# Rail Service in the Midwest and Northeast Region

A REPORT
BY THE SECRETARY OF TRANSPORTATION


Volume I

THE SECRETARY OF TRANSPORTATION
WASHINGTON, D.C. 20590

February 1, 1974

The Regional Rail Reorganization Act of 1973 (P.L. 93-236), enacted January 2, 1974, directed the Secretary of Transportation to submit a comprehensive report containing his conclusions and recommendations with respect to the geographic zones in the midwest and northeast region within and between which rail service should be provided. This report is submitted in accordance with that provision.

I urge the United States Railway Association, the Interstate Commerce Commission, the Congress, and other affected parties to consider carefully these conclusions and recommendations. I believe they provide the proper guidelines for the difficult task of developing a viable system that meets the rail service needs of the region.

This report, which was prepared under my supervision, is the product of a joint task force from the Federal Railroad Administration and the staff of the Office of the Secretary. Although a great many individuals contributed to its preparation, I would like to give special recognition to James Hagen, William Loftus, James McClellan, and Gerald Davies of the Federal Railroad Administration; to Barrs Lewis and Gary Broemser of the Office of Transportation Policy Development; to Ralph Mueller of the Office of Planning and Program Review; and to Asaph Hall, Special Assistant to the Secretary.

Claude S. Brinegar

# RAIL SERVICE IN THE MIDWEST AND NORTHEAST REGION

A Report
by
The Secretary of Transportation

Submitted in Accordance with Section 204 of the
Regional Rail Reorganization Act of 1973
(P. L. 93–236)

U.S. Department of Transportation
February 1, 1974

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## INTRODUCTION AND SUMMARY

### LEGISLATIVE MANDATE

Much of the railroad system in the region comprising the Northeast and portions of the Midwest has fallen into serious physical disrepair and financial insolvency.[1] Seven of the region's Class I and one of its Class II railroads are undergoing reorganization under section 77 of the Bankruptcy Act, and some are close to liquidation.[2] There are also 15 subsidiaries of the Penn Central that have filed for reorganization.

The Regional Rail Reorganization Act of 1973 (P.L. 93-236) ("the Act") which became law on January 2, 1974:

(1) Established the United States Railway Association to plan and finance the restructuring of this ailing rail system;

(2) Directed the establishment of the Consolidated Rail Corporation to operate and modernize parts or all of the restructured system;[3]

(3) Allowed for the future abandonment of unnecessary services; and

(4) Established an interim joint Federal-State subsidy program for the continuation and improvement of local rail services which would otherwise not be included in the Corporation's or other solvent railroads' operations.

The planning process for restructuring rail service within this region is to be accomplished in seven basic steps:

(1) Within 30 days of the date of enactment of the Act, the Secretary of Transportation will submit a report containing his conclusions and recommendations for rail service within and between the several geographic zones of the region and describing the criteria used in developing those conclusions and recommendations. This document, consisting of two volumes, is that report.

(2) The Rail Services Planning Office ("Office") of the Interstate Commerce Commission ("ICC"), established pursuant to the Act, will hold public hearings on the Secretary's report and prepare a report containing an evaluation of the Secretary's recommendations.

(3) The United States Railway Association will prepare a detailed Preliminary System Plan based upon the reports prepared by the Secretary of Transportation and the ICC Office.

(4) The ICC Office will hold public hearings on the Preliminary System Plan and prepare a report evaluating the Plan.

(5) The Association will then prepare a Final System Plan reflecting the changes recommended by the ICC Office report on the Preliminary System Plan.

(6) The ICC will prepare an evaluation of the Final System Plan.

(7) The Congress will approve or reject the Final System Plan before it is implemented. (If rejected, the Plan must be revised by the Association and returned to the Congress for approval.)

Once approved by the Congress, the Final System Plan will become the basis on which specific rail properties of the existing bankrupt[4] and solvent railroads in the region are transferred or conveyed to the Corporation or other solvent railroads to make up the restructured system or are abandoned (unless retained for the provision of rail service under the subsidy provisions of the Act).

Three of the six purposes set out in the declaration of policy in the Act are directly relevant to this planning process. They are:

"to provide for—

(1) the identification of a rail service system in the midwest and northeast region which is adequate to meet the needs and service requirements of this region and of the national rail transportation system;

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[1] The region, as designated in the Act, includes Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, Ohio, Indiana, Illinois, Michigan, Virginia, West Virginia, and those portions of contiguous States in which are located rail properties owned or operated by railroads doing business primarily in the aforementioned jurisdictions (as determined by the Interstate Commerce Commission by order). In its order in *Ex Parte No. 293* approved January 14, 1974, and served January 23, 1974, the Commission delineated areas in the vicinity of Louisville, Kentucky, St. Louis, Missouri, and Kewaunee and Manitowoc, Wisconsin, as included in the region.

[2] Railroad operating companies are classified by the Interstate Commerce Commission on the basis of operating revenue, with those carriers with $5 million or more of annual revenue classified as Class I and those with less than $5 million classified as Class II. The Class I railroads in reorganization are the Ann Arbor, Boston & Maine, Central Railroad of New Jersey, Erie Lackawanna, Lehigh Valley, Penn Central, and Reading. The Class II railroad in reorganization is the Lehigh & Hudson River.

[3] If the Association deems it necessary for competitive or other reasons, there could be two or more new rail corporations established to operate the system.

[4] The term "bankrupt railroad" is used throughout this report to identify a railroad which is within the definition of "railroad in reorganization" in section 102(12).



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(2) the reorganization of railroads in this region into an economically viable system capable of providing adequate and efficient rail service to the region;

* * * * *

(6) necessary Federal financial assistance at the lowest possible cost to the general taxpayer."

The Act provided specific guidelines for the restructuring and reorganization process in terms of the goals to be sought in the Final System Plan. Among those goals are (1) the creation of a financially self-sustaining rail service system in the region; (2) the establishment and maintenance of a rail service system adequate to meet the rail transportation needs and service requirements of the region; (3) the preservation, to the extent consistent with other goals, of existing patterns of service by railroads, and of existing railroad trackage in areas in which fossil fuel natural resources are located, and the utilization of those modes of transportation in the region which require the smallest amount of scarce energy resources and which can most efficiently transport energy resources; (4) the retention and promotion of competition in the provision of rail and other transportation services in the region; and (5) the attainment and maintenance of environmental standards, particularly the applicable national ambient air quality standards and plans established under the Clean Air Act Amendments of 1970, taking into consideration the environmental impact of alternative choices of action.

Other factors which the Act directs the Association to consider in arriving at the Final System Plan include: the need for and the cost of rehabilitation and modernization of track, equipment and other facilities; methods of achieving economies in the cost of rail operations in the region; means of achieving rationalization of rail services and the rail system in the region; marketing studies; the impact on railroad employees; consumer needs; traffic analyses; financial studies; and any other factors identified by the Association or in the report of the Secretary.

This summary of the legislative mandate shows the important role of this report in the reorganization planning process. In essence, the purpose of this report is to launch the planning process and to give it direction as to where rail service should be provided in the restructuring of the region's rail system.

Thus, the objectives of this report are to provide:

- A description of the existing rail system in the region;
- An analysis of the capital and operating problems that exist and possible improvements that might be realized; and
- Recommendations as to where rail service should be provided and for the restructuring and consolidation of interstate and local rail service.

The report first discusses the railroad problem in the region with reference to the specific factors addressed by the Act. It then discusses the criteria on which the recommendations for rail service are based both for the interstate and local service rail networks, and presents conclusions and recommendations for use by the Association in its development of the Preliminary and Final System Plans.

## CONCLUSIONS

The Department's analysis of rail service in the region has led to several basic conclusions which underlie the recommendations contained in this report. These conclusions are:

- A fundamental consolidation and restructuring of the region's railroad industry (including both bankrupt and solvent carriers) is required if the public policy goals described in the Act are to be realized.
- The major benefits to be realized from this consolidation and restructuring will be, first, improved capital productivity and a viable financial base for the Corporation and other railroads in the region. This improvement will then lead to higher quality rail service for the entire region.
- In order to achieve improved productivity, the existing, highly duplicative and underutilized individual railroad interstate mainlines in the region should be consolidated into a high volume, upgraded interstate network.
- In order to maintain and enhance rail competition and improve efficiency of operations within the region, the Corporation and other solvent carriers should, to the fullest extent practicable, share facilities and coordinate operations over the high volume network.
- Local rail service requirements in the region should be fulfilled generally with single carrier, direct rail service in order to give the rail mode a viable economic base and to support effective intermodal competition.
- The existing, highly duplicative, feeder and local service network used for local rail services should be streamlined by permitting the abandonment of rail facilities which are not financially self-sustaining.

## RECOMMENDATIONS

Based on the above conclusions, the Department makes the following recommendations:

- The solvent carriers in the region are urged to become full participants in the planning and restructuring of the region's rail system.
- The Association should concentrate its planning efforts on two levels of the region's rail system—local rail service and high volume, interstate rail service. Each of these levels must be restructured in order to improve the economic efficiency and financial viability of rail operations in the region.
- At the local service level, continued direct rail service should be provided for nearly all of the region's normal rail freight traffic. Less than 4 percent of the region's rail traffic is originated or terminated on lines which are potentially excess and most of this traffic can be retained by the rail mode through subsidy programs or combined motor carrier/rail service.
- At the interstate level, duplicative lines and facilities should be downgraded or eliminated and service coordinated with the goal of substantially increasing utilization of the consolidated and restructured system.

- At the local level, rail pick-up and delivery service should be coordinated so that it is provided by a single railroad in a given geographic area.
- Existing interstate routes should be consolidated to establish a high volume interstate network which warrants a major modernization program.
- Rail competition should be maintained only over the high volume interstate network between major traffic generating centers which provide a sufficient volume of rail traffic to produce at least eight train loads per day each moving more than approximately 200 miles in the same general direction. In our judgment other points do not require mainline service by more than one railroad.

Table 1 summarizes, by State in the region, the Secretary's recommendations on regional rail service. comparing current levels of traffic and route mileage with the levels resulting from the recommendations as to points in the region which should receive direct local rail service. As can be seen in the table, at least 96 percent of the region's rail traffic would continue to receive direct rail service. Of the remaining 4 percent of the traffic, a part may be covered by additions to the Association's Final System Plan, other elements may continue under the short term subsidy provisions contained in the Act, and the remainder can be served by motor carrier or joint motor carrier/rail service. Thus, the overall impact of the recommended cutback in rail freight service is quite small.

Approximately 25 percent of the region's railroad route mileage appears to be potentially excess, either because it is uneconomic or clearly redundant. However, it is emphasized that this constitutes only a rough estimate of the route mileage which may be classified as excess in the Final System Plan. The available mileage data is neither current nor precise, and additional analysis by the Association will be necessary to establish the mileage involved and further define the potentially excess trackage.

TABLE 1.—SUMMARY OF SECRETARY'S RECOMMENDATIONS

| States | 1972 Route Mileage | | | 1972 Annual Carloads Generated [1] | | |
|---|---|---|---|---|---|---|
| | State Totals (Miles) | Potentially Excess [2] Rail Line: Miles | Potentially Excess [2] Rail Line: Percent of Total | State Totals (Thousands) | Retained In Service Recommendations: Carloads (Thousands) | Retained In Service Recommendations: Percent of Total [3] |
| Connecticut | 664 | 175 | 26 | 161 | 154 | 95 |
| Delaware | 291 | 75 | 26 | 157 | 154 | 98 |
| District of Columbia | 30 | — | — | 180 [4] | 167 [4] | 93 |
| Illinois | 10,822 | 2,650 | 24 | 4,541 [5] | 4,393 [5] | 97 |
| Indiana | 6,405 | 2,350 | 37 | 1,846 [6] | 1,733 [6] | 94 |
| Maine | 1,666 | 75 | 5 | 309 | 289 | 94 |
| Maryland | 1,110 | 225 | 20 | 631 | 613 | 97 |
| Massachusetts | 1,430 | 475 | 33 | 399 | 375 | 94 |
| Michigan | 6,159 | 2,275 | 37 | 2,053 | 1,985 | 97 |
| New Hampshire | 817 | 400 | 49 | 71 | 63 | 88 |
| New Jersey | 1,742 | 300 | 17 | 819 | 809 | 99 |
| New York | 5,595 | 1,875 | 34 | 1,330 | 1,258 | 95 |
| Ohio | 7,804 | 2,500 | 32 | 3,979 | 3,837 | 96 |
| Pennsylvania | 8,273 | 1,450 | 18 | 3,539 | 3,389 | 96 |
| Rhode Island | 146 | 25 | 17 | 41 | 38 | 91 |
| Vermont | 766 | 250 | 33 | 60 | 52 | 88 |
| Virginia | 3,895 | 275 | 7 | 1,872 | 1,824 | 97 |
| West Virginia | 3,569 | 200 | 6 | 1,985 | 1,916 | 97 |
| Total for Region | 61,184 | 15,575 | 25 | 23,973 | 23,049 | 96 |

[1] Total, originating or terminating traffic.

[2] Estimated from zone maps (see Volume II); does not include mileage in zones not served by bankrupt railroads.

[3] It is expected that some additional traffic will also continue to be carried by rail, either directly or via motor carrier/rail piggy-back combinations.

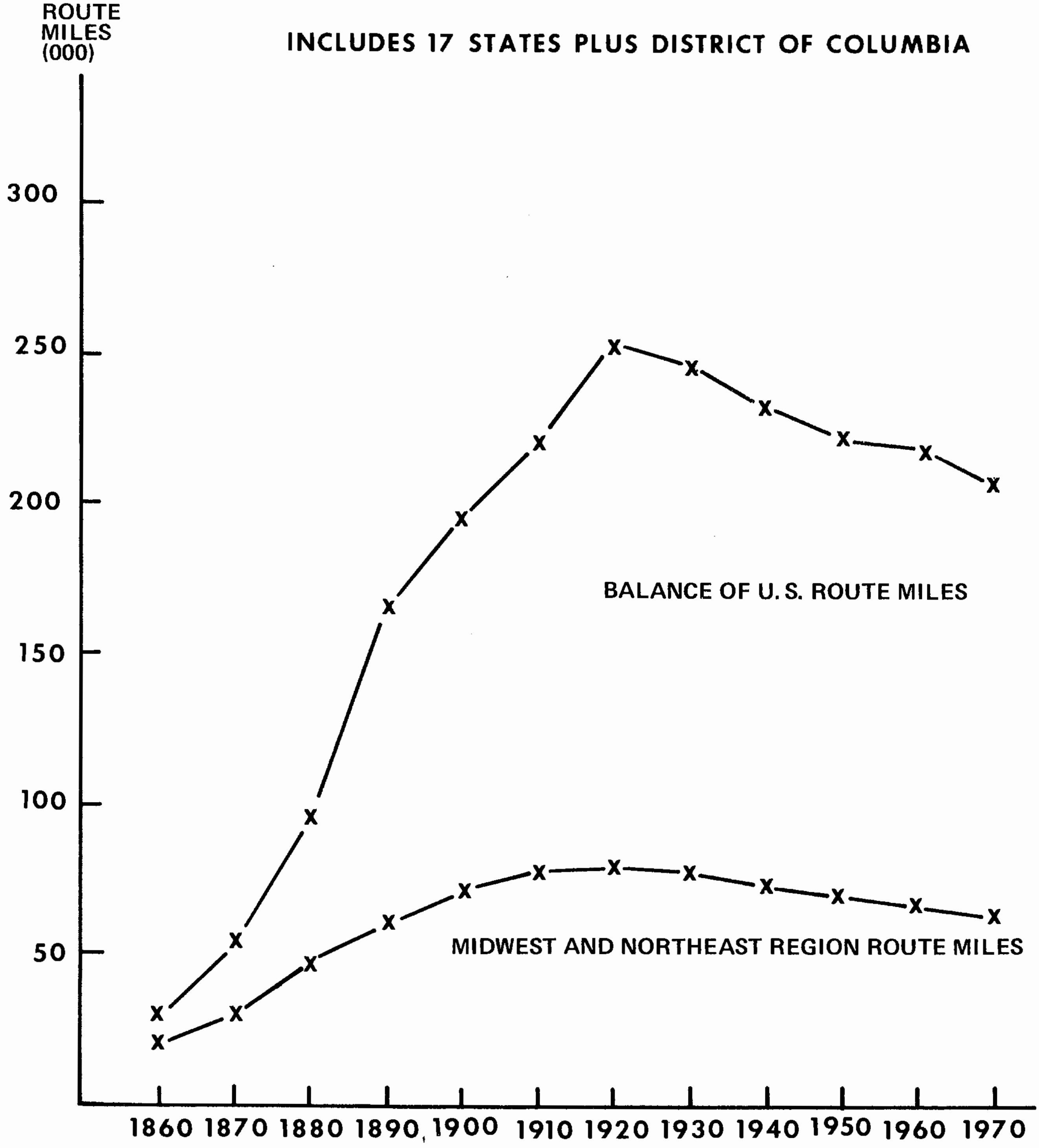
[4] Includes entire Washington, D.C., Standard Metropolitan Statistical Area.

[5] Includes St. Louis, Missouri.

[6] Includes Louisville, Kentucky.

*Data Sources:* (1) State Mileage from *Transport Statistics in the U.S.*, Interstate Commerce Commission; (2) State annual carloads from Federal Railroad Administration, Office of Economics, compiled from traffic data supplied by the region's Class I railroads.

# FIGURE 1
# ROUTE MILES OF RAILROAD IN THE REGION
# (1860 TO 1971)




SOURCE: STATISTICAL ABSTRACTS OF THE UNITED STATES, U. S. DEPARTMENT OF COMMERCE, AND TRANSPORTATION STATISTICS IN THE UNITED STATES FOR THE YEAR ENDED DECEMBER 31, INTERSTATE COMMERCE COMMISSION.

# PART I

## THE RAILROAD PROBLEM IN THE MIDWEST AND NORTHEAST REGION

### PROBLEM

Any analysis of rail service in the midwest and northeast region must take into account the fundamental problems facing the rail industry in the region, the importance of the rail industry to the economic base both of the region and the nation as a whole, and the role of the bankrupt railroads as essential elements in the region's transportation system. Since these subjects have been well documented in previous reports,[1] this report only summarizes these important factors, with primary emphasis on aspects related directly to the restructuring process established by the Act.

The causes of the region's rail problems are both external and internal to the industry. The major external factors are limited access to capital markets due to historic low profit rates; trends in intermodal competition; shifts in regional transportation demand; unbalanced Federal investment policies; and adverse regulatory policies. The main internal factors are operating inefficiencies, low service quality, resistance to change by both management and labor, and lack of innovations in marketing and pricing strategies and operating practices. The restructuring process for the region's rail system can only hope to improve certain of these factors. Specifically, in dealing with external factors, the process can serve to improve: (1) the effectiveness of rail as a competitor with other transportation modes; (2) indirectly, the balance of Federal investment among the various transportation modes; and (3) the ability of the railroads in the region to attract capital. In dealing with internal factors it can influence primarily those relating to difficulties with operating efficiency and quality of service, although hopefully it will also help bring more flexibility into the future roles of management and labor.

It is important to realize that other factors adversely affecting the rail industry in the region will not be changed simply through a "successful" restructuring process. Still remaining will be the long-term effects of restrictive and outdated regulatory policies, work rule practices, and the inability of both rail management and labor to adapt more quickly to changing technology and market conditions.

This report concentrates on the discussion and development of recommendations for improving the operating efficiency of both the bankrupt and solvent railroads in the region through a restructuring and consolidating process as set forth as a primary objective of the Act. While these steps will go a long way toward improving the industry's financial viability and service quality, they must, of course, be supplemented by action to deal with the other factors. These other actions, however, are beyond the scope of this report.

#### Historical Background

From a meager start in about 1830, the rail system in the region grew rapidly following the Civil War. By 1900 the construction phase along the northeastern seacoast was nearly completed; by 1910 the growth in route mileage in the entire region was practically ended and the physical basis for today's system was set. As shown in Figure 1, 90 percent of the peak route mileage in the region was in place by 1900, and 99 percent was in place by 1910. Since 1920, when the peak of 78,000 route miles was reached, route mileage has declined slowly at an average yearly rate of about 330 miles. The present system totals 61,000 miles.

The capacity of this system continued to increase after 1920, despite the leveling off in total route mileage. Tonnage capacity multiplied several times as freight cars became larger and locomotives more powerful. Moreover,

TABLE 2.—RAIL SYSTEM CAPACITY

| Number of Tracks | Signal System: Automatic Block Signal — Trains Per Day[1] | Automatic Block Signal — Gross Tons Per Year[2] (Millions) | Centralized Traffic Control — Trains Per Day[1] | Centralized Traffic Control — Gross Tons Per Year[2] (Millions) |
|---|---|---|---|---|
| Single | 40 | 62 | 60 | 93 |
| Double | 120 | 186 | 160 | 250 |

[1] Total both directions.

[2] Gross ton miles per route mile; total both directions.

*Data Source:* Federal Railroad Administration, Office of Research, Development & Demonstrations.

*Note:* This table represents the engineering capacity of the respective lines. Practical capacity will be affected by terrain, train size, tonnage, operating procedures, etc.

[1] Notably in *The Penn Central and Other Railroads*, a report to the Senate Committee on Commerce, December 1972; *The Northeastern Railroad Problem*, U.S. Department of Transportation, March 1973; and *Improving Railroad Productivity*, Final Report of the Task Force on Railroad Productivity to the National Commission on Productivity and the Council of Economic Advisers, November 1973.

track capacity increased dramatically as centralized track control (CTC) signal systems were installed. The increased capacity associated with the installation of various signal systems on a given track is illustrated in Table 2, which shows that the change from an automatic block system to a CTC signal system results in a 50 percent increase in the train capacity of a single track roadway.[1]

While capacity of the rail system increased after 1920, the economic fortunes of the railroads in the region began to decline significantly. This decline was a result of the combined influences of changing demand for transportation service from bulk commodities (particularly coal) to high value processed goods, the decentralization of manufacturing, and the inability of the railroads to adjust their operations and physical plant to changing market conditions.

During the same period intercity motor carriage captured much of the short and medium haul, high value, high rated traffic, leaving the railroads with the lower value, lower rated and long haul commodities. This was, of course, the logical result of the rapid development of a national highway network which accelerated the emergence of highly flexible and responsive motor carriers which could provide fast, frequent and reliable freight service.

Also during this period new technology for inland waterway barge operations was emerging in the form of larger, more powerful towboats and larger barges. In addition, large Federal investments in waterway, lock and dam facilities (but without appropriate charges to the users) were producing new and low cost competition for railroads for the movement of such long haul, bulk commodities as coal and grain. On a national basis, the rail share of intercity freight ton-miles dropped from more than 75 percent in 1929 to 36 percent in 1970.

The legacy of these changing conditions and the railroads' inability to adjust to them is a physical plant with a capacity far exceeding the foreseeable demand for rail service, and with a need of substantial upgrading.

Despite these adverse conditions, rail remains an essential element of the total transportation system of the region. Table 3, which gives the proportion of manufacturing output shipped by rail for the region's 16 major production areas, shows that railroads carry 32 percent of the originating tonnage. The significance of these data is underscored by the fact that 15 of the nation's top 25 major production areas are located in the region.

TABLE 3.—ORIGINATING TONNAGE, MODAL SHARE, AND LENGTH OF HAUL FOR REGION'S MAJOR CENSUS PRODUCTION AREAS

(Manufacturing Output)

| Production Area | Originating Tonnage (Million Tons) | | | | Modal Share[1] (Percent) | | | Average Length of Haul (Miles) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| City | Total | Rail | Truck | Other | Rail | Truck | Other | All Modes | Rail | Truck[2] |
| Chicago, IL | 62.2 | 23.5 | 33.0 | 5.7 | 38 | 53 | 9 | 275 | 377 | 208 |
| Philadelphia, PA | 52.7 | 7.1 | 21.7 | 23.9 | 13 | 41 | 45 | 396 | 473 | 201 |
| Detroit, MI | 41.4 | 20.0 | 19.8 | 1.6 | 48 | 48 | 4 | 277 | 404 | 156 |
| Pittsburgh, PA | 37.5 | 15.7 | 15.0 | 6.8 | 42 | 40 | 18 | 347 | 375 | 229 |
| Cleveland, OH | 33.9 | 11.9 | 21.8 | 0.2 | 35 | 64 | 1 | 273 | 406 | 196 |
| St. Louis, MO | 28.3 | 8.0 | 13.0 | 7.3 | 28 | 46 | 26 | 302 | 529 | 182 |
| Newark, NJ | 27.3 | 3.8 | 15.7 | 7.8 | 14 | 58 | 29 | 247 | 620 | 227 |
| Buffalo, NY | 23.4 | 9.9 | 8.4 | 5.1 | 42 | 36 | 22 | 300 | 375 | 235 |
| Baltimore, MD | 12.0 | 4.1 | 7.6 | 0.4 | 34 | 63 | 3 | 262 | 394 | 184 |
| Boston, MA | 11.6 | 1.1 | 10.2 | 0.3 | 10 | 88 | 3 | 377 | 662 | 340 |
| Cincinnati, OH | 11.2 | 3.9 | 7.2 | 0.1 | 35 | 65 | 1 | 326 | 491 | 234 |
| Allentown, PA | 8.3 | 2.6 | 5.6 | 0.1 | 32 | 68 | 1 | 196 | 234 | 153 |
| New York, NY | 6.9 | 0.9 | 5.4 | 0.6 | 14 | 78 | 9 | 408 | 666 | 340 |
| Syracuse, NY | 6.7 | 3.1 | 3.6 | 0.1 | 45 | 54 | 1 | 312 | 411 | 214 |
| Harrisburg, PA | 6.2 | 1.9 | 4.3 | 0.0 | 31 | 69 | | 259 | 408 | 191 |
| Hartford, CT | 4.9 | 1.0 | 3.7 | 0.2 | 20 | 77 | 3 | 454 | 924 | 321 |
| 16—Area Totals | 374.5 | 118.5 | 196.0 | 60.2 | 32 | 52 | 16 | 309 | 420 | 212 |
| U.S. Totals | 1,385.0 | 454.0 | 560.0 | 371.0 | 33 | 40 | 27 | 490 | 550 | 229 |

[1] Totals may not add to 100 percent in all cases because of rounding.
[2] Weighted by tons carried by motor carrier and private truck.

*Data Source: 1967 Census of Transportation, Volume III, Commodity Transportation Survey,* U.S. Department of Commerce

[1] It is interesting to note that while the train capacity of the system, in engineering terms, increased with the installation of more sophisticated signal systems, the number of trains operating over the system did not increase proportionately. This results from the fact that the impetus for installation of more productive traffic control systems was less that of increasing system capacity and more that of reducing the labor cost associated with the less sophisticated systems.

TABLE 4.—SELECTED STATISTICS FOR EASTERN DISTRICT CLASS I RAILROADS
(1972)

| Railroads | Miles of Road Operated | | | Revenue Ton Miles | | | Operating Revenues | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Percent of | | Amount | Percent of | | Amount | Percent of | |
| | (Miles) | District | U.S. | (Billions) | District | U.S. | ($ Millions) | District | U.S. |
| **Bankrupt Railroads** | | | | | | | | | |
| Ann Arbor | 300 | 0.5 | 0.1 | 0.7 | 0.3 | 0.1 | 11 | 0.2 | 0.1 |
| Boston and Maine | 1,416 | 2.6 | 0.7 | 2.6 | 1.2 | 0.3 | 77 | 1.6 | 0.6 |
| Central RR of New Jersey | 402 | 0.8 | 0.2 | 0.8 | 0.3 | 0.1 | 42 | 0.9 | 0.3 |
| Erie Lackawanna | 2,979 | 5.5 | 1.4 | 13.3 | 5.8 | 1.7 | 264 | 5.5 | 2.0 |
| Lehigh Valley | 972 | 1.8 | 0.5 | 2.7 | 1.1 | 0.3 | 51 | 1.1 | 0.4 |
| Penn Central | 19,853 | 36.9 | 9.5 | 83.2 | 36.0 | 10.7 | 1,825 | 38.2 | 13.6 |
| Reading | 1,169 | 2.2 | 0.6 | 3.5 | 1.5 | 0.5 | 111 | 2.3 | 0.8 |
| Total, 7 Bankrupts | 27,091 | 50.3 | 13.0 | 106.8 | 46.2 | 13.7 | 2,381 | 49.8 | 17.8 |
| **Selected Solvent Railroads** | | | | | | | | | |
| Chessie System [1] | 11,354 | 21.1 | 5.5 | 57.0 | 24.6 | 7.3 | 1,002 | 21.0 | 7.5 |
| Delaware and Hudson | 717 | 1.3 | 0.3 | 2.3 | 1.0 | 0.3 | 42 | 0.9 | 0.3 |
| Pittsburgh and Lake Erie | 211 | 0.4 | 0.1 | 1.3 | 0.6 | 0.2 | 38 | 0.8 | 0.3 |
| Maine Central | 908 | 1.7 | 0.4 | 0.9 | 0.4 | 0.1 | 28 | 0.6 | 0.2 |
| Norfolk and Western | 7,616 | 14.2 | 3.7 | 48.7 | 21.1 | 6.3 | 795 | 16.6 | 5.9 |
| Richmond, Fredericksburg and Potomac | 110 | 0.2 | 0.1 | 1.1 | 0.5 | 0.1 | 25 | 0.5 | 0.2 |
| Detroit, Toledo & Ironton | 476 | 0.9 | 0.2 | 1.4 | 0.6 | 0.2 | 42 | 0.9 | 0.3 |
| Total, 7 Solvents | 21,392 | 39.8 | 10.3 | 112.7 | 48.8 | 14.5 | 1,972 | 41.3 | 14.7 |
| Other Eastern Solvents—Total | 5,338 | 9.9 | 2.6 | 11.6 | 5.0 | 1.5 | 430 | 8.9 | 3.2 |
| Total Eastern Solvents | 26,730 | 49.7 | 12.8 | 124.3 | 53.8 | 16.0 | 2,402 | 50.2 | 17.9 |
| Eastern District—Total | 53,821 | 100.0 | 25.9 | 231.1 | 100.0 | 29.8 | 4,783 | 100.0 | 35.7 |
| United States—Total | 208,044 | | 100.0 | 778.1 | | 100.0 | 13,411 | | 100.0 |

[1] Statistics given for the Chessie System represent the combined statistics for the B&O, the C&O, and the Western Maryland

*Data Sources:* (1) Statistics for individual railroads: *Moody's Transportation Manual*, 1973, supplemented by Association of American Railroads statistics.

(2) Miles of Road Operated, Revenue Ton-Miles and Operating Revenue Totals for the Eastern District and the United States: Association of American Railroads.

A summary of data on the major railroads in the Eastern District[1] is shown in Table 4. The importance of the bankrupt Class I railroads is indicated by the fact that, in 1972, they accounted for 46 percent of the District's ton-mile rail freight volume and 14 percent of the total U.S. rail freight volume. In addition, a high percentage of rail traffic is interchanged between bankrupt and solvent carriers. For example, 74 percent of Penn Central's 1972 traffic was handled in conjunction with some 80 other railroads.

## FACTORS INFLUENCING RAILROAD EFFICIENCY

As pointed out earlier, a basic purpose of the restructuring process established by the Act is to maintain adequate rail service while revising the existing rail system so that financially viable, privately-operated railroads will continue to serve the region. This process necessarily involves *all* of the railroads in the region—both bankrupt and solvent—since the operations of each impact on all the others. Therefore, the need is to improve the operating efficiency of the region's railroads as a whole, although the most noticeable end product of the process will be a reorganization of the bankrupt carriers under a new corporate organization.

To identify those areas where operating efficiency may be improved, it is useful to analyze the rail system on two levels. One level covers the interstate mainline network over which the individual rail carriers operate. This network consists basically of the system's comparatively high quality, high density rail lines. On the other level, there is the local service, pick-up and delivery and feeder network which serves to feed the interstate mainline structure. The following discussion deals first with efficiencies in the production of rail services in general and then with the provision of those services within the framework of intramodal and intermodal competition.

[1] The Eastern District, as defined by the Interstate Commerce Commission, differs from the region addressed in this report in that it excludes the northwestern third of Illinois and the Upper Peninsula of Michigan.

To understand the factors which influence the economic viability of a specific rail service, it is necessary to consider separately the major operations involved: (1) origination and termination switching; (2) intermediate switching; and (3) the line haul. Overall operating efficiency is closely linked to the generation of sufficient traffic volumes to achieve high utilization of labor and equipment in the line haul operation.

Because individual shippers seldom generate the traffic volumes required to fill an entire train, carriers must pick up cars from several shippers and assemble them into efficient-sized trains for the line haul portion of the overall movement. The specific location of the shipper's siding also has an important influence on the cost of rail pick-up and delivery service, a cost that can be measured in both time and money. If a shipper generates a large number of cars which can be efficiently assembled into trains with a minimum of crew and engine time, there will be a lower per unit cost. If, however, a shipper generates only one or a few cars at a time, the unit cost of assembling trains will be high.

Each individual rail carrier providing service within a given area generally provides yards for the assembly and disassembly of trains, and each of these yards must be maintained, staffed with train and yard crews, and equipped with switching locomotives. Thus, where two or more railroads provide local service, the resultant redundancy and under-utilization of resources increases the overall cost to the system of providing pick-up and delivery services within that area. In this connection, it should be noted that the time taken to assemble trainload volumes represents essentially lost time to shippers because their goods are not moving toward their destination. To the extent that this assembly process is prolonged by the presence of more than one carrier in a given local area, the "cost" to the shipper is just that much more.

In addition, a shipment's delay in transit will be further increased if the train cannot move through to its ultimate destination without additional switching enroute. Such intermediate switching is required in three types of situations. First, it is necessary when cars are added or dropped off at small traffic-generating points along the route. Second, such switching results from the fragmentation of locally generated traffic among the mainline systems of the several railroads providing the local service. In both of these cases it is necessary to reclassify (or regroup) cars at major junction points in order to keep traffic moving in trainload lots. Finally, intermediate switching occurs where a shipment moves out of one carrier's territory into another's.

The optimum train operation, obviously, is the direct movement of trainload lots from one origin to one termination. The cost for this highly efficient type of direct service is roughly half that of the average train movement. However, as traffic volumes decline, the rates of labor and equipment utilization, and hence efficiency, also decline.

Of the three principal factors of production involved in the provision of rail services (labor, capital and materials), labor and capital costs each amount to approximately 44 percent of total expenses.[1]

Thus, while the efficiency of rail operations can be improved in many ways, the significant improvements will have to be realized through increases in capital and/or labor productivity. In our opinion, one of the greatest opportunities for increasing productivity is in finding ways to change inflexible labor work rules to permit better utilization of both labor and capital. However, since the Act does not provide any direct mechanism for making such changes, the focus of this report is on obtaining improvements in capital productivity. Such improvements may also provide a means for increasing rail revenues by attracting new and higher rated traffic.

### Means of Improving Capital Productivity

The greatest potential for improvement in capital productivity lies in increasing the rate of utilization of the fixed plant (right-of-way and yards), increasing the productivity of equipment, and eliminating unnecessary excess capacity. The opportunities for accomplishing this in the region are clearly evident, and include mainline[2] and local tracks and facilities as well as equipment, especially freight cars.

**Duplicate Mainlines:** The region's existing 36,000 miles of mainline track contain some segments which carry the highest traffic density (measured in terms of gross ton-miles per track mile per year) of any rail lines in the nation. However, the average traffic density on most of this mainline network is very low relative to capacity. As shown in Table 5, almost a third of the Eastern District's mainline track falls into the traffic density category having only three average-sized trains per day or 1.5 trains in each

TABLE 5.—MAINLINE TRACK UTILIZATION

(In Eastern District, 1972)

| Million Gross Ton Miles Per Track Mile Per Year | Number of Average Sized Trains Per Day [1] | Percent of Total Track Miles In District [2] |
|---|---|---|
| 1— 9.9 | 0.6— 6.1 | 27 |
| 10—19.9 | 6.2—12.3 | 39 |
| 20—29.9 | 12.4—18.5 | 23 |
| 30—39.9 | 18.6—24.7 | 10 |
| 40 and over | 24.8 and over | 1 |

[1] Based on Eastern District average train size of 4,254 tons in 1972, data contained in Class I Railroad *Financial and Operating Statistics*, Interstate Commerce Commission

[2] Eastern District as defined by the Interstate Commerce Commission

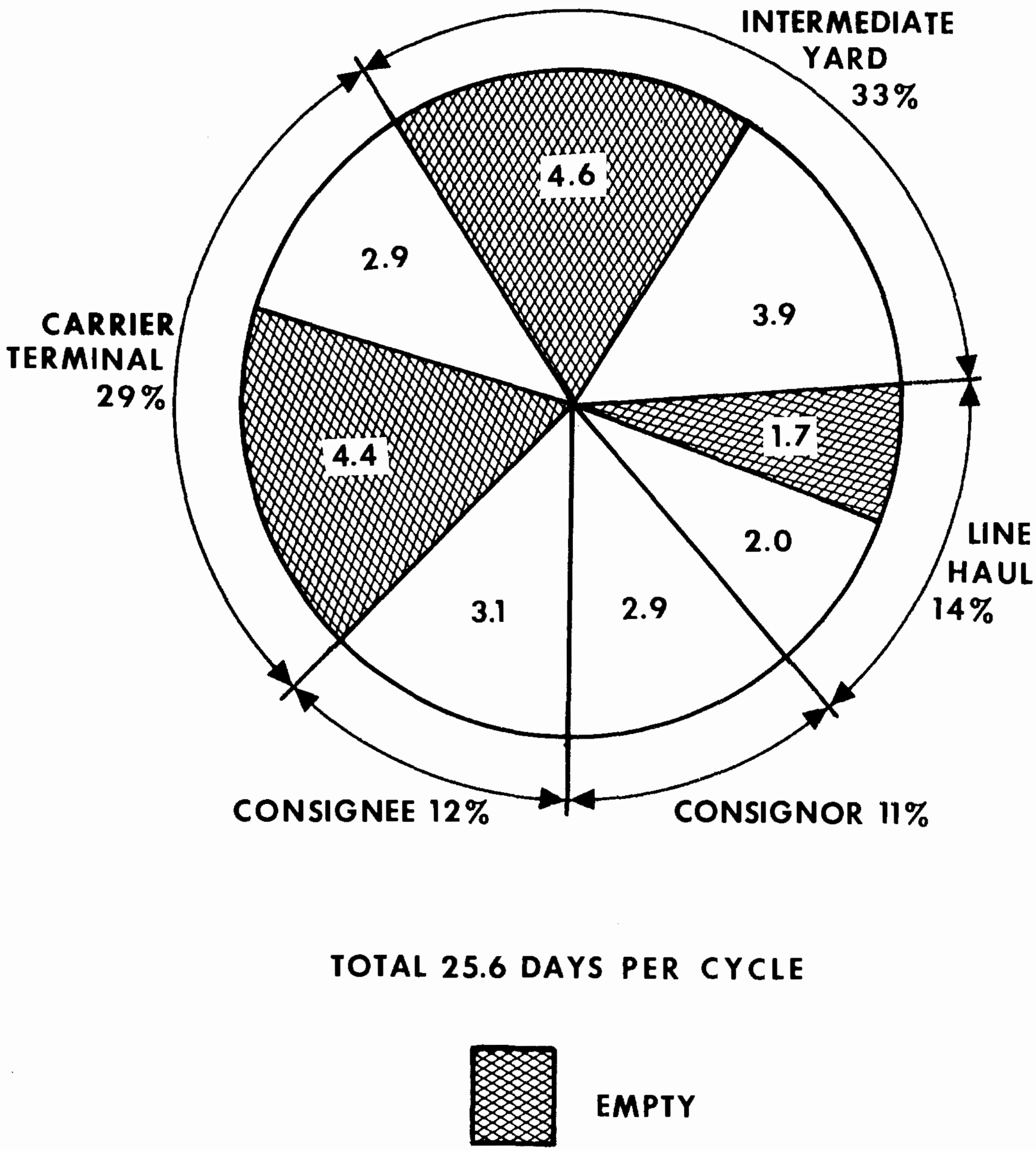
*Data Source:* Federal Railroad Administration, Office of Economics, compiled from traffic density maps supplied by region's Class I railroads.

[1] *Improving Railroad Productivity*, November 1973, p. 79.

[2] In this report a section of track is classified as "mainline" if it is equipped with railroad signals.

FIGURE 2

## TYPICAL FREIGHT CAR CYCLE
IN DAYS



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direction per day. Only one percent of the District's mainline trackage is found in the highest density category which represents at least one train per hour.

An insight into the low rate of capacity utilization represented by these data can be gained by comparing it with the practical capacity of a track equipped with an automatic block signal system. As shown earlier, the capacity of a single track automatic block signal system is 40 trains per day (total in both directions). For a CTC signal system on a single track the daily capacity is 60 trains.

A second method for measuring mainline track utilization is to compare actual traffic densities with practical line capacities for the mainlines in selected areas of the region and other sections of the nation. As shown in Table 6, such a comparison indicates that utilization rates

TABLE 6.—MAINLINE CAPACITY UTILIZATION IN SELECTED AREAS—(1972)

| Selected Area | Estimated Typical Utilization (Percent) |
|---|---|
| In Region | |
| Eastern Seaboard to the Alleghenies (Harrisburg/Cumberland) | 25 |
| Mainlines through the Alleghenies to Pittsburgh | 40 |
| New York and New England to Buffalo | 20 |
| East-West Mainlines in Central Ohio | 30 |
| North-South Mainlines in Central Ohio and Central Indiana | 25 |
| Mainlines into St. Louis | 25 |
| Mainlines into Chicago | 30 |
| Outside Region | |
| Mainlines through Rocky Mountains | 45 |
| Los Angeles to the North | 40 |
| Los Angeles to the East | 45 |

*Data Source:* Federal Railroad Administration, Office of Economics, compiled from traffic density maps supplied by Class I railroads.

for the region range from 20 to 45 percent of practical capacity but center around 25 percent. In contrast, utilization rates in the western part of the U.S. are substantially higher.

This low utilization of capacity results primarily from duplicative mainlines. This suggests that one obvious solution to this problem is to either eliminate or downgrade to secondary feeder status the unnecessary mainlines and utilize the remaining lines at a much higher level.

**Excess Local Lines:** As discussed in detail in Part II of this report, the region abounds with low density local lines which were laid during an era when rail transportation was the only efficient way to move goods. With the changing structure of the economy of the region and the great increase in transportation by motor carrier, the traffic over many of these lines is so light that the cost of their operation far exceeds the revenue produced. However, by introducing certain changes in operating procedures, by using the services of a different rail carrier in some cases, and by adjusting some tariff rates, continued direct rail service should be possible to almost all the region's current rail customers while still permitting the elimination of a significant part of the existing rail network. Also, alternative means of transportation by motor carrier/rail combinations will be available for those few shippers who could no longer be located on a direct rail line.

**Freight Car Utilization:** The relative inefficiency of present rail industry practices is illustrated by the utilization pattern of freight cars. A national measure of freight car utilization is shown in Figure 2. Out of a typical car cycle totalling 26 days, 14 percent of the average car's time is spent in the line haul operation while 33 percent is spent in intermediate switching operations, 29 percent is spent in a railroad's terminal operations at origin or termination points, and 23 percent is spent at the shipper's siding.

The region's problem is compounded by the fact that its average daily car mileage is substantially lower than in the rest of the country—about 41 miles as compared to 52 miles in the south and 72 miles in the west.

The length of time a freight car spends in switching yards at either terminal or intermediate points contrasts sharply with the physical length of time required to perform the actual mechanical switching and classification operation.[1] Obviously, some additional terminal time beyond that actually necessary for the physical process of car switching is inevitable. However, the excessive amount of time freight cars are idled in this essentially unproductive activity is indicative of the gap between today's train operations and what is possible.

**Impact on Costs:** The impact of the present low rates of plant and equipment utilization upon the industry's cost structure is evident if one considers the large amout of capital currently invested in freight cars. The net investment of Class I railroads on road and equipment in 1972 was estimated to be $25 billion. Of this, freight cars account for $8 billion or roughly 33 percent.[2] In addition a significant portion of the nation's railroad equipment fleet is owned by entities other than railroads (e.g., shippers, financial institutions, etc.). The total value of such non-railroad owned equipment is unknown but has been estimated to be as high as $5 billion (by the

[1] The average length of time required to perform the actual switching or classification process at origin or termination terminals is less than 30 minutes, and the time required to perform the actual switching and reclassification operation at each intermediate switching point along the line haul movement requires less than ten minutes.

[2] *Transport statistics in the United States*, 1973, Interstate Commerce Commission.

Table 7.—ESTIMATED COST TO MODERNIZE TRACK AND ROADWAY

| Track Factors | | Estimated Modernization Costs | | |
|---|---|---|---|---|
| Type of Modernization | Total Miles of Track [1] | Cost Per Mile | Total Modernized (Percent) | Total Cost (Billions) |
| Major Rebuild of Signalled Track [2] | 36,000 | $225,000 | 100 | $8.1 |
| | | | 25 | 2.0 |
| | | | 10 | 0.8 |
| Minor Rebuild [3] of Signalled and Unsignalled Track | 75,000 | $20,000 | 100 | $1.5 |
| | | | 25 | 0.4 |
| | | | 10 | 0.2 |

[1] There are approximately 75,000 miles of track (excluding yard and way-switching tracks) in the ICC Eastern District of which 36,000 miles are signalled.

[2] Includes rebuilding subgrade and ballast, new ties and rails, and rehabilitating signal systems.

[3] Includes necessary tie and rail replacement, resurfacing and alignment.

*Data Sources:* (1) Cost estimates from Federal Railroad Administration Offices of Economics; Research, Development and Demonstration; and Safety.

(2) Total track miles from *Transport Statistics in the United States, 1971* Interstate Commerce Commission.

(3) Signalled track miles from Federal Railroad Administration, Office of Safety; as of 1970.

Task Force on Railroad Productivity).[1] If that estimate is correct, then freight cars could account for some 50 percent of the total net capital investment involved in providing rail service. Any reduction in the proportion of the freight car cycle which is spent in non-productive terminal operations would thus appreciably increase the productivity of the industry's capital investment.

Similarly, any increase in the industry's utilization of its mainline capacity would also permit an appreciable increase in the industry's capital productivity. Improved utilization of the mainline becomes particularly important when considering the magnitude of the estimated capital costs of rehabilitating the region's mainline system.

The poor capital productivity resulting from the rail system's excess capacity is clearly one of the causes of rail's low rate of return on investment. Moreover, the great cost of major plant modernization coupled with this low rate of return tends to deter the individual railroad from risking such investments. Needless to say, given the current precarious financial situation of much of the rail industry, most railroads find it difficult to raise expansion and modernization capital.

The magnitude of this problem is placed in sharp focus by the data in Table 7. The data indicate that major rebuilding of all existing signalled track in the Eastern District would require some $8 billion. This cost is, of course, not only prohibitive, but would also be a poor investment. Investment is warranted only where the utilization of the fixed plant is high enough to produce an acceptable return on the investment. We believe that in a restructured system only between 10 and 25 percent of the current track miles would require major or minor rebuilding.

Similarly, maintenance costs, as shown in Table 8, would be so large as to be prohibitive if the entire track network in the Eastern District were to remain in place and be properly maintained. Retention of the existing track structure and patterns of operation would require (1) maintenance of approximately 36,000 miles of signalled track at an annual cost of about $430 million, (2) maintenance of 39,000 miles of unsignalled track at an annual cost of approximately $195 million, and (3) maintenance of yard and way switching tracks at an

Table 8.—ESTIMATED ANNUAL COST TO MAINTAIN MODERNIZED TRACK AND ROADWAY

| Track Factors | | Estimated Annual Maitenance Costs | | |
|---|---|---|---|---|
| Type of Track | Total Miles of Track [1] | Cost per Mile [2] | Total Maintained (Percent) | Total Cost (Millions) |
| Signalled Track (primarily heavy density) | 36,000 | $12,000 | 100 | $430 |
| | | | 40 | 170 |
| Unsignalled Track (primarily light density) | 39,000 | $5,000 | 100 | $195 |
| | | | 75 | 145 |

[1] ICC Eastern District.

[2] Signalled track assumed maintained to Federal Railroad Administration Track Safety Standards, minimum Class 4 and maximum Class 5; unsignalled track to minimum Class 3 and maximum Class 4.

*Data Sources:* (1) Cost estimates from Federal Railroad Administration, Offices of Economics; Research, Development and Demonstration; and Safety.

(2) Total track miles from *Transport Statistics in the United States, 1971* Interstate Commerce Commission.

(3) Signalled track miles from Federal Railroad Administration Office of Safety; as of 1970.

[1] *Improving Railroad Productivity*, November 1973.

annual cost of approximately $150 million—a total of $775 million. It is estimated that the annual cost of maintaining a restructured and modernized system would be approximately $450 million.

**Reducing Variable Costs:** The Department evaluated the impact upon variable costs of changes in two selected aspects of operating efficiency. For line haul operation, potential variable cost savings were calculated on the basis of various possible reductions in the circuity of carrier routing in the region. On the average trains within the region follow routes that are 13 percent longer than the shortest available rail routes. In the case of switching operations, potential variable cost savings were calculated on the basis of reductions in the average amount of time required to perform the actual switching operation. The results of these calculations are shown in Table 9, which summarizes the estimated 1970 variable cost and the range of estimated variable cost savings for four primary rail operations at improved levels which the Department believes to be achievable:

1. *Line haul services*—Consolidation of traffic flows on a more direct and reduced mainline network could eliminate 30 to 50 percent of the existing circuity—saving $60 to $110 million annually.

2. *Terminal switching*—Consolidation of local service rail operations could produce an estimated 20 to 40 percent improvement in the amount of time required for terminal switching—saving $105 to $215 million annually.

TABLE 9.—ESTIMATED VARIABLE COSTS FOR RAILROADS IN THE REGION—(1970)

| Cost Element | Cost Factor: Line Haul | Terminal Switching | Interchange Switching | Enroute Switching |
|---|---|---|---|---|
| At 100 Percent of 1970 Average | | | | |
| Circuity (percent) [1] | 13 | — | — | — |
| Switch Minutes (per car) | — | 31 | 14 | 8 |
| *Costs* | | | | |
| Roadway ($ millions) | 250 | 30 | 10 | 10 |
| Equipment ($ millions) | 510 | 60 | 30 | 20 |
| Direct Labor ($ millions) | 290 | 270 | 120 | 90 |
| All Other ($ millions) | 730 | 170 | 80 | 60 |
| Total ($ millions) | 1,780 | 530 | 240 | 180 |
| Probable Percent Improvement Attainable | 30–50 [2] | 20–40 | 40–60 | 30–50 |
| Possible Annual Saving ($ millions) | 60–110 | 105–215 | 95–145 | 55–90 |

[1] Percent in excess of shortest available rail distance.
[2] Percent reduction in 13 percent circuity.

*Data Source:* Federal Railroad Administration
Office of Economics

3. *Interchange switching*—Consolidation of operations of the bankrupt railroads in the region would eliminate much of the interchange switching that now goes on among them; also, consolidation of both mainlines and local service lines and the coordination of services over those lines would further reduce the need for interchange switching—all together saving 40 to 60 percent or $95 to $145 million annually.

4. *Enroute switching*—Consolidation of local service operations would serve to concentrate line haul traffic flows and thereby reduce the need for enroute switching by 30 to 50 percent—saving $55 to $90 million annually.

These savings are representative of the variable costs of these four operations to the extent they can be quantified. It is expected that further savings will accrue in these and other operations when overall operating efficiency is improved.

**Reducing Service Duplication:** Setting aside for the moment considerations of rail competition which are discussed in the following section, the rail industry has the problem of too many railroads competing in low density markets that can support only a single rail carrier. Moreover, the quality of rail service is substantially below that required by the region's rail users. The greatest potential for service improvements lies in the elimination of duplicative service in order to permit the more frequent scheduling of efficient train size lots from origin terminals, and to permit more direct origin-to-destination service without intermediate stops for reclassification (regrouping) of trains.

The poor service levels which result from duplication of service is best measured by the large amount of time the average freight car is idled in essentially unproductive activity, as discussed above. This unproductive activity, which results primarily from the holding of cars for trainload lots and from switching cars into trains, represents delay in the movement of cars toward their destination and therefore is viewed as a reduction in service quality by the shipper. In addition, the low average daily car movement further reduces service quality. Thus, rail's long average transit time places it at a competitive disadvantage with the motor carrier.

Some further insight into the problem of mainline service duplication can be gained by comparing the total traffic generated at 17 of the region's major freight generating SMSA's[1] to the number of rail carriers serving them. Table 10 shows that the average number of daily trains per carrier is eight or more for only eight of these major SMSA's. The result is fragmented traffic flows, reduced service frequency by each carrier, and overall, lower quality service than would be possible with fewer carriers.

**Rail Competition:** The required improvements in rail operating efficiency cannot be achieved without making some significant reductions in interrailroad competition. Railroads compete with each other largely on the basis of quality of service, which includes freight car availability. Price competition among railroads is also a factor,

[1] SMSA's (Standard Metropolitan Statistical Areas) are comprised of one or more contiguous counties having a total population in excess of 50,000 and sharing certain socio-economic characteristics as established by the United States Office of Management and Budget.

Table 10.—TRAFFIC GENERATED BY SELECTED MAJOR SMSA's IN REGION [1]
(1972)

| SMSA | Average No. of Trains Per Day [2] | Number of Line Haul Rail Carriers |
|---|---|---|
| Chicago, IL | 175 | 16 |
| Pittsburgh, PA | 91 | 6 |
| Detroit, MI | 80 | 8 |
| St. Louis, MO | 75 | 14 |
| Philadelphia, PA/Camden, NJ | 69 | 4 |
| Newark, NJ | 56 | 6 |
| Cleveland, OH | 53 | 5 |
| Baltimore, MD | 47 | 3 |
| Gary, IN | 41 | 8 |
| Buffalo, NY | 36 | 8 |
| New York, NY | 25 | 5 |
| Cincinnati, OH | 24 | 6 |
| Boston, MA | 19 | 2 |
| Indianapolis, IN | 17 | 5 |
| Peoria, IL | 16 | 9 |
| Washington, DC | 16 | 5 |
| New Brunswick, NJ | 16 | 4 |

[1] Includes both originating and terminating traffic to SMSA noted.

[2] Computed on the basis of an average of 30 loaded cars per train (actual 1972 Eastern District average number of loaded cars per train was 38).

*Data Source:* Federal Railroad Administration
Office of Economics

but not of the same magnitude. For most traffic, competition in such service quality as transit time, reliability, and handling care is minimal, largely because a railroad's actual market (i.e., the origin-destination dimensions of a specific shipment) often lies outside its own service area and therefore involves other railroads. Since most traffic must be interchanged with another carrier, any single railroad is unable to control the efficiency of a shipment's total movement and thereby loses much of the incentive to try.

Despite the fact that a shipper may be served directly by only a single railroad, he can still choose among competing railroads by specifying the routing of his traffic. Thus, the shipper can switch his shipments from the railroad which provides his local service to another railroad at the nearest interchange point. This form of shipper control provides some significant measure of competitive leverage since it can deprive the originating railroad of the revenue from the more desirable line-haul segment of the overall movement. In instances where an individual shipper generates a large volume of traffic and where the shipper is located in a metropolitan area which also generates large volumes of rail freight traffic, direct rail access is even less of a constraining factor in a shipper's choice of railroads. In such areas, railroads often enter into agreements which allow one carrier to serve a shipper directly by using the tracks of another railroad.

By far the most significant market force facing the rail industry is intermodal competition. Though limited by geography, the relative efficiency of water carriers in the movement of bulk commodities has forced railroads to take innovative steps in the areas of rates, operating techniques, and freight car design. However, competition from motor carriers is more significant because of the large number of trucks and their ability to provide reliable, high quality service. These factors, together with the growth of the importance of service-sensitive manufactured commodities in the total transportation sector, the decentralization of manufacturing activity, and the inefficiencies of the existing rail system, have limited the effectiveness of railroads in competing with other modes. As shown in Table 11, when compared with motor carriers, the railroads clearly find it hard to compete in the short-haul markets of under 200 miles.

The primary reasons for rail's decline as an effective intermodal competitor are two: (1) the economic advantages of motor carriers in the shorter haul markets by providing greater flexibility in pick-up and delivery operation, greater load factor efficiency for less than trainload shipments, and more reliable service; and (2) the different intermodal environment in which the rail industry now competes, which has been significantly affected by an uneven public policy toward each of the modes. We believe that rail has been the net loser from this unevenness.

Table 11.—DISTRIBUTION OF NONURBAN FREIGHT TRAFFIC BY TYPE OF CARRIER AND LENGTH OF HAUL—(1965)

| | Percentage of Total Ton-Miles Hauled | | | | |
|---|---|---|---|---|---|
| Length of Haul (Miles) | Total, all Carriers [1] | Rail | Motor Carrier | Domestic Water | Pipeline |
| 0 and under 2.5 | * | — | * | — | — |
| 2.5 and under 20 | 2.9 | 0.1 | 2.2 | 0.1 | 0.6 |
| 20 and under 50 | 7.9 | 1.3 | 4.2 | 1.3 | 1.1 |
| 50 and under 200 | 20.6 | 3.4 | 8.6 | 4.7 | 3.9 |
| 200 and under 400 | 19.5 | 4.7 | 4.3 | 5.4 | 5.1 |
| 400 and under 600 | 9.4 | 4.3 | 1.2 | 1.9 | 2.0 |
| 600 and under 1,000 | 14.7 | 6.0 | 0.8 | 5.6 | 2.3 |
| 1,000 and over | 25.0 | 17.4 | 0.2 | 6.2 | 1.2 |
| Total, all Hauls | 100.0 | 37.3 | 21.5 | 25.1 | 16.1 |

[1] Includes air (less than 0.1 percent of total for all hauls).

* Less than 0.1 percent

*Note:* Figures may not add to totals due to rounding.

*Data Source:* U.S. Department of Transportation, *1972 National Transportation Report.*

The rail industry, however, still retains important advantages over its intermodal competition in certain areas. The principal advantages of rail over water carriers are a more flexible pickup and delivery operation, a more extensive network, faster transit time, and greater load factor efficiency at volumes less than barge-load. The advantages of rail over motor carrier are lower costs, the alternative of converting to non-petroleum electric motive power, and the potential of fast long haul transit times.

## RESTRUCTURING PROCESS

As the Association, the ICC and the Congress carry out the remainder of the planning process, they will have to consider various trade-offs among the countervailing pressures for equitable (or favored) treatment of particular groups. This section points out the principal areas where these choices must be made prior to publication of the Association's Final System Plan.

### Participation by the Region's Solvent Railroads

Although the legislation did not specify that the region's solvent railroads *must* participate in the restructuring process, our analysis indicates the potential value and importance of their participation. Full participation would offer the solvent railroads not only the long term financial advantages of a streamlined and rationalized system but would also preclude the possibility that their own viability would be threatened by a Federally-assisted new rail system. Their nonparticipation would prevent full realization of the rail industry's economic potential in the region. The Department urges the solvent railroads to become participants in the planning and restructuring process.

Both the Association and the solvent railroads should consider the options of the Corporation buying lines and facilities from the solvent railroads, or selling lines and facilities to them, or joining with them in coordinated operations. In the local service area, the solvent railroads should consider abandoning service on lines they own which are excess to the system, and combining services with the Corporation or other railroads to points which are jointly served. On the mainlines, solvent railroads should consider combining some operations with the Corporation, either by buying or selling lines or by joint use of lines where this would improve efficiency.

### Interrailroad Competition vs. Financial Viability

Under the private enterprise organization of our economy, balanced competition is a vital mechanism for regulating efficiency and safeguarding the public interest. In the rail industry today, both the enhancement of the competitive balance in the region's multi-modal transportation system and the need for rail consolidation require a major competitive reorganization of the industry.

Our view of the promotion of competition in the provision of rail freight transportation has two aspects. First, where traffic volumes are low or where the length of haul is short, public policy should seek to encourage intermodal competition between rail and motor carriers. Second, where traffic volumes are high and the length of haul is relatively long, public policy should promote interrailroad competition. Also, in those markets where barge operations are a relevant factor, intermodal competition between water carriers and rail should be encouraged.

Based on the evaluation of the nature of the excess capacity and service duplication problem and our view of the appropriate public policy, it is clear that the competitive realignment of the rail industry should be conducted differently at the mainline and local service levels. At the local service level, rail operations should in most, if not all, cases be consolidated so that service is provided by only one railroad. On the mainlines, interrailroad competition should generally be maintained for direct service between the region's major traffic generating centers. In certain areas, this competitive service may be provided over the same right-of-way.

These conclusions are based on explicit policy trade-offs. We believe that the benefits of financial viability, economic efficiency, and effective intermodal competition all outweigh the disadvantages associated with the creation of local service rail monopolies. Resolution of the financial viability problem should permit the railroads competing in the region's major interstate markets to maintain a more vital level of competitive innovation than was possible when their basic financial viability was under constant threat. In addition to receiving the benefits of industry-wide innovations, shippers in local service areas will still have the benefits of interrailroad competition since they will be able to switch to a competing railroad at mainline interchange points.

### Optimizing Investment

Given the serious need for upgrading which exists in the region's present rail system and the limitations on the amount of funds which can productively be invested, an optimum allocation of the available resources for modernization is essential. The magnitude of the costs required for significant up-grading of the region's physical rail system coupled with the level of utilization required to make this investment economic constitutes one of the strongest arguments for substantial consolidation. In addition, joint usage of the rebuilt right-of-way, where possible, would enhance the efficiency in the use of resources.

### Energy Considerations

The energy efficiency of rail in intercity freight ranges from two to five times that of motor carriers in long-haul service. Consequently, an improvement in the competitive posture of the rail vis-a-vis the motor carrier mode would work toward greater energy conservation in the nation's transportation system. Moreover, consolidation of the large rail traffic flows over a mainline network shared by rail carriers could warrant electrification of many of the mainline routes as an economic and energy-effective improvement.

In contrast, the energy efficiency of motor carriers is greater than that of rail for short haul and very low volume movements. In this case, the objective of energy conservation would be promoted by the elimination of light density, short haul rail movements. In many other cases, substitution of truck or containerized intermodal (piggyback) movements would also improve the energy efficiency of the overall transportation system.

### Environmental Considerations

Consolidation of traffic onto a reduced rail system and the modernization of that system can serve to reduce existing adverse environmental impacts in three ways. First, the movement of rail traffic can be made more efficient with the consequent reduction in resource consumption and pollution. Second, the railroads' improved intermodal competitive ability can attract traffic back to rails from the highways either as piggyback or freight car traffic. Third, rights-of-way released by the restructuring process can be employed for other more useful public purposes.

We recognize that the abandonment of rail freight lines as part of the restructing process could have other interrelated impacts on the environment, including the potential social and economic effects on a few local communities that might lose rail service. From the standpoint of the communities, it appears that nearly all of the region's rail traffic will continue to move by direct rail service, and employment and other economic impacts will thus be minimal. The availability of substitute transportation and of the short-term rail service continuation subsidy support under the Act can also serve to eliminate these impacts. It is not expected that rail passenger service will be adversely affected; in fact it should be materially improved as a result of the modernization of the rail system in the region.

The shift of freight from rail to motor carrier may have a small impact upon the existing ambient air quality in a few instances. The amount of the impact would depend upon the level of efficiency of the rail operations to be dropped. In the case of some inefficient current rail operations, the emissions per ton-mile exceed those for motor carrier operations. From the long range view, the key point is that an improvement in the competitive position of the railroads versus motor carriers will lead to more freight being moved by rail and relatively less by motor carrier.

Regarding land use impacts, the opportunity exists to promote positive effects if care is taken, particularly at the State and local levels, to provide for continued transportation use of rail rights-of-way scheduled for abandonment or, in the event that is not feasible, to promote the use of such corridors for other public purposes.

* * * * *

Proceeding from the analysis of the region's rail system and the potential for its improvement, Part II of this Volume presents criteria and recommendations concerning the restructuring process at both the interstate and local service levels. Volume II presents the Secretary's recommendations for specific points to receive direct local rail service based on the criteria and analysis described in this volume, together with maps and other pertinent information on each of the 184 zones.

# PART II

## RECOMMENDATIONS FOR RAIL SERVICE

### OBJECTIVES AND METHODOLOGY

The process of restructuring the region's rail services must achieve these four objectives:

1. *The resulting rail system should be capable of providing service of adequate quality to meet user requirements.* Service of unacceptable quality will cause continued diversion of traffic from rail carriers to less efficient modes or, where other modes do not represent a long-term alternative, changes in the location of productive activity in order to minimize dependence on rail service.

2. *The resulting rail system should have sufficient capacity to meet the needs of the region's commerce.* The process of consolidation of services and rationalization of facilities must not proceed so far as to preclude access to the resulting rail system by a significant portion of existing or projected traffic flows.

3. *The resulting rail system should improve efficiency in the use of resources.* Inefficiency results in the consumption of excessive amounts of resources not only in the transportation sector but throughout those sectors of the economy which require transportation services.

4. *The resulting rail system should be financially viable.* Long-term financial stability is essential so that the rail system will be capable of efficiently meeting the region's transportation requirements without further major restructuring or continuing Federal financial involvement.

#### General Methodology

Attainment of the above objectives requires the application of different guidelines, criteria and analyses according to the type of rail service under study. For the purposes of this report, the region's rail freight services have been divided into two groups classed as either interstate (high volume traffic between zones) or local (pick-up and delivery within zones and feeder connections to the interstate network). The problems associated with each type of service are different, as is the approach to rationalizing and revitalizing them.

The interstate service network is that portion of the rail freight system which carriers the major traffic flows *between* traffic generating areas (zones). The existing interstate rail network is characterized by many duplicate, underutilized facilities due to the fragmentation of the traffic flows. The overall goal of the restructuring of the interstate network is the concentration of traffic flows onto a reduced network of track and associated yards and terminals. Such concentrated flows enable the efficient use of roadway, equipment and labor, and serve to make financially possible the investment in and maintenance of facilities necessary to provide high quality service.

The local service network is that portion of the rail freight system which connects the rail user in a zone *to* the interstate network. Thus, the local service network provides pickup and delivery service to the system's users and funnels that traffic onto the high volume interstate mainlines. The region's local service network is characterized by substantial redundancy in facilities and services with resulting poor efficiency, excessive costs and fragmentation of interstate traffic flows. Overall, the goal of the process of restructuring the local service network is the elimination of redundancy in order to make the network financially viable and more economically efficient, but yet provide adequate service.

The Act specifies that this report contain ". . . conclusions and recommendations with respect to the geographic zones within the region in and between which rail service should be provided . . .". The basis for identification of these zones may be SMSA's, groups of SMSA's, counties, or groups of counties having similar economic characteristics such as mining, manufacturing, or farming.

This zone approach facilitates the analysis of the region's rail requirements in four ways:

1. It permits the analysis of an area which is small enough to allow the inclusion of a substantial amount of detail and the identification of each traffic generating point.

2. It emphasizes local rail service requirements by excluding the need to consider traffic which now flows through the zone on mainlines but which may not continue to be routed through the zone in the future. If the points in a zone generate sufficient traffic to justify local rail service, that service will continue regardless of the ultimate configuration of the mainlines which carry traffic through the area.

3. It maintains a neutral position with respect to the present railroad corporate structures and their related track networks. The zone approach emphasizes the area's basic demand for rail service—where the traffic originates or terminates—and defines alternatives that allow the rail system (not specific companies) to meet that demand as efficiently as possible.

4. It facilitates the grouping of traffic generated in the zone in order to evaluate the requirements of the mainline rail network.

The region has been divided into a total of 184 zones, shown in Figure 3. The zones were created in two steps.



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First, the SMSA's were used as the basis for defining the initial set of zones. Second, those areas of the region outside of SMSA's were aggregated into groupings of contiguous counties (townships in the New England States) with similar socio-economic characteristics. The resulting 184 zones include St. Louis and Louisville, which are in states contiguous with the States specified in the Act as constituting the region. With these two exceptions, the 184 zones do not include any zones in States contiguous with those specified States.[1]

Of the 184 zones, 21 do not contain facilities or operations of bankrupt carriers. These zones are on the periphery of the region and include two zones in the Upper Peninsula of Michigan, six zones in northern and western Illinois, one zone in West Virginia, nine zones across southern Virginia and the three most northerly zones in Maine.

Following the identification of the zones, information was gathered for each zone with regard to major highways, rail lines and their characteristics (e.g., number of tracks, type of signal system, traffic density, etc.), and railroad traffic generating points. This information is needed for an understanding of each zone's overall transportation system, the capacity of its rail network and the sources of rail freight traffic.

Traffic data for 1972 originations and terminations were then obtained from all Class I railroads operating in the region. After these data were sorted by zone, they represented a comprehensive information base as to traffic, station loadings and the commodities involved. Table 12 summarizes total originating or terminating traffic for each of the 184 zones in the region.

Using this traffic data and rail facility information for each zone, the analysis was conducted on two levels with a continuous iterative process between the two. First, adjacent zones were analyzed on a state wide basis to determine connecting traffic flows between adjacent zones and to points outside the region. Next, zone traffic was aggregated to give a first cut at determining the major traffic generating centers which would support high volume, mainline interstate traffic in the region. The possible mainline routes connecting these centers were then identified on the zone maps.

From this point, various criteria were applied on a zone-by-zone basis to determine which points in each zone should be recommended for local rail service. Similarly, other criteria were applied on a regional basis to determine which major traffic generating centers should be recommended for competitive rail service on an interstate network. Both sets of criteria and recommendations are discussed in detail in the sections that follow.

Each of the 184 zones has been analyzed uniformly with regard to recommendations of points to receive direct rail service. However, for the 163 zones served by bankrupt railroads, the analysis went one step further by identifying potentially excess rail lines which are not necessary to serve the points recommended for service or are duplicate light-density feeder lines. This additional analysis is intended as a potential planning tool for the Association and for the States and local communities in determining where their own analysis should be concentrated during the remainder of the planning process.

For the remaining 21 zones we did not carry out the additional analysis of potentially excess lines. This type of analysis, when it impacts only on solvent carriers, can best be made in the context of the Association's overall dealings with these carriers.

### TABLE 12.—SUMMARY OF TRAFFIC BY ZONES

(Ranked in Order of Traffic Volume)

(1972)

| Zone | | Total Originating or Terminating Traffic | |
|---|---|---|---|
| *No.* | *Name and State* | *Annual Carloads (Thousands)* | *Cumulative Percentage of all Regional Carloads* |
| 131 | Chicago, IL | 1,906 | 8.3 |
| 076 | Pittsburgh, PA | 974 | 12.5 |
| 155 | Detroit, MI | 874 | 16.3 |
| 195 | Beckley, WV | 836 | 19.9 |
| 323 | St. Louis, MO | 805 | 23.4 |
| 066 | Philadelphia, PA | 749 | 26.7 |
| 194 | Bristol, VA | 627 | 29.4 |
| 094 | Cleveland, OH | 579 | 31.9 |
| 060 | Newark, NJ | 573 | 34.4 |
| 087 | Baltimore, MD | 501 | 36.5 |
| 113 | Toledo, OH | 460 | 38.5 |
| 146 | Carbondale, IL | 449 | 40.5 |
| 184 | Norfolk, VA | 430 | 42.3 |
| 130 | Gary, IN | 420 | 44.2 |
| 049 | Buffalo, NY | 390 | 45.9 |
| 200 | Huntington, WV | 354 | 47.4 |
| 075 | New Castle, PA | 339 | 48.9 |
| 197 | Clarksburg, WV | 334 | 50.3 |
| 093 | Youngstown, OH | 303 | 51.6 |
| 092 | Ashtabula, OH | 291 | 52.9 |
| 205 | Louisville, KY | 280 | 54.1 |
| 078 | Johnstown, PA | 276 | 55.3 |
| 098 | Steubenville, OH | 276 | 56.5 |
| 058 | New York, NY | 266 | 57.7 |
| 106 | Cincinnati, OH | 256 | 58.8 |
| 091 | Lorain, OH | 230 | 59.8 |
| 123 | Vincennes, IN | 223 | 60.7 |
| 014 | Boston, MA | 199 | 61.6 |
| 122 | Indianapolis, IN | 187 | 62.4 |
| 199 | Charleston, WV | 187 | 63.2 |
| 069 | Allentown, PA | 183 | 64.0 |
| 100 | Sandusky, OH | 176 | 64.8 |
| 099 | Wheeling, WV | 175 | 65.5 |

[1] As indicated in the first footnote in the Introduction and Summary, the Commission served on January 23, 1974, an order delineating four areas to be included in the region which are in States not specified by the Act as constituting part of the region. The Department anticipated the delineation by the Commission of the areas in the vicinity of Louisville and St. Louis. There was insufficient time to adjust this report to the delineation of the areas in the vicinity of Kewaunee and Manitowoc, Wisconsin. The Department will publish an addendum to this report dealing with those two zones.

TABLE 12 (continued)
SUMMARY OF TRAFFIC BY ZONES
(Ranked in Order of Traffic Volume)
(1972)

| Zone | | Total Originating or Terminating Traffic | |
|---|---|---|---|
| No. | Name and State | Annual Carloads (Thousands) | Cumulative Percentage of all Regional Carloads |
| 156 | Flint, MI | 168 | 66.2 |
| 090 | Washington, DC | 167 | 67.0 |
| 137 | Peoria, IL | 166 | 67.7 |
| 062 | New Brunswick, NJ | 164 | 68.4 |
| 185 | Newport News, VA | 160 | 69.1 |
| 001 | Bangor, ME | 148 | 69.7 |
| 107 | Hamilton/Middletown, OH | 144 | 70.4 |
| 166 | Escanaba, MI | 137 | 71.0 |
| 097 | Dover, OH | 136 | 71.5 |
| 046 | Syracuse, NY | 136 | 72.1 |
| 134 | La Salle/Peru, IL | 135 | 72.7 |
| 074 | State College, PA | 132 | 73.3 |
| 103 | Columbus, OH | 128 | 73.8 |
| 186 | Petersburg, VA | 127 | 74.4 |
| 082 | Pottsville, PA | 126 | 74.9 |
| 083 | York, PA | 125 | 75.5 |
| 081 | Harrisburg, PA | 122 | 76.0 |
| 139 | Kankakee, IL | 120 | 76.5 |
| 084 | Wilmington, DE | 119 | 77.0 |
| 167 | Marquette, MI | 117 | 77.5 |
| 117 | Kokomo, IN | 115 | 78.0 |
| 047 | Rochester, NY | 115 | 78.5 |
| 136 | Galesburg, IL | 112 | 79.0 |
| 196 | Martinsburg, WV | 111 | 79.5 |
| 124 | Evansville, IN | 107 | 79.9 |
| 145 | Mt. Vernon, IL | 105 | 80.4 |
| 108 | Dayton, OH | 103 | 80.8 |
| 163 | Grand Rapids, MI | 98 | 81.3 |
| 187 | Richmond, VA | 96 | 81.7 |
| 193 | Radford, VA | 94 | 82.1 |
| 198 | Parkersburg, WV | 94 | 82.5 |
| 142 | Decatur, IL | 92 | 82.9 |
| 125 | Terre Haute, IN | 92 | 83.3 |
| 190 | Staunton, VA | 90 | 83.7 |
| 133 | Sterling, IL | 89 | 84.1 |
| 135 | Davenport, IA/Rock Island, IL | 87 | 84.4 |
| 042 | Albany, NY | 87 | 84.8 |
| 161 | Lansing, MI | 84 | 85.2 |
| 002 | Augusta, ME | 83 | 85.6 |
| 141 | Mattoon, IL | 82 | 85.9 |
| 102 | Zanesville, OH | 82 | 86.3 |
| 165 | Traverse City, MI | 80 | 86.6 |
| 088 | Hagerstown, MD | 78 | 86.9 |
| 095 | Akron, OH | 78 | 87.3 |
| 112 | Marion, OH | 77 | 87.6 |
| 096 | Canton, OH | 75 | 87.9 |
| 150 | Battle Creek, MI | 72 | 88.3 |
| 162 | Midland, MI | 69 | 88.6 |

TABLE 12 (continued)
SUMMARY OF TRAFFIC BY ZONES
(Ranked in Order of Traffic Volume)
(1972)

| Zone | | Total Originating or Terminating Traffic | |
|---|---|---|---|
| No. | Name and State | Annual Carloads (Thousands) | Cumulative Percentage of all Regional Carloads |
| 105 | Portsmouth, OH | 68 | 88.8 |
| 132 | Rockford, IL | 65 | 89.1 |
| 188 | Charlottesville, VA | 62 | 89.4 |
| 126 | Crawfordsville, IN | 62 | 89.7 |
| 044 | Watertown, NY | 60 | 89.9 |
| 077 | Uniontown, PA | 59 | 90.2 |
| 143 | Lincoln, IL | 55 | 90.4 |
| 052 | Elmira, NY | 54 | 90.7 |
| 068 | Reading, PA | 54 | 90.9 |
| 116 | Ft. Wayne, IN | 54 | 91.1 |
| 148 | Quincy, IL | 53 | 91.3 |
| 159 | Saginaw, MI | 50 | 91.6 |
| 024 | Springfield, MA | 47 | 91.8 |
| 041 | Plattsburg, NY | 46 | 92.0 |
| 189 | Winchester, VA | 46 | 92.2 |
| 101 | Mansfield, OH | 45 | 92.4 |
| 065 | Vineland, NJ | 45 | 92.6 |
| 151 | Kalamazoo, MI | 44 | 92.7 |
| 110 | Bellefontaine, OH | 43 | 92.9 |
| 157 | Port Huron, MI | 43 | 93.1 |
| 153 | Ann Arbor, MI | 43 | 93.3 |
| 114 | Defiance, OH | 42 | 93.5 |
| 067 | Lancaster, PA | 41 | 93.7 |
| 111 | Lima, OH | 41 | 93.8 |
| 158 | Bay City, MI | 40 | 94.0 |
| 010 | Montpelier, VT | 38 | 94.2 |
| 027 | Providence, RI | 38 | 94.3 |
| 005 | Portland, ME | 38 | 94.5 |
| 051 | Erie, PA | 38 | 94.7 |
| 085 | Dover, DE | 35 | 94.8 |
| 191 | Roanoke, VA | 35 | 95.0 |
| 144 | Springfield, IL | 34 | 95.1 |
| 073 | Williamsport, PA | 34 | 95.3 |
| 192 | Lynchburg, VA | 33 | 95.4 |
| 072 | Wilkes-Barre, PA | 32 | 95.5 |
| 121 | Bloomington, IN | 31 | 95.7 |
| 149 | Benton Harbor, MI | 31 | 95.8 |
| 070 | Lehighton, PA | 31 | 95.9 |
| 120 | Richmond, IN | 31 | 96.1 |
| 032 | Hartford, CT | 30 | 96.2 |
| 037 | New Haven, CT | 30 | 96.3 |
| 089 | Waldorf, MD | 30 | 96.5 |
| 050 | Jamestown, NY | 30 | 96.6 |
| 140 | Champaign, IL | 30 | 96.7 |
| 080 | Chambersburg, PA | 29 | 96.9 |
| 012 | Lawrence, MA | 29 | 97.0 |
| 008 | Nashua, NH | 29 | 97.1 |
| 025 | Worcester, MA | 28 | 97.2 |
| 071 | Scranton, PA | 26 | 97.3 |

TABLE 12 (continued)
SUMMARY OF TRAFFIC BY ZONES
(Ranked in Order of Traffic Volume)
(1972)

| Zone | | Total Originating or Terminating Traffic | |
|---|---|---|---|
| *No.* | *Name and State* | *Annual Carloads (Thousands)* | *Cumulative Percentage of all Regional Carloads* |
| 035 | Bristol, CT | 26 | 97.5 |
| 115 | Elkhart, IN | 26 | 97.6 |
| 128 | Michigan City, IN | 26 | 97.7 |
| 183 | Fredericksburg, VA | 24 | 97.8 |
| 129 | South Bend, IN | 24 | 97.9 |
| 119 | Anderson, IN | 22 | 98.0 |
| 104 | Athens, OH | 22 | 98.1 |
| 164 | Muskegon, MI | 20 | 98.2 |
| 127 | Lafayette, IN | 20 | 98.2 |
| 007 | Berlin, NH | 19 | 98.3 |
| 063 | Trenton, NJ | 19 | 98.4 |
| 079 | Altoona, PA | 18 | 98.5 |
| 045 | Utica/Rome, NY | 15 | 98.6 |
| 031 | Middletown, CT | 15 | 98.6 |
| 004 | Biddeford, ME | 15 | 98.7 |
| 011 | Rutland, VT | 14 | 98.7 |
| 118 | Muncie, IN | 14 | 98.8 |
| 056 | Poughkeepsie, NY | 13 | 98.9 |
| 030 | Norwich, CT | 13 | 98.9 |
| 038 | Bridgeport, CT | 13 | 99.0 |
| 021 | Greenfield, MA | 13 | 99.0 |
| 054 | Cortland, NY | 12 | 99.1 |
| 152 | Jackson, MI | 12 | 99.1 |
| 053 | Binghamton, NY | 12 | 99.2 |
| 020 | Fitchburg, MA | 12 | 99.2 |
| 036 | Waterbury, CT | 10 | 99.3 |
| 009 | Manchester, NH | 10 | 99.3 |
| 048 | Batavia, NY | 10 | 99.4 |
| 055 | Hudson, NY | 9 | 99.4 |

TABLE 12 (continued)
SUMMARY OF TRAFFIC BY ZONES
(Ranked in Order of Traffic Volume)
(1972)

| Zone | | Total Originating or Terminating Traffic | |
|---|---|---|---|
| *No.* | *Name and State* | *Annual Carloads (Thousands)* | *Cumulative Percentage of all Regional Carloads* |
| 138 | Bloomington, IL | 9 | 99.4 |
| 109 | Springfield, OH | 8 | 99.5 |
| 029 | Putnam, CT | 8 | 99.5 |
| 013 | Lowell, MA | 8 | 99.5 |
| 019 | Marlboro, MA | 7 | 99.6 |
| 022 | Pittsfield, MA | 6 | 99.6 |
| 003 | Lewiston, ME | 6 | 99.6 |
| 017 | New Bedford, MA | 6 | 99.7 |
| 016 | Taunton, MA | 6 | 99.7 |
| 061 | Sparta, NJ | 5 | 99.7 |
| 018 | Fall River, MA | 5 | 99.7 |
| 086 | Salisbury, MD | 5 | 99.7 |
| 015 | Brockton, MA | 5 | 99.8 |
| 006 | Portsmouth, NH | 4 | 99.8 |
| 160 | Owosso, MI | 4 | 99.8 |
| 023 | Adams, MA | 4 | 99.8 |
| 064 | Atlantic City, NJ | 4 | 99.8 |
| 033 | New Britain, CT | 3 | 99.8 |
| 043 | Amsterdam, NY | 3 | 99.9 |
| 040 | Stamford, CT | 2 | 99.9 |
| 039 | Norwalk, CT | 1 | 99.9 |
| 026 | Webster, MA | 1 | 99.9 |
| 034 | Meriden, CT | 1 | 99.9 |
| 182 | Cape Charles, VA | 0 | |
| 028 | Westerly, RI | 0 | |

Note: Totals do not add to 100% due to rounding.
Data Source: 1972 Traffic data from Class I railroads.

# FIGURE 3

# ZONE MAP OF THE MIDWEST AND NORTHEAST REGION

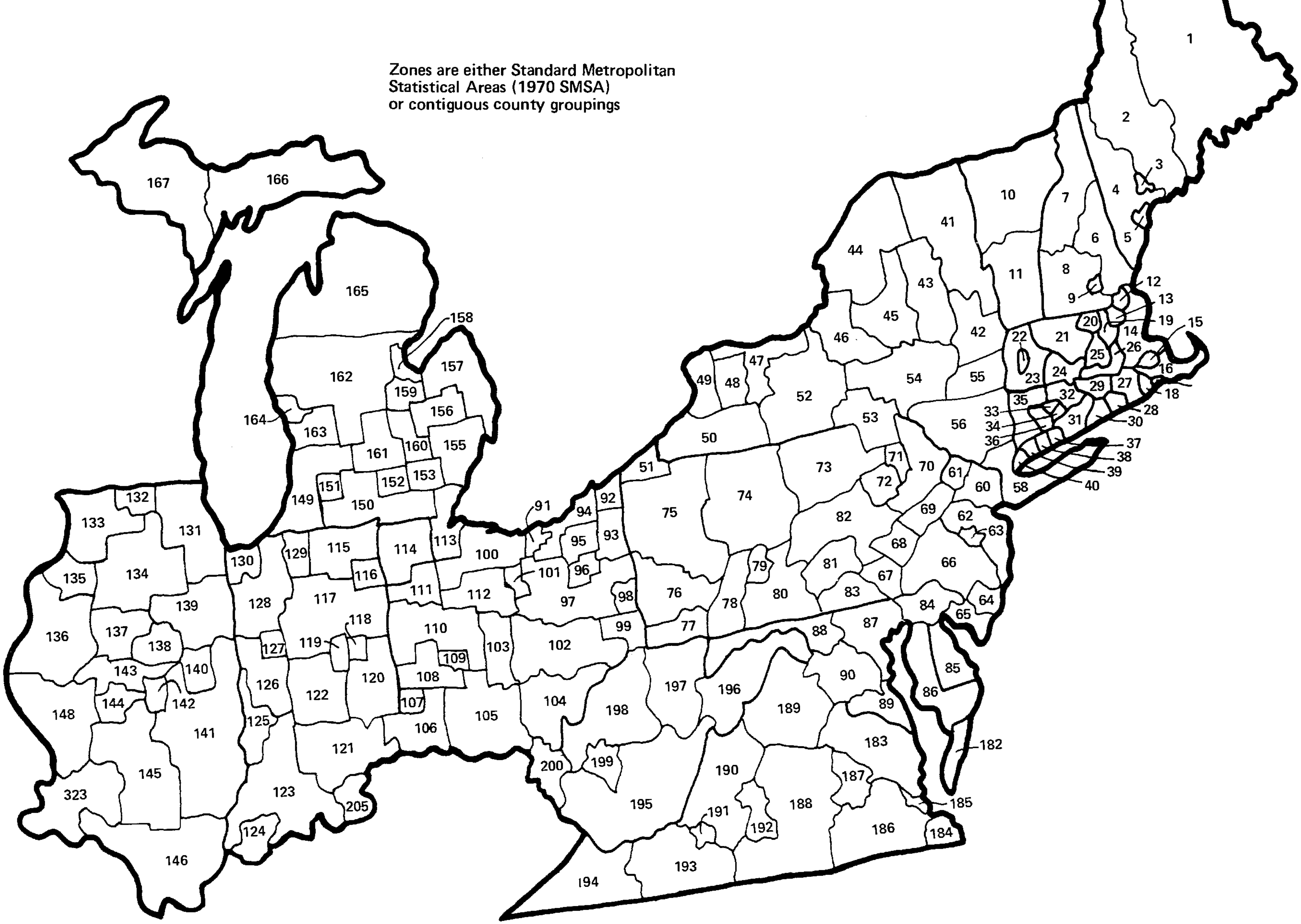


**FIGURE 3**

**ZONES LISTED BY NUMERICAL ORDER**

| *Zone Number* | *Zone Name* |
|---|---|
| 001 | Bangor, ME |
| 002 | Augusta, ME |
| 003 | Lewiston, ME |
| 004 | Biddeford, ME |
| 005 | Portland, ME |
| 006 | Portsmouth, NH |
| 007 | Berlin, NH |
| 008 | Nashua, NH |
| 009 | Manchester, NH |
| 010 | Montpelier, VT |
| 011 | Rutland, VT |
| 012 | Lawrence, MA |
| 013 | Lowell, MA |
| 0I4 | Boston, MA |
| 015 | Brockton, MA |
| 016 | Taunton, MA |
| 017 | New Bedford, MA |
| 018 | Fall River, MA |
| 019 | Marlboro, MA |
| 020 | Fitchburg, MA |
| 021 | Greenfield, MA |
| 022 | Pittsfield, MA |
| 023 | Adams, MA |
| 024 | Springfield, MA |
| 025 | Worcester, MA |
| 026 | Webster, MA |
| 027 | Providence, RI |
| 028 | Westerly, RI |
| 029 | Putnam, CT |
| 030 | Norwich, CT |
| 031 | Middletown, CT |
| 032 | Hartford, CT |
| 033 | New Britain, CT |
| 034 | Meriden, CT |
| 035 | Bristol, CT |
| 036 | Waterbury, CT |
| 037 | New Haven, CT |
| 038 | Bridgeport, CT |
| 039 | Norwalk, CT |
| 040 | Stamford, CT |
| 041 | Plattsburg, NY |
| 042 | Albany, NY |
| 043 | Amsterdam, NY |
| 044 | Watertown, NY |
| 045 | Utica/Rome, NY |
| 046 | Syracuse, NY |
| 047 | Rochester, NY |
| 048 | Batavia, NY |
| 049 | Buffalo, NY |
| 050 | Jamestown, NY |
| 051 | Erie, PA |
| 052 | Elmira, NY |
| 053 | Binghamton, NY |
| 054 | Cortland, NY |
| 055 | Hudson, NY |
| 056 | Poughkeepsie, NY |
| 058 | New York, NY |
| 060 | Newark, NJ |
| 061 | Sparta, NJ |
| 062 | New Brunswick, NJ |
| 063 | Trenton, NJ |
| 064 | Atlantic City, NJ |
| 065 | Vineland, NJ |
| 066 | Philadelphia, PA |
| 067 | Lancaster, PA |
| 068 | Reading, PA |
| 069 | Allentown, PA |
| 070 | Lehighton, PA |
| 071 | Scranton, PA |
| 072 | Wilkes-Barre, PA |
| 073 | Williamsport, PA |
| 074 | State College, PA |
| 075 | New Castle, PA |
| 076 | Pittsburgh, PA |
| 077 | Uniontown, PA |
| 078 | Johnstown, PA |
| 079 | Altoona, PA |
| 080 | Chambersburg, PA |
| 081 | Harrisburg, PA |
| 082 | Pottsville, PA |
| 083 | York, PA |
| 084 | Wilmington, DE |
| 085 | Dover, DE |
| 086 | Salisbury, MD |
| 087 | Baltimore, MD |
| 088 | Hagerstown, MD |
| 089 | Waldorf, MD |
| 090 | Washington, DC |
| 091 | Lorain, OH |
| 092 | Ashtabula, OH |
| 093 | Youngstown, OH |
| 094 | Cleveland, OH |
| 095 | Akron, OH |
| 096 | Canton, OH |
| 097 | Dover, OH |
| 098 | Steubenville, OH |
| 099 | Wheeling, WV |
| 100 | Sandusky, OH |
| 101 | Mansfield, OH |
| 102 | Zanesville, OH |
| 103 | Columbus, OH |
| 104 | Athens, OH |
| 105 | Portsmouth, OH |
| 106 | Cincinnati, OH |
| 107 | Hamilton/Middletown, OH |
| 108 | Dayton, OH |
| 109 | Springfield, OH |
| 110 | Bellefontaine, OH |
| 111 | Lima, OH |
| 112 | Marion, OH |
| 113 | Toledo, OH |
| 114 | Defiance, OH |
| 115 | Elkhart, IN |
| 116 | Fort Wayne, IN |
| 117 | Kokomo, IN |
| 118 | Muncie, IN |
| 119 | Anderson, IN |
| 120 | Richmond, IN |
| 121 | Bloomington, IN |
| 122 | Indianapolis, IN |
| 123 | Vincennes, IN |
| 124 | Evansville, IN |
| 125 | Terre Haute, IN |
| 126 | Crawfordsville, IN |
| 127 | Lafayette, IN |
| 128 | Michigan City, IN |
| 129 | South Bend, IN |
| 130 | Gary, IN |
| 131 | Chicago, IL |
| 132 | Rockford, IL |
| 133 | Sterling, IL |
| 134 | La Salle/Peru, IL |
| 135 | Davenport, IA/Rock Island, IL |
| 136 | Galesburg, IL |
| 137 | Peoria, IL |
| 138 | Bloomington, IL |
| 139 | Kankakee, IL |
| 140 | Champaign, IL |
| 141 | Mattoon, IL |
| 142 | Decatur, IL |
| 143 | Lincoln, IL |
| 144 | Springfield, IL |
| 145 | Mt. Vernon, IL |
| 146 | Carbondale, IL |
| 148 | Quincy, IL |
| 149 | Benton Harbor, MI |
| 150 | Battle Creek, MI |
| 151 | Kalamazoo, MI |
| 152 | Jackson, MI |
| 153 | Ann Arbor, MI |
| 155 | Detroit, MI |
| 156 | Flint, MI |
| 157 | Port Huron, MI |
| 158 | Bay City, MI |
| 159 | Saginaw, MI |
| 160 | Owosso, MI |
| 161 | Lansing, MI |
| 162 | Midland, MI |
| 163 | Grand Rapids, MI |
| 164 | Muskegon, MI |
| 165 | Traverse City, MI |
| 166 | Escanaba, MI |
| 167 | Marquette, MI |
| 182 | Cape Charles, VA |
| 183 | Fredericksburg, VA |
| 184 | Norfolk, VA |
| 185 | Newport News, VA |
| 186 | Petersburg, VA |
| 187 | Richmond, VA |
| 188 | Charlottesville, VA |
| 189 | Winchester, VA |
| 190 | Staunton, VA |
| 191 | Roanoke, VA |
| 192 | Lynchburg, VA |
| 193 | Radford, VA |
| 194 | Bristol, VA |
| 195 | Beckley, WV |
| 196 | Martinsburg, WV |
| 197 | Clarksburg, WV |
| 198 | Parkersburg, WV |
| 199 | Charleston, WV |
| 200 | Huntington, WV |
| 205 | Louisville, KY |
| 323 | St. Louis, MO |

## INTERSTATE RAIL SERVICE

The purpose of this section is to establish a methodology and to identify a set of prerequisitics for planning the development of a rail system capable of efficiently handling the region's interstate mainline freight movement both between zones in the region and to points outside the region. This section addresses the service from zone accumulation points (e.g. Lansing, Michigan) to major yards (e.g. Detroit) and the movement of traffic between major traffic generating points (e.g. Detroit-Buffalo). This section does not address pick-up and delivery and intrazone feeder lines and facilities which are analyzed on a zone-by-zone basis in the Local Rail Service section. Figure 4 shows conceptually the distinctions among these categories of rail service.

As discussed previously, we believe that the process for identifying rail service requirements between zones in the region must: (1) reduce duplicate facilities and service to permit efficient rail operations; (2) maintain sufficient interrailroad competition to assure a competitive approach to rates, quality and innovative service. and car supply to shippers in the region; and (3) demonstrate that the resultant system has sufficient potential economic efficiency to warrant major modernization and rehabilitation. The resulting rail network should meet the region's future rail transportation needs.

The planning process must determine the amount of fixed plant required to meet the region's large interstate traffic movements. The key portion of the regional interstate network should be a series of high volume, modernized mainline routes between major traffic generating centers in the region. Since competitive carriers can use facilities jointly, traffic volume should set the requirements for interstate facilities. The fact that two or more railroads serve a market does not necessarily require that each maintain an entire set of separate facilities, although the general practice today is for each carrier to have its own yards and line haul track. Therefore, the methodology seeks to determine first, the fixed plant requirements for efficient connectivity of the system and second, those zones which can support competitive rail service.

The remainder of this section will (1) describe the existing interstate rail network in the region and the key factors which have shaped its development; (2) identify the key factors which the Association must consider in planning the consolidation of the existing network's mainline facilities into a more efficient system; and (3) recommend a level of competitive service between zones in the region. The final portion of the section consists of eight example analyses of routes between major traffic generating zones. These examples describe how our recommendations regarding efficient fixed plant and competitive service can be applied by the Association in the planning process.

### The Existing Interstate Rail Network

The planning process should start with an understanding of the present mainline network. The basic rail physical facilities are already in place and the planning process must, therefore, deal with changes to an existing network.

The physical plant of the existing interstate network in the region, especially its mainline routes, developed over time in response to two primary interrelated factors: (1) the need to serve the dominant traffic generating centers; and (2) the region's geography. An analysis of the present configuration of the interstate network indicates that there are a series of predominant traffic flows which link the region's major rail traffic generators and over which a substantial portion of the interzone traffic moves. The concentration of the region's interstate flow along predominant patterns is apparent in Figure 5 which shows schematically the freight densities of the region's mainline traffic.

The heavy traffic concentrations over the broad bands of the region not only define the major current interstate traffic flows but also define the principal mainline routings which the Association must review to achieve the substantial route consolidation and rationalization required to establish an efficient interstate rail network. Because the two primary factors which caused the development of the existing interstate network are still present, it is important to understand their relevance in shaping today's structure.

*Traffic:* Of the region's 184 zones, 40 zones generate the region's dominant interstate flows. Their location in the region is illustrated in Figure 6. Cumulatively they account for 70 percent of the region's total carload originations and terminations. In terms of broad commodity categories, 28 of the zones generate primarily processed and manufactured product commodities and 12 of the zones generate primarily unprocessed bulk commodities—e.g. coal.

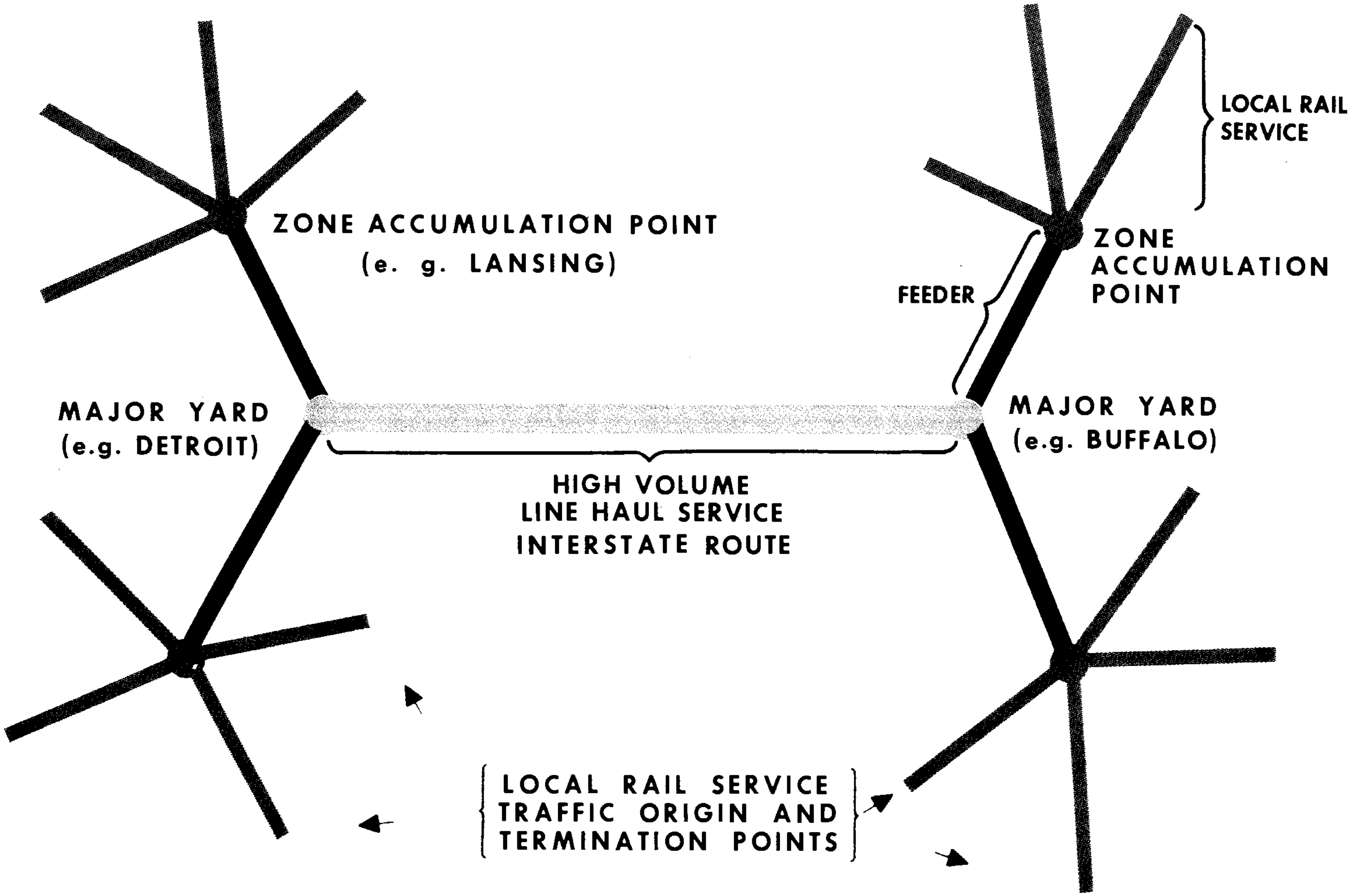
In addition to those zones which generate large volumes of traffic as a result of their local economic base, there are four major rail "gateways" located along the perimeter of the region which influence the dominant traffic flows. These gateways are largely the consequence of the institutional organization of the rail industry. The industry is structured so that the nation is composed of several major regions, each of which is served by separate rail carriers. This causes a convergence of interregional traffic flows at rail gateways to interchange freight between the rail carriers serving the separate regions. Like the major traffic generating centers these gateways along the region's perimeter anchor the predominant traffic flows. The major flows between the northeast and midwest region and the region west of the Mississippi go through Chicago and St. Louis. Similarly, the major flows between the northeast and midwest region and the southeast region go through Cincinnati and Washington, D.C. Although there are additional gateways along the region's perimeter, these four dominate the interregional traffic flows.

*Geography:* The geography of the region has also had a profound influence upon the configuration of the traffic flow pattern. For example, the Allegheny Mountains force the interstate flows along the east-west axis of the region's northern boundary to converge upon the Cleveland area in a narrow belt which extends along the southern shore of Lake Erie. Likewise, Lake Michigan causes flows to and from the northern plains states and the northwest region to converge at Chicago. East-west flows oriented

FIGURE 4

## SCHEMATIC OF RAIL SERVICE CATEGORIES

RELATIONSHIP OF TRAFFIC GATHERING AND LINE HAUL FUNCTIONS IN RAIL OPERATION



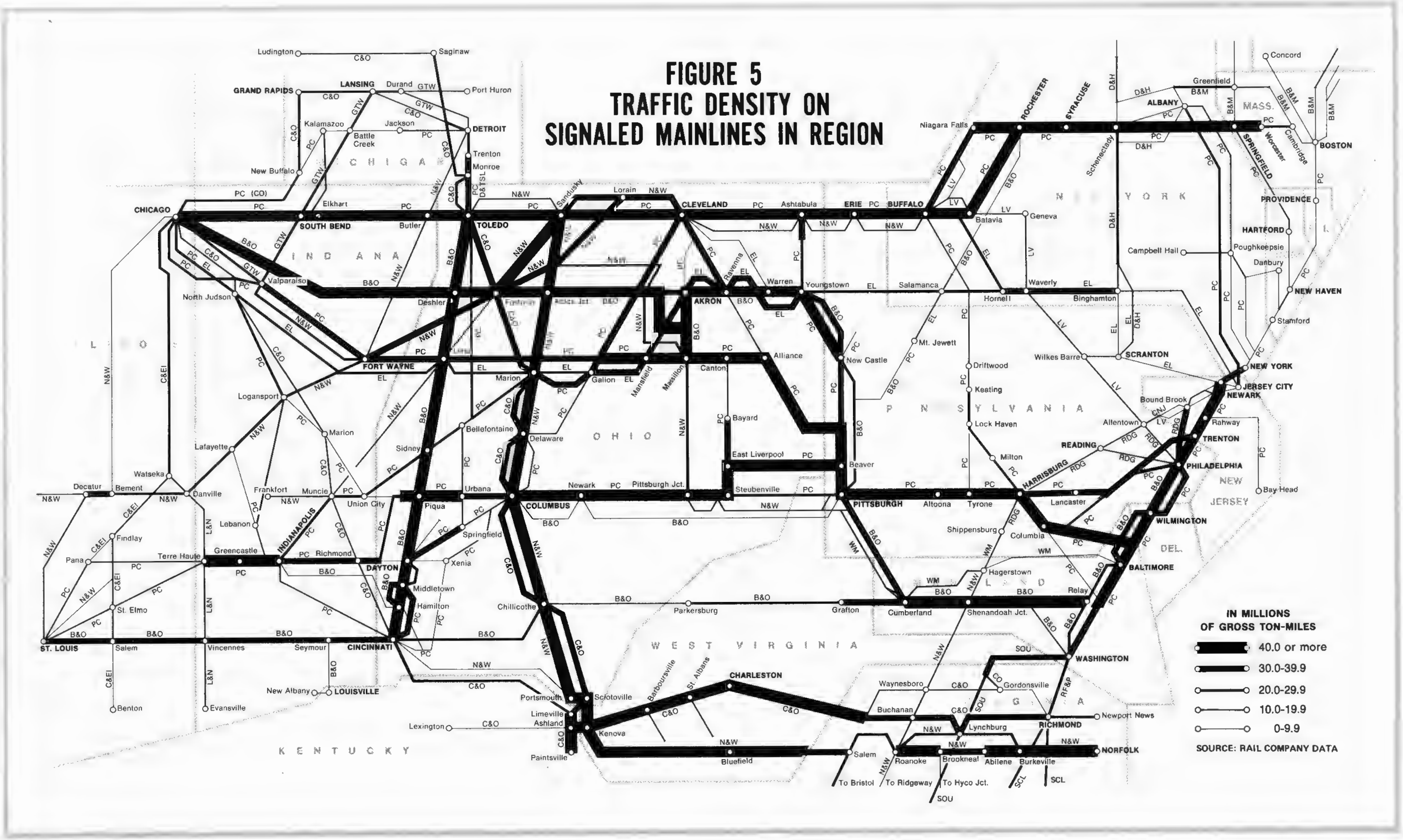
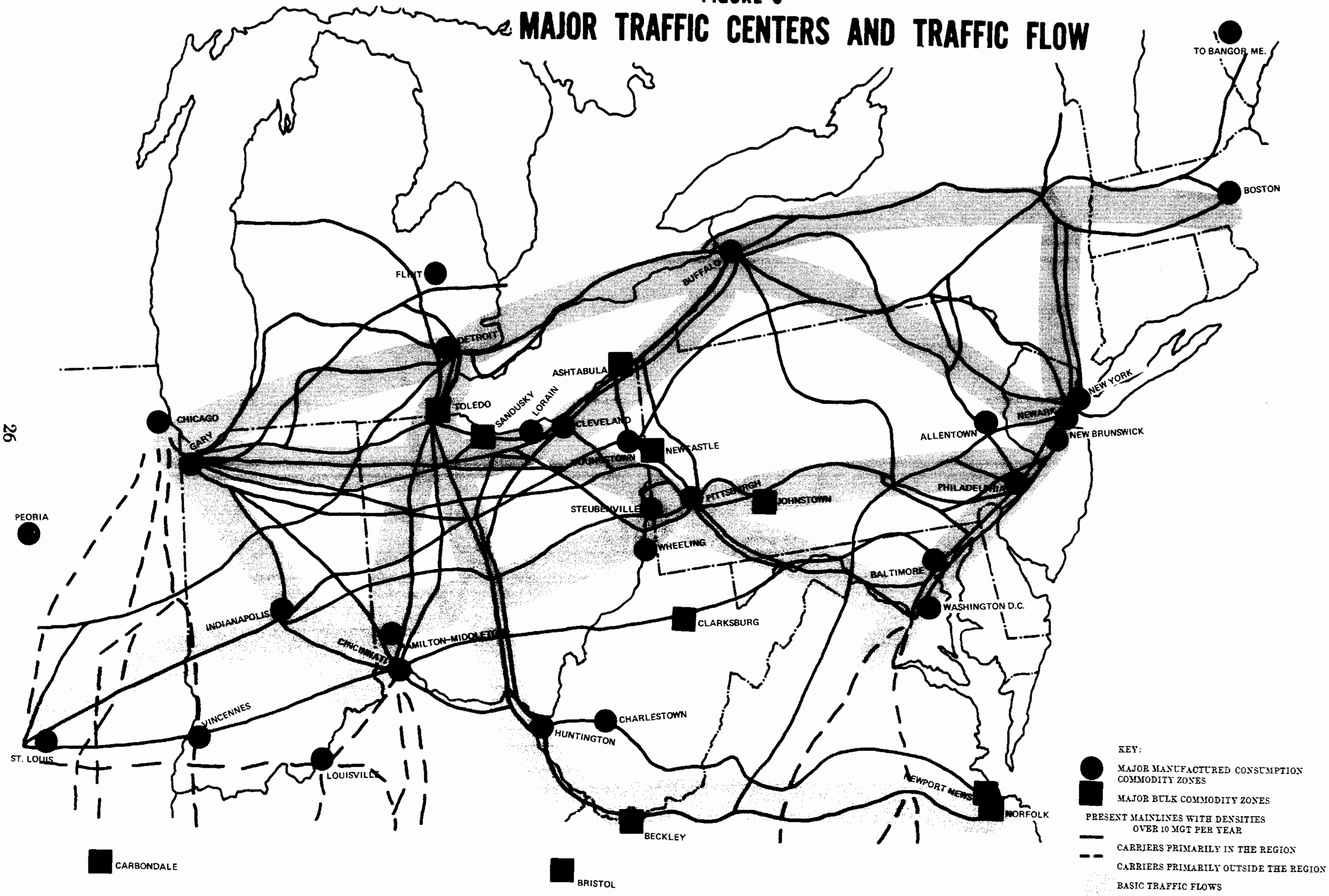


FIGURE 5
TRAFFIC DENSITY ON
SIGNALED MAINLINES IN REGION
IN MILLIONS
OF GROSS TON-MILES
40.0 or more
30.0-39.9
20.0-29.9
10.0-19.9
0-9.9
SOURCE: RAIL COMPANY DATA
CHICAGO
SOUTH BEND
TOLEDO
DETROIT
CLEVELAND
ERIE
BUFFALO
ROCHESTER
SYRACUSE
ALBANY
BOSTON
PROVIDENCE
HARTFORD
NEW HAVEN
NEW YORK
JERSEY CITY
NEWARK
TRENTON
PHILADELPHIA
WILMINGTON
BALTIMORE
WASHINGTON
RICHMOND
NORFOLK
PITTSBURGH
COLUMBUS
DAYTON
CINCINNATI
INDIANAPOLIS
ST. LOUIS
LOUISVILLE
FORT WAYNE
AKRON
CHARLESTON
SCRANTON
READING
HARRISBURG
LANSING
GRAND RAPIDS
SPRINGFIELD
Ludington
Saginaw
Port Huron
Kalamazoo
Battle Creek
Jackson
New Buffalo
Trenton
Monroe
Elkhart
Butler
Valparaiso
North Judson
Deshler
Lorain
Sandusky
Ashtabula
Youngstown
Warren
Ravenna
Alliance
Canton
Mansfield
Massillon
Marion
Galion
Bellefontaine
Sidney
Delaware
Newark
Pittsburgh Jct.
Steubenville
East Liverpool
Bayard
Beaver
New Castle
Salamanca
Hornell
Binghamton
Waverly
Geneva
Batavia
Niagara Falls
Schenectady
Concord
Greenfield
Worcester
Cambridge
Poughkeepsie
Danbury
Stamford
Campbell Hall
Wilkes Barre
Allentown
Bound Brook
Rahway
Bay Head
Lancaster
Columbia
Shippensburg
Hagerstown
Cumberland
Shenandoah Jct.
Relay
Grafton
Parkersburg
Chillicothe
Portsmouth
Scotoville
Limeville
Ashland
Kenova
Paintsville
Barboursville
St. Albans
Waynesboro
Gordonsville
Buchanan
Lynchburg
Newport News
Salem
Roanoke
Brookneal
Abilene
Burkeville
Bluefield
To Bristol
To Ridgeway
To Hyco Jct.
Altoona
Tyrone
Milton
Lock Haven
Keating
Driftwood
Mt. Jewett
Logansport
Lafayette
Marion
Frankfort
Muncie
Union City
Lebanon
Watseka
Danville
Decatur
Bement
Findlay
Pana
Terre Haute
Greencastle
Richmond
St. Elmo
Salem
Vincennes
Seymour
New Albany
Benton
Evansville
Lexington
Piqua
Urbana
Springfield
Xenia
Middletown
Hamilton
K E N T U C K Y
W E S T V I R G I N I A
O H I O
I N D I A N A
N E W Y O R K
P E N N S Y L V A N I A
MASS.
NEW JERSEY
DEL.

**FIGURE 6**

# MAJOR TRAFFIC CENTERS AND TRAFFIC FLOW



along the southern portion of the region converge upon a natural passage through the Allegheny Mountains via Pittsburgh.

From these factors the following broad patterns have emerged to shape today's physical plant. The northernmost series of concentrated east-west freight movements span the region from Chicago to the East Coast and serve the heavy concentration of industrial activity along the Great Lakes. The other series of major east-west freight movements span the region from St. Louis to the East Coast and serve principal concentrations of economic activity in the southern half of the region. These two heavy traffic flows converge and overlap in the Akron-Cleveland-Youngstown area in the form of an "X". This permits diagonal flows across the region—for example, from St. Louis to Buffalo or Boston, or from Baltimore to Chicago.

Of the two principal freight patterns oriented along a north-south axis, one serves the north-south flows east of the Alleghenies from the Canadian border to Washington, D.C. and the Virginia area. The second is anchored in the north at the western end of Lake Erie and extends south to the Cincinnati area and the West Virginia coal mining region.

When all these factors are considered, what emerges is a series of multiple parallel routes handling major traffic flows which converge at a limited number of points in the region. Between these points the actual rail lines, for various historical and institutional reasons, diverge and serve broader market areas. The existence of major parallel flows through a limited number of points provides a means of breaking the existing, complex regional network into smaller segments which reflect the overall patterns of rail commerce in the region.

The major segments are as follows:

| *Traffic Flows* | *Major Interstate Rail Segment* |
|---|---|
| Buffalo area to mid-Atlantic | Buffalo-Albany<br>Albany-New York/Newark<br>Buffalo-New York/Newark (via Waverly, N.Y.) |
| Buffalo area to New England | Buffalo-Albany (same as above)<br>Albany-Boston |
| Alleghenies to Eastern Seaboard | Pittsburgh-Harrisburg/Cumberland<br>Harrisburg/Cumberland-Philadelphia/Newark<br>Harrisburg/Cumberland-Baltimore/Washington |
| North-South on the Eastern Seaboard | Newark-Washington |
| Coalfields to the Virginia Tidewater | Beckley/Bristol-Norfolk/Newport News |
| East-West flow along the Great Lakes | Buffalo-Detroit (via Canada)<br>Detroit-Chicago<br>Buffalo-Cleveland<br>Cleveland-Chicago |
| Western Lake Erie area to the South | Detroit-Cincinnati<br>Toledo-Beckley/Bristol |
| Lake Michigan area to the South | Chicago to Cincinnati |
| Alleghenies to Lake Erie area | Pittsburgh-Cleveland |
| Alleghenies to the Southwest | Pittsburgh-St. Louis |

These basic flows are shown in Figure 6.

## Consolidating and Modernizing the Regional Interstate Network

To determine the mainline route and facilities required for an efficient interstate rail freight system capable of providing high quality service, it will be necessary for the Association to follow a process such as the following:

1. Determine minimum traffic levels on mainline routes necessary to achieve efficient utilization of rail facilities.

2. Compare the present regional system to these minimums.

3. Identify excess capacity so that actions can be taken to increase utilization to levels that will justify major rehabilitation and modernization of these mainlines.

The initial step in determining mainline route and facility requirements is one of estimating the minimum traffic levels required to operate mainline routes. Based on a review of current traffic densities throughout the nation, it is the Department's judgment that an average route density of at least 30 million gross ton-miles per track mile per year (about 18 average size trains per day) is a reasonable goal for efficient utilization of a modern single track mainline equipped with a Centralized Traffic Control (CTC) signal system. We recognize that such key factors as terrain, the traffic mix, and scheduling vary from route-to-route and will affect the traffic levels required for efficient use of facilities on a specific route. However, densities of 30 million gross tons per year on single track routes have been achieved by a number of the nation's rail carriers under a wide variety of operating and geographic conditions. In fact some single track routes achieve density levels substantially in excess of this density.

The 30 million gross ton-mile per track mile goal represents a capacity utilization rate of approximately 30 percent of the design capacity of a single track line equipped with a CTC signal system. (See Table 2 for a listing of rail system capacity by number of tracks and type of signal system.) As traffic volumes increase (as they have in the west and the south) the tonnage capacity of a basic single track CTC line is increased by lengthening existing sidings and adding new sidings. This process may ultimately result in certain segments of a single track railroad becoming double track. The capacity of a single track line need not remain fixed. There is considerable latitude in adjusting capacity to traffic levels in excess of the 30 million gross tons goal. At some point, however, efficiency is increased by going to a double track operation because the additional capital and maintenance costs are offset by improved train operating efficiency.

A modern double track route with traffic control has an estimated design capacity of 250 million gross ton-miles per route mile per year (about three times that of a single track CTC line). At a 30 percent utilization rate, through-puts of 80 million gross ton-miles per route miles are achievable. Currently, except for very short links, such traffic levels are not achieved on the highest density double track routes in the country. However, the restructuring process could produce densities of this magnitude.

TABLE 13.—TRAFFIC FLOWS ON MAJOR SEGMENTS

| Route Segment | Railroad | No. of Tracks | Annual Traffic Ton-Miles[1] (Millions) |
|---|---|---|---|
| Buffalo–Albany | D&H | 1 | 23 |
| | PC | 2 | 63 |
| | Total | 3 | 86 |
| Albany–New York/Newark | PC (Hudson Div.) | 2 | 13 |
| | PC (West Shore) | 1 | 26 |
| | Total | 3 | 39 |
| Buffalo–New York/Newark (via Waverly, N.Y.) | EL | 2 | 37 |
| | LV | 1 | 12 |
| | Total | 3 | 49 |
| Albany–Boston | PC | 2 | 43 |
| | B&M | 1 | 20 |
| | Total | 3 | 63 |
| Pittsburgh–Harrisburg/Cumberland | PC | 3 | 120 |
| | B&O | 2 | 28 |
| | WM | 1 | 10 |
| | Total | 6 | 158 |
| Harrisburg/Cumberland–Philadelphia/Newark | PC | 2 [2] | 67 |
| | RDG | 2 | 20 |
| | Total | 4 | 87 |
| Harrisburg/Cumberland–Baltimore/Washington | PC | 1 | 41 |
| | B&O | 2 | 63 |
| | WM | 1 | 10 |
| | Total | 4 | 114 |
| Newark–Washington | PC | 1–2 [2] | 50 |
| | B&O | 1–2 | 31 |
| | Total | 2+ | 81 |
| Beckley/Bristol–Norfolk/Newport News | C&O | 1–2 | 36 |
| | N&W | 1–2 | 58 |
| | Total | 2+ | 94 |
| Buffalo–Detroit (via Canada) | PC | 2 | 8 |
| | N&W | —[3] | 2 |
| | C&O | —[4] | 10 |
| | Total | 2+ | 20 |
| Detroit–Chicago | N&W | 1 | 11 |
| | PC | 1–2 | 12 |
| | C&O | 1 | 20 |
| | GTW | 2 | 21 |
| | Total | 5+ | 64 |
| Buffalo–Cleveland | PC | 2 | 63 |
| | N&W | 1 | 17 |
| | EL | 1–2 | 28 |
| | Total | 4+ | 108 |
| Cleveland–Chicago | PC | 2 | 51 |
| | B&O | 1–2 | 45 |
| | N&W | 1 | 23 |
| | EL | 1–2 | 24 |
| | PC | 2 | 31 |
| | Total | 7+ | 174 |
| Detroit–Cincinnati | B&O | 1–2 | 56 |
| | PC | 1–2 | 18 |
| | Total | 2+ | 74 |
| Toledo–Beckley/Bristol | N&W | 1–2 | 52 |
| | C&O | 2 | 37 |
| | Total | 3+ | 89 |
| Chicago–Cincinnati | PC | 1 | 13 |
| | C&O | 1 | 13 |
| | Total | 2 | 26 |
| Pittsburgh–Cleveland/Akron–Canton | N&W | 1 | 21 |
| | PC | 2 | 51 |
| | B&O | 2 | 52 |
| | P&LE (PC) | 2 | 25 |
| | Total | 7 | 149 |
| Pittsburgh–St. Louis | PC | 1–2 | 42 |
| | N&W | 1 | 28 |
| | B&O | 1 | 30 |
| | Total | 3+ | 100 |

NOTE: 1–2 indicates that a significant part of the route has double track.

[1] Annual traffic measured in millions of gross ton-miles per route mile.

[2] Shared track with major passenger operation; number shown is estimate of track used for freight service.

[3] Trackage rights.

[4] Carrier has facilities for half of the route distance and trackage rights for the remainder.

*Data Source:* Railroad company traffic data, 1972.

Compared to the utilization goal of 30 million gross tons, the present 36,000-mile mainline trackage in the region is very poorly utilized. Approximately 90 percent of the region's mainline trackage experienced a density level of less than 30 million gross tons in 1972; and 27 percent had a density of less than 10 million gross tons.

Actually, such gross regional totals can be misleading. Table 13 lists each of the major interstate segments and shows their respective annual traffic flows by individual interstate mainline in each segment. It can be seen that only some segments of the interstate network can economically support multiple mainline routes, based on the 30 million gross tons goal. For any network segment where the traffic volume of individual routes is less than 30 million gross tons, the consolidation of parallel routes should be considered. For example, the Chicago-Cincinnati segment has a total annual traffic flow of 26 million gross tons divided between a Penn Central line and a Chessie System line. The analysis of this segment would indicate that these two lines should be consolidated into a single track high volume interstate route, shared by the two competitors.

One of the first tasks for the Association is the determination through engineering studies of the practical capacity for each of the major segments in the interstate network. The Association must next measure the use of these facilities against this capacity. This comparsion should indicate the amount of consolidation which should occur in each of these segments of the interstate mainline network to assure efficient utilization. At this stage of the planning process efficient handling of the region's interstate traffic flows should be determined without regard to corporate ownership of the facilities if the efficiency goal is to be attained.

The decision to consolidate routes must be based on such factors as the commodity composition of the traffic and the current physical status of the routes. In addition, the Association should consider—to the extent that such service is consistent with operating efficiency—the objectives of serving the maximum number of local traffic generating points with high quality mainline service.

The consolidation process will require downgrading of some existing mainlines, elimination of duplicate mainline or excess double track, and implementing joint operating agreements. It may also provide for the electrification of some of the high volume interstate lines where economically feasible. The precise actions taken will vary widely among different lines depending on the operational and institutional constraints in each case.

The concentration of traffic over a more limited route structure should not undermine the capabilities of the rail system to absorb heavier traffic volumes in the future. Present single track lines, or lines reduced to single track, can be expanded in capacity as volumes grow through the process already described. Similarly, double track lines can be expanded. The Association's planning process must, however, assure that necessary expansion capability exists on the routes selected.

### Connections to the Interstate Network

All traffic points which originate or terminate sufficient traffic to justify local rail service (as discussed in the Local Rail Service section) must be connected into the interstate network. For those traffic points in zones which are not located on a major interstate route this will require providing feeder service from the zone to a junction with the interstate network. The Association will need to examine each of these connecting routes with the objectives of reducing duplicative rail services and facilities and better matching their capacity to the available traffic. This may require that certain mainline routes be eliminated or downgraded to secondary status and that service be concentrated on the remaining routes. Only after the interstate routes have been selected can the Association determine the best means of connecting all zones to the regional network.

The creation of a high volume interstate network with connecting service to all zones is a key element in improving the efficiency of the region's rail system and justifying major modernization and improvement. In short, the desired result is high quality rail service over a much improved yard and track system, rather than the present multiplicity of services offered over a generally obsolete and rundown rail plant.

### Identifying the Zones Which Should Receive Competitive Service

Once the mainline routes have been designated, it is necessary to determine the configuration and level of railroad competition which would best serve the region. Therefore, the focal point of this section is on operations rather than plant efficiency. Railroads perform best operationally when large volumes can be aggregated at one point and moved directly to another point. Splitting available traffic flows between several carriers reduces operating efficiency. Based on this fact, the Department recommends that the Association provide direct competitive rail services only to those zones having the traffic volumes and flow patterns necessary to permit two or more carriers to provide services and maintain acceptable operating efficienceies. Therefore, the objective in this section is to identify those markets where traffic volumes are such that competitive operations can be continued without so fragmenting traffic that basic efficiency and service quality is impaired.

In some cases where competition can be economically warranted, the total traffic flow does not justify separate high quality routes. In this case the carriers can share a single route to provide efficient and quality service. In other cases, competitive carriers might efficiently sustain separate high quality routes. In some areas of the region (such as New England and New York) the continuation of rail competition is threatened by the bankruptcy of all the major carriers serving the areas, and yet competition is warranted by the traffic. In these cases one objective of the planning process should be to preserve rail competition to the major traffic generating zones.

In our judgment, the requisite traffic characteristics in a zone which will permit two or more carriers to compete are:

1. *The traffic must move relatively long distances.* Intermodal competition for short haul traffic generally undermines a railroad's potential for maintaining effective intermodal competition. As shown in Part I, trucks enjoy the dominant market share for shipments under 200 miles. Effective competition in this market is thereby maintained through existing intermodal competition. Intramodal rail competition forces the railroads to provide costly duplicate facilities and services for a market which from an economic standpoint they are poorly suited to serve.[1] Therefore, as a general rule, direct competition between railroads for traffic having a length of haul less than 200 miles should not be required.

2. *There must be sufficient traffic to operate efficient sized trains.* Efficient production of rail service requires movement of full train lots. The size of an "efficient" train under existing railroad practice depends on the composition of the traffic being moved. Data available to the Department on current industry practice indicate that an average train has approximately 40 loaded cars and 30 empty cars. This composite figure includes two types of train movements—those for manufactured and processed commodities and those for bulk goods. While precise data is not available, industry practice indicates that for manufactured and processed commodities, trains typically consist of 30–35 loaded cars, while a unit train of bulk unprocessed commodities (such as coal) often has as many as 100 or more carloads. For the purposes of this report we have defined an efficient sized train to include fewer carloads than is the case under general industry practice. The minimum thresholds selected are 30 loaded cars for trains carrying manufactured and processed commodities and 75 loaded cars for trains carrying bulk commodities.

3. *The directional flow of the traffic must permit efficient operation.* Not only should efficient sized trains be operated, but the train make-up should be such that out-of-route movement, both of the train and of the individual carloads in the train, is minimized. Further, intermediate switching of the train should be minimized. Therefore, all cars in the trains operated should be moving in the same general direction (north, south, east, or west). The ideal situation would be efficient sized trainloads moving directly between zones. Rarely, however, does any pair of zones generate sufficient traffic for more than one train per day each way moving between them. (This can be seen in Table 14, which shows that traffic originating or terminating in Chicago to and from other major centers—but not traffic passing through Chicago—is usually less than two trainloads each way per day.)

4. *Traffic volume and directional flow must be sufficient to support frequent trainload service.* Twice daily outbound service is an acceptable frequency level to minimize the time cars must spend waiting for a departing train. Similarly, twice daily inbound service by a railroad would enable the morning delivery of loaded and

TABLE 14.—SELECTED ORIGIN-DESTINATION RAIL TRAFFIC FLOWS BETWEEN CHICAGO AND MAJOR SMSA'S

(1969)

| City Pairs (From-to) | Cars Per Day | Number of Average-sized [1] Trains Per Day |
|---|---|---|
| Chicago—New York | 28 | 0.9 |
| New York—Chicago | 36 | 1.2 |
| Chicago—Newark | 150 | 5.0 |
| Newark—Chicago | 59 | 2.0 |
| Chicago—Philadelphia | 61 | 2.0 |
| Philadelphia—Chicago | 56 | 1.9 |
| Chicago—Pittsburgh | 21 | 0.7 |
| Pittsburgh—Chicago | 47 | 1.6 |
| Chicago—Boston | 37 | 1.2 |
| Boston—Chicago | 23 | 0.8 |
| Chicago—Washington | 14 | 0.5 |
| Washington—Chicago | 4 | 0.1 |

[1] 30 Carloads Per Train

Source: Federal Railroad Administration, Office of Economics; compiled from 1969 traffic data of Class I railroads.

empty cars received the preceding afternoon and evening, and the afternoon delivery of cars received the preceding evening and morning. Therefore, service by more than one carrier should not be required until a zone generates at least eight trainloads moving (inbound or outbound) in the same general direction.

Based on these characteristics it is our judgment that a zone warrants competitive service where the two following threshold levels of traffic volume and flow can be reasonably maintained:

1. Sufficient traffic moving more than 200 miles is generated to operate minimum sized, efficient trains (75 carloads for bulk commodities and 30 carloads for manufactured and processed goods) ; *and*

2. The traffic is sufficiently concentrated to result in a minimum of eight trainloads per day where each car in the train is moving in the same general direction (north, south, east, west) so as to minimize back hauling, circuity, and intermediate switching.

Matching the application of the above thresholds with present traffic flows will identify zones which should be served by more than one railroad. The threshold levels are based on our judgment of the prerequisite traffic volume and flow required to warrant competitive service to a zone. However, we recognize that the threshold levels are based on a substantial degree of judgment. For example, with a different axis for directional flow (e.g., southeast, southwest, etc.) or a change in the geographic boundaries of zones (for determining the amount of traffic generated) or a different requirement for the number of daily trains (six or ten instead of eight), additional zones

[1] The analysis to support this contention is contained in the *National Transportation Report*, published by the Department of Transportation, July 1972, p. 265.

for competitive service might be included or excluded. The validity of the threshold levels ultimately must rest on a judgment of whether their application to the region strikes a fair balance between the long term efficiencies associated with rail competition and the improvements in operating efficiency which could be achieved by permitting railroads to realize their inherent economies of high volume operation. We believe that the threshold levels developed in this section have struck that balance.

### Application of the Thresholds

The threshold levels were applied to the 184 zones in the region. Each zone's traffic was considered individually. Contiguous zones (e.g. Norfolk and Newport News) which generate a common flow of traffic were not aggregated. The Association will need to consider these common flows of traffic as it actually structures a final competitive system.

Table 15 shows the application of these thresholds to the 40 zones which account for most of the region's originations and terminations. Of the 184 zones only 17 meet the two thresholds and are therefore recommended for competitive service in the directions shown. The 17 zones are (in east to west order):

1. Boston
2. New York
3. Newark
4. New Brunswick, N.J.
5. Philadelphia
6. Baltimore
7. Norfolk
8. Beckley, W. Va. (coal)
9. Pittsburgh
10. Buffalo
11. Cleveland
12. Bristol, Va. (coal)
13. Detroit
14. Toledo
15. Gary
16. Chicago
17. St. Louis

It must be recognized that Table 15 is based on the 1969 one percent waybill sample collected from the Class I railroads. This is the most recent year for which commodity flow and origin-destination information is available and reflects the most recent period prior to the bankruptcy of several of the region's carriers. Therefore, the data should not be affected by the service deterioration that followed bankruptcy. The 1972 data available on total traffic originated or terminated by zone does not include traffic flow information. Comparing 1969 originations and terminations with 1972 revealed substantial changes in traffic volume in many of the zones, but with the absence of 1972 traffic flow information it was impossible to recompute Table 15 for 1972. However, by applying the percentage of change in traffic volume between 1969 and 1972 to each of the directional components it appears that a few zones may move below the eight train per day threshold. Final determinations by the Association should be based on the most current data available.

As mentioned previously, certain zones should receive special consideration because they are the "major gateways" for interregional rail movements. The gateways are:

*Northeast/Southeast*

Washington, D.C.
Hagerstown, Md.
Virginia Cities (Bristol/Elkton City, Va.)
Cincinnati, O.
Louisville, Ky.
Evansville, Ind.

*Northeast/West*

St. Louis, Mo.
Peoria, Ill.
Streator, Ill.
Chicago, Ill.
Ludington, Mich. (Car Ferry)
Frankfort, Mich. (Car Ferry)

While there are many gateways, the major interregional traffic, as mentioned previously, is handled through Chicago, St. Louis, Cincinnati and Washington, D.C. Of these four zones, two—Chicago and St. Louis—warrant competitive service based on the two thresholds mentioned above. The other two—Cincinnati and Washington, D.C.—are recommended for competitive service to assure that the major traffic flow in and out of the region is not monopolized by a single railroad.

These 19 competitive service zones account for about 48 percent of the region's originations and terminations. Also, the four gateways account for a majority of interregional flows. As indicated by Figure 7, the location of these points will provide competition throughout the region. Since the high volume interstate network which will interconnect the zones designated for competitive service will also interlace many other zones, no zone will be far from this network.

An essential prerequisite underlying the foregoing recommendations is that each of the carriers serving a competitive zone should be a strong regional carrier providing competitive interstate service. If interrailroad competition is to be preserved in New York, Newark, and Boston—areas which are now served only by bankrupt carriers—it will be necessary for one or more of the major solvent railroads in the region to begin serving these markets (assuming all the bankrupt railroads serving these points decide to reorganize under the Act). The extension of service by one of the solvent railroads could be accomplished either through purchase of the necessary plant of a bankrupt railroad or by operation over tracks owned by the Corporation through lease or trackage rights agreements. If these solvent railroads cannot or do not assume such service, then the alternatives would be either for one or more railroads from outside the region to serve these

TABLE 15.—COMPETITIVE SERVICE RECOMMENDATIONS

(In Order of Total Trains Per Day—1969)

| Zone | | Average Number of Trains Per Day [1] | | | | Direction Recommended for Competitive Service [2] |
|---|---|---|---|---|---|---|
| No. | Name and State | North | East | South | West | |
| 131 | Chicago, IL | .2 | 45.7 | 26.6 | 49.6 | East, South, West |
| 155 | Detroit, MI | .1 | 17.7 | 14.1 | 24.5 | East, South, West |
| 060 | Newark, NJ | 1.4 | .4 | 8.1 | 43.8 | South, West |
| 323 | St. Louis, MO | 6.7 | 19.1 | 8.0 | 19.1 | East, South, West |
| 066 | Philadelphia, PA | 3.0 | .8 | 6.1 | 32.4 | West |
| 049 | Buffalo, NY | — | 8.6 | 9.4 | 16.4 | East, South, West |
| 076 | Pittsburgh, PA | 3.3 | 8.2 | 6.0 | 14.7 | East, West |
| 058 | New York, NY | 1.6 | 1.1 | 3.1 | 24.1 | West |
| 191 | Beckley, WV | 5.8 | 14.4 | 3.6 | 3.9 | East |
| 087 | Baltimore, MD | 2.6 | .8 | 3.3 | 19.3 | West |
| 130 | Gary, IN | — | 10.9 | 6.6 | 4.8 | East |
| 094 | Cleveland, OH | .4 | 6.9 | 3.8 | 10.2 | West |
| 106 | Cincinnati, OH | 3.6 | 6.1 | 6.5 | 5.1 | North-Gateway |
| 014 | Boston, MA | .5 | — | 2.0 | 17.4 | West |
| 184 | Norfolk, VA | 1.0 | .0 | 3.4 | 15.0 | West |
| 113 | Toledo, OH | .3 | 3.1 | 11.5 | 3.7 | South |
| 194 | Bristol, VA | 5.9 | 8.7 | 2.2 | .8 | East |
| 205 | Louisville, KY | 1.9 | 4.3 | 4.6 | 5.3 | |
| 197 | Clarksburg, WV | 2.9 | 7.6 | .4 | 1.5 | |
| 062 | New Brunswick, NJ | .5 | .2 | 2.5 | 8.3 | West |
| 090 | Washington, DC | .9 | .2 | 2.4 | 7.5 | North-Gateway |
| 100 | Sandusky, OH | — | 2.8 | 6.0 | 1.9 | |
| 093 | Youngstown, OH | .1 | 2.7 | 2.3 | 5.5 | |
| 122 | Indianapolis, IN | 1.3 | 4.1 | 1.4 | 3.8 | |
| 075 | New Castle, PA | 0.7 | 4.5 | 1.8 | 3.0 | |
| 199 | Charleston, WV | 2.9 | 3.2 | 1.9 | 1.2 | |
| 156 | Flint, MI | 1.2 | — | 1.5 | 4.6 | |
| 185 | Newport News, VA | 1.0 | — | 3.4 | 6.4 | |
| 146 | Carbondale, IL | 3.5 | 1.0 | 1.9 | 2.3 | |
| 078 | Johnstown, PA | 1.7 | 4.4 | .4 | .9 | |
| 107 | Hamilton-Middletown, OH | .8 | 4.1 | .7 | 1.8 | |
| 200 | Huntington, WV | 4.5 | .9 | .6 | 1.1 | |
| 069 | Allentown, PA | .2 | .5 | 1.1 | 5.1 | |
| 123 | Vincennes, IN | 2.6 | 1.0 | 1.8 | 1.4 | |
| 001 | Bangor, ME | — | — | 4.4 | 2.4 | |
| 137 | Peoria, IL | .1 | 2.4 | .9 | 2.4 | |
| 091 | Lorain, OH | — | 2.0 | 1.3 | 2.1 | |
| 099 | Wheeling ,WV | 1.2 | 2.0 | .1 | 1.3 | |
| 098 | Steubenville, OH | 1.1 | 1.2 | .5 | 1.7 | |
| 092 | Ashtabula, OH | — | .7 | .9 | 2.5 | |
| 167 | Marquette, MI | — | — | — | 1.2 | |
| 166 [3] | Escanaba, MI | — | — | — | .6 | |

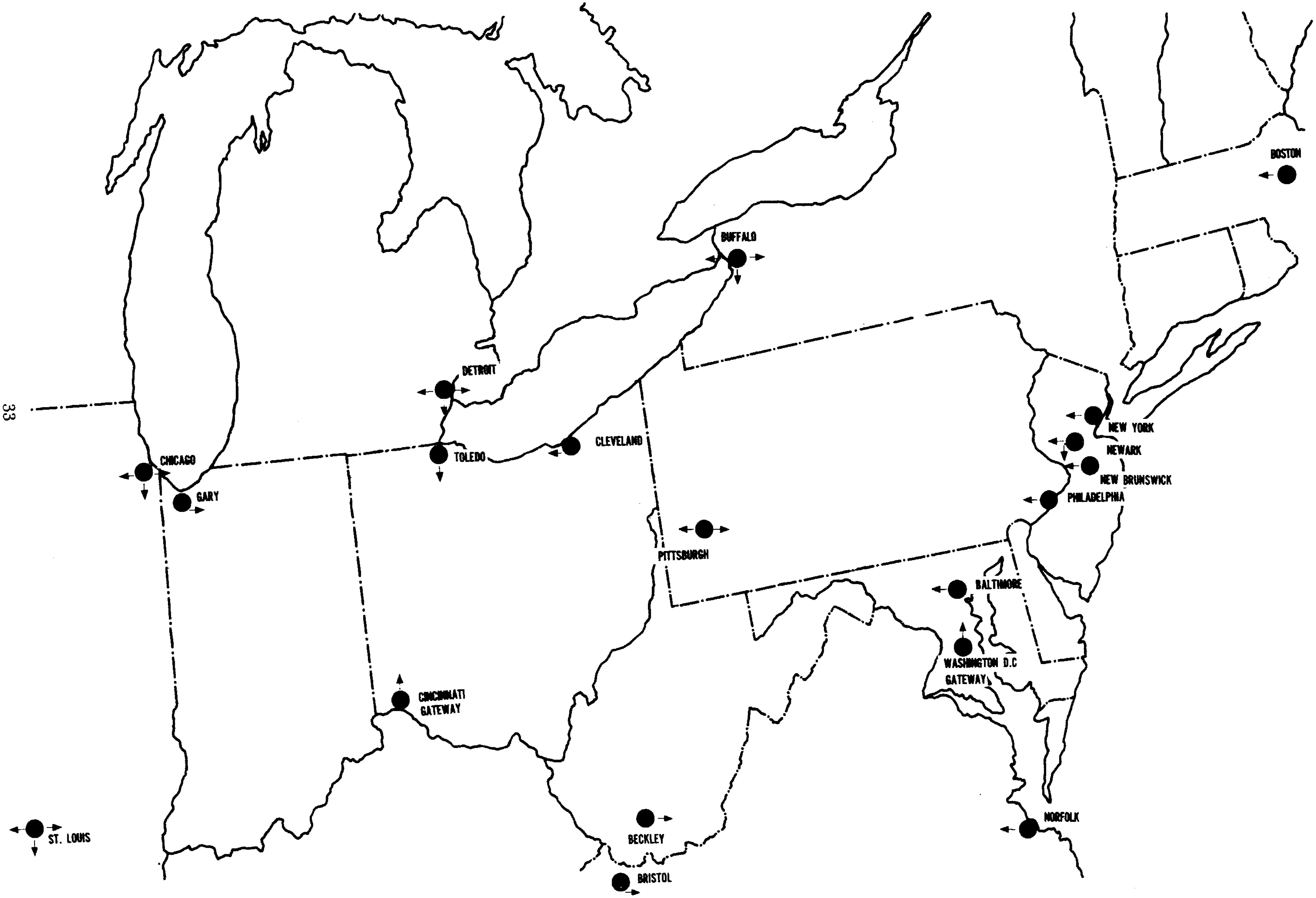
[1] Includes both originating or terminating trains in zone noted with over 200 mile haul.

[2] Recommended for competition if average number of train loads per day is eight or more in direction noted.

[3] Subsequent zones have further declining levels of total train traffic. Hence, they could not be considered for competitive service as noted in ([2]) above.

Data Source: Federal Railroad Administration
Office of Economics
Data compiled from reports (one percent waybill sample) by Class I railroads for Calendar Year 1969

# FIGURE 7
# RECOMMENDED ZONES FOR COMPETITIVE RAIL SERVICE



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points (with ICC approval), or for two new corporations to be established.

### Determining the Connections Between Competitive Zones

A comparison between Figure 7 and Figure 5 (Traffic Density Map) indicates that the 19 competitive zones are clearly the major traffic generators in the region and are the points which anchor the existing interstate network in the region. However, as shown in Table 15, most of the zones have traffic flows that predominate in only one or two directions. For example, Pittsburgh has a heavy flow to the west, a substantially smaller flow to the east, and a modest one to the south and north. On the other hand, Detroit has a sufficient traffic volume and directional flow to justify competitive service in all directions except the north.

The Association in its Final System Plan will have to consider how the 19 zones recommended for competitive service are to be connected into a high volume interstate network. This will be dependent on many specific operational trade-offs and, of course, the willingness of the various railroads in the region to participate in the restructuring process. As a guide to the Association's planning of the interconnections of competitive zones, we believe these two prerequisites are necessary:

1. The two zones must be separated by a distance of more than 200 miles, and
2. The directional flow of traffic of the two zones can be matched (i.e., the daily traffic volume for each carrier moving in a general direction—west—which can be matched with a similar flow of traffic from another zone moving in the opposite general direction—east).

These two prerequisites recognize that it is neither feasible nor desirable to connect each of the 19 zones designated to receive competitive service *directly* with all others. Rather, it is important to structure competitive service along the major traffic flow patterns that now exist. For example, there is a substantial amount of traffic from Chicago east and from Detroit west. This traffic flow can be matched and the zones are more than 200 miles apart. Therefore, serious consideration should be given to providing competitive service between these two zones. On the other hand, there is a substantial amount of traffic from Chicago east, but it is not matched by a flow of traffic from Toledo west. Therefore, in this case only one of the two prerequisites is present, and we would question the need for competitive service.

Table 16 has been derived from the application of the 200 mile and matched-flow prerequisites. We believe that this application defines the maximum number of zones between which competitive service should be considered. However, the strict application of these two prerequisites results in the inclusion of some instances where direct competitive service is not warranted. The Association will have to carefully examine each of these 61 zone pairs to determine whether the traffic volume and flow patterns are such that direct competitive service between the pairs is warranted.

The establishment of competition between two zones on the basis of matched directional traffic flows does not require that the same competitive carriers provide the service to the zones over the entire route. For example, it is possible that the service linkage between St. Louis and Boston might be provided by carriers "A" and "B" in St. Louis and carriers "A" and "C" in Boston. In this case, direct continuity in carrier service would be provided by carrier "A", while an intermediate interchange would be required between carriers "B" and "C" in order to serve competitively the complete St. Louis-Boston linkage.

### Summary Recommendations on the Level of Competitive Service

Our process for the selection of the zones to receive competitive service and the selection of zones between which competitive service should be considered was based on a set of considerations designed to improve substantially the operational efficiency of the rail system within the region. We recognize, however, that the method of restructuring services within the region to reduce service and operational duplication resulting from competition must proceed on a basis which considers existing traffic flows, the present pattern of rail services, maintaining corporate system connectivity, geography, and numerous other factors. All these factors must be weighed by the Association in finally developing the specific level of competition which should occur in the region. However, the overwhelming pressures will be to maintain much of the existing competitive structure. Therefore, we have established as a base line the amount of competition which is warranted on a strict operating efficiency basis.

We recommend several key principles which should be followed by the Association throughout the process of establishing a level of competition in the region. They are:

1. For zones recommended for competition:

   (a) Whenever significant economies can be achieved, the Association should encourage the utilization of joint facilities, both within the zone (terminals) and between zones (roadway and track).

   (b) Whenever more than two carriers are in a market in which traffic volumes between competitive zone pairs cannot support more than two carriers efficiently, the Association should encourage the provision of coordinated rail operations between carriers so that balanced but efficient competition results.

2. For zones not recommended for competition:

   (a) Whenever two or more carriers continue to serve an area not recommended for competition, the Association should ensure that, to the maximum extent possible, the firms utilize joint facilities (both terminals and track).

   (b) Similarly, whenever two or more carriers serve an area not recommended for competition, the Association should encourage the firms to enter into cooperative service agreements designed to reduce their overall operating costs.

Table 16.—ZONES BETWEEN WHICH COMPETITIVE RAIL SERVICE SHOULD BE CONSIDERED

From **Baltimore** to:

Chicago
Detroit
Gary
Pittsburgh
St. Louis

From **Beckley** to:

Norfolk

From **Boston** to:

Buffalo
Chicago
Detroit
Gary
Pittsburgh
St. Louis

From **Bristol** to:

Norfolk

From **Buffalo** to:

Boston
Chicago
Cincinnati
Detroit
Gary
Newark
New Brunswick
New York
Philadelphia
St. Louis
Washington

From **Chicago** to:

Baltimore
Boston
Buffalo
Cleveland
Detroit
Newark
New Brunswick
New York
Norfolk
Philadelphia
Pittsburgh

From **Cincinnati** to:

Buffalo
Detroit
Toledo

From **Cleveland** to:

Chicago
Gary
St. Louis

From **Detroit** to:

Baltimore
Boston
Buffalo
Chicago
Cincinnati
Gary
Newark
New Brunswick
New York
Norfolk
Philadelphia
Pittsburgh
St. Louis

From **Gary** to:

Baltimore
Boston
Buffalo
Cleveland
Detroit
Newark
New Brunswick
New York
Norfolk
Philadelphia
Pittsburgh

From **Newark** to:

Buffalo
Chicago
Detroit
Gary
Pittsburgh
St. Louis
Washington

From **New Brunswick** to:

Buffalo
Chicago
Detroit
Gary
Pittsburgh
St. Louis

From **New York** to:

Buffalo
Chicago
Detroit
Gary
Pittsburgh
St. Louis

From **Norfolk** to:

Beckley
Bristol
Chicago
Detroit
Gary
Pittsburgh
St. Louis

From **Philadelphia** to:

Buffalo
Chicago
Detroit
Gary
Pittsburgh
St. Louis

From **Pittsburgh** to:

Baltimore
Boston
Chicago
Detroit
Gary
Newark
New Brunswick
New York
Norfolk
Philadelphia
St. Louis

From **St. Louis** to:

Baltimore
Boston
Buffalo
Cleveland
Detroit
Newark
New Brunswick
New York
Norfolk
Philadelphia
Pittsburgh

From **Toledo** to:

Cincinnati

From **Washington** to:

Buffalo
Newark

In summary, while the result of the planning process must meet the test of practicality, it should be recognized that large scale deviations from the competitive service goals outlined in this report will reduce the economic efficiency of rail service in the region.

### Planning the High Volume Interstate Rail Network

Discussions in this section have focused on the objective of eliminating duplicative service and facilities at the interstate service level. Restructuring the high volume interstate network is especially critical inasmuch as the cost of rehabilitating and modernizing even the consolidated lines and facilities will be substantial. The cost of upgrading the complete existing network would be prohibitive.

One of the principal tasks of the Association is the reconciliation of (1) the requirements for competitive services with (2) the requirements of reducing duplicate facilities to ensure efficient interstate rail operations. To assist the Association we have prepared a series of eight route analyses to demonstrate the evaluation and planning processes that can be followed in the restructuring of the interstate mainline facilities. The eight routes were selected to serve as examples. They portray the variety of problems the Association will encounter and the impact of the restructuring process throughout the entire region.

The eight route analyses are:

1. Boston-Buffalo
2. New York/Newark-Buffalo
3. New York/Newark-Pittsburgh
4. Washington Gateway-Newark
5. Buffalo/Cleveland-Chicago
6. Detroit-Chicago
7. Pittsburgh-Chicago
8. Cincinnati Gateway-Chicago

Each of these route analyses contain three parts: (1) a map of the present high volume lines (10 million or more gross tons per route mile per year) connecting the zones; (2) a discussion of the service, facilities and basic problems which exist today, planning objectives which, in the Department's judgment, apply to each case, and an identification of the alternatives to be considered; and (3) a map depicting the primary and other route alternatives.

Our proposed alternatives were selected primarily on the basis of present traffic densities, number of tracks and signal system (which provides an index of capacity), and mileage for each route. We were not able to consider other factors of equal importance in developing the Final System Plan. Among these are condition of the lines, location of existing and proposed major yards, deployment of the work force, engineering information on gradient and curvature, and the exact mix of traffic over the lines (piggyback, general merchandise and bulk commodities). The willingness of the various bankrupt and solvent railroads in the region to participate in the restructuring is also a necessary part of the process. Thus, the Association's work in analyzing all alternatives will involve more detailed data and consideration of all factors before the Final System Plan is complete.

We believe that the eight examples which follow will be useful in assisting the Association, States, carriers, shippers, and other interested parties to begin to consider the options available for implementing the restructuring and consolidation process in specific segments of the interstate system.

## BOSTON-BUFFALO

### (Buffalo-New England Traffic Flow)

### PRESENT SERVICE

| *Carrier(s)* | *Route Identification* |
|---|---|
| Penn Central (PC) | Springfield, Albany, Syracuse |
| Boston and Maine (B&M), Delaware and Hudson (D&H), Erie Lackawanna (EL) | Greenfield, Mechanicville, Binghamton, Hornell |

### STATEMENT OF THE PROBLEM AND PLANNING OBJECTIVES

Excess interstate capacity exists on the route, particularly east of the Albany area where each of the two bankrupt carriers have separate mainline routes. Route utilization can be improved by concentrating traffic on one route and this will also provide the economic basis for improving and modernizing the remaining interstate route where required.

Maintaining competition between Boston and Buffalo must be given major attention in the planning process, since only bankrupt carriers serve Boston. If all the bankrupt carriers decide to reorganize under the Act, the Association plan will have to provide for effective competition with particular consideration given to the D&H, which is the only solvent carrier in the present joint route of the B&M-D&H-EL.

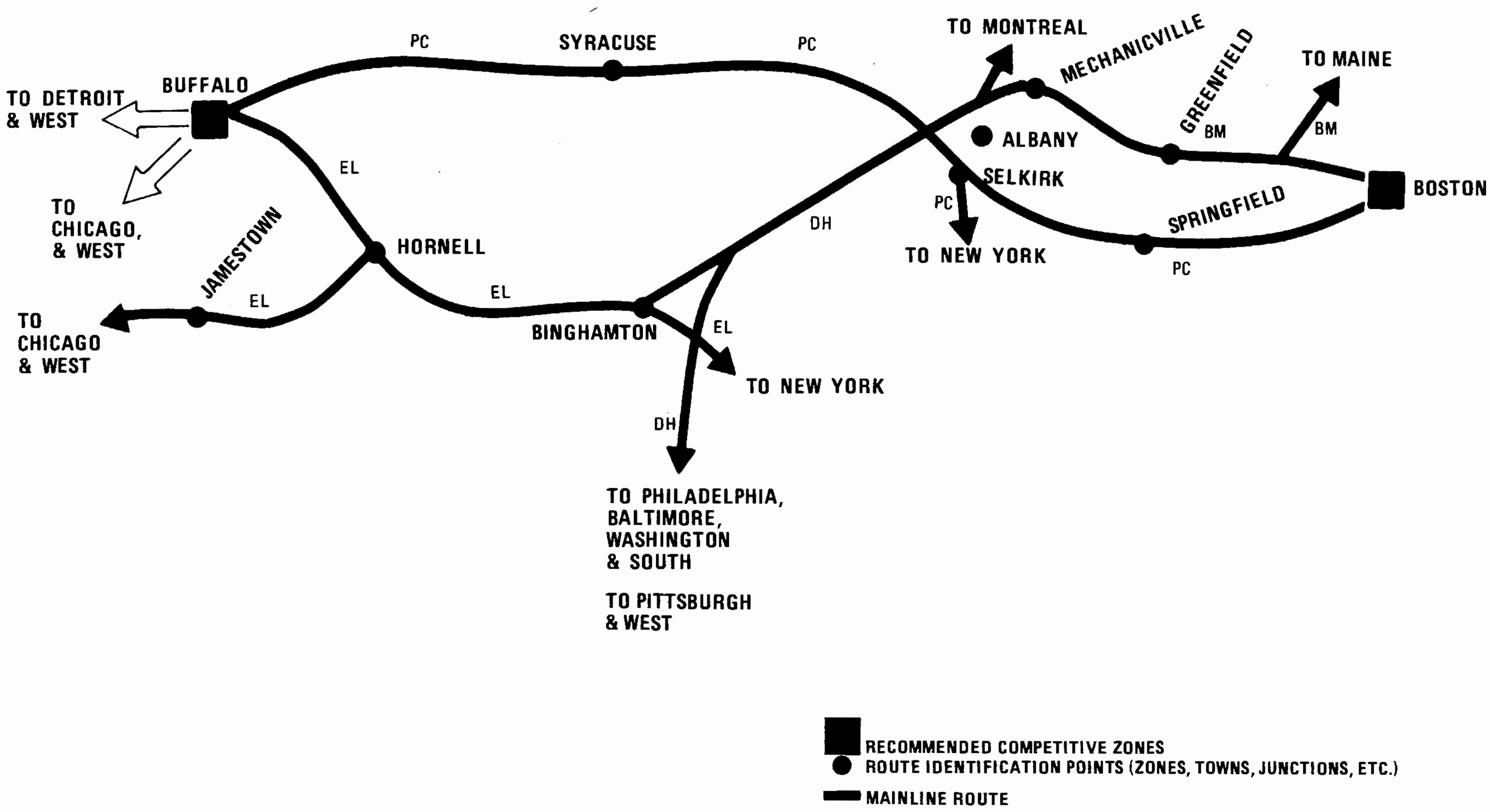
### ANALYSIS OF ALTERNATIVE ROUTES

The requirement to maintain competition between these points is the principal consideration in recommending that both routes between Buffalo and Albany be considered primary routes. Traffic density is at an acceptable level on both routes. East of Albany, the PC's line is recommended as the primary route. It has the higher density and greater capacity of the two routes. The B&M route from Mechanicville could be reduced to feeder status. An alternative to be considered is the operation of the B&M and PC mainlines under a paired track arrangement (east on one line, west on the other).

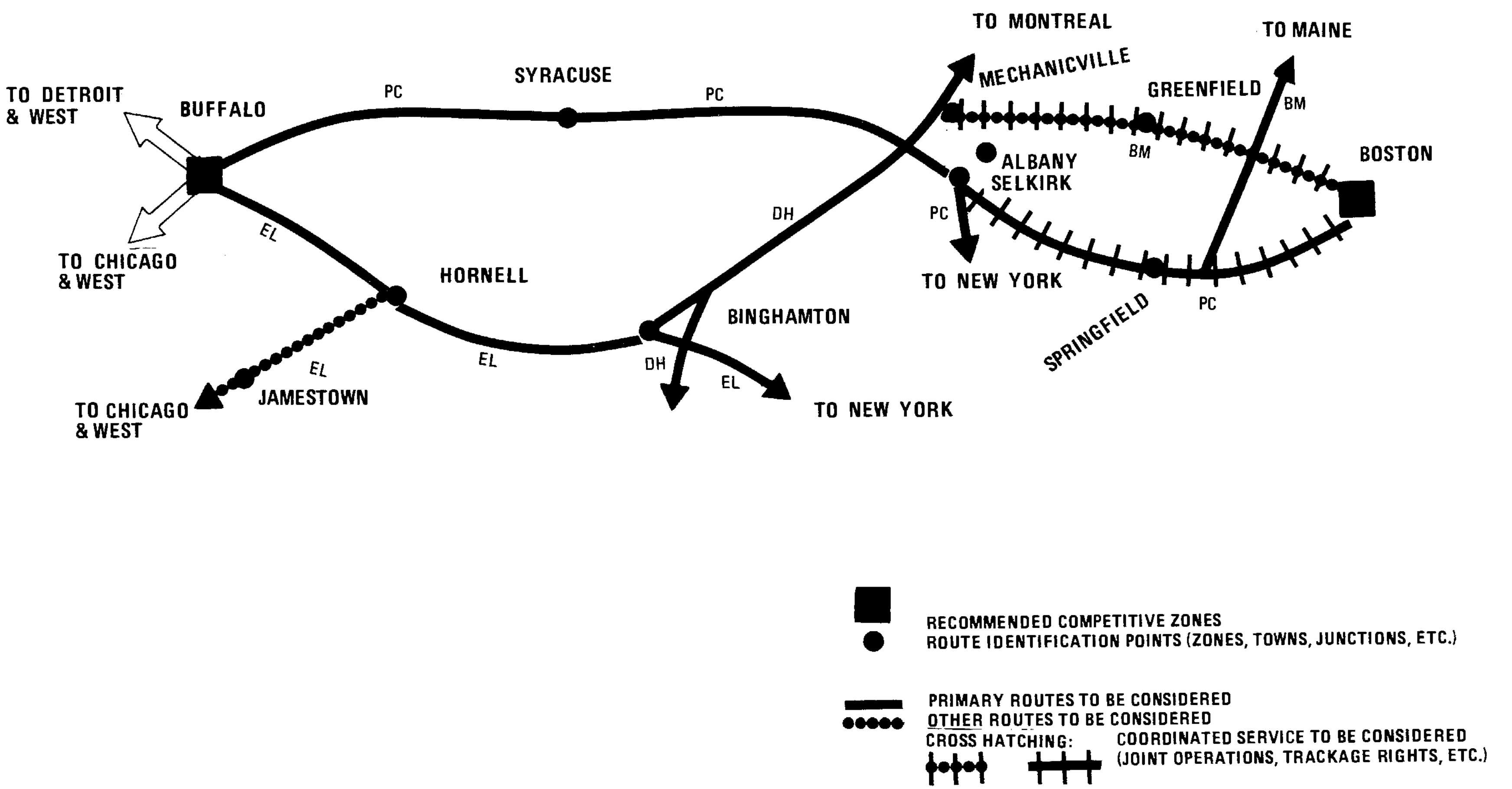
Maintaining competition to the Boston zone will require a solvent carrier such as the D&H, to begin serving this market, preferably under a coordinated service arrangement with the Corporation. The same situation prevails in providing competitive service to Buffalo if the EL elects to reorganize under the Act. A solvent railroad such as the N&W, utilizing either trackage rights or purchase or lease of the line, could expand its service to connect to the D&H at Binghamton.

## PRESENT INTERSTATE RAIL ROUTES

# BOSTON — BUFFALO



# ANALYSIS OF ALTERNATIVE ROUTES
# BOSTON — BUFFALO



## NEW YORK/NEWARK-BUFFALO

### (Buffalo—Mid-Atlantic Traffic Flow

### PRESENT SERVICE

| *Carrier(s)* | *Route Identification* |
|---|---|
| Penn Central (PC) | New York, Poughkeepsie, Albany, and Newark, Kingston, Albany (two routes) thence via Syracuse |
| Lehigh Valley (LV) | Newark, Allentown, Wilkes-Barre, Sayre |
| Erie-Lackawanna (EL) | Newark, Binghamton, (Alternate route to Newark via Port Jervis or via Scranton). (Note: West of Hornell, main EL traffic flow moves to Cleveland and Chicago through Jamestown. |

### STATEMENT OF THE PROBLEM AND PLANNING OBJECTIVES

Substantial excess interstate capacity exists because each of the three bankrupt carriers maintain separate mainline routes. The elimination of one or more routes will permit the more productive utilization of the remaining interstate facilities. This consolidation of traffic flows should provide the economic basis for improving and modernizing, the remaining interstate routes where required.

Maintaining competition between the New York/Newark and Buffalo areas has to be given major attention in the planning process since only bankrupt carriers serve the market. If all the bankrupt carriers decide to participate in the reorganization process under the Act, the plan should provide for effective competition by a major solvent carrier.

### ANALYSIS OF ALTERNATIVE ROUTES

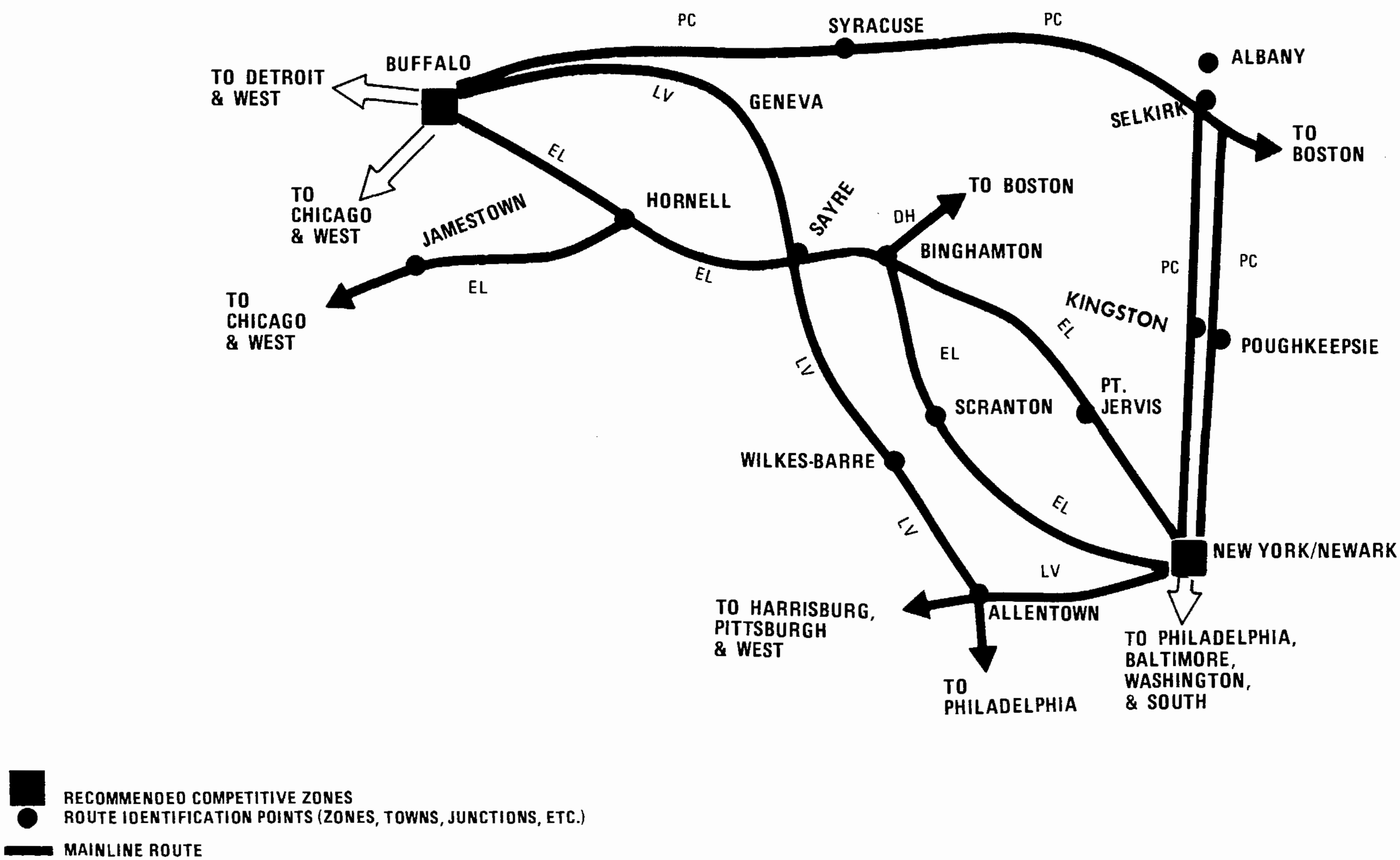
The present PC mainline from Albany (Selkirk) to Buffalo has the heaviest density and from Boston as well. Thus, it is recommended as a primary route to be considered. The PC from Albany (Selkirk) to New York (East Shore) provides the only direct rail link into New York proper (no car float required), and is recommended as another primary route to be considered. The PC (West Shore) line from Albany (Selkirk) to Newark is also shown as a primary route because it has acceptable density levels and is an important link in maintaining competitive services.

The EL line from Buffalo to Binghamton is the second heaviest density line, reflecting in part New England traffic flows (see Boston-Buffalo), and is recommended as a primary route to be considered. East of Binghamton, the EL maintains two routes, one via Port Jervis and one via Scranton. Recent changes in traffic patterns make it difficult to determine which should be considered a primary route. Both are listed for consideration, but only one ultimately should be retained.

The LV is the lightest density line between these markets and due to this fact and the existence of two other routes, it is not considered as either a primary or an alternative route, although portions of the line may be desirable between other markets.

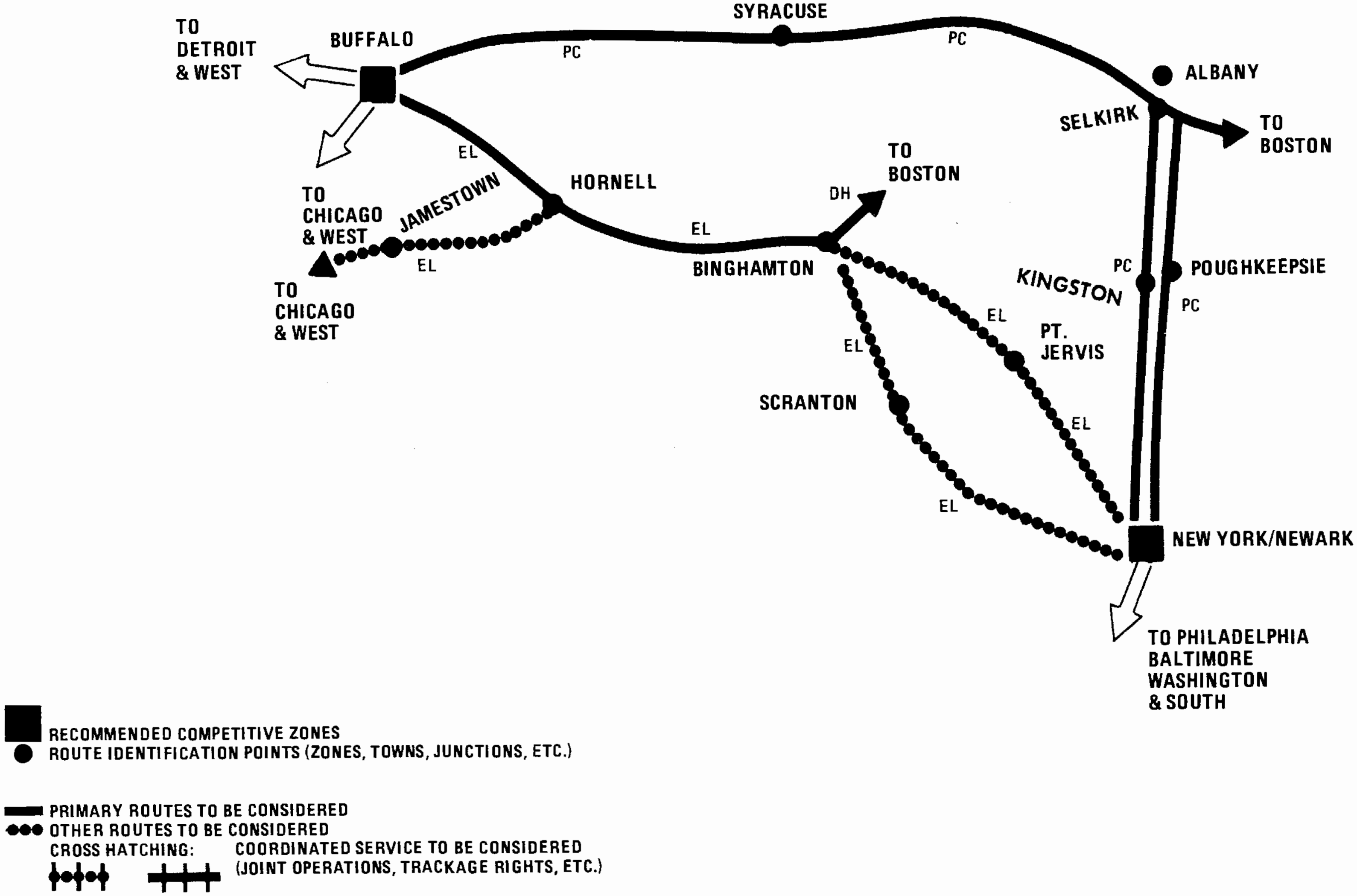
Continuation of effective competition requires that a major solvent carrier be provided access to the New York/Newark area. As two routes can be maintained and still achieve the capacity improvement objective, this goal can be achieved through either sale or lease of the present EL route.

# PRESENT INTERSTATE RAIL ROUTES
# NEW YORK/NEWARK — BUFFALO



## ANALYSIS OF ALTERNATIVE ROUTES

# NEW YORK/NEWARK
# BUFFALO



## NEW YORK/NEWARK-PITTSBURGH

**(Allegheny-Eastern Seaboard Traffic Flow)**

### PRESENT SERVICE

| *Carrier(s)* | *Route Identification* |
|---|---|
| Penn Central (PC) | Trenton, Harrisburg, Johnstown, (Bypass routes available between Trenton-Harrisburg and Johnstown-Pittsburgh) |
| Central of New Jersey (CNJ), Reading (RDG), Baltimore & Ohio (B&O-Chessie System) | Philadelphia, Baltimore, Cumberland |
| Lehigh Valley (LV), Reading (RDG), Western Maryland (WM-Chessie System), Norfolk & Western (N&W) | Allentown, Harrisburg, Hagerstown, Cumberland, Connellsville |

### STATEMENT OF THE PROBLEM AND PLANNING OBJECTIVES

With three major routes serving the entire link between New York/Newark and Pittsburgh and a fourth route between Harrisburg and the eastern seaboard there is substantial excess capacity in this market. Consolidating the mainline route structure to develop higher traffic densities will permit concentration of resources on a more limited, but more productive rail network. Minimizing interference between freight and passenger trains east of the Philadelphia area is also an objective in this market.

Maintaining competition to the New York/Newark area has to be given major attention in the planning process since only bankrupt carriers serve these markets. The Association should encourage an alternative carrier to serve this market.

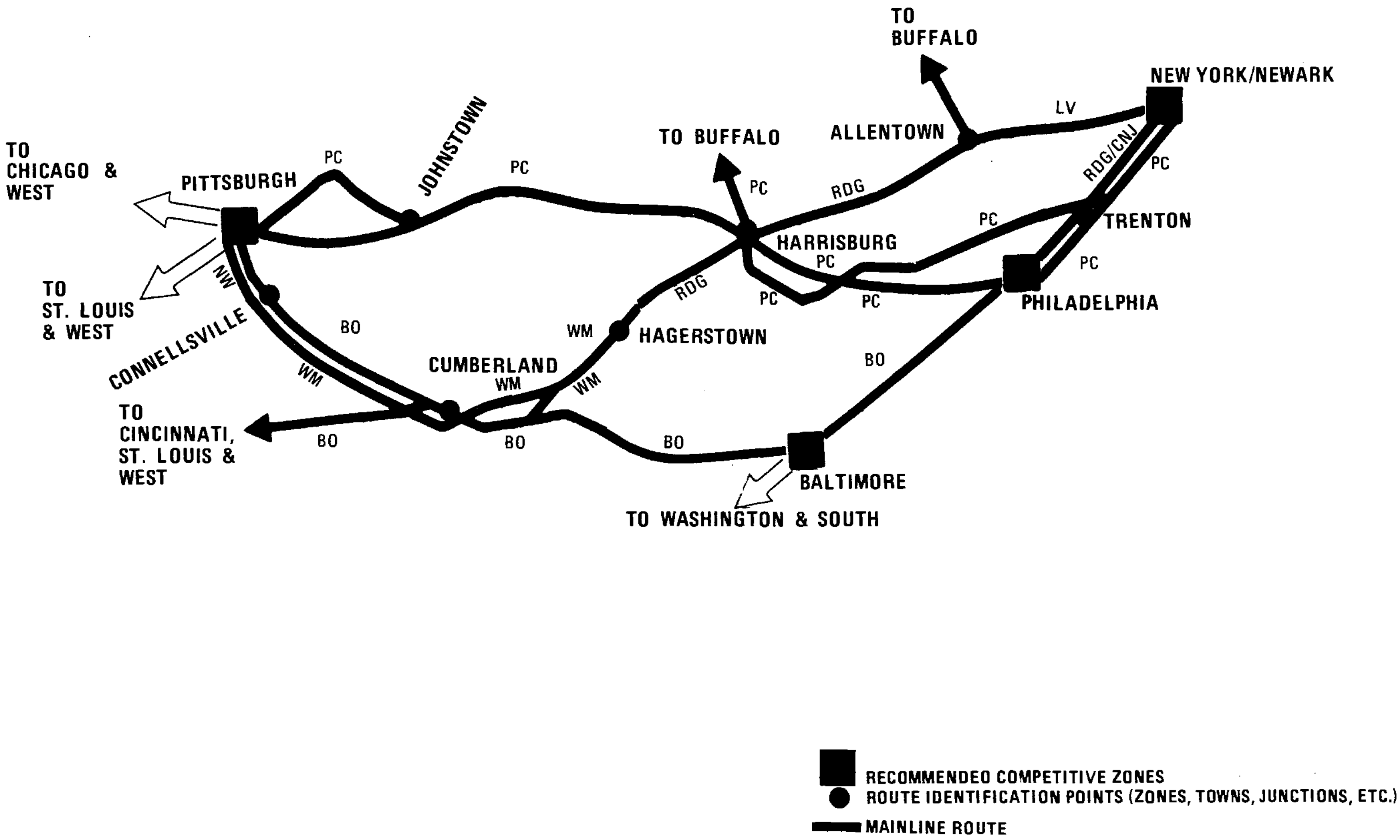
### ANALYSIS OF ALTERNATIVE ROUTES

The PC route has the heaviest traffic density and is recommended as the primary route to be considered. Continuation of the PC's bypass route from Trenton to Harrisburg should be consdered as a primary route in order to avoid rail traffic congestion in the Philadelphia area arising from heavy rail traffic (freight, intercity passenger and commuter). The CNJ-RDG-B&O route is also recommended as a primary route to be considered since it is required for other major traffic flows such as the flow between Newark and the Washington Gateway and between Baltimore and Pittsburgh.

The third route in this analysis—LV-RDG-WM-N&W via Allentown-Harrisburg—represents excess capacity west of Hagerstown (Cherry Run) where it parallels the B&O route. East of Hagerstown the route is more direct than the B&O route via Baltimore and, therefore, is recommended as an alternative route to be considered.

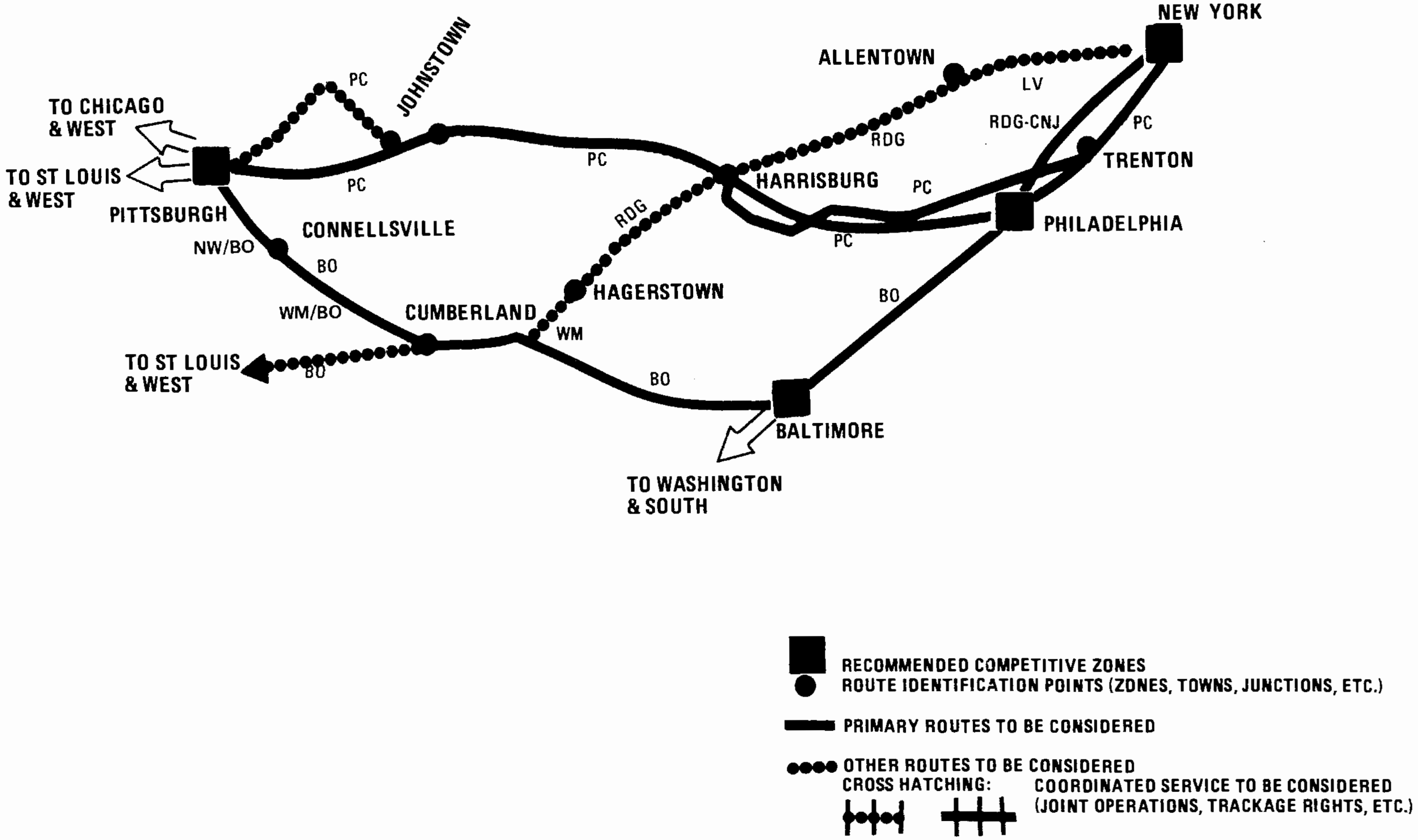
Competition to the New York/Newark area can be maintained through sale or lease, of the RDG-CNJ trackage from Newark to Philadelphia to a solvent carrier or through a coordinated services arrangement over this trackage.

# PRESENT INTERSTATE RAIL ROUTES
# NEW YORK/NEWARK-PITTSBURGH



## ANALYSIS OF ALTERNATIVE ROUTES

# NEW YORK/NEWARK — PITTSBURGH



## WASHINGTON GATEWAY-NEWARK

**(North-South Eastern Seaboard Traffic Flow)**

### PRESENT SERVICE

| *Carrier(s)* | *Route Identification* |
|---|---|
| Penn Central (PC) | Baltimore, Philadelphia |
| Baltimore and Ohio (B&O-Chessie System) | Baltimore, Philadelphia |
| Reading (RDG), Central Railroad of New Jersey (CNJ) | |

### STATEMENT OF THE PROBLEM AND PLANNING OBJECTIVES

Since the bankrupt carriers only operate between Philadelphia and Newark, preservation of freight competition is a major consideration in the planning process. Another major planning objective should be to improve the efficiency of both freight and passenger services along this congested corridor, particularly in light of the Act's requirements of Northeast Corridor passenger service improvements.

Excess capacity is not a problem on this route. Rather, extensive and expanding passenger service acts to constrain efficient freight operations during peak passenger periods. This increasing congestion hinders the efficient operation of both freight and passenger service.

### ANALYSIS OF ALTERNATIVE ROUTES

The traffic volumes, both passengers and freight, are high enough that both routes are required.

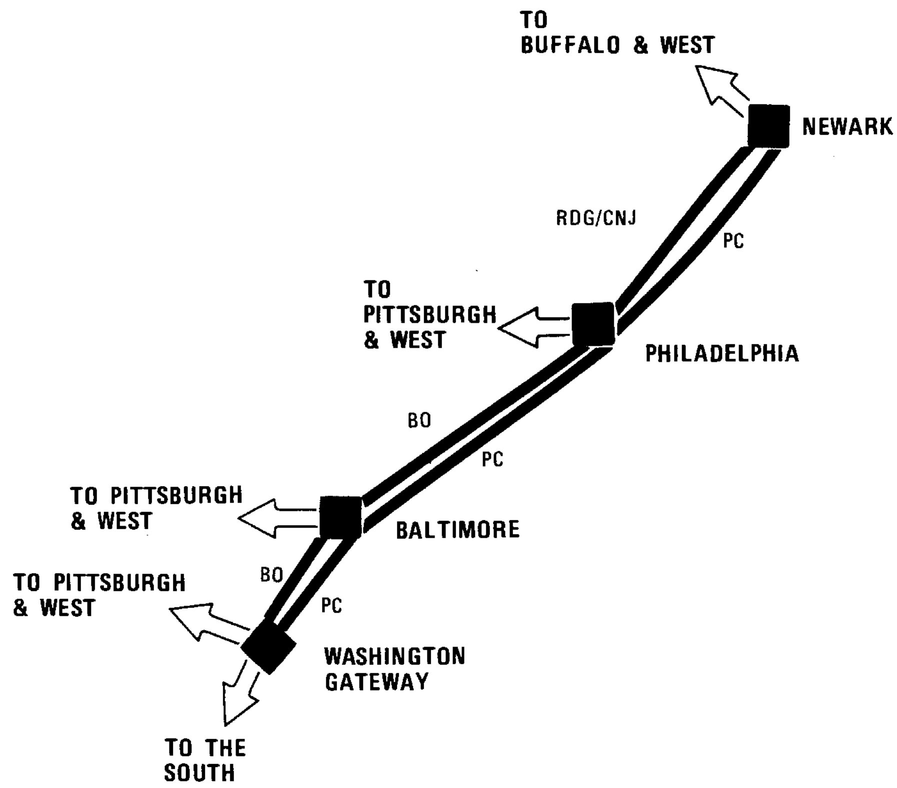
To maintain competition, the Association should encourage an alternate carrier (to the Corporation) to provide mainline service between Philadelphia and New York. This can be most readily achieved by providing B&O access to Newark by sale, lease or trackage rights over the CNJ-RDG line.

Joint trackage rights over both routes should be considered since such coordination will provide the greatest operating flexibility to improve both passenger and freight service efficiency.

Special attention has to be given by the Association to implement the provisions of the Act regarding the improvement of passenger train service in the Northeast Corridor. The legislation makes provisions for Amtrak to acquire through sale, lease or otherwise the necessary trackage.

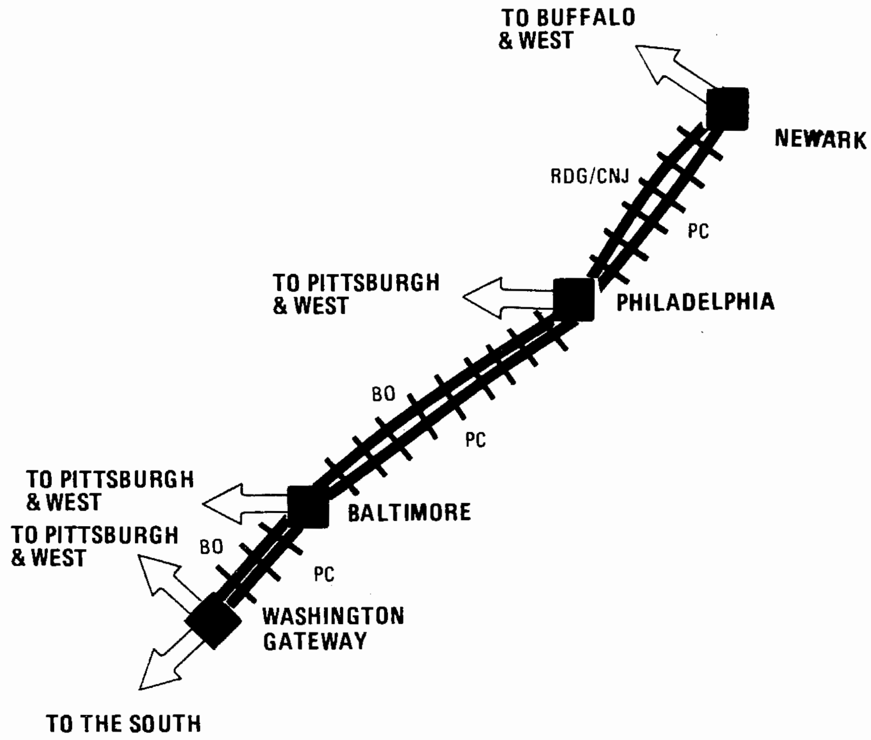
## PRESENT INTERSTATE RAIL ROUTES

# WASHINGTON GATEWAY — NEWARK




■ RECOMMENDED COMPETITIVE ZONES
● ROUTE IDENTIFICATION POINTS (ZONES, TOWNS, JUNCTIONS, ETC.)
▬ MAINLINE ROUTE

# ANALYSIS OF ALTERNATIVE ROUTES
# WASHINGTON GATEWAY- NEWARK




RECOMMENOEO COMPETITIVE ZONES
ROUTE IDENTIFICATION POINTS (ZONES, TOWNS, JUNCTIONS, ETC.)

PRIMARY ROUTES TO BE CONSIDERED
OTHER ROUTES TO BE CONSIDERED
CROSS HATCHING: COORDINATED SERVICE TO BE CONSIDERED (JOINT OPERATIONS, TRACKAGE RIGHTS, ETC.)

# BUFFALO/CLEVELAND-CHICAGO

### (East-West Great Lakes Traffic Flow)

## PRESENT SERVICE

### BUFFALO-CHICAGO

| *Carrier(s)* | *Route Identification* |
|---|---|
| Penn Central (PC) | Cleveland |
| Erie Lackawanna (EL) | Jamestown, Youngstown, Marion |
| Norfolk & Western (N&W) | Erie, Cleveland, Fostoria, Ft. Wayne |

### CLEVELAND-CHICAGO

| | |
|---|---|
| Penn Central (PC) | Toledo, South Bend |
| Baltimore & Ohio (B&O-Chessie System) | Akron, Fostoria |
| Norfolk & Western (N&W) | Fostoria, Ft. Wayne |

## STATEMENT OF THE PROBLEM AND PLANNING OBJECTIVES

Excess interstate capacity exists on the route both east and west of Cleveland. Traffic densities can be improved by the elimination of one or more routes. If this consolidation occurs it will permit the more productive utilization of the remaining interstate facilities. This should provide the economic basis for improving and modernizing, where required, the remaining interstate routes.

Continued competition is not an issue between Buffalo and Chicago because of the existence of a solvent carrier's line over the entire route in addition to the PC line. However, west of Cleveland, consideration should be given to coordinating the services and operations of the two solvent carriers to provide a stronger basis for competition with the Corporation.

## ANALYSIS OF ALTERNATIVE ROUTES

The PC has the highest density routes over the entire distance between Buffalo and Chicago. Shifting this tonnage to alternate routes would not be feasible in view of capacity limitations on other routes and present yard configurations.

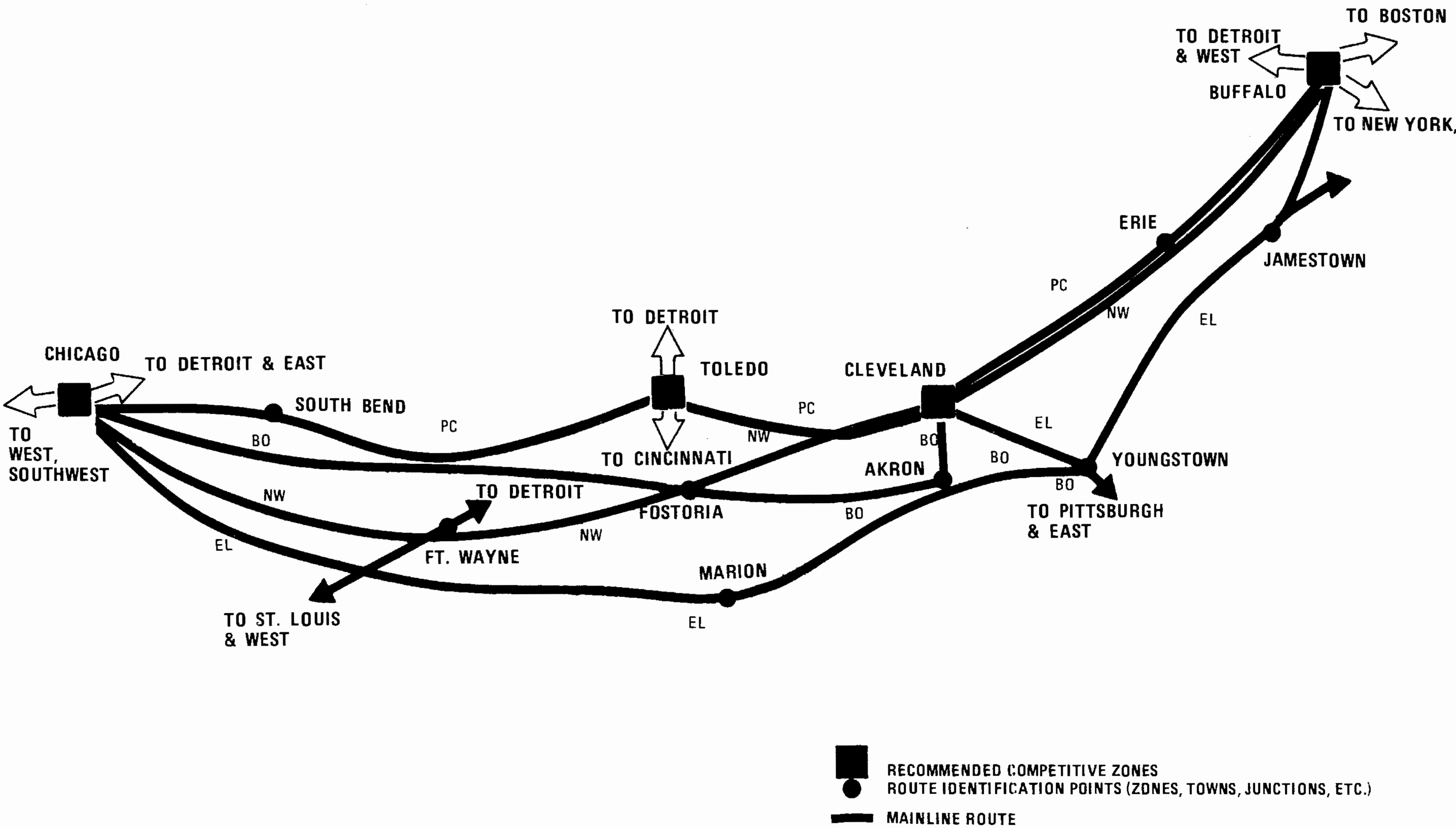
Between Buffalo and Cleveland the solvent N&W parallels the PC, and the EL provides a more southerly mainline route which generally parallels the PC and N&W. To improve utilization east of Cleveland the Association should consider (1) rerouting EL traffic throughout Buffalo rather than Jamestown and (2) operation of the N&W route on a coordinated basis with PC, hereby allowing the elimination of one set of tracks. The EL should however, be considered as a possible alternative because it provides a bypass around Buffalo for east-west traffic.

Between Cleveland and Chicago consideration should be given to consolidating mainline operations of the N&W and the B&O. Concentrating flows over the N&W to the Fostoria area will improve density while reducing circuity. West of Fostoria, where both lines are primarily single track and handle other major market flows, each can maintain separate routes without significantly reducing utilization. Such coordination should permit both the N&W and the B&O to improve efficiency and to ensure a stronger basis for competition with the Corporation.

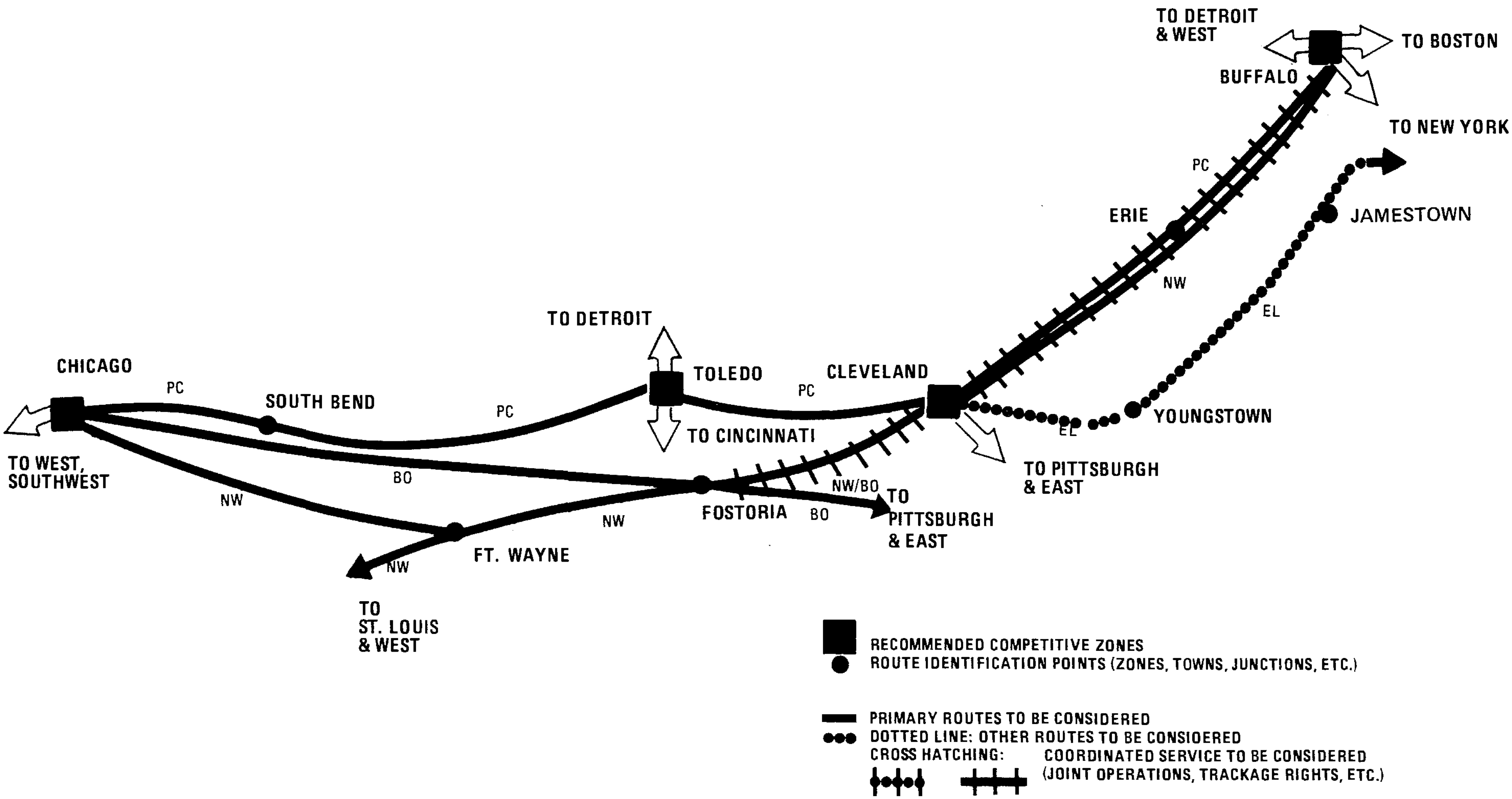
The EL is not proposed as an alternative west of Cleveland, as this traffic can be moved over other routes and thereby reduce excess circuity and plant.

# PRESENT INTERSTATE RAIL ROUTES

# BUFFALO/CLEVELAND — CHICAGO



# ANALYSIS OF ALTERNATIVE ROUTES
# BUFFALO/ CLEVELAND — CHICAGO

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## DETROIT-CHICAGO

### (East-West Great Lakes Traffic Flow)

### PRESENT SERVICE

| *Carrier(s)* | *Route Identification* |
|---|---|
| Chesapeake & Ohio (C&O-Chessie System) | Lansing, Grand Rapids |
| Grand Trunk Western (GTW) | Durand, Lansing, Battle Creek, South Bend |
| Norfolk and Western (N&W) | Butler, Fort Wayne |
| Penn Central (PC) | (1) Battle Creek, South Bend<br>(2) Toledo, Butler, South Bend |

### STATEMENT OF THE PROBLEM AND PLANNING OBJECTIVES

Excess interstate capacity exists on the route with each of the three solvent carriers having one mainline route and the bankrupt Penn Central having two routes. Traffic densities can be improved by the elimination of one or more routes. If this consolidation occurs it will permit the more productive utilization of the remaining interstate facilities. This would provide the economic basis for improving and modernizing, where required, the remaining interstate routes.

Continued competition is not an issue between Detroit and Chicago because of the existence of three solvent carriers. Consideration, however, should be given to coordinating the services and operations of the solvent carriers and the Corporation to provide balanced competition while still improving efficiency.

### ANALYSIS OF ALTERNATIVE ROUTES

There are now four carriers providing service between Detroit and Chicago. None of the carriers has the predominant amount of traffic. Consolidation of the traffic on two routes needs to be considered. However, because each of the four carriers has a relatively equal share of traffic among the routes, no clear alternative emerges.

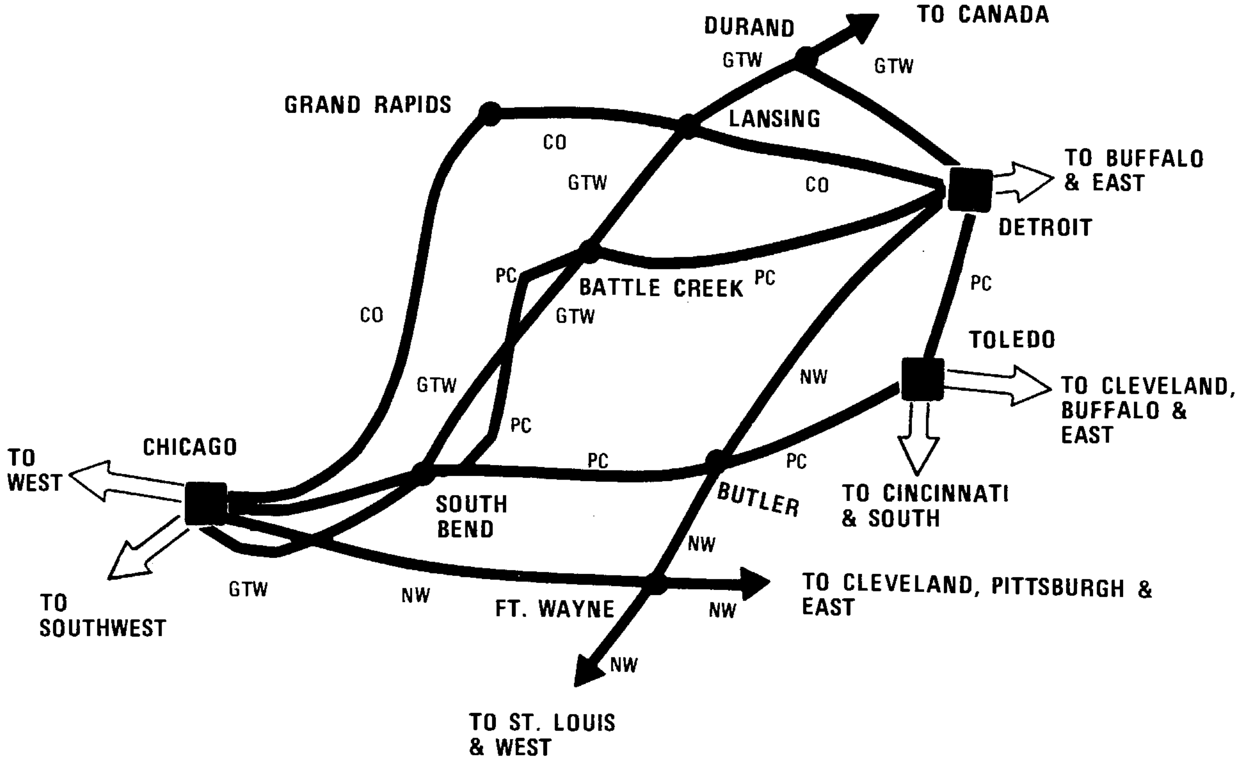
Based on the need to reduce circuity and minimize rehabilitation costs, the primary alternative is to consider retaining the following two routes: (a) the C&O from Detroit to Lansing and the GTW from Lansing to Chicago; and (b) the N&W from Detroit to Butler, Indiana and the PC route from Butler to Chicago (via South Bend).

To improve efficiency, it is also recommended that these carriers not only use facilities jointly but also coordinate their overall services and operations.

Since the N&W route to Ft. Wayne will be needed to serve other routes (e.g. Detroit-St. Louis), the Association may wish to consider the route from Butler to Chicago (via Ft. Wayne) as an alternative to one of the primary routes suggested above.

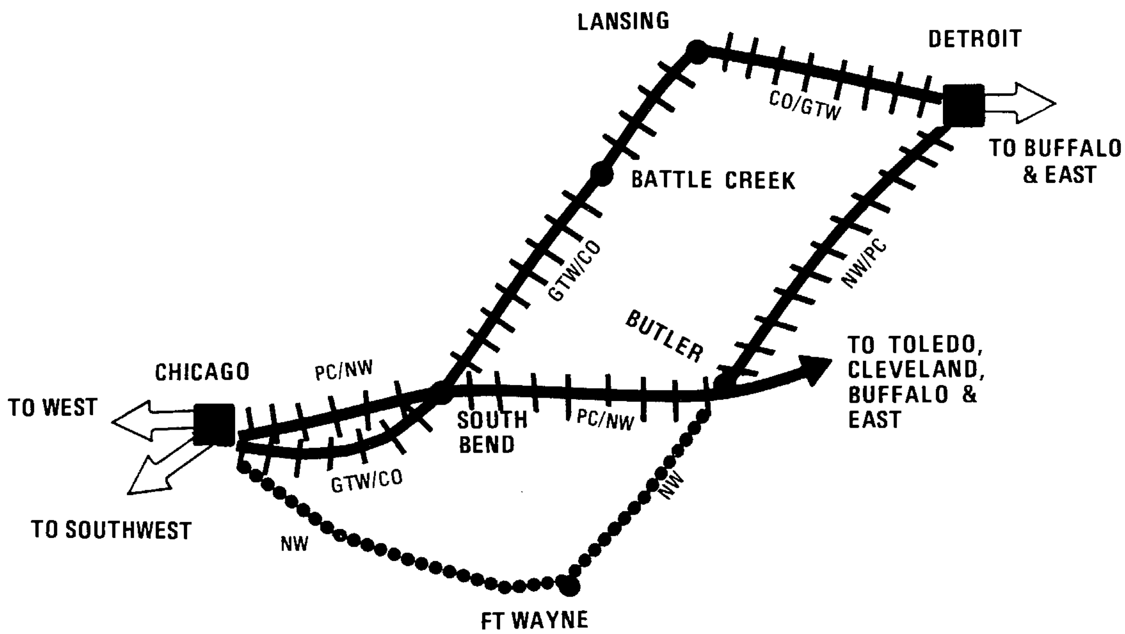
## PRESENT INTERSTATE RAIL ROUTES

# DETROIT — CHICAGO




■ RECOMMENDED COMPETITIVE ZONES
● ROUTE IDENTIFICATION POINTS (ZONES, TOWNS, JUNCTIONS, ETC.)
▬ MAINLINE ROUTE

# ANALYSIS OF ALTERNATIVE ROUTES
# DETROIT — CHICAGO




RECOMMENDED COMPETITIVE ZONES
ROUTE IDENTIFICATION POINTS (ZONES, TOWNS, JUNCTIONS, ETC.)

PRIMARY ROUTES TO BE CONSIDERED
OTHER ROUTES TO BE CONSIDERED
CROSS HATCHING: COORDINATED SERVICE TO BE CONSIDERED (JOINT OPERATIONS, TRACKAGE RIGHTS, ETC.)

M73-1921-2

## PITTSBURGH-CHICAGO

**(Traffic Flows from the Alleghenies to Lake Erie and East-West along the Great Lakes)**

### PRESENT SERVICE

| *Carrier(s)* | *Route Identification* |
|---|---|
| Baltimore & Ohio (B&O-Chessie System) | Youngstown, Akron, Fostoria |
| Norfolk & Western (N&W) | Massillon, Bellevue, Ft. Wayne |
| Penn Central (PC) | (1) Alliance, Mansfield, Ft. Wayne |
| | (2) Alliance, Cleveland, Toledo |

### STATEMENT OF THE PROBLEM AND PLANNING OBJECTIVES

Excess capacity exists on the route with each of the two solvent carriers having one mainline route and the bankrupt Penn Central having two routes. Traffic densities can be improved by the elimination of one or more routes. If this consolidation occurs it will permit more productive utilization of the remaining interstate facilities. This should provide the economic basis for improving and modernizing, where required, the remaining interstate routes.

Continued competition is not an issue between Pittsburgh and Chicago because of the existence of two solvent carriers. Consideration, however, should be given to coordinating the services and operations of the two solvent carriers to provide a stronger basis for competition with the Corporation.

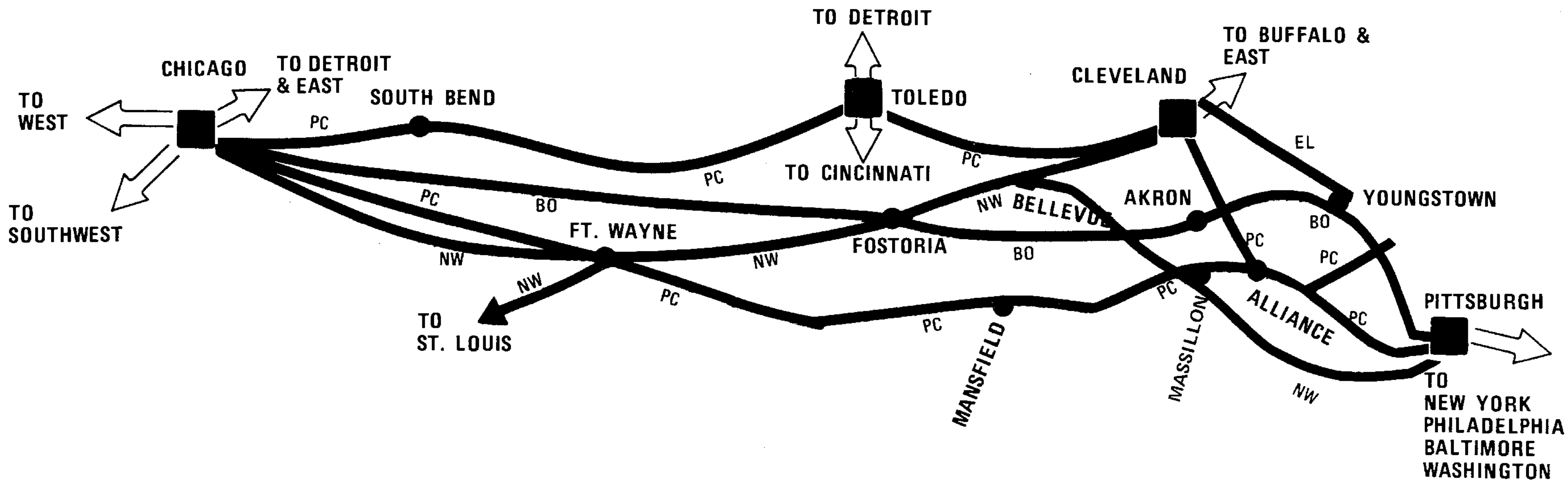
### ANALYSIS OF ALTERNATIVE ROUTES

This route presents a complex set of planning alternatives. Two primary routes are recommended for consideration. Interstate traffic between Pittsburgh and Chicago which is currently moved on the PC line via Mansfield and Ft. Wayne should be concentrated on the PC route via Alliance to Cleveland, thence over their high density route to Chicago through Toledo. This would eliminate the need for major rehabilitation of the PC's Mansfield/Ft. Wayne route.

In order to assure that the solvent carriers are also able to reduce costs and compete effectively with the Corporation's mainline density, the N&W and B&O should consider operating coordinated service from Pittsburgh to just east of the Bellevue, Ohio area (several connections from B&O to N&W are possible). The primary route to be considered for these coordinated services could be either the P&LE (already used by B&O under trackage rights) or the B&O from Pittsburgh to Youngstown and the B&O from Youngstown to Fostoria. West of Fostoria both the N&W and B&O lines are recommended as primary routes to be considered. Both are primarily single track lines with acceptable traffic densities.

Because traffic flows to and from other parts of the Northeast are very heavy over portions of the routes between Pittsburgh and Chicago, it may be necessary to consider other routes or route segments. For example, the P&LE-EL route from Pittsburgh to Cleveland may be required, as might be the PC's current Pittsburgh-Ft. Wayne-Chicago line. The latter may be retained as only a single track line in addition to a local service and feeder line function.

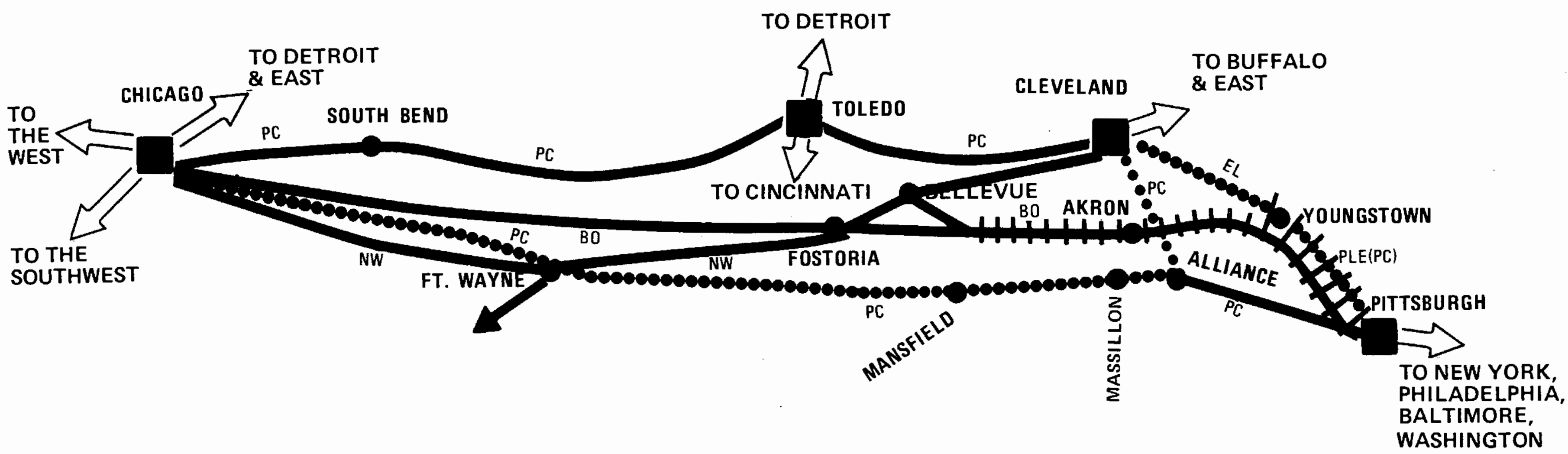
# PRESENT INTERSTATE RAIL ROUTES
# PITTSBURGH— CHICAGO




RECOMMENDED COMPETITIVE ZONES
ROUTE IDENTIFICATION POINTS (ZONES, TOWNS, JUNCTIONS, ETC.)
MAINLINE ROUTE

# ANALYSIS OF ALTERNATIVE ROUTES

## PITTSBURGH— CHICAGO




RECOMMENDED COMPETITIVE ZONES
ROUTE IDENTIFICATION POINTS (ZONES, TOWNS, JUNCTIONS, ETC.)

PRIMARY ROUTES TO BE CONSIDERED
OTHER ROUTES TO BE CONSIDERED
CROSS HATCHING: COORDINATED SERVICE TO BE CONSIDERED (JOINT OPERATIONS, TRACKAGE RIGHTS, ETC.)

## CINCINNATI GATEWAY-CHICAGO

**(Lake Michigan to South Traffic Flow)**

### PRESENT SERVICE

| *Carrier(s)* | *Route Identification* |
|---|---|
| Chesapeake & Ohio (C&O-Chessie System) | Muncie |
| Penn Central (PC) | Indianapolis, Logansport |

### STATEMENT OF THE PROBLEM AND PLANNING OBJECTIVES

Excess interstate capacity exists between Cincinnati and Chicago with the solvent C&O maintaining a single track route and the PC maintaining a separate single track route (double track south of Indianapolis). Total volume on both lines will support only one high volume, modernized single track route. If consolidation occurs, the economic basis for improving and modernizing, where required, will exist. Continued competition is not an issue between Cincinnati and Chicago because of the existence of a solvent carrier.

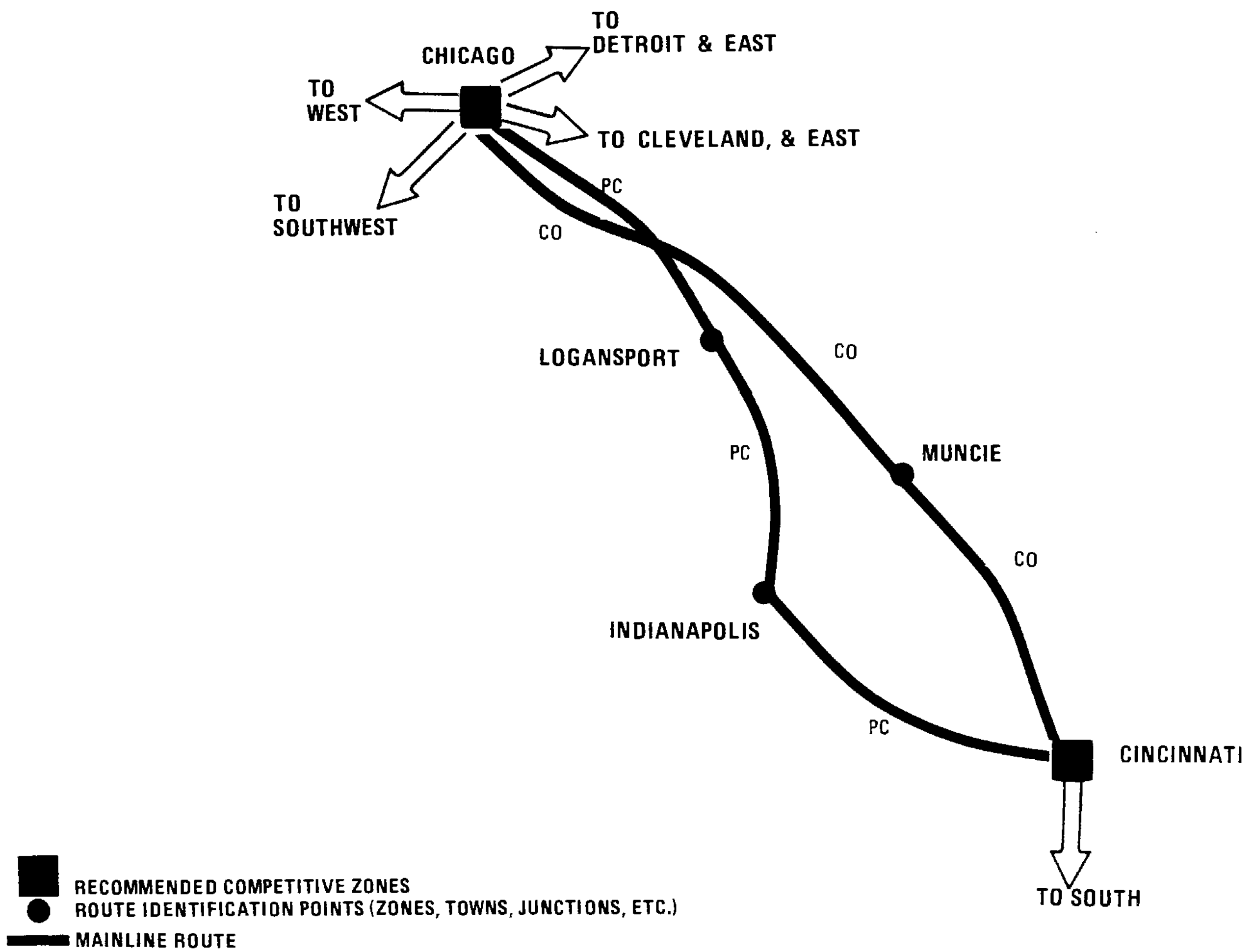
### ANALYSIS OF ALTERNATIVE ROUTES

The C&O route is in superior physical condition and therefore is recommended as the primary route to be considered for serving this market. The Corporation could obtain trackage rights over this route. This may require some lengthening of sidings to handle the additional tonnage.

Recognizing that Indianapolis is an important traffic center, the Association may choose to improve the PC line which serves Indianapolis directly. Therefore, the PC line is shown as an alternative to be considered. If this choice is made, the Chesapeake and Ohio should be provided trackage rights and its own route reduced to local service status.

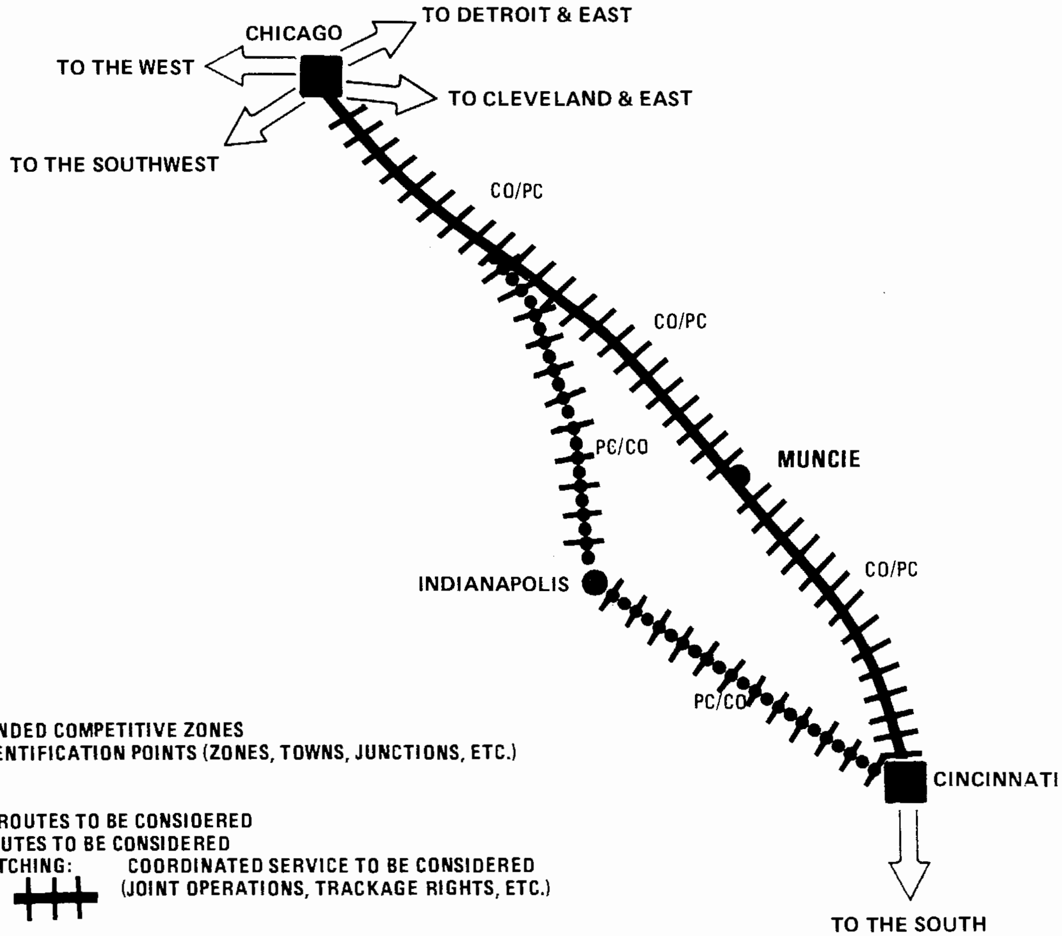
## PRESENT INTERSTATE RAIL ROUTES

# CINCINNATI GATEWAY — CHICAGO



# ANALYSIS OF ALTERNATIVE ROUTES

# CINCINNATI GATEWAY — CHICAGO




RECOMMENDED COMPETITIVE ZONES
ROUTE IDENTIFICATION POINTS (ZONES, TOWNS, JUNCTIONS, ETC.)

PRIMARY ROUTES TO BE CONSIDERED
OTHER ROUTES TO BE CONSIDERED
CROSS HATCHING: COORDINATED SERVICE TO BE CONSIDERED (JOINT OPERATIONS, TRACKAGE RIGHTS, ETC.)

## LOCAL RAIL SERVICE

### *The Existing Local Rail System*

As discussed in Part I, the region's rail system developed during the nineteenth century and early 1900's into a comprehensive network of railroad trackage designed to provide access by the region's commerce to what was then the most efficient means of transportation. Today, despite the changed economic conditions in the region, the size of this system remains essentially the same as it was when constructed.

The dimensions of the duplication of service and excess capacity problems at the local service level can be illustrated by examining the case of Philadelphia's rail system. The city's 19th century transportation requirements brought into being more than 12 different railroads, some less than two miles long. Over the years, many of them were brought under the control of the Pennsylvania Railroad (now the Penn Central). The city's growth and expansion during the subsequent period left little chance to construct new modern yards, and regulatory requirements often stymied efforts to eliminate uneconomic trackage. As a consequence, Philadelphia today has a multitude of freight yards (18 operated by Penn Central, three operated by the Reading and two operated by the Chessie System) and a maze of duplicative and often parallel trackage (much of which runs down the center of busy streets). The 150 square mile Philadelphia area is served by four Class I railroads which operate within the area approximately 500 miles of line haul trackage and more than 300 miles of yard and siding trackage, as illustrated in Figure 8. While this trackage was constructed to serve a large number of shippers, some have since gone out of business, many are only occasional users of rail service and only a few are users of high volume rail service. For example, although the Penn Central serves more than 1,800 users (industries, coal and ore facilities, grain elevators, intermodal facilities and food terminals), only 36 of these customers account for more than half of the traffic generated in Philadelphia.

While Philadelphia may be one of the more vivid examples of duplicate and uneconomic local rail service plant, the problem is by no means limited to metropolitan areas. The Bay City, Michigan, zone is an example of the excess capacity problem in a basically rural area. Annually, only 40,000 carloads originate or terminate in the Bay City Zone (about 110 per day), yet three different railroad lines connect the Bay City area to the south and the west (two Penn Central lines and one line of the Chessie System). Additionally, two parallel low density lines extend to the north from Bay City. Typically, each carrier maintains a separate local yard.

As a result of this redundant railroad system at the local level there are often too many carriers vying for too little traffic with a consequent loss of efficiency, viability and service quality.

### Planning Guidelines

In order to meet the restructuring objectives for the region's local rail service, five basic planning guidelines are recommended:

1. The volume of rail traffic generated should be used as a key determinant of rail service requirements. This traffic, in conjunction with the location of the generating points, indicates both the dependence on rail service and rail's ability to provide efficient and financially viable service.

2. The maximum volume of existing rail traffic should continue to have access to direct rail service consistent, however, with the requirement that the individual segments of the system be financially viable.

3. The feeder lines connecting groups of traffic generating points to the high volume, interstate network should be made more efficient. The efficiency of the resulting system will be enhanced substantially by the reduction of duplicate facilities and services.

4. The unneeded and uneconomic portions of the local rail service network should be excluded from the Association's Final System Plan. The continued support of these facilities by viable segments of the system cannot be justified. However, some of these facilities may warrant continued operation where local or State interests believe this to be in their best interest and are willing to provide the necessary subsidy.

5. The restructured local service network should be modernized and rehabilitated where necessary in order to provide quality service.

In restructuring the region's local rail service network, the Association and the solvent railroads in the region should analyze each segment on the basis of these guidelines. However, since the vast majority of the region's traffic is of sufficient concentration and volume for planners to identify readily the rail line requirements for high traffic points, the rail lines generating lower volumes and/or serving diffused traffic points should receive the greater attention.

### Criteria

The purpose of this section of the report is to present criteria for separating those lines which have a high probability of being financially viable from those which are of questionable financial viability or have no hope of being financially viable. This screening process will allow the concentration of the analytical effort on those portions of the rail system where the continuation of rail service is not clear cut.

A study conducted for the Department developed a viability criteria for the screening process.[1] This study estimated, for lines of varying length, the traffic levels required to make financially viable rail operations highly probable or, conversely, highly unlikely. The procedure involved estimating the costs associated with the production of rail services and relating those costs

[1] Federal Railroad Administration, *Development and Evaluation of An Economic Abstraction of Light Density Rail Line Operations*, June 1973, prepared under contract by R. L. Banks and Associates, Inc.

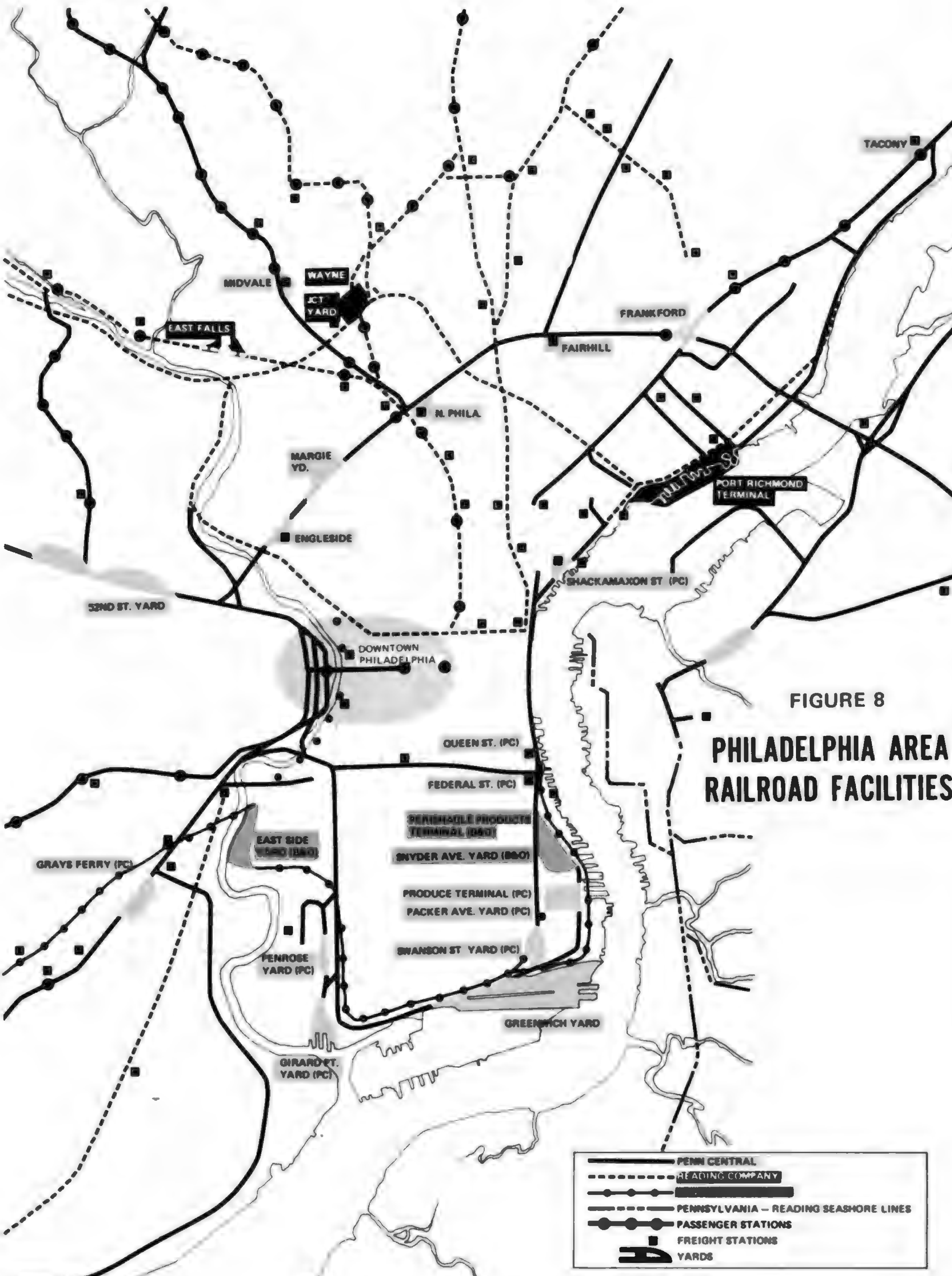



FIGURE 8

# PHILADELPHIA AREA RAILROAD FACILITIES

to the revenue per carload typically realized by railroads from traffic generated on light density lines. Statistical analysis was then employed to determine the relationship between line profit (or loss) and the variables of line length and traffic volume.

The results of this study for the region are shown in Figure 9. For any specified length of local service rail line, the "DOT Upper Criteria" line indicates the amount of traffic that would have to be generated annually to give the line a high probability of financial viability. The "DOT Lower Criteria" line on the chart indicates the amount of traffic below which operation on any particular length of line would have a high likelihood of being financially nonviable. Between the upper and lower criteria, financial viability is questionable. For example, if a local service line five miles long originates or terminates 480 or more carloads of traffic annually, it would have a high probability of being financially viable; if it generated between 140 and 480 carloads, its financial viability would be questionable and would require detailed study; and if it generated less than 140 carloads annually there would be a high probability that it would be a financially nonviable operation.

Also shown on Figure 9 is a line reflecting the "34-Carload Rule" which was developed by the Interstate Commerce Commission for use in abandonment cases. This rule is a presumptive standard which says that a rail line which generates less than 34 carloads per mile of line per year (i.e., falls below the ICC's 34-Carload Rule line in the figure) is presumed to be financially nonviable. The close agreement between the ICC's 34-Carload Rule and the DOT Lower Criteria is noteworthy.

The application of the above criteria to the region's rail network requires accurate and current rail traffic data and the ability to analyze each section of rail line in detail. Data concerning the volume and location of rail traffic generated in the region during 1972 was collected from each of the major rail carriers operating in the region. This data was then programmed for computer zone-by-zone analysis.

### Application of Screening Standard

As discussed above, the screening process is designed to identify those segments of the local rail service network which have a high probability of financial viability and those segments whose financial viability is questionable or improbable. Thus, the appropriate screening standard is the DOT Upper Criteria line, since it represents the boundary between these two levels of viability. The process of applying this screening standard to the region's many traffic generating points involved two steps:

1. The railroads' traffic data was plotted at the point on the rail lines where it was generated (originated or terminated); and

2. The traffic volume and the distance from the generating point to the nearest financially viable point or line (whether within or outside the zone) were compared with the DOT Upper Criteria line. Those points falling above the line were identified as having a high probability of financial viability and are recommended for direct local rail service. Those points falling below the line were identified as having a questionable or low probability of financial viability.

These two steps were applied to each zone as follows:

1. All traffic generating points (stations) originating or terminating less than 75 carloads per year were excluded from specific consideration because, by either the DOT Lower Criteria or the ICC's 34-Carload Rule, service to these points has a high probability of being financially nonviable.

2. Those stations in each zone which generated sufficient traffic to justify connection with the region's interstate rail network were identified using the criteria for probable financial viability and are recommended for direct rail service.

3. Starting from each of these stations identified as meeting the criteria of paragraph 2 above and proceeding in sequence, all other points generating more than 75 carloads per year in the zone were compared with the DOT Upper Criteria based on traffic volume and the rail distance between each point and the nearest financially viable station or junction with a financially viable line. All those meeting the criteria are recommended for direct rail service.

An example of the application of this screening process to a specific zone is presented at the end of this section.

### Points Recommended For Direct Local Rail Service

Based on the data available for the analysis, we recommend that those points which meet the above criteria be included in the Association's Final System Plan for direct rail service by the Corporation or one of the region's solvent carriers. The points included in the Secretary's recommendations originate or terminate 96% of the region's traffic (see Table 1). This same service level can be expected to accommodate a substantial rise in regional traffic without straining the capacity of the restructured local rail service network.

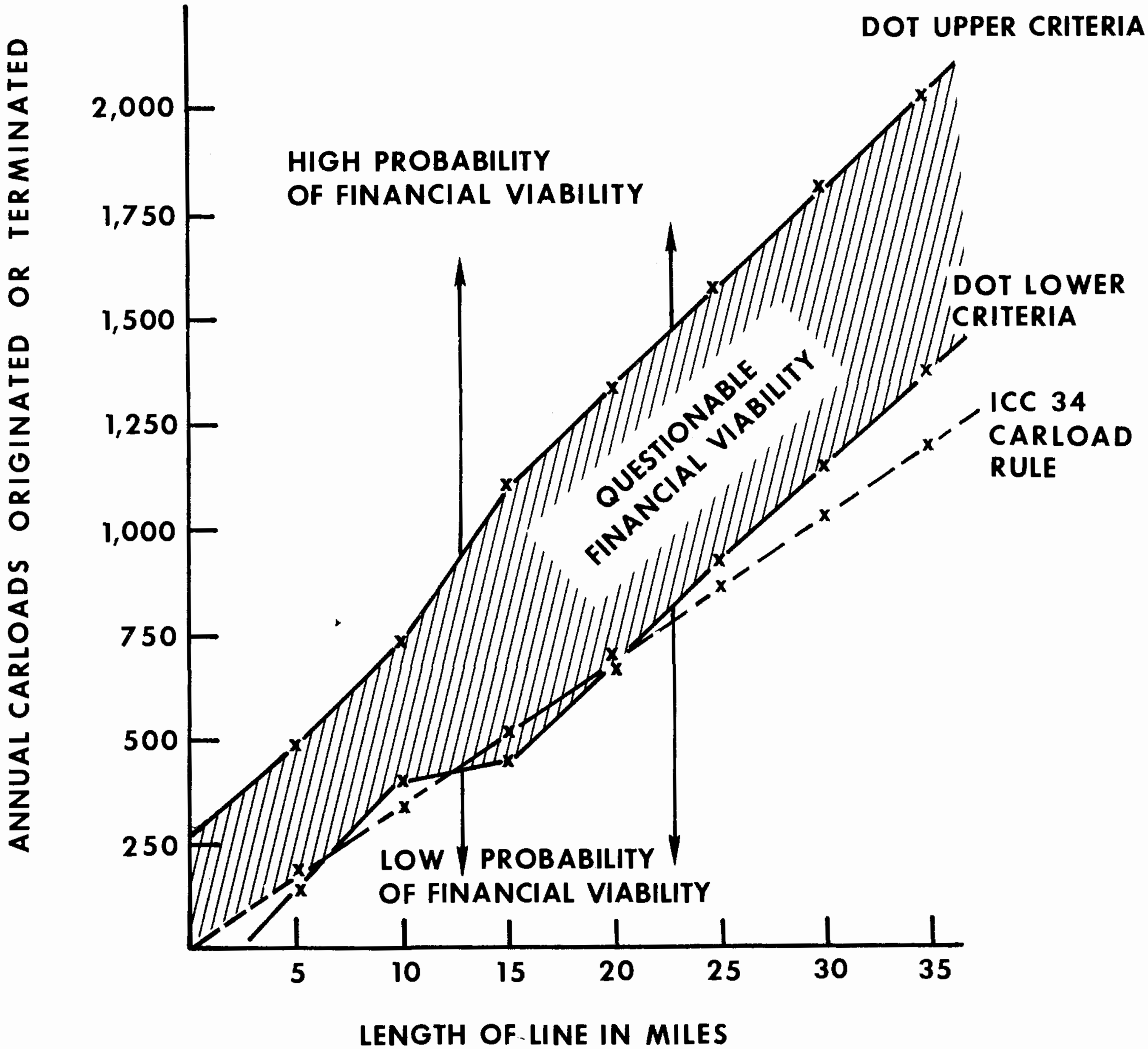
On the basis of the screening criteria, rail freight service would be provided in all but two of the 184 zones—Cape Charles, Virginia, and Westerly, Rhode Island. Cape Charles generated only 13 carloads per day in 1972 and this traffic was diffused throughout the zone. Connections from the only adjacent zones—Salisbury, Maryland, to the north and Norfolk to the south (via float operations)—cannot be justified by the very small volume of traffic.

In the case of Westerly, the zone is traversed by the Boston to New York "Northeast Corridor" route, which has a high volume of passenger service. Even though this route will be retained for passenger service, the level of freight traffic is too low to justify the inclusion of this zone in the points recommended for local freight service.

Before the Association accepts any of these recommendations, it should, of course, review the most recent data on rail traffic in the region. The basic traffic data used in the Department's analysis reflected 1972 rail operations, which was the latest data available. Since 1972, traffic

FIGURE 9

## RELATIONSHIP OF RAIL LINE LENGTH AND TRAFFIC VOLUMES FOR FINANCIALLY VIABLE LOCAL SERVICE OPERATION




SOURCE: FEDERAL RAILROAD ADMINISTRATION RESEARCH REPORT OE-73-3 - DEVELOPMENT AND EVALUATION OF AN ECONOMIC ABSTRACTION OF LIGHT DENSITY RAIL LINE OPERATIONS volumes or future expectations at certain of the points may have changed so as to affect the results of the screening process. In addition, the criteria used to screen these points were based on "typical" revenue levels. Where the "actual" revenue generated by the traffic at a given point is significantly above or below the typical or average figure, the probability of a financially viable rail operation may change accordingly. However, it is not anticipated that traffic volumes at many of the points recommended for service will have changed to the extent that the Association's Final System Plan would not include them. Therefore, the Association's analysis should center primarily on those points not recommended for service.

In addition to considering service by the Corporation and existing Class I solvent carriers, the Association should also consider the possibility of providing service to some of these points by short line railroads (Class II) which, in certain cases, may be more economical.

### Designation Of Potentially Excess Rail Lines

All rail lines which are neither necessary nor optional to serve those points recommended for continued direct rail service, and those lines which provide duplicate, low density feeder service, are designated as potentially excess rail lines for the purposes of this report. These are the lines which should receive the closest analysis in the process of restructuring the local rail service network. While the rail lines classified as potentially excess represent a significant portion of the track miles in the region, they generate only 4 percent of the region's total rail traffic.

The process of identifying potentially excess lines considered several factors—the location of points recommended for service, the existence of duplicate feeder lines, a line's traffic density and whether the owning railroad is bankrupt or solvent. A line was *not* identified as potentially excess if any one of the following conditions were met:

1. A line was necessary to serve points recommended for direct rail service or was an alternative line to such points and met the screening criteria; or

2. A line did not directly serve a point recommended for service but was the *only* line which provided access for the points to a mainline in the system; or

3. A line did not directly serve a point recommended for service but was one of two or more lines which served as access for the points to the mainline rail system, and the existing traffic density on the line was greater than ten million gross ton miles per route mile per year for bankrupt carriers' lines or greater than five million gross ton miles per route mile per year for solvent carriers' lines.

If none of these conditions applied, the line was then identified as potentially excess.

The lower traffic density requirement for solvent carriers in paragraph 3 above was used to reflect the fact that the solvent carriers' systems are not faced with the same degree of financial nonviability as are the bankrupt carriers, but that some degree of restructuring of their systems is needed. Also, the potential for duplicate feeder service in the bankrupt carriers' systems is much greater than in the case of any of the solvent carriers.

The lines classified as potentially excess should be carefully analyzed by all affected parties—the Association, solvent railroads, the States, and the affected communities and shippers. The Association and the solvent railroads should be concerned for three reasons:

1. Some of the lines classified as being potentially excess may serve points where rail service is, in fact, financially viable. As discussed earlier, the screening criteria is based on average revenue and 1972 traffic levels. A given point may generate traffic which produces revenues which are significantly higher than the average, or current traffic levels may be higher than they were in 1972. Either of these cases may serve to justify the inclusion of additional rail lines in the Final System Plan.

2. Certain of those lines which continue to be classified as financially nonviable may be made viable through tariff adjustments which would be acceptable to the line's users.

3. The lines considered necessary to serve the points recommended for continued direct rail service represent the shortest rail distance from each point to a junction with another financially viable rail line without consideration of the identity of the corporate entity now serving the point. Thus, under the resulting network, a point now served by one railroad may have to be served by a different railroad. The implementation of the plan therefore requires consideration of a variety of factors by the involved railroads as well as negotiations among them for the transfer and/or joint use of facilities.

The lines classified as potentially excess also merit close attention by States, local communities and shippers because they are the lines most likely to be determined to be financially nonviable and hence excluded from the Association's Final System Plan. In addition, the availability of matching Federal subsidy funds may make it possible for State and local interests to continue those rail lines which are identified as financially nonviable and which they believe to be of particular importance to them. Thus, a determination must be made on the desirability of subsidizing and/or acquiring each of these lines.

The decision regarding the subsidization of a local rail line should be based, in part, on a comparative analysis of the total resources consumed by direct rail service and by motor carrier service either from the origin to destination point or to an intermodal facility. A given rail line may be unable to generate enough traffic for financially viable rail operation yet that traffic volume may be sufficient to justify continuing subsidized rail service since its total resource consumption would be less than for comparable motor carrier service.

However, at low traffic levels, motor carrier service is less costly than rail in terms of total resource consumption, and in such a case the traffic should be hauled by motor carrier rather than by rail unless other overriding considerations are involved. Ultimately, if States or localities do determine that subsidy is justified, the necessary agreements would have to be implemented.

Figure 10 shows, for rail lines of varying length, the relationship between the level of traffic required for a high probability of rail financial viability and the breakeven line between rail and motor carriers in terms of total resource consumption. The line labeled (1) is the DOT Upper Criteria discussed earlier. The line labeled (2) is based on an analysis conducted by the Department of the total cost of resources consumed by motor carriers and Class I railroads under efficient operations in moving like tonnages over the same distance, which is the distance from a traffic generating point to an intermodal facility. The estimated rail resource consumption was based on the service involved in switching the empty and loaded freight cars at the shipper's siding, moving the loaded cars to the yard, switching them into a line haul train and delivering empty cars to the shipper's siding. The estimated motor carrier resource consumption was based on placement of empty trailers at the shipper's location, pick-up and movement of the loaded trailers to the railroad yard, placement of the load on railroad cars, and switching those cars into a line haul train. Line (2) thus represents the volume of traffic required for each length of haul in order for the two modes to consume the same value of resources. Below this line motor carriers are more efficient, while above it rail has the efficiency advantage in moving the traffic.

Based on this analysis, it is recommended that only those lines falling between curve (1) and curve (2) be considered for local subsidy. The States and local communities can consider whether rail service by other than Class I railroads may change the relationship of these curves. It is possible that short line railroad operations could improve the rail efficiency curve to the point where the line is financially viable or where a local subsidy might be justified.

It is important to note that even for the small proportion of traffic not included in the Secretary's local rail service recommendations (4 percent of the region's total rail traffic), part of it will continue to be carried by rail after the restructuring process has been completed because:

1. Some of this traffic and associated lines will be determined by the Association to be, in fact, financially viable and will therefore continue to have direct rail service;

2. Some of it will be subsidized by States and localities and will thereby continue to receive direct rail service; and

3. Some of it will go by motor carrier from the traffic generating point to the nearest financially viable rail facility where it will be shipped by railroad. Since about 80 per cent of the local service lines in the region are less than 20 miles in length, the distances to the financially viable rail facilities are reasonably short. Thus, while these generating points will no longer have "direct" rail service, they will have rail service available by trucking the relatively short distances to operating rail facilities. In cases where piggyback service can be used, it may not even be necessary to transfer cargo from truck to freight cars.

## Specific Recommendations For Local Rail Service

The Secretary's specific recommendations concerning the rail service which should be provided within each of the 184 zones and accompanying data are contained in Volume II of this report. The material presented by State for each zone includes:

1. *Information Summary:*
A summary of pertinent information regarding the demographic and transportation characteristics of the zone.

2. *Zone Map of Points Recommended for Rail Service:*
A railroad line and railroad station map of the zone showing rail stations in the zone, railroad mainlines which pass through the zone and points recommended for direct rail service (city or station names shown in shaded blocks).

3. *Station Data Summary—Points Recommended for Rail Service:*
A list of all cities and stations which are recommended for local rail service (shown in shaded blocks on map) and the approximate annual carloads originating or terminating at each point. Total traffic at these points is compared to the zone total.

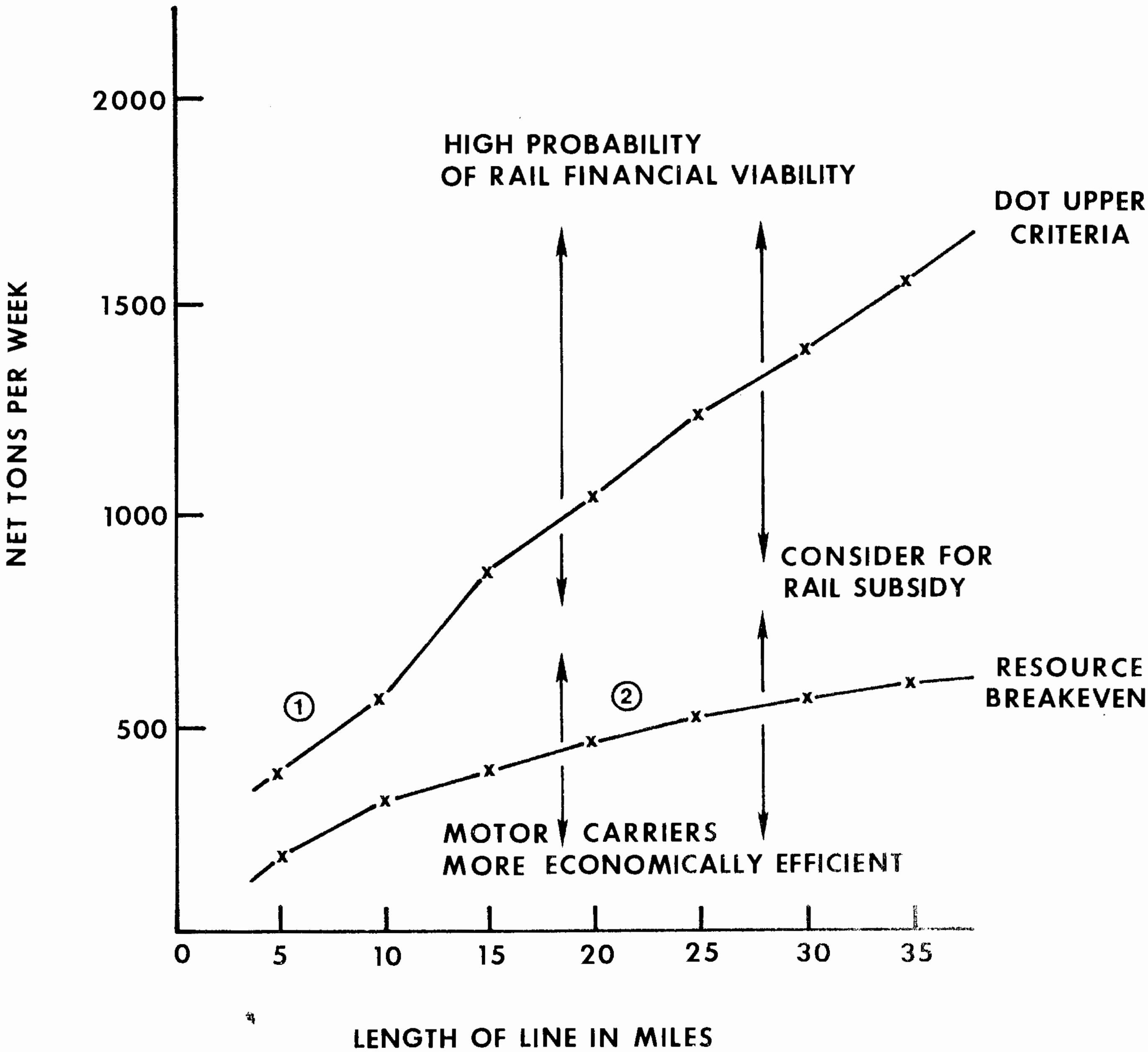
4. *Zone Map of Potentially Excess Rail Lines:*
A zone map identifying those segments of rail lines which are potentially excess either because they are not required for service to the points recommended for service or because they are duplicate feeder lines (lines which connect points which are already connected by other, heavier-density lines).

FIGURE 10

# RAILROAD-MOTOR CARRIER BREAKEVEN ANALYSIS FOR LOCAL SERVICE LINES OF VARYING LENGTH

① NET TONS PER WEEK NECESSARY FOR A HIGH PROBABILITY OF FINANCIALLY VIABLE RAIL OPERATION.

② NET TONS PER WEEK PER CONSUMPTION OF AN EQUAL AMOUNT OF RESOURCES BY MOTOR CARRIERS AND RAILROADS




SOURCE: (1) FRA REPORT OE-73-3

(2) FRA OFFICE OF ECONOMICS

## ZONE SUMMARY EXAMPLE

An example of one of the 184 individual zone reports, the four-page summary of Lansing, Michigan (Zone 161) is shown in the following pages. It is preceded by a discussion of the application of the local rail service criteria and procedures to the Lansing zone.

### *Discussion*

The Lansing zone originated or terminated an average of 239 carloads of rail traffic per day during 1972. Rail service within the zone is provided by four railroads. The service of two of these carriers, the Chesapeake and Ohio, and the Grand Trunk Western, is provided over heavy density (more than 10 million gross ton-miles per mile per year) signalled track. The other two carriers, the Penn Central and the Ann Arbor (both of which are bankrupt) provide light density local service.

The approach followed by the Department in developing its local rail service recommendations involved two steps:

1. All stations within the zone that generated more than 75 carloads of traffic per year were identified. Next, each of these stations was considered using the DOT Upper Criteria in conjunction with the traffic at the station and the distance from the station to the nearest financially viable rail line or station to determine whether rail service had a high probability of being financially viable. As a result of this process, stations recommended for service in the Lansing zone are all located on present main-for continued direct rail service. These stations are Lansing, East Lansing, Ensel, and Charlotte (shaded on the map). Even if there were no mainlines in the zone, the traffic volumes at Lansing justify having rail service from the closest major traffic center which is Detroit, and the other three stations are close enough to Lansing to justify extending service from Lansing.

2. The existing route structure was examined to determine which local service lines were potentially excess, either because they were not required to serve the points recommended for service or because they represented duplicate facilities. The four stations recommended for service in the Lansing zone are all located on present mainlines. The remainder of the local service network is unnecessary and was, therefore, judged potentially excess as indicated by the shaded lines on the Potentially Excess Rail Lines map.

### *Specific Lansing Zone Line Analysis*

1. The Penn Central line from Lansing south through Mason has no viable local traffic and it is not required to serve Lansing, which already has two mainline carriers.

2. The Penn Central line from Jackson to Grand Rapids through Charlotte serves no viable traffic points within Zone 161, nor in the adjacent Jackson or Grand Rapids zones, except Charlotte, which can be served out of Lansing or Battle Creek along the Grand Trunk Western's mainline labeled B.

3. The Chesapeake and Ohio branch from Grand Ledge through Eagle to Ionia has no viable local traffic.

4. The Grand Trunk Western line through the northern part of the zone which runs from Owosso to Grand Rapids via St. Johns in Zone 161 has no viable local traffic and is not necessary for through traffic from adjacent zones.

5. The Ann Arbor and Grand Trunk Western also have lines that cross into the zone at Elsie and Stockbridge, respectively. These lines were analyzed in conjunction with other zones and found redundant.

### *Association Plan for Lansing*

The restructuring process for Lansing will require a number of additional steps by the Association before it can be implemented. These further considerations include:

1. As indicated above in the discussion on Interstate Rail Service, Lansing is a zone not recommended for competitive service. Is it possible to consolidate operations so that only one railroad continues to serve the Lansing zone?

2. If two railroads continue to serve the zone, is it possible to have them utilize joint facilities, both terminals and track, and/or enter into cooperative service agreements designed to reduce their overall operating costs?

3. Some of the traffic in Lansing is located on Penn Central sidings. Can the Penn Central assets be transferred to either the Chesapeake and Ohio and/or Grand Trunk Western to assure continued service? If not, it may be necessary to continue other Penn Central lines (i.e., over the Grand Trunk Western to Battle Creek or the Penn Central service to Lansing, perhaps using trackage rights to provide access to Chesapeake and Ohio to Detroit).

4. Do the Chesapeake and Ohio and Grand Trunk Western desire to abandon their lines (there is no requirement that they do so) and if so, include this abandonment in the system plan? Early indication of their intentions would facilitate any State determination of subsidy requirements.

# ZONE 161 LANSING, MI

**Location:** Central Michigan

**Population:** 378,423[1]

**Area (sq. miles):** 1,702[1]

**Interstate Highways:** 96

**Railroad Service:**

**Bankrupt:** Ann Arbor, Penn Central

**Solvent:** Chesapeake & Ohio, Grand Trunk Western

**Rail Freight Originated and Terminated:** [2]

**Carloads per year:** 87,172

**Carloads per day:** 239

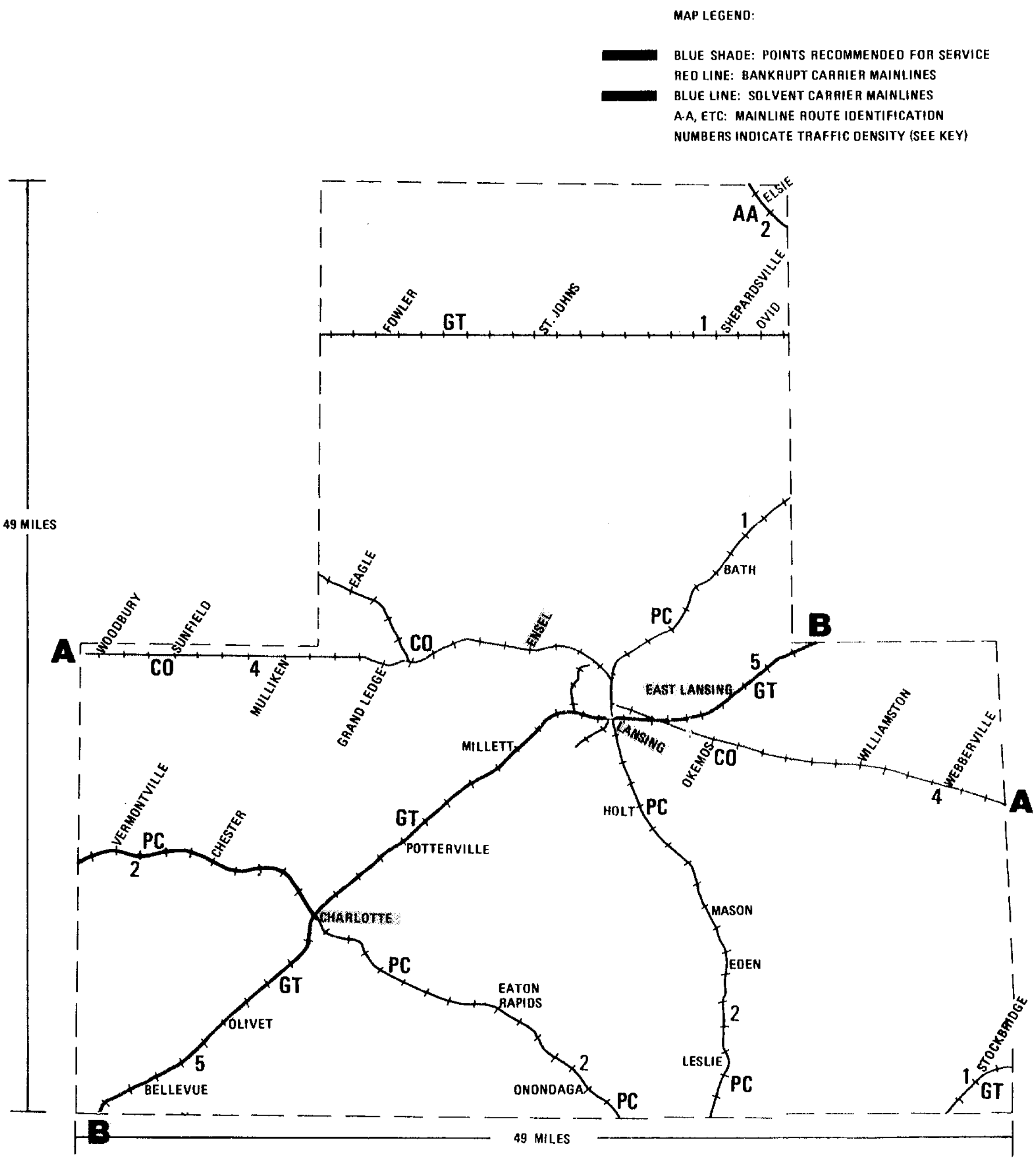
**Principal Commodity:** [2] Transportation Equipment

[1] 1970 Census of population

[2] 1972 Traffic data supplied by individual railroads

# ZONE 161 LANSING, MI

## POINTS RECOMMENDED FOR RAIL SERVICE



# ZONE 161 LANSING, MI

## RAILROAD MAINLINES IN ZONE

| Line | Carrier | Route |
|---|---|---|
| A | Chesapeake & Ohio | Chicago-Detroit to East |
| B | Grand Trunk Western | Detroit-Chicago<br>Chicago-Pt. Huron to Canada |

## POINTS RECOMMENDED FOR LOCAL RAIL SERVICE

Points listed are stations that originate and terminate sufficient traffic to require rail service.

| Station Name | Annual Carloads [1] |
|---|---|
| Lansing | 80,090 |
| Charlotte | 2,061 |
| E. Lansing | 1,056 |
| Ensel | 899 |

**Traffic Summary**

Total annual carloads in Zone: 87,172

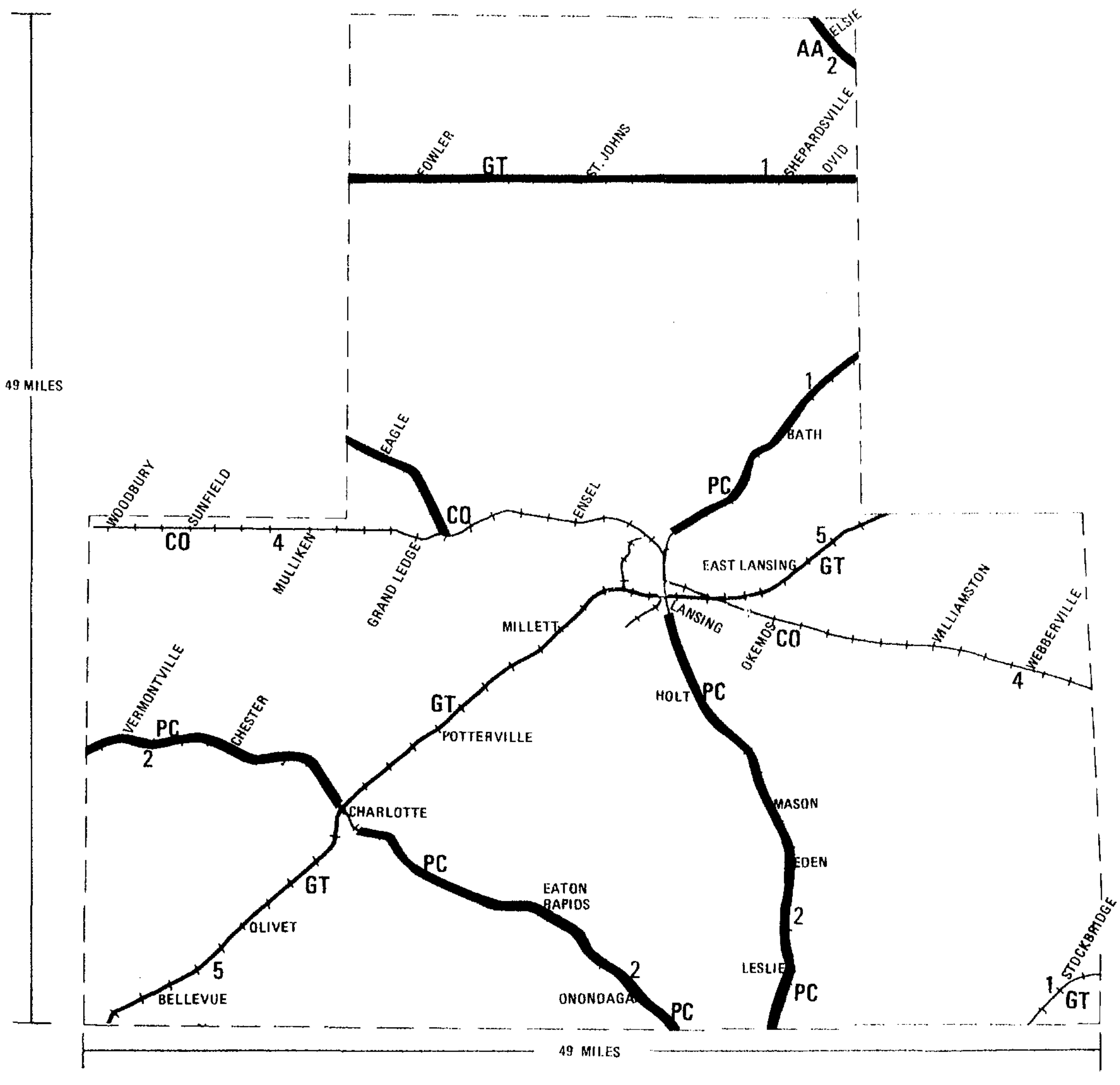
Percent of traffic in zone at stations recommended for service: 96%

1 Traffic data supplied by individual railroads

# ZONE 161 LANSING, MI

## POTENTIALLY EXCESS RAIL LINES
## MAXIMUM PERCENT OF ZONE TRAFFIC ON THESE LINES 4%

(ORANGE LINE: RAIL LINES EITHER NOT NECESSARY TO SERVE THOSE POINTS RECOMMENDED FOR SERVICE OR WHICH ARE DUPLICATE FEEDER LINES.)



## PASSENGER SERVICE

Although a significant portion of the railroad passenger miles operated in the nation is attributable to intercity and commuter passenger operations in the region, most of the rail lines used for intercity rail passenger service primarily carry freight. The exception to this is the "Northeast Corridor" between Washington, D.C., and Boston, where intercity passenger and commuter operations are extensive.

TABLE 17.—INTERCITY PASSENGER SERVICES IN THE REGION
(Other Than Northeast Corridor)
(First Nine Months 1973)

| Railroad Company and End-Points | Railroad [1] | Route Mileage [2] | Daily Round-trips [3] | Average Daily Ridership [4] |
|---|---|---|---|---|
| AMTRAK | | | | |
| New York–Kansas City via St. Louis | PC/MP | 1,470 | 1 | 646 |
| New York–Chicago [5] | PC | 1,047 | 1 | 780 |
| Newport News/Washington—Chicago | PC/Chessie | 1,057 | 1 | 339 |
| Chicago—Florida via Louisville | PC/L&N/SCL | 1,871 | 1 | 335 |
| Washington–Montreal | PC/BM/CV | 670 | 1 | 330 |
| New York–Florida | PC/RF&P/SCL | 2,167 | 4 | 3,350 |
| Buffalo–New York [6] | PC | 436 | 5 | 1,145 |
| Chicago–Detroit | PC | 282 | 2 | 416 |
| Harrisburg–Phila. | PC | 103 | 10.5 | 1,790 |
| Wash.–Cumberland | Chessie | 146 | 1 | 300 |
| SOUTHERN | | | | |
| Wash.–Birmingham [7] (New Orleans) | Southern | 1,154 | 1 | 557 |
| Wash.–Atlanta | Southern | 633 | 1 | 135 |
| Wash.–Lynchburg | Southern | 172 | 1 | 35 |
| ROCK ISLAND | | | | |
| Chicago–Peoria | Rock Island | 161 | 1 | 133 |
| Chicago–Rock Island | Rock Island | 181 | 1 | 91 |
| Region Total (Other than Northeast Corridor) | | | 32.5 | 10,373 |

[1] PC–Penn Central, MP–Missouri Pacific, L&N–Louisville & Nashville, SCL–Seaboard Coast Line, BM–Boston & Maine, CV–Central Vermont, RF&P–Richmond, Fredericksburg & Potomac.

[2] Total for route, not limited to miles in the region.

[3] Represents number of roundtrips offered for December 1973.

[4] Total passengers served by trains operating between end-point cities.

[5] Includes Harrisburg–Washington section.

[6] Includes intermediate service between New York–Albany and New York–Syracuse.

[7] Daily Washington–Birmingham, tri-weekly Birmingham–New Orleans.

*Data Source:* Monthly financial reports for railroads noted.

The National Railroad Passenger Corporation (Amtrak) operates virtually all intercity service in the region over a route network that serves most major population centers. With the exception of the Boston-New-York-Washington, Philadelphia-Harrisburg, New York-Buffalo, and New York-Florida routes, where more frequent service is offered. Amtrak operates only one or two trains a day in each direction over each of its routes (Table 17).

Virtually all of these Amtrak services are operated over Penn Central lines. Two other railroads in the region, the Southern Railway and the Rock Island, operate intercity passenger service outside the Amtrak system. The Southern's services consist of daily round trips from Washington to Lynchburg, Atlanta, and Birmingham, with the latter train continuing to New Orleans three times each week. The Southern cooperates with Amtrak to provide joint ticketing and through car services to New York City and Los Angeles. The Rock Island operates daily round trips from Chicago to Peoria and Rock Island. Both of these latter operations receive substantial subsidies from the State of Illinois. The Auto-train Corporation also provides daily service from Lorton, Virginia, in the Washington, D.C., area to Sanford, Florida.

### Northeast Corridor

The Act specifies as one of the goals of the Final System Plan the establishment of improved high-speed rail passenger service in the Northeast Corridor, consonant with the recommendations of the Secretary in his September 1971 report entitled *Recommendations for Northeast Corridor Transportation*. The Act requires the Secretary to initiate work on the necessary engineering studies and improvements to implement these recommendations. It also requires the Consolidated Rail Corporation to negotiate an appropriate agreement with Amtrak for the sale or lease to Amtrak of those rail properties designated for such purposes in the Association's Final System Plan. The Association is authorized to issue Federally guaranteed obligations to support the improvement of these properties.

As shown in Table 18, over half of all Amtrak trains in the region run in the Corridor. The coordination of this passenger traffic with rail commuter and freight service presents one of the major problems that the Association must deal with in its plan for this route.

### Commuter Service

Extensive commuter service is performed by regional carriers in Boston, New York, Philadelphia and Chicago (Table 19). Local commuter services are operated on all but 140 miles of the 460-mile Boston-Washington route (all Penn Central trackage). There are also smaller commuter service operations in the Washington, Pittsburgh, Detroit, and Cleveland areas. In all the high use areas, commuter service has already been supported by local authorities in the form of operating subsidies, facility acquisition and capital grants. Segments of the right-of-way are owned or leased by public agencies in the New York and Boston areas.

TABLE 18.—AMTRAK SERVICES IN NORTHEAST CORRIDOR

(Including Present Feeder Service)

(First Nine Months of 1973)

| End-Points | Railroad | Route Mileage | Daily [1] Round-trips | Average[2] Daily Rider-ship |
|---|---|---|---|---|
| Boston—Wash. | Penn Central | 457 | 8 | 7,030 |
| New York—Wash. | Penn Central | 225 | 17 | 6,700 |
| New Haven—Washington | Penn Central | 300 | 1 | 530 |
| Springfield—Washington | Penn Central | 361 | 1 | 755 |
| New York—Bos. | Penn Central | 232 | 2 | 560 |
| Phila.—Boston | Penn Central | 322 | 2 | 985 |
| Phila.—New York | Penn Central | 90 | 10 | 9,675 |
| New Haven—Hartford | Penn Central | 37 | 3 | 265 |
| New Haven—Springfield | Penn Central | 62 | 4 | 210 |
| Total—Northeast Corridor | | | 48 | 26,710 |
| Region Total (including other than Northeast Corridor) | | | 80.5 | 37,083 |

[1] Represents number of roundtrips offered for December' 1973.

[2] Represents total number of passengers served by trains operating between noted end-points.

*Data Source:* Monthly Amtrak financial reports, first nine month, 1973.

TABLE 19.—RAILROAD COMMUTER SERVICE IN THE REGION

(1973)

| Area and Local Gov't. Authority [1] | Railroad | Route Mile-age [2] | Week-day Trips [3] |
|---|---|---|---|
| Boston | | | |
| MBTA | Boston and Maine | 157 | 20,000 |
| MBTA | Penn Central | 43 | 2,600 |
| MBTA | Penn Central | 44 | 12,000 |
| Total | | 244 | 34,600 |
| New York | | | |
| MTA | Long Island Railroad | 355 | 245,000 |
| N.J. DOT | Central of New Jersey | 50 | 15,600 |
| N.J. DOT/MTA | Erie-Lackawanna | 217 | 72,000 |
| MTA | Penn Central | 150 | 76,000 |
| N.J. DOT | Penn Central | 58 | 40,600 |
| N.J. DOT | New York & Long Branch | 57 | 23,000 |
| MTA/CTA | Penn Central | 135 | 59,000 |
| MTA | Staten Island Rapid Transit | 14 | 18,000 |
| N.J. DOT | Reading | 85 | 400 |
| Total | | 1,121 | 549,600 |

TABLE 19.—RAILROAD COMMUTER SERVICE IN THE REGION—Continued

(1973)

| Area and Local Gov't. Authority [1] | Railroad | Route Mile-age [2] | Week-day Trips [3] |
|---|---|---|---|
| Philadelphia | | | |
| SEPTA | Penn Central | 119 | 67,000 |
| SEPTA | Reading | 204 | 46,000 |
| N.J. DOT | Pennsylvania-Reading Seashore Lines | 116 | 500 |
| Total | | 439 | 113,500 |
| Washington | | | |
| | Penn Central | 40 | 900 |
| | Chessie | 86 | 2,700 |
| Total | | 126 | 3,600 |
| Pittsburgh | | | |
| | Chessie | 18 | 1,000 |
| | Penn Central | 31 | 400 |
| Total | | 49 | 1,400 |
| Detroit | | | |
| | Grand Trunk Western | 26 | 2,000 |
| | Penn Central | 36 | 200 |
| Total | | 62 | 2,200 |
| Cleveland | | | |
| | Erie-Lackawanna | 66 | 300 |
| Total | | 66 | 300 |
| Chicago [4] | Burlington Northern | 38 | 43,000 |
| | Illinois Central Gulf | 75 | 60,000 |
| | Milwaukee Road | 110 | 29,500 |
| | Norfolk & Western | 23 | 1,600 |
| | Chicago & North Western | 145 | 85,000 |
| | Penn Central | 43 | 1,200 |
| | Rock Island | 52 | 26,000 |
| | South Shore | 90 | 10,600 |
| Total | | 576 | 256,900 |
| Regional Total | | 2,683 | 962,100 |

[1] MBTA-Massachusetts Bay Transportation Authority, MTA—Metropolitan Transportation Authority (State of New York), N.J. DOT—New Jersey Department of Transportation, CTA—Connecticut Transportation Authority, SEPTA—Southeast Pennsylvania Transportation Authority.

[2] Total route mileage may include some duplication.

[3] Total passenger trips per day, any direction.

[4] Several railroads which provide commuter service in the Chicago area participate in suburban mass transit districts which permit them to receive matching public funds for capital purchases for this service. These railroads are the Burlington Northern, Illinois Central Gulf and Milwaukee Road.

*Data Source:* Urban Mass Transportation Administration, Office of Capital Assistance; Chicago area Transportation Study.

### Association Plan

Improvements to the rail network in the region should result in a direct benefit to passenger services where improvements in track and signals occur on those facilities which carry both freight and passenger services.

However, because of the concentration of passenger operations in the region, we believe that passenger service requirements at both the local and intercity levels must be afforded special consideration in the formulation of the Final System Plan. In most cases the routes now utilized for passenger services are heavy freight routes and will likely continue as such. The Department recognizes that Amtrak may wish to make changes in service on segments of present passenger routes as a result of the final plan. Such changes should be limited in their impact to intermediate points on Amtrak's system. The major end-point cities should not be affected.

The Association must devote special attention to the current and projected requirements of commuter and intercity passenger service. The Final System Plan must insure that there will be no diminution of service quality and that appropriate priority status is given to passenger train movements, particularly in the Northeast Corridor.

TABLE 20.—LIST OF RAILROAD NAMES AND ABBREVIATIONS USED IN THIS REPORT

| *Code* | *Railroad Name* |
|---|---|
| AA | Ann Arbor Railroad Company |
| AY | The Akron, Canton & Youngstown Railroad Company |
| BA | Bangor and Aroostook Railroad Company |
| BL | Bessemer & Lake Erie Railroad Company |
| BM | Boston & Maine Corporation |
| BN | Burlington Northern |
| BO | The Baltimore and Ohio Railroad Company |
| CE | Chicago & Eastern Illinois Railroad |
| CM | Chicago, Milwaukee, St. Paul & Pacific Railroad |
| CO | The Chesapeake and Ohio Railway Company |
| CP | Canadian Pacific |
| CV | Central Vermont Railway, Incorporated |
| DH | Delaware and Hudson Railway Company |
| DM | Detroit and Mackinac Railway Company |
| DS | Detroit and Toledo Shore Line Railroad Company |
| DT | Detroit, Toledo and Ironton Railroad Company |
| EL | Erie Lackawanna Railway |
| EJ | Elgin, Joliet and Eastern Railway Company |
| GT | Grand Trunk Western Railroad |
| IC | Illinois Central Gulf Railroad |
| JC | The Central Railroad Company of New Jersey |
| LH | The Lehigh and Hudson River Railway Company |
| LI | The Long Island Railroad |
| LN | Louisville and Nashville Railroad |
| LS | Lake Superior & Ishpeming Railroad Company |
| LV | Lehigh Valley Railroad |
| MC | Maine Central Railroad Company |
| MG | Monongahela Railway |
| MP | Missouri Pacific Railroad Company |
| NO | Chicago and North Western Transportation Company |
| NW | Norfolk and Western Railway Company |
| PC | Penn Central Transportation Company |
| PL | Pittsburgh & Lake Erie Railroad |
| PR | Pennsylvania-Reading Seashore Lines |
| PW | Providence and Worcester Company |
| RF | Richmond, Fredericksburg and Potomac Railroad Company |
| RG | Reading Company |
| RI | Chicago, Rock Island and Pacific Railroad Company |
| SC | Seaboard Coast Line Railroad |
| SF | The Atchison, Topeka and Santa Fe Railway Company |
| SL | Soo Line Railroad Company |
| SO | Southern Railway Company |
| TW | Toledo, Peoria & Western Railroad Company |
| VT | The Vermont Railway Incorporated |
| WM | Western Maryland Railway |



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