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Nº 64

ECONOMIC INTELLIGENCE REPORT

GROWTH IN INLAND FREIGHT TRANSPORTATION IN THE EUROPEAN SATELLITES, 1951-55, AND PROSPECTS THROUGH 1960



CIA/RR 112
27 November 1957

CENTRAL INTELLIGENCE AGENCY

OFFICE OF RESEARCH AND REPORTS

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17 January 1958

CORRIGENDA

TO: Holders of CIA/RR 112, Growth in Inland Freight Transportation in the European Satellites, 1951-55, and Prospects Through 1960, 27 November 1957. SECRET

1. Page 1, paragraph 1, lines 6 and 7, should read

This rate of growth is slightly higher than the 64 percent growth achieved in Soviet inland freight transport and substantially higher than the 28 percent growth achieved in inland freight transport in Western Europe during 1951-55.

2. Paste revised Figure 1 (attached) over Figure 1, following p. 4

3. Page 10, paragraph 2, lines 4 and 5 should read

increased from 2,808,000 gross tkm in 1950 to 4,824,000 gross tkm in 1955,

4. Table 2, pp. 28 and 29, unit of measure should read

Billion Net Ton-Kilometers

5. Page 47, paragraph 1, line 6, should read

and multiplied by estimated average length of haul.

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GROWTH IN INLAND FREIGHT TRANSPORTATION
IN THE EUROPEAN SATELLITES, 1951-55,
AND PROSPECTS THROUGH 1960

CIA/RR 112

(ORR Project 43.1606)

CENTRAL INTELLIGENCE AGENCY

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FOREWORD

The purpose of this report is to analyze and evaluate the development of the inland transportation sector of the economy of the European Satellites during 1951-55 and transportation plans for 1956-60. The report attempts, where possible, to treat the area as a whole rather than on an individual country basis. Principal emphasis is placed on comparison of growth in transport performance with that in transportation facilities. This report considers railroad, highway, and inland water freight transport. Air, pipeline, and coastal transport, which make up a negligible portion of the total output of inland transportation in these countries, are not included. Although the transportation of passengers is important to the development of economies, it does not affect development as directly or as vitally as the transportation of freight.

Data from the Second Five Year Plans used in this report predate the recent disturbances in the European Satellites. In view of these events, it is likely that Satellite plans will be revised in the near future. It appears doubtful, however, that plans for investment in the transport sector can be substantially reduced without having serious effects on the economies of the Satellites.

This report has been coordinated within ORR but not with other IAC agencies.

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GROWTH OF INLAND FREIGHT TRANSPORTATION
IN THE EUROPEAN SATELLITES, 1951-55,
AND PROSPECTS THROUGH 1960*

Summary

Transportation systems in the European Satellites achieved a substantial growth in freight traffic performance during 1951-55. Inland freight traffic -- that is, railroad, highway, and inland water traffic -- in the area as a whole increased from 93.7 billion net ton-kilometers (tkm)** in 1950 to 155 billion net tkm in 1955, an increase of 65 percent. This rate of growth is slightly higher than the rate of 64 percent achieved in inland freight transport in Western Europe during 1951-55.

Investment in Satellite transportation, which had been high in the immediate post-World War II years, was small during 1951-55 relative to the increase in freight traffic performance. The impressive growth in freight traffic performance was achieved in large part by increasing the intensity of utilization of equipment and facilities -- that is, through improving operating efficiency. Consequently, Satellite transportation systems have been operating at closer to capacity than previously and even so have been hard-pressed to meet traffic demands. In some instances, transportation shortages have caused temporary difficulties in other sectors of the Satellite economy.

The Second Five Year Plans of the European Satellites for inland transportation call for substantial, though reduced, rates of growth in freight traffic during 1956-60. Inland freight traffic for the area as a whole is planned to increase by 43.5 billion net tkm, or 28 percent by 1960 in comparison with 1955. This rate of growth is considerably less than the 46-percent increase planned in the USSR but is above the 18-percent increase estimated for inland freight traffic in Western Europe.

In 1956, in spite of unusually cold weather in January and February and severe economic dislocations caused by events in Poland and Hungary,

* The estimates and conclusions contained in this report represent the best judgment of ORR as of 1 September 1957.

** Tonnages are given in metric tons throughout this report.

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inland freight traffic in the European Satellite area (excluding Hungary) increased at slightly above the average annual rate of growth envisaged by the Second Five Year Plans. Performance by country and by type of transport, however, varied widely, and Satellite transportation systems again failed in some instances to satisfy traffic demand fully. In Hungary the revolution and subsequent strikes caused inland freight traffic to fall to a level slightly below that in 1953.

The principal feature of the Second Five Year Plans of the European Satellites for investment in the transport sector is the beginning of a changeover from steam to diesel-electric and electric motive power on the railroads.

Much of the reserve transport capacity available during 1951-55 no longer exists. Consequently, greater capital investment per unit of traffic increase will be required in the present plan period. The Second Five Year Plans of the European Satellites call for increased investment in the transport sector, but fulfillment of traffic plans will still depend, at least in part, upon fulfillment of plans also to increase operating efficiency. Temporary and local transportation difficulties similar to those experienced in the past will therefore probably recur during 1956-60.

I. Growth of Freight Transportation, 1951-55.*

Transportation systems in the European Satellites achieved substantial growth in freight traffic during 1951-55. The rate of growth of inland freight traffic -- that is, railroad, highway, and inland water traffic -- in the area was significantly greater than in comparable Western European countries and slightly greater than that in the USSR. All of the Satellites substantially fulfilled original long-term freight traffic plans with the exception of Poland. Performance data indicate that there has been inconsequential diversion of traffic from the railroads, which carry the great bulk of internal commerce in the area, to other forms of inland transportation.

* The first long-term plan periods covered the years 1950-55 in Poland, 1949-53 in Czechoslovakia, 1950-54 in Hungary, and 1949-53 (revised to 1949-52) in Bulgaria. All the other European Satellites used a 1951-55 plan period.

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Investment in the transport sector, which had been high in the immediate post-World War II years, was small during 1951-55 relative to the increase in freight traffic performance. The impressive achievements in traffic performance were made possible in large part by increasing the intensity of utilization of equipment and facilities -- that is, through improving operating efficiency. There are many indications that the Satellite transportation systems have found it difficult to handle steadily increasing traffic demands and that shortages of transportation have, in some instances, retarded economic growth.

A. Freight Traffic Performance.

As indicated by Figure 1,* which shows freight traffic performance by inland transportation in the European Satellites, all of the European Satellites except East Germany regained their respective prewar levels of inland freight traffic by 1950. Freight traffic in East Germany reached the prewar level of performance in 1953. Total inland freight traffic in the Satellite area increased from 93.7 billion tkm in 1950 to 155 billion tkm in 1955, or 65 percent. The highest rate of growth was achieved by Albania, the smallest of the European Satellites, and the lowest rate of growth was that of Poland, largest of the Satellites in terms of freight traffic.

Figures 2,* 3,* and 4* show the growth in freight traffic in the European Satellites by railroad, highway, and inland water transport, respectively, and Figure 5* shows rates of growth by each type of transport. In spite of higher rates of growth in freight traffic by other types of transport, rail transport remains by far the most important inland freight carrier in the European Satellites, as shown graphically in Figure 6* and indicated in Table 4.** An increase in the share of highway transport in total inland traffic from 3.3 percent in 1950 to 4.6 percent in 1955 reflects the development of that carrier as a feeder service for the railroads rather than as a long-distance, competitive form of transportation. The share of inland water transport in total traffic increased slightly, from 4.9 to 5.1 percent during 1950-55, but remained far below the 11.0-percent share which it had in 1938.

* Following p. 4.

** P. 32, below.

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Inland freight traffic in the European Satellites as a whole showed a much more rapid rate of growth during 1951-55 than that in Western Europe. Although the growth in Western European traffic, measured in absolute terms, was almost twice that in the European Satellites during the period, the rate of growth in Western Europe was only 28 percent 1/^{*} compared with a 65-percent rate in the Satellites. The principal factor responsible for the higher rate of growth in the Satellites was the more rapid development of heavy industry in the area, a phase of economic development which Western Europe had already largely completed. Other contributing factors were a reorientation of Satellite international traffic to the east (resulting in a greater length of haul in some countries and sustaining relatively high average lengths of haul in others) and the fact that some of the Satellites had not yet fully recovered from World War II by 1950.

The 65-percent rate of growth in Satellite inland traffic was slightly larger than the 64-percent rate of growth realized by Soviet inland transportation during the period under consideration. 2/ All of the European Satellites except Poland had greater percentage increases than the USSR during the period.

A comparison of transport achievements with traffic goals established by the First Five Year Plans of the various European Satellites indicates that plans were realized in most instances. Satellite railroads, which accounted for 90 percent of total inland traffic in 1955, fulfilled or overfulfilled original long-term traffic plans in Czechoslovakia (1949-53), 3/ East Germany (1951-55), 4/ Hungary (1950-54),** and Rumania (1951-55).*** In Poland, the largest Satellite in terms of freight traffic, the Six Year Plan (1950-55) for railroad freight traffic was not met.**** The current Bulgarian Five Year Plan

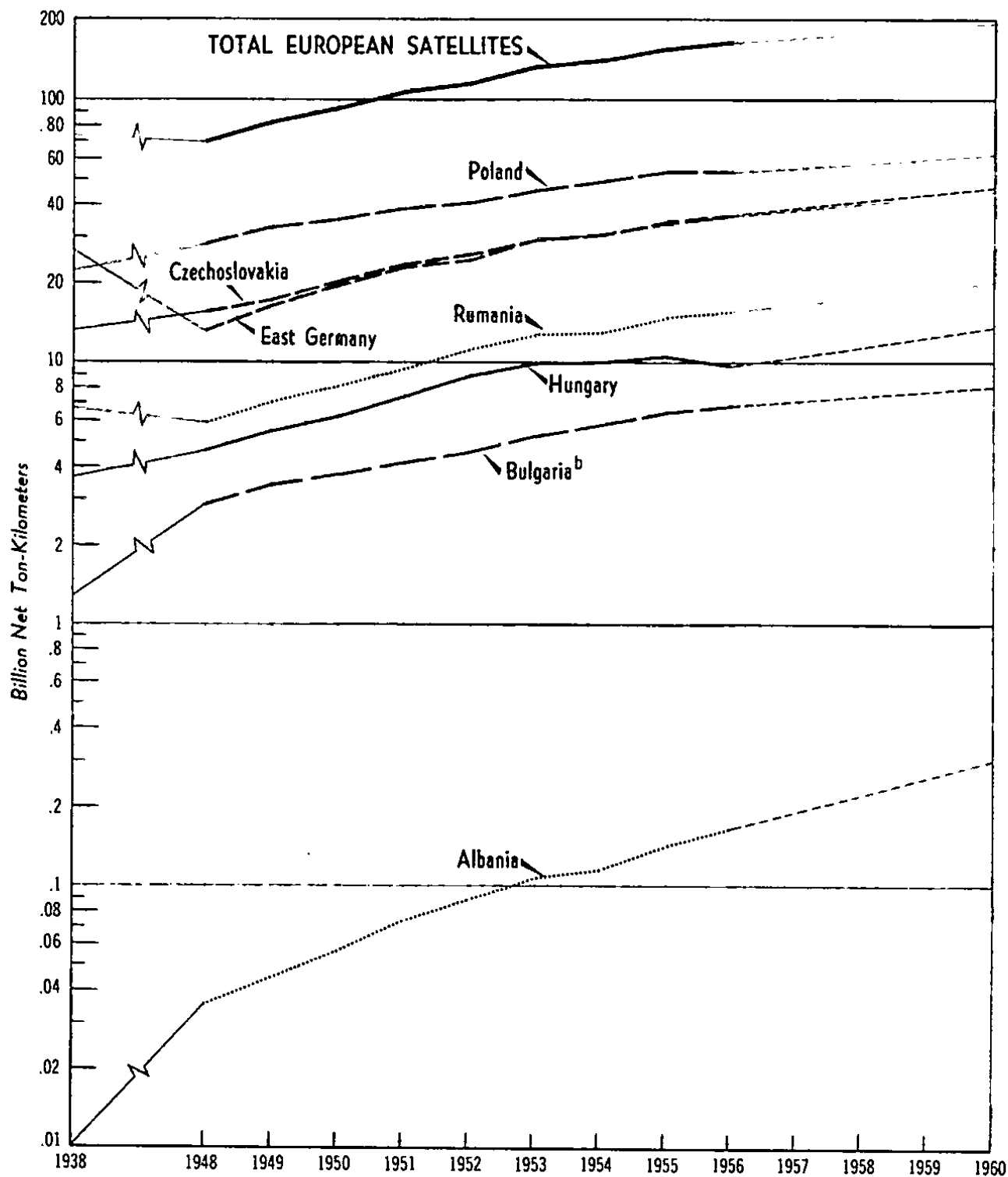
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** The original Hungarian Five Year Plan (1950-54) called for the railroads to perform 5,800 million tkm in 1954, 5/ but actual performance in 1954 was 8,148 million tkm.

*** The Rumanian Five Year Plan (1951-55) called for the railroads to perform 12 billion tkm in 1955, 6/ but actual performance was 14.1 billion tkm.

**** The Polish Six Year Plan called for a 74-percent increase in rail freight traffic, 7/ but the actual increase was only 62.8 percent during the plan period.

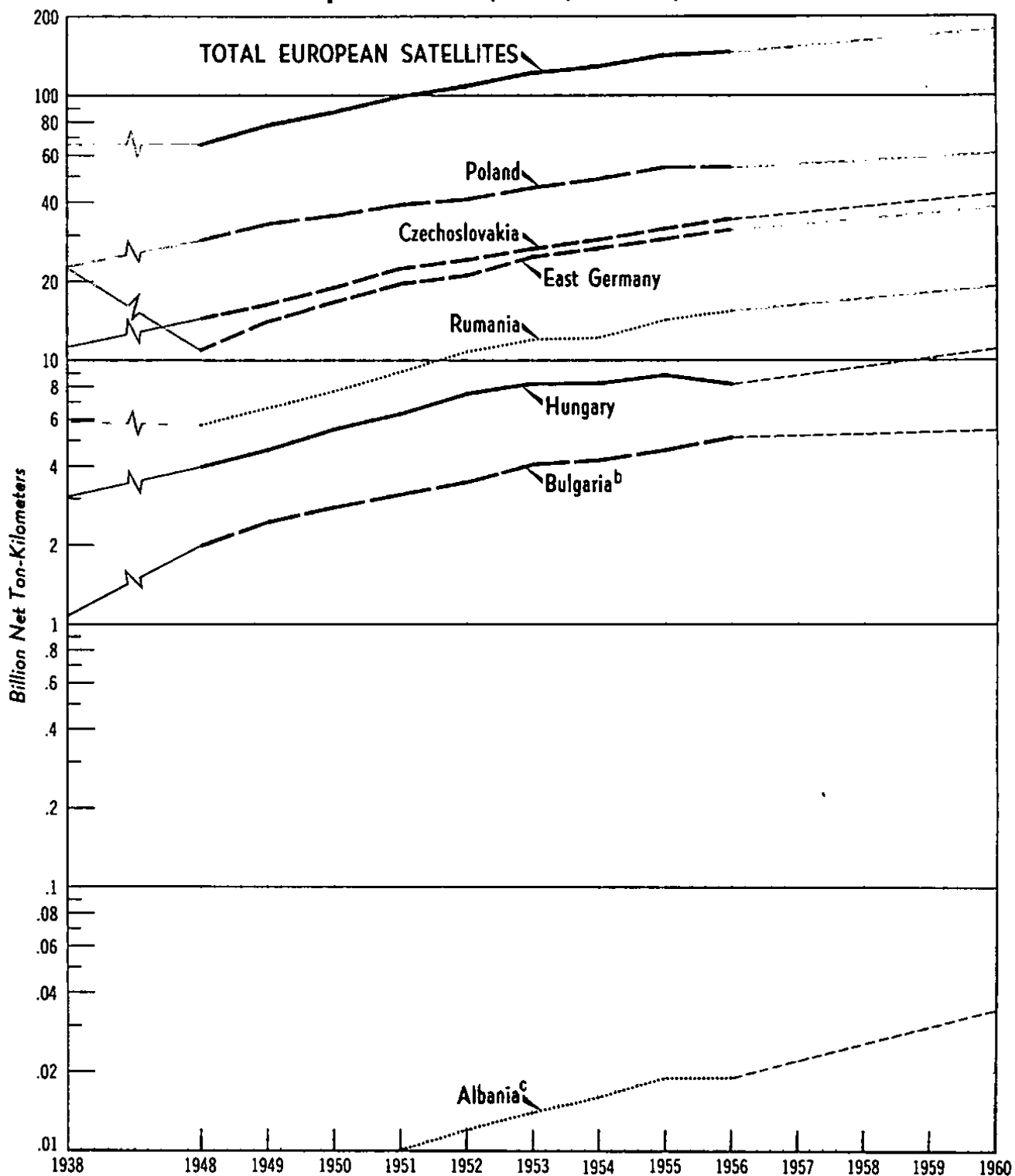
Estimated Freight Traffic Performance by Inland Transportation in the European Satellites, 1938, 1948-56, and 1960 Plan^a



^a Plan figures for 1956-60 period extrapolated from 1955 actual and 1960 plan figures.

^b Bulgaria is presently operating under a 1953-57 plan period. 1956-60 plan figures are estimated.

Estimated Freight Traffic Performance by Railroad Transportation in the European Satellites, 1938, 1948-56, and 1960 Plan^a

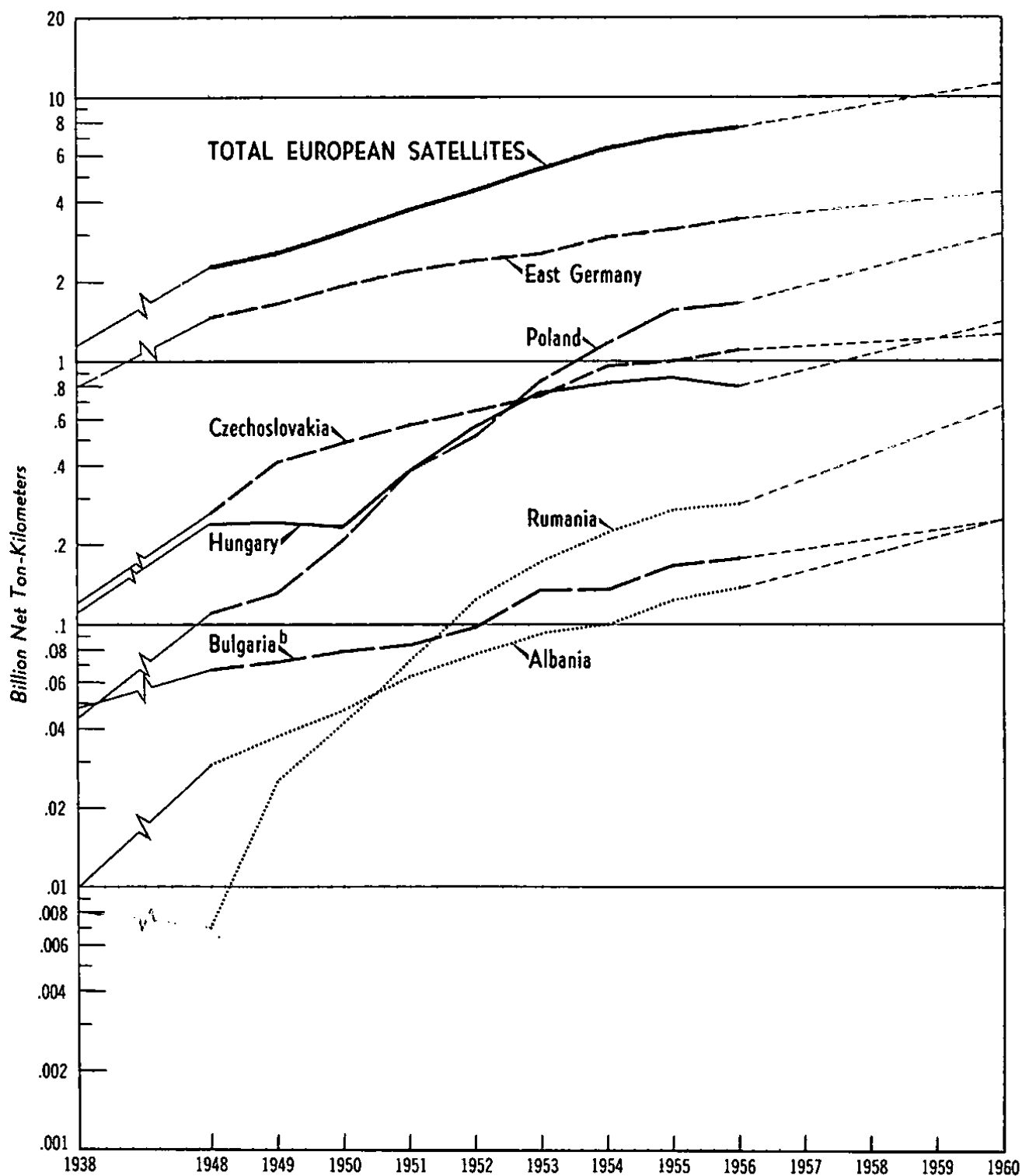


^a Plan figures for 1956-60 period extrapolated from 1955 actual and 1960 plan figures.

^b Bulgaria is presently operating under a 1953-57 plan period. 1956-60 plan figures are estimated.

^c Albania negligible before 1951.

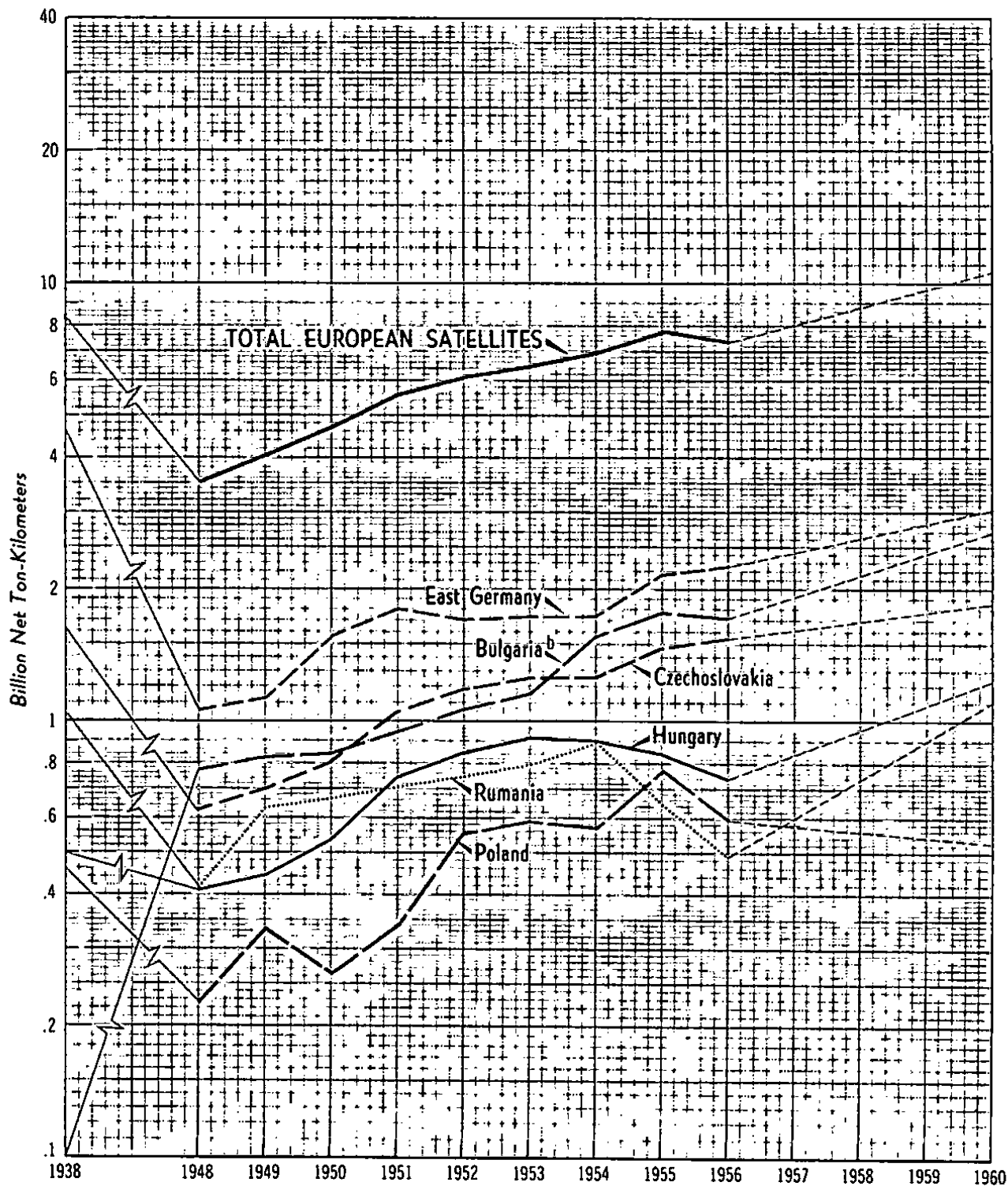
Estimated Freight Traffic Performance by Highway Transportation in the European Satellites, 1938, 1948-56, and 1960 Plan^a



^a Plan figures for 1956-60 period extrapolated from 1955 actual and 1960 plan figures.

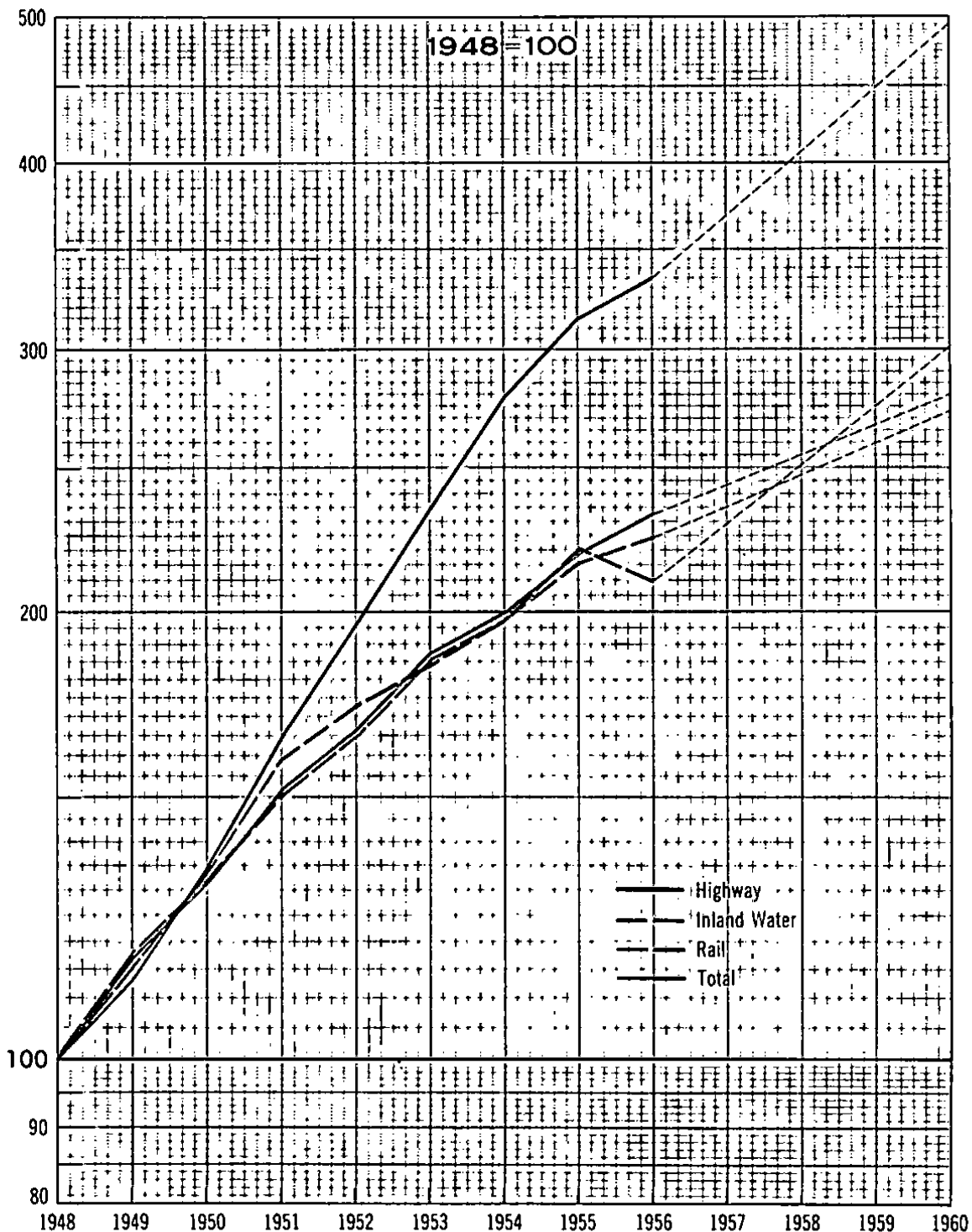
^b Bulgaria is presently operating under a 1953-57 plan period. 1956-60 plan figures are estimated.

Estimated Freight Traffic Performance by Inland Water Transportation in the European Satellites, 1938, 1948-56, and 1960 Plan^a



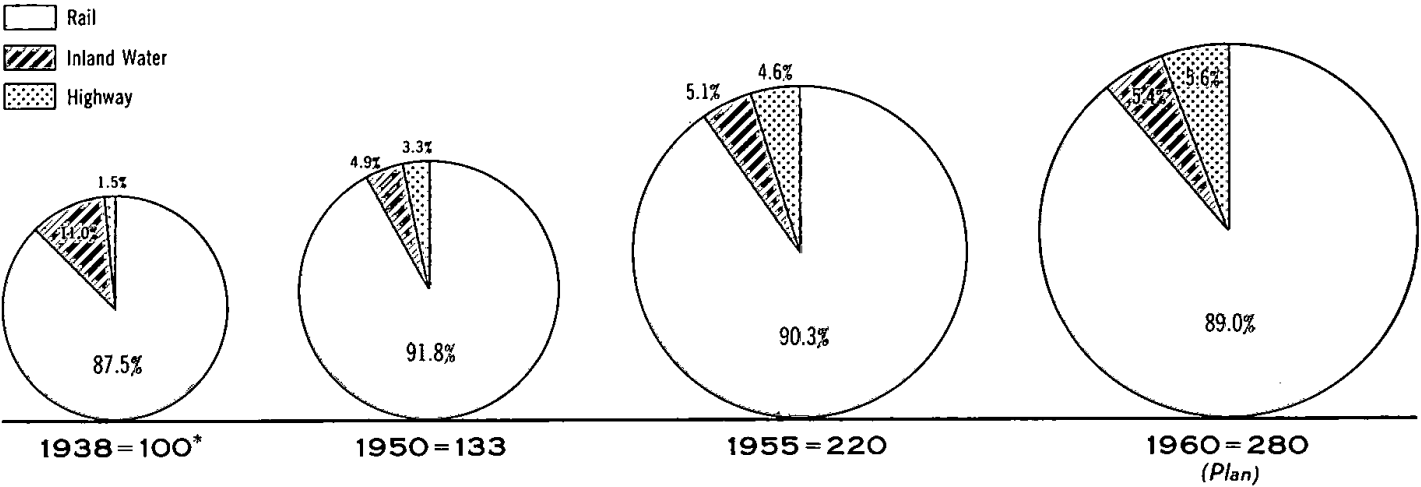
^a Plan figures for 1956-60 period extrapolated from 1955 actual and 1960 plan figures. Albania negligible.
^b Bulgaria is presently operating under a 1953-57 plan period. 1956-60 plan figures are estimated.

Indexes of Estimated Rates of Growth in Freight Traffic Performance by Inland Transportation in the European Satellites, by Type of Transport, 1949-56 and 1956-60 Plan *



*Plan figures for 1956-60 period extrapolated from 1955 actual and 1960 plan figures.
Bulgaria is presently operating under a 1953-57 plan period. 1956-60 plan figures are estimated.

Distribution of Inland Freight Traffic Performance in the European Satellites, by Type of Transport, 1938, 1950, 1955, and 1960 Plan



*Size of circles proportional to index of total transport.

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(1953-57) was being fulfilled on a proportionate basis at the end of 1955.* Failure to realize the original long-term plan in Poland should perhaps not be taken too seriously, because this plan represented a first attempt at long-range planning. The goal was probably established at a level too difficult to attain even with an unusually great effort. In addition, it appears that Polish economic growth was not able to generate sufficient traffic to meet planned levels.

There are numerous indications that the rapid growth in demand for freight traffic during 1951-55 exerted considerable strain on transportation systems in the European Satellites and that, at least in some countries, shortcomings in transportation may have prevented more rapid economic development. The East German and Czechoslovak railroads were particularly hard pressed to provide adequate service to the economy. Prague newspapers stated in 1954 that "railroad transportation is lagging behind the expansion of the national economy," causing a slowdown of production in mining areas. 9/ A number of newspaper articles appeared in the fall of 1955 complaining that a shortage of freight cars was hampering production in various industries and stating in general that if the Czechoslovak economy was to improve, rail transport would also have to improve. 10/ A statement in 1955 by the Central Committee of the Communist Party of East Germany that "the large number of derailments and breakdowns of transportation equipment have caused a production deficiency in the brown coal industry" attests to like difficulties on the East German railroads. 11/ Comparable evidence suggests that similar transportation deficiencies existed in the other Satellites, although perhaps to a lesser degree than in East Germany and Czechoslovakia. 12/

B. Growth of Transportation Systems.

The rapid increase in traffic in the European Satellites since 1950 can be attributed only to a limited extent to an increase in the capacities of the various transportation industries. Investments in this sector, which had represented a large percentage of total investments in the immediate postwar years, received less emphasis during 1951-55. In Poland, for example, transportation and communications received 40.8 percent and 27.5 percent of total investment in 1946 and 1947, respectively, but only 13.1 percent in the period of the Six Year

* The Bulgarian Five Year Plan (1953-57) called for a 50-percent increase in rail freight traffic. 8/ Traffic in 1955 exceeded that of 1952 by 33.5 percent, suggesting that the planned 50-percent increase will be exceeded.

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Plan (1950-55). 13/ In Hungary the share of transportation in total investment was 20.7 percent in 1947-49 and 12.7 percent in 1950-54. 14/ In East Germany the percentage of total investment allocated to transportation and communications for 1951-55 was only 8.8 percent. 15/

The principal transportation routes in the European Satellites are shown in the accompanying map, Figure 7.*

1. Railroad.

Railroad construction efforts in the European Satellites during 1951-55 were directed primarily toward improving and modernizing existing facilities rather than toward building new railroad lines. The main emphasis in new construction was toward building lines to bypass capital cities so as to speed the flow of traffic. Significant new lines completed in the period were as follows: (a) the Skierniewice-Lukow section in Poland, permitting east-west traffic to bypass Warsaw 16/; (b) portions of the Bucharest-Craiova line in Rumania 17/; (c) the Aszod-Vac and Retszilas-Stalinvaros sections in Hungary, the former allowing certain through traffic in northern Hungary to bypass Budapest and the latter connecting the Komlo coal mines with the Stalinvaros steel mills 18/; and (d) the Turna-Roznava section in eastern Czechoslovakia. 19/ The Outer Freight Ring, a railroad line in East Germany designed to bypass West Berlin, was completed except for a 14-kilometer (km) stretch between Golm and Saarmund.

More important than construction of new lines was the strengthening, realigning, double tracking, and otherwise improving of existing lines in the European Satellites. In East Germany, where the USSR removed most of the second track on double-track routes after World War II, some restoration of the second track was accomplished, but the system remains largely a single-track network. In Poland, most of the effort on fixed facilities was concentrated on rehabilitation of lines and improvement of junctions. The principal achievement in Czechoslovakia was the upgrading of the low-capacity, single-track Friendship Line between Zilina and Cierna to a high-capacity, double-track route 20/ facilitating both domestic commerce and trade with the USSR. In Hungary and Rumania the principal east-west railroad arteries were improved, 21/ and the outstanding accomplishment in Bulgaria was the completion of the Sub-Balkan Line -- a realigned and strengthened east-west route through the central part of the country. 22/

* Inside back cover.

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Among the other railroad developments in the European Satellites were the completion of several large international bridges, the electrification of several railroad lines, the expansion of yards and stations, and the installation of improved signal and communications facilities. The new Giurgiu-Ruse bridge over the Danube River, joining Bulgaria and Rumania, was opened to traffic in late 1954. 23/ Other recent bridge construction included the rebuilding of the Komarom (between Hungary and Czechoslovakia) 24/ and Ujpest (Budapest) 25/ bridges across the Danube and certain spans over the Oder. Railroad electrification has taken place on the Warsaw-Czestochowa line in Poland, 26/ on stretches of the Prague-Cierna route in Czechoslovakia, 27/ on the Halle-Koethen section in East Germany, 28/ and on a short stretch in Hungary extending east from Budapest. 29/ Several major terminals were improved and modernized, including certain key yards in East Germany and Poland along the Berlin-Brest route used intensively for trade with the USSR. There was considerable progress in the installation of improved signaling and communications facilities, particularly on the East German and Polish railroads.

Locomotive and freight car inventories did not increase nearly as rapidly as did rail traffic during 1951-55. Locomotive and freight car parks in East Germany, for example, increased by 17.9 and 37.3 percent, respectively, 30/ compared with a 74.8-percent increase in rail freight traffic. In Poland the freight car inventory increased 14.8 percent, the number of locomotives remained approximately unchanged during the Six Year Plan, 31/ and freight traffic increased by 59 percent. The fact that additions to rolling stock since 1950 have generally consisted of higher capacity units than pre-1950 inventories only partly explains these differences. Other Satellites show similar disproportions between increases in rolling stock and increases in traffic. Because rolling stock is a principal element of railroad capacity, it appears that Satellite railroad capacity increased at a lower rate than performance during 1951-55. Consequently, it has been necessary to make more intensive use of railroad facilities, and the Satellite railroad systems are presently operating closer to capacity than in 1950.

2. Highway.

The very low percentage of total traffic performed by highway carriers in the European Satellites reflects the small share of resources allocated to highway transport in the area. Road construction activity during 1951-55 consisted largely of maintenance and

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improvement of existing roads rather than extensive building of new highways. Only in Poland, where about 5,000 km of hard-surface roads reportedly were built during 1949-55, 32/ has new road construction been significant. Data on this subject are limited and, as a result of insufficiently precise definition of terms, are difficult to interpret. It appears, however, that construction plans have not been met.

Comprehensive data on motor vehicle inventories for the European Satellites are not available. Although truck inventories were expanded in all of the Satellite countries, growth in the Satellite truck park since 1950 has probably not kept pace with the 96-percent increase shown in Western Europe in 1950-55. 33/ In recent years a large part of Satellite vehicle production has been allocated to export, in spite of failure to meet traffic plans in several countries, suggesting that these countries regard the export of motor vehicles as economically more advantageous than larger additions to domestic inventories.

3. Inland Water.

In spite of rather ambitious plans, the expansion of inland water facilities in the European Satellites since 1950 has been negligible. Work on the waterways themselves has been restricted largely to maintenance rather than improvement or expansion of the existing network. Original plans included such extensive undertakings as the following: (a) completion of an east-west waterway linking the Oder and the Pripet Rivers and extending into the USSR, 34/ (b) improvement of navigation on the Oder and Vistula Rivers in Poland, 35/ (c) construction of a Danube - Black Sea Canal in Rumania, 36/ and (d) construction of the Trans-Tisza Eastern Main Canal in Hungary to connect the Danube with the Tisza River. 37/ All of these projects either have been abandoned or are being held in abeyance. The only improvement of any consequence in inland water routes since 1950 has been the addition of the 21-mile Paretz-Niederneuendorf Canal bypassing West Berlin, 38/ which was motivated largely by political considerations.

As nearly as can be determined from incomplete data, only three of the European Satellites -- Hungary, Rumania, and Bulgaria -- increased the carrying capacities of their fleets in the same or greater proportion to the increase in traffic during 1950-56. Poland and Czechoslovakia achieved increases in their fleets during 1950-56 but not to

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the extent of the increase in traffic performance, and East Germany increased traffic performance with apparently little or no increase in fleet. The latter three nations were able to increase their traffic performance only by greater utilization of their vessels and, to some extent, by mechanization of port loading facilities.

C. Improvement in Operating Efficiency.

The substantial increase in ton-kilometer performance in the European Satellites during 1951-55 was realized to a large extent through improvements in operating efficiency. This tendency has been reflected in all forms of transportation but is especially evident in rail transport, which accounts for the bulk of inland traffic in the Satellites.

1. Railroad.

Because the number of freight cars often determines the theoretical capacity of a railroad system, one of the more important measures of the operating efficiency of a railroad system is the extent to which freight car capacity is being utilized -- that is, net tkm per freight car per year. Net tkm performance per freight car has increased substantially in the European Satellites since 1950, permitting percentage increases in freight traffic performance to exceed percentage increases in freight car parks. In East Germany, for example, freight traffic performance increased 75 percent during 1951-55, but the freight car park increased only 37 percent. 39/ Annual freight car performance, however, increased 28 percent, from 155,000 net tkm per car in 1950 to 198,000 net tkm in 1955.* Thus about half of the increase in freight traffic performance during 1951-55 can be attributed to increased operating efficiency. Other Satellite railroads experienced similar gains in annual freight car performance.

Decreases in average freight car turnaround time (average time lapse between two successive freight car loadings) and increases in average net load per loaded car have contributed heavily to the increase in freight car performance. Freight car turnaround time decreased appreciably in all of the Satellites during 1951-55. In East Germany, turnaround time dropped from 4.12 days in 1950 to 3.53 days in 1955, 41/ or 14.3 percent; and in Czechoslovakia, turnaround time

* Computed from traffic estimates and from freight car inventories of 106,644 cars in 1950 and 145,250 cars in 1955. 40/

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dropped from 4.9 days in 1949 to 4.2 days in 1955, 42/ or 14.3 percent. In both of these countries, reductions in turnaround time were achieved in spite of increases in average lengths of haul. On the Polish railroad system, where the average length of haul remained constant, turnaround time dropped from 5.64 days in 1950 to 5.02 days in 1955,* or 11.0 percent. These achievements become even more impressive when compared with the 1955 turnaround time of 5.2 days in West Germany and 10.5 days in France. 46/ Average net loads per loaded freight car in the Satellites have likewise improved since 1950. In Poland the average net load per loaded car increased from 17.19 tons in 1950 to 18.37 tons in 1955, 47/ or 6.9 percent. In Czechoslovakia, this average rose 6.5 percent from an estimated figure of 14.85** tons in 1950 to 15.81 tons in 1955. 49/ In East Germany the average rose 11 percent on main lines and 9 percent on secondary lines during 1951-55. 50/ These increases, as well as similar increases experienced in the other Satellites, reflect for the most part a greater utilization of freight car capacity rather than a rise in average car capacity.

Locomotive utilization increased to an even greater extent than did freight car utilization in the European Satellites during 1951-55. In East Germany, for example, performance per freight locomotive (steam) increased from 2,808 million gross tkm in 1950 to 4,824 million gross tkm in 1955, 51/ an increase of 72 percent. Contributing heavily to these increases have been efforts on the part of each of the Satellites to raise the average load of freight trains -- the so-called "heavy tonnage movement." The Polish railroads, achieved a 14.1-percent increase in average net train load during 1949-55 and contemplated further increases in subsequent years. 52/ In East Germany the average gross load of scheduled through freight trains reportedly rose from 1,068 tons in 1951 to 1,187 tons in 1955, an increase of 11 percent. 53/ In Czechoslovakia a substantial increase of 23.4 percent in average gross weight of all freight trains was apparently achieved during the First Five Year Plan (1949-53). 54/ The other Satellites have also been successful in raising locomotive performance through increasing average train weights.

* These estimates were based on (1) a 1949 figure (5.94 days), 43/ (2) index numbers (1949 = 100; 1950 = 94.9), 44/ (3) 1954 figures (5.21 days), 45/ and (4) an announcement that in 1955 turnaround time improved 3.6 percent in comparison with 1954.

** This estimate is based on an interpolation of a 1948 figure of 14.47 tons 48/ and a 1955 figure.

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There is no evidence that the increases in freight traffic performance achieved during 1951-55 were realized, in effect, through borrowing from future freight car and locomotive capacity -- that the increases in equipment utilization were achieved at the expense of capital equipment. If the increase in equipment utilization has been accomplished through neglecting essential maintenance and/or overloading equipment, the number of breakdowns and thus the number of cars and locomotives undergoing repairs would have increased rather sharply. That such has not been the case on the East German railroads, one of the more hard-pressed of the Satellite railroad systems, is indicated by the following tabulation showing the percentages of equipment undergoing repairs during the first 6 months of each of the respective years 55/:

<u>Year</u>	<u>Percent of Total</u>	
	<u>Freight Cars</u>	<u>Locomotives</u>
1950	13.0	29.7
1951	9.2	32.9
1952	10.8	38.1
1953	14.7	37.2
1954	11.4	32.6
1955	9.4	27.6

Labor productivity and fuel consumption are other measures which, although they do not describe the degree to which locomotives and rolling stock are being utilized, serve to bring out other important aspects of the operating efficiency of a railroad system. Data on the former are limited, but the trend appears to be toward greater productivity per employee. In East Germany, for example, performance per employee increased from 81,700 net tkm in 1953 to 83,600 in 1955.* In Czechoslovakia, performance per employee increased from about 73,400 net tkm in 1948 to 167,800 in 1955.** Recent employment data

* These figures were computed from estimates of ton-kilometer performance (see Table 1, p. 17, below) and from employment figures of 297,729 employees in 1953 and 306,425 in 1955. 56/

** These figures were computed from estimates of ton-kilometer performance (see Table 1) and from employment figures of 194,528 employees in 1948 57/ and 188,900 in 1955. 58/

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for Poland are sketchy, but performance per employee increased 5.3 percent in 1953-54, from 152,250 to 160,380* net tkm.

A trend toward more efficient utilization of fuel has also been evident in all of the Satellite countries in recent years. Consumption of coal on the Polish railroads, for example, was reduced from 57.5 kilograms (kg) per 1,000 gross tkm in 1949 (weight of coal is expressed in terms of standard or uniform BTU -- British thermal units -- rated coal) to 46.2 kg in 1955, or 19.7 percent. 60/ A substantial drop from 75.7 to 61.0 kg per 1,000 gross tkm occurred in East Germany during the same period. 61/ In Czechoslovakia, coal consumption (expressed in terms of "normal fuel") decreased in 1948-53 from 132.0 62/ to 100.3 kg per 1,000 gross tkm.**

2. Other.

Although the lack of complete data prevents calculations of reliable ratios of tkm per motor vehicle or per ton of inland water fleet capacity, it is estimated that these ratios in the European Satellites have been raised to some extent over the past several years. As indicated previously, vessel deadweight tonnage for inland water transport in Poland, Czechoslovakia, and East Germany remained relatively stable during 1950-55, but traffic rose significantly. Motor vehicle inventories have increased, but it is difficult to establish the degree to which utilization of such equipment has increased.

II. Growth of Freight Transportation Under the Second Five Year Plans, 1956-60.***

The Second Five Year Plans in the European Satellites for inland transportation call for substantial, though reduced, rates of growth in freight traffic during 1956-60. The planned growth rate for inland

* These figures were computed from estimates of ton-kilometer performance (including narrow gauge) of 44,617 million and 48,221 million tkm and from employment figures of 293,000 employees in 1948 and 298,000 in 1954. 59/

** These figures were computed from the 1948 figure and an announcement that in 1953 16.2 percent less fuel per 1,000 gross tkm were used than in 1948. 63/

*** All of the European Satellites except Bulgaria are presently operating under a 1956-60 plan period. Bulgaria's plan period extends from 1953 through 1957. For complete plan data, see Appendix B.

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traffic in the Satellites is substantially below that planned in the USSR but above that estimated for inland traffic in Western Europe. Although it is planned to increase highway and inland water traffic in the Satellites more rapidly than rail traffic, rail transport will continue to carry the great bulk of inland traffic during 1956-60.

In 1956, in spite of unusually cold weather in January and February and severe economic dislocations caused by events in Poland and Hungary, inland freight traffic in the Satellite area (excluding Hungary) increased at slightly above the average annual rate of growth envisaged by the Second Five Year Plans. Performance by country and by type of transport, however, varied widely, and Satellite transportation systems again failed in some instances fully to satisfy traffic demand. Polish inland freight traffic remained at approximately the 1955 level. In Hungary the revolution and subsequent strikes caused inland freight traffic performance in 1956 to fall slightly below the 1953 level. Unless performance in 1958-60 rises high enough to offset the losses in 1956-57, a downward revision of cumulative performance during the Second Five Year Plan period will be necessary, perhaps to the extent of about 7 to 10 percent. It is believed that the planned performance for 1960, however, can and probably will be met in view of two major factors: the fact that transportation facilities were largely undamaged during the revolution and the assumption that the demand for transport of goods will be as high as originally planned for the year 1960, although patterns of origin of goods may be changed. The rate of growth in Satellite rail traffic (excluding Hungary) in 1956 exceeded the average annual rate of growth planned for 1956-60, offsetting the facts that highway traffic performance was slightly below its planned rate of growth and inland water traffic slightly below the 1955 level.

The principal feature of the Second Five Year Plans with regard to investment is the beginning of a changeover from steam to electric and diesel-electric motive power on the railroads.

Much of the reserve transportation capacity available in the European Satellites during 1951-55 no longer exists. Consequently, greater capital investment per unit of traffic increase will be required in the present plan period. Satellite plans call for increased investment in transportation, but fulfillment of traffic plans will depend in part upon fulfillment of plans to increase operational efficiency. Temporary and local transportation difficulties similar to those experienced in the past will probably recur during the remainder of the 1956-60 period.

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A. Performance.

1. Second Five Year Plans.

Transportation plans of the European Satellites anticipate substantial increases in freight traffic during 1956-60. Figure 1* shows 1960 plans for inland freight traffic as well as performance during 1948-56. Inland freight traffic in the Satellites is planned to increase 43.5 billion net tkm, or 28.3 percent, above the 1955 level by 1960. Although sizable, this growth is 28 percent less than that during 1951-55, and, as shown in Figure 5,* indicates an even greater reduction in the rate of growth in inland freight traffic. The larger increase in the earlier period, however, reflects in part the fact that in 1950 some of the Satellites were still in the process of post-World War II reconstruction. The 18-percent increase planned for Polish inland transportation is substantially below the average planned for the area.

The 28.3-percent increase planned for Satellite inland freight traffic during 1956-60 is substantially below the 46.2-percent increase planned for Soviet inland freight traffic** but is above the 18-percent increase estimated for inland freight traffic in Western Europe during 1956-60. 66/

Figure 2* shows plans for rail freight traffic in 1960 as well as performance during 1948-56. Rail freight traffic is planned by 1960 to exceed the 1955 level by 36.7 billion tkm, or 26 percent,

* Following p. 4, above.

** The Soviet increase was computed from the following:

<u>Sector</u>	<u>Performance 1955 <u>64/</u> (Billion Ton- Kilometers)</u>	<u>Planned Performance 1960 (Billion Ton- Kilometers)</u>	<u>Planned Increase 1955-60 <u>65/</u> (Percent)</u>
Railroad	971.0	1,374.0	42.0
Highway	42.5	85.0	100.0
Inland water	67.4	121.3	80.0
Total	<u>1,080.9</u>	<u>1,580.3</u>	46.2 (computed)

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compared with the increase of 53.1 billion tkm, or 62 percent, achieved during 1951-55. Increases of 35 percent are planned in Czechoslovakia and Rumania, 32 percent in East Germany, and 25 percent in Hungary. Albania plans an 81-percent increase, and Poland plans a relatively moderate 16.6-percent increase in rail freight traffic by 1960. As shown in Figure 6* railroads in the European Satellites will continue to carry the great bulk (89 percent planned in 1960) of inland freight during the period under discussion.

Figure 3* shows plans for highway freight traffic in 1960 as well as performance during 1948-56. Highway freight traffic in the Satellite area is planned by 1960 to exceed the 1955 level by 3.9 billion tkm, or 56 percent, compared with the increase of 4.0 billion tkm, or 130 percent, achieved during 1951-55. The share of highway transport in total inland traffic is to increase from 4.6 percent in 1955 to 5.6 percent in 1960. This increase, however, should not be interpreted as an attempt to develop highway transport as a long-haul service in competition with rail transport. It is intended, rather, to continue to develop highway transport as a short-haul feeder service for the railroads. The 1960 highway traffic goals for the various countries, expressed as percentage increases above the level of 1955, are as follows: Rumania, 150; Albania, 110; Poland, 96; Hungary, 62; East Germany, 39; and Czechoslovakia, 25.

Figure 4* shows plans for inland water freight traffic in 1960 as well as performance during 1948-56. Freight traffic by inland waterways is planned by 1960 to exceed the 1955 level by 3.0 billion tkm, or 37 percent, compared with the increase of 3.3 billion tkm, or 73 percent, achieved during 1951-55. Percentage increases for 1960 above the level of 1955 anticipated by individual countries are as follows: Albania, 110; Rumania, 70; Hungary, 46; East Germany, 42; and Czechoslovakia, 25. Poland anticipates a 31.5-percent decrease in inland water traffic by 1960. The share of inland water transport in total inland transportation was 5.1 percent in 1955 and is planned to increase to 5.4 percent in 1960 but will remain far below the prewar share of 11.0 percent.

2. Performance in 1956.

Plan fulfillment and growth in inland freight traffic performance in the European Satellites in 1956 varied widely by country

* Following p. 4, above.

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and by type of transport, as shown in Table 1.* Figure 1** shows actual performance in 1956 and compares performance with average annual rates of growth planned for 1956-60. Inland traffic in the European Satellites, excluding Hungary, increased by 7.5 percent, or at slightly above the average annual rate of growth of 5.1 percent envisaged for the area as a whole by the Second Five Year Plan. Czechoslovak and East German transportation, in overfulfilling 1956 Plans for total inland traffic, exceeded average annual rates of growth planned for 1956-60. In spite of an announced 106-percent fulfillment of the 1956 Plan in Rumania, inland freight traffic in that country increased at slightly below the average annual rate called for by the Second Five Year Plan. In Poland, inland freight traffic performance remained at approximately the 1955 level, and in Hungary, as a result of the revolution and subsequent strikes, freight traffic performance in 1956 fell to a level slightly below that in 1953.

Figure 2** shows freight traffic by rail transport in 1956 and compares performance with average annual rates of growth planned for 1956-60. Rail freight traffic in the Satellites (excluding Hungary) increased by 4.3 percent in 1956 compared with the 4.8-percent average annual increase indicated by the Second Five Year Plans. Freight traffic plans were overfulfilled in Bulgaria, East Germany, Czechoslovakia, and Rumania but were underfulfilled in Albania and Poland. In the latter country, rail freight traffic increased by less than 1 percent in 1956. Hungarian rail freight traffic dropped 7.1 percent below the 1955 level.

Figure 3** shows freight traffic by highway transport in 1956 and compares performance with average annual rates of growth planned for 1956-60. The 8.2-percent growth in highway freight traffic in the European Satellites (excluding Hungary) in 1956 was slightly below the 9.2-percent average annual growth called for by the Second Five Year Plans. Plans for 1956 were met only in Bulgaria, Czechoslovakia, and East Germany. In Poland and Rumania, where Second Five Year Plans call for 14.4- and 20.1-percent average annual rates of growth in highway freight traffic, respectively, 1956 traffic increases were below the average 8.2-percent increase for the area as a whole. Hungarian highway freight traffic dropped 6.8 percent below the 1955 level.

* Table 1 follows on p. 17.

** Following p. 4, above.

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Table 1

Plan Fulfillment and Growth in Freight Traffic Performance by Inland Transportation
in the European Satellites
1956

Country	Plan Fulfillment				Change from 1955 ^{a/}			
	Railroad	Highway	Inland		Railroad	Highway	Inland	
			Water	Total			Water	Total
Albania ^{b/}	88.0	93.0	87.3	92.2	2.0	12.3	0	9.9
Bulgaria ^{c/}	105.3	104.8	92.4	101.8	12.1	6.6	3.9	7.4
Czechoslovakia ^{d/}	104.3	101.5	94.7	104.0 ^{e/}	8.2	9.6	4.1	8.2
East Germany ^{f/}	104.0	108.0	98.0	103.0	8.0	9.0	5.0	7.9
Poland ^{g/}	97.6	87.6	N.A.	97.0	0	5.8	-23.0	0
Rumania ^{h/}	108.0	N.A.	N.A.	106.0	8.5	5.1	-23.6	6.0
Total					4.3	8.2	- 4.2	7.5
Hungary ^{i/}	N.A.	N.A.	N.A.	83.8	-7.1	-6.8	-12.6	-7.5

a. Derived from Table 2, p. 28, below.

b. ^{67/}

c. Figures are based on the 1956 Plan ^{68/} and estimates of performance in 1956 (see Table 2).

d. ^{69/}

e. Tons carried.

f. ^{70/}

g. ^{71/}

h. ^{72/}

i. Based on the 1956 Plan ^{73/} and estimates of performance in 1956 (see Table 2).

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Figure 4* shows freight traffic by inland water transport in 1956 and compares performance with average annual rates of growth planned for 1956-60. A late spring thaw and disruption of traffic on the Danube caused by the Hungarian revolution contributed to a poor showing by inland water transport in the European Satellites in 1956. Freight traffic by inland water transport in the Satellites (excluding Hungary) decreased by 4.2 percent in 1956. Inland water traffic plans were fulfilled in none of the Satellite countries.

Transportation systems in the European Satellites continued to experience difficulty in meeting freight traffic demand in 1956. Complaints of transportation shortages in the Satellite press were more voluminous than in previous years, suggesting that transportation difficulties may have been more serious than during 1951-55. In Czechoslovakia the shortage of freight cars apparently became more acute, resulting in the closing of five surface mines in the North Bohemian Brown Coal Basin in June. ^{74/} Czechoslovak plan fulfillment announcements for the first 6 months of 1956 stated that shortcomings in rail transport had serious repercussions in other sectors of the economy. ^{75/} The East German press complained throughout the year of transportation shortages, accusing the transport sectors of failing to keep step with industrial production and blaming temporary setbacks in production and delay in the distribution of agricultural products on transportation deficiencies. ^{76/} In Hungary a severe shortage of fuel, coupled with a shortage of locomotives and poor condition of roadbed and track, made necessary the cancellation of 55 percent of normal passenger operations in September 1956 in order that harvest freight traffic requirements could be met. ^{77/} There is evidence of similar transportation difficulties in the other Satellites in 1956.

B. Growth of Transportation Systems.**

The growth in freight traffic in the European Satellites achieved during the period of the First Five Year Plan (1951-55 in most of the Satellites) was realized to a large extent through increased utilization of facilities and equipment. Second Five Year Plans call for further increases in operational efficiency. Much of the reserve transportation capacity available in 1951, however, has disappeared. A larger increment of capital investment per additional unit of traffic performance

* Following p. 4, above.

** Excluding Bulgaria, which is presently operating on a 1953-57 plan period and has not yet announced plans for 1958-60.

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therefore will be required in the present plan period (1956-60) than was necessary in the 1951-55 plan period. Substantial additional capital investment in the transport sectors of the various Satellite countries will be needed if traffic levels envisaged by the Second Five Year Plans are to be met.

Although differences in price levels in the 1951-55 and 1956-60 plan periods make difficult an accurate comparison of investment in these two periods, it appears that the Second Five Year Plans of most of the European Satellites call for larger sums to be invested in transportation and communications* than were provided in the 1951-55 plan period. Perhaps more revealing than a comparison of the actual amount of funds to be devoted to transportation is a comparison of the share of total investment to be allocated to this sector in the two periods. Only in Poland and Albania do Second Five Year Plans call for lesser shares of total investment to be devoted to transportation and communications than were allocated in the 1951-55 period. Czechoslovakia has announced neither the absolute amount nor the share of investment to be devoted to transportation in the Second Five Year Plan.

The Second Five Year Plan for East Germany clearly reveals an anticipated emphasis on transportation in the 1956-60 plan period. This Plan calls for 7,084 million East German marks (Deutsche Mark East -- DME) to be allocated to transportation during the 5-year period. Funds to be made available to the railroads are to be almost double the amount made available in the previous plan period. Of the total amount to be invested in the East German economy, 16.1 percent is to be devoted to transportation during 1956-60 compared with 8.8 percent during 1951-55. 78/ This share is higher than that experienced in the 1951-55 plan period or anticipated by the present plans of the USSR or any of the other European Satellites.

The increase in investment in transportation under the Hungarian Second Five Year Plan was only slightly less pronounced than that in East Germany. Total investment in transportation was to increase from 7.7 billion forints in the 1950-54 plan period 79/ to 10.4 billion forints in the 1956-60 plan period, or a 35-percent increase. Investment in rail transport during 1956-60 was to increase more sharply, from 3,064 million 80/ to 5,300 million forints, or 73 percent. Total investment was to increase only 13.2 percent during this plan period, from 68.9 billion to between 76 billion and 78 billion forints. 81/ The share

* Most announcements on investment combine transportation and communications.

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of transportation in total investment was also to increase under the Second Five Year Plan. In the 1950-54 period, transportation received 11.2 percent of total investment in Hungary. ^{82/} Under the provisions of the 1955-60 Plan, this share was to increase to 13.5 percent. As a result of the 1956 revolution, the Hungarian Second Five Year Plan will undoubtedly be revised in many respects, the investment picture possibly radically. No information is available to date on revised investment plans, but it can be assumed that the share of transportation in the total budget will be changed, and possibly the absolute amount budgeted for transportation as well.

The Polish Second Five Year Plan calls for 30,150 million zlotys to be invested in transportation and communications compared with 28,290 million zlotys allocated to this sector in the 1950-55 plan period. ^{83/} Rail transport is reported to receive 32 percent more investment funds under the Second Five Year Plan directive than were received during the 1950-55 period, but this figure probably does not allow for the change in prices between the two periods. The share of transportation and communications in total investment is to drop from 12.9 percent in the 1950-55 period ^{84/} to 10.0 percent in 1956-60.

The Rumanian Second Five Year Plan proposes a slight increase in the share of transportation and communications in total investment, from 11.2 percent in the 1951-55 plan period ^{85/} to 11.5 percent in 1956-60. In Albania, 2.011 million leks, or approximately the same sum invested in this sector during 1951-55, ^{86/} are to be devoted to transportation under the Second Five Year Plan.

1. Railroad.

As in the case of the First Five Year Plans, investments in rail transport under the Second Five Year Plans in the European Satellites are to be of an intensive rather than an extensive nature, geared primarily toward improving and modernizing rather than extending railroad facilities.

Planned investment in line construction appears to be directed for the most part toward much-needed track overhaul. Length of track to be overhauled includes 3,000 to 4,500 km, approximately 34 percent of total kilometrage, in Czechoslovakia; 3,000 km, or 29 percent of total kilometrage, in Rumania; and 2,400 km, or 27 percent of total kilometrage, in Hungary. The East German Plan calls for a rather

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modest 1,750 km, or 12 percent of total track kilometrage, to be overhauled during 1956-60. In Czechoslovakia, 3,860 km and in Hungary, 1,600 km of track are to be made capable of withstanding 18- to 20-ton and 22-ton axle loads, respectively. Double tracking is to be completed on 170 km of line in Hungary and 134 km in Rumania. In Poland, 5.1 percent of total railroad investment is to be devoted to construction and reconstruction of second tracks.

Expansion and modernization of yards as well as improvement of signaling are included in the Second Five Year Plans of the various Satellites. Important yards are to be equipped with automatic switches and car retarders, and loading is to be further mechanized in several of the countries. The length of station sidings and yard tracks is to be increased to accommodate heavier trains in both Hungary and Rumania, and in the former country, several important stations are to be rebuilt. Improvement of communications and signaling facilities is stressed in the plans of all the Satellite countries except Albania. In East Germany the length of line equipped with automatic block signaling by 1960 is to be 15 times that in 1955. Automatic block signaling is to be installed on 300 km of line in Rumania, more than 282 km in Czechoslovakia, and 200 km in Hungary. The Polish Five Year Plan calls for a "considerable" increase in the number of line block and automatic block systems. 87/

An outstanding feature of the new Satellite plans for rail transport is the provision for the beginning of a changeover from steam to electric and diesel* motive power. Railroad electrification plans in the northern Satellites are ambitious. Second Five Year Plans call for electrification of 933 km of line in Poland, 750 km in Czechoslovakia, and 380 km in East Germany. It should be recognized, however, that past electrification plans in both the Satellites and the USSR have not been met. Plans call for the acquisition of 440 diesel and 284 electric locomotives in Czechoslovakia, more than 400 diesel and electric locomotives in East Germany, 300 diesel and 30 electric locomotives in Hungary, and an unspecified number of diesel locomotives in Rumania. Poland has not announced plans with regard to rolling stock, but electrification plans suggest that sizable additions to the electric locomotive inventory will be made. Diesel and electric locomotives, which handled only an insignificant volume of traffic in 1955, are to account for 18 percent of total rail traffic in the European

* The term diesel means both diesel-electric and diesel-mechanical.

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Satellites in 1960. 88/ These two types of motive power are to handle 25 percent of railroad traffic in both Hungary and Czechoslovakia by 1960. 89/

Although steam locomotives will continue to be the principal type of motive power on railroads in the European Satellites in 1960, it is obvious that significant steps toward the modernization of motive power are planned. In spite of the high initial cost and need to import diesel fuel (or crude oil for manufacture of diesel fuels), these countries have apparently become convinced of the many advantages of diesel compared with steam operation, including greater flexibility, lower maintenance costs, less time in maintenance, more efficient fuel utilization, less wear and tear on roadbed and track, and other points of superiority. Likewise, the advantages and economies of electric over steam locomotives on lines of high train density appear to outweigh high initial costs.

Freight car parks are to be expanded during the Second Five Year Plan period in all of the Satellites, with the possible exception of Albania. In Czechoslovakia, 36,000 freight cars, most of which will be 4-axle cars, are to be added to the park. The East German freight car park is to be increased by 39,600 2-axle units of higher average capacity than the present cars. The Hungarian plan calls for the addition of 11,000 high-capacity freight cars. In Rumania, 12,000 to 13,000 freight and passenger cars, in terms of 2-axle units, are to be added to the rolling stock park. The Polish Five Year Plan does not specify the number of cars to be acquired, but allocates 22.4 percent of total railroad investment to the purchase of rolling stock and states that 60 percent more freight cars, in terms of 2-axle units (41 percent more in terms of physical units), are to be added to the park than were during 1951-55. The announced plan for Albania makes no reference to rolling stock.

2. Highway.

Following the same general pattern as that for railroad construction, investments in road construction under the Second Five Year Plans in the European Satellites are to be directed primarily toward modernizing the existing road net. Emphasis is placed on paving and otherwise improving roads and providing them with dust-free surfaces. The Czechoslovak plan stands out in this respect, calling for the paving of 15,000 km of roads, improving 50 percent of all gravel roads, and increasing the percentage of dust-free roads

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from 24 to 29 percent of the total network. Only in Poland, where 3,000 km of new roads are planned, is new road construction significant.

Increases in truck inventories are planned in the Satellites, but these appear to be modest in comparison with planned traffic increases.

3. Inland Water.

Plans for inland water transportation in the European Satellites indicate that relatively little attention is to be devoted to developing this form of transportation in the Second Five Year Plans. Principal emphasis appears to be directed toward expanding and modernizing fleets and improving port loading and unloading facilities. In Czechoslovakia, 32 tugs, 7 freighters, and 52 barges are to be acquired in the 1956-60 plan period; and in Hungary, 15 tugs and 50 barges are to be added to the fleet. The state-owned inland water fleet in East Germany is to be expanded through the addition of new barges and motor vessels, and 30 percent of the state-owned barge fleet is to be motorized by 1960. Port loading capacity in East Germany is planned to increase 15 percent by 1960 above the level of 1955. In Rumania the index of mechanized loading in ports is to increase 60 to 65 percent, and the ports of Braila and Galati are to be developed during the 1956-60 plan period.

C. Operations.

In spite of plans for increased investment in the transport sectors of all of the European Satellites except Albania, these countries apparently intend to continue policies of operating at near capacity in the 1956-60 plan period. Fulfillment of traffic plans in all Satellites appears to be contingent upon further improvement in operating efficiency. Consequently, the economies of the European Satellites will probably continue to be plagued during the remainder of the 1956-60 plan period with recurring local transportation difficulties of a temporary nature similar to those being experienced at present.

1. Railroad.

Percentage increases in freight traffic envisaged in the Second Five Year Plans of most of the European Satellites appear to exceed planned increases in freight car inventories. In East Germany,

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for example, assuming that planned freight car additions represent net additions to the freight car park, the freight car inventory is to increase about 27 percent,* but traffic is planned to increase 32 percent by 1960. Assuming that these cars represent a gross addition to the park from which retirements must be deducted, the difference between planned percentage growth in inventory and in traffic is even greater (this may be partly offset, however, because the new cars are planned to be of higher capacity than the retired cars). This disparity is apparently to be resolved by reducing freight car turnaround time 10 percent and by increasing the average load per car 4 percent by 1960. The Czechoslovak Second Five Year Plan calls for an increase of about 31 percent** in the freight car park, assuming planned freight car acquisitions represent net additions to the park, compared with a planned increase of 35 percent in freight traffic. To offset this difference, freight car turnaround time is to be lowered 14.3 percent,*** and average net load per loaded freight car is to increase 8 percent by 1960. Other Satellite railroad plans reveal similar disproportions between planned increases in freight car inventories and freight traffic and anticipate similar compensating increases in operational efficiency in the 1956-60 plan period.

2. Other.

Available data for types of transportation other than railroads permit only rough comparisons between planned transportation capacity and planned traffic performance. Fulfillment of highway traffic plans will apparently depend upon more effective utilization of equipment to an even larger degree than will fulfillment of railroad traffic plans. In Czechoslovakia and Rumania, the only countries for which comparative data are available, truck inventories are to increase by 50 and "more than" 100 percent, respectively, and truck freight traffic is to increase by 235 and 150 percent. Although these inventory data ignore such considerations as increases in truck capacity and the increased use of trailers, it appears that substantial improvement in utilization of equipment will be necessary if traffic goals are to

* Based on a 1955 inventory of 145,250 freight cars 90/ and planned additions of 39,600 2-axle cars of higher unit capacity than those presently employed on the East German railroads.

** Based on an estimate of 115,900 units for the 1955 freight car park. 91/

*** Computed from turnaround figures of 4.2 days for 1955 92/ and 3.6 days planned for 1960.

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be met. A similar pattern is believed to hold true in the other Satellites, because highway transportation plans of most of these countries include provisions for increasing the utilization of truck loading capacity.

Fleet inventory data announced in the Satellite Second Five Year Plans for inland water transport do not permit statistical comparison of planned traffic and fleet increases. In East Germany, however, barge turnaround time (state-owned fleet) is to decrease 55 percent; and in Hungary, ton-kilometer performance per vessel per day is to increase 24 percent under the plan provisions. It is believed that in these countries, as well as in other Satellites, planned increases in fleet inventories are modest relative to planned traffic increases.

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APPENDIX A

STATISTICAL TABLES

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Table 2
 Freight Traffic Performance by Inland Transportation
 in the European Satellites a/*
 1938, 1948-56, and 1960 Plan

Country and Type of Transport	Million Net Ton-Kilometers										
	1938	1948	1949	1950	1951	1952	1953	1954	1955	1956	1960 (Plan)
Albania											
Railroad	Negligible	0.006	0.007	0.009	0.01	0.012	0.014	0.015	0.019	0.019	0.034
Highway	0.01	0.029	0.037	0.047	0.063	0.076	0.092	0.099	0.122	0.137	0.251
Inland water	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	0.010	0.022
Total	0.01	0.035	0.044	0.056	0.073	0.088	0.106	0.115	0.141	0.166	0.307
Bulgaria b/											
Railroad	1.08	1.96	2.43	2.75	3.07	3.40	3.98	4.16	4.54	5.08	5.44
Highway	0.048	0.067	0.072	0.079	0.083	0.097	0.135	0.135	0.167	0.178	0.250
Inland water	0.1	0.778	0.832	0.845	0.947	1.06	1.16	1.56	1.79	1.72	2.72
Total	1.23	2.80	3.34	3.67	4.10	4.55	5.28	5.85	6.50	6.98	8.41
Czechoslovakia c/											
Railroad	11.2	14.3	16.1	18.8	22.1	23.9	26.3	28.5	31.7	34.3	42.8
Highway	0.121 <u>d/</u>	0.363	0.422	0.491	0.571	0.644	0.744	0.955	1.00	1.10	1.26
Inland water	1.64	0.629	0.700	0.806	1.05	1.19	1.26	1.26	1.48	1.55	1.86
Total	13.0	15.3	17.2	20.1	23.7	25.8	28.4	30.7	34.2	37.0	45.9
East Germany e/											
Railroad	22.1 <u>f/</u>	10.8	13.9	16.5	19.3	20.9	24.5	26.5	28.8	31.1	38.0
Highway	0.8	1.46	1.65	1.94	2.20	2.40	2.57	2.94	3.19	3.48	4.44
Inland water	4.5	1.06	1.13	1.58	1.80	1.71	1.74	1.74	2.17	2.27	3.08
Total	27.4	13.3	16.7	20.0	23.3	25.0	28.8	31.2	34.2	36.9	45.6
Hungary g/											
Railroad	3.04 <u>d/</u>	3.92	4.54	5.41	6.26	7.43	8.15	8.15	8.78	8.16	11.0
Highway	0.11 <u>d/</u>	0.241	0.246	0.237	0.381	0.566	0.766	0.826	0.868	0.809	1.41
Inland water	0.5	0.410	0.443	0.538	0.745	0.844	0.918	0.906	0.847	0.740	1.24
Total	3.65	4.57	5.23	6.19	7.39	8.84	9.84	9.88	10.5	9.71	13.6

* Footnotes for Table 2 follow on p. 29.

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Table 2
 Freight Traffic Performance by Inland Transportation
 in the European Satellites a/
 1938, 1948-56, and 1960 Plan
 (Continued)

Country and Type of Transport	Million Net Ton-Kilometers										
	1938	1948	1949	1950	1951	1952	1953	1954	1955	1956	1960 (Plan)
Poland b/											
Railroad	22.4	28.3	32.7	35.1	38.5	40.3	44.6	48.2	51.9	51.9	60.3
Highway	0.044	0.110	0.130	0.210	0.380	0.514	0.842	1.17	1.56	1.65	3.05
Inland water	0.456	0.227	0.334	0.264	0.339	0.557	0.593	0.574	0.774	0.596	0.530
Total	22.9	28.6	33.1	35.5	39.2	41.4	46.0	49.9	54.2	54.1	63.9
Rumania i/											
Railroad	5.80	5.64	6.60	7.60	9.00	10.6	12.0	12.0	14.1	15.3	19.0
Highway	0.008	0.007	0.025	0.042	0.072	0.122	0.172	0.221	0.272	0.286	0.680
Inland water	1.04	0.420	0.635	0.669	0.711	0.752	0.797	0.894	0.649	0.496	1.10
Total	6.84	6.07	7.26	8.31	9.78	11.5	13.0	13.1	15.1	16.0	20.7
Total European Satellites											
Railroad	65.5 d/	64.8	76.2	86.0	97.9	107	120	128	140	145	177
Highway	1.14 d/	2.28	4.07	3.05	3.75	4.45	5.35	6.35	7.18	7.64	11.3
Inland water	8.24 d/	3.52	4.07	4.70	5.59	6.10	6.47	6.94	7.78	7.38	10.6
Grand total	74.9 d/	70.6	82.9	93.7	107	117	132	141	155	165	198

a. [redacted] estimates are derived from announced figures and announced indexes and/or percentage increases. In some cases, particularly inland water transport estimates, ton-kilometer estimates are based on estimates of tons originated derived in the above manner and estimated average lengths of haul and/or inventory data. [redacted] methodology can be obtained from the appropriate branch. Plan figures are based on performance estimates for 1955 and announced percentage increases (see Appendix B). Totals are derived independently from unrounded figures and do not always agree with the sum of their rounded components.

b. Bulgaria is presently operating on a 1953-57 plan period. The plan figures for 1960 are projected from the 1953-57 Plan, which calls for the following percentage increases in traffic in 1957 compared with 1952: railroad transport, 50 percent; highway transport, 100 percent; and inland water transport, 77 percent. 93/

c. Railroad and highway transport estimates for 1948 and 1953-56 are from 94/.

d. 1937.

e. Estimates for 1950-55 are from 95/ and represent net operating ton-kilometers.

f. 1936.

g. Estimates for 1949-55 are from 96/.

h. Estimates for 1949-56 are from 97/.

i. Estimates for 1948, 1950, and 1955-56 are from 98/.

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Table 3

Index of Freight Traffic Performance by Inland Transportation
in the European Satellites
1951-55

, 1950 = 100

<u>Country and Type of Transport</u>	<u>1951</u>	<u>1952</u>	<u>1953</u>	<u>1954</u>	<u>1955</u>
Albania					
Railroad	111.1	133.3	155.6	177.8	211.1
Highway	134.0	161.7	195.7	210.6	259.6
Total	130.4	157.1	189.3	205.4	251.8
Bulgaria					
Railroad	111.9	123.7	145.1	151.3	165.2
Highway	105.1	122.8	170.9	170.9	211.4
Inland water	112.1	124.9	137.3	184.9	212.2
Total	111.8	123.9	143.8	159.4	177.0
Czechoslovakia					
Railroad	117.4	127.3	140.2	151.5	168.8
Highway	116.3	135.2	157.6	194.5	204.5
Inland water	130.5	147.5	156.3	156.3	184.2
Total	117.9	128.3	141.3	152.8	170.3
East Germany					
Railroad	116.8	126.9	148.6	160.5	174.8
Highway	113.2	123.6	132.1	151.4	164.2
Inland water	113.8	108.1	110.1	110.3	137.3
Total	116.2	125.1	143.9	155.7	170.8

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Table 3

Index of Freight Traffic Performance by Inland Transportation
in the European Satellites
1951-55
(Continued)

1950 = 100

<u>Country and Type of Transport</u>	<u>1951</u>	<u>1952</u>	<u>1953</u>	<u>1954</u>	<u>1955</u>
Hungary					
Railroad	115.7	137.2	150.6	150.5	162.2
Highway	160.8	238.8	323.2	348.5	366.2
Inland water	138.5	156.9	170.6	168.4	157.4
Total	119.4	142.8	158.9	159.6	169.6
Poland					
Railroad	109.7	114.8	127.0	137.3	147.9
Highway	181.0	244.8	401.0	557.1	741.0
Inland water <u>a/</u>	101.5	166.8	177.5	171.9	231.7
Total	110.4	116.6	129.6	140.6	152.7
Rumania					
Railroad	118.4	139.5	157.9	157.9	185.5
Highway	171.4	290.4	409.5	526.2	647.6
Inland water	106.3	112.4	119.1	133.6	98.3
Total	117.7	138.4	156.4	157.6	181.7
Total European Satellites					
Railroad	113.8	124.4	139.5	148.8	162.8
Highway	122.9	145.9	175.4	208.2	235.4
Inland water	118.9	129.8	137.7	147.7	165.5
Grand total	114.2	124.9	140.9	150.5	165.4

a. Because 1950 was an unusually low year for Polish inland water traffic, 1949 is used as the base year.

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Table 4

Average Annual Rates of Growth in Freight Traffic Performance
of the European Satellites
1949-50, 1951-55, and 1956-60 Plan

	Percent		
<u>Country and Type of Transport</u>	<u>1949-50</u>	<u>1951-55</u>	<u>1956-60 Plan</u>
Albania			
Railroad	22.5	16.1	12.3
Highway	27.3	21.0	15.4
Total	26.5	21.9	15.2
Bulgaria			
Railroad	18.5	10.6	
Highway	8.6	16.1	
Inland water	4.2	16.2	
Total	14.5	12.1	
Czechoslovakia			
Railroad	14.7	11.0	6.2
Highway	16.3	15.4	4.6
Inland water	13.2	13.0	4.6
Total	14.7	11.2	6.1
East Germany			
Railroad	23.8	11.8	5.7
Highway	15.3	10.4	6.8
Inland water	22.1	6.5	7.3
Total	22.8	11.3	5.9
Hungary			
Railroad	17.5	10.2	4.5
Highway	-0.8	29.6	10.1
Inland water	14.5	9.5	7.9
Total	16.4	11.1	5.4

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Table 4

Average Annual Rates of Growth in Freight Traffic Performance
of the European Satellites
1949-50, 1951-55, and 1956-60 Plan
(Continued)

	Percent		
<u>Country and Type of Transport</u>	<u>1949-50</u>	<u>1951-55</u>	<u>1956-60 Plan</u>
Poland			
Railroad	11.4	8.1	3.0
Highway	38.2	49.3	14.4
Inland water	7.8	15.0 a/	-7.3
Total	11.4	8.8	3.4
Rumania			
Railroad	16.1	13.2	6.1
Highway	148.0	45.3	20.1
Inland water	26.2	b/	11.1
Total	18.3	12.7	6.5
Total European Satellites			
Railroad	15.2	10.2	4.8
Highway	15.7	18.7	9.5
Inland water	15.5	10.6	6.4
Grand total	15.2	10.6	5.0

a. 1950-55.

b. The concept of average annual rate of growth is meaningless here, inasmuch as performance rose 134 percent between 1950 and 1954 but dropped in 1955 to a level below that of 1950. Statistically the period would show a slight annual decrease.

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Table 5

Distribution of Inland Freight Traffic
in the European Satellites
by Type of Transport a/
1938, 1950, 1955, and 1960 Plan

<u>Type of Transport</u>	<u>Percent of Total</u>			
	<u>1938</u>	<u>1950</u>	<u>1955</u>	<u>1960 Plan</u>
Railroad	87.5	91.8	90.3	89.0
Highway	1.5	3.3	4.6	5.6
Inland water	11.0	4.9	5.1	5.4
Total	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>

a. Excluding pipeline and air traffic.

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APPENDIX B

SECOND FIVE YEAR PLANS FOR INLAND TRANSPORTATION
IN THE EUROPEAN SATELLITES, 1956-60

1. Albania.*

a. Freight Traffic.

The index of the planned level of inland freight traffic for 1960 (1955 = 100) is as follows:

Railroad	181
Highway	205
Inland water	219 <u>100/</u>
Total (computed)	203

b. Operations (Highway).

Coefficient of vehicle utilization to increase from 57 to 68 percent.

Labor productivity to increase 49 percent.

Costs to decrease 20 percent.

c. Capital Investment.

Investment funds allocated to transportation to be 2,011 million leks (US \$40 million), or 9.2 percent of total investment.

(1) Railroad.

No new railroad lines to be constructed.

* Data are from 99/ unless otherwise indicated.

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(2) Highway.

(a) Routes.

57 km of new roads to be built including the Ulze-Burrel, Milot-Ulze, Fier-Vlore, Burrel-Klos, and Elbasan-Pishkas roads).

(b) Vehicles.

Transport capacity to increase 89 percent.
More than 500 vehicles to be imported.
More than 400 trailers to be imported.
More than 50 percent of vehicles to be equipped with trailers.

2. Czechoslovakia.

a. Freight Traffic. 101/

The index of the planned level of inland freight traffic for 1960 (1955 = 100) is as follows:

Railroad	135
Highway	125
Inland water	125

Total (computed) 134

b. Operations (Railroad). 102/

Freight car turnaround time to be lowered to 3.6 days.
Average net load per loaded freight car to increase 8 percent, to 17 tons.
Average gross weight of freight trains to increase to 935 tons.

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c. Capital Investment.

(1) Railroad.

(a) Fixed Facilities.*

750 km of line to be electrified (electrification of Usti nad Labem - Ceska Trebova - Kosice and Prague-Kolin lines should be completed). 104/

Electrification of the Hranice-Bohumin line to be started.

General overhaul of track to be increased from 600 to 900 km annually.

3,860 km of track to be replaced with rails capable of withstanding an 18- to 20-ton axle load. 105/

At least 5 classification yards to be equipped with automatic switches and car retarders and 17 yards with wireless communication facilities.

Mechanization of loading to be increased by 80 per cent.

Automatic block signaling to be installed on 282 km of line and expansion of this signaling to be carried out on the Usti nad Labem - Nymburk - Kolin and Prague Ceska Trebova lines.

(b) Rolling Stock. 106/

284 electric locomotives and 440 diesel locomotives (up to 1,200 horsepower) to be acquired.

36,000 freight cars (mostly 4 axle) to be acquired.

(2) Highway. 107/

15,000 km of dirt roads to be made dust free.

Length of dust-free roads to increase from 24 to 29 per cent of total network.

50 percent of gravel roads to be improved.

Truck inventory to increase by 50 percent. 108/

* Data are from 103/ unless otherwise indicated.

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(3) Inland Water. 109/

32 tugs, 7 freighters, and 52 barges (including 6 tankers) to be acquired.

Construction of transshipping center at Loubi nad Labem to be completed, and reconstruction of Bratislava and Komarno ports to be begun.

3. East Germany.*

a. Freight Traffic.

The index of the planned level of inland freight traffic for 1960 (1955 = 100) is as follows:

Railroad	132
Highway	139
Inland water	142

Total (computed) 133

b. Operations.

(1) Railroad.

Labor productivity to increase 14 percent.

Freight car turnaround time to decrease 10 percent.

Average net load per loaded freight car to increase 4 percent.

Locomotive utilization to increase 10 percent.

Operating costs to decrease 8 percent.

Specific fuel consumption to decrease 4 percent.

(2) Highway (Socialized Sector).

Utilization of loading capacity to increase 35 percent.

Labor productivity to increase 24 percent.

Operating costs to decrease 13.5 percent.

(3) Inland Water.

Ship turnaround time in the socialized sector of inland water transport to increase 55 percent.

* Data are from 110/ unless otherwise indicated.

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Labor productivity to increase 73 percent.
Operating costs to decrease 28 percent.

c. Capital Investment.

Investment funds allocated to transportation to be 7,084 million DME (US \$3,191 million) (computed), or 16.1 percent of total investment.

(1) Railroad.

Railroads to receive twice the amount of investment funds received in 1951-55. 111/

(a) Fixed Facilities.

350 km of track to be replaced annually.
380 km of track in the central German industrial area to be electrified.
Length of track equipped with fully automatic block signaling to be increased 15 times.
13 automatic humping installations and about 30 automatic car retarders to be put into operation in classification yards.
Centralized traffic control to be developed, with installation beginning in 1958.

(b) Rolling Stock.

Freight car park to be enlarged by 39,600 2-axle units (75 percent of new cars to be of large-capacity type).
More than 400 diesel and electric locomotives to be acquired. 112/

(2) Highway.

Funds available for construction and maintenance to be increased 52 percent.
The number of highway maintenance and construction enterprises to increase.
Road construction and maintenance to be mechanized.

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(3) Inland Water.

Port loading capacity to increase 15 percent.
Capacity of state fleet to be increased through addition
of new barges and motor vessels.
Motorized barges to comprise 30 percent of total barge
fleet.

4. Hungary.*

a. Freight Traffic.

The index of the planned level of inland freight traffic for
1960 (1955 = 100) is as follows:

Railroad	125
Highway	162
Inland water	146

Total (computed) 130

b. Operations.

(1) Railroad.

Average freight car turnaround time to decrease to 3.8 days.
Average net load per loaded freight car to increase to
16 tons.
Average load per train to increase to 740 tons.

(2) Highway.

Utilization of loading capacity to increase 12 to 15 per-
cent.

(3) Inland Water.

Ton-kilometers per vessel per day to increase 24 percent
through increasing speed of operation.

* Data are from 113/ unless otherwise indicated.

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c. Capital Investment.

Investment funds allocated to transportation and communications to be 10,400 million forints 114/ (US \$885.9 million), or 13.5 percent of total investment. 115/

(1) Railroad.

Investment funds allocated to railroad transport to be 5,300 million forints 116/ (US \$541 million).

(a) Fixed Facilities.

530 km of industrial sidings to be constructed.
170 km of line to be double tracked (should render Miskolc-Ujszasz, Szolnok-Debrecen, and Budapest-Szekesfehervar lines completely double tracked).
2,400 km of track to be renovated (1,600 km to be made suitable for 22-ton axle load).
Electrification to be completed on Budapest-Hatvan line and to be begun on Budapest-Szolnok line. 117/
Length of station sidings to increase from 38 to 42 percent of total length of rail network.
The following stations to be completely or partly rebuilt: Gyor, Hatvan, Debrecen, Szolnok, Zahony, and several stations of secondary importance.
200 km of line to be equipped with automatic block signaling.

(b) Rolling Stock.

300 diesel, 30 electric, and 120 steam (to replace steam locomotives to be scrapped) locomotives to be put into service.
11,000 high-capacity freight cars to be put into service.

(2) Highway.

Budapest-Tatabanya, Budapest-Salgotarjan, and Miskolc-Ozd highways to be hard surfaced.
1,700 km of trunk road to be provided with dust-free surface.
17,000 new trucks to be put into service.

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(3) Inland Water.

15 motor tugs to be put into service.
Fifty 1,000-ton barges to be put into service.

5. Poland.

a. Freight Traffic.

The index of the planned level of inland freight traffic for 1960 (1955 = 100) is as follows 118/:

Railroad	116.6
Highway	196.0
Inland water	68.5

Total (computed) 118.2

b. Operations (Railroads). 119/

Average freight car turnaround time to decrease 9.8 percent.
Average net load per loaded freight car to increase 8.6 percent.

Average gross load per train to increase 8.5 percent.

Commercial speed of trains to increase 12.7 percent.

Average daily run of trains to increase 5.5 percent.

c. Capital Investment.*

Investment funds to be allocated to transportation and communications to be 30,150 million zlotys (US \$7,537 million), or 10.0 percent of total investment. 121/

(1) Railroad.

Railroads to receive 31 percent more investment than in the Six Year Plan (1950-55).

(a) Rolling Stock.

22.4 percent of total railroad investment to be allocated for purchase of rolling stock.

* Data are from 120/ unless otherwise indicated.

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60 percent more freight cars in terms of 2-axle units (41 percent more in terms of physical units) to be added to the freight car park than were added in 1951-55. 122/

(b) Fixed Facilities.

20.4 percent of total railroad investment to be allocated for development of stations and junctions.

5.1 percent of total railroad investment to be allocated for reconstruction and construction of double tracks.

14.1 percent of total railroad investment to be allocated for electrification of about 933 km of line, including the Stalinogrod-Breslau and Stalinogrod - Krakow - Nowa Hute lines as well as completion of the Warsaw-Stalinogrod line.

Number of line blocks and automatic block signal systems to be increased.

Laying of 1,000 km of line (presumably including double tracking, new lines, and other track).

(2) Highway.

3,000 km of new roads to be constructed.

6,000 km of existing roads to be modernized.

Truck park to be increased 35 percent. 123/

6. Rumania.*

a. Freight Traffic.

The index of the planned level of freight traffic for 1960 (1955 = 100) is as follows:

Railroad	130 to 135
Highway	250
Inland water	165 to 170
Total (computed)	132 to 138

* 124/

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b. Capital Investment.

Investment funds to be allocated to transportation and communications to be more than 12,650 million lei (US \$2,013 million), or 11.5 percent of total investment.

(1) Railroad.

(a) Fixed Facilities.

134 km of single track lines to be double tracked (Ilia - Vintul-de-Jos, Razboieni-Apahida and Podul-Olt - Sibiu sections).
Sidings and shunting lines to be lengthened.
Capacity of Pojorata-Floreni (48 km on Dej-Darmanesti line) and Deva-Pestera (83 km on Craiova-Arad line) sections to be increased.
At least 3,000 km of track to be rebuilt with heavy-duty rails.
3 or 4 principal shunting yards to be mechanized.
Automatic block signaling to be installed on 300 km of line.

(b) Rolling Stock.

450 to 500 locomotives to be put into service, including high-powered diesel electric locomotives.
12,000 to 13,000 2-axle freight and passenger cars to be put into service.

(2) Highway.

(a) Fixed Facilities.

2,200 to 2,500 km of roads to be modernized (cement surface predominant).
2,000 km of roads to be repaired.

(b) Motor Vehicles.

Motor transport park to more than double.

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(3) Water (Inland and Maritime).

(a) Ports.

Ports of Constanta, Braila, and Galati to be developed.
Index of mechanization of loading to be increased 60 to
65 percent.

(b) Fleets.

Capacity in tons, to be 3.5 times the 1955 capacity.
At least 8 medium and small vessels to be built and 5 or
6 large vessels to be imported.

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APPENDIX C

METHODOLOGY

Data on freight traffic performance are taken from official announcements of the European Satellites. For years where absolute figures are not available, estimates are based on announced indexes and/or percentage changes. In some cases, ton-kilometer estimates are based on tons-originated estimates, derived in the above manner and divided by estimated average length of haul. Where no data are available for a given year, estimates are based on extrapolation or interpolation of past and planned future trends. [REDACTED]

50X1
50X1
50X1

[REDACTED] Investment data have been taken directly from Satellite announcements.

The techniques utilized in estimating levels of operating efficiency are given in some detail in the body of the report. Measures of operating efficiency which have been derived from freight traffic performance, inventory, and estimates of employment are not strictly comparable with those including passenger traffic performance. Because levels of operating efficiency are analyzed in relative rather than absolute terms, however, the conclusions should not be affected.

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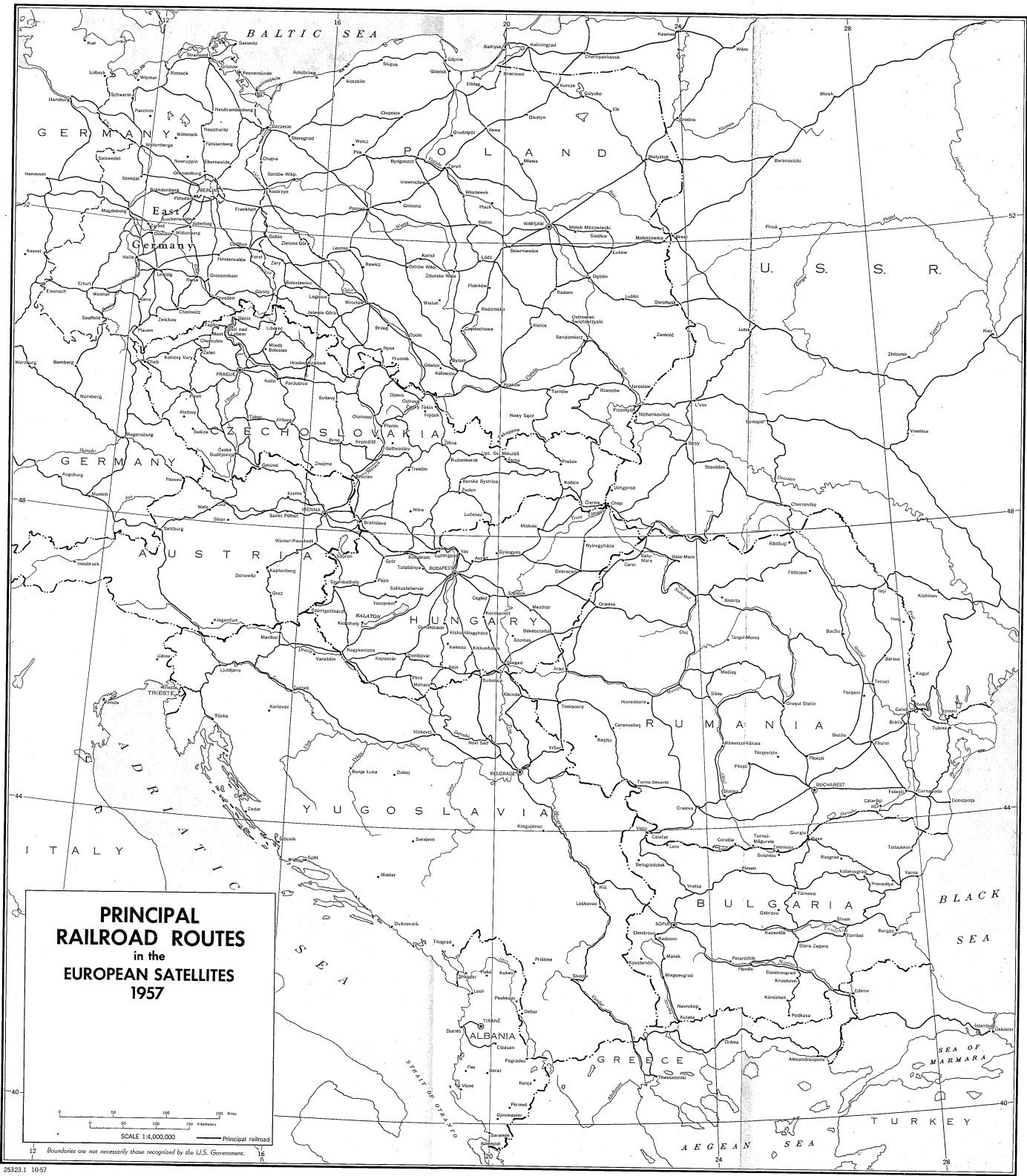


Figure 7

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