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No 122

Economic Intelligence Report

TRANSPORTATION GROWTH AND TRENDS IN THE USSR 1950–65

CIA/RR ER 61-3

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CENTRAL INTELLIGENCE AGENCY

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FOREWORD

During 1950-65, certain basic trends in inland transport are being established in the USSR, and other trends established before this time are being continued or reversed. These trends in transport have significant influences on the economic growth and military potential of the country. The purpose of this report is to point out these trends and to measure the extent of their effect. Inland transport includes railroads, highways, inland waterways, coastal shipping, and pipelines -- the modern carriers that comprise the Soviet capability to move freight and passengers within the country. Comparisons with inland transport in the US are incorporated when they are helpful for obtaining an understanding of Soviet problems. Every effort has been made to effect complete comparability in the basic data used in these comparisons.

It has been necessary to provide only gross analysis of many pertinent aspects of Soviet transport in order to keep the length of the report within manageable limits.

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CONTENTS

Page

Appendixes

50X1

Tables

Page

Illustrations

TRANSPORTATION GROWTH AND TRENDS IN THE USSR*
1950-65

Summary and Conclusions

Soviet inland transport has been developing since 1950 at a rate adequate to support current economic growth. Its development has been restricted, however, by a policy of keeping just ahead of requirements and obtaining maximum productivity from limited inputs of capital. The high utilization of existing facilities tends to create transport shortages at specific times and places, and the lack of alternate service often leads to excessive transport costs.

Hope for greater economy in the use of transport is indicated by the current Soviet Seven Year Plan (1959-65) in spite of the fact that, since 1955, transport has grown at a more rapid rate than the economy of the USSR as a whole. Economy is to be realized through plans for a rapidly changing fuel balance in combination with more rational shipping policies and location of industry. Increased use of pipeline transport, however, is not occurring at planned rates, and the average length of haul for railroads is still increasing in spite of plans for its decrease.

The USSR is incurring more rapidly increasing demands for transport in relation to over-all economic growth than the US is at the present time. This trend in the USSR is believed to be the result of several factors, the most significant of which is the increasing traffic between the traditional production and consumption centers of the western USSR and the areas being developed in Kazakhstan and in eastern and central Siberia. Although the USSR will continue to require greater increases in transport input per unit of economic growth than the US will require, the rate at which these demands increase will not continue to accelerate during the period of this estimate as it has in the past.

Inland freight traffic by all modes of transport in the USSR increased to about 1,530 billion ton-kilometers (tkm)** in 1958 from about 700 billion in 1950 and probably will increase to about 2,400 billion tkm in 1965. Absolute annual traffic increases are to average

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

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

about the same during the 7-year period 1959-65 as during the 8-year period 1950-58. The average annual rates of growth* for 1951-58 and for the 7-year period 1959-65 will decelerate from 10.4 percent during the earlier period to 6.4 percent during the later period. Total inland transport performance in the USSR was 67 percent of comparable US performance in 1958, and by 1965 it may increase to about 76 percent.

Railroads performed about 85 percent of total inland freight traffic in 1959 and should perform about 78 percent by 1965. Their share was 87 percent in 1950. The principal increase in the carrier share of total transport during 1950-58 occurred in motor transport. The shares of both motor transport and petroleum pipelines in total traffic will gain during 1959-65. The US depends much less than the USSR on railroads. Only 37 percent of the total inland freight traffic in the US was performed by rail carriers in 1958 compared with 85 percent in the USSR.

Soviet policy seeks to limit expansion of private passenger transport. Public carriers are expanded sufficiently to handle the necessary urban commuting and long-distance official travel. Development of good roads and production of passenger automobiles have low priority. Railroads handle a major share of passenger transport, currently accounting for about 50 percent of total passenger-kilometers. By 1965 the railroads' share of total passenger traffic is to decrease to about 40 percent with significant expansion of intercity bus and long-distance air transport.

Soviet policy has limited capital investment in transport so that a larger share of available capital could be devoted to increasing industrial capacity. Consequently, transport equipment is kept in operation for a longer time than would be considered economical in most Western countries, and investment is concentrated in the existing network to bring it to a high level of productivity before any expansion is undertaken. This policy is expected to continue.

In recent years, there has been a tendency to increase investment in nonrail transport faster than in railroads. This policy has been carried out in motor transport to relieve the railroads of costly short-haul traffic and in maritime and inland water shipping, together with petroleum pipelines, to divert petroleum traffic from the railroads to lower cost carriers.

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* Average annual rates of growth throughout this report are computed at the compound rate for the stated period, including the terminal years.

Soviet investment in transport amounted to about 20 billion rubles* in 1958, nearly double the amount invested annually during 1946-50. As a share of total investment in all sectors of the economy, however, the transport sector received only 10 percent during 1958 compared with 14 percent during 1946-50. During 1950-59, Soviet investment in transport averaged about 10 percent of total investment, with a slight downward trend, while the comparable US transport share of domestic investment was about 20 percent.

Fixed assets of the transport sector represented about 20 percent of total Soviet assets in 1956 compared with about 26 percent in 1950. This decline is a direct result of the relatively low level of investment in transport since 1950.

Soviet transport investment and rate policies have led, nevertheless, to increasing productivity and profit from railroad operations in recent years. Railroad operating indexes reflect lower operating costs per unit of output. Steady growth in traffic together with a policy of not lowering rates to the same extent as the costs have decreased cause profits to increase to an extent that more than offsets losses by other modes of inland transport. Until 1953, railroad operations had been subsidized, but net accrual to the state budget from such operations was 12.2 billion rubles in 1959 and is planned to be 22 billion rubles in 1965. Railroad earnings are more than adequate to support the capital investment planned through 1965.

Soviet inland transport is growing at a more rapid rate than comparable US transport. As the Soviet economy has developed in recent years, a greater increase in transport input per unit of economic growth has become necessary. Diversification of transport facilities is expected to continue in both countries through 1965, although Soviet diversification by 1965 will not reach the level already achieved in the US.

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* Unless otherwise indicated, ruble values in this report are given in current rubles and may be converted to US dollars at a rate of exchange of 4 rubles to US $1. This rate does not necessarily reflect the value of rubles in terms of dollars. All dollar values in this report are given in terms of current US dollars.

I. Introduction

The method and the rate of development of transport in the USSR have been markedly influenced by the political and economic framework within which they took place. In order to maximize the short-run productivity of available capital for over-all economic growth, investment policy for transport facilities appears to keep one step ahead of the current requirement for transport. Planned economic development as practiced in the USSR does not require advance capital investment in transport facilities to stimulate industrial growth.

Surpluses of some inputs have been substituted for deficiencies in others. There was extensive use of labor, including forced labor, until the early 1950's, when labor became more critical in relation to available capital and materials. Investment to modernize the existing plant and facilities then began to receive emphasis, with increased production and improved labor productivity as a result. The current Seven Year Plan (1959-65) continues the emphasis on modernization, with extension of transport facilities concentrated in areas of new industrial development.

II. Transport Performance and the Economy

The performance of the Soviet inland transport system in recent years has not been a limiting factor in the aggregate development of the Soviet economy. Soviet transport, however, has failed to satisfy certain specific plan goals contained in ministerial directives and has demonstrated localized inadequacy from time to time. Traffic has tended to expand more rapidly than transport facilities since 1928. Although the resultant high-density transport system has managed to move substantially all the freight offered, little excess capacity exists, and transport operations have been oriented toward producing maximum output rather than optimum service. Although present capacity would allow for considerable increases in military traffic without a serious reduction in essential economic activity, the transport network is not so diversified as in the US and most Western European countries.

A. Freight Service*

Freight traffic in the USSR has increased rapidly during the postwar period. Performance by the inland transport system in 1959 was nearly 1,700 billion tkm compared with about 700 billion in 1950, an average increase of 10.4 percent per year. The increase in the last few years was more rapid than in the earlier postwar years because

* Table 1, Appendix A, p. 52, below, and the chart, Figure 1, following p. 6.

of the intensified economic development of the eastern regions* and the consequent increase in the average length of haul. The increase is not expected to be as rapid during the period of the Seven Year Plan. Total inland freight traffic is planned to reach about 2,400 billion tkm in 1965, requiring an increase of 6.4 percent per year during the plan period. Even with the rapid growth achieved in the past and that planned for the future, the total freight traffic in the USSR in 1965 probably will be only at about the same level as the US performance during 1958.

Rail freight traffic in the USSR will constitute a smaller share of the total than heretofore -- it will decline from about 87 percent of the total in 1950 to about 78 percent in 1965. A rapid expansion of motor transport was principally responsible for the decline in the railroads' share of the total during 1950-59, and petroleum pipeline transport will be largely responsible for the shift expected by 1965. Motor transport increased its share of the total from about 3 percent in 1950 to about 5 percent in 1959 and in 1965 may account for about 6 percent. The share performed by petroleum pipeline transport increased from less than 1 percent in 1950 to more than 2 percent in 1959, and the plan for 1965 calls for pipeline transport to perform about 8 percent of total ton-kilometers. The share of freight traffic performed by inland water transport declined a little during 1950-59, and although some increase is expected, the share in 1965 probably will not regain the 1950 proportion.

Modern freight transport service in the US has always been more diversified than in the USSR. Of the total inland freight traffic in the US during 1958, railroads accounted for about 37 percent compared with 85 percent in the USSR. Railroads in the USSR carried more traffic than railroads in the US for the first time in 1955, and the Soviet performance in 1958 was 55 percent more than that of the US railroads. Freight transport by all other inland carriers in the US is much more developed than in the USSR. Performance by each of the other modes of transport in 1958 averaged more than five times the comparable level in the USSR.

B. Passenger Service**

The USSR has relatively little long-haul passenger traffic. Although Soviet passenger traffic has increased considerably in recent

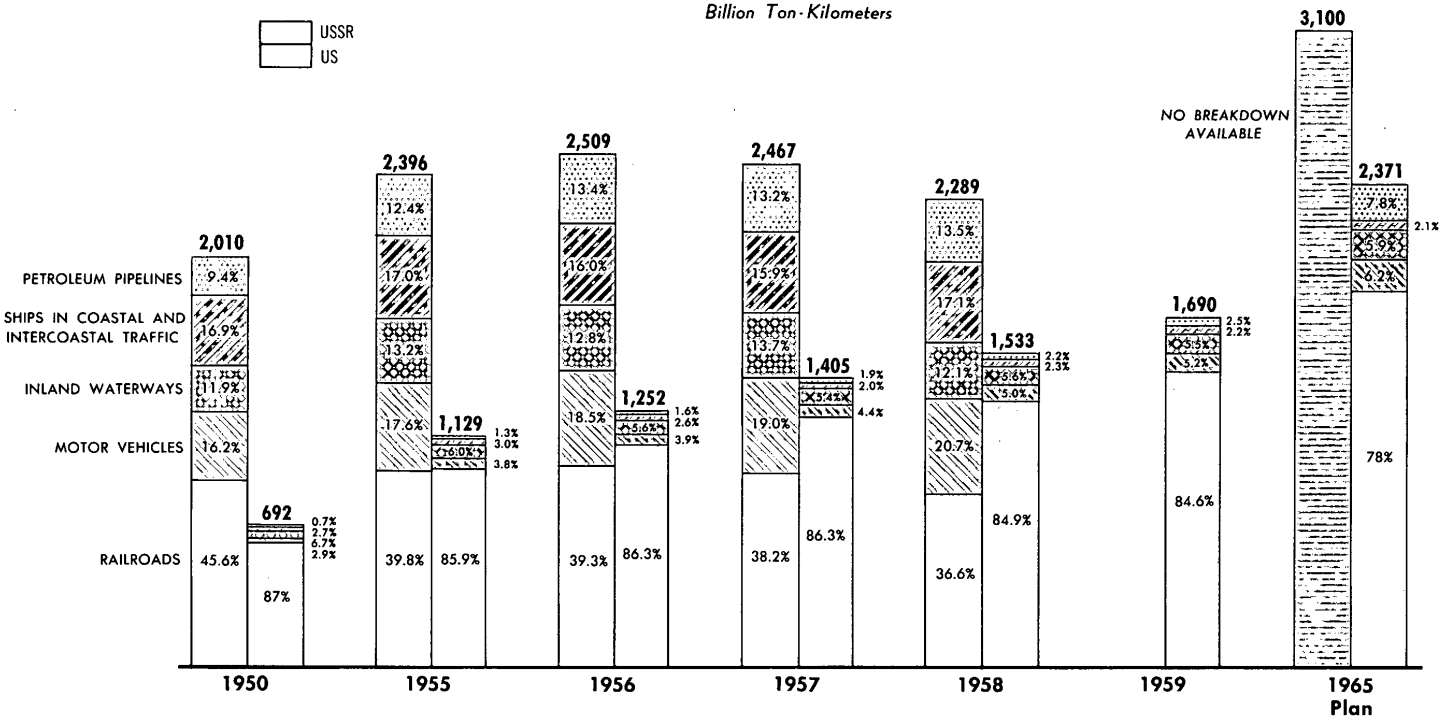
* The economic regions referred to in this report are those defined and numbered [redacted] 50X1 50X1

** See Tables 2 and 3, Appendix A, pp. 53 and 54, respectively, below. The data include both intercity and intracity movement by all modes of transport.

Figure 1 50X1

USSR AND US

TON-KILOMETER PERFORMANCE OF INLAND TRANSPORT BY MODE OF TRANSPORT, 1950, 1955-59, AND 1965 PLAN



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50X1

years, absolute performance remains rather low, especially when compared with that in the US. In 1950, about 127 billion passenger-kilometers were produced in the USSR, less than 10 percent of the level of the US. By 1957, passenger-kilometers in the USSR had doubled. The Seven Year Plan calls for another 70-percent increase, to 470 billion passenger-kilometers, by 1965, a level that would be less than one-half of the US performance in 1938.

In the USSR, railroads are the principal mode of passenger transport, whereas in the US passengers travel mainly by automobile. In 1950 the Soviet railroads produced 69 percent of the total passenger-kilometers compared with less than 4 percent by the US railroads. In the same year, automobiles in the USSR performed only about 1 percent of total passenger-kilometers, whereas automobiles in the US were responsible for about 85 percent of the US total passenger-kilometers. During the 1950's, automobiles in both countries increased their passenger traffic more rapidly than did the railroads.

The motorbus has rapidly enlarged its share of intercity passenger traffic in the USSR. In 1958 the number of intercity passengers traveling by bus was more than eight times the level of 1950 compared with an increase of about 20 percent by rail. Buses were responsible also for a large portion of the growth in local and urban passenger traffic. The over-all number of local and urban passengers* increased by 163 percent in 1958 compared with 1950, and the share carried by buses rose from 11 percent to 34 percent of the total. Again, these gains were made concurrently with slower growth in urban streetcar and suburban railroad traffic. The growth trends for individual carriers established during the 1950's are expected to continue through 1965, with buses increasing their share to about 55 percent of the total.

C. Relationship of Transport Performance to Economic Growth

Certain comparisons of the development of the economy and of transport performance in both the USSR and the US help to assess the past and future demand for transport services in the USSR. Industrial production grew slightly faster than freight transport from 1950 to 1955 in both the USSR and the US (see Table 4** and the chart, Figure 2***). In 1955 or 1956 the trend was reversed in the USSR, and freight transport has grown faster than industrial production since that time. Whether or not this reversal of the trend is a temporary or secular development

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* Passenger movement by automobiles other than taxis is not included. Taxis, however, carried more than one-half of the total automobile passengers.

** Appendix A, p. 55, below.

*** Following p. 8.

cannot yet be accurately ascertained. The indexes for industrial production and freight transport have a general tendency to parallel each other over extended periods, and the recent reversal of lead relationships probably does not alter this long-run relationship.

Data on industry and transport for the Seven Year Plan indicate that a return to the relationships of 1950-55 is planned in the USSR. A 55-percent increase in freight traffic is planned, whereas industrial production is planned to increase by 80 percent. The plan implies considerable economy in the use of transport compared with the trend in 1956-58. The USSR may hope to achieve this objective in the following two ways: (1) a change in consumption from coal to gas and oil for fuel and power and (2) a reduction in the average length of haul. There is no doubt that the change in fuel consumption patterns will reduce the rate of growth for rail transport performance, although pipeline transport has not met planned rates* and increasing amounts of petroleum are transported by rail each year. Expected decreases in the average length of rail freight haul also have been overly optimistic. Decreases planned each year since 1950 were only partly realized in 1952 and 1958. Increases in every other year caused the average length of haul in 1959 to reach 810 kilometers (km), 88 km greater than in 1950.**

A comparison of transport performance with the gross national product (GNP) demonstrates that demands for transport in support of growth have been greater and have increased more rapidly in the USSR than in the US (see the chart, Figure 3***). Soviet planners, however, do not expect growth in production through 1965 to require equal concurrent growth in demand for transport. Although transport input necessary to produce a given unit of GNP in the USSR has increased over recent years, plans for future growth of GNP and transport indicate a reduction in unit transport input. Several factors, however, including the probable degree of success with plans for fuel balance and industry location, cast serious doubt on the validity of estimating any significant reduction in unit transport input.

Comparing freight traffic with the total tons produced of a comprehensive list of basic commodities† for the USSR and the US demonstrates the extent of transport economy practiced in the past in the

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* See III, D, p. 25, below.

** For a fuller discussion of the length of haul, see IV, A, 1, p. 27, below.

*** Following p. 8.

† The 24 commodities used include the most important ores, fuels, agricultural products, and chemicals.

Figure 2

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USSR AND US

COMPARATIVE INDEXES OF INLAND FREIGHT TRANSPORT AND INDUSTRIAL PRODUCTION

SELECTED YEARS, 1950-65

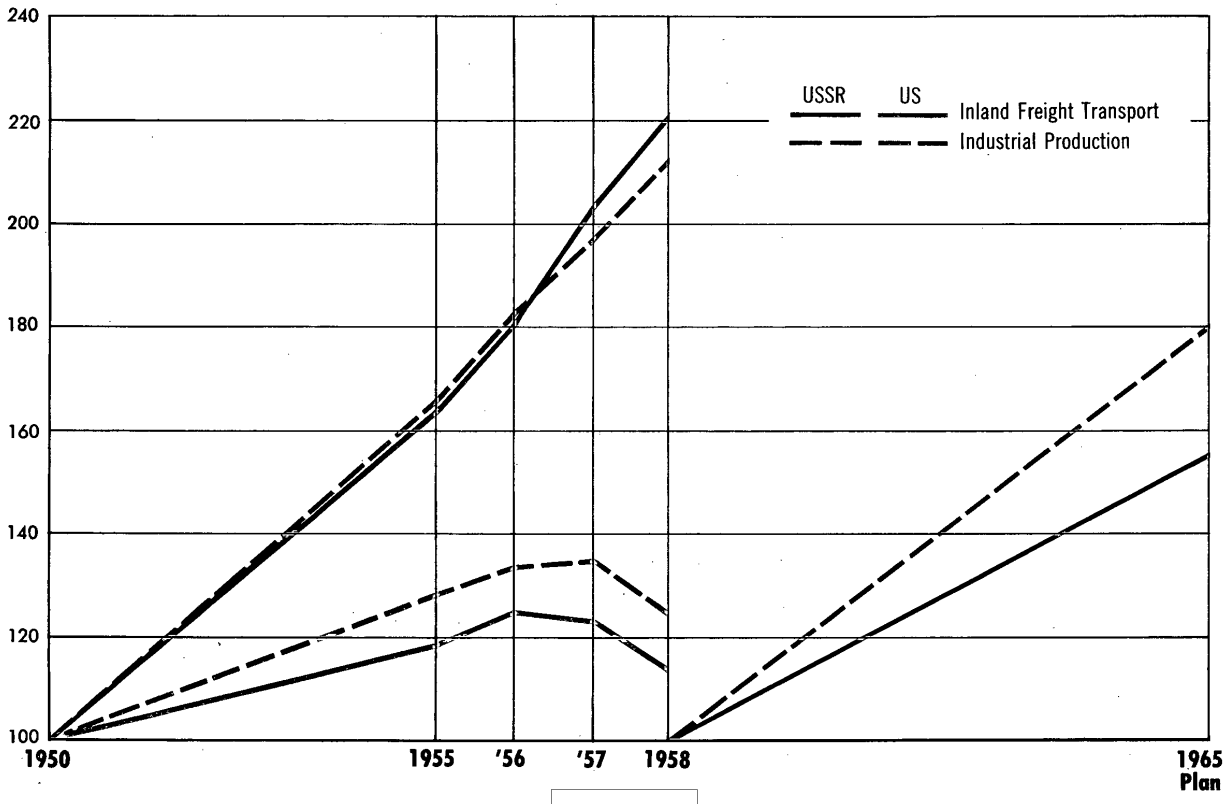

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Figure 3

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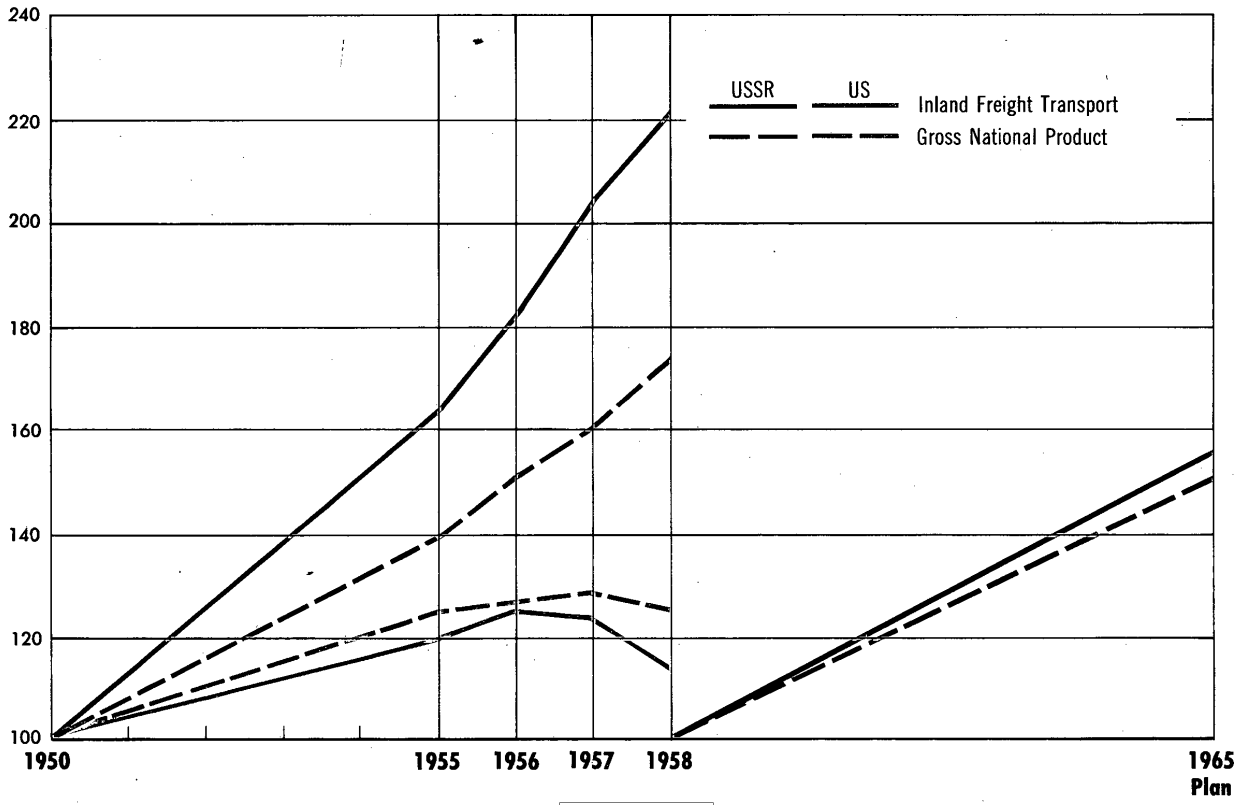
USSR AND US

COMPARATIVE INDEXES OF INLAND FREIGHT TRANSPORT AND GROSS NATIONAL PRODUCT

SELECTED YEARS, 1950-65



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USSR* (see the chart, Figure 4**). On the basis of US experience (1938-58) and Soviet experience (1950-58), it would seem likely that the Soviet requirement for transport during the current phase of economic development will continue through 1965 to increase at least as fast as the US requirement.

III. Development and Maintenance of the Transport System

A. Railroads

1. Administrative Organization***

Throughout the recent postwar years, there has been a tendency to shift some operating and traffic responsibilities in the Soviet transport system to lower organizational levels. There have been two significant administrative changes in this respect. Most industrial and line organizations formerly assigned to the Ministry of Railroad Transport (Ministerstvo Putey Soobshcheniya -- MPS) have been shifted to divisional level, and the railroad system has assumed increased responsibility for traffic planning and car distribution. These delegations of power and increases in authority of local administration probably have not enhanced efficiency to any marked degree but were consistent with and in part stemmed from the general industrial reorganization of 1957 that created the sovnarkhozes (councils of national economy). Before the reorganization, 67 percent of the total freight shipment plan was arranged for by the MPS working directly with other ministries at the national level. Now that some industrial ministries have been abolished, much of the information necessary for planning shipments is gathered by the railroad system and its divisions at the sovnarkhoz level and is passed on to the central planners assigned to the MPS. Each railroad system also is responsible for car distribution in its area, within the framework of a general plan worked out at the ministerial level.

Attempts have been made to introduce close cooperation and joint study of transportation problems between the local transport units and the sovnarkhozes. The major problem is that there is usually little relationship between the boundaries of the divisions and the sovnarkhozes. The MPS attempts to shape the boundaries of the operating divisions so as to increase operating efficiency. Although cooperative traffic planning will be stressed in the future, the MPS very likely will continue to determine the boundaries of the operating divisions on the basis of operating efficiency.

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* Comparison with the US is believed to be particularly useful because the average hauls in both countries are relatively long.

** Following p. 10.

*** See the map, Figure 5, inside back cover.

At the same time that the responsibilities of the systems and the operating divisions have increased, the size of these units also has increased. In 1952, in addition to 56 systems and 277 divisions, there existed another administrative echelon (the okrug), which stood between the MPS and the systems. Today the okrug no longer exists; there are only 35 systems; and the operating divisions, which now number 230, have become larger and have assumed many of the powers of the system. The major reorganization took place in July 1959 after a few large systems had been tried on an experimental basis early in 1959. The new systems are expected to make better use of high-caliber personnel, utilize equipment more efficiently, and fulfill expanded traffic planning responsibilities more effectively.

2. Plant

a. Network*

The route length of the Soviet railroad network operated by the MPS was officially reported to be 122,800 km** at the end

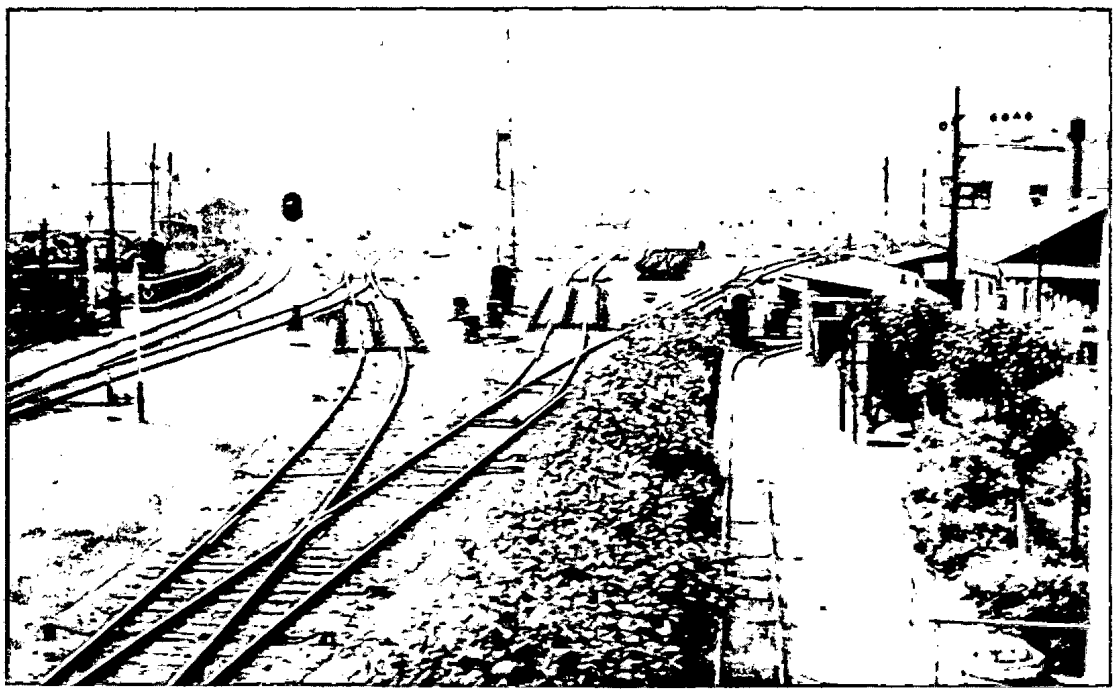


FIGURE 7. USSR: Typical Freight Yard on Rail Network.

* For data on the network, see Table 5, Appendix A, p. 56, below, and for a map of the network, see Figure 6, inside back cover. See also the accompanying photograph, Figure 7.

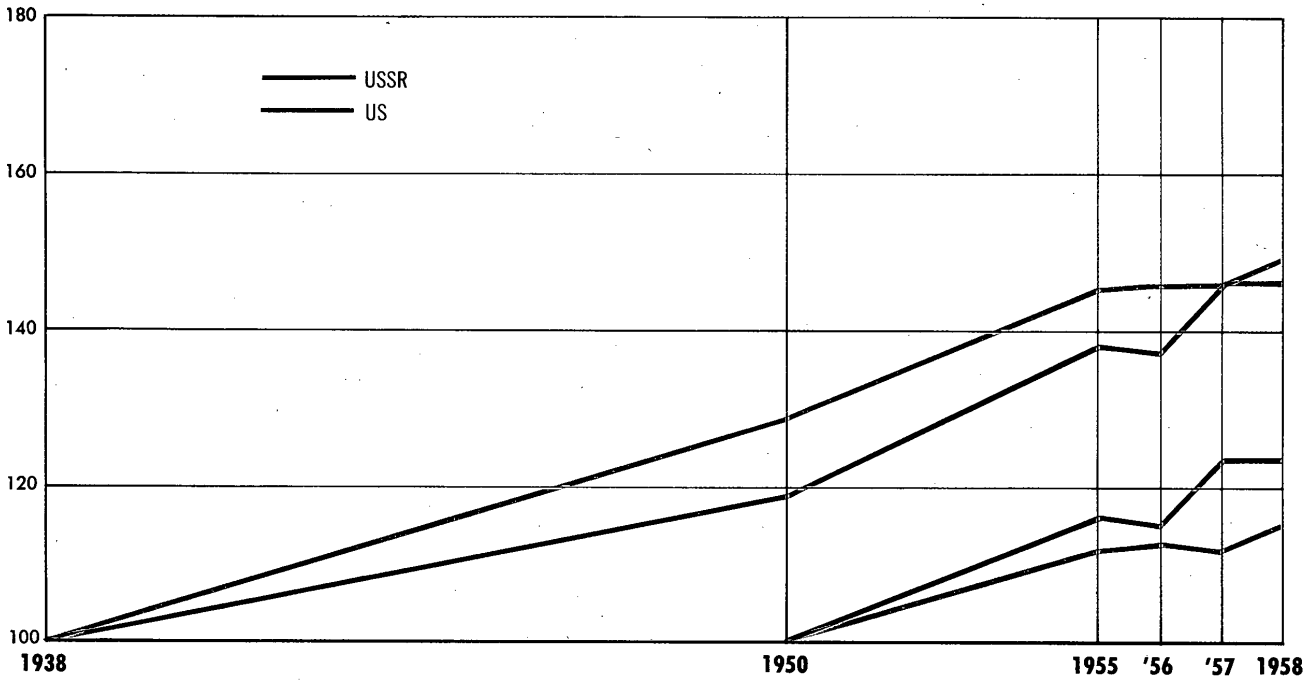
** Trackage nearly equal to the length operated by the MPS is operated by other organizations. All long-distance traffic, however, enters the MPS system.

50X1

Figure 4

USSR AND US

INDEX OF TON-KILOMETERS PERFORMED BY INLAND TRANSPORT PER METRIC TON OF BASIC PRODUCTION*, SELECTED YEARS, 1938-58



*Ton-kilometer performance divided by total production of 24 basic commodities, which include ores, fuels, chemicals, and agricultural products.

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50X1

of 1958. Of this total, about 27 percent was double tracked. Eight percent of the route had been converted to electric traction and 9 percent to diesel operation. Automatic block signaling was installed on about 18 percent, and 2 percent was equipped with centralized traffic control. About 96 percent of the route is broad gauge (5 feet). Of the total network operated by the MPS, about 73 percent is concentrated in the European USSR and only 27 percent in the Asiatic USSR. 1/*

Soviet plans for construction of new railroads have been consistently underfulfilled. The Fifth Five Year Plan (1951-55) was only about 54 percent fulfilled, 2/ and construction completed during 1956-60 probably will amount to only about 66 percent of that called for under the original Sixth Five Year Plan (1956-60). The Seven Year Plan (1959-65) calls for about 9,000 km of new trunk lines, plus about 2,700 km of logging railroads. The route length of railroads of the MPS in 1965 must therefore be planned at about 131,800 km. This figure does not include the logging railroads, some of which may be transferred to the MPS at a later date, as has occurred in the past. In view of past experience, it would not be surprising if the present plan for line construction should, like its predecessor, also prove to be overly ambitious.**

Important construction scheduled for the current Seven Year Plan includes completion of the South Siberian and Central Siberian Railroads, the Aktogay-Gosgranitsa section of the Trans-Sinkiang line, and the Yesil'-Turgay, Suoyarvi-Lendery, and Miass-Uchaly lines as well as construction of the new Gur'yev-Astrakhan' and Pavlograd-Zolotonosha-Zhashkov lines. It is planned during 1959-65 to double track about 8,000 km of line, an increase of about 24 percent above the 1958 length. Instead of new construction and double tracking of other lines, the capacity of the railroads on certain heavily traveled or difficult sections has been increased by electrification, automatic blocking, and centralized traffic control.

Railroad electrification is now being intensively carried out under the pressure of increasing traffic.*** The route length of electrified railroads was scheduled to be increased from 5,361 km in 1955 to 13,361 km in 1960. Electrification plans were exceeded every year during 1956-59, bringing the length of electrified lines to about 11,600 km at the end of 1959. A total of 30,000 km of electrified route is planned by the end of 1965.

50X1

By 1965, automatic block signaling is to be installed on 18,000 to 20,000 km of additional route, nearly doubling the amount installed by the end of 1958. Plans call for the introduction of centralized traffic control on about 10,000 km of route by 1965, which would extend it to more than five times the length existing at the end of 1958. Rail lines under diesel operation totaled 3,432 km in 1950, located principally in the water-deficit areas of Central Asia. By 1958 the total dieselized route had expanded to 11,100 km. These lines were still concentrated largely in Turkmen, Tadzhik, Uzbek, and Kazakh SSR's; in the Trans-Volga area; and in the Caucasus. Dieselized lines by 1965 are to total 70,000 km, including many heavy-density, primarily single-track lines requiring an increase in capacity but not scheduled for electrification. Lines on which water supply is inadequate and fuel coal is not readily available also are included.

b. Inventory of Freight Cars and Locomotives

(1) Freight Cars

The freight car inventory in 1958 represented about 14 percent of the value of the fixed assets of the railroads in the USSR. 5/ On 1 January 1959 the railroads are estimated to have had 889,000 freight cars, 27 percent of which are still the old two-axle types. During 1952-59 the inventory increased by about 86,000 cars and is expected to increase to 969,700 cars by 1965, with two-axle cars then constituting only 14 percent of the total. Compared with the US, the USSR is handling about 50 percent more freight traffic on its railroads with about one-half of the total number of freight cars. Additions to the inventory in recent years have been in higher capacity units, causing the freight-carrying capacity of the freight car inventory in the USSR to increase about 170 percent since 1945, although the unit increase was only about 46 percent (see Table 6*). Three types of freight cars in use in the USSR are shown in the accompanying photographs, Figures 8, 9, and 10.**

Most Western countries attempt to achieve quantity manufacture of spare parts and a reduction in the spare parts inventory by using a high degree of standardization throughout a wider range of types, whereas the USSR follows a policy of reduction in the number of types themselves. There exist two types of standard wheel sets, the latest of which is a version of the earlier design having all-coil springs and shock absorbers. Standardization of car types is currently achieved with only two designs of four-axle chassis having cast steel frames. Two-axle cars are no longer produced and are being retired as rapidly as practicable.

* Appendix A, p. 57, below.
** P. 13, below.

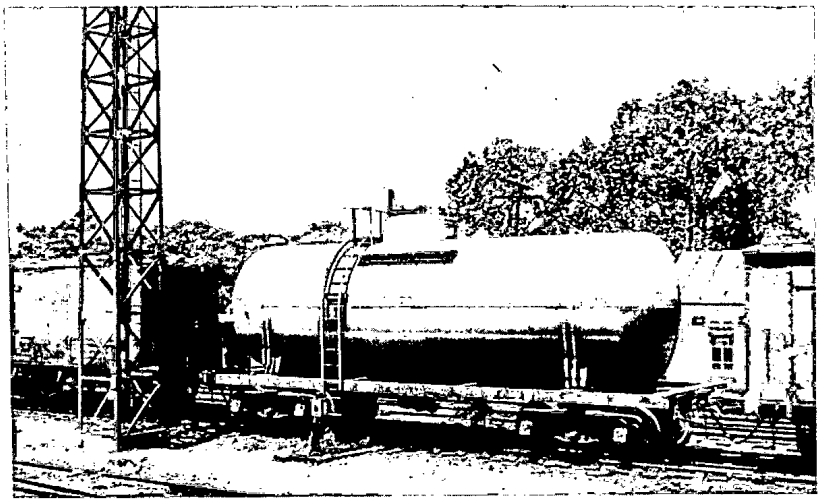

FIGURE 8. USSR: Typical Four-Axle Freight Car in General Use.

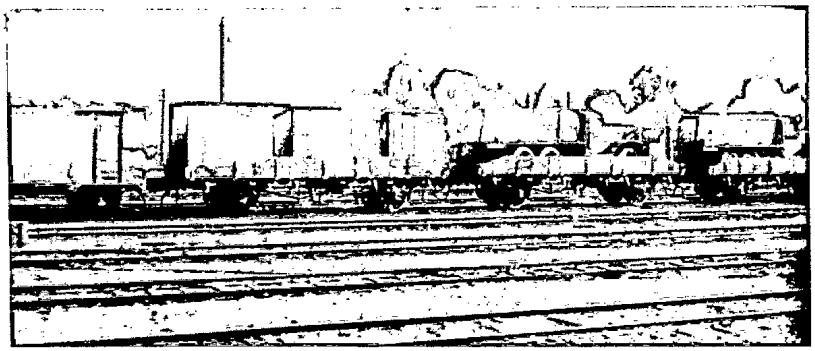

FIGURE 9. USSR: Obsolete Two-Axle Freight Cars. These types of cars are still widely used but are being retired as rapidly as practical.

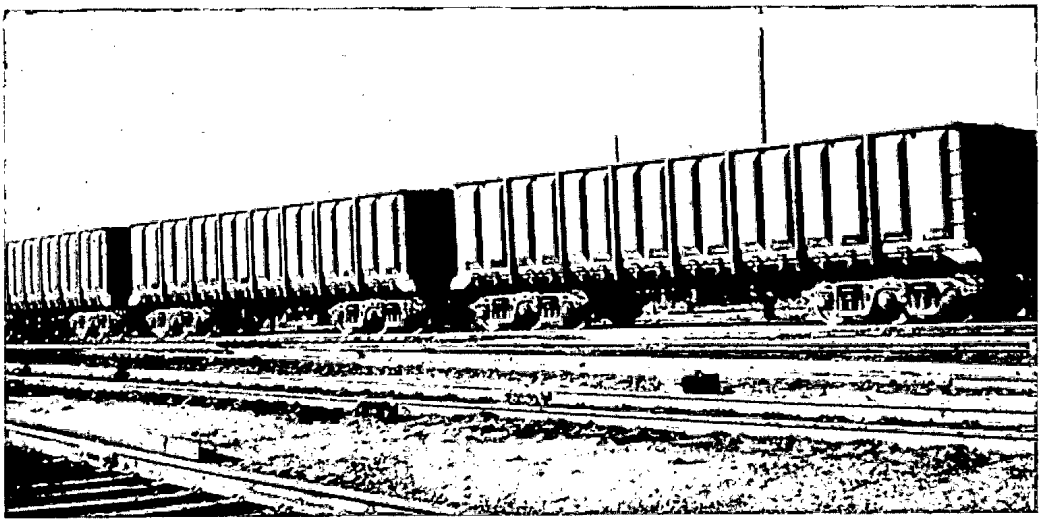

FIGURE 10. USSR: 95-Ton Six-Axle, All-Steel Gondola Cars Equipped with Roller Bearings. These types of cars are now operating in limited but increasing numbers.

The backbone of the working freight car inventory consists of open-top gondolas and hopper cars, types that carry more than 40 percent of the freight traffic in terms of both tons and ton-kilometers. The following tabulation shows the distribution of freight traffic by type of car, probably for 1954 6/:

Type of Car	Percent of Total Tons	Percent of Total Ton-Kilometers
Box	21.8	28.4
Flat	25.6	18.7
Open-top	45.7	41.6
Tank	6.1	9.9
Refrigerator	0.8	1.4
Total	100.0	100.0

The 60-ton four-axle, open-top car with steel frame and wooden body is the most representative type now in production. Production has commenced on a 93-ton six-axle, all-steel open-top car, but only a few hundred are in use. Large-scale production of wooden body types probably will continue through 1965 because of a limited supply of steel plate for freight cars.

(2) Locomotives

On 1 January 1959 the Soviet railroads are estimated to have had 36,000 operable mainline locomotives of all types.* Coal-fired steam locomotives predominate (88 percent), although about one-third of rail freight traffic in 1959 was moved by diesel and electric locomotives. A significant transition in motive power is in progress, which, while increasing the capacity of the locomotive inventory, will lower the total number of units to about 26,300 by 1965. The inventory will then consist of approximately equal magnitudes of steam, electric, and diesel units (see Table 7**). The ultimate motive power goal of the Soviet railroads is to effect a complete changeover to electric and diesel traction by about 1970, with about 55 percent of total railroad freight traffic to be hauled by electric locomotives. Three types of locomotives in use in the USSR are shown in the accompanying photographs, Figures 11, 12, and 13.***

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** Appendix A, p. 58, below.
*** P. 15, below.

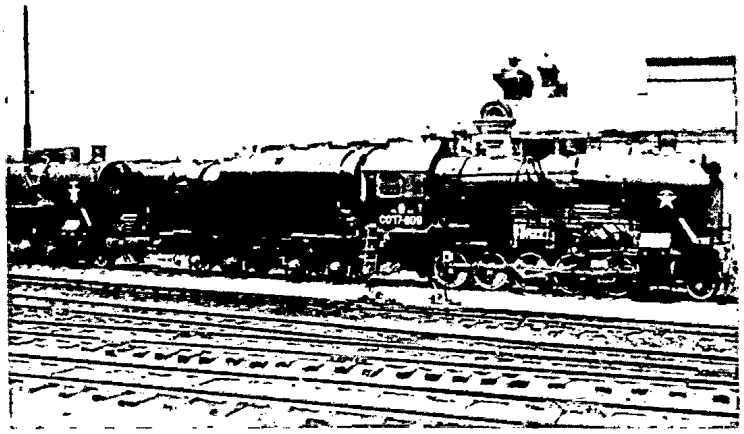

FIGURE 11. USSR: Typical Mainline Steam Locomotive and Tender. About two-thirds of the rail traffic is still handled by steam traction.

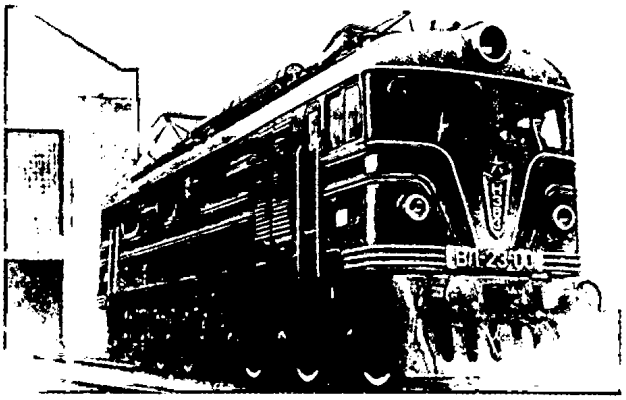

FIGURE 12. USSR: VL-23 Electric Locomotive. This type of locomotive is the backbone of the current electric locomotive inventory.

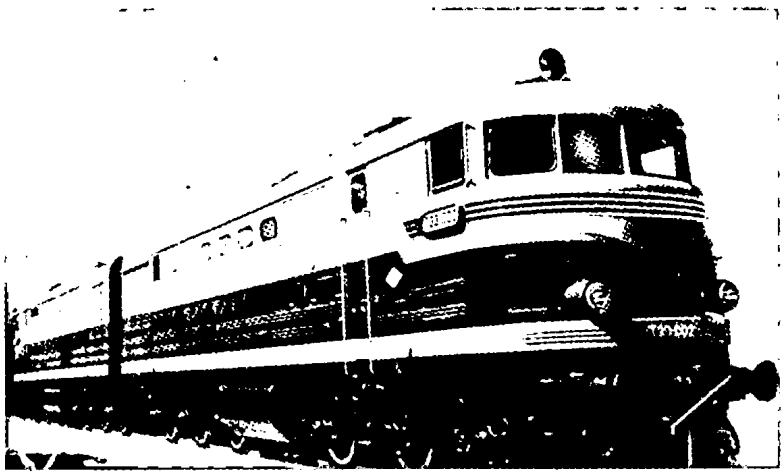

FIGURE 13. USSR: TE-3 Diesel Locomotive. This locomotive is the most typical of the current inventory of diesel locomotives, which are to handle nearly one-half of the rail traffic by 1970.

The Soviet conversion from steam to diesel and electric traction is taking place at a rate considerably slower than the conversion to diesel traction in the US after World War II, in spite of the already higher and still increasing traffic density on the Soviet network. US railroads, which were hauling more than 90 percent of freight traffic by steam in 1945, were handling more than 85 percent by diesel traction in 1955 and are now, for all practical purposes, completely dieselized.*

Considering the availability to the USSR of Western experience, as well as its own experience with diesel and electric locomotives, Soviet capability to date to develop and produce really efficient electric or diesel locomotives has been incredibly unimpressive. Soviet authorities themselves admit that they do not yet have suitable passenger electric or diesel locomotives, and lack of adequate success with the development of AC electric locomotives has necessitated imports from France and West Germany to take advantage of completed AC line electrification.

The last steam locomotive was built in the USSR in 1956, and increasing production of existing standard electric and diesel locomotive designs, plus a measure of exploration into new lines of development, is indicated. Steam locomotives are being either relegated to light traffic lines and switching service or exported to Communist China as they are replaced by more efficient types. Some locomotives may be held in reserve, and others may be scrapped. Diesels will be transferred from area to area within the USSR. Locomotive units of about 6,000 horsepower (hp) (two units of 3,000 hp each in the case of diesels) probably will predominate eventually, possibly supplemented by gas turbine locomotives burning low-grade oil or diesels modified to run on compressed natural gas, depending on the outcome of current experimentation. Electric locomotives powered by atomic energy either directly or through power substations also are a long-range possibility, although Soviet railroad officials have stated that they do not consider the former to be a practical approach.

3. Labor Force

In recent years the labor force of the MPS has amounted to about 3.4 million employees, or about 5.7 percent of the total state-employed labor force. About 2.3 million of this total are engaged in functions comparable with those performed by US railroads (see Table 8** and the accompanying photograph, Figure 14.***)

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** Appendix A, p. 59, below.
*** P. 17, below.

FIGURE 14. USSR: Typical Gang of Railroad Workers. Observe the large number of women.

Although traffic on the railroads of the USSR continues to increase, gains in labor productivity have largely offset requirements for additional personnel for several years. Investment in modernization of plant and equipment, especially dieselization and electrification, together with the supplementary facilities necessary to utilize the advantages of the modern traction, has been largely responsible for the impressive gains in labor productivity.

Even so, the US railroads, with their transition from steam to diesel traction virtually completed, have continued to register about the same absolute gains in traffic-kilometers per employee as the railroads of the USSR. The US railroad laborer is still about 60 percent more productive than the comparable Soviet worker, and by 1965, if present traffic and productivity trends continue, each US railroad employee probably will still outproduce his Soviet counterpart by more than 50 percent. What this statement really means is that investment in modernization of railroads in both countries is paying handsome dividends in increased labor productivity. Because labor is a relatively more costly input in the US than in the USSR, it may be argued that greater increases in labor productivity are necessary in the US (see Table 8*). It will become increasingly important to the USSR, however, to keep its railroad labor requirement to a minimum as the labor supply

* Appendix A, p. 59, below.

becomes more critical. A reduction in the labor force for certain activities should not be difficult, because labor is used inefficiently and even lavishly in many instances on the railroads.

Current productivity gains in the US are now largely the result of improved signaling and mechanized maintenance of way, whereas the USSR still has much to gain from the changeover to diesel and electric traction, which probably will not be completed until about 1970.

Average annual earnings of US and Soviet railroad employees since 1950 have increased at a somewhat faster rate than productivity in the US and at a much lesser rate than productivity in the USSR. In both countries, however, the average railroad worker is paid better than the average worker in the economy as a whole.*

B. Highways

1. Administrative Organization

The administration of both freight and passenger motor transport and the highway network in the USSR is largely decentralized. If the element of private ownership is disregarded, it may be said that the administration of motor transport in the USSR is similar to that in the US, although there is in the USSR considerably more centralized control over the operating pools, especially in matters of policy. Responsibility for highway construction and maintenance also is considerably decentralized. Roads of "All-Union significance" are financed by direct centralized allocations. Each republic is responsible for the maintenance and development of all highways within its borders. Some of this responsibility is established at the republic level, and some is assumed by administrative districts within the republics. Kolkhozes and industrial enterprises also construct and maintain roads for their own use.

The administration and operation of the civilian freight motor vehicle inventory may be divided into the following four major categories: (a) common carrier, (b) agricultural, (c) industrial, and (d) trade. Responsibilities, subordination, and administration of the inventory of these vehicles have changed considerably in recent years. Common carrier trucking** is now subordinate to republic transport organizations and is being significantly expanded. A reorganization in motor transport in 1956 transferred vehicles from many ministerial pools to common carrier organizations. The reason given for this change was that the ministries were not utilizing their vehicles nearly

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** Common carrier trucking includes considerable contract trucking.

as effectively as the common carriers. Consequently, more transport and less expensive transport could be produced by expanding the common carrier system. The need for more effective control over unauthorized use of vehicles also probably influenced the decision. During 1953-58 the share of motor freight ton-kilometers performed by common carrier trucks increased from 8 to 24 percent, and by 1965 common carrier trucks are to perform 44 percent of the total 10/ (see Table 9*).

More recently, centralized industrial pools have been created within the sovnarkhozes from vehicles formerly owned and operated by individual enterprises, and the common carrier pools have been reorganized into larger units. In addition to operating at lower costs, the larger pools are believed to be more flexible and hence better able to meet shipper demands. Agricultural vehicles, formerly controlled by the machine tractor stations, are now controlled entirely by the kolkhozes and sovkhozes.

Practically all passenger service by motor vehicles is by common carrier. Intercity buses are administered by common carrier organizations of the republics, and taxis and urban bus organizations are controlled by the governments of the cities in which they operate.

2. Plant

a. Network**

Development of a good road system has been assigned a relatively low priority in the USSR. In 1950 the Soviet highway system had only 2 percent of the US mileage of paved roads.*** Total Soviet highway expansion during 1950-58 was equal to only about 75 percent of annual US expansion in recent years. There were still only 58,500 km of paved roads in the USSR at the end of 1958 (see Table 10†). Operating efficiency of motor vehicles often suffers because of adverse road conditions, and motor traffic is practically nonexistent in many areas that could benefit from such service. Service stations and repair points are few and far between, and their stock of spare parts is often inadequate. Planned expansion by 1965 is to increase the Soviet network of paved roads to only about 158,500 km. Even if construction is somewhat less than planned,†† the anticipated traffic load will not strain the capacity of the network.

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* Appendix A, p. 60, below.

** For a map of the highway network, see Figure 15, inside back cover.

*** Roads that are graded and surfaced with either a water-resistant material or a material that facilitates drainage.

† Appendix A, p. 61, below.

†† During the 5 years ending in 1955 the program for construction of new hard-surfaced roads was fulfilled only 65 percent. 11/

b. Vehicle Inventory

The motor vehicle inventory in the USSR has expanded rather significantly since the end of World War II, and annual production of motor vehicles is to increase from 511,000 in 1958 to a level of 750,000 to 856,000 by 1965.* 13/ The motor vehicle inventory by 1958 had reached 3.4 million vehicles, and if plans for increasing production are successful, the 1965 inventory will consist of about 5.4 million vehicles, an increase of about 57 percent above the level of 1958 (see Table 11** and the accompanying photograph, Figure 16). Although trucks will continue to make up the largest share of the inventory, production of passenger vehicles is expanding rapidly. Automobiles and buses together will account for about 25 percent of the inventory in 1965 compared with 10 percent in 1950.

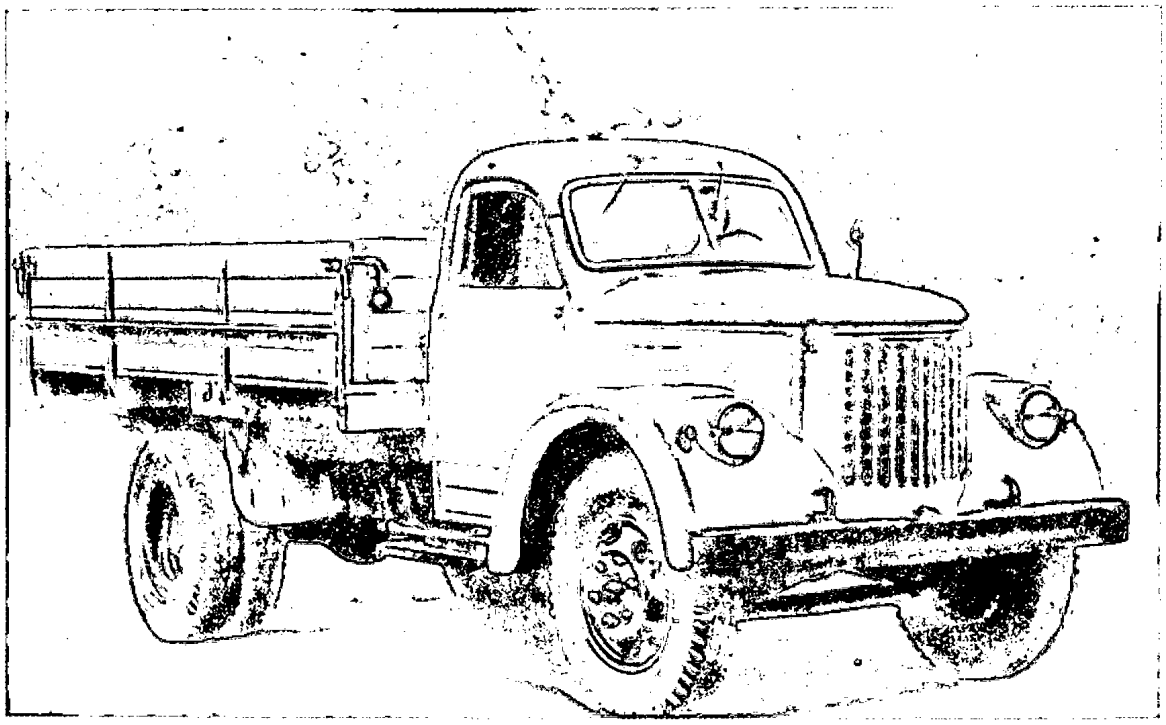

FIGURE 16. USSR: ZIS-355M Truck. This size of truck is typical of the current inventory, although limited numbers of larger and specialized types are beginning to be produced.

Recent expansion of the truck inventory has aided the growth and improvement of transport services to some extent, but the

* Although Soviet production of all motor vehicles is only about 10 percent of US production of all motor vehicles, Soviet truck production is 34 percent of US truck production, based on 1957 data. 12/

** Appendix A, p. 62, below.

quality and quantity of motor transport services are still below Western standards. Operating characteristics of some vehicles are poor, and there is a high degree of obsolescence as well as a lack of sufficient research and development. Too few types of vehicles are produced to satisfy the varied needs of industry and agriculture. The majority of trucks produced are 2.5-ton to 4.5-ton vehicles. The output of light, heavy, and specialized trucks is inadequate. Most of the vehicles in agriculture can utilize only 75 percent of their weight capacity, and trucks are used where trailers or semitrailers could be used to greater advantage. An analysis of truck types in 1956 recommended the following desired distribution:

Capacity	Percentage in the 1956 Inventory	Desired Percentage
1.5 tons and under	13	30
2 to 5 tons	85	60
Above 5 tons	2	10
Total	100	100

By 1958, most of the basic models of both trucks and passenger vehicles made in the USSR had been in production from 10 to 12 years. In recent years, new designs have been prepared and prototypes constructed which, if successfully introduced into serial production, should help alleviate some of the weak spots in motor transport.

3. Labor Force

Data are not available from which estimates of labor force and productivity of labor can be made for motor transport. The labor force is believed to be substantial. Although Soviet sources indicate that labor productivity has increased considerably in recent years, it is still believed to be very low as a result of the poor condition of highways and equipment.*

C. Inland Waterways

1. Administrative Organization

In June 1956 the administration of river transport, which had been centralized under an All-Union ministry, was transferred

* Labor productivity for common carrier operations increased by 48 percent between 1940 and 1950 and by 72 percent between 1950 and 1956. 14/

to the control of the individual republics. At the present time, in all republics except the RSFSR, the administrative organizations of river transport have the status of main administrations. Ministerial status has been retained in the RSFSR only. This ministry accounts for approximately 95 percent of the total freight ton-kilometers and 90 percent of freight tons originated on the inland waterways of the USSR.*

At the time of the 1956 reorganization the shipping activities of all private and state organizations (noncommon carrier), excepting those essential to their own productive needs, were transferred to common carrier steamship agencies. Before this change the volume of freight carried by noncommon carriers normally exceeded that of the common carrier organizations but was hauled for short distances only.

No substantial changes in Soviet river transport operations appear to have resulted from decentralization of river fleet management or from absorption of the noncommon carriers. The practical effects, if any, would scarcely be reflected in statistics available since that time, because of the dominating influence of river operations in the RSFSR on total river statistics in the USSR.

2. Plant**

a. Network***

The length of navigable rivers in the USSR is estimated to be 527,000 km, about 135,000 km of which were used in 1958 for river transport. River transport in 1950 operated on about 130,000 km, using navigation aids on 112,000 km, of which lighted aids were on 66,000 km. By 1965, river transport is expected to extend operations to 142,000 km. Common carrier steamships operated on 65 percent of the operating network in 1958.

In recent years, most new routes have been opened in the Siberian regions where the rivers are the longest and least utilized in the USSR because of short ice-free navigation periods and the presence of shallow beds, fast currents, and rapids. Exploitation of the eastern rivers, concurrent with the projected industrial growth of

* All coastal shipping, including that on the Caspian, is under the jurisdiction of the All-Union Ministry of the Maritime Fleet. Although that part of the total performance of the maritime fleet which is domestic has been included in the over-all performance data in this report, the maritime fleet is excluded from this discussion.

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*** For a map of the inland water network, see Figure 17, inside back cover.

this area, should account for the greatest share of new routes to be opened.

b. Fleet Inventory

In 1945-46 the river fleet in the USSR had 612,000 hp in self-propelled units and 4.2 million deadweight tons (DWT)* in non-self-propelled units, but about 40 percent of each fleet was inoperable or in limited service. By the end of 1959 the river fleet totaled about 1.6 million hp in self-propelled units, of which 45 percent were diesel propelled. Non-self-propelled units were estimated to total 8.6 million DWT, of which 54 percent were steel (see the accompanying photograph, Figure 18).

FIGURE 18. USSR: Timber Rafts Being Towed on the Kuybyshev Reservoir.

A large percentage of the existing fleet has always been out of service and undergoing repairs, thus imposing heavy demands on shipbuilding facilities, especially those of outside transport organizations on which the Ministry of the River Fleet was considerably

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

dependent. Because of high building costs, the scarcity of metal resources, and a limited capability for producing diesel engines in the USSR, ambitious plans for expanding the fleet with large numbers of new and modern ships were never fulfilled.

Detailed plans for future river fleet acquisitions are not available, but the relatively small increase in traffic projected for the period indicates that growth will be limited. The fleet, however, will be modernized to some extent. In 1959 a program was begun to convert the steamships built since World War II to diesel propulsion. By 1965 these ships should represent 84 percent of the total horsepower in the fleet. Obsolete wooden barges, replaced by metal ones, will be retired. By 1965, metal barges should account for 92 percent of the non-self-propelled tonnage. It is planned to increase the load capacity of the self-propelled cargo fleet by 320 percent. This is to be accomplished both by new construction and by converting non-self-propelled ships. In 1958, self-propelled cargo ships made up 12 percent of the dry deadweight tonnage and 2.3 percent of the oil deadweight tonnage. In 1965, 23 percent of the dry cargo fleets and 27 percent of the oil fleets will be self-propelled. Turnaround time of self-propelled ships is 2 to 2.5 times faster than that of non-self-propelled ships. Their over-all productivity is more than three times as great, and their operating costs are 25 to 30 percent lower.

3. Labor Force

Common carrier river transport organizations employ about 340,000 persons in the USSR, 8 percent more than in 1950. Less than 27 percent of this force is engaged in hauling cargoes -- that is, in actual operations. The remainder is employed in port operations, industrial enterprises belonging to river transport organizations, and other nonoperating activities. Increased labor productivity resulting from modernization of plant and equipment should keep total river transport employees to fewer than 370,000 persons (122,300 operating) through 1965. Not included in this total are employees of consumer organizations, who perform a large share of the loading and unloading.

The labor productivity of operating employees of the common carrier fleet increased only 7 percent by 1957 compared with 1950. By 1965 an increase of about 40 percent above the level of 1958 is planned, to an average of about 1.2 million tkm per operating employee.*

* In view of plans in progress to increase the use of push barges and diesel tows, both of which supposedly release crews and increase labor productivity, this low planned increase is surprising. Although labor productivity increased 20 percent in 1958, the average annual increase in the Seven Year Plan is only 4.9 percent.

D. Pipelines

1. Administrative Organization

The administration of petroleum pipeline transportation in the USSR, formerly controlled to a large extent by a main administration of the Council of Ministers of the USSR, has recently been decentralized. Responsibility for the administration of the entire system of trunk oil pipelines and oil distribution bases has been turned over to the republic councils of ministers. Organs subordinate to either the republic councils of ministers or the republic Gosplans have been given the responsibility for petroleum distribution and presumably, therefore, for operation of the pipelines. 16/

2. Plant

Emphasis on petroleum pipeline transport is relatively new in the USSR. The petroleum pipeline network consisted of only 5,400 km of trunk lines in 1950, none of which exceeded 14 inches in diameter or had capacities of more than 1.5 million tons per year. Three-fourths of these lines had been installed before World War II.* By the end of 1956 the length of the network had more than doubled, and 33 percent of the network (3,800 km) consisted of 20-inch pipe. 17/ By the end of 1959 the network had increased to 16,700 km, and substantial quantities of 28-inch pipe were being installed. Expansion of the pipeline network, however, has not occurred at anticipated rates. The 3,915 km of pipeline put in operation during 1956-58 were only 60 percent of the plan for the 3-year period. 18/ Lack of large-diameter pipes has been the major obstacle to network expansion (see the accompanying photograph, Figure 19).

FIGURE 19. USSR: Tuymazy-Irkutsk Oil Pipeline Under Construction.

* See Table 12, Appendix A, p. 63, below. Gathering lines that are employed extensively in the producing fields are considered to be industrial transport and not a part of the mainline system.

Original data from the Seven Year Plan indicated that network length was to increase by about 200 percent, to 43,000 km, by the end of 1965. More recently, a semiofficial Soviet source indicated that the goal may have been revised down to about 35,400 km, 19/ possibly because of difficulty in obtaining pipe. Of the six major trunklines under construction at the beginning of the plan period, three were of 28-inch diameter. 20/

The Soviet petroleum pipeline network is designed primarily to transport crude oil from the producing fields to the refineries, most of which are located in the vicinity of the fields. A large portion of the network, therefore, is characterized by relatively short crude oil pipelines. In 1958, about 84 percent of the total volume of petroleum shipped on the system was crude oil, and the average distance that all petroleum freight was pumped was only 357 km.

The heaviest concentration of pipelines in the USSR is in the Ural and Volga Regions, where about 65 percent of the tonnage carried by pipeline originated in 1958. Most of these pipelines also terminate within the area at the important refinery complexes of Kuybyshev and Ufa. The most important interregional pipelines also originate in these areas.*

The Seven Year Plan for expansion of the petroleum pipeline network consists primarily of a series of trunklines that are to transport crude oil from the Ural-Volga area to refineries which are either under construction or to be constructed in the major consuming areas. When the plan is completed, the longer interregional crude oil pipelines will have become the dominant feature of the network. It is estimated that the average distance that petroleum is pumped will increase from 357 km to approximately 1,100 km by 1965. The most ambitious of the planned pipelines is a system that is to originate at Kuybyshev and supply crude oil to refineries in the Ukraine, Belorussia, and the European Satellites and to the port of Klaipeda on the Baltic Sea. A petroleum product line to be built from Kuybyshev to Bryansk is already under construction between Syzran' and Penza.

Two additional pipelines of considerable importance, which are to be completed before 1965, will originate in the Volga area. One of these is the Al'met'yevsk-Chistopol'-Gor'kiy pipeline (probable diameter, 20 inches), which will be completed to Moscow via Ryazan' and to Yaroslavl'. The other line is a 28-inch crude oil carrier being constructed from Romashkino in the Tatar fields to Saratov via Kuybyshev. Plans for a pipeline from Stalingrad to Tuapse via Tikhoretskaya have been completed, and construction should commence in the near future.

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Although it has not been announced, it is more than likely that the line will be used to facilitate the southward movement of Ural-Volga crude oil. In the Urals, two intraregional crude oil pipelines are to be constructed. A second pipeline is being installed between the Shkapovo fields and the Salavat refining area, and a pipeline to the Orsk refinery to the south from Ishimbay is planned.

Of the four pipelines that now terminate in West Siberia, at least two are to become Trans-Siberian trunk lines. The gasoline pipeline that is completed to Novosibirsk is being extended to Irkutsk, and the second crude oil line now under construction is to be completed to the site of a refinery also under construction at Angarsk near Irkutsk. The crude oil line also will supply the refinery to be constructed at Bogotol in west central Siberia. This line is large enough to transport considerably more crude oil than the two new refineries will require. The excess capacity will be used to carry crude oil destined for Far Eastern consumption and possibly for export. A branch crude oil line is to be constructed from the vicinity of Omsk to the site of a new refinery at Pavlodar in northern Kazakhstan, and a branch product line is under construction from Chelyabinsk to Atbasar, also in northern Kazakhstan.

IV. Trends in Freight Traffic on Individual Carriers

A. Railroads

1. Freight Traffic by Major Commodity Groups

About 80 percent of Soviet rail freight traffic in ton-kilometers consists of the transport of a few bulk commodities -- coal, coke, wood, petroleum, mineral construction materials, ferrous metals, ore, and grain. Coal and coke account for more than one-fourth of total ton-kilometers. In 1958, wood and petroleum together accounted for another 26 percent. The commodity distribution of ton-kilometers and tons originated in 1950-58 is shown in Tables 13 and 14.* These bulk commodities, both as a group and individually, have changed their relative roles in total traffic only slightly over the years.

The average length of haul, by commodity, given in Table 15,** indicates why the share occupied by the individual commodity in total ton-kilometers differs from its share in total tons originated. The difference is particularly striking in the case of mineral construction materials, which account for almost 20 percent of tons originated but less than 9 percent of ton-kilometers.

* Appendix A, pp. 64 and 65, respectively, below.
** Appendix A, p. 66, below.

The most significant change expected in the commodity composition of Soviet rail freight traffic in the near future is a decrease in the relative importance of coal. Although the volume of coal (excluding coke) transported on the railroads is planned to increase from 457 million tons in 1958 to 552 million tons in 1965, the share of coal in total rail tonnage is to decline from 28 percent in 1958 to about 23 percent in 1965. Simultaneously the share of petroleum is scheduled to increase from 7 to 9 percent. If pipelines do not absorb much of the expected increase in the demand for transport of petroleum, the amount of petroleum moved by rail will be considerably greater. Planned loadings of various bulk commodities in 1965 are compared with loadings in 1958 in Table 14.*

Goals for ton-kilometers and average length of haul by commodity in 1965 are not available. It is known, however, that a decrease in the average length of haul of coal and an increase in the average length of haul of petroleum are anticipated, so that the change in the role of coal and petroleum in total rail traffic will be even more pronounced in ton-kilometers than in tons originated.

2. Freight Traffic by Region

The more densely populated and industrially developed western part of the USSR has always generated more rail traffic than the eastern, but the role of the eastern regions has been steadily growing (see Table 16**). The share of the eastern regions in total tons originated on Soviet railroads increased from about 28 percent in 1940 to 36 percent in 1955. This growth of traffic has been especially great in the Urals (Region VIII), Siberia (Regions IX and XI), and Kazakhstan (Region Xa).

During the Seven Year Plan an increase of about 47 percent in freight tons originated on the rail network as a whole is expected. Freight dispatched on the railroads of Kazakhstan is to increase by 120 percent, that on East Siberian railroads by 88 percent, and that on West Siberian railroads by 60 percent. 22/ Almost 40 percent of the total increment in loadings is to take place on the railroads of the Urals, Siberia, and Kazakhstan. 23/

B. Motor Transport

Since the late 1930's, motor truck transport has assumed increasing importance in the Soviet transport system. Throughout the postwar period the rates of growth of truck freight traffic have been

* Appendix A, p. 65, below.
** Appendix A, p. 67, below.

higher than those for rail and water transport. The importance of truck transport in the USSR is best illustrated by freight tons originated, for truck traffic is primarily short-haul, intracity, or farm to market or railhead and industrial traffic. The share of total tons originated performed by motor vehicles, which was 55 percent in 1940, increased from 66 percent in 1950 to 77 percent in 1958 (see Table 17*). Although motor vehicles will account for a large portion of additional tons originated, they will not be able to increase their own share significantly. In 1965, motor vehicles should account for about 78 percent of the total.

Motor vehicles do not carry a large volume of freight in long-distance transport. Although considerable growth took place in terms of ton-kilometers during 1950-59, motor vehicle performance in 1959 remained at about 5 percent of total inland transport performance (see Table 1**). The average length of haul during the period increased only from 10.8 to 11.9 kilometers (see Table 9***). The nature of motor freight traffic probably will remain substantially the same through 1965. The average length of haul for trucks is planned to be about 14 km for 1965, and the motor transport share of total performance will still be only 6 percent.

C. Inland Water Transport

River shipping in the USSR is slow and unreliable and is employed primarily for low-priority bulk cargoes. Use of river transport by shippers (with the exception of its use for rafted timber) is usually a function of the availability of other carriers. The share of river shipping in total freight ton-kilometers in the USSR was 6.7 percent in 1950 and had been reduced to 5.5 percent in 1959† (see Table 1**).

Cargoes carried on the Volga River and its tributaries (the Central Basin) account for 90 percent of the petroleum products, 51 percent of the rafted timber, and 60 percent of all dry cargoes carried on Soviet inland waterways. The long navigation seasons and even the river beds are suitable to long, deep-draft hauls, and both operating costs and tariff rates are relatively low. In the Siberian

* Appendix A, p. 68, below.
** Appendix A, p. 52, below.
*** Appendix A, p. 60, below.
† These data include that portion of performance of the maritime fleet which is domestic. This section, however, deals with freight handled by the river fleets only. Performance by ship in coastal and intercoastal traffic together with river shipping accounted for 9.4 percent of total inland traffic in 1950 and 7.7 percent in 1959.

regions the short seasons and adverse route conditions limit river shipping, but rivers are often the most important mode of transport because no alternate bulk transport facilities are available. At present, tons originated on Siberian rivers account for approximately 16 percent of the inland water total in the USSR (see Table 18*).

Inadequate ports and landings and a lack of suitable ships have resulted in low efficiency of river transport, and, in spite of the advantage of comparatively lower rates, shipment by rail and pipeline is usually preferred. In recent years, service problems have been increased as a result of changes in the waterways occasioned by the construction of power dams, particularly on the important Volga system. A reduction in currents and the creation of large reservoirs have slowed traffic and have made certain shipping practices obsolete. The practice of hauling a large share of the timber in the form of log rafts, at low rates to consumers and high profits to the shippers, has been especially affected. The equally profitable petroleum traffic also has been slowed. Other river shipping operations formerly were subsidized by profits from both rafted timber and petroleum.

Traffic goals announced for the current Seven Year Plan call for an increase of 64 percent in ton-kilometers and 50 percent in tons originated above the level of 1958. The planned rate of growth is consistent with past performance and probably will be carried out. It is significant, however, that the rates of increase for the 1957 and 1958 navigation seasons were higher than the average annual increases planned through 1965. The emphasis appears to be on increasing the number of long petroleum hauls and dry cargo hauls at the expense of a relative reduction in the haulage of timber rafts. This plan should be accomplished if sufficient self-propelled cargo ships are made available. Increases in river traffic by major commodity are shown in Table 19.**

D. Pipelines

In 1950, mainline petroleum pipelines*** accounted for less than 1 percent of total tons originated and ton-kilometers performed in inland transport in the USSR. During 1951-58, tons originated increased at an average annual rate of 26 percent, and ton-kilometers increased at an average annual rate of 27 percent. In 1958, tons originated and ton-kilometers represented 1.1 and 2.2 percent, respectively, of the totals for all inland transport (see Tables 1, 12, and 17†). Data for the Seven Year Plan specify that ton-kilometers

* Appendix A, p. 69, below.
** Appendix A, p. 70, below.
*** Field gathering lines are excluded.
† Appendix A, pp. 52, 63, and 68, respectively, below.

performed by pipelines are to increase to about 185 billion and will constitute 7.8 percent of the total in 1965. An average annual rate of increase of about 27 percent will be necessary to achieve this goal. Performance during 1959 showed an increase of 23 percent above the level of 1958. Tons originated are scheduled to reach about 170 million tons in 1965 and will comprise 1.3 percent of total freight originated.

The growing significance of pipeline traffic also may be illustrated by a comparison with the petroleum traffic of other carriers.* The share of pipelines in the total tons of petroleum originated increased from 18 percent in 1950 to 37 percent in 1958. It is estimated, however, that the share of each mode of transport in the total will not be altered substantially during the Seven Year Plan. In 1950, pipelines performed 6 percent of petroleum ton-kilometers and in 1958 increased this performance to 14 percent. The 185 billion tkm to be performed by pipelines in 1965 should account for 30 to 34 percent of the total petroleum traffic. 24/

In 1950, pipelines originated cargo equal to 40 percent of the total crude oil extracted in that year, yet performed only 6 percent of total petroleum ton-kilometers by all modes of transport. In 1958, pipelines originated cargo equal to 83 percent of total extractions and performed 14 percent of petroleum ton-kilometers. The average distance that petroleum is pumped declined from 320 km in 1950 to a low of 257 km in 1954. The distance had increased to 374 km in 1959. If the ambitious construction program of the Seven Year Plan is completed on schedule, the average distance that petroleum is pumped on the network in 1965 should be approximately 1,100 km (see Table 12**).

Average network traffic density has increased considerably because of the increased use of large-diameter pipes. Density increased from 0.9 million to 2.3 million tkm per kilometer of line between 1950 and 1958 and is expected to reach 4.3 million tkm by 1965.

V. Operating Efficiency

A. Railroads***

Soviet railroad operations are characterized by the concept of maximum utilization of the freight car. Success in the accomplishment of this objective is much more attainable under the conditions encountered in the USSR than in the US. Concentration in the origin and

* Motor vehicle transport of petroleum is small in volume and local in character and is therefore excluded from this discussion.

** Appendix A, p. 63, below.

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termination of tonnage as a result of the location of resources, the manufacturing capacity, and the urban population in a limited number of major centers has made the Soviet problem one primarily of handling long-haul carload business originating and terminating at a limited number of major points. The traffic mix includes higher proportions of bulk commodities and lesser proportions of manufactures than in the US. With few competitive or alternate routes, a minimum of branch lines, and no shipper control over routing, it becomes easy to minimize intermediate yard work. There also is, in sharp contrast to US practice, effective pressure on shippers to accept and unload freight immediately. Soviet seasonal variations also are much less marked than those in the US.

The highly concentrated and remarkably even flow of traffic, resulting in exceptionally high traffic densities, has created ideal conditions in the USSR for intensive utilization of plant. Requirements of a competitive economy resulted in the US railroad plant being substantially overbuilt both to encourage traffic generation and to handle peak demands over which the railroads have no control.

Results of the conditions described above are clearly reflected in certain key operating indexes (see Tables 20 and 21*). Soviet freight car turnaround time, which has been reduced almost steadily since World War II, was reported to be 5.83 days** in 1958. Freight car turnaround time in the US is about 15 days and has never been much below 11 days. Most of the difference is accounted for by loading and unloading time for shippers, with some lesser time required in yards and terminals in the USSR. The average operating freight car in the USSR spends 34 percent of its time in trains between terminals, whereas the average operating freight car in the US spends only 10 percent of its time in trains between terminals.

Gross ton-kilometers per freight train hour, generally regarded as the best single index of line-haul efficiency, increased by 82 percent during 1950-58 in the USSR. US performance in this respect is still more efficient than Soviet performance, principally because of longer, heavier trains and higher average speeds in the US. Acquisition of more powerful electric and diesel locomotives, considerable upgrading of existing steampower, lengthening of sidings, and improvement of signaling and yard facilities are planned to enable the USSR to increase efficiency in terms of gross ton-kilometers per freight train hour by 42 percent from 1958 to 1965. Diversion of extremely short-haul traffic from the rail system to motor transport, together

* Appendix A, pp. 72 and 73, respectively, below.

** Soviet statistical methods tend to understate this figure, but it is nevertheless significantly less than its comparable US counterpart.

with technological developments, should continue to develop more favorable operating indexes through 1965.

B. Motor Transport

1. Utilization of Equipment

The operating efficiency of Soviet motor vehicles is very poor. Nearly one-half of the civilian motor park is chronically unfit for service, and trucks and buses are more often than not engaged in hauling traffic for which they were not designed. Partly because of the short-haul nature of Soviet trucking, it is difficult to provide back haul, and nearly 50 percent of truck-kilometers are run empty, as shown in the following tabulation 26/:

	1940	1950	1955	1956	1957	1958
Serviceable vehicles (percent of total)	39.0	48.0	52.0	54.4	56.9	60.8
Utilization of vehicle kilometers (percent of total truck-kilometers that run loaded)	55.0	53.7	52.5	53.0	53.5	53.1

Repair facilities, supplies of spare parts, and trained personnel have not been adequate to meet requirements. Although these shortcomings have long been recognized as a handicap to efforts to increase motor vehicle operating efficiency and decrease operating costs, few effective measures have been taken to alter the situation.

The consolidation of motor pools that began recently has alleviated the situation somewhat by making possible the application of mass repair techniques, which could not be used previously. Consolidation also has improved utilization by reducing empty runs to some extent and by increasing the size of loads carried.

During 1959-65 the expanding motor freight traffic is to be handled by increasing the average volume of ton-kilometers performed per vehicle by 32 percent. Ton-kilometer performance of civilian trucks is to increase by 90 percent with an increase in inventory of only about 20 percent.

2. Utilization of Network

Most of the good roads in the USSR have only recently been constructed, and their full capacity has not yet been developed. Given

the modest increment in intercity movement expected, this situation should continue through 1965. In most cases, highway construction is undertaken not because maximum density has been reached but rather to permit the existing or proposed future traffic levels to operate more efficiently. In some cases, construction is simply a matter of providing a passable road. There is a pressing need for farm-to-market highway links. Even within urban and industrial centers, traffic is not heavy, and, except in a few large cities, it has not been necessary to increase the traffic capability of city streets.

C. Inland Water Transport

1. Utilization of Equipment

During 1950-55, all utilization indexes for tugs with rafts and for petroleum barges showed declines except in technical speeds.* The increase in technical speeds, however, does not necessarily indicate faster deliveries, because the over-all operating time of ships between terminal points has increased. The faster running time probably can be traced to the acquisition of new diesel tugs, push tugs, and metal barges that are speedier and can operate more effectively when underway. There are no detailed breakdowns available after 1955, but 1958 productivity figures for tugs with rafts and for petroleum barges indicate that tug utilization per horsepower continues to decrease, while the productivity of petroleum barges per deadweight ton increased to the 1950 level. The productivity of dry cargo barges has slowly, but consistently, increased during this period.

The general decline in performance of the river fleet may be explained by a number of factors. Decreased loadings per horsepower and deadweight ton unit may have been caused by surplus shipping capacity stemming from an inability to attract traffic or by a deliberate reduction in loads (particularly timber rafts) in order to insure tugs better control of their tows. Navigation probably has deteriorated to such an extent that a large proportion of the ships are incapable of maintaining or achieving efficient operations under existing circumstances. Although the declines noted are not drastic, they will continue until ships suitable for shipping under lake and reservoir conditions are provided.**

* Technical speed is the average speed of movement between terminal points and includes only the net running time. Route speeds -- or the gross running time -- of a ship operating between terminal points include all delays en route.

50X1

2. Utilization of Network

On river networks of the USSR the average freight density* is approximately 1 million tkm per kilometer of route. The Volga has an average density of 10 million tkm, but some of the longer Siberian rivers average less than 400,000 tkm. Freight increases scheduled for 1959-65 are relatively higher for the eastern regions, which should result in increasing utilization of the Siberian networks. Average freight density should total about 1.5 million tkm per kilometer of route by 1965.

D. Pipelines

Although the USSR has been successful in achieving substantial annual traffic increments on its petroleum pipeline system for a number of years, analysis of operating indexes and literature on pipelines indicates that the low level of pipeline technology has been an obstacle to even more significant increases. In constructing the pipelines, emphasis has been placed on getting the pipelines into the ground and ready for low-pressure operation. Relatively less attention has been given to increasing traffic by the installation of more and better pumping and control facilities.

The diameter of pipe used in the construction of new petroleum pipelines in the USSR is excessively large when the other factors that determine capacity are considered. This situation is contrary to current Western design practice in which operating capacities are high relative to pipe diameter. Soviet pipelines of 15-inch, 20-inch, and 24-inch diameters are planned for capacities of 3 million, 7 million, and 10 million to 12 million tons, respectively, per year. 28/ US experience indicates that pipelines of these diameters operate most economically when used at capacities of about 5 million, 10 million, and 12 million to 15 million tons, respectively. 29/

The installation and operation of pipelines at even the low capacities presently planned are goals that are not now being met in

* Freight density figures used in this report are derived from ton-kilometer performance of common carrier river transport steamship agencies and the length of route operated by them during given navigation periods. Figures for noncommon carrier operations are not available. An accurate estimate of river network utilization in the USSR is complicated as a result of the inclusion in river statistics of some coastal traffic performed by some inland waterway agencies and the exclusion of river route lengths where common carrier deliveries may not have been carried out. The extent of these variations, however, should not substantially alter the estimates made above.

the USSR. This situation is largely due to shortcomings in production and installation of pumping facilities. The inability to coordinate new refining capacity with pipeline completion dates and inadequate storage and distribution facilities contributes to the problem. During 1956, only 5 of the planned 22 pumping stations were built. 30/ This situation has not improved. In 1958, one pumping station was completed for operation. Automatic control systems have been limited to one or two lines and must be considered experimental.

In 1955 the level of utilization of designed capacity of the network was 74 to 75 percent, and in 1958 the network operated at only 68.2 percent of designed capacity. 31/ Full utilization of existing capacity is apparently not planned until some time after 1965. Although emphasis is being placed on pipelines as a method of relieving the railroads of much burdensome long-haul freight, the savings will not be as great as they might be, because of the low technical level of installation and utilization of the pipelines.

Consideration of the problem of steel allocation in the Soviet economy and of the fact that pipe-producing capacity has not been able to keep up with pipeline construction makes it seem reasonable to assume that the over-all design of pipelines and production and installation of pumping facilities are hindering and will continue to hinder the application of the improved petroleum pipeline technology necessary for a high level of operating efficiency.

VI. Rate Structures and Policies

A. Railroads*

Before World War II and during the immediate postwar period the general direction of Soviet rail rates had been upward in order to help achieve solvency. The revision of rates on 1 January 1949, which was intended to enable the railroads to support themselves at current levels of traffic, brought the rates to a level 68 percent 33/ above that of 1939. Since 1949, freight tariffs have been revised six times, generally downward. By 1955 the rates had decreased 30 percent and stood at about 21 percent above the level of 1939. 34/ At the same time, the railroad operating ratio has improved steadily every year since 1949 (see Table 22**). This improvement has been possible because unit operating costs declined even more rapidly than unit operating revenue throughout the period. Cost and profit data in the Seven Year Plan indicate that rates will be held at current levels

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** Appendix A, p. 74, below.

rather than continuing to decrease as costs decrease. Essentially this situation indicates the establishment of a new rate policy, which, in retrospect, can be seen to have developed during the past few years. Railroad revenues in the USSR have been sufficiently high to accrue operating surpluses that not only cover capital investment in rail transport and other nonoperating expenses but produce net surpluses that accrue to the central budget for allocation to other carriers or other sectors of the economy. The new financial policy appears to be designed to increase operating surpluses rather than lower rates. Results obtained from this policy are contained in the discussion of profits and surpluses.*

Rate structures, in addition to influencing the financial status of the railroads by their general level, also have been used to influence economic development. The latter has been accomplished by so constructing rates and rules as to influence traffic patterns and marketing areas. Another device for influencing industrial development has been the use of preferential rates for industrial raw materials and producer goods at the expense of consumer goods and passenger traffic.** In effect, this policy has amounted to a subsidy to heavy industry or a hidden tax paid by the consumer (see Table 23***).

The new system of rates introduced in 1949 generally accentuated certain distinguishing features of the 1939 rates.† Restriction of marketing areas for most industrial commodities continued. These restrictions were achieved by increasing the charge per unit of distance as the distance increased after the agreed optimum haul had been reached. 35/ For certain commodities, chiefly coal, petroleum, and mineral construction materials, a combination of prohibitive surcharge rates and exceptions was introduced to control the market area. 36/ The surcharge rates of between 50 and 100 percent established tariff barriers at traffic divides, which usually persuade the purchasing

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* See VII, p. 40, below.

** Although there is a tendency in other countries for bulk commodity rates that are essentially industrial to be lower than consumer goods rates, the extent of the discrepancy is very seldom as great as in the USSR.

*** Appendix A, p. 75, below. This table shows average revenue rates for selected commodities as a percent of unit costs of railroad freight traffic for selected postwar years. The data presented indicate the differences between commodities that are essentially industrial and consumer goods.

† In 1942, certain special reduced rates that favored heavy industry were abolished. Military shipments, which had been exempt from paying freight charges, lost their privileged position and were treated as normal commercial traffic.

industry to resort to local sources of supply. In practice the use of surcharge rates and exceptions has been more effective than the manipulation of distance rates.

Heavy industry lost more of its privileged position in the 1949 revision. The freight rates for industrial raw materials and producer goods were increased relatively more than those for consumer goods. In spite of the disproportionate change, revenues from consumer goods and passenger traffic continued to account for most of the operating surpluses.* The rates for most industrial commodities were simply brought closer to their transport costs, whereas rates for consumer goods remained considerably above their transport costs. Passenger fares, which were at their peak in 1948, also have declined since 1949, although not as much as freight rates. In 1951 suburban fares were reduced and the use of season tickets was increased.

Railroad rates, which are applied to such a large portion of the total inland traffic moved, provide a natural base on which rate systems for the less developed modes of transport can be built. In instances where it is desired to divert traffic from the railroads to another mode of transport and where the rail tariff is low enough to compete with the costs of the alternate mode, increases and penalties are applied to bring about the desired results. Rate structures thus also are used as an instrument for preserving the noncompetitive, maximum-use aspect of Soviet transport.

B. Motor Transport

Motor freight traffic in the noncompetitive transport system in the USSR is assured not so much by the motor freight rate structure as by certain other factors. Because of the relatively limited extent of railroad and water networks in the USSR and because of the fixed nature of railroad and water networks in general, certain hauls must necessarily be made by motor vehicles. Also, a penalty rate for rail shipments under specified distances tends to force shippers to use motor vehicles for short hauls even when railroad service also is available.

In general, however, the rate structure for motor freight traffic is not unreasonably high. It is believed that the motor vehicle rates are sufficiently high to cover operating costs in most instances.** If the cost reductions that are now forecast occur, considerable profits will result. These profits probably will be

* The consistently low operating ratios for passenger service are shown in Table 24, Appendix A, p. 76, below.
** See VII, p. 40, below.

reinvested in motor transport, although a rate reduction also is a possibility.

C. Inland Water Transport

The current tariffs for inland water transport, which became effective on 1 January 1957, represent the first complete revision of the river freight rate structure since 1940. The new tariff, in addition to adjusting rates to bring them closer to costs, simplified rate-making and made more rational the application of the rate policies already in existence.

Several elements of rate policy are evident in each of the tariffs and in the changes from one to the other. Unlike railroad rates, which apply to the whole network, river rates vary from one steamship company to another. Before 1957, rates varied from one river to another.* In general, the level of rates applicable to a given steamship company bears some relationship to operating costs. Rates, which are generally lowest in the Volga Basin, become higher as one progresses from the Volga Basin to other river systems northward and eastward. Thus the Lena and Pechora Rivers have the highest rates and the highest costs. 37/ Unlike rail rates, there is no attempt to limit length of haul, and almost without exception charges per unit of distance decrease as the length of haul increases.

Rates applicable on waterways that are connected with or are parallel to railroad lines are manipulated so as to induce shippers to utilize water transport as much as possible. There are 68 exception rate classes, which are grouped under two categories and which apply to shipments between ports, also connected by railroads. One category is for through water traffic, and the other category is for the water part of combined rail/water through shipments. The rates are computed at a certain percent below the rail rate for the all-rail distance between the ports -- that is, 10 to 20 percent below the rail rate in the case of through water traffic and 20 to 50 percent below the rail rate for combined through rail/water traffic where a through water route is not available. 38/

Great success has been claimed for the policy. The volume of combined hauls had already increased considerably before the introduction of the new tariff. Between 1946 and 1957 the volume increased 200 percent. In 1958 alone, combined hauls increased 35 percent and accounted for 20.6 percent of all freight hauled. 39/

As a result of the policy of giving inducements to water shipments and the relatively low level of rates, substantial operating

* Steamship company lines generally coincide with individual rivers.

losses are incurred each year on dry cargo shipments. The deficit is made up by revenues from oil and rafted timber traffic, the rates for which, although low, are significantly higher than the very low operating costs. The following operating ratios for the various types of freight computed from 1950 plan data are illustrative 40/:

	Kopecks per Ton-Kilometer		
	Revenue	Cost	Operating Ratio
Rafted timber	2.2	1.4	63.6
Oil	4.2	2.4	57.1
Dry cargo	5.9	7.2	122.0
All freight	4.0	4.0	100.0

Subsequent changes in the structure of freight and rates have not significantly altered the situation.

D. Pipelines

Pipelines in the USSR are owned and operated by the petroleum industry. For this reason, no rates for the transport of petroleum have been announced, and none is believed to exist.

VII. Costs, Revenues, and Profits

A. Railroads

Unit operating costs,* probably the most useful single indicator of changes in over-all operating efficiency, have decreased spectacularly for a number of years on Soviet railroads. Because concurrent decreases in unit operating revenue have been less, the operating ratio** for both freight and passenger service has declined sufficiently for the railroads to move from a position of financial dependence to a position of financial independence during the past decade. Unit operating costs for combined freight and passenger service decreased about 36 percent, from 5.252 to 3.349 kopecks per traffic-kilometer, between 1950 and 1958. Unit operating costs for freight

* The cost of performing 1 ton-kilometer or 1 passenger-kilometer.

** The operating ratio (operating costs as a percent of operating revenues) illustrates the relationship between operating income and expenditure. The operating ratio is used as an indicator of financial condition resulting from operations alone and does not include nonoperating income or expenditures such as taxes and investment.

service declined about 40 percent, from 4.861 to 2.930 kopecks per ton-kilometer, and unit operating costs for passenger service declined about 16 percent, from 8.058 to 6.793 kopecks per passenger-kilometer. Unit operating costs for combined service are expected to decline 21 percent, to 2.64 kopecks per traffic-kilometer, during 1959-65 (see Tables 22, 24, and 25* and the chart, Figure 20**).

As a result of declining unit costs, obtained by modernization of plant and equipment, Soviet railroads have been able to handle a spectacular increase in traffic and at the same time hold increments to total cost of their services to a minimum. Between 1950 and 1958, performance in terms of traffic-kilometers increased at an average annual rate of about 10 percent, whereas total operating costs increased only 3.8 percent per year. It is estimated that operating costs will increase only 10 percent by 1965, whereas traffic will increase by nearly 40 percent.

Operating revenue per traffic-kilometer declined somewhat during 1950-58 as a result of tariff changes and changes in the general composition of freight and traffic patterns. As a result of traffic increases, however, operating revenues increased at a much faster rate than costs. The operating ratio for combined freight and passenger services declined from 85.2 to 71.9, and total operating profits grew accordingly, from 6.3 billion to 19.1 billion rubles. Most of the decline in the combined ratio was due to consistent decreases in the ratio for freight service, which was lowered from 90.2 to 73.3. The ratio for passenger service remained at approximately 70 throughout the period. Until very recently, high passenger receipts were used to offset low income from freight operations. In 1950, profits from passenger operations accounted for 50 percent of total operating profits. By 1958, however, profits from passenger operations had dropped to 25 percent of total operating profits.

By the end of 1953, total profits had increased sufficiently to provide a net surplus of 363 million rubles for the year.*** Deficits had occurred for several years before 1953. Since that year the net surplus has increased steadily. By 1958 it had reached 9.8 billion

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* Appendix A, pp. 74, 76, and 77, respectively, below.

** Following p. 42.

*** The net surplus or deficit indicates the financial status of the railroads after payments to and allocations from the state budget. The railroads pay to the state budget from profits, from funds resulting from the sale of property, and from the turnover tax and receive from the budget funds for capital investment and expansion of working capital. In short, net deficits are covered by the state budget and net surpluses accrue to the state budget. Table 26, p. 78, below, shows profits surpluses and deficits for 1950-59 and the 1965 Plan.

rubles and was planned to increase to 12.2 billion in 1959. It is expected that by 1965 the annual surplus will reach 22 billion rubles and that during 1959-65 a total of 121 billion rubles will accrue to the state budget for allocation to other sectors (see the chart, Figure 21*).

B. Motor Transport

The only published financial data on motor carriers are operating costs. It is not known, therefore, to what extent motor vehicle operations are profitable and to what extent capital investments are self-financed.**

Motor vehicle operating costs are high as a result of certain technical and organizational weaknesses*** but have undergone some decline in recent years. Between 1950 and 1956, operating costs decreased one-third, to 70 kopecks per ton-kilometer for all motor freight carriers 41/ and to 49 kopecks per ton-kilometer for the common carrier park. 42/ As a result of reductions in operating costs, the annual cost of motor freight service has increased much more slowly than traffic turnover. Total operating costs increased 62 percent, from 21 billion rubles in 1950 to 34 billion rubles in 1956, whereas freight turnover increased 141 percent during the same period.

The high total cost of motor freight service also indicates the importance of the service in the economy, as do tons originated. In 1950, total operating expenditures by motor freight carriers were 72 percent of the total operating expenditures by railroads, and by 1956 these expenditures had increased to 95 percent.

C. Inland Water Transport

Attempts to reduce unit operating costs of inland water transport have been less successful than for railroad transport. Although plan data have consistently indicated that costs would be lowered, relatively little actually has been accomplished. Serious underfulfillment of investment plans and changing navigational conditions have been largely responsible.

Between 1950 and 1958, costs per traffic-kilometer decreased 24 percent. During the same period, unit costs for railroad transport decreased more than 36 percent. Data for the Seven Year Plan specify that operating costs are to be lowered about 24 percent during 1958-65.

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* Following p. 42.

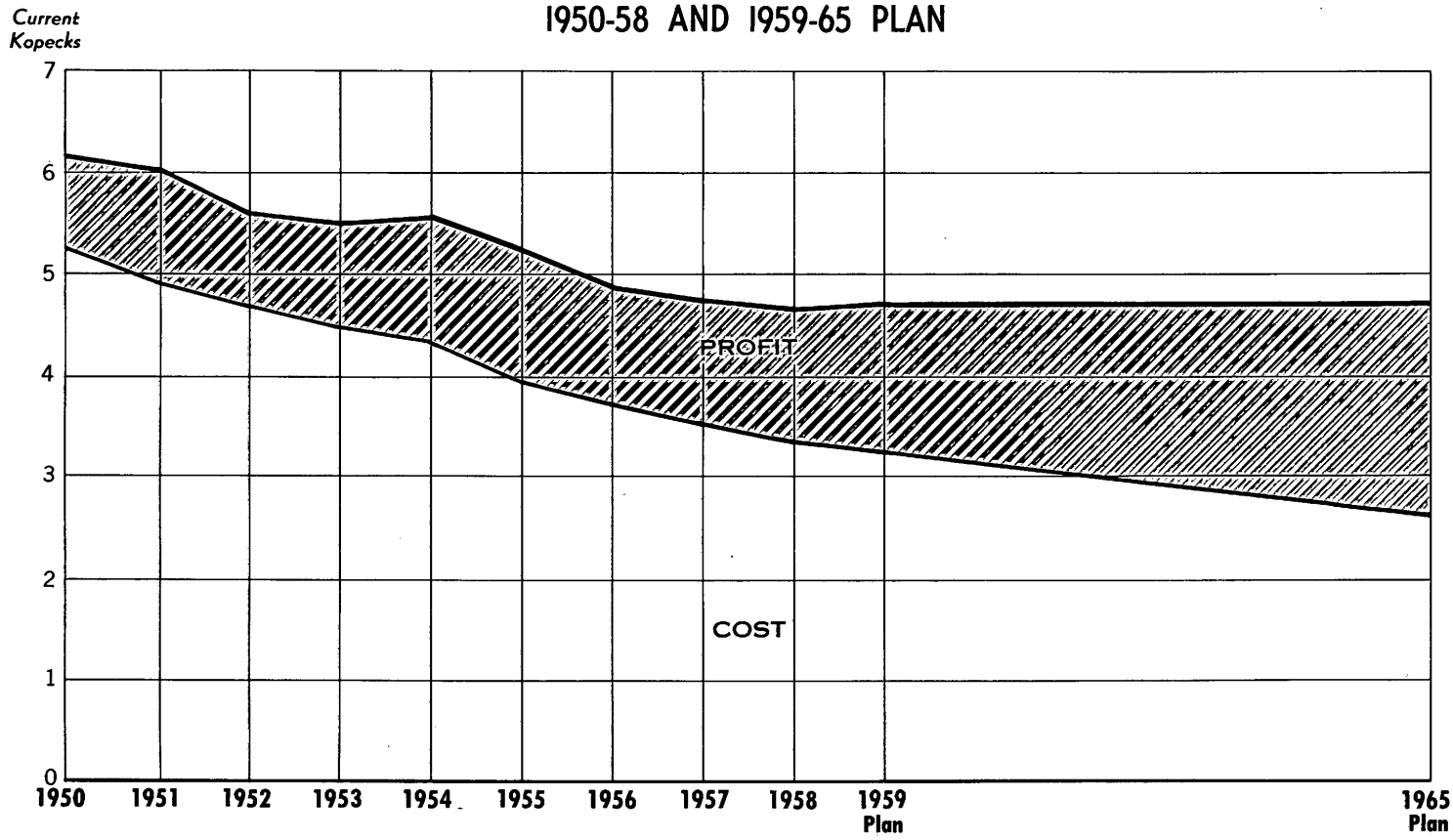
** Analysis of the motor vehicle freight tariff and composition of freights suggests that operating income is slightly higher than operating costs.

*** See V, B, p. 33, above.

Figure 20 50X1

USSR

PROFIT AND COST SEGMENTS OF UNIT REVENUE OF RAILROADS 1950-58 AND 1959-65 PLAN



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29365 12-60

Figure 21

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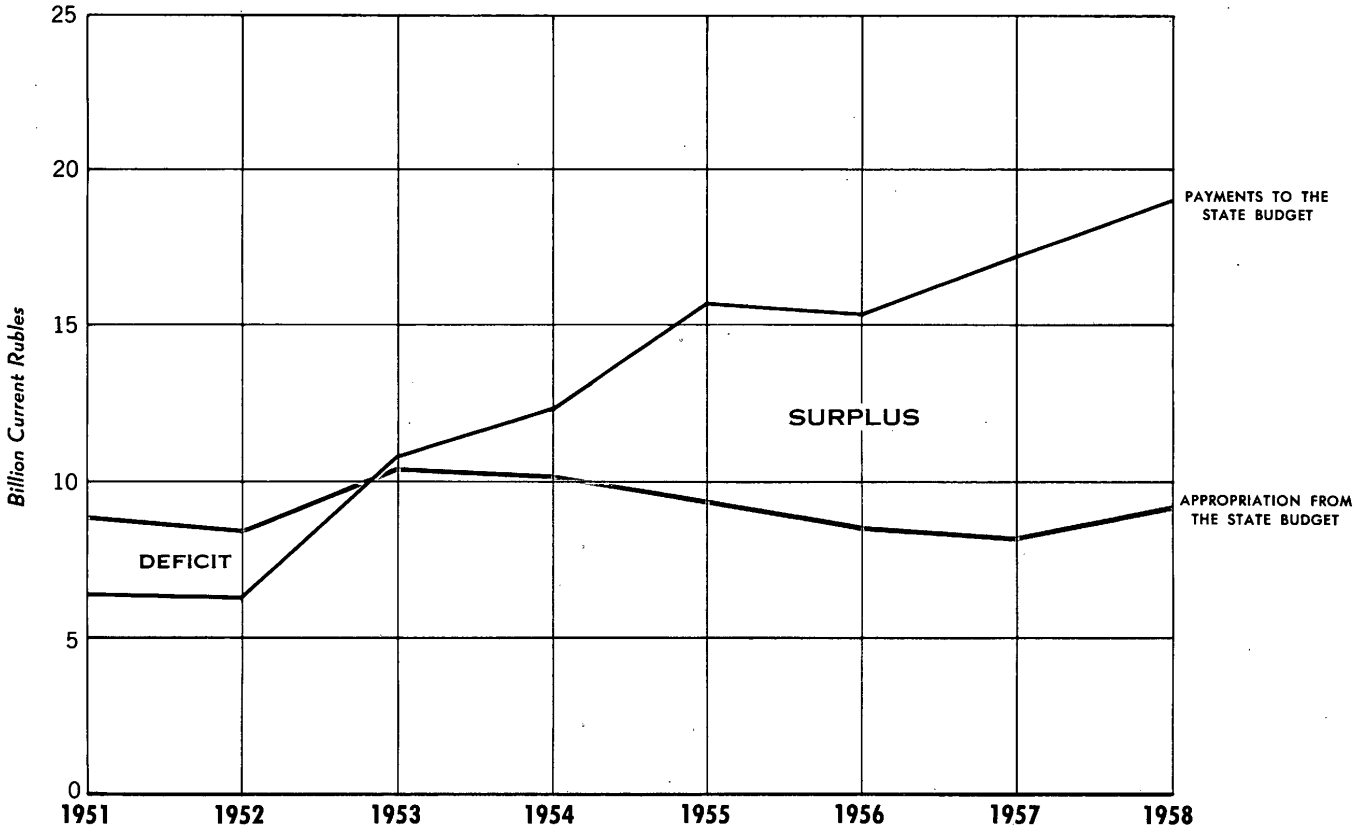
USSR

NET CONTRIBUTION OF THE MINISTRY OF RAILROAD TRANSPORTATION TO THE STATE BUDGET, 1951-58



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This reduction will be possible only if the investment plan is adhered to strictly.

The relationship between inland water operating costs and railroad operating costs indicates the seriousness of the cost problem. In 1950, unit operating costs for inland water transport were only 79 percent of those for railroads. By 1958 they had risen to 94 percent (see Table 27*).

Operating ratios for inland water transport are very high as a result of relatively low tariffs and high operating costs. The ratio exceeded 100 until 1953, and in 1957 the ratio was still above 95.** The inland water fleet incurred operating losses throughout the postwar period until 1954. Since that year, there have been small operating profits. These profits have not been sufficient, however, to offset other nonoperational expenses. In order to cover all such expenses, it would be necessary to lower the operating ratio, currently above 90, to about 85.

Capital investments in inland water transport are completely subsidized through the All-Union and republic budgets. It is not likely that the inland water fleet will become financially self-sufficient in the foreseeable future, as the operating ratio would have to be lowered to about 57 to bring this result about. 43/

D. Pipelines

As a result of accelerated network expansion and the use of larger diameter pipes that are potentially more efficient, operating costs of petroleum pipelines have decreased faster than those for other modes of transport. Consistent cost data for petroleum pipeline operations, which are available for 1954-56, indicate that the unit cost decreased 31 percent, from 2.38 to 1.65 kopecks per ton-kilometer, for these 3 years alone. 44/ Thus although the number of ton-kilometers performed doubled during the 3-year period, total operating costs increased only 39 percent.

Because of certain technical and operational difficulties, operating costs are still higher than they should be. Operating costs for petroleum pipelines of a given diameter and annual throughput for the USSR and the US indicate that unit operating costs in the USSR are about one-third of the average cost per rail ton-kilometer and such

* Appendix A, p. 79, below.

** Operations on the Volga-Kama River system, where most of the traffic is handled, are somewhat more profitable than the over-all ratios indicate.

costs in the US are only about 7 percent of the average cost per rail ton-kilometer. 45/

No tariff or revenue data have ever been found for Soviet petroleum pipelines. Inasmuch as the pipelines are not common carriers, Soviet planners probably consider cost to be the only measure of price paid for the transport of petroleum by pipeline in the USSR.

VIII. Capital Inputs and Productivity

A. Capital Allocations

The term capital allocations as used in this report is a Soviet financial term describing the total disposable financial resources available to the economy or any of its sectors. These allocations provide funds for new fixed investment; expansion of working capital; capital repairs; and various other outlays, including health, welfare, housing, and education. Funds for capital formation are made from the state budget and from internal organizational funds. Sources of funds allocated through the budget are primarily state accumulations from the turnover and profits taxes. Sources for organizational allocations are primarily amortization allowances, retained profits, and surpluses resulting from savings in investment costs.

The portion of total allocations made available to the transport and communications sector has decreased significantly in recent years (see Table 28*). Between 1950 and 1953, estimated allocations to this sector alone** averaged nearly 14 percent of total investment in the Soviet economy. In 1958 and 1959 these allocations had dropped to 7.8 and 9.9 percent, respectively. The relative significance of allocations from the state budget alone to the transport sector has declined, although the allocations have not decreased absolutely. During 1951-55 they averaged 8.6 percent of total state budget allocations, and since then they have averaged 7.1 percent.

B. Capital Investment, Fixed Assets, and Capital Productivity

The Soviet economy has developed a policy of minimum capital investment in transport. In general, Soviet practice has been to use relatively large amounts of labor to keep equipment in operation for much longer periods before overhaul or retirement than is the practice in Western Countries and to increase the capability of the existing network while holding construction of new lines to a mimimum.

* Appendix A, p. 80, below.

** Communications have generally taken from 3 to 5 percent of the total allocated to transport and communications.

Only limited manufacturing and construction capacity has been allocated to transport, although the demand for transport services by the economy has increased rapidly. A reversal of these trends is not envisioned in the near future. The increases in capital investment planned for the Seven Year Plan period are modest when consideration is given to the expected levels of transport performance and to investment increases in other sectors of the economy. A consequence of the investment program is the strong tendency to continue to increase over-all traffic density on the existing carrier network.

In recent years, there has been a tendency to increase nonrailroad investment faster than railroad investment. This trend has occurred mostly in motor transport, in order to relieve the railroads of costly short-haul traffic, and in maritime and inland water shipping, together with petroleum pipelines, in order to relieve the railroads of burdensome petroleum traffic.

Absolute capital investment in transport has increased throughout the period of Communist control. However, the relative share of investment in the national economy accruing to transport has declined. Table 29* shows estimated capital investment in transport and communications and the share of total investment allocated to transport, by plan period.

Average annual investment in transport and communications during the immediate prewar years was 8.5 billion rubles, or about 20 percent of total investment. During the Fourth Five Year Plan (1946-50) and the Fifth Five Year Plan (1951-55), average annual investment rose to 9.6 billion and 13.2 billion rubles, respectively, but these figures as a percent of total investment dropped to 14.2 percent and 10.1 percent, respectively. During the first 2 years of the original Sixth Five Year Plan, investment in transport and communications continued to increase, averaging 17.9 billion rubles per year. At the same time, the share of total investment declined to 9 percent. Investment data for the Seven Year Plan indicate that the share of total investment that will go to transport is to remain at about the present level and that an annual average of about 30 billion rubles is planned. The budget figure for 1959 was 23.3 billion, and the investment plan was exceeded.

Although the data that are readily available are not completely comparable, valid investment comparisons can be made between the USSR and the US that confirm the relatively low level of investment in transport in the USSR. The share of US investment that went to transport remained constant at about 19 percent between 1951 and 1957. In 1958

* Appendix A, p. 81, below.

and 1959 the percentages increased sharply to 22 and 25 percent, respectively, because of stagnation in general investment and increases in highway building programs. During the same decade, Soviet transport investment averaged 11 percent of total investment, with a slight downward trend (see Table 31*). In absolute figures, annual transport investment in the US averaged $6.5 billion during 1951-57. On the basis of a 5.5-to-1 ruble-dollar ratio, comparable annual investment in the USSR amounted to about $3.3 billion.**

As a result of the relatively low level of investment in transport, the transport share in total Soviet fixed assets has declined throughout the period of Communist control. Estimates for selected years are as follows 46/: 1913, 36.4 percent; 1928, 34.9 percent; 1940, 29.3 percent; 1950, 25.6 percent; and 1956, 20.1 percent. Soviet official estimates state that the productive assets of industry and construction organizations increased 32.6 times between 1913 and 1956 and that the assets of the transport and communications sector increased only 8.2 times. 47/

1. Railroads

Capital investment in railroad transport has increased in recent years as investment has increased generally in the Soviet economy. Representative, however, of the trend in total transport investment, investment in railroad transport has not grown as fast as investment in the economy as a whole. During the 8 1/2 years immediately preceding World War II, 14.3 percent of total investment went to the railroads. In the Fourth Five Year Plan, 10.4 percent went to the railroads. Their average share declined to 6.0 percent during 1952-58. Actual investment in railroad transport averaged 7.0 billion rubles during 1946-50 and 9.8 billion rubles during 1951-55. In 1959, 14 billion rubles were invested (see Tables 29 and 30***). Average annual investment in railroad transport is planned to be about 16.1 billion rubles during 1959-65.

The portion of investment in all modes of transport that has gone to railroad transport has remained very high throughout the Soviet period, although it has shown a slight decline in recent years. Investment in railroad transport accounted for nearly 74 percent of all

* Appendix A, p. 83, below.

** The appropriate dollar valuation of the ruble varies greatly according to the composition of the goods and services comprising the investment ruble for various investment programs. The ratio of 5.5 to 1 is an estimate based on the ruble-dollar cost of the components of the transport investment plan and cannot be applied to any of its components.

*** Appendix A, pp. 81 and 82, respectively, below.

investment in transport during 1945-55 and probably averaged between 60 and 65 percent during 1956-59.* Data in the Seven Year Plan indicate that the share of transport investment going to railroad transport will decline only about 3 percent by 1965.

In contrast to the high share of transport investment absorbed by the railroads in the USSR, the relative share of transport investment in the US that has gone to railroad transport has been very low. Between 1950 and 1959, railroad investment in the US declined from about 29 to 10 percent of the total** (see Table 31***).

Railroad transport investment policy in the USSR has been dominated almost entirely by a single financial consideration. This consideration has been the necessity of keeping capital inputs at a minimum level consonant with increasing performance at sustained high rates. The desire to reduce transport costs, although of significance, has been a secondary consideration. It has been true, however, that investment which had been planned to increase capacity, and hence performance, also has served to decrease operating costs.

A comparison of the relative effectiveness of new construction with an increase in the capacity of existing railroads in terms of annual increases of freight traffic (expressed in ton-kilometers per ruble of new capital investment) indicates that investment savings have accrued from the increases in capacity but also points up the decreasing practicability of pursuing this policy with such single-mindedness in the future. During 1946-50, each ruble of capital investment in reconstruction of the existing network resulted in five to six times greater traffic increases than each ruble invested in the construction of new railroad lines. The ratio of investment in existing network to construction of new lines during 1951-55 was 1 to 3, and in the plan for 1959-65 it is expected that this ratio will change to 1 to 1. 48/

One result of Soviet railroad investment policy discussed above has been to limit construction of new lines to areas of the highest priority. During 1917-58 the length of the network increased only 75 percent, while freight traffic increased nearly 20 times. Since 1950 the length of the network has increased 5 percent and freight traffic 116 percent. Average freight density per kilometer of line was 10.6 million tkm in 1958, about three times greater than in

* Because of the noncomparability of Soviet data, it has not been possible to determine exact percentages for the latter years.

** Although transport investment figures for the US and the USSR are not entirely comparable, the significance of the comparison offered is not altered. See Table 31, footnote a, p. 83, below.

*** Appendix A, p. 83, below.

the US. The resultant concentration of traffic on the relatively restricted network has brought about strains and imbalances in the railroad system that are costly to the national economy and that tend to be hidden by impressive operating indexes. Because of the lack of direct connections, circuitous routing is frequent. Another result of Soviet railroad investment policy is that adequate transport in depth often is not available to areas which have recently been brought under development.

Comments on the investment program for railroad transport under the Seven Year Plan have emphasized that funds for the construction of new lines are not adequate. T.S. Khachaturov, a prominent transport economist, has stated that an annual average of 3,000 km of new lines should be constructed through 1975 if the railroads are to be able efficiently to support general economic development. 49/ The plan calls for the construction of about 9,000 km of new lines during 1959-65. This plan implies a slower rate of construction than was planned for the 1946-50 and 1951-55 Plans, which were considerably underfulfilled.

A capital-output ratio series for Soviet railroads previously constructed by a US economist indicated that the ratio declined to about 2.4 in 1939, rose to a high of 3.7 in 1947, and declined again to about 2.9 in 1952. 50/ The sharp postwar decline was the result of extremely high rates of growth that in the early years represented recovery of lost traffic with but limited capital investment. The decline is confirmed by more recent analysis, which in addition indicates that the ratio has leveled off during the last few years and that at some point in the next few years it will begin to move slowly upward. The validity of the recent direction of the ratio is supported by several observations of decreasing capital efficiency that have recently become apparent* (see Table 32**).

The marginal value of continued investment in the existing network as opposed to network expansion has been noted. As Soviet railroads approach maturity and achieve a lower labor-capital ratio, a leveling off or a rise of the capital-output ratio should be experienced.

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* The calculation of a capital-output ratio for railroad transport in the USSR is difficult because assets are figured at book value rather than at current prices and have to be adjusted accordingly. The ratios presented here were constructed largely on the basis of estimates of value that have been made by Soviet economists. An industry-wide inventory is now underway that should allow more accurate analysis of capital-output ratios in the near future.

** Appendix A, p. 84, below.

A comparison of incremental output and new investment for the two 7-year periods 1952-58 and 1959-65 serves as further corroboration of the analysis of declining capital efficiency. It was found that during the earlier period, for each additional billion traffic-kilometers performed, 98 million rubles were invested, and it is expected that during the Seven Year Plan 192 million rubles will need to be spent to generate each additional billion traffic-kilometers.

2. Motor Transport

The available financial data for motor vehicle transport have not been sufficient to enable a satisfactory estimate of capital investment to be made. It is possible, however, by taking into consideration the low level of highway construction and inventory increases, to state that investment in motor vehicle transport has been kept to a minimum. The low volume of highway construction has been especially significant.

Data in the Seven Year Plan do indicate, however, that investment in motor vehicle transport probably will increase faster than that in other modes of transport except petroleum pipelines. Plans for highway construction and inventory expansion suggest that investments during 1959-65 are to increase by nearly 200 percent in comparison with the previous 7-year period. The corresponding percentages for railroad and inland water transport are 88 and 30, respectively. Even if expected increases occur, Soviet investment in motor vehicle transport during the entire 7-year period is not likely to approach US investment for any single year of the period.

3. Inland Water Transport

Capital investment in inland water transport has been modest and insufficient throughout the postwar period. Partly as a result of inadequate investment, traffic plans have not always been fulfilled, operating costs have not been lowered as planned, and modernization of the fleet has taken place very slowly.

Three billion rubles were allocated for investment in inland water transport during the Fourth Five Year Plan. Of this amount, it is estimated that less than 2 billion rubles actually were spent. Investments began to increase during 1951-55 and averaged about 1.7 billion rubles per year between 1950 and 1958. 51/ Data in the Seven Year Plan indicate that average annual investments are to increase to about 2.2 billion rubles, or 30 percent more than the average during the previous 7-year period. 52/ By comparison, railroad investments are to increase by nearly 88 percent. At the same time, inland water freight traffic is scheduled to increase by more than 60 percent, whereas railroad freight traffic is to increase by 40 to 45 percent.

Planned investment may not be entirely adequate. It is probable that the traffic plan will be fulfilled but that planned decreases in operating costs and increases in labor productivity will be difficult to achieve without greater investment in modernization of plant and network.

4. Pipelines

Investment in petroleum pipelines has been low until very recently, as the figures for network expansion indicate. On the basis of construction completions and costs, it is estimated that about 2 billion rubles were spent for pipeline construction during 1951-55.*

The considerable emphasis being placed on development of petroleum pipeline transport is reflected in the planned investment of 12 billion rubles reported for 1959-65. 53/

* Investment for petroleum pipeline construction is contained in investment allocations to the oil and gas industry and is not a part of transport and communications investments.

APPENDIX A

STATISTICAL TABLES

Table 1

Ton-Kilometer Performance by Inland Transport in the USSR and the US
by Mode of Transport a/
1950, 1955-59, and 1965 Plan

Carrier	Billion Ton-Kilometers							Percent of Total						
	1950	1955	1956	1957	1958	1959	1965 Plan	1950	1955	1956	1957	1958	1959	1965 Plan
	USSR													
Railroads b/	602.3	970.9	1,079.1	1,212.8	1,302.0	1,429.5	1,850	87.0	85.9	86.3	86.3	84.9	84.6	78.0
Motor vehicles b/	20.1	42.5	48.5	61.7	76.8	87.6	146	2.9	3.8	3.9	4.4	5.0	5.2	6.2
Inland water fleet b/	46.2	67.7	70.5	76.4	85.5	93.6	140	6.7	6.0	5.6	5.4	5.6	5.5	5.9
Ships in coastal and intercoastal traffic c/	18.8	33.4	33.0	27.8	35.1	38.0	50	2.7	3.0	2.6	2.0	2.3	2.2	2.1
Petroleum pipelines b/	4.9	14.7	20.5	26.6	33.8	41.6	185	0.7	1.3	1.6	1.9	2.2	2.5	7.8
Total	692.3	1,129.2	1,251.6	1,405.3	1,533.2	1,690.3	2,371	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	US													
Railroads d/	917.5	955.7	988.4	941.3	839.1			45.6	39.8	39.3	38.2	36.6		
Motor vehicles e/	325.0	421.0	463.0	470.0	474.0			16.2	17.6	18.5	19.0	20.7		
Inland water fleet f/	238.5	316.1	321.2	338.4	276.0			11.9	13.2	12.8	13.7	12.1		
Ships in coastal and intercoastal traffic g/	340.2	406.8	400.6	391.8	391.8			16.9	17.0	16.0	15.9	17.1		
Petroleum pipelines h/	188.6	296.7	335.7	325.2	308.5			9.4	12.4	13.4	13.2	13.5		
Total	2,009.8	2,396.3	2,508.9	2,466.7	2,289.4		3,100 i/	100.0	100.0	100.0	100.0	100.0		

a. Excluding air freight transport, which is not significant in terms of ton-kilometers.
b. 54/. The figure for inland waterways does not include traffic on the landlocked Caspian Sea, which is included in coastal shipping.
c. Computed from total maritime traffic [redacted] utilizing a Soviet statement that the share of foreign trade traffic in the total is expected to increase from 67 percent in 1958 to 79 percent in 1956 56/ and utilizing similar information for other years [redacted] 57/
d. Revenue traffic for Class I, Class II, and electric railroads and nonrevenue traffic for Class I railroads. 58/ This total figure has been ascertained to be the US figure most comparable with Soviet data. 59/
e. 60/.
f. 61/. Including the Great Lakes.
g. The figure for 1950 was estimated [redacted] and the figure for 1955-57 by the Interstate Commerce Commission. 63/ The figure for 1958 was estimated to have been the same as that for 1957.
h. 64/
i. Estimated on the basis of the 3-percent average annual rate of growth achieved during 1951-57.

50X1

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Table 2

Passenger-Kilometer Performance by Inland Transport in the USSR and the US, by Mode of Transport a/ Selected Years, 1950-58, and 1965 Plan

Carrier	Billion Passenger-Kilometers							Percent of Total						
	1950	1953	1955	1956	1957	1958	1965 Plan	1950	1953	1955	1956	1957	1958	1965 Plan
							USSR							
Railroad b/	88.0	118.3	141.4	142.4	153.4	158.4	190	69.2	66.2	65.8	63.8	61.0	57.6	40.5
Automobile c/	1.7	3.7	5.9	6.8	7.9	8.9	17.3	1.3	2.1	2.7	3.0	3.1	3.2	3.7
Intercity bus d/	1.4	2.6	5.5	7.2	9.7	12.3	61.5	1.1	1.5	2.6	3.2	3.9	4.5	13.1
Urban e/	31.1	46.9 f/	54.0	58.8	70.5	82.3	145.6	24.4	26.3	25.1	26.3	28.0	29.9	31.1
Air g/	1.2	2.2	2.9	3.3	4.8	7.8	46.5	0.9	1.2	1.4	1.5	1.9	2.8	9.9
Water h/	3.9	4.8	5.1	4.9	5.2	5.4	7.9	3.1	2.7	2.4	2.2	2.1	2.0	1.7
Total	127.3	178.5	214.8	223.4	251.5	275.1	468.8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
							US							
Railroad i/	51.2	51.0	45.9	45.3	41.7			3.7	3.2	2.6	2.5	2.2		
Automobile j/	1,168.0	1,400.0	1,569.0	1,632.0	1,704.0			85.1	86.8	88.1	88.3	89.4		
Intercity bus k/	71.0	83.5	87.1	88.7	78.9			5.2	5.2	4.9	4.8	4.1		
Urban l/	69.0	55.6	46.1	43.8	41.6			5.0	3.4	2.6	2.4	2.2		
Air m/	12.9	22.4	31.9	36.4	40.8			1.0	1.4	1.8	2.0	2.1		
Water n/														
Total	1,372.1	1,612.5	1,780.0	1,846.2	1,907.0			100.0	100.0	100.0	100.0	100.0		
							USSR as a Percent of US							
Railroad	171.9	231.4	308.1	314.3	367.9									
Automobile	0.1	0.3	0.4	0.4	0.5									
Intercity bus	2.0	3.1	6.3	8.1	12.3									
Urban	45.1	84.4	117.1	134.2	169.5									
Air	9.3	9.8	9.1	9.1	11.8									
Total	9.3	11.1	12.1	12.1	13.2									

a. All figures are rounded to the nearest 100 million passenger-kilometers.

e. Including urban buses, streetcars, trolley buses, and subways. Figures are estimated from the number of passengers. and

f. This figure is for 1954.

h. the maritime portion of the figures for 1965 was derived from the number of passengers and the estimated average length of haul. 78/

j. Estimated by the Bureau of Public Roads
k. Estimated from Department of Commerce data. 81/
l. Estimated from Department of Commerce data. 82/
m. 83/. Including revenue passenger-kilometers only.
n. Annual passenger traffic on US waterways has not exceeded 1 billion passenger-kilometers.

50X1
50X1
50X1
50X1

Table 3

Passengers Carried by Inland Transport in the USSR, by Mode of Transport a/
Selected Years, 1950-58, and 1965 Plan

Carrier	1950	1955	1958	1965 Plan	1950	1955	1958	1965 Plan
	Million Passengers b/				Percent of Total Intercity Traffic			
Intercity								
Railroad c/	209	249	251	300	76.6	54.2	34.3	11.6
Bus d/	52	188	445	2,203	19.0	41.0	60.9	85.0
Air e/	1	3	8	49	0.4	0.7	1.1	1.9
Water f/	11	19	27	38	4.0	4.1	3.7	1.5
Total intercity	273	459	731	2,590	100.0	100.0	100.0	100.0
					Percent of Total Local and Urban Traffic			
Local and Urban								
Railroad c/	955	1,392	1,583	1,950	10.7	8.9	6.7	4.8
Bus g/	1,001	4,294	7,932	22,570	11.2	27.6	33.7	55.3
Streetcar g/	5,186	6,415	8,129	7,026	58.1	41.2	34.6	17.2
Trolleybus g/	947	1,850	2,778	4,259	10.6	11.9	11.8	10.4
Subway g/	629	945	1,852	2,548	7.1	6.1	7.9	6.2
Taxi h/	160	600	1,148	2,365	1.8	3.9	4.9	5.8
Water i/	46	70	87	119	0.5	0.4	0.4	0.3
Total local and urban	8,924	15,566	23,509	40,837	100.0	100.0	100.0	100.0
Grand total	9,197	16,025	24,240	43,427				

	1951-55	1956-58	1959-65
	Average Annual Rates of Growth j/		
Intercity	11.0	16.8	19.8
Local and urban	11.8	14.7	8.2
Total	11.7	14.8	8.7

a. Excluding passengers carried by automobiles other than taxis. Taxis, however, account for approximately one-half of the passenger-kilometers performed by automobiles.
b. All figures are rounded to the nearest million passengers.

[redacted]

50X1

f. The total number of maritime passengers plus 15 percent of the number of inland water passengers (which is estimated to be the proportion of the latter in intercity traffic). [redacted]

50X1

[redacted]

h. Figures for 1950-58 are estimated from taxi-kilometers 97/ and for 1965 from total automobile travel.
i. These figures represent 85 percent of the total number of inland water passengers. [redacted]

50X1

j. Average annual rates of growth are computed at the compound rate for the stated period, including the terminal years.

Table 4

Indexes of Performance of Inland Transport and Other Economic Indicators
in the USSR and the US
Selected Years, 1938-65

Economic Indicators	1938	1950	1955	1956	1957	1958	1965
		USSR					
Index of inland freight transport (1950 = 100) a/		100	163	181	203	221	342
Index of inland freight transport (1958 = 100)						100	155
Index of industrial production (1950 = 100) b/		100	166	183	197	212	
Index of industrial production (1958 = 100)						100	180 c/
Index of gross national product (GNP) (1950 = 100) d/		100	139	151	160	174	261
Index of GNP (1958 = 100)						100	150
Ton-kilometers performed per 1955 US $1,000 of GNP		6,351	7,478	7,585	8,076	8,069	8,319
Index of ton-kilometers performed per metric ton of basic production (1950 = 100) e/		100	116	115	123	123	
Ton-kilometers performed per metric ton of basic production e/		1,020	1,182	1,176	1,251	1,258	
Index of ton-kilometers performed per metric ton of basic production (1938 = 100) e/ f/	100	119	138	137	146	146	
		US					
Index of inland freight transport (1950 = 100) a/		100	119	125	123	114	149
Index of inland freight transport (1958 = 100)						100	131
Index of industrial production (1950 = 100) b/		100	129	134	135	125	
Index of GNP (1950 = 100) d/		100	124	126	128	125	171
Index of GNP (1958 = 100)						100	137
Ton-kilometers performed per 1955 US $1,000 of GNP		6,241	6,021	6,195	5,973	5,659	
Index of ton-kilometers performed per metric ton of basic production (1950 = 100) e/		100	112	113	112	115	
Ton-kilometers performed per metric ton of basic production e/		1,456	1,633	1,647	1,638	1,678	
Index of ton-kilometers performed per metric ton of basic production (1938 = 100) e/ f/	100	129	145	146	146	149	

a. Calculated from data in Table 1, p. 52, above.
b. 100/
c. 101/
d. 102/
e. For tons of basic production the 24 most important ores, fuels, agricultural products, and chemicals were used. 103/
f. 104/

Table 5

Railroad Network in the USSR
1950, 1958-59, and 1965 Plan

Route-Kilometers as of the End of Each Year

Year	Total a/	Electrified	Diesel Operated	Double Tracked	Automatic Block	Centralized Traffic Control
1950	116,900 b/	3,042 b/	3,432 b/	26,900 c/	12,300 d/	197 d/
1958	122,800 b/	9,500 b/	11,100 b/	33,700 e/	22,700 f/	2,400 f/
1959	124,000 g/	11,600 h/	14,300 h/	34,386 i/	24,200 j/	2,900 f/
1965 Plan	131,800 k/	30,000 k/	70,000 k/	41,700 k/	40,700-42,700 l/	12,500 m/

a. The operational network of the Ministry of Railroad Transportation only, excluding industrial spurs and sidings and the lines in "temporary" operation (recently constructed but not yet up to operational standards).
b. 105/
c. During 1951-55, 4,700 km were built. The length in 1955 was 6,600 km less than the 1960 Plan, and 30 percent of the planned route of about 127,200 km was to be double tracked in the 1960 Plan. 106/
d. 107/
e. In 1956, 876 km were added and in 1957, 514 km 108/. In 1958, 157 km more were laid than in 1957. 109/
f. 110/
g. 111/
h. 112/
i. 113/
j. 114/
k. 115/
l. 116/
m. 117/

Table 6

Estimated Inventory of Railroad Freight Cars in the USSR
Selected Years, 1945-59, and 1965 Plan

Year	Inventory as of the Beginning of Each Year: Thousand Units a/	Inventory as of the Beginning of Each Year: Index (1945 = 100)	Total Capacity b/: Million Metric Tons	Total Capacity b/: Index (1945 = 100)	Percent: Two-Axle Cars c/	Percent: Automatic Brakes d/	Percent: Automatic Couplings d/
1945	609.1	100	15.8	100	73.0	71.1	41.5
1952	802.8	132	26.3	166	53.0	79.1	61.5
1958	875.9	144	39.9	253	30.0	96.3	100.0
1959	889.0	146	42.5	269	27.0	100.0	100.0
1965 Plan	969.7	159	56.2	356	14.0	100.0	100.0

a. These estimates are based on recent Soviet experience, published by a Soviet railroad expert and others, showing that the working inventory represents 75 to 85 percent of the total inventory. 118/ The working inventory was derived from daily carloadings and turnaround time [redacted] The margin of error on total inventory is plus or minus 5 percent. 50X1

b. The total inventory times the average capacity per physical unit. 119/

c. 120/. Interpolations have been made where necessary.

d. 121/.

Table 7

Estimated Inventory of Mainline Locomotives in the USSR
Selected Years, 1946-65

Units

Beginning of Year	Total Mainline	Steam a/	Diesel b/	Electric
1946	25,682	25,300	151	231 b/
1951	31,468	30,500	498	470 c/
1952	32,179	31,022	574	583
1959	35,979	31,680	2,277	2,022
1965	26,343	9,149 d/	8,752	8,442 e/

a. [redacted] Figures on retirements of steam locomotives are estimated to be about 2 percent per year through 1958. Exports beginning in 1959 (principally to Communist China) are considered to be part of steam locomotive retirements. About 75 percent of the estimate of mainline steam locomotives produced by the European Satellites (except East Germany) are estimated to have been exported to the USSR. No steam locomotives were produced or imported after 1956.

50X1

b. 123/. These figures are for total production and imports. Retirements are estimated to be negligible. The 1959-65 increment is estimated from the average annual rate of increase necessary to attain the planned production rate for 1965.

c. 124/. Total production during 1946-50 is added to the 1946 inventory. Imports and retirements are estimated to be negligible. Production data for 1956-58 are published in several Soviet newspapers and journals.

d. It is assumed that the acquisition of an estimated total of 12,845 electric and diesel electric and diesel locomotives will eliminate the need for about 22,500 steam locomotives, many of which will be good mainline units and may be exported to Communist China.

e. The 1959-65 increment is estimated from the average annual rate of increase necessary to attain the planned production rate for 1965. The total includes estimated imports of AC types of locomotives known to be on order from France and West Germany for use on the Trans-Siberian Railroad.

Table 8

Railroad Labor Force, Productivity, and Earnings in the USSR and the US a/
1950-58 and 1965 Plan

	USSR b/									US b/					
Year	Total Employees (Thousand)	Operating Employees (Thousand)	Productivity (Thousand Traffic-Kilometers per Operating Employee)	Index (1950 = 100)	Adjusted Railroad Labor Force c/ (Thousand Employees)	Adjusted Productivity c/ (Thousand Traffic-Kilometers per Employee)	Index (1950 = 100)	Average Annual Earnings (Current Rubles)	Index (1950 = 100)	Total Employees (Thousand)	Productivity (Thousand Traffic Kilometers per Employee)	Index (1950 = 100)	Average Annual Earnings (Current US $)	Index (1950 = 100)
1950	3,014	1,712	403	100	2,013	343	100	8,640	100	1,221	745	100	3,785	100
1951	3,088	1,765	440	109	2,063	376	110	9,045	105	1,276	784	105	4,182	110
1952	3,233	1,866	455	113	2,160	393	115	9,152	106	1,227	776	104	4,352	115
1953	3,326	1,901	482	120	2,222	412	120	9,128	106	1,206	775	104	4,415	117
1954	3,421	1,968	501	124	2,285	432	126	9,319	108	1,065	797	107	4,560	120
1955	3,400	1,980	562	139	2,271	490	143	9,319	108	1,058	904	121	4,719	125
1956	3,414	1,980	617	153	2,281	536	156	9,422	109	1,042	950	128	5,107	135
1957	3,439 d/	1,995 e/	685 e/	170	2,297	595	173	9,530 f/	110	986 g/	997 g/	134	5,434 g/	144
1958	3,443 d/	1,997 e/	731 e/	181	2,300	635	185	9,735 f/	113	841 g/	1,043 g/	140	5,860 g/	155
1965 Plan	3,587 d/	2,081 h/	980 i/	243	2,396	851	248	10,710 f/	124	757 j/	1,296 j/	174	7,608 j/	201

b. All data for the USSR are for the Ministry of Transportation (MPS) and for the US for Class I railroads.
c. Adjusted for comparability with the labor force in the US. Employees of the MPS believed to be engaged in functions not performed by US railroads were eliminated: 66.8 percent of total employment of the MPS is believed to be comparable with the railroad labor force in the US in the matter of productivity.
d. Operational employees are estimated to constitute about 58 percent of total employment of the MPS, based on the relationship in 1950-56.
e. 126/
f. Present Soviet intentions 127/ indicate continued gradual wage increases and decreased hours. Earnings after 1956 are therefore estimated to increase at the 1950-56 rate.
g. 128/
h. Derived from statements of planned traffic and productivity.
i. Actual performance is estimated to reach the minimum of the planned range.
j. Estimated on the assumption that present trends in traffic, productivity, and earnings will continue. Significant changes in government transport policy now under review could have considerable effect on the validity of these estimates, probably in the direction of increased traffic and employment rather than on productivity or average earnings.

50X1

Table 9

Volume and Selected Characteristics of Motor Freight Traffic in the USSR
Selected Years, 1950-59, and 1965 Plan

	1950	1953	1955	1958	1959	1965 Plan
Performance by all motor vehicles a/ (billion ton-kilometers)	20.1	31.4	42.5	76.8	87.6	146
Performance by common carrier motor vehicles b/ (billion ton-kilometers)	0.93	2.52	9.26	18.39	21	64
Common carrier performance as a percent of total	4.6	8.0	21.8	23.9	24.0	44 c/
Tons originated by all motor vehicles d/ (million metric tons)	1,859.2	3,002.7	3,730.0	6,474.4	7,361.3	10,500
Tons originated by common carrier motor vehicles e/ (million metric tons)	46.4	127.4	452.1	1,145.6	1,302	N.A.
Common carrier tons originated as a percent of total	2.5	4.2	12.1	17.7	17.7	
Average length of haul for all motor freight f/ (kilometers)	10.8	10.4	11.4	11.9	11.9	14
Average length of haul for noncommon carrier freight (kilometers)	10.6	10.0	10.1	11.0	11.0	N.A.
Average length of haul for common carrier freight g/ (kilometers)	20.0	19.8	20.5	16.1	16.1	N.A.

50X1

b. [redacted] the figure for 1965 50X1 has been computed from the percent reported.

c. 133/

50X1

Table 10

Length of the Highway Network in the USSR and the US
Selected Years, 1950-59, and 1965 Plan

Year	USSR a/ (Thousand Kilometers)		US b/ (Thousand Kilometers)		USSR as a Percent of US	
	Total Improved c/	Paved d/	Total Improved c/	Paved d/	Total Improved	Paved
1950	177.3	19.2	2,776.0	958.0	6.4	2.0
1953	194.2	30.3	3,063.0	1,101.0	6.3	2.8
1955	206.8	41.1	3,211.0	1,196.0	6.4	3.4
1956	214.5	47.1	3,264.0	1,257.0	6.6	3.7
1957	225.7	52.0	N.A.	N.A.		
1958	235.9	58.5	N.A.	N.A.		
1959	246.0 e/	65.0 e/	N A.	N.A.		
1965 Plan	N.A.	158.5 f/	N.A.	N.A.		

a. 142/

[redacted] 50X1

c. Totals are for surfaced roads only. In each country, there are at present more than 1 million km of nonsurfaced roads.
d. Surfaced with a water-resistant binding material.
e. The 1958 total plus estimated additions in 1959.
f. It is estimated that there will have been constructed or reconstructed about 100,000 km of roads which fall into this category. A total of 70,000 km of all-weather roads will be constructed in the USSR, 145/ and 16,000 km of roadways will be reconstructed to higher standards in the RSFSR alone. 146/

Table 11

Estimated Inventory of Motor Vehicles in the USSR a/
Selected Years, 1950-59, and 1965 Plan

Type of Vehicle	Thousand Vehicles					Percent of Total				
	1950	1955	1958	1959	1965 Plan	1950	1955	1958	1959	1965 Plan
Truck b/	1,172	2,126	2,815	3,100	4,200	90.3	82.9	81.9	81.5	77.6
Automobile	111	396	555	630	1,000	8.6	15.5	16.2	16.6	18.5
Bus	14	42	65	74	209	1.1	1.6	1.9	1.9	3.9
Total	1,297	2,564	3,435	3,804	5,409	100.0	100.0	100.0	100.0	100.0
Index (1950 = 100)	100	198	265	293	417					

	1951-55	1956-58	1959-65
Average annual rate of growth c/	14.6	10.2	6.7

a. Estimates are for the end of each year and are based on official production figures, with allowances for net exports and retirement. Estimates include military vehicles, which accounted for about 18 percent of the total at the end of 1957.
b. Including jeeps.
c. Average annual rates of growth are computed at the compound rate for the stated period, including the terminal years.

Table 12

Mainline Petroleum Pipeline Transport in the USSR
1950-59 and 1960 and 1965 Plans

	Length of Line As of the End of Each Year a/ (Thousand Kilometers)	Traffic a/		Average Distance Pumped (Kilometers)	Traffic Density (Million Ton-Kilometers per Kilometer of Line)
		Million Tons Originated	Billion Ton-Kilometers		
1950	5.4	15.3	4.9	320	0.9
1951	6.0	18.4	5.5	299	0.9
1952	6.2	23.2	6.4	276	1.0
1953	7.1	29.4	7.6	259	1.1
1954	8.1	39.7	10.2	257	1.3
1955	10.4	51.7	14.7	284	1.4
1956	11.6	65.3	20.5	314	1.8
1957	13.2	80.9	26.6	329	2.0
1958	14.4	94.7	33.8	357	2.3
1959	16.7	111.3	41.6	374	2.5
1960 Original Plan	24.9 b/	126.4 b/	83.0 c/	657	3.3
1960 Revised Plan	20.9 d/	126.4 e/	65.0 f/	514	3.1
1965 Plan	43.0 g/	170.0 h/	185.0 i/	1,100 j/	4.3

50X1

b. 150/
c. 151/
d. 152/
e. There is no evidence that the plan for tons originated was altered.
f. 153/
g. 154/
h. 155/
i. 156/. The performance plan may very well be revised downward if the original construction plan is not fulfilled.
j. The average distance pumped will not reach the plan figure if the ton-kilometers plan is not fulfilled.

Table 13

Commodity Composition of Railroad Traffic in the USSR in Ton-Kilometers
1950-58

Commodity	1950 a/	1951 b/	1952 b/	1953 a/	1954 c/	1955 a/	1956 a/	1957 a/	1958 a/
	Billion Ton-Kilometers								
Coal and coke	178.2	188	201	211.5	234.7	266.7	303.2	336.4	348.9
Wood, excluding firewood	72.2	84	94	98.5	100.1	119.9	124.1	151.9	178.4
Firewood	4.5	5	5	4.3	4.6	5.2	5.0	5.9	6.8
Petroleum	52.0	60	68	76.9	84.5	101.6	112.4	131.2	154.0
Ferrous metals, including scrap	47.5	57	65	67.5	69.7	75.7	80.2	83.8	90.6
Ore	27.8	33	39	42.3	40.5	45.0	49.2	58.1	59.9
Mineral construction materials	46.7	53	64	68.2	68.4	82.1	90.0	100.0	113.9
Grain and flour	30.9	37	37	45.1	53.1	55.1	80.1	95.6	80.8
Other	142.5	160	166	183.7	201.2	219.6	234.9	249.9	268.7
Total	602.3	677.3	741.3	798.0	856.8	970.9	1,079.1	1,212.8	1,302.0
	Percent of Total								
Coal and coke	29	28	27	27	27	27	28	27	26
Wood, excluding firewood	12	12	13	12	12	12	12	13	14
Firewood	1	1	1	1	1	1	1	Negl.	1
Petroleum	9	9	9	9	10	10	10	11	12
Ferrous metals, including scrap	8	8	9	8	8	8	7	7	7
Ore	5	5	5	5	5	5	5	5	5
Mineral construction materials	8	8	9	9	8	8	8	8	9
Grain and flour	5	5	5	6	6	6	7	8	6
Other	23	24	22	23	23	23	22	21	20
Total	100	100	100	100	100	100	100	100	100

a. 157/ b. 158/ c. 159/

Table 14

Commodity Composition of Railroad Traffic in the USSR in Tons Originated
1950-58 and 1965 Plan

Commodity	1950 a/	1951 b/	1952 b/	1953 a/	1954 c/	1955 a/	1956 a/	1957 a/	1958 a/	1965 Plan
	Million Tons Originated									
Coal and coke	266.1	283	304	322.1	349.3	389.0	422.4	454.1	478.8	N.A.
Coal, excluding coke									(457.4 d/)	552 e/
Wood, excluding firewood	72.4	77	82	82.6	84.3	94.1	96.0	110.6	121.5	158 f/
Firewood	18.9	17	17	16.2	16.0	16.4	15.3	16.7	18.1	N.A.
Petroleum	43.2	48	55	62.3	69.9	77.6	86.5	99.0	112.5	210 e/
Ferrous metals, including scrap	43.3	50	57	61.3	64.6	71.8	77.2	81.8	88.3	N.A.
Ferrous metals, excluding scrap									(66.8 g/)	110 e/
Ore	48.4	56	66	72.4	75.3	83.8	89.8	100.1	108.1	203 e/
Mineral construction materials	157.5	169	194	207.9	209.8	245.6	263.0	282.2	324.2	500 e/
Grain and flour	38.8	43	44	47.5	53.2	58.0	67.8	71.9	71.5	N.A.
Other	145.7	166	178	195.1	209.0	230.7	253.0	271.3	293.9	N.A.
Total	834.3	909.2	997.0	1,067.4	1,131.4	1,267.0	1,371.0	1,487.7	1,616.9	2,372 e/
	Percent of Total									
Coal and coke	32	31	30	30	31	31	31	31	30	N.A.
Coal, excluding coke									(28)	23
Wood, excluding firewood	9	8	8	8	7	7	7	7	8	7
Firewood	2	2	2	2	1	1	1	1	1	N.A.
Petroleum	5	5	6	6	6	6	6	7	7	9
Ferrous metals, including scrap	5	6	6	6	6	6	6	5	5	N.A.
Ferrous metals, excluding scrap									(4)	5
Ore	6	6	7	7	7	7	7	7	7	9
Mineral construction materials	19	19	19	19	19	19	19	19	20	21
Grain and flour	5	5	4	4	5	5	5	5	4	N.A.
Other	17	18	18	18	18	18	18	18	18	N.A.
Total	100	100	100	100	100	100	100	100	100	

b. 161/
c. 162/
d. Derived by subtracting coke shipments of 21.4 million metric tons 163/ from the total for coal and coke [redacted]
e. 165/
f. 30 percent above the level of 1958. 166/
g. 167/

50X1

50X1

Table 15

Average Length of Haul per Metric Ton of Railroad Freight
in the USSR, by Principal Commodity
1950-58

Kilometers

Commodity	1950 a/	1951 b/	1952 b/	1953 a/	1954 b/	1955 a/	1956 a/	1957 a/	1958 a/
Coal and coke	670	665	661	657	672	686	718	741	729
Wood, excluding firewood	998	1,084	1,148	1,193	1,187	1,274	1,293	1,373	1,469
Firewood	241	263	273	266	290	314	329	352	374
Petroleum	1,205	1,253	1,231	1,235	1,210	1,309	1,298	1,326	1,369
Ferrous metals, including scrap	1,095	1,138	1,147	1,101	1,078	1,055	1,039	1,025	1,026
Ore	574	587	588	585	538	537	548	580	554
Mineral construction materials	296	314	329	328	326	334	342	354	352
Grain and flour	795	873	829	949	997	950	1,182	1,329	1,129
Other	978	964	933	942	963	952	928	921	914
All freight	722	745	744	748	757	766	787	815	805

a. 168/
b. 169/

Table 16

Railroad Freight Traffic in the USSR, by Economic Region a/
1940, 1950, and 1955

Economic Region	Tons Originated						Tons Terminated					
	1940		1950		1955		1940		1950		1955	
	Million Metric Tons	Percent of Total	Million Metric Tons	Percent of Total	Million Metric Tons	Percent of Total	Million Metric Tons	Percent of Total	Million Metric Tons	Percent of Total	Million Metric Tons	Percent of Total
Ia North	11.2	1.9	24.9	3.0	39.4	3.1	7.2	1.2	12.6	1.5	21.4	1.7
Ib Northwest	33.1	5.6	29.8	3.6	43.5	3.4	45.1	7.7	38.7	4.6	59.8	4.7
IIa Baltic			17.4	2.1	20.7	1.6			17.4	2.1	39.0	3.1
IIb Belorussia	15.0	2.5	17.7	2.1	18.6	1.5	20.0	3.4	17.1	2.1	27.8	2.2
III South	201.1	33.9	231.1	27.7	351.6	27.8	167.4	28.4	203.5	24.4	318.0	25.0
IV Southeast	37.9	6.4	49.9	6.0	70.5	5.6	26.9	4.6	38.8	4.6	53.0	4.2
V Transcaucasus	14.3	2.4	17.2	2.1	29.2	2.3	16.0	2.7	21.8	2.6	33.7	2.6
VI Volga	20.8	3.5	30.5	3.7	57.2	4.5	21.9	3.7	38.9	4.7	57.7	4.5
VII Central	95.8	16.2	131.7	15.8	180.6	14.3	132.3	22.5	171.6	20.6	242.1	19.0
Total for the western regions	429.2	72.4	550.1	65.9	811.4	64.1	436.8	74.2	560.4	67.2	852.4	66.9
VIII Urals	56.0	9.4	114.9	13.8	185.2	14.6	57.3	9.7	124.2	14.9	184.5	14.5
IX West Siberia	39.5	6.7	65.3	7.8	103.4	8.2	27.6	4.7	50.5	6.1	80.8	6.3
Xa Kazakhstan	15.5	2.6	35.2	4.2	58.0	4.6	12.2	2.1	28.0	3.4	50.3	3.9
Xb Central Asia	12.9	2.2	17.7	2.1	25.8	2.0	13.8	2.3	20.9	2.5	31.3	2.5
XI East Siberia	18.0	3.0	28.3	3.4	49.6	3.9	15.5	2.6	23.8	2.9	38.9	3.1
XII Far East	21.6	3.6	23.0	2.8	32.3	2.6	25.5	4.3	26.3	3.2	35.9	2.8
Total for the eastern regions	163.5	27.6	284.4	34.1	454.3	35.9	151.9	25.8	273.8	32.8	421.6	33.1
Total	592.7	100.0	834.5	100.0	1,265.6	100.0	588.7	100.0	834.1	100.0	1,274.0	100.0

a. 170/. Totals in this table differ slightly from those given in Table 17, p. 68, below, [redacted] Because of rounding, components may not add to the totals shown.

50X1
50X1

Table 17

Tons Originated by Inland Transport in the USSR, by Mode of Transport
Selected Years, 1950-59, and 1965 Plan

Carrier	Million Metric Tons							Percent of Increase	
	1950	1955	1956	1957	1958	1959	1965 Plan	1950-58	1958-65
Railroad a/	834.3	1,267.0	1,371.0	1,487.7	1,616.9	1,763.8	2,372	93.8	46.7
Motor vehicle b/	1,859.2	3,730.0	4,200.9	5,216.4	6,474.4	7,361.3	10,500	248.2	62.2
Inland water fleet c/	91.8	139.5	147.1	159.2	178.3	192.2	268	94.2	50.3
Ships in coastal and intercoastal traffic d/	25.0	42.9	45.9	48.4	49.4	49.7	69	97.6	39.7
Petroleum pipeline	15.3	51.7	65.3	80.9	94.7	111.3	170	519.0	79.5
Total	2,825.6	5,231.1	5,830.2	6,992.6	8,413.7	9,478.3	13,379	197.8	59.0
	Percent of Total								
Railroad	29.5	24.2	23.5	21.3	19.2	18.6	17.7		
Motor vehicle	65.9	71.3	72.1	74.5	77.0	77.7	78.5		
Inland water fleet	3.2	2.7	2.5	2.3	2.1	2.0	2.0		
Ships in coastal and intercoastal traffic d/	0.9	0.8	0.8	0.7	0.6	0.5	0.5		
Petroleum pipeline	0.5	1.0	1.1	1.2	1.1	1.2	1.3		
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0		

a. Figures [redacted] for 1965 from Table 14, p. 65, above. 50X1

[redacted] 50X1

c. [redacted] The figure for 1965 was planned to be about 50 percent above the level of 1958. 177/ 50X1

d. Estimated. [redacted] the 1965 Plan figure is 70.5 percent above the level of 50X1
1958. 179/ The amount of coastal and intercoastal traffic in relationship to total maritime traffic was estimated [redacted] 50X1

Table 18

Distribution of Total River Cargoes in the USSR, by River Basin 1955

River Basin [a]	Tons Originated (Million Metric Tons)	Percent of Total Cargoes, by Type	Percent of Total Basin Cargo
USSR [b]			
Total	139.1 [c]	100.0	100.0
Petroleum	14.4	100.0	10.4
Dry cargo	68.5	100.0	49.2
Rafted timber	56.2	100.0	40.4
Central Basin [d]			
Total	82.8	59.5	100.0
Petroleum	13.0	90.3	15.7
Dry cargo	41.1	60.0	49.6
Rafted timber	28.7	51.1	34.7
Northwestern Basin [d]			
Total	14.2	10.2	100.0
Petroleum	Negl.	Negl.	Negl.
Dry cargo	7.5	10.9	52.8
Rafted timber	6.7	11.9	47.2
Northern Basin [d]			
Total	17.1	12.3	100.0
Petroleum	0.1	0.7	0.6
Dry cargo	4.1	6.0	24.0
Rafted timber	12.9	23.0	75.4
Eastern Basin [d]			
Total	25.0	18.0	100.0
Petroleum	1.3	9.0	5.2
Dry cargo	15.8	23.1	63.2
Rafted timber	7.9	14.0	31.6

a. Major waterways located in individual basins are as follows:

(1) Central Basin: the Volga, Kama, Belaya, Moscow, and Oka Rivers and the Moscow-Volga and Volga-Don Canals.
(2) Northwestern Basin: the Neva, Svir', and Sheksna Rivers and the Ladoga, Mariinskiy, and Stalin Canals.
(3) Northern Basin: the Severnaya Dvina, Pechora, Sukhona, and Vychegda Rivers.
(4) Eastern Basin: the Ob', Irtysh, Yenisey, Angara, Lena, and Amur Rivers.

b. 181/
c. This figure differs from that given in Table 17, p. 68, above [redacted] This figure is being retained because of the breakdown by type of cargo. 50X1
d. Percentages were derived from a table [redacted] and were applied to official totals. 50X1

Table 19

Performance of River Transport in the USSR
Selected Years, 1945-58, and 1965 Plan

	1945 a/*	1950 a/	1955 a/	1958 b/	1965 Plan c/
Petroleum					
Billion ton-kilometers	6.3	12.0	14.3	15.3	23.0
Million metric tons	5.5	11.9	14.4	16.2	24.5
Average length of haul (kilometers)	1,145.5	1,008.4	993.1	944.4	938.8
Percent of total cargo	15.0	13.0	10.4	9.1	9.2
Timber in rafts					
Billion ton-kilometers	5.1	17.2	23.9	30.0	30.0
Million metric tons	15.9	42.4	56.2	68.4	78.5
Average length of haul (kilometers)	320.8	405.7	425.3	438.6	382.2
Percent of total cargo	43.4	46.3	40.4	38.4	29.3
Dry cargo					
Billion ton-kilometers	7.2	16.7	29.2	40.2	87.0
Million metric tons	15.2	37.2	68.5	93.7	164.5
Average length of haul (kilometers)	473.7	448.9	426.3	429.0	528.9
Percent of total cargo	41.5	40.7	49.2	52.6	61.5
Total freight performance					
Billion ton-kilometers	18.6	45.9	67.4	85.5 d/	140.0 e/
Million metric tons	36.6	91.5	139.1	178.3 d/	267.5 e/
Average length of haul (kilometers)	508.2	501.6	484.5	479.5	523.4
Percent of total cargo	100.0	100.0	100.0	100.0	100.0

* Footnotes for Table 19 follow on p. 71.

Table 19

Performance of River Transport in the USSR
Selected Years, 1945-58, and 1965 Plan
(Continued)

	1945 a/	1950 a/	1955 a/	1958 b/	1965 Plan c/
Total passenger performance					
Billion passenger-kilometers	2.3	2.7	3.6	4.0 d/	5.5
Million passengers	38.5	53.6	82.4	102.2 d/	140
Average length of trip (kilometers)	59.7	50.4	43.7	39.1	39.3

a. 183/. Data for total ton-kilometers and metric tons originated in this table differ slightly from those shown in Tables 1 and 17 (pp. 52 and 68, respectively, above) because of a difference in coverage. These data were published before the Ministry of the River Fleet, RSFSR, took over some transport organizations not included in common carrier river transport before 1957. The later data are not used here, because a breakdown is not available.

b. 184/. [redacted] for all figures except total freight and passenger traffic (for which see footnote d). Individual breakdowns are based on percentage increases above the level of 1955 and have been adjusted to figures for total freight traffic (see footnote d), which are absolutes. 50X1

c. 185/. [redacted] for all figures except freight traffic (for which see footnote e). Individual breakdowns are based on percentage increases above the level of 1958 on which absolute figures have not been published, except as in footnote e. The figures have been adjusted to correspond with increases scheduled for total freight traffic (see footnote e). 50X1

d. 186/

e. 187/

Table 20

Average Freight Car Performance of Railroads in the USSR a/
1950-58 and 1965 Plan

Year	Average Freight Car Trip: Kilometers: Loaded	Empty	Total	Percent Empty	Average Turnaround Time (Days)	Average Kilometers Per Day
1950	801	296	1,097	27.0	7.49	146.4
1951	826	308	1,134	27.2	7.13	159.0
1952	818	317	1,135	27.9	6.87	165.2
1953	825	316	1,141	27.7	6.64	171.8
1954	838	320	1,158	27.6	6.68	173.3
1955	844	328	1,172	28.0	6.23	188.2
1956	868	338	1,206	28.0	6.31	191.2
1957	896	366	1,262	29.0	6.12	206.4
1958	893	369	1,262	29.2	5.83	216.6
1965 Plan					5.33	

a. 188/

Table 21

Average Freight Train Performance of Railroads in the USSR a/
1950-58 and 1965 Plan

Year	Gross Ton-Kilometers per Freight Train-Hour	Average Weight (Metric Tons)		Average Speed (Kilometers per Hour)	
		Gross	Net	Excluding Stops	Including Stops
1950	28,740	1,430	815	33.8	20.1
1951	32,520	1,478	839	34.5	22.0
1952	35,440	1,521	859	34.9	23.3
1953	37,110	1,579	894	35.0	23.5
1954	38,010	1,660	936	35.2	22.9
1955	43,420	1,758	1,002	37.1	24.7
1956	45,410	1,831	1,052	37.6	24.8
1957	48,130	1,880	1,100	37.8	25.6
1958	52,220	1,963	N.A.	N.A.	26.6
1965 Plan	74,400	2,400	N.A.	N.A.	31.0

a. 189/

Table 22

Profits, Revenues, and Costs of Railroad Operations
in the USSR
1940, 1950-58, and 1959 and 1965 Plans

Year	(1) Gross Operating Profit (Million Current Rubles)	(2) Operating Ratio a/	(3) Operating Profit per Traffic-Kilometer b/ (Current Kopecks)	(4) Gross Operating Revenue (Million Current Rubles)	(5) Operating Revenue per Traffic-Kilometer c/ (Current Kopecks)	(6) Total Operating Cost (Million Current Rubles)	(7) Operating Cost per Traffic-Kilometer (Current Kopecks)	(8) Total Traffic-Kilometers d/ (Billion)
1940	5,147 e/	72.5	1.002	18,692 f/	3.644	13,545 g/	2.642 h/	513.0
1950	6,342 i/	85.2	0.935	42,711 j/	6.187	36,369 j/	5.252 k/	690.3
1951	8,708 i/	81.3	1.124	46,625 j/	6.010	37,917 j/	4.886 h/	775.8
1952	7,678 i/	83.8	0.906	47,316 j/	5.575	39,638 j/	4.669 h/	848.7
1953	9,496 i/	81.2	1.035	50,423 j/	5.503	40,927 j/	4.468 h/	916.3
1954	11,918 i/	78.2	1.209	54,761 j/	5.554	42,843 j/	4.345 h/	985.9
1955	14,374 i/	75.2	1.292	58,065 j/	5.220	43,691 j/	3.928 h/	1,112.3
1956	14,346 i/	75.9	1.174	59,603 l/	4.879	45,257 m/	3.705 n/	1,221.5
1957	16,813 i/	74.1	1.231	64,849 l/	4.747	48,036 m/	3.516 o/	1,366.2
1958	19,121 p/	71.9	1.309	68,030 l/	4.658	48,909 m/	3.349 q/	1,460.4
1959 Plan	21,919 r/	69.4	1.435	71,730 l/	4.697	49,811 m/	3.262 s/	1,527.0
1965 Plan	41,963 i/	56.2	2.057	95,819 t/	4.697 u/	53,856 m/	2.640 v/	2,040

a. Column (6) divided by Column (4).
b. Column (7) subtracted from Column (5).
c. Column (4) divided by Column (8) unless otherwise indicated.
d. See Tables 1 and 2, pp. 52 and 53, respectively, above, except for 1940, 1951, 1952, and 1954, [redacted]
e. 191/
f. Column (1) plus Column (6).
g. Column (1) divided by profitability [redacted].
h. Column (6) divided by Column (8). The figure for 1940 also is given as 2.616 and the figure for 1955 as 3.932. 193/ Derived figures, which are not sufficiently different to affect the time series, have been used to maintain internal consistency.
i. Column (6) subtracted from Column (4).
j. 194/
k. 195/
l. Column (6) multiplied by profitability [redacted]
m. Column (7) multiplied by Column (8).
n. 197/
o. 198/. A figure of 3.480, which is for the first 9 months of operations only, has erroneously been carried in the more official sources. 199/
p. This figure is 83.5 percent of total profits [redacted] 83.5 percent is estimated to be the portion of total profits derived from operations. On the basis of previous established relationships between total profits and operating profits.
q. 201/
r. 202/. An increase of 3.7 billion rubles is planned.
s. 203/. A decrease of 2.6 percent is planned.
t. Column (5) multiplied by Column (8).
u. In order to obtain estimates of profits and revenues, unit revenue for 1965 is assumed to be the same as for 1959.
v. 204/. [redacted] carries out the figure to three places beyond the decimal point (2.612), which does not seem warranted considering the ranges given in other related control data.

50X1
50X1
50X1
50X1
50X1

Table 23

Average Revenue Rates for Selected Commodities
as a Percent of Unit Costs of Railroad Freight Traffic in the USSR
Selected Years, 1949-56

Percent

Commodity	1949 a/	1950 a/	1952 a/	1955 b/	1956 c/
Coal	105	96	91	99	115
Coke	95	92	82	N.A.	88
Iron ore	94	91	92	98	103
Earth, sand, and clay	94	76	82	N.A.	88
Mineral fertilizer	105	92	65	N.A.	65
Ferrous metals	94	96	95	N.A.	120
Grain	117	123	110	N.A.	111
Cotton	92	119	124	105	120
Sugar	300	263	230	218	243
Shoes	286	N.A.	N.A.	230	N.A.
Textiles	385	N.A.	N.A.	257	N.A.

a. 206/
b. 207/
c. 208/

Table 24

Profits, Revenues, and Costs of Railroad Passenger Operations in the USSR a/
1940, 1950-58, and 1965 Plan

Year	(1) Gross Operating Profit b/ (Million Current Rubles)	(2) Operating Ratio c/	(3) Operating Profit per Passenger-Kilometer d/ (Current Kopecks)	(4) Gross Operating Revenue e/ (Million Current Rubles)	(5) Operating Revenue per Passenger-Kilometer f/ (Current Kopecks)	(6) Total Operating Cost g/ (Million Current Rubles)	(7) Operating Cost per Passenger-Kilometer h/ (Current Kopecks)	(8) Total Passenger-Kilometers i/ (Billion)
1940	2,674	52.0	2.729	5,570	5.684	2,896	2.955	98.0
1950	3,174	69.1	3.607	10,265	11.665	7,091	8.058	88.0
1951	3,365	68.8	3.416	10,769	10.933	7,404	7.517	98.5
1952	3,749	67.4	3.491	11,496	10.704	7,747	7.213	107.4
1953	3,576	70.5	3.023	12,135	10.258	8,559	7.235	118.3
1954	3,086	74.8	2.390	12,264	9.500	9,178	7.109	129.1
1955	3,801	71.0	2.688	13,104	9.267	9,303	6.579	141.4
1956	3,749	71.6	2.633	13,223	9.286	9,474	6.653	142.4
1957	4,467	69.3	2.912	14,542	9.480	10,075	6.568	153.4
1958	5,216	67.4	3.293	15,976	10.086	10,760	6.793	158.4
1965 Plan	9,895	53.7	5.208	21,386	11.256	11,491	6.048	190

a. Revenues and costs of baggage and mail service are included in revenues and costs of passenger service, but there is no allowance for these items in total passenger-kilometers. The resulting inflation is not sufficient to alter the time series.
b. Column (6) subtracted from Column (4).
c. Column (6) divided by Column (4).
d. Column (1) divided by Column (8).
e. Column (1) plus Column (6).
f. Column (4) divided by Column (8).
g. Column (7) multiplied by Column (8).
h. Column (6) divided by Column (8).
i. See Table 2, p. 53, above, except for 1940, 1951, 1952, and 1954 [redacted]

50X1

Table 25

Profits, Revenues, and Costs of Railroad Freight Operations
in the USSR
1940, 1950-58, and 1965 Plan

Year	(1) Gross Operating Profit a/ (Million Current Rubles)	(2) Operating Ratio b/	(3) Operating Profit per Ton-Kilometer c/ (Current Kopecks)	(4) Gross Operating Revenue d/ (Million Current Rubles)	(5) Operating Revenue per Ton-Kilometer e/ (Current Kopecks)	(6) Total Operating Cost f/ (Million Current Rubles)	(7) Operating Cost per Ton-Kilometer c/ (Current Kopecks)	(8) Total Ton-Kilometers g/ (Billion)
1940	2,473	81.2	0.596	13,122	3.162	10,649	2.566	415.0
1950	3,168	90.2	0.526	32,446	5.387	29,278	4.861	602.3
1951	5,344	85.1	0.789	35,856	5.294	30,512	4.505	677.3
1952	3,929	89.0	0.530	35,820	4.832	31,891	4.302	741.3
1953	5,921	84.5	0.742	38,288	4.798	32,367	4.056	798.0
1954	8,833	79.2	1.031	42,497	4.960	33,664	3.929	856.8
1955	10,573	76.5	1.089	44,962	4.631	34,389	3.542	970.9
1956	10,597	77.2	0.982	46,380	4.298	35,783	3.316	1,079.1
1957	12,346	75.5	1.018	50,307	4.148 h/	37,961	3.130 i/	1,212.8
1958	13,905	73.3	1.068	52,054	3.998 j/	38,149	2.930 k/	1,302.0
1965 Plan	31,598	57.3	1.708	73,963	3.998 l/	42,365	2.290 m/	1,850

a. Column (6) subtracted from Column (4).
b. Column (6) divided by Column (4).
c. Column (1) divided by Column (8).
d. Column (5) multiplied by Column (8).
e. Source 210/ unless otherwise indicated.
f. Column (7) multiplied by Column (8).
g. See Table 1, p. 52, above, except for 1940, 1951, 1952, and 1954 [redacted]
h. 212/
i. Source 213/ [redacted]
j. Estimated decrease of 0.15 kopeck based on the actual decrease per traffic kilometer.
k. Estimated decrease of 0.2 kopeck based on the actual decrease per traffic kilometer.
l. In order to obtain estimates of profits and revenues, the unit revenue for 1965 is assumed to be the same as for 1959.
m. Estimated decrease of 0.64 kopeck based on the planned decrease per traffic kilometer.

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50X1

Table 26

Profits and Budget Transactions of the Ministry of Railroad Transportation of the USSR
1950-59 and 1965 Plan

Million Current Rubles

Year	(1) Profits: Gross Operating [a]	(2) Profits: Other [b]	(3) Profits: Total	(4) Budget Transactions: Payments to the State Budget	(5) Budget Transactions: Appropriations from the State Budget	(6) Budget Transactions: Net Surplus or Deficit
1950	6,342	1,277 [c]	7,619 [d]	N.A.	N.A.	-6,200 [e]
1951	8,708	1,533 [c]	10,241 [d]	6,365 [f]	8,924 [f]	-2,559 [f]
1952	7,678	1,882 [c]	9,560 [d]	6,276 [f]	8,428 [f]	-2,152 [f]
1953	9,496	1,069 [c]	10,565 [d]	10,841 [f]	10,478 [f]	+363 [f]
1954	11,918	1,047 [c]	12,965 [d]	12,285 [f]	10,191 [f]	+2,094 [f]
1955	14,374	2,305 [c]	16,679 [d]	15,722 [f]	9,384 [f]	+6,338 [f]
1956	14,346	1,442 [c]	15,788 [d]	15,400 [g]	8,500 [g]	+6,900 [g]
1957	16,813	3,387 [h]	20,200 [i]	17,200 [j]	8,200 [k]	+9,000 [j]
1958	19,121	3,779 [h]	22,900 [i]	19,000 [j]	9,200 [k]	+9,800 [i]
1959	21,562	3,938 [h]	25,500 [l]	N.A.	N.A.	+12,200 [l]
1965 Plan	41,494	7,322 [m]	48,816 [d]	N.A.	N.A.	+22,000 [n]

a. See Table 22, p. 74, above.
b. Other profits refer to profits resulting from enterprises of the Ministry of Railroad Transportation that are not directly engaged in transport, such as stations and maintenance organizations.
c. 214/
d. Column (1) plus Column (2).
e. 215/
f. 216/. [redacted] 50X1
g. 218/
h. Column (1) subtracted from Column (3).
i. 219/
j. 220/. The figure for 1958 is a plan figure.
k. Column (6) subtracted from Column (4).
l. 221/
m. Based on a continuation of the present relationship between Columns (1) and (3).
n. [redacted] there will be a net surplus of 121 billion rubles during 1959-65. A straight-line increase resulting in this total yields a figure of 22 billion for 1965. 50X1

Table 27

Profits, Revenues, and Costs of Inland Water Transport Operations in the USSR a/ 1950-59 and 1965 Plan

Year	(1) Gross Operating Profit or Deficit (Million Current Rubles)	(2) Operating Ratio b/	(3) Gross Operating Revenue (Million Current Rubles)	(4) Operating Revenue per Traffic-Kilometer (Current Kopecks)	(5) Total Operating Cost c/ (Million Current Rubles)	(6) Operating Cost per Traffic-Kilometer (Current Kopecks)	(7) Operating Cost per Traffic-Kilometer as a Percent of Railroad Operating Cost per Traffic-Kilometer d/	(8) Total Traffic-Kilometers e/ (Billion)
1950	-63 f/	103.2	1,944 g/	4.0 h/	2,007	4.13 i/	78.6	48.6
1951	Deficit j/		N.A.	N.A.	2,160	3.97 k/	81.3	54.4
1952	Deficit j/		N.A.	N.A.	2,213	3.64 k/	78.0	60.8
1953	Deficit j/		N.A.	N.A.	2,451	3.94 k/	88.2	62.2
1954	+5 f/	99.7	2,549 l/	3.87 m/	2,544	3.86 i/	88.8	65.9
1955	+143 f/	94.8 n/	2,742 l/	3.86 m/	2,599	3.66 i/	93.2	71.0
1956	N.A.	N.A.	N.A.	N.A.	2,513	3.41 i/	92.0	73.7
1957	+136 o/	95.1	2,749 l/	3.44 m/	2,613	3.28 p/	93.3	79.9
1958	+114 g/		N.A.	N.A.	2,819	3.15 p/	94.1	89.5
1959	N.A.		N.A.	N.A.	2,970	3.04 r/	93.2	97.7
1965 Plan	N.A.		N.A.	N.A.	3,507	2.41 s/	91.3	145.5

a. Including common carriers only.
b. Column (5) divided by Column (3).
c. Column (6) multiplied by Column (8).
d. Column (6) divided by Column (7) in Table 22, p. 74, above.
f. Column (3) minus Column (5).
g. Column (4) multiplied by Column (8).
h. 225/
i. 226/
j. The magnitude of the deficits for these years is unknown.
k. Column (7) multiplied by Column (7) in Table 22.
l. Column (1) plus Column (5).
m. Column (3) divided by Column (8).
n. 227/
o. 228/
p. 229/. Cost in 1958 decreased by 14 percent from 1955. The figure for 1957 is interpolated.
q. 230/. Estimated from data for the first 9 months of operations.
r. 231/. Plan figure.
s. 232/. Plan figure.

50X1

Table 28

Estimated State Budget and Nonbudget Allocations for Transport and Communications in the USSR a/
1950-51, 1956-57, 1952-55 Plan, and 1958-59 Plan

Year	State Budget Allocations		Nonbudget Allocations		Total Allocations	
	Billion Current Rubles	Percent of Total Allocated to the National Economy	Billion Current Rubles	Percent of Total Allocated to the National Economy	Billion Current Rubles	Percent of Total Allocated to the National Economy
1950	15.7 b/	9.9	17.5 c/	43.0	33.2	16.7
1951	11.9 c/	6.7	20.2 c/	23.3	32.1	12.1
1952 Plan	14.3 c/	8.0	19.7 c/	22.7	34.0	12.8
1953 Plan	17.4 d/	9.6	20.0 c/	20.4	37.4	13.4
1954 Plan	21.5 d/	10.1	17.3 c/	15.6	38.8	12.0
1955 Plan	19.5	8.4	17.5 c/	14.6	37.0	10.5
1956	21.6 b/	8.8	18.8 c/	17.1	40.4	11.4
1957	18.8 b/	7.3	N.A.	N.A.	N.A.	N.A.
1958 Plan	14.4 b/	5.6	17.8 e/	11.4	32.2	7.8
1959 Plan	20.8 f/	6.7	27.2 f/	15.5	48.0	9.9

a. Communications have generally taken from 3 to 5 percent of the total allocated to transport and communications.
b. 233/
c. 234/
d. 235/
e. 236/
f. 237/

Table 29

Estimated Capital Investment
in the National Economy, Transport and Communications, and Railroad Transport
in the USSR, by Plan Period a/

	First Five Year Plan b/ (1928-32)	Second Five Year Plan b/ (1933-37)	Third Five Year Plan b/ (1938-42)	Fourth Five Year Plan b/ (1946-50)	Fifth Five Year Plan b/ (1951-55)	1956-57 b/	1952-58 c/	Seven Year Plan c/ (1959-65)
Capital investment in the national economy (Billion Current Rubles)	64.9 d/	147.6 d/	145.3 d/	338.7 d/	654.4 d/	396.2 d/	997.0	1,955
Capital investment in the transport and communications sector (Billion Current Rubles)	12.1 d/	31.8 d/	29.6 d/	48.1 d/	66.0 d/	35.8 d/	108.1	211.5
Percent invested in the transport and communications sector	18.6 d/	21.5 d/	20.4 d/	14.2 d/	10.1 d/	9.0 d/	10.8	10.8
Capital investment in railroad transport (Billion Current Rubles)	8.2 e/	21.4 e/	20.6 e/	35.2 e/	49.1 e/	22.0 f/	60.0	112.5
Percent of total investment invested in railroad transport	12.7 g/	14.5 g/	14.2 g/	10.4 g/	7.5 g/	5.6	6.0	5.8
Percent of transport and communications investment invested in railroad transport	67.8	67.3	69.6	73.2	74.4 h/	61.5 h/	55.5 h/	53.2 h/

a. Communications have generally taken from 3 to 5 percent of the total allocated to transport and communications.
b. Including both centralized and noncentralized investment.
c. 238/. Including centralized investment only.
d. 239/
e. [redacted] Data for 1951-55 differ from data in Table 30, p. 82, below. The reason for this difference is not evident [redacted]
f. See Table 31, p. 83, below.
g. 241/
h. The inconsistency between the percentages for 1951-57 and 1952-58 results from the latter figure not including noncentralized investment, which is relatively high for railroad transport.

50X1
50X1

Table 30

Capital Inputs of Railroad Transport in the USSR
1950-59 and 1965 Plan

Year	(1) Total Retained Profits a/ (Billion Current Rubles)	(2) Total Appropriation from the State Budget b/ (Billion Current Rubles)	(3) New Financial Inputs c/ (Billion Current Rubles)	(4) Depreciation Charges d/ (Billion Current Rubles)	(5) Total Available Capital e/ (Billion Current Rubles)	(6) Estimated Capital Investment (Billion Current Rubles)	(7) Percent of Investment in the National Economy
1950			13.8	5.1	18.9	12.2 f/	N.A.
1951	3.9	8.9	12.8	5.0	17.8	11.5 g/	
1952	3.3	8.4	11.7	6.0	17.7	11.4 g/	
1953	-0.3	10.5	10.2	6.5	16.7	10.8 g/	Average 7.5
1954	0.7	10.2	10.9	6.9	17.8	11.5 g/	
1955	1.0	9.4	10.4	7.4	17.8	11.5 g/	
1956	0.4	8.5	8.9	8.1	17.0	10.9 f/	5.8
1957	3.0	8.2	11.2	8.8	20.0	11.1 h/	5.8
1958	3.9	9.2	13.1	9.3	22.4	12.8 i/	6.3
1959	N.A.	N.A.	13.3 j/	N.A.	N.A.	14.0 k/	6.0
1965 Plan	N.A.	N.A.	26.8 j/	13.9	40.7	26.3 f/	N.A.

a. Column (4) in Table 26 subtracted from Column (3) in Table 26, p. 78, above.
b. See Table 26.
c. Column (1) plus Column (2) except for 1950, which is Column (3) in Table 26 plus Column (6) in Table 26.
d. See Table 32, p. 84, below.
e. Column (3) plus Column (4).
f. Estimated on the basis of the relationship between total available capital and capital investment established in footnote g, below.
g. 242/. A total of 56.7 billion rubles was invested in railroad transport during 1951-55, or 64.6 percent of the total available capital for this period. Therefore, 64.6 percent of the available capital for each year was used to derive these estimates.
h. 243/
i. 244/
j. Net surplus subtracted from total profits. See Table 26.
k. 245/

50X1

Table 31

Estimated Capital Investment in Transport in the USSR and the US a/
1951-59

	USSR					US				
Year	Transport Investment (Billion Current Rubles)	Transport Investment as a Percent of National Investment	Investment in Railroad Transport b/ (Billion Current Rubles)	Railroad Investment as a Percent of Transport Investment	Railroad Investment as a Percent of National Investment	Transport Investment c/ (Billion Current US $)	Transport Investment as a Percent of National Investment	Investment in Railroad Transport d/ (Billion Current US $)	Railroad Investment as a Percent of Transport Investment	Railroad Investment as a Percent of National Investment
1951	14.0 e/	N.A.	11.5	82.1		5.2	18.7	1.5	28.8	5.3
1952	15.5 e/	N.A.	11.4	73.5	Average	5.3	18.2	1.4	26.4	4.8
1953	17.7 e/	N.A.	10.8	61.0	7.5	5.8	18.6	1.3	22.4	4.2
1954	18.0 f/	11.5	11.5	63.9		6.2	20.2	0.9	14.5	2.8
1955	19.0 f/	11.4	11.5	60.5		6.5	20.3	0.9	13.8	2.9
1956	21.5 f/	13.4	10.9	50.7	5.8	7.8	19.5	1.2	15.4	3.1
1957	22.5 g/	12.6	11.1	54.2	5.8	8.4	19.7	1.4	16.7	3.3
1958	19.8 h/	9.7 i/	12.8	72.7	6.3	8.2	22.4	0.8	9.8	2.1
1959	23.3 h/	10.0 i/	14.0	67.0	6.0	9.4	24.9	0.9	9.6	2.2

a. Data for the USSR include investment in communications, which have generally taken from 3 to 5 percent of investment in the transport and communications sector. Data for the USSR also exclude investment in air transport and petroleum pipeline transport for all years and exclude republic investment in motor vehicle and inland water transport for 1958 and 1959. Data for the US exclude government investment in inland waterways, port facilities, ship construction, and air facility development. Data for both countries exclude farm-owned trucking.
b. See Table 30, p. 82, above.
c. 246/. The US estimates consist of US business expenditures on new plant and equipment for rail and nonrail transport plus investment in highways by federal, state, and local governments.
d. 247/
e. 248/
f. 249/
g. 250/
h. 251/
i. The percentages probably remained at previous levels (see footnote a).

Table 32

Estimated Fixed Assets, Depreciation Charges, Output, and Capital-Output Ratios for Railroads in the USSR 1950-58 and 1965 Plan

Year	(1) Book Value of Fixed Assets a/ (Billion Current Rubles)	(2) Depreciation Charges: Billion Current Rubles b/	(3) Depreciation Charges: Percent of Total Operating Costs c/	(4) Fixed Assets d/ (Billion July 1955 Rubles)	(5) Traffic-Kilometers Performed per July 1955 Ruble of Fixed Assets e/	(6) Output f/ (Billion July 1955 Rubles)	(7) Capital-Output Ratios g/
1950	78	5.1	14.0	92.9 h/	7.4	36.0	2.6
1951	77	5.0	13.2	96.8 i/	8.0	40.5	2.4
1952	92	6.0	15.1	100.9 i/	8.4	44.3	2.3
1953	100	6.5	15.8	105.1 i/	8.7	47.8	2.2
1954	106	6.9	16.2	109.7 j/	9.0	51.5	2.1
1955	114	7.4	17.0	118.7 k/	9.4	58.1	2.0
1956	125	8.1	17.9	130.0 l/	9.5	63.8	2.0
1957	135	8.8	18.3	141.2 l/	9.7	71.3	2.0
1958	143	9.3	19.1	149.2 l/	9.8	76.2	2.0
1965 Plan	214	13.9	25.8	223.1 l/	9.2	106.5	2.1

a. Column (2) divided by an amortization rate of 6.5 percent.
b. Column (6) in Table 22, p. 74, above, multiplied by Column (3).

[redacted] 50X1
50X1

e. Column (8) in Table 22 divided by Column (4).
f. Revenue per traffic-kilometer for 1955 [Column (7) in Table 22 multiplied by Column (8) in Table 22].
g. Column (4) divided by Column (6).
h. 257/
i. Interpolation based on an average annual rate of growth of 4.2 percent between 1950 and 1954.
j. 258/. A coefficient of utilization of 8 traffic-kilometers per ruble of fixed assets at 1954 prices is estimated.
k. 259/
l. Derived by applying percentage increases in Column (1).

APPENDIX B

METHODOLOGY

Official Soviet transport statistics that have been published were accepted as the basis for all estimates, aggregations, and comparisons in this report. Adjustments, as duly noted on appropriate tables, were made where necessary to effect maximum possible comparability. Where published data were not available, estimates were based on past and present trends.

Detailed techniques for estimating aggregates such as performance, inventory, investment, and the labor force are given in their respective sections of this report.

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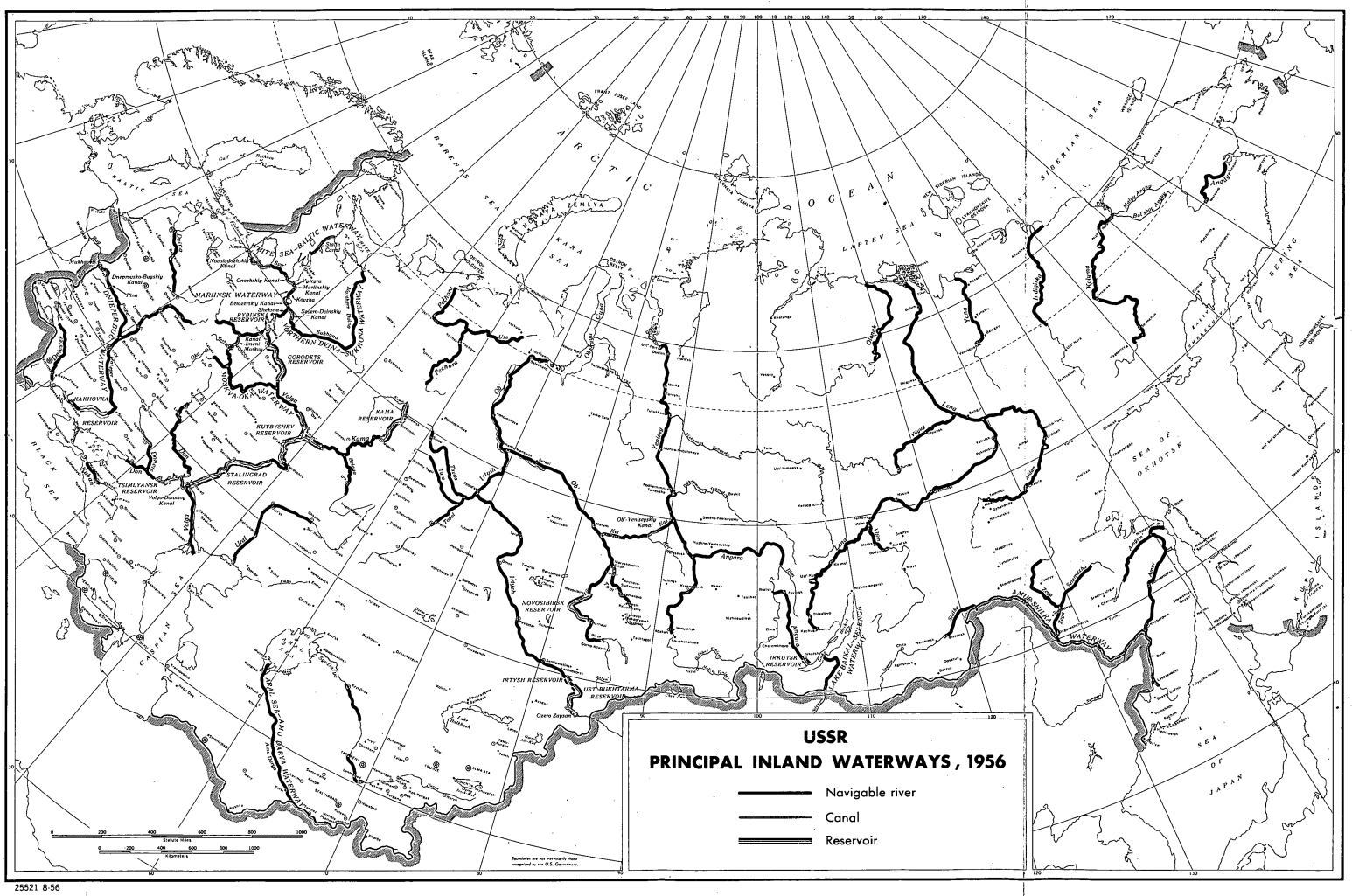

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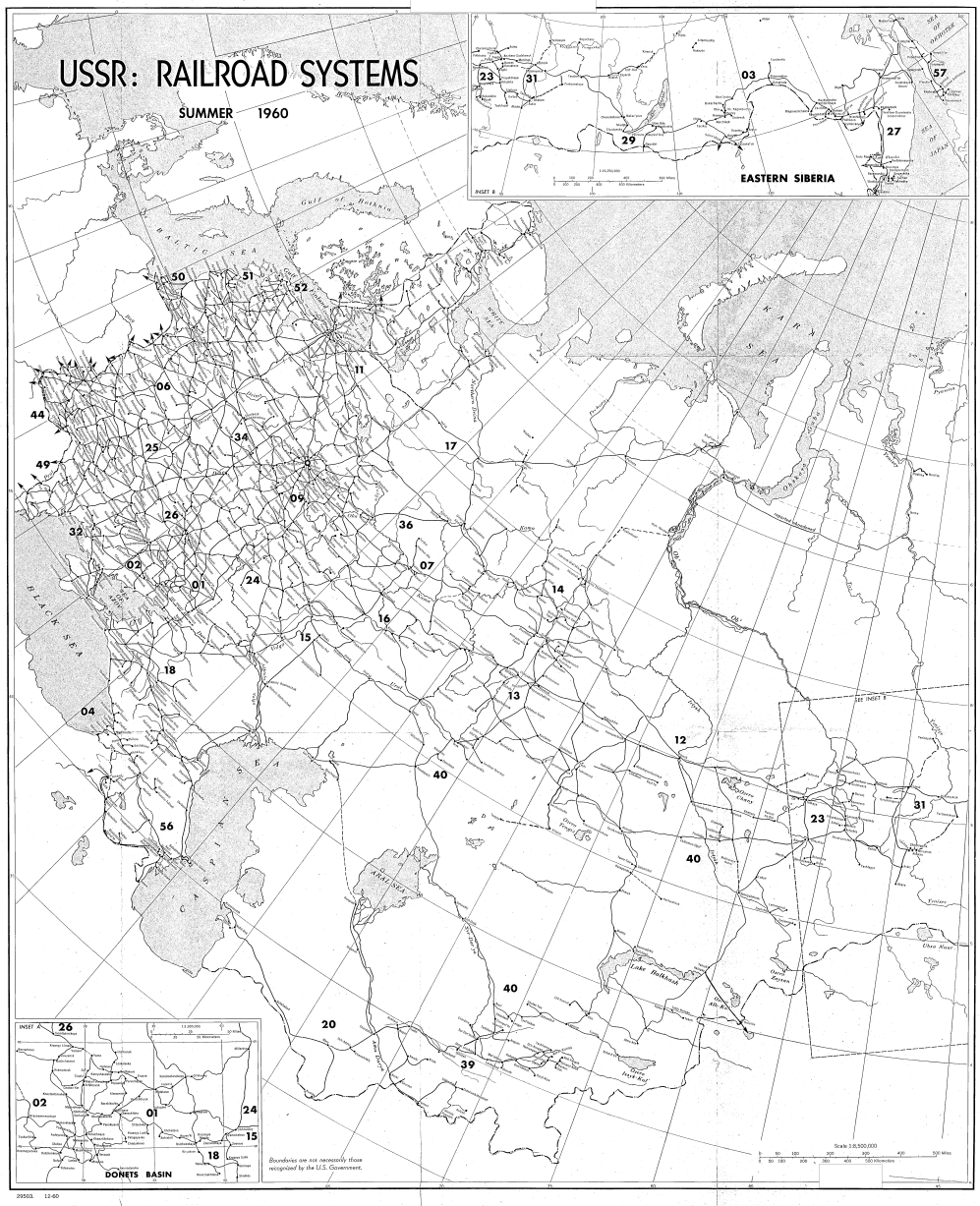
USSR: RAILROAD SYSTEMS

SUMMER 1960



LEGEND

- Railroad identified with a system
- Other railroad
- Railroad under construction
- 22 Railroad system number

RAILROAD SYSTEMS

Number*	Name	Transliterated Russian Name
01	Donets	Donetskaya
02	Stalin	Stalinskaya
03	Transbaykal	Zabaykal'skaya
04	Transcaucasus	Zakavkazskaya
06	Belorussian	Belorusskaya
07	Kazan'	Kazanskaya
09	Moscow	Moskovskaya
11	October	Oktyabr'skoye
12	Omsk	Omskaya
13	South Ural	Yuzhno-Ural'skaya
14	Sverdlovsk	Sverdlovskaya
15	Volga	Privolzhskaya
16	Kuybyshev	Kuybyshevskaya
17	Northern	Severnaya
18	North Caucasus	Severo-Kavkazskaya
20	Azerbaydzhan	Azerbaydzhanskaya
23	Tomsk	Tomskaya
24	Southeastern	Yugo-Vostochnaya
25	Southwestern	Yugo-Zapadnaya
26	Southern	Yuzhnaya
27	Far-Eastern	Dal'ne-Vostochnaya
29	East Siberian	Vostochno-Sibirskaya
31	Krasnoyarsk	Krasnoyarskaya
32	Odessa	Odesskaya
34	Kalinin	Kalininskaya
36	Gor'kiy	Gor'kovskaya
39	Tashkent	Tashkentskaya
40	Alma-Ata	Alma-Atinskaya
44	Lvov	Lvovskaya
49	Moldavian	Moldavskaya
50	Lithuanian	Litovskaya
51	Latvian	Latvyskaya
52	Estonian	Estonskaya
56	Azerbaydzhan	Azerbaydzhanskoye
57	South Sakhalin	Yuzhno-Sakhalinskaya

* The system numbers follow the listing in TARIFNOYE RUKOVODSTVO, N.4 (Tariff Handbook). Transzheldorizdat, Moscow, 1958.

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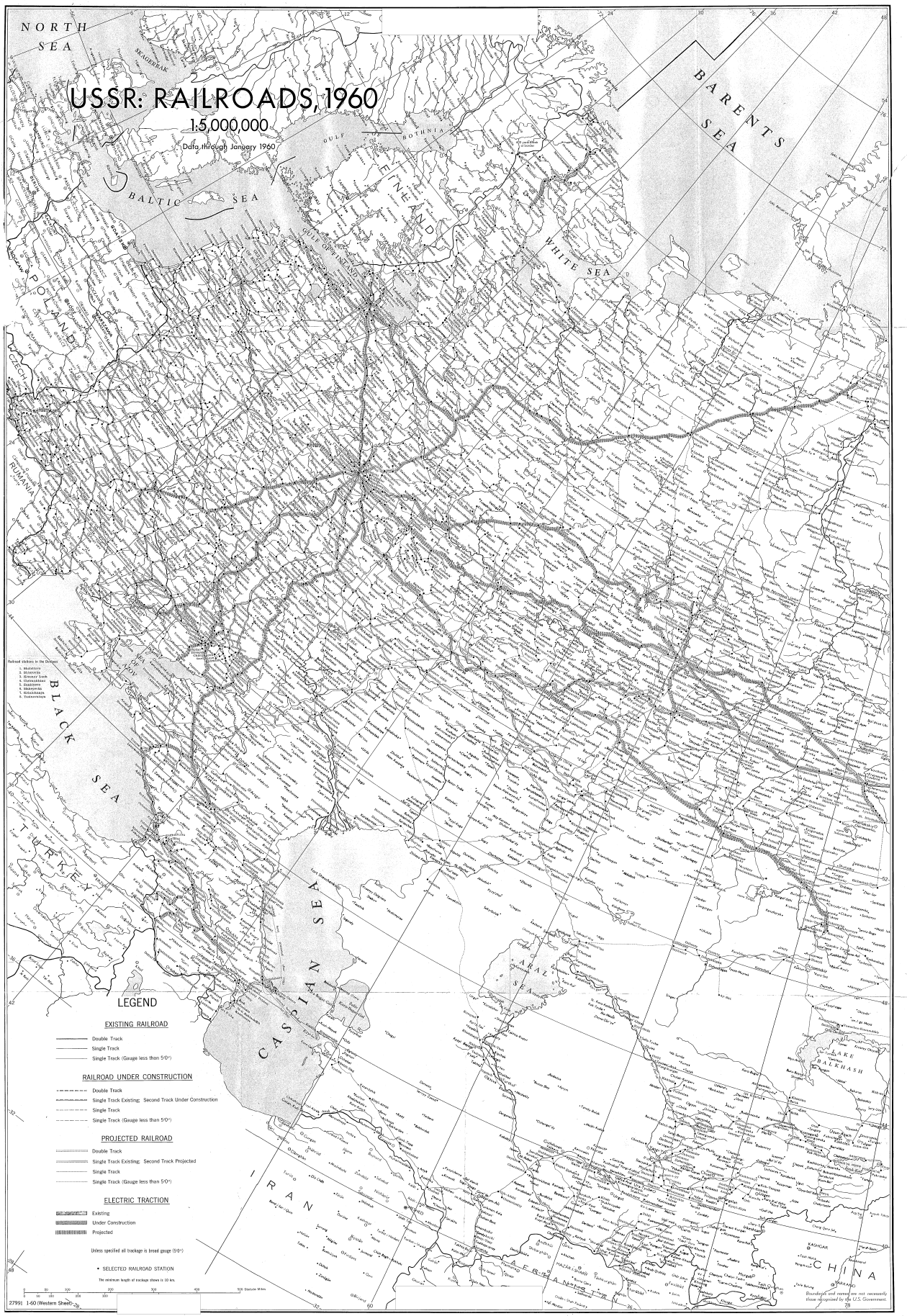

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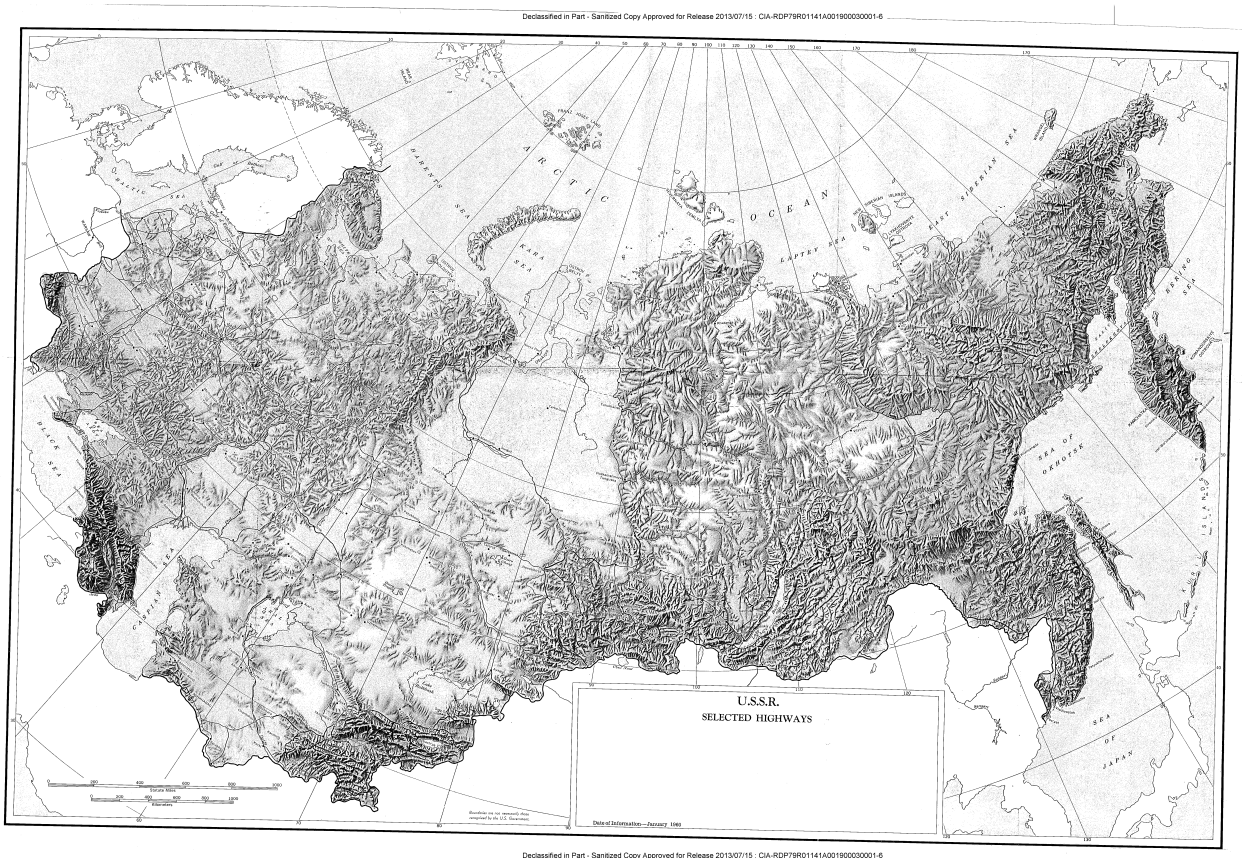

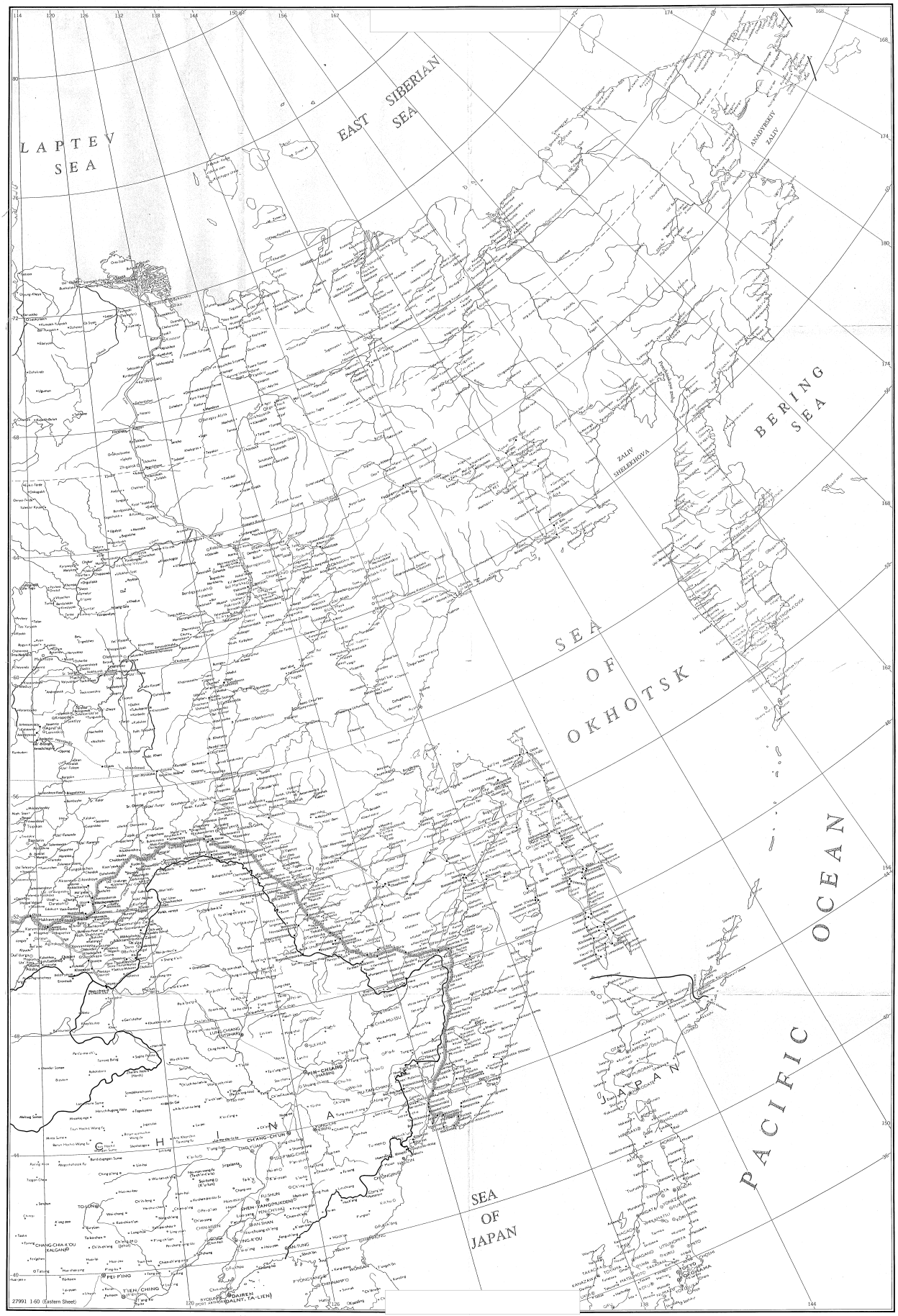

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