. We observed the railmaking process at two of the five mills that manufacture rail today. In addition, we met with company officials from several firms involved in the manufacture of crossties to obtain information as to the crosstie production process, availability of timber, and capacity of the industry.

APPENDIX I

OFFICE OF THE SECRETARY OF TRANSPORTATION
WASHINGTON, D.C. 20590

ASSISTANT SECRETARY
FOR ADMINISTRATION

August 9, 1976

Mr. Henry Eschwege
Director
Community & Economic Development
Division
U.S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Eschwege:

This is in response to your letter of July 6, 1976, requesting comments on the General Accounting Office (GAO) draft report entitled, "Will There Be Enough Rail and Crossties for Nationwide Railroad Track Rehabilitation?" GAO estimates that about 18 million tons of rail and 402 million crossties will be needed to continue normal maintenance of railroad track and return substandard track to normal condition. Whether or not there will be enough rail and crossties will depend on how much track is rehabilitated and how long this program will take. In general, the findings contained in the report are consistent with our understanding of the situation. However, there are a number of issues which should be discussed further and others which GAO fails to note in the report. These issues are discussed in detail in the enclosed Department of Transportation reply.

Sincerely,

for William S. Heffelfinger

Enclosure

DEPARTMENT OF TRANSPORTATION REPLY

TO

GAO DRAFT REPORT

ON

WILL THERE BE ENOUGH RAIL AND CROSSTIES FOR NATIONWIDE RAILROAD TRACK REHABILITATION?

SUMMARY OF GAO FINDINGS AND RECOMMENDATIONS

GAO's findings in this report deal with the availability of rail and crossties to rehabilitate the nation's railroads. Because the present level of rail shipments would not be sufficient to provide for normal maintenance alone, GAO estimates there would be a shortfall of about six million tons of steel at the end of ten, fifteen and twenty years. In the area of crosstie availability, GAO concluded that the basic timber resource for ties appears to be adequate to meet the needs of a nationwide rehabilitation program over a ten year period.

GAO recommends that the Secretary of Transportation direct that one of the studies called for by the Railroad Revitalization and Regulatory Reform Act of 1976 address the issue of industry's capability to provide needed materials for a nationwide track rehabilitation program.

DEPARTMENT OF TRANSPORTATION POSITION

In general, the findings contained in the report are consistent with our understanding of the situation. However, there are a number of items to be discussed.

The report assumes that a massive rehabilitation of all existing rail lines is necessary. In its Final System Plan, the United States Railway Association recommended that many miles of main line in the Northeast be downgraded or eliminated, thus considerably reducing the potential candidate lines for rehabilitation in the area. The Section 503 study under the Railroad Revitalization and Regulatory Reform Act will result in designation of rail lines by standards of classification and according to the degree to which they are considered essential to the rail transportation system. These studies will have an impact on the total resources needed for rehabilitation.

APPENDIX I

As a part of the planning for the execution of the Northeast Corridor Improvement Program (NECIP), a study was directed at the demand/supply equation for a variety of materials and equipment critical to this program. Two of the items examined were steel rail and ties as set forth in the attached report.

It should be noted that the report was directed primarily at identifying potential problems concerning timely availability of critical items and cost effective procurement of these items within the 5 years legislated for completion of the program. This is in contrast to the national scope of the GAO report and its 10-15-20 years points of reference.

Overall, both the GAO as well as the FRA reports tend to complement each other quite well with respect to steel rail and wood ties. The NECIP report does address the question of national demand and the ability of industry to supply this demand. Other than a relatively minor difference in current steel rail capacity (i.e., 1.5 million tons (GAO) versus 1.3 million tons (NECIP)) the statistics in the two reports are consistent in those cases where they lend themselves to comparison.

The GAO report fails to note some points that are pertinent to the subject in question:

1. An industry practice exists that can directly affect the availability of steel rail. When demand for steel products is high the individual steel companies allocate hot steel to steel product lines. Large tonnage products and customers tend to get better treatment than small customers. Steel rail constitutes about 1% of total steel products and tends to have a low profit margin. This combination would tend to cause hot steel to be allocated away from steel rail unless, for example, the recent Energy Policy and Conservation Act of 1975 could be invoked to give this transportation-oriented item preferential treatment.

2. In examining the question of industry's capacity to produce wood ties, the GAO report only mentions two of the three major processes associated with readying such ties for market. In addition to the lumbering and impregnation process there is a drying process. The drying process involves a vapor drying method or an air drying process. The vapor drying process is energy intensive and the capacity to perform this process is very limited. Conversely, air drying takes almost a year; in terms of the GAO projections of tie requirements there would be a very sizable cost in carrying a 12-month plus tie inventory. It is generally conceded that hardwood timber resources will be ample for the foreseeable future. What needs to be clarified is the extent to which these resources will be used for crosstie production and the effect that competition for hardwoods for other purposes will have on the price.

APPENDIX I

3. In comparing the tabular data on page 26 (Production of Treated Crossties) with other source data indicative of consumption (Transportation statistics of the U.S.) extensive variations are evident; as much as 23% in one year (1967). These statistical anomalies suggest an uncertainty in the level of confidence that can be applied to volume timber crosstie statistics. The report postulates a total annual crosstie requirement of about 40 million units to cover current needs and to account for reducing the deferral backlog. The report also cites Railway Tie Association figures for a four month period in 1974 to support an estimate for a potential annual output of about 42 million units. This was used, without further substantiation, to conclude that there was no problem in meeting the needs. This rough comparison indicates that the question of hardwood timber tie shortage has not yet been adequately treated and that the results can vary depending on the assumptions and source of statistics.

4. The report ignores completely the possibility of using concrete ties. Although the NECIP report does not address this subject, research is being sponsored that will involve the testing under operating conditions of concrete ties. It is problematical whether test results will be conclusive enough to permit timely usage of concrete ties to a large degree in the NECIP. However, in the context of the GAO study's time frame to ignore concrete ties is to ignore a commodity substitute with a high potential for application. With respect to the comparative life cycle costing of wood versus concrete ties, a rather extensive analysis is contained in Task 3, Track and Structures Standards Development (NTIS Number 245774).

5. The statement that ". . . a total of $6.4 billion of Federal funds were authorized for . . . replacement of rail, ties and other track material . . ." is somewhat misleading since it is understood that the RRRR Act of 1976 is broader than just track improvements.

6. The statement attributed to "a Department of Commerce official" is only partially correct. According to the Norfolk and Western Railroad (one of two railroads that bought Japanese rail) quality is excellent; however, they did not confirm the remark on cost. Japanese rail steel probably costs at least 20% more than the domestic product. Norfolk and Western stated that they and the second user of Japanese steel (Chessie System) paid substantially more than the domestic price.

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Finally, we have some doubts that the bases used by GAO for estimating total cost of national rail rehabilitation program are thorough enough. In response to the recommendation that a study based upon the RRRR Act be directed by the Secretary, a great deal of economic analyses will be performed on this subject in the near future by FRA.

[See GAO note on this page.]

Federal Railroad Administrator

GAO note: Deleted comments refer to material discussed in our draft report but not included in this final report.

APPENDIX I

United States Railway Association
2100 Second Street, S.W.
Washington, D.C. 20595
(202) 426-9315

Donald C. Cole
Vice President, Secretary
and Asst. to the Chairman

July 27, 1976

Mr. Henry Eschwege, Director
United States General Accounting Office
411 G Street, N.W.
Washington, D.C. 20548

Dear Mr. Eschwege:

Thank you for the opportunity to review the GAO draft report. "Will There Be Enough Rail and Crossties for Nationwide Track Rehabilitation."

We are attaching a critique of the subject report as prepared by our Operations Office which we trust will be informative and helpful in your preparation of the final report.

Sincerely,

Attachment.

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UNITED STATES RAILWAY ASSOCIATION

COMMENTS ON

GAO DRAFT REPORT

Will There Be Enough Rail and Crossties for Nation-wide Track Rehabilitation

This report is based on the rail system and condition as of the end of 1974. Total nationwide trackage is approximately 328,000 miles and normal and deferred requirements are based on information contained in a study prepared by T. K. Dyer, Inc. entitled, "Estimate of Deferred Maintenance in Track Materials for Twenty-Five Railroads."

By expanding the data in this report, the total deferred units nationwide are estimated to be 25,364 miles of rail and 123,392,360 crossties. Yearly normal requirements based on an average tie life of 35 years and a rail life of 62.7 years is calculated to be 27,840,491 crossties and 5,236 miles of rail. These are the figures used within this report that analyzed the production capabilities relative to the need of the rail and crosstie industry. It would seem unreasonable to assume that it would be desirable to remove deferred maintenance from all trackage or, in effect, apply a normal level of maintenance to the entire system on a continuing basis.

During the study of the northeastern bankrupts, it was determined that approximately 25% of the existing system was either out-of-service, abandoned, or available for subsidy. Of the balance, approximately 25% of the trackage was programmed for holding maintenance reflecting the rail usage and ROI of any rehabilitation. This left a net of 50% of the trackage to receive normal maintenance and some level of rehabilitation.

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It is recognized that these percentages probably cannot accurately be applied nationwide; however, it can be assumed that some trackage will be retired over the next ten years, while others are out-of-service or no maintenance will be performed. In addition, there is certainly a percentage of the trackage that would not warrant rehabilitation or a normalized level of maintenance and should be programmed for a holding maintenance level.

If it is assumed, conservatively, I feel, that 10% of the trackage falls into the category to be retired or out-of-service and 20% programmed for holding maintenance, the balance of 70% will receive normalized maintenance. Further, rehabilitation will only be applied to the trackage programmed for normalized maintenance.

If these assumptions are applied to the normal requirements, a total of 22,491,000 ties and 4,185 miles of rail are required annually. The adjusted deferred totals then become 86,375,000 ties and 17,755 miles of rail.

If the deferred requirements are programmed over 10 years, the total yearly needs for normal and rehabilitation work are then 31,131,000 crossties and 5,960 miles of rail.

According to the report, the industry's capability for these two items is 42,000,000 crossties and 6,522 miles of rail per year.

It is obvious that the industry then has a capability to handle a realistic maintenance and rehabilitation program as outlined above. There is, in fact, excess capacity available to handle the needs of capital programs, transit systems, private track owners, and requirements for frogs and switch points not included in the above figures.

It should be noted that with respect to industry supply figures of capacity, there is some reservation. I have no doubt that there is a great deal of hardwood timber available in the Continental United States. However, it should be noted that there are limitations to tie treating capacity that, while addressed in the GAO report, were done so rather superficially. With respect to the availability of rail, it should be noted that rail rolling capacity is one thing, and that raw steel capacity is another. Therefore, in times of general steel shortage, rail rolling requirements in excess of 5,000 miles could become problematical.

Two other statements within the report are questioned as follows: The statement is made that Japanese rail is of better quality and that it is less expensive--including freight--than domestic steel. We cannot comment as to the quality of the Japanese steel; however, in 1974, the cost was 15% to 20% above rail prices in this country. In relation to crossties, the report states that the standard tie is 8 feet long, 9 inches wide, by 7 inches deep. In fact, most railroads require an 8 foot 6 inch long tie.

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In summary, it would appear that in order to make an intelligent determination as to the requirements for rail and ties, the on-going study as to usage and viability of railroad lines must be completed. Following this, the requirement for miles of track to be rehabilitated and maintained in a normalized manner would be determined. It does appear, however, that the steel and tie industries do have the capacity to supply the nation's needs during a 10 to 15 year rehabilitation program, although my feeling is that metallurgical improvements to rail processing should be introduced by the mills, particularly because of increasing track loadings. As outlined in the report, however, it is considered important that a stabilized level of purchasing be obtained so that the industries involved can gear up for the long term program requirements.

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CONSOLIDATED RAIL CORPORATION
SIX PENN CENTER PLAZA
PHILADELPHIA, PENNSYLVANIA 19104

July 27, 1976

Mr. Henry Eschwege, Director
United States General Accounting Office
Community and Economic Development Division
Washington, D. C. 20548

Dear Mr. Eschwege:

Thank you for forwarding draft of GAO's proposed report to the Congress entitled "Will There Be Enough Rail And Crossties For Nationwide Railroad Track Rehabilitation?".

I have several comments to make concerning this report.

We note that you predict a shortage of rail within the next ten years. We do not fully agree with this assessment since rail production represents such a small fraction of the total steel production. Your prediction of a shortage is based upon the competition for steel between the rail industry and other steel users. This assumes a uniform surge in demand among all steel users which, of course, is difficult to predict.

We have also noted a study prepared for the FRA by Richardson Associates of New York in May of 1976 (NEC Demand/Supply Study) which indicates a tight, but adequate, supply of rail for the next ten years. We feel that the additional capacity necessary to meet both rail and other steel users requirements will be available because of plant expansions and installation of some entirely new facilities. We do not foresee a rail shortage primarily because of the small percentage of total steel production that is devoted to rail manufacture as well as the fact that your report assumes a uniform increase in demand among all steel users.

Your report also indicates that there will not be a shortage of hardwood tie production but that there may be a treating problem. Our investigation verifies that there is enough hardwood production to meet tie demands and that treating capacity may be a limiting factor, especially if some existing treating facilities are shut down because of environmental problems caused by antiquated equipment.

Sincerely,

E. G. Jordan
Chairman and
Chief Executive Officer

APPENDIX I

Bethlehem Steel Corporation

BETHLEHEM, PA. 18016

J. G. WHITE, JR.
GENERAL MANAGER OF SALES
J. D. CUMMINGS
J. B. DOUGHERTY
ASST. GEN. MANAGERS OF SALES

RAILROAD PRODUCTS
W. T. ANTHONY
MANAGER OF SALES
R. H. JONES
F. W. KERN
S. T. MARCIN
ASST. MANAGERS OF SALES

July 19, 1976

Mr. Henry Eschwege, Director
United States General Accounting Office
Washington, DC 20548

Dear Mr. Eschwege:

You very kindly submitted to J. G. White a draft of a report covering the topic, "Will There Be Enough Rail and Crossties for Nationwide Railroad Track Rehabilitation?". This report was reviewed by J. G. White as well as representatives of our Market Research Department and has been transmitted to me for response.

Rather than comment or offer suggested modifications to specific paragraphs of the draft, we wish to offer a number of general comments regarding our forecast of demand and capabilities, most of which were presented to your representatives when they visited here with us. You may then wish to revamp some portions of your report.

Overall, the key to the question of whether or not there will be enough rail for nation-wide railroad track rehabilitation is the estimate of future demand for rail. We believe and have so stated to Mr. William A. Romano in our March 12, 1976 letter to the U.S. GAO that demand for rail will range from 1.4 to 1.6 mil. tons per year for 8 to 10 years and then drop off to a level of from 1.1 to 1.3 mil. tons per year. This doubling of demand in the next 8 to 10 years from that experienced over the past 18 years reflects our estimates of rail needed for "normal" maintenance and that required for catch-up or deferred maintenance. This assumes that the main line track system remains about 200,000 miles.

The draft report's use of the 1.5 to 1.8 mil. N.T. annual forecast (with emphasis on the 1.8 mil. ton level), coupled with the report's estimate of the domestic steel industry's current rail capacity (1.5 mil. N.T. per year), leads to a conclusion that the domestic steel industry cannot meet future rail demand. We believe this is misleading -- primarily because we believe the demand forecast is too high.

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Bethlehem Steel Corporation

Mr. Henry Eschwege, Director
United States General Accounting Office

July 19, 1976

If our forecast is correct, then it would appear reasonable to believe that the domestic steel industry could support the future rail demand.

Checking with the FRA, we have learned that of the 25 railroads used in the survey, 8 or about one-third were bankrupt railroads. This we believe over-estimates the industry rail requirements that were extrapolated from the study's results when applied to the remaining railroads in the system. Also, according to the FRA, the 1974 study was not a very thorough or exhaustive study (not major project) with the 16-page report primarily a description of the methodology used to get the results. The consultant used each railroad's Annual Form A (now R-1) report to the ICC vs. contacting each railroad directly.

Using the "draft report's" average weight of new rail required of 130 lb. rail, using a 50-year rail replacement rate (figure often quoted by track engineers for the desired rail replacement cycle they would like to attain), and a 200,000-mile main line track system, we estimate that 4,000 miles of track or 920,000 tons of new rail are required each year for normal annual maintenance. This may be too high for the future as the FRA now has under study a national rail system plan to classify and designate main and branch lines into high, mid, and low density. The implied purpose of this plan, authorized under the 4R Act of 1976, is to consolidate and rationalize the existing U.S. rail system. This would decrease the miles of main line track and the amount of rail required for normal annual maintenance.

However, when the 920,000 tons are added to the 580,000 tons of deferred maintenance rail estimated by the GAO, a total rail requirement of 1.5 mil. tons per year is reached. Since existing annual rail capacity is 1.5 mil. tons per year excluding announced expansions, then there appears to be no shortage of domestic rail capacity to meet railroads' needs in the next 10 years.

Concerning the Bureau of Mines' year 2000 steel projection for the railroad industry of 14 mil. tons, we believe it is not only much too optimistic but also inconceivable that the railroad industry would require that much steel to build and repair tracks, bridges, buildings, freight cars, and locomotives.

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Bethlehem Steel Corporation

Mr. Henry Eschwege, Director
United States General Accounting Office

July 19, 1976

Also, we believe their 1980 projection of steel shipments to the railroad industry are high by about 1 mil. tons. Our 1980 projections are a low of 3.2 mil., a high of 3.7 mil., and a best estimate of 3.5 mil. These projections include strong trackwork forecasts with the differences between the 1980 low and high projections reflecting different levels of freight car building.

In note "a" on Page 21 of the "draft report", the Bureau of Mines have used incorrect rail and related accessories' steel shipments to the railroad industry in 1964 and 1974. The numbers as published by the AISI are 721,000 tons in 1964 vs. their 836,000 and 1,124,000 in 1974 vs. their 1,285,000. Our 1980 projection ranges from 1,110,000 to 1,315,000 with a best estimate of 1,235,000 vs. their 1,558,000 tons.

The recent upsurge in tonnages of foreign rail obtained by the domestic railroad industry is a carry-over of the commitments made by these railroads with foreign producers during the 1974 period of extremely tight steel supply. Contrary to the statements contained in your report, these purchases were made at prices well above the prevailing domestic market price. Even under current market conditions, railroads presently negotiating with foreign rail producers for rail, on long term, non-cancellable contracts, are finding their price offering to be <u>not below</u> prevailing domestic prices at time of delivery.

Much has been said about the superior quality of foreign produced rail; nevertheless, all domestic suppliers are delivering rail which meets every facet of the current AREA rail specifications and intend to continue to produce a product which will conform to all modifications to those accepted standards.

We wish to emphatically state our position in the developing rail supply situation. We are satisfied with the correctness of our projected demand and are confident of the present domestic rail industry's capability of meeting that demand <u>if orders are forthcoming on a uniform continuous basis.</u> Right now we are experiencing a lack of rail orders on our mills for 1976 and 1977 delivery. With that condition prevailing we cannot see the need for discussion of increased capacities or discussion of dependency upon foreign sources for the rail required for rehabilitation and future maintenance of our country's rail system.

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Bethlehem Steel Corporation

Mr. Henry Eschwege, Director
United States General Accounting Office

July 19, 1976

We wish to thank you for this opportunity to review and comment upon this important study and are hopeful that our suggestions will result in the final report being an accurate appraisal of this situation.

Very truly yours,

BETHLEHEM STEEL CORPORATION

W. T. Hathaway

Manager of Sales

WTA:dpb

APPENDIX I

United States Steel Corporation

J. M. CURTO
GROUP VICE PRESIDENT — STEEL

600 GRANT STREET
PITTSBURGH, PENNSYLVANIA 15230
412/433-1127

August 27, 1976

Mr. Henry Eschwege, Director
Community and Economic Development Division
United States General Accounting Office
Washington, D. C. 20548

Dear Mr. Eschwege:

We appreciated the opportunity to review your report entitled, "Will There Be Enough Rail and Crossties for Nationwide Railroad Track Rehabilitation?". From our particular viewpoint, it is our contention that the United States Steel Corporation will be able to satisfy the needs of the railroads in the future markets that we serve. It has been illustrated in your report that past deferred maintenance has created a need far beyond existing domestic production capabilities.

We are not in a position to dispute the projected shortfall as shown, but question the ability of the railroads financially to undertake a total rehabilitation of the track within a ten-year period, even with governmental assistance. The report also does not recognize, which is understandable, the possible effects of future mergers on the overall estimated shortfall.

We should like to conclude by emphasizing that United States Steel has adequately handled the needs of the railroads in the past. Our more recent problems in 1975, 1976, and even projecting the needs of 1977 have been in filling our mills with rail orders. With proper guidance and firm commitments by the railroad industry, we will take the steps to meet their demands.

Sincerely yours,

J M Curto

GAO note: Page references in this appendix refer to our draft report and may not correspond to the pages of this final report.

PRINCIPAL OFFICIALS

RESPONSIBLE FOR ADMINISTERING ACTIVITIES

DISCUSSED IN THIS REPORT

	Tenure of office	
	From	To
SECRETARY OF TRANSPORTATION:		
William T. Coleman, Jr.	Mar. 1975	Present
ADMINISTRATOR FOR FEDERAL RAILROAD ADMINISTRATION:		
Asaph H. Hall	Aug. 1975	Present
SECRETARY OF AGRICULTURE:		
Earl L. Butz	Dec. 1971	Present
SECRETARY OF COMMERCE:		
Elliot L. Richardson	Feb. 1976	Present
CHAIRMAN OF INTERSTATE COMMERCE COMMISSION:		
George M. Stafford	May 1970	Present

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