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**Economic Intelligence Report**

**THE INLAND TRANSPORTATION SYSTEM  
OF RUMANIA**



CIA/RR ER 61-38

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**CENTRAL INTELLIGENCE AGENCY**  
**Office of Research and Reports**

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FOREWORD

This report. [redacted] 50X1  
[redacted] is concerned only with the public tran50X1  
portation services in Rumania that are operated and controlled by the  
Ministry of Transportation and Communications. Quantitative data gener-  
ally cover the years 1950-60, but some reference to historical develop-  
ment and probable future development is made in the text.

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THE INLAND TRANSPORTATION SYSTEM OF RUMANIA\*

Summary and Conclusions

Since 1950, freight performance of the Rumanian inland transportation system has more than tripled. This growth has been accomplished without overintensive exploitation of the transportation system, which has been able to meet the demands placed on it. At present the system has some unused capability in terms of current traffic requirements, and its future investment programs are more than adequate to meet anticipated traffic demands.

The Second Five Year Plan (1956-60) provided for an increase of 50 to 55 percent above 1955 in tons carried by all modes of transport, including sea and air as well as inland surface transportation. A 51-percent increase was achieved by the end of 1959, and the tonnage carried by inland surface transportation alone was sufficient to overfulfill the original goal for all modes of transport in 1960.

Although the original plan anticipated an increase of 35 percent in railroad tonnage to be carried in 1960, the actual increase was about 31 percent. The failure of the railroad system to meet its planned output was due principally to the underfulfillment of plan goals in agriculture, which failed, by a wide margin, to generate the volume of traffic on which the railroad transport plan was based.

Passenger traffic on the railroads has actually declined in recent years. Public acceptance of the recently instituted improvements in highway transport services accounts for much of the decline in railroad passenger traffic. There has been a steady but moderate increase in railroad freight traffic, but the increase has been limited by shortfalls in agricultural production as well as by a substantial increase in highway freight traffic.

The supply of locomotives and rolling stock is adequate. Domestic production of steam locomotives is scheduled to terminate in 1961, and the Rumanians will then concentrate on acquiring a competence in production of electric and diesel-electric locomotives. The Rumanian industry is capable of supplying the freight car requirements of the railroads, and it has a surplus of domestic production for export. The capacity of

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\* The estimates and conclusions in this report represent the best judgment of this Office as of 1 July 1961.

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the freight cars produced in Rumania is increasing and their utilization has improved, so that fewer freight cars are required now than were required in 1950 in spite of the fact that freight traffic has more than doubled.

Highway transport, which was of negligible importance in 1950, handled about 40 percent of the tons carried by all modes of inland transportation in 1960. Highway transport is predominantly a feeder service to and from the railroads, but it also provides some short-haul service to outlying districts. Only 30 percent of the trucks in Rumania were engaged in public transportation service (under the jurisdiction of and operated by the Ministry of Transportation and Communications) until late in 1960. The Rumanians appear to be fully aware of the potentialities of public highway transport, however, and they recently issued a decree directing that all trucks and buses, with minor exceptions, be placed under the Ministry. It is probable, therefore, that public highway transport will become even more important and will continue to divert increasing amounts of short-haul traffic from the railroads, thereby enhancing the capability of the railroads for long-haul, high-volume traffic. Rumania has recently developed a motor vehicle production industry capable of supplying the requirements of the public transportation system, and no shortage of trucks or buses is evident.

Inland water transport has declined steadily in importance, although traffic output by this mode of transport increased about 73 percent during the past 10 years.

The pipeline transport system as presently constituted has been operating at almost full capacity, and the system probably was fully utilized in 1960. There are no current plans to add to the capacity of the pipeline system.

During the Third (or Six Year) Plan period (1960-65), Rumania plans to invest in transportation more than twice the amount invested during the preceding 6 years. Electrification and dieselization of segments of the railroad, acquisition of new railroad cars, a highway modernization program, and the construction of 20 new maritime vessels will account for about 42 percent of the total. The planned allocation of investment funds appears to be sufficient for the attainment of the major investment goals.

The 1960-65 Plan provides for an increase of 80 percent in tons to be carried by all modes of public transportation compared with 1959. Railroad tonnage alone is to increase 40 percent. The impressive investment program planned for the future should provide a transportation plant that is more than adequate for this purpose.



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I. Ministry of Transportation and Communications

All modes of public transportation in Rumania except urban passenger transport and pipeline transport are operated under the jurisdiction of the Ministry of Transportation and Communications.  Urban passenger transport is locally controlled. Pipeline transport is under the jurisdiction of the Ministry of the Petroleum and Chemical Industries. In March 1957 the entire structure of the Rumanian Government was reorganized and the Ministry of Transportation and Communications, as presently constituted, was established. The Ministry is divided into three departments -- the Department of Railroads; the Department of Roads, Water, and Air Transport; and the Department of Post and Telecommunications. Each of the departments is headed by a deputy minister.

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The Rumanian railroad system functions under the policy and administrative direction of the Department of Railroads of the Ministry of Transportation and Communications. Operational management, however, is vested in the Railroad General Directorate with headquarters in Bucharest. The General Directorate is composed of a number of staffs such as those controlling operations, traffic, finance, construction, maintenance of way, locomotives, freight cars, and signaling. The entire railroad system is divided into six regional districts, or divisions, each of which is responsible for all operations and maintenance within its area. The six division headquarters are at Bucharest, Craiova, Timisoara, Cluj, Orasul-Stalin, and Iasi.

All public highway transport functions under the general direction of the Department of Road, Water, and Air Transport. Operational management is exercised by a General Directorate of Automobile Transport with headquarters in Bucharest. Under the jurisdiction of the General Directorate are 16 regional offices known as Regional Enterprises for Motor Transport. Each regional office is responsible for the direction and supervision of all state-owned public motor transport within its region. Construction and maintenance of roads and bridges are under a separate General Directorate of the Department of Roads, Water, and Air Transport. The General Directorate is divided into subdirectorates controlling planning, new construction, road maintenance, financial investments, and political matters.

Inland water transport also functions under the direction of the Department of Highway, Water, and Air Transport. The operating company for inland water transport and sea transport is known as Rumanian Sea and River Navigation (Navigatia Maritima Si Flurala Romina -- NAVROM). Statistics pertaining to performance are published separately for inland water traffic and sea traffic.

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II. Routes

A. Railroad

Before World War II the Rumanian railroad system comprised 11,400 kilometers (km) of standard\* and narrow-gauge route\*\* (see the accompanying map, Figure 1\*\*\*). More than 13 percent of this network was lost as a result of territorial changes occasioned by World War II. New construction since the war has increased the length of the network to 10,981 km of standard and narrow-gauge route. 2/ This total constitutes a density of 1 km of railroad route to 21.6 square kilometers of land area in the country.† By comparison the route density is 1 to 10 in Czechoslovakia, 1 to 11 in Hungary, and about 1 to 30 in Bulgaria.

The narrow-gauge routes (totaling 742 km) are predominantly forest or local special-purpose railroads which have no international significance and very little domestic significance for public transportation service.

The standard-gauge system radiates principally from Bucharest and from Timisoara and is reasonably well developed in those areas. It serves all important cities and towns and the sea and river ports. Adequate international connections with the railroad systems of Bulgaria, Yugoslavia, and Hungary are provided. Connections with the Soviet railroad system are provided at four points on the Rumanian-Soviet border, but because of the difference in railroad gauge, transloading of cargo is required. The principal east-west routes traverse either the Transylvanian Alps or the Moldavian Carpathian Mountains and are characterized by steep grades; sharp curves; and numerous bridges, tunnels, and cuts in these areas.

The Rumanian railroad system is predominantly steam powered, and only one unimportant narrow-gauge route of 60 km is electrified. 3/ Sixteen main-line diesel-electric locomotives were acquired during 1959-60, and these locomotives have been observed operating on the route between Orasul-Stalin and Bucharest. Some diesel-engine passenger railroad cars are used for commuter traffic.

B. Highway

The Rumanian highway network includes 76,000 km of route, of which about 40,000 km are state highways (see the accompanying map, Figure 2\*\*\*). The remainder are local roads which are almost exclusively dirt surfaced.

\* Standard gauge is 1.435 meters, or 4 feet 8-1/2 inches.

\*\* Narrow gauge is any gauge less than standard gauge.

\*\*\* Following p. 6.

† The area of Rumania was 237,500 square kilometers in 1960.

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The state highway system consists of 10,000 km of national highways,\* 10,000 km of regional highways,\*\* and 20,000 km of raion roads.\*\*\* Only 4,600 km of the national highways are modernized or improved to the extent that they are paved with asphalt or concrete. Some of the national highways are classified as strategic highways -- strategic highway No. 1, for example, enters Rumania at Sighet on the Rumanian-Soviet border and terminates at Turnu near the Rumanian-Hungarian border. 4/ This strategic highway utilizes a number of Rumanian national highways, all of which are paved and probably are capable of accommodating heavy military traffic. Other national and strategic highways are so constructed that heavy military traffic could be accommodated for a limited period of time. 5/

C. Inland Waterway<sup>†</sup>

The inland waterways of Rumania consist mainly of the Danube River (see the accompanying map, Figure 3<sup>††</sup>) and its tributaries, the Prut and the Siretul. Neither of these tributaries plays a significant role in the inland transportation system, because low water in the summer months and ice conditions in the winter restrict their use to about 5 months of the year and only during daylight hours. Both rivers are used to float timber from their upper reaches to the Danube, making any other navigation extremely hazardous.

The Danube River is the only waterway in Rumania that is worthy of consideration as a medium of transport. About 1,075 km of the Danube either flow through Rumania or serve as the international border between Rumania and Bulgaria or Rumania and Yugoslavia. About 116 km serve as the Rumanian-USSR border. Upstream from the Black Sea port of Sulina to Braila (171 km) the river is navigable for all types of river craft and for seagoing vessels of up to 10,000 tons.<sup>†††</sup> This section of the river is commonly referred to as the Maritime Danube. Continuing upstream from Braila to Turnu-Severin (at kilometer post 930) the river is navigable

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\* National highways are those which connect Bucharest and the regional capitals with one another and with the important economic or industrial centers, ports, health resorts, and tourist centers of the country.

\*\* Regional highways are those which connect the capital of each region with neighboring region capitals, with the raion administration centers, and with economic or industrial centers and health and tourist resorts within the region.

\*\*\* Raion highways are those highways (other than national or regional highways) which connect the raion centers with each other and with other towns or centers of economic importance within the raion.

† 6/

†† Inside back cover.

††† Unless otherwise indicated, tonnages are given in metric tons throughout this report.

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for river craft of up to 1,500 tons. This section is referred to as the Lower Danube. From Turnu-Severin upstream to Moldova (at kilometer post 1049) is the Iron Gates section of the river, which is the most difficult for navigation. Nighttime navigation is not permitted in this section. River craft of up to 1,500 tons can pass, but upstream traffic requires towing facilities which are furnished by a locomotive on the Yugoslav side of the river. The remaining 23 km to the point where the river enters Yugoslavia are navigable for 1,500-ton craft. For the entire Rumanian section of the river, interruption of navigation by ice averages about 40 days annually and generally occurs during January and February. There are numerous ports along the Danube ranging in size and importance from those with quays and basins, direct rail connections, and mechanized handling equipment to small improvised installations using the natural bank of the river.

#### D. Pipeline

Rumania is the only country in the European Satellites in which pipeline transport plays a significant role in inland transportation. It is estimated that in 1960 Rumania had about 760 km of petroleum product pipelines. These lines are used to deliver petroleum products to sea and river ports and to bulk storage areas for ultimate delivery to consumers. Although these pipelines are under the jurisdiction of the Ministry of the Petroleum and Chemical Industries, performance statistics are maintained and reported as an integral part of the performance of the public transportation system. It is estimated that, in addition, there are about 2,400 km of gathering lines for crude oil in Rumania with an estimated yearly capacity of about 12.3 million tons. These lines originate in the oilfields and terminate at the various refineries. They are not a part of the public transportation system, and accurate statistics of performance are not available.

### III. Performance

#### A. General

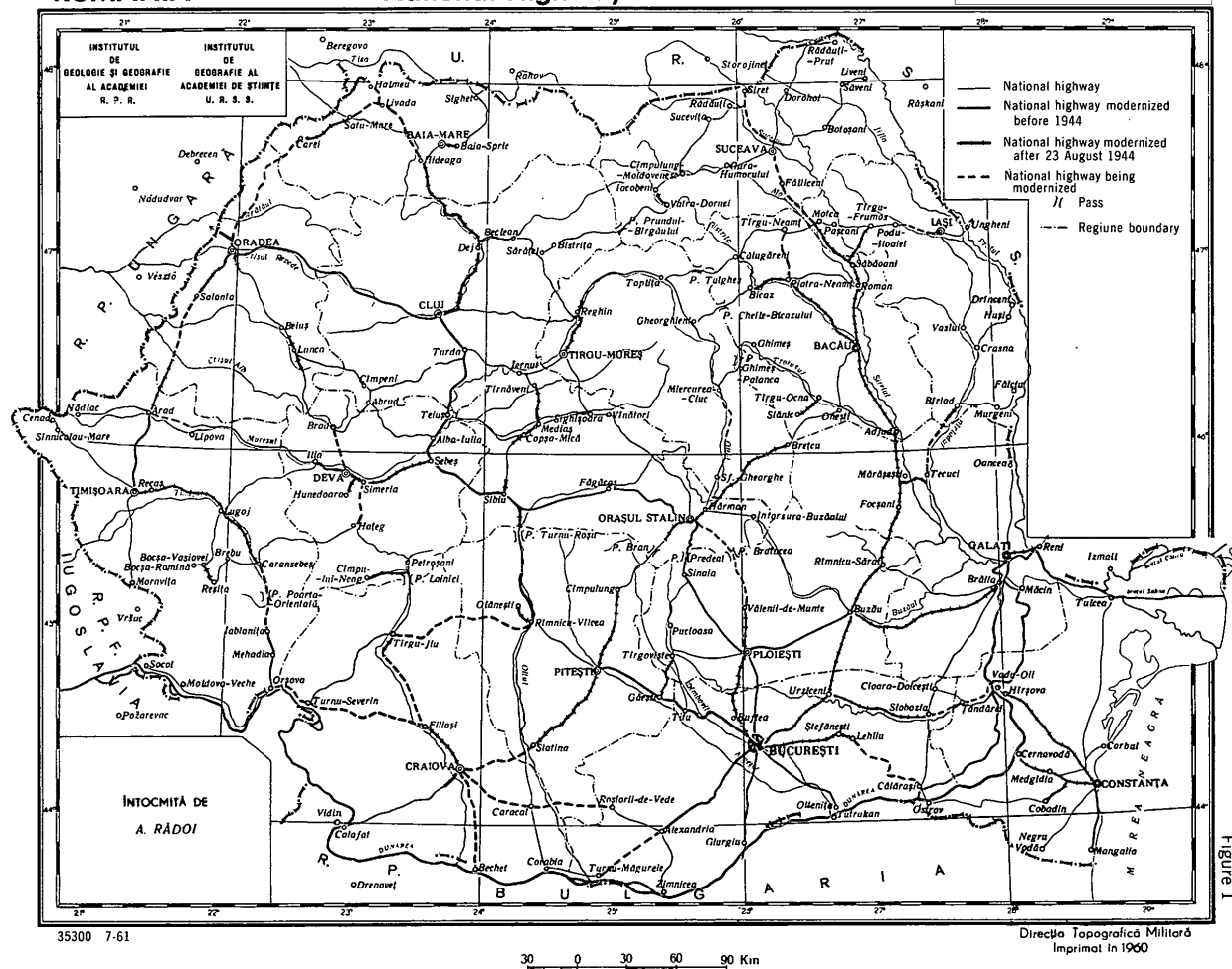
The inland transportation system of Rumania appears to be adequate for the needs of the Rumanian economy in its present stage of economic development. Although there are occasional complaints of shortages of equipment and criticisms of the efficiency of the system, it is probable that these complaints and criticisms, in some measure at least, stem from the lack of cooperation by shippers in the use of facilities and equipment rather than from a failure of transportation management or a lack of transportation capability. The Second Five Year Plan (1956-60) provided for an increase of 50 to 55 percent in tonnage to be carried by all modes of transport in 1960 compared with

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### RUMANIA National Highway Network—1958

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### RUMANIA Railroad Network—1958

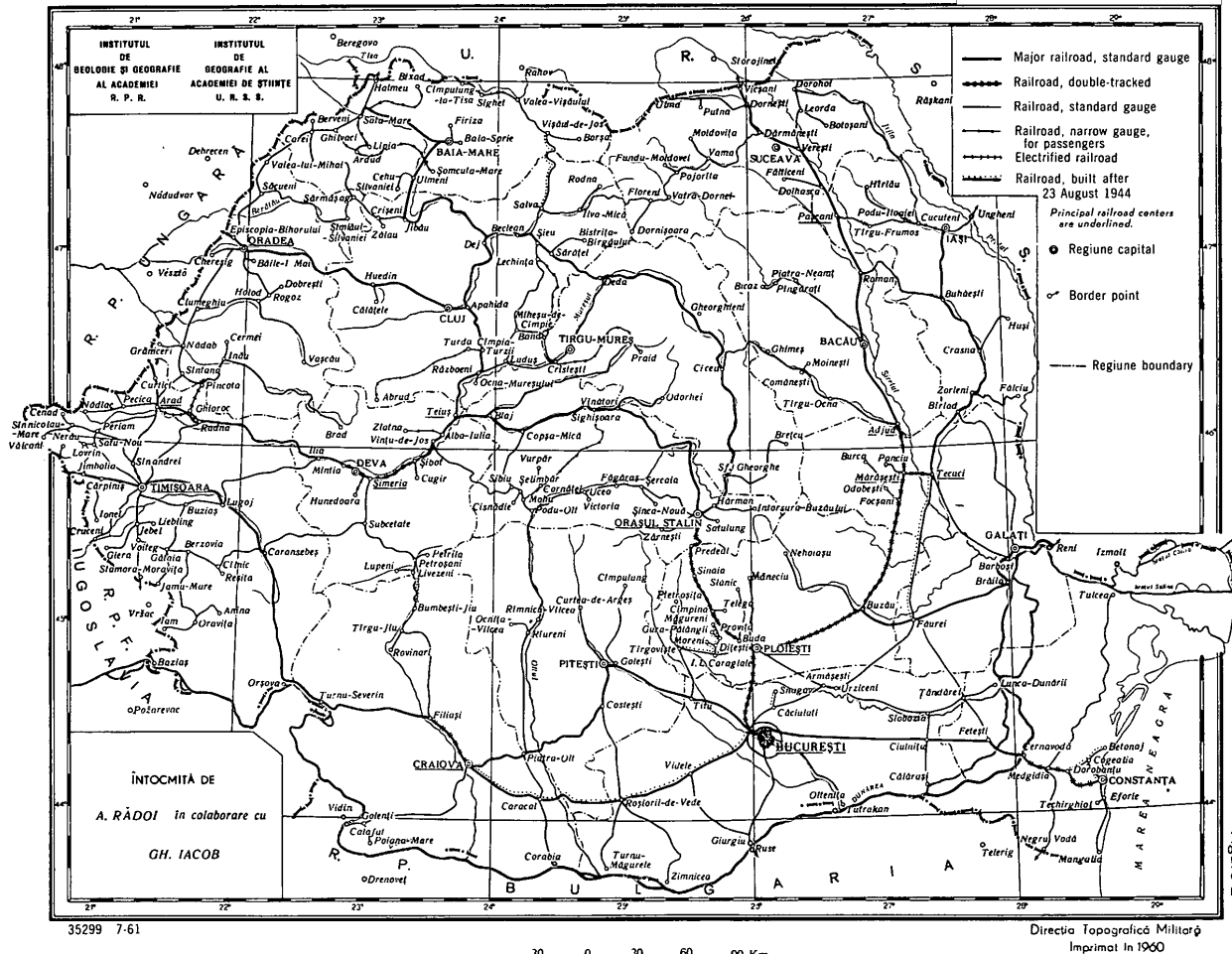


Figure 2

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1955.\* This over-all goal was overfulfilled. Although the railroad system did not achieve the increase which had been planned for 1960, there is no evidence that the system failed to respond to demands for service. The failure to achieve the planned goal in railroad transport probably stems from a failure on the part of industry and agriculture, particularly the latter, to generate the amount of traffic on which the railroad plan was based. In any event, the exceptional increase recorded by highway transport was sufficient to more than offset the shortfall in railroad transport.

Freight traffic on the various modes of inland transport in Rumania during 1950-60 is shown in Table 5\*\* and passenger traffic in Table 6.\*\*\*

#### B. Railroad

In 1960 the railroad accounted for 30.6 billion traffic-kilometers,† reflecting a traffic density of 2.783 million traffic-kilometers per kilometer of route. This is the lowest traffic density of any of the European Satellite railroads except those of Albania and Bulgaria.

The highest traffic density ever achieved in Rumania before 1960 was recorded in 1957, when the figure was 2.685 million traffic-kilometers per kilometer of route. The fact that even this modest figure was not achieved in 1958 and 1959 and was only barely exceeded in 1960 indicates that the Rumanian railroad system has been able to operate at a relatively leisurely pace compared with the railroads of other European Satellite countries. The reduction in traffic density during 1958 and 1959 is attributable principally to the sharp decline in passenger traffic as freight traffic increased. Freight shipments on the Rumanian state railroad, by commodity, are shown in Table 7.††

During 1956-60, railroad passenger traffic in Rumania declined significantly. The highest performance in this traffic was recorded in 1957, when 265 million passengers were carried 13.3 billion passenger-kilometers, but by 1960 it had declined about 19 percent below the level of 1957. Some of the passenger traffic appears to have been diverted to public highway transport, which recorded an increase of 95 percent in passengers carried between 1957 and 1960. The diversion probably is the result of a policy decision and a deliberate effort on the part of management at the ministry level to release railroad personnel, locomotives,

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\* Including railroad, highway, inland waterway, sea, and air transport. A total of 70.132 million tons was carried in 1955.

\*\* Appendix A, p. 23, below.

\*\*\* Appendix A, p. 24, below.

† Ton-kilometers plus passenger-kilometers.

†† Appendix A, p. 25, below.

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route space, and other railroad facilities from passenger service for the more economically important function of carrying freight traffic. In any event, the diversion has created additional freight-carrying capability in railroad transport.

C. Highway

The public sector of highway transport of freight and passengers recorded a remarkable growth during 1950-60. Whereas highway transport accounted for only 2.7 percent of the tons carried in 1950, it accounted for about 40 percent in 1960. The original motor transport plan for 1956-60 provided for an increase in tonnage carried of 150 percent. The actual increase in highway transport amounted to about 670 percent, but in achieving this increase the average length of haul was reduced from 37 km to about 16.5 km. As a consequence, the ton-kilometer performance increased only 244 percent during that period. This figure suggests that a major portion of the tonnage hauled by highway transport may be as a pickup and delivery service for railroad, sea, inland water, and air transport and as a consequence is counted twice. There is little or no evidence that highway transport of freight has yet become a significant factor in over-the-road transportation between the original consignor and the consignee. It has been reported that freight can be carried by truck at less cost than by rail for distances of up to 60 km. There is no evidence, however, that the Ministry of Transportation and Communications has issued any order which would force a diversion to the less costly mode and at the same time create additional capability in railroad transport.

Early in 1960 a policy decision of the Council of Ministers and subsequent implementing decrees directed that by 31 December 1960 all highway transport and maintenance facilities necessary to the national economy be transferred to the jurisdiction and ownership of the Ministry of Transportation and Communications. <sup>7/</sup> The only exceptions to the order, according to the decrees, are urban bus and taxi services, local freight service within the confines of certain cities and localities, internal transportation of construction materials on a construction site, and buses belonging to the National Office of Tourism. A limited number of vehicles will be allocated to other ministries for internal use only and under strict control of the Ministry of Transportation and Communications. <sup>8/</sup> The effects of this change will not become clear until 1961, but the recorded output of public highway transport undoubtedly will show a phenomenal growth.

Rumania appears to have become increasingly aware of the potential services to be derived from passenger transport by motor bus, as this mode of transport recorded an increase of 273 percent from 1955 to 1960.



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There are a number of regularly scheduled bus routes which are operated by the Ministry as public transportation facilities serving the principal cities and intermediate points along the route. Some of these routes serve as a continuation of the railroad service, and their schedules are published in the railroad timetables. There are about 19,000 km of bus routes over which 72 million passengers were carried in 1960. Although the Ministry operates an extensive network of medium and long-distance passenger routes, the average distance traveled by a bus passenger in 1960 was less than 20 km. 9/

On 8 June 1960 the Bucharest newspaper Agerpres reported an agreement between the transportation ministries of Rumania and Bulgaria by which a scheduled international bus service would be inaugurated in August 1960. The route runs between Constanta in Rumania and Telbukhin in Bulgaria, a distance of about 100 km. This is the first reported international bus service in either country and suggests a growing awareness of the potential benefits to be derived from highway transport.

D. Inland Waterway

Statistical data on inland water transport in Rumania are misleading in that they do not accurately reveal the contribution of this mode of transport to the Rumanian economy. Rumania, like the other European Satellite countries, reports only the traffic carried by Rumanian river vessels operated under the jurisdiction of the Ministry of Transportation and Communications. Foreign river vessels of all the Danube riparian countries carry goods from and to Rumania. Rumanian river vessels operate upstream to Regensburg in West Germany and may on occasion carry cargo which neither originates in nor is destined to Rumania. It is also probable that some tonnage is carried by tankers that are owned and operated by the petroleum industry and are not a part of the public transportation system.

Public inland water transport on Rumanian vessels accounted for 1.9 million tons and about 865 million ton-kilometers in 1960. This is the highest tonnage figure recorded by this mode of transport in the past 10 years.

E. Pipeline

About 5.6 million tons were carried by the petroleum products pipeline system of Rumania in 1960. Data on the length and location of the Rumanian pipelines in 1960 are shown in Table 9.\*

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\* Appendix A, p. 27, below.

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#### IV. Inventory of Equipment and Efficiency of Utilization

##### A. Railroad Locomotives and Rolling Stock

The locomotive inventory of 1960 is estimated to have comprised 2,970 main-line steam locomotives, 16 main-line diesel-electric locomotives, and 26 diesel switching locomotives. In addition, there are about 190 diesel engine railroad cars used for commuter and other short-distance passenger service. A few electric locomotives are used on the 60 km of electrified narrow-gauge route in Rumania.

The main-line diesel-electric locomotives are 2,100-horsepower units produced in Switzerland or under Swiss license in Rumania with diesel engines and electric generators purchased from Switzerland. The total inventory of main-line steam and diesel-electric locomotives reflects a ratio of 1 locomotive to 3.7 km of railroad route, which compares favorably with Czechoslovakia, Hungary, and Poland.

Rumanian industry has produced steam locomotives for many years, and it is believed that most, if not all, steam locomotives in use are from domestic production. Since 1955 a rate of production of 66 locomotives yearly represents a replacement factor of 2 percent, which is believed to be adequate to meet the needs of the railroad at present. Production of steam locomotives is scheduled to terminate in 1961, when Rumania will devote all its efforts to production of diesel-electric and electric locomotives.

In May 1959, Rumania ordered six 2,100-horsepower diesel-electric locomotives from Switzerland and obtained a license to construct 10 additional locomotives in Rumania using diesel engines and other components to be supplied by Swiss industries. <sup>10/</sup> The exact date of delivery of the Swiss locomotives is not known. However, in December 1960 the US Legation in Bucharest reported that 10 locomotives had been produced in Rumania and that 8 locomotives were being tested in regular operation on the Bucharest - Orasul-Stalin route. The other eight locomotives were reportedly not operational because of the malfunctioning of generators produced by the Swiss industries and because of faulty traction motors produced in Rumania. <sup>11/</sup>

The freight car inventory of the Rumanian railroad system is estimated to have consisted of 55,200 units in 1960. During 1955-59, Rumania produced freight cars at an average rate of 2,760 cars per year. Production in 1959 was 4,150, of which 2,350 were exported. An examination of requirements for freight cars during the 5 years, 1956-60, indicates that the fluctuation was negligible. Whereas 54,400 cars were required in 1956, a total of 55,200 cars was required in the peak season of 1960. This figure represents an increase in requirements of only 800 cars during the 5-year period. It is evident, therefore, that domestic production

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facilities are capable of producing the number of freight cars required to carry the increased tonnage generated on the railroad system with a substantial margin for replacement of obsolete equipment and, if desired, a considerable number for export. If the Rumanian Government should decide to discontinue exporting freight cars, the entire inventory could be renewed within 13 years at the 1959 rate of production.\*

The efficiency of utilization of freight cars has improved rapidly since 1955 in that cars are more heavily loaded and are turned around faster (see Table 8\*\*). These improvements have made possible a 16-percent increase in the annual tonnage carried by a freight car. In 1960, each freight car carried about 1,700 tons -- a performance roughly equivalent to that obtained in Czechoslovakia and Hungary. More than 50 percent of the cargo carried on the Rumanian railroad system consists of petroleum, coal, quarry and ballast products, cereal grain, and construction materials, all of which lend themselves to heavy loading weight. It is probable, therefore, that the average load per car will improve as newer, high-capacity freight cars become available in greater numbers.

B. Trucks

It is estimated that there were about 40,000 motor trucks in civilian use in Rumania in 1960. Rumanian industry produced almost 30,000 motor vehicles during 1955-59, most of which were trucks. All of the trucks produced were of the 4-ton capacity class. 12/ More than 50 percent of this production was allocated to the civilian economy either as replacements for obsolete vehicles or as additions to the civilian truck fleet.

In the absence of accurate statistics for tonnage handled by other than public transportation, it is impractical to attempt an analysis of utilization of the entire inventory. It is estimated that in 1960 not more than 40 percent of the total truck inventory, or about 16,000 trucks, was engaged in public transportation.\*\*\* The utilization of these trucks can be related directly to the freight carried in public transportation in 1960. Official statistics for the 10-year period 1950-59 reveal that on the average only 60 percent of the trucks available for use by the highway transport department of the Ministry of Transportation and Communications were utilized. 13/ This information implies either that a high percentage of the trucks were inoperable at all times or that a large number were held in reserve for peak traffic requirements and were not required for normal daily use. An examination

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\* In 1955 the UN reported that only 28 percent of the freight car inventory in 12 European countries was in the age group of 5 to 15 years.

\*\* Appendix A, p. 26, below.

\*\*\* The Rumanians reported only 30 percent in 1959.

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of the data available indicated that the latter was probably true and that a similar situation prevailed through 1960. If only 9,600 trucks\* were actually used, each truck would have accounted for about 16.2 tons and 267 ton-kilometers per day. Each truck reportedly traveled 140 km per day.

The weight-carrying capacity of the trucks produced in Rumania in recent years is about 4 tons. Mixed cargo, however, of the type normally carried by truck transport in a short-haul operation, may consist of some bulky articles such as furniture, and the loading space or cubic measurement of a 4-ton truck would preclude loading to full weight capacity. As a consequence, it is estimated that the average load per truck in Rumania would not exceed 3.25 tons. At that rate of loading, each truck would have made five trips under load at an average length of haul of 16.5 km and would have performed 267 ton-kilometers per day. In doing so, the truck would have operated 82.5 km under load and 57.5 km without a load, for a loaded ratio of about 59 percent. These figures clearly indicate that a substantial part of the total distance traveled is without a load -- a situation which constitutes weakness in the highway transport system of Rumania, where a large portion of the trucks are owned and operated by agencies other than the public transportation system. This system operates loaded trucks outbound from industrial centers and returns them empty, while trucks operated by the Ministry of Agriculture, for example, may be loaded inbound to the markets and returned to the outlying districts empty. The regulations that went into effect on 31 December 1960\*\* should result in a reduction of empty truck movement. For the present, however, it is evident that unused freight transport capability exists in significant quantity in Rumanian highway transport.

C. Passenger Buses

It is estimated that there were about 2,500 passenger buses in Rumania in 1960. As a result of new production and imports since 1955, about 63 percent of the total bus fleet was not more than 5 years old at the beginning of 1960.

About 500 of these buses are utilized in the urban transportation of passengers in the principal cities and towns, and it is known that a number of buses are operated by the National Office of Tourism 14/ and are not subordinate to the Ministry of Transportation and Communications. About 1,400 buses were reported to have been engaged in the public transportation of passengers in Rumania in 1959. 15/

\* This number represents 60 percent of the 16,000 trucks available.

\*\* See III, C, p. 8, above.

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An analysis of official statistical data reveals that each bus in daily use accounted for about 135 passengers daily during 1959. In 1960, about 72 million passengers were carried by bus, representing an increase of 48 percent above 1959, or, in absolute terms, about 23.3 million passengers. At the rate of utilization of seating capacity which prevailed through 1959, the requirement for buses amounted to over 1,400 units in 1960. Presumably, some of the buses previously operated by other agencies were transferred to the public transportation system in 1960. Considering the fact that the average bus passenger journey is less than 20 km in length, it appears that the utilization factor of 135 passengers per day per bus is low.

D. Inland Waterway Vessels

It is estimated that the inland waterway vessels engaged in public freight transportation in Rumania during 1960 numbered about 290 barges (with a total capacity of about 187,400 tons) and 70 tugs. The breakdown of this fleet by type is shown in Table 1.

Table 1

Rumania: Number and Capacity of Inland Waterway Vessels a/  
1960

<u>Type of Vessel</u>	<u>Number</u>	<u>Total Capacity (Metric Tons)</u>
Self-propelled dry cargo barges	5	2,250
Self-propelled tank barges	5	3,200
Dumb barges (dry cargo)	235	152,350
Dumb barges (tank)	45	29,600
Total barges	<u>290</u>	<u>187,400</u>
Tugs	70	

a. 16/

A substantial number of these vessels are believed to be very old, although many have been reconstructed since World War II. Rumanian shipyards are producing tugs and barges, and it is believed that most of the newly constructed vessels are being used as replacements for the older

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obsolete vessels that were constructed before World War II. It is therefore probable that the number of vessels in use during 1960 was about the same as in 1958.

The Ministry of Transportation and Communications reported that 79 percent of the dry cargo vessels and almost 92 percent of the tanker vessels were utilized in 1959. This is the highest rate of utilization obtained during the past 10 years. Rumanian reports indicate that about 78 percent of the inland waterway traffic consisted of dry cargo and the balance was liquid cargo. If the utilization factor for 1959 was applicable through 1960, each dry cargo vessel was loaded once every 30 days, and each tank vessel was loaded once every 26 days. Because dry cargo vessels can often be loaded in both directions, the utilization of the dry cargo vessels in the fleet appears to be low. Moreover, because 51 vessels, or almost one-fourth of the fleet, appears to be an excessively high number to be out of service for repairs, it is possible that reserve capability exists in significant quantity in the dry cargo fleet.

In view of the facts that Rumanian tank vessels operate upstream as far as Regensburg in West Germany and that a tank vessel would normally be loaded in one direction only, a yearly average of 13.5 loaded trips (or one loaded trip every 26 days) is relatively high, and it is doubtful that any unused capability exists in the inland water tanker fleet.

#### V. Labor Productivity in Public Transportation

##### A. General

In 1960, 192,400 persons were in the transportation labor force in Rumania. Of this total, 180,600 persons were engaged in public transportation, as follows 17/:

<u>Mode of Transport</u>	<u>Persons</u>	<u>Percent of Total</u>
Railroad	138,000	76.5
Highway	31,300	17.3
River and maritime	10,000	5.5
Civil air	1,300	0.7
Total	<u>180,600</u>	<u>100.0</u>

Presumably, some of the remaining 11,800 persons were engaged at the ministerial level as administrative, planning, and supervisory personnel for the construction of railroads, roads, bridges, and ports and were not assigned to any specific directorate controlling a given mode of transport. Some of these employees may have been engaged in transportation activities

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other than public transportation and therefore were outside the jurisdiction of the Ministry of Transportation and Communications. The number of persons employed in all modes of transport, 1950 and 1955-60, is shown in Table 10.\*

B. Railroad

The 138,000 persons engaged in railroad transport\*\* in 1960 accounted for 30.6 billion traffic-kilometers -- an average of 221,400 traffic-kilometers per employee. By comparison, railroad labor in Czechoslovakia accounted for about 350,000 in 1960. The highest rate of labor productivity in Rumania was achieved in 1957, when 131,800 employees accounted for 29.5 billion traffic-kilometers. In 1958 a slight decrease in the number of employees coincided with a sharp decline in traffic-kilometers, particularly its passenger component, thereby resulting in a reduction of labor productivity. In 1959 the number of persons employed increased by 1,800 persons, although traffic-kilometers continued to decline. The net result was a further decline in labor productivity compared with previous years. In 1960 an increase in traffic-kilometers coincided with a 3.6 percent increase in the labor force, and a slight upward trend in labor productivity occurred.

C. Highway

Public highway transport in Rumania employed 31,300 persons in 1960. It is estimated that the Highway Transport Department of the Ministry of Transportation and Communications had about 16,000 trucks and 1,400 buses under its jurisdiction during 1960. These figures indicate about 1.8 employees for each vehicle, or barely enough personnel to furnish drivers for the vehicles. It is probable, therefore, that personnel engaged in public highway transport perform only those functions associated with the physical movement of freight and passengers and have none of the functional responsibilities for the various administrative and clerical duties that are normally associated with a commercial transport enterprise. It is also probable that all freight handling is the responsibility of the consignees and the consignors and that all freight delivered to or from the railroad is handled by railroad personnel. Therefore it is impractical to attempt an analysis of labor productivity in highway transport or to compare it with labor productivity in railroad transport.

\* Appendix A, p. 28, below.

\*\* This total includes executive and clerical personnel as well as operating personnel.

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VI. Investment in Public Transportation

In the immediate postwar period and continuing through 1953, transportation and communications apparently received a comparatively high percentage of the total investment in Rumania. Presumably this allocation of funds was dictated by the necessity for rehabilitating those facilities which were damaged during the war. It is also probable that construction of new rail routes was required during the period in order to reestablish internal connections which were broken when some Rumanian territory was ceded to Bulgaria and some to the USSR. The lowest amount allocated to transportation and telecommunications during 1950-59 was recorded in 1954, when only 962 million 1955 lei\* were allocated. During 1955-59, investment in transportation remained reasonably constant with a slight upward trend in 1959, when the figure was 1,902 million 1955 lei, representing 10.9 percent of total investment (see Table 2).

Table 2

Rumania: Total Capital Investment in the Socialized Sector  
 and in Transportation and Telecommunications  
 1950-59

Year	Total (Million 1955 Lei)	Transportation and Telecommunications (Million 1955 Lei)	Transportation and Telecommunications as a Percent of Total	Public Transportation b/ (Million 1955 Lei)
1950	5,650	979	17.3	842
1951	7,952	1,080	13.6	929
1952	10,586	1,450	13.7	1,247
1953	13,463	1,756	13.0	1,520
1954	11,875	962	8.1	808
1955	13,178	1,032	7.8	888
1956	14,804	1,307	8.8	1,118
1957	13,673	1,271	9.3	1,093
1958	14,865	1,358	9.1	1,191
1959	17,421	1,902	10.9	1,598

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\* Unless otherwise indicated, leu values in this report are given in current lei and may be converted to US dollars at a rate of exchange of 6 lei to US \$1. This rate does not necessarily reflect the dollar value.

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It is estimated that 86 percent of the funds allocated to transportation and communications have been allocated to transportation and the balance of 14 percent has been allocated to telecommunications. There is no information available which would indicate the division of the allocation of transportation funds among railroad transport, highway transport, and inland waterway transport. Presumably the railroads have received the major portion of the funds available.

During 1960-65, the Third (or Six Year) Plan period, a total investment of 180 billion to 190 billion lei has been planned, of which about 9 percent, or 16.2 billion to 17.1 billion lei, is to be allocated to transportation and communications. Assuming that transportation will continue to receive 86 percent of that amount, then the amount to be invested in transportation will be about 2,322 million to 2,451 million lei per year. This amount represents an increase of more than 100 percent above the yearly average for the 6-year period 1954-59.

VII. Third (or Six Year) Plan (1960-65)

A. General

The Rumanian Third Plan period covers 6 years instead of the usual 5 years. The original plan for 1960 was dropped from the Second Five Year Plan and was incorporated in the Six Year Plan for 1960-65. 20/ The principal features of the Six Year Plan are the following 21/: agricultural production is to increase 70 to 80 percent above 1959 (production of cereal grains alone is to increase from 11 million tons in 1959 to 16 million tons by 1965), and industrial production is to increase 13 percent annually so that production in 1965 will be 110 percent greater than in 1959. The transportation plan calls for an increase of 80 percent above 1959 in terms of tons carried by all modes of transport, and railroad tonnage is to increase 40 percent above 1959 for an average annual increase of 5.8 percent.

B. Requirements in 1965

Significant production goals in terms of tonnage which can be directly related to freight transport are shown in Table 3.\*

The increase in tonnage of these commodities alone indicates a growth of 20 percent in tonnage to be moved by public transportation in 1965.\*\* In view of the fact that the increases in Table 3 relate to domestic production only, it is probable that inland surface transportation

\* Table 3 follows on p. 18.

\*\* All modes of transport (including inland surface, sea, and air transport) carried 106.2 million tons in 1959.

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will be required to carry most, if not all, of the increase in tons produced in 1965. The railroads carried about 55 percent of total inland transport in 1960, and, assuming that they will continue to do so, the net increase in tons to be carried by railroads in 1965 (for only the nine commodities shown in Table 3) is 11.7 million tons, or an increase of more than 17 percent above 1959. During the 6-year period 1954-59, total railroad tons carried increased about 30 percent above 1953, and the railroad system operated at a comparatively leisurely pace compared with other European Satellite railroads. The plan for a 40-percent increase in tons carried by 1965 would result in a ton-kilometer performance of about 23.2 billion ton-kilometers at the current average length of haul. If passenger traffic continues at the 1960 level, total traffic-kilometers in 1965 would amount to 33.7 billion, or about 3 million traffic-kilometers per kilometer of route. This figure is well below current performance in either Czechoslovakia or Poland. Rumania has the resources and the skills to fulfill the 1965 goals for railroad transport, and it is estimated that the railroad system is fully capable of achieving the goals if the economy generates the traffic.

Table 3

Rumania: Production of Selected Commodities in 1959  
and Plan for 1965 a/

Commodity	Thousand Metric Tons	
	1959 Production	1965 Plan
Coal	7,977	12,500
Coke	609	1,600
Crude oil	11,438	12,200
Iron ore	1,064	4,000
Steel	1,419	3,300
Mineral fertilizer	52	500
Cement	2,851	6,500
Cereal grains	11,000	16,000
Pig iron	846	2,000
	<u>37,256</u>	<u>58,600</u>
Increase above 1959		21,344

a. 22/

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Although the performance goals for highway transport and inland water transport have not been announced, it is estimated that the trend shown during 1954-59 will probably continue through 1965 for both modes of transport.\*

C. Cost of Planned Improvements

In order to achieve the transportation goals for 1965 and to reduce operating costs, the Rumanians have planned a number of improvements to the transportation system. It is planned to move 40 to 45 percent of the railroad traffic by electric or diesel-electric power in 1965. 23/ The double-tracked route from Bucharest to Orasul-Stalin (166 km) and the route from Filiasi to Caransebes (210 km) are planned to be electrified. Although Rumania has not announced the investment funds allocated to these electrification projects, it is estimated that the cost will be at least 1.5 million lei per kilometer of route, exclusive of locomotives. This estimate is based on the estimated cost of electrification in the USSR of about 1 million rubles (1.5 million lei) per kilometer of route. 24/ This amount would provide for the expansion of power stations, the construction of power transmission lines and transformer stations, and the related improvement of signaling and communications. The total cost of the electrification of 376 km would amount to 564 million lei.

It is estimated that about 50 electric locomotives would be required for these routes (1 locomotive for each 8 km of route\*\*). Rumania has no known capability to produce electric locomotives, and the Sino-Soviet Bloc countries do not produce in sufficient quantities to satisfy their own needs, so it is probable that the locomotives must be obtained in Western Europe. Based on the current prices in Western European markets, the 50 locomotives would require an investment of about 99.6 million lei.

Rumania also plans to acquire 330 diesel-electric locomotives during the 1960-65 plan period. The government recently purchased six locomotives in Switzerland at 1.6 million Swiss francs each (2.3 million lei) and obtained a license to construct 10 more in Rumania using diesel engines and electric motors produced in Switzerland. 25/ Based on these prices, the dieselization program in locomotives alone will require an investment of about 755 million lei.

\* Highway transport may record a faster rate of growth because more highway transport facilities will be in the public transportation sector and statistics will be officially recorded in accordance with the decree that went into effect on 31 December 1960 (see III, C, p. 8, above).

\*\* Rumania has about 1 steam locomotive for each 4 km of route. One electric locomotive can replace two steam locomotives.

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Rumania also plans to modernize 4,300 km of highways during 1960-65. 26/ In 1959 the average cost for modernization of 1 km of highway was 882,000 lei. 27/ At that rate, the program will require an investment of 3.8 billion lei.

The plan calls for 11,000 new freight cars by 1965. It is estimated that a tank car produced in Rumania costs about 45,000 lei and a gondola car about 43,000 lei. A boxcar probably costs less. Assuming an average cost of 40,000 lei, an investment of 440 million lei will be required.

The plan stipulates that 20 new maritime vessels totaling 134,000 deadweight tons (DWT)\* will be added to the maritime fleet. 28/ At an estimated cost of US \$200 (1,200 lei) per DWT, this investment will amount to 160.8 million lei.

The planned investment in transportation which has been identified amounts to about 5,813 million lei, or 41.7 percent of the total investment planned for transportation during 1960-65 as indicated in Table 4. The balance of more than 8 billion lei presumably will be used for the purchase of other equipment such as new rail, railroad passenger cars, trucks, and buses and for allocations to air and inland water transport. The total amount planned for investment, if actually used, appears to be adequate at least for the attainment of the major improvement goals.

Table 4

Rumania: Estimated Cost of Investment Project in Transportation  
Identified in the 1960-65 Plan

<u>Investment Project</u>	<u>Million Current Lei</u>
Railroad electrification	564.0
Electric locomotives	99.6
Diesel locomotives	754.6
Railroad cars	440.0
Highway modernization	3,794.0
Maritime vessels	160.8
Total	<u>5,813.0</u>
Total investment planned	13,932.0
Balance	8,119.0

\* Deadweight tonnage is a measure of the carrying capacity of a vessel expressed in metric tons -- that is, the difference between the displacement of the vessel light and its displacement loaded.

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APPENDIX A

STATISTICAL TABLES

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Table 5

Rumania: Freight Traffic of Railroads, Highways, Inland Waterways, and Pipelines a/  
1950-60

Year	Thousand Metric Tons					Million Ton-Kilometers				
	Total Inland Traffic	Railroads	Highways	Inland Waterways	Pipelines	Total Inland Traffic	Railroads	Highways	Inland Waterways	Pipelines
1950	38,220	35,069	1,046	1,108	997	8,498	7,598	42	669	189
1951	41,678	38,116	1,185	1,222	1,155	9,802	8,670	50	865	217
1952	50,237	45,194	2,177	1,535	1,331	12,009	10,691	77	910	331
1953	59,948	53,157	3,671	1,546	1,574	13,539	12,193	115	906	325
1954	58,282	50,376	4,768	1,287	1,851	13,676	12,105	195	979	397
1955	69,928	58,963	7,335	1,596	2,034	16,025	14,675	272	648	430
1956	74,442	62,015	8,987	1,300	2,140	16,493	15,260	286	496	451
1957	83,796	65,272	13,746	1,410	3,368	17,807	16,210	375	548	674
1958	94,146	66,643	22,241	1,558	3,704	18,803	17,018	422	585	778
1959	106,010	68,974	30,921	1,574	4,541	19,449	17,475	471	611	892
1960	141,590	77,492	56,598	1,914	5,586	22,641	19,821	936	865	1,019
	Percent of Total									
1950	100.0	91.8	2.7	2.9	2.6	100.0	89.4	0.5	7.9	2.2
1951	100.0	91.5	2.8	2.9	2.8	100.0	88.5	0.5	8.8	2.2
1952	100.0	90.0	4.3	3.1	2.6	100.0	89.0	0.6	7.6	2.8
1953	100.0	88.7	6.1	2.6	2.6	100.0	90.1	0.8	6.7	2.4
1954	100.0	86.4	8.2	2.2	3.2	100.0	88.5	1.4	7.2	2.9
1955	100.0	84.3	10.5	2.3	2.9	100.0	91.6	1.7	4.0	2.7
1956	100.0	83.3	12.1	1.7	2.9	100.0	92.5	1.7	3.0	2.8
1957	100.0	77.9	16.4	1.7	4.0	100.0	91.0	2.1	3.1	3.8
1958	100.0	70.8	23.6	1.7	3.9	100.0	90.2	2.3	3.2	4.3
1959	100.0	65.0	29.2	1.5	4.3	100.0	89.9	2.4	3.1	4.6
1960	100.0	54.7	40.0	1.4	3.9	100.0	87.6	4.1	3.8	4.5

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Table 6

Rumania: Passenger Traffic of Railroads, Highways, and Inland Waterways a/  
1950-60

Year	Thousand Passengers				Million Passenger-Kilometers			
	Total Inland Traffic	Railroads	Highways	Inland Waterways	Total Inland Traffic	Railroads	Highways	Inland Waterways
1950	128,408	116,551	11,294	563	8,559	8,155	388	16
1951	187,075	172,662	13,694	719	10,329	9,873	433	23
1952	197,206	180,777	15,744	685	9,621	9,185	412	24
1953	243,005	222,331	19,781	893	12,521	11,971	520	30
1954	248,697	231,856	16,021	820	12,408	11,929	451	28
1955	271,898	251,690	19,257	951	13,052	12,460	558	34
1956	287,112	263,898	22,202	1,012	13,734	13,054	642	38
1957	302,866	265,035	36,743	1,088	14,170	13,323	799	48
1958	275,127	232,604	41,378	1,145	12,542	11,619	875	48
1959	263,297	213,844	48,455	998	11,592	10,558	999	35
1960	287,739	214,823	71,757	1,159	12,197	10,737	1,419	41
	Percent of Total							
1950	100.0	90.8	8.8	0.4	100.0	95.3	4.5	0.2
1951	100.0	92.3	7.3	0.4	100.0	95.6	4.2	0.2
1952	100.0	91.7	8.0	0.3	100.0	95.5	4.3	0.2
1953	100.0	91.5	8.1	0.4	100.0	95.6	4.2	0.2
1954	100.0	93.3	6.4	0.3	100.0	96.2	3.6	0.2
1955	100.0	92.6	7.1	0.3	100.0	95.5	4.3	0.2
1956	100.0	91.9	7.7	0.4	100.0	95.0	4.7	0.3
1957	100.0	87.5	12.1	0.4	100.0	94.1	5.6	0.3
1958	100.0	84.6	15.0	0.4	100.0	92.6	7.0	0.4
1959	100.0	81.2	18.4	0.4	100.0	91.1	8.6	0.3
1960	100.0	74.7	24.9	0.4	100.0	88.1	11.6	0.3

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Table 7

Rumania: Freight Traffic on the Rumanian State Railroad, by Commodity a/  
1950-60

Commodity	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
	Thousand Metric Tons										
Total	35,069	38,116	45,194	53,137	50,376	58,963	62,015	65,272	66,643	68,974	77,492
Crude oil and petroleum products	3,801	4,586	5,962	7,606	8,837	9,873	10,336	9,851	9,802	10,184	9,964
Coal	3,013	3,431	3,792	3,955	3,836	4,255	4,648	5,310	5,719	6,296	6,631
Coke	492	441	560	649	635	695	451	746	755	884	1,018
Ferrous and nonferrous metallurgical products, machines, and equipment	1,585	1,473	1,756	2,179	1,802	2,338	2,395	2,939	3,346	4,094	5,502
Wood products	3,983	4,430	4,804	5,572	5,385	5,616	5,624	6,292	6,558	6,716	7,115
Firewood	3,048	2,938	3,120	3,032	3,291	3,187	3,305	3,452	3,440	3,342	3,607
Quarry and ballast products	6,910	6,818	9,442	11,460	8,425	11,523	13,212	14,588	14,276	12,973	13,943
Construction materials	2,534	2,760	3,189	4,132	3,454	4,083	4,274	4,658	5,093	5,324	5,778
Cereal grains	1,922	1,892	2,010	2,225	2,156	2,919	2,210	2,077	2,500	2,196	2,909
Sugar beets	537	1,076	744	798	791	1,187	1,153	1,446	1,221	1,575	2,685
Products of the light and chemical industries	633	582	559	537	579	730	821	1,121	1,311	1,623	1,949
Food products	2,224	2,400	2,634	2,803	3,036	2,955	3,197	3,406	3,336	3,436	3,916
Other commodities not identified	4,387	5,289	6,622	8,189	8,149	9,602	10,389	9,386	9,286	10,331	12,475
	Percent of Total										
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Crude oil and petroleum products	10.8	12.0	13.2	14.3	17.5	16.7	16.7	15.1	14.7	14.8	12.8
Coal	8.6	9.0	8.4	7.4	7.6	7.2	7.5	8.1	8.6	9.1	8.6
Coke	1.4	1.2	1.2	1.2	1.3	1.2	0.7	1.1	1.1	1.3	1.3
Ferrous and nonferrous metallurgical products, machines, and equipment	4.5	3.9	3.9	4.1	3.6	4.0	3.9	4.5	5.0	5.9	7.1
Wood products	11.4	11.6	10.6	10.5	10.7	9.5	9.1	9.6	9.8	9.7	9.2
Firewood	8.7	7.7	6.9	5.7	6.5	5.4	5.3	5.2	5.2	4.8	4.7
Quarry and ballast products	19.8	17.9	21.0	21.7	16.7	19.6	21.1	22.4	21.5	18.8	17.9
Construction materials	7.2	7.2	7.1	7.8	6.9	6.9	6.9	7.1	7.6	7.7	7.5
Cereal grains	5.5	5.0	4.4	4.2	4.3	5.0	3.6	3.2	3.8	3.2	3.8
Sugar beets	1.5	2.8	1.6	1.5	1.6	2.0	1.9	2.2	1.8	2.3	3.5
Products of the light and chemical industries	1.8	1.5	1.2	1.0	1.1	1.2	1.3	1.7	2.0	2.4	2.5
Food products	6.3	6.3	5.8	5.3	6.0	5.0	5.2	5.2	5.0	5.0	5.1
Other commodities not identified	12.5	13.9	14.7	15.4	16.2	16.3	16.8	14.4	13.9	15.0	16.0

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Table 8

Rumania: Basic Data and Performance Factors of the Rumanian State Railroad a/  
1955-60

Performance Factor	Unit	1955	1956	1957	1958	1959	1960
Length of route	Kilometers	10,967	10,967	10,967	10,998	10,998	10,981
Route density (land area per kilometer of route)	Square kilometers	21.6	21.6	21.6	21.6	21.6	21.6
Ton-kilometers per route-kilometer	Thousand kilometers	1,338	1,391	1,470	1,476	1,589	1,805
Passenger-kilometers per route-kilometer	Thousand kilometers	1,136	1,190	1,215	1,056	960	978
Traffic-kilometers per route-kilometer	Thousand kilometers	2,474	2,581	2,685	2,532	2,549	2,783
Total number of railroad employees	Persons	139,900	137,100	131,800	131,400	133,200	138,000
Traffic-kilometers per railroad employee	Kilometers	194,000	206,500	223,400	212,000	210,500	221,400
Turnaround time for freight cars	Days	4.33	4.43	4.12	3.94	3.82	3.58
Average load per car b/	Metric tons	16.5	17.0	17.0	17.0	17.0	17.0
Average length of haul	Kilometers	239	246	247	244	242	243
Maximum number of freight cars in use at peak traffic period c/	Units	52,220	54,400	53,190	51,444	53,333	55,200

b. Estimated.

c. Estimated on the basis of the average load per car and turnaround time.

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Table 9

Rumania: Estimated Length and Location of Petroleum Pipelines  
1960

<u>Origin</u>	<u>Location of Repumping Station</u>	<u>Destination</u>	<u>Length of Pipeline (Kilometers)</u>	<u>Outside Diameter of Pipeline (Inches)</u>	<u>Year Placed in Operation</u>
Crude Oil Gathering Lines					
Ploesti fields	Baicoi	Ploesti area	2,000	2 to 5	N.A.
Oltenia fields	N.A.	Ploesti area	225	8	1958
Moldavia fields	N.A.	Moldavian refineries	100	2 to 10	1957
Tirgoviste fields	N.A.	Ploesti area	55	8	1958
Total			<u>2,380</u>		
Product Lines					
Baicoi	Ploesti Buzau	Faurei <u>a/</u>	130	9 to 10	1919
Faurei	Hagieni Cérna Voda Palas	Constanta	170	10	1919
Baicoi	Ploesti Buzau	Faurei <u>a/</u>	130	10	1950
Faurei	Galati	Reni (USSR)	110	10	1950
Ploesti area	N.A.	Bucharest	60	10	N.A.
Cimpina refinery	Ploesti	Giurgiu	160	5	1916
Total			<u>760</u>		

a. Faurei is a storage-in-transit station on the line from Baicoi to Constanta and Reni by way of Ploesti and Buzau.

Table 10

Romania: Number of Persons Employed in All Modes of Transport a/  
1950 and 1955-60

<u>Year</u>	<u>Total Transportation</u>	<u>Public Transportation</u>					<u>Persons</u>
		<u>Total</u>	<u>Railroad Transport</u>	<u>Highway Transport</u>	<u>River and Maritime Transport</u>	<u>Civil Air Transport</u>	
1950	123,800	118,300	102,900	5,900	9,100	400	
1955	183,900	163,900	139,900	12,900	10,100	1,000	
1956	180,500	163,300	137,100	15,600	9,500	1,100	
1957	173,100	157,500	131,800	15,500	9,000	1,200	
1958	174,900	159,300	131,400	17,800	8,800	1,300	
1959	179,500	164,800	133,200	21,500	8,800	1,300	
1960	192,400	180,600	138,000	31,300	10,000	1,300	

a. 33/

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## APPENDIX B

METHODOLOGY

The techniques utilized in estimating levels of operating efficiency in Rumania are given in some detail in the body of the report. The measures of railroad operating efficiency in which traffic density and labor productivity are discussed are based on the arbitrary assumption that 1 ton-kilometer and 1 passenger-kilometer are equal and that each requires identical track space and labor output.

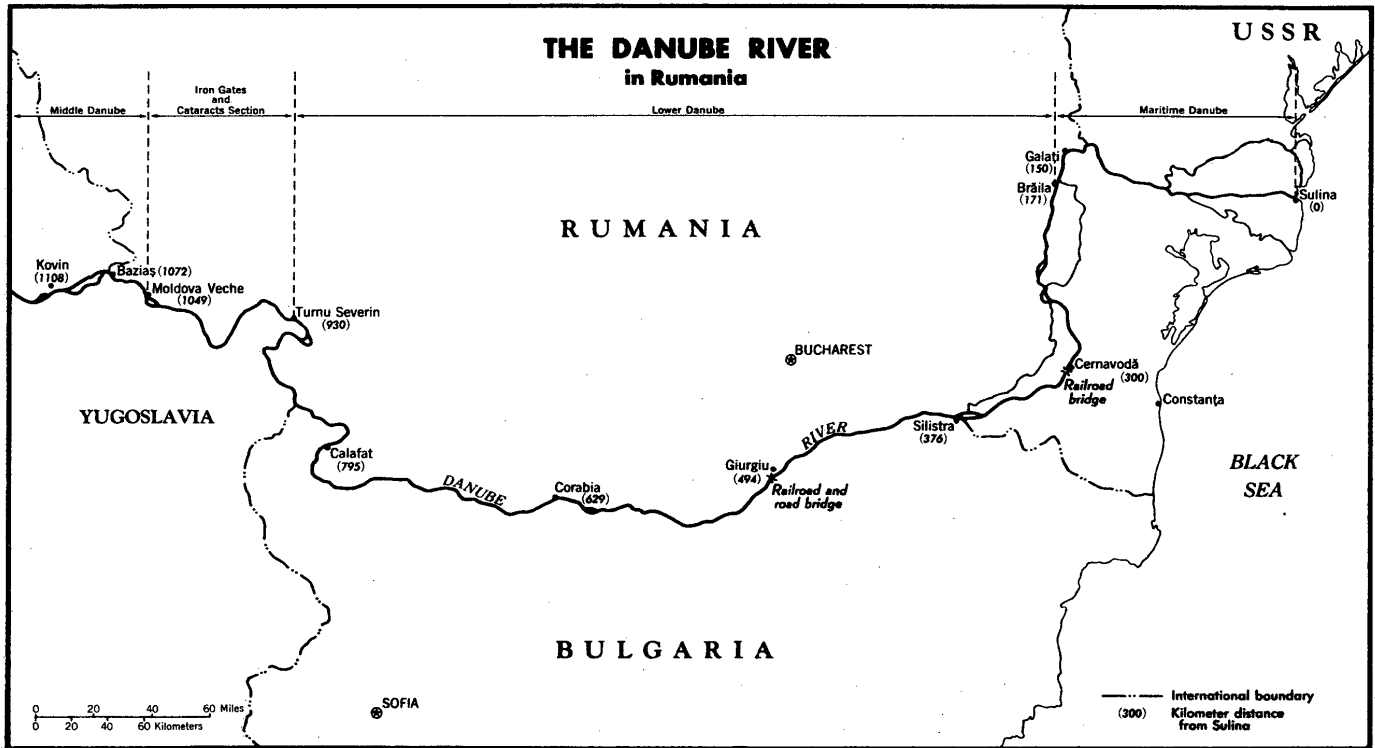
The methodology employed in estimating the number of freight cars in use is based on the estimated average load per freight car and the number of times that each freight car is used per year. The turnaround time of a freight car divided into 365 days per year equals the number of times each freight car is loaded during the year. This figure times the average load per car equals the number of tons each car carries per year. This figure divided into the total tons carried during the year (and adjusted to compensate for the peak traffic period) equals the number of freight car units required to carry the tonnage. This result is believed to represent about 90 percent of the freight cars required because 10 percent of the total freight car inventory is believed to be out of service for repair and maintenance at any given time.

Investment data for 1950-59 are taken from official Rumanian statistical publications. Data for 1960-65 are taken from official publications pertaining to the Six Year Plan. In both instances the estimated investment in transportation is based on the assumption that 86 percent of the funds allocated to transportation and communications combined were or will be allocated to transportation.

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Figure 3

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