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ECONOMIC INTELLIGENCE REPORT

**RAIL TRANSPORT IN COMMUNIST CHINA
1958-59**



CIA/RR 59-45

November 1959

CENTRAL INTELLIGENCE AGENCY

OFFICE OF RESEARCH AND REPORTS

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FOREWORD

The expanding economy of Communist China requires a continuing increase in railroad facilities. In 1958-59 a heavy demand for service was placed on the railroad system, and announced performance was considerably higher than anticipated. The main purpose of this report is to explain how the Chinese railroad system achieved the performance levels that were announced for 1958 and how the system is expected to achieve planned performance goals for 1959.

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

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RAIL TRANSPORT IN COMMUNIST CHINA*
1958-59

Summary

Approximately 380 million tons** of freight were originated on the railroads of Communist China in 1958. Performance of this magnitude, which was adequate only to handle the demands made on the railroad system by the modern industrial sector of the economy, resulted from an increase in the average load per loaded car to 37.6 tons, a reduction in actual turnaround time to about 3.3 days, an increase of about 11,000 units in the freight car park, and an increase of 350 units in the locomotive park. The planned performance of 520 million tons originated in 1959 is expected to be attained by a further increase in the average load per loaded car to 40 tons and a further decrease in turnaround time to about 3 days. An increase of 20,000 to 28,000 units in the freight car park and an increase of about 1,000 units in the locomotive park also will be important factors in the attainment of the performance goal for 1959. Under these circumstances it is estimated that the railroad system will continue to support economic growth in the modern industrial sector of the Chinese Communist economy during 1959.

During 1958 the great increases in production in Communist China created a heavy demand for rail service. The railroad system, however, had little or no excess capacity, because the relatively small increments of investment made during 1950-57 had not been adequate to provide sufficient facilities and equipment to handle completely the increased demand. Had a greater portion of railroad investment during 1950-57 been made in improvements to the existing system instead of in new construction, the system would have been in a much better position in 1958. Railroad investment during 1957 and 1958 remained at about the level of 1956. Planned investment in 1959 will be about double investment in 1958, reflecting a realization on the part of the Chinese Communist leaders that a higher level of state investment is necessary to cope with a congested transportation situation of the type that developed in 1958. Investment expenditures for construction of new rail lines in 1958 were directed primarily toward extending the railroad network. Investment in 1959, however, has been directed largely

* The estimates and conclusions in this report represent the best judgment of this Office as of 15 September 1959.

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

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toward the improvement of the existing network through reconstruction and double tracking and the addition of branch and special lines. The large increase planned for production of rolling stock will help to meet the shortage of transportation equipment in the face of the demand for rapidly increasing tonnage.

A simplified organization of the Ministry of Railroads in Peking and a decentralized administration in the provinces also contributed to the performance of 380 million tons originated on the railroads of Communist China in 1958. The reorganization of railroad administration abolished the more than 50 subbureaus which were responsible to about 15 regional administrative bureaus and changed the regional bureaus to about 30 provincial (or city) bureaus, which were in turn made responsible both to the Ministry and to the "provincial authorities." The authorities in Peking expect the new organization to effect a closer liaison at the local level between transportation and the expansion of all branches of industry and agriculture and to provide better results in railroad operations and construction.

I. Introduction

During 1958 the "leap forward" program placed a heavy burden on the transportation system of Communist China. The Chinese claimed that record-breaking performances were achieved by all forms of transportation, both primitive and modern. Railroads and other modern types of transportation allegedly produced 229 billion ton-kilometers (tkm), an increase of 39 percent above the level of 1957, and originated 633 million tons of freight, an increase of 48 percent above the level of 1957. In addition, primitive forms of land transport and junks were said to have originated about 663 million tons. In total, nearly 1.3 billion tons of freight were originated by all forms of transportation, both primitive and modern. Against this background of tremendous achievement by the transportation system as a whole, it seems appropriate to examine and evaluate the performance of the railroads in 1958-59, because railroads remain the most important type of transportation in Communist China, particularly with respect to the support of heavy industry.

II. Performance

A. 1958

Late in January 1959, Yu Kuang-sheng, a Vice Minister of Railroads, stated that more than 380 million tons of goods were shipped on

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the railroads of Communist China in 1958. 1/* This performance represented an increase of 38.7 percent above performance in 1957, or 22.6 percent above the original state plan for 1958 of 310 million tons originated. 2/ The 38.7-percent increase was a remarkable achievement when compared with the average annual increase of 15.7 percent which took place during the First Five Year Plan (1953-57).

During 1958 the ton-kilometer performance of the railroads increased by 38 percent above the level of 1957, or at almost the same rate as tons originated. 3/ Thus it is estimated that the railroad system of Communist China produced about 186 billion tkm in 1958 compared with 134.6 billion tkm in 1957. The system produced 5.96 million tkm per route-kilometer in 1958 compared with 4.51 million tkm in 1957, 4.14 million tkm in 1956, and 2.46 million tkm in 1952. The railroad system of the USSR produced about 10.6 million tkm per route-kilometer in 1958.

Because the ton-kilometer performance of the railroads of Communist China is reported to have increased at a slightly slower rate than tons originated in 1958, it can be inferred that the average length of haul decreased from 491 kilometers (km) in 1957 to 489 km in 1958. Most of the available evidence before the end of the year had pointed to a greater decrease in the average length of haul than actually took place. A number of references were made to a shortening of the average length of haul for coal, but apparently the expected results did not materialize sufficiently to have a significant effect on the over-all figure. Table 1** contains estimated performance figures for the railroads of Communist China in 1952 and 1956-59.

Performance of the magnitude announced for 1958 was adequate only to handle the demands made on the railroad system by the modern industrial sector of the economy. Because of the over-all shortage of transportation in 1958 and the high priorities given to heavy industry in the use of transportation of all kinds, there was increasing congestion of rail transport, primarily in the movement of goods of lower priority. Thus a lack of additional transport capacity may have contributed to serious shortages of food in some urban areas and to the decline in exports that took place at the end of 1958 and the beginning of 1959.

The tremendous increase in production that occurred in 1958 created an unusual demand for service by a railroad system that had little or no excess capacity. During 1950-57 the Chinese Communists had not invested heavily in transportation, possibly because it appeared

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** Table 1 follows on p. 4.

Table 1

Communist China: Estimated Rail Transport Performance
1952 and 1956-59

Year	Tons Originated (Million)	Ton-Kilometers (Billion)	Average Length of Haul (Kilometers)	Railroad Network (Kilometers)	Ton-Kilometer Performance per Route-Kilometer (Thousand) ^{a/}
1952	132 ^{b/}	60.2 ^{c/}	455 ^{d/}	24,477 ^{e/}	2,459
1956	246 ^{b/}	120.4 ^{c/}	489 ^{d/}	29,071 ^{f/}	4,142
1957	274 ^{g/}	134.6 ^{h/}	491 ^{d/}	29,862 ^{e/}	4,507
1958	380 ^{i/}	186 ^{j/}	489 ^{d/}	31,193 ^{k/}	5,963
1959	520 ^{l/}	253 ^{m/}	487 ^{n/}	N.A.	N.A.

a. Ton-kilometers divided by length of railroad network -- that is, the number of route-kilometers in use at the end of the year.

b. ^{4/}

c. ^{5/}

d. Ton-kilometers divided by tons originated (using unrounded data).

e. The total length of operating rail lines was 29,862 km by the end of 1957, 22 percent above the level of 1952. ^{6/}

f. ^{7/}

g. ^{8/}

h. ^{9/}

i. ^{10/}

j. During 1958, ton-kilometer performance increased by 38 percent. ^{11/}

k. By the end of 1958, 31,193 km of railroad line were open to traffic. ^{12/}

l. 1959 plan. ^{13/}

m. Tons originated multiplied by the estimated average length of haul of 487 km.

n. Estimated.

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that a satisfactory rate of growth was being maintained with relatively small increments of investment. Railroads fared better than other carriers, but a large part of the amounts invested had gone into new construction. If larger amounts had been devoted to improvements in the existing system, railroad facilities and equipment might have been adequate to handle the increased traffic demands of 1958. Figure 1* shows the relationship between annual investment and the performance of the railroads in terms of freight ton-kilometers during 1952-59.

B. 1959 Plan

At the end of 1958, about 30 million to 40 million tons of goods were waiting to be moved on the railroads of Communist China. 14/ The evidence indicates that these goods were primarily products other than those of heavy industry. Thus the railroad system started 1959 with a backlog of unshipped commodities that was approximately equal to 10 percent of 1958 performance. The 1959 plan for railroad tons originated, announced in April, was set at 520 million tons, 15/ an increase of 37 percent above the level of 1958.** If the plan is fulfilled, tons originated will increase by 140 million tons, the largest absolute annual increase ever attained. Although the demand for rail transport in 1959 was expected to increase by about 100 percent above the level of 1957, 17/ the 37-percent increase in tons originated planned for 1959 should be practically sufficient to take care of increases in production in industry and agriculture, which are not expected to expand as rapidly as in 1958. Many problems remain in the field of rail transport in 1959, but, in contrast to the situation in 1958, the regime is acutely aware of them and will pay more attention to transport capabilities when production plans are made.

* Following p. 6. For the location of railroads and selected roads in Communist China as of May 1959, see the map, Figure 2, inside back cover.

** The volume of freight originated on the railroads of Communist China during the first 6 months of 1959 reportedly was 247 million tons, 49 percent more than that in the first 6 months of 1958 (166 million tons). 16/ In the first 6 months of 1958 only 43.7 percent of total annual performance was accomplished. In 1959, however, 47.5 percent of the annual plan was fulfilled during the first 6 months of the year. Because performance during the second half of the year usually exceeds that in the first half, it appears that the plan goal of 520 million tons will be achieved, if past experience is a guide. During the first 6 months of 1959 the railroads originated a volume of freight about equal to total performance in 1956. If the 1959 goal is achieved, the volume of freight originated during July-December will be about equal to performance in 1957.

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C. Comparison Between the Rate of Growth of Railroad Tons Originated and Production of Selected Commodities

In order to compare the rates of growth of rail transport performance and industrial production, a multiple correlation between tons originated on the railroads and the production of coal, cement, and ferrous materials in Communist China can be computed for 1950-57.* With the three key commodities as the independent variables and tons originated as the dependent variable, the coefficient of correlation is found to be 0.99. To determine whether or not announced rail transport performance was adequate in 1958, production estimates for the three commodities can be substituted in the regression equation for the multiple correlation and the equation solved for tons originated. The results show that the tonnage originated by the railroads should have been 385 million tons. This is only 1.3 percent higher than the announced performance of 380 million tons originated and indicates that for all practical purposes rail transport performance was generally adequate to support estimated production in the modern industrial sector of the economy in 1958.

In order to check the rail transport performance planned for 1959, a new regression equation can be computed using data for 1950-58, and production goals planned for 1959 can be substituted in the equation. The results indicate that the railroads should originate 504 million tons in 1959, or 97 percent of planned performance, in order to support modern production in other sectors. Thus it is estimated that rail transport performance in 1959 will be adequate to support production in the modern industrial sector of the economy.

D. Commodity Composition of Railroad Freight Traffic

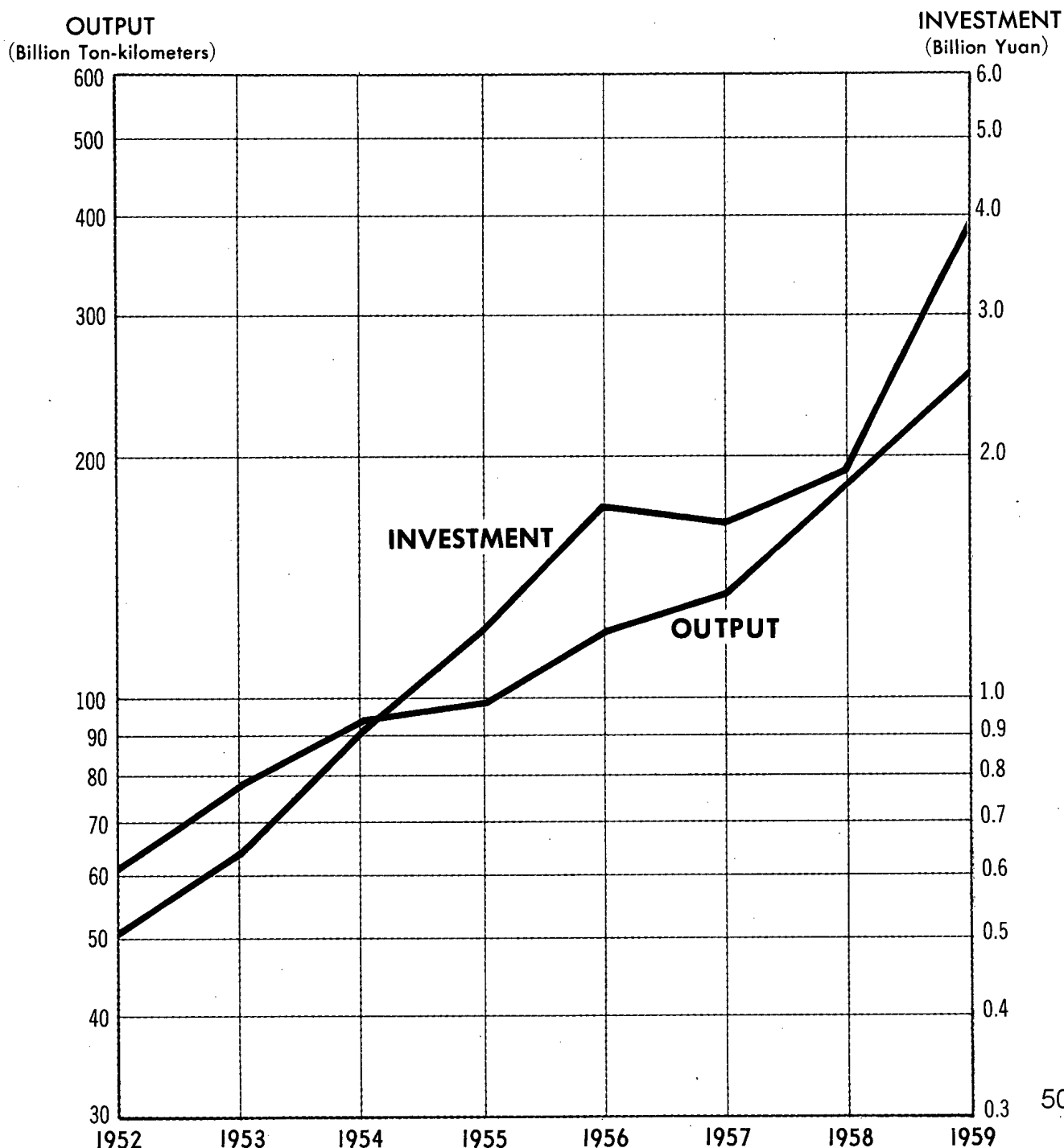
The estimated tonnage of certain basic commodities originated on the railroads of Communist China in 1958-59 is shown in Table 2.** The identified commodities listed in this table account for about 78 percent of the total tons originated by the railroads.

* These commodities were chosen because they are key commodities from the point of view of both transportation and the growth of industry in the present stage of economic development in Communist China. The three commodities also constituted about 40 percent of the tonnage originated by the railroads during 1950-57. The production estimates for 1958 and 1959, used in computing or substituting in the equation, exclude the large quantities of handicraft or native production not included in the data for 1950-57.

** Table 2 follows on p. 7.

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COMMUNIST CHINA ANNUAL INVESTMENT IN AND PERFORMANCE OF RAILROADS, 1952-59



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Table 2

Communist China: Estimated Tonnage
of Basic Commodities Originating on Railroads
1958-59

Commodity	Percent of Total ^{a/}	Volume (Million Metric Tons)	
		1958	1959
Coal	39	148	203
Construction materials	12	46	62
Ferrous materials	11	42	57
Agricultural goods	10	38	53
Timber	5	20	26
Petroleum	1	3	5
Other	22	83	114
Total	<u>100</u>	<u>380</u>	<u>520</u>

a. These percentages are for the most part based on Chinese announcements of the percentage of rail tons originated which were accounted for by different commodities. In arriving at these estimates, however, consideration was given to the volume and location of production, flow patterns, methods of distribution, and consumption areas. The percentages are assumed to be about the same for both years.

Because the irrational transportation of coal wasted transportation facilities during 1958, transportation of coal is considered by the Chinese Communists to be the key to fulfillment of the 1959 goal for tons originated. Careful planning for transportation of coal in the first part of 1959 resulted in "more coal and other goods being delivered." ^{18/} Production of coal in 1958 was announced to be about double production in 1957, or 270 million tons, of which about 208 million tons were produced by modern mines. Traditionally, the railroads have hauled about three-fourths of modern production of coal ^{19/} and probably hauled about this share in 1958, even though coal accounted for about 39 percent of tons originated compared with 33 percent in 1957. ^{20/} In recent years, about 60 percent of the coal has been produced in north and northeast China, and the surplus in these areas has been shipped by rail and water to central and south China. Some of this surplus production is transported 2,000 km, more than five times the average distance over which coal is transported by rail. ^{21/}

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Construction materials -- including cement, glass, brick, sand, gravel, earth, and stone -- are estimated to constitute only about 12 percent of total railroad tons originated in 1958-59 compared with about 18 percent in 1954. 22/ In 1958 these materials were not given the priority in the transportation system accorded to materials for the steel industry, nor in 1959 when coal, steel, grain, and cotton are priority items. During 1959, however, the increase of 35 percent in the amount of these materials transported by railroad* is more than the planned increase of 26 percent in construction investment. 23/ Cement produced by modern plants amounted to 6.9 million tons in 1957, 9.3 million in 1958, and 12.5 million planned for 1959. 24/ About 70 percent of production in the past has been hauled by railroad. 25/

In 1958 the movement of ferrous materials was given top priority to achieve the "leap forward" goal of 11 million tons of crude steel. About one-fourth of the 42 million tons of these materials estimated to have moved by railroad consisted of iron ore transported from the mines near An-shan to the steel complex. About 3 million tons of pig iron and semifinished steel moved as interplant shipments. Of the 4.6 million tons of finished steel produced in 1958, more than 2 million tons are estimated to have moved by railroad. Not only did materials from modern plants enter the railroad system, but also native production of crude steel was reported to have added to the congestion in the last half of 1958. 26/

Agricultural goods, which in rail transport comprise mainly government-procured grain and cotton, move from inland producing areas to the large cities. During 1958, apparently both grain and perishable agricultural products were delayed at loading points. Not until December were agricultural goods moved on a priority basis. The timber industry, which is mainly in northeast, central, and south China, is being modernized and is using narrow-gauge steel or wooden railroads to take logs to waterways or directly to the mills. Lumber is shipped either by rail or by water to large cities and construction projects. In 1958 the estimated production of timber was 35 million cubic feet. This production is estimated to have accounted for 20 million tons on the railroad system, either as logs or as lumber. In the petroleum industry the major movements of crude oil were the movement to refineries on the coast of about 600,000 tons of Yu-men production and about 360,000 tons imported from the USSR through the transloading stations of Otpor and Chi-ning. Of about 4 million tons of domestic and imported refined products available in 1958, it is estimated that roughly 2 million tons were distributed by rail.

* Based on information in Table 2, p. 7, above.

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Other categories not listed include such important groups as railroad stores, which in past years have accounted for as much as 11 percent of the railroad tons originated, 27/ and military supplies. In addition, there are the products of industries such as chemicals, nonferrous minerals and metals, and consumer goods other than products of agriculture.

III. Operating Efficiency

A. Freight Cars

1. Average Load per Loaded Car

In order to originate 380 million tons of freight in 1958 with their relatively limited freight car park, the Chinese Communists apparently increased substantially their average load per loaded car. In January 1959 the publication Hung Ch'i (Red Flag) carried an article by Lu Cheng-ts'ao, a Vice Minister of Railroads, which stated that during 1958 the average net load per freight car was increased to 37.6 tons. 28/ This figure represents an increase of about 8 percent above the 1957 figure of 34.7 tons per freight car. 29/ In October 1958 it was reported in the Soviet newspaper Gudok (The Whistle) that freight cars in Communist China were being loaded 20 percent above their load capacity in order to cope with rapidly growing traffic. 30/ The Chinese announced at the same time that the loading capacity of freight cars had been increased by 15 to 30 percent as a result of a series of technical innovations. 31/

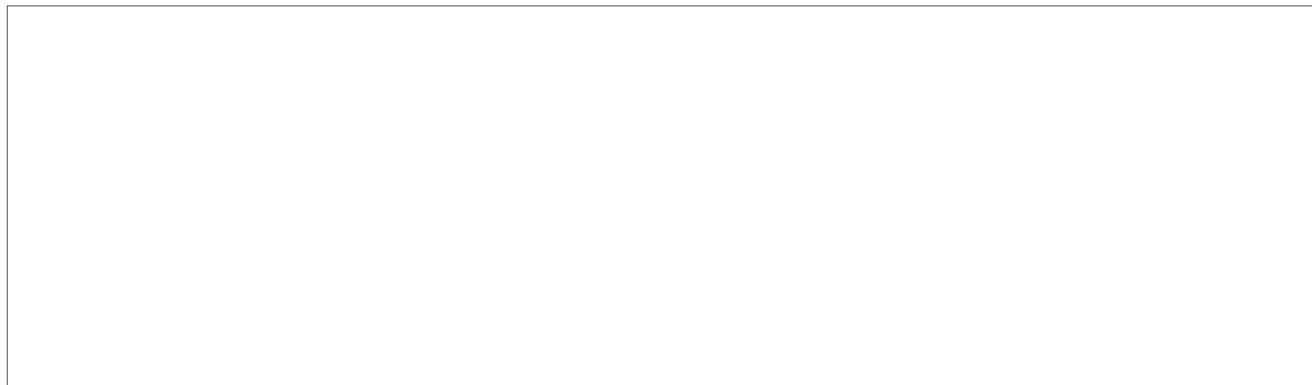
A large percentage of commodities carried on the railroads of Communist China are materials that load to 100 percent or more of capacity, often in freight cars with a carrying capacity of 50 or 60 tons. It is estimated that more than two-thirds of the freight carried by the Chinese railroads consists of such heavy-loading goods as coal, grain, railroad supplies, ores, heavy steel products, chemicals, salt, and cement and other construction materials. 32/ With many 50-ton and 60-ton freight cars regularly loaded to 100 percent or more of rated capacity, many 30-ton cars loaded to 120 percent of capacity, and the remainder packed as fully and heavily as is humanly possible, the announced figure of 37.6 tons per car does not appear implausible. In addition, it is less than 1 percent above the average capacity of the entire freight car park of 37.28 tons as of mid-1957. 33/

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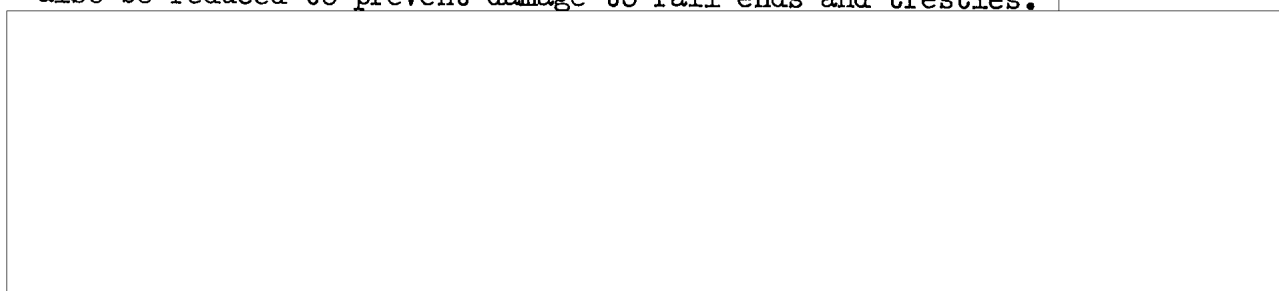
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The most serious consequence of overloading of freight cars 50X1
is the possible damage to springs and bearings. Operating speeds must
also be reduced to prevent damage to rail ends and trestles.



The Chinese Communists have said very little concerning 50X1
their 1959 plan for average load per loaded freight car. In April 1959,
however, it was announced that the plan for railroad freight transport
for the first quarter of the year had been fulfilled. The same announce-
ment contained a statement to the effect that during the second quarter
the plan called for an average load per loaded freight car of 40
tons. 36/ If such a figure was attained during the second quarter, it
is estimated that the annual achievement in 1959 will approach the same
figure.*

2. Daily Carloadings

In order to originate 380 million tons of freight in cars 50X1
loaded to an average of 37.6 tons, the Chinese Communists averaged



* During 11-20 August 1959, average load per loaded car reportedly was
increased to 40.1 tons. 37/ Another announcement indicated that during
the first 20 days of August average load per loaded car was 40 tons,
1 ton more than during the first half of the year. 38/

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27,689 carloadings per day in 1958, a 26.5-percent increase above the level of 1957.* From a daily average of 25,741 during the first quarter of 1958, 39/ carloadings increased to a peak of 32,800 during November. 40/ In January 1959, daily carloadings dropped to 30,146. 41/ During the next few months, however, daily carloadings again increased, reaching a new peak of 36,870 in May. 42/ During the first half of 1959 an average of slightly less than 35,000 freight cars was loaded each day.** In order to reach their plan goal of 520 million tons originated in 1959, the Chinese will have to average slightly more than 35,600 freight cars loaded per day with 40 tons per car during the entire year. Thus continued improvement in daily carloadings is a necessity if the plan is to be fulfilled.

3. Turnaround Time and Freight Car Requirements

a. Turnaround Time

According to Chinese Communist announcements, turnaround time was again reduced significantly in 1958, from the 1957 figure of 2.9 days to an average of 2.75 days. 43/ This Office previously estimated that the Chinese are referring to turnaround time for loaded cars in their announcements rather than to conventional turnaround time as the term is used in other countries. Therefore, if approximately one-fifth to one-third is added to the announced turnaround time figure to take care of the empty haul, actual turnaround time may have ranged from 3.3 to 3.7 days.

Although a range of 3.3 to 3.7 days for turnaround time in Communist China seems to be low when compared with turnaround time of 5.7 days in the USSR in 1958 and nearly 15 days in the US, it is conceivable that the Chinese have been able to attain such figures.*** During the last three quarters of 1958 the Chinese made frantic efforts

* The figure of 380 million tons originated divided by 365 days gives 1,041,096 tons originated per day, and 1,041,096 tons divided by 37.6 tons per car gives 27,689 cars loaded per day.

** The figure of 247 million tons originated divided by 181 days gives 1,364,641 tons originated per day, and 1,364,641 tons divided by 39 tons per car gives 34,991 cars loaded per day.

*** In 1958 the average length of haul on the railroad system of the USSR was 806 km. Thus the average length of haul of 489 km on the Chinese Communist railroads was only 61 percent of the average length of haul on the Soviet system. At the same time, turnaround time on the Chinese system was 58 percent of the Soviet turnaround time, if the 3.3-day figure mentioned above is compared with the Soviet figure of 5.7 days. Thus average length of haul and turnaround time in China were both about 60 percent of the similar Soviet figures in 1958.

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to reduce unloading and loading time so that the existing car park could be used to transport more freight. Under the leadership of local Communist Party committees, numerous rail transport commands were established. These commands organized great masses of people into loading and unloading teams to assist in rail operations. On one occasion, more than a million people were organized to deal with congestion of railroad freight at a number of stations. 44/ Thus the Chinese attempted to organize the available labor force in such a way that "men wait for the cars instead of making the cars wait for the men." 45/

Turnaround time on the railroads of Communist China allegedly was reduced to 2.42 days in April 1959 and to 2.38 days in May. 46/ If these figures represent loaded car turnaround time, actual turnaround time may have been reduced almost to 3 days by May 1959. The reductions in turnaround time in 1959 were to be accomplished by continued use of special loading and unloading teams, by effecting technical innovations in freight loading and unloading equipment, and by strengthening cooperation between transport units and factory and mining enterprises. 47/ The greatest stress was to be placed on increasing labor productivity rather than on mass use of labor. New devices were to be emphasized rather than an increase in the number of workers or working hours. 48/

b. Freight Car Requirements

During 1958 the Chinese Communists averaged 27,689 freight cars loaded per day with 37.6 tons per car. Estimates of freight car requirements thus depend on estimates of turnaround time plus an estimated allowance for cars in reserve and under repair. The following tabulation indicates the number of freight cars which would have been required during 1958 under varying assumptions for actual turnaround time. Because the number of freight cars required would have to be available on the average during the entire year, the figure for car requirements must be equated to the midyear figure for the freight car park.

<u>Actual Turnaround Time (Days)</u>	<u>Total Freight Car Requirements* (Units)</u>
4.0	112,400
3.7	104,000
3.5	98,400
3.3	92,700
3.0	84,300

* A factor equal to 1.5 percent of the operating freight car park has been included to take care of cars being repaired and cars in reserve.

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At the end of 1957 the freight car park of Communist China reportedly consisted of about 86,000 cars. ^{49/} During 1958, production of freight cars increased greatly, although production reportedly was hampered by a shortage of wheels and axles. ^{50/} According to the State Statistical Bureau, Communist China produced 11,000 freight cars in 1958, a 51-percent increase above production in 1957. ^{51/} Thus the freight car park at the end of 1958 probably consisted of no more than 97,000 cars and the midyear park of no more than 92,000 to 93,000 cars. The park at the end of the year may have been considerably less than 97,000 freight cars if a large number of cars were retired during 1958. Because there is no evidence to indicate large retirements and because the demand for freight cars was extremely heavy, it is believed that retirements in 1958 were negligible.

If the midyear park in 1958 is compared with freight car requirements, it appears that actual turnaround time was reduced to about 3.3 days in 1958. Even a turnaround time of 3.5 days would have left the Chinese Communists with a deficit of about 6,000 freight cars. An estimate for actual turnaround time of 3.3 days is 20 percent above the announced figure of 2.75 days for loaded car turnaround time. Thus only about one-sixth of the time between loadings was taken up with the empty haul rather than one-fourth, as previously estimated. In view of the efforts which the Chinese made during 1958 to utilize all their available freight cars and to reduce loading and unloading time, it is estimated that turnaround time was reduced to 3.3 days and that production of new freight cars in 1958 was sufficient to meet total car requirements for the year.

In order to originate 520 million tons of freight in 1959 in freight cars loaded on the average to 40 tons, the Chinese will have to average 35,616 carloadings per day. The following tabulation indicates the number of freight cars which would be required in 1959 under varying assumptions for actual turnaround time:

<u>Actual Turnaround Time (Days)</u>	<u>Total Freight Car Requirements (Units)</u>
4.0	144,600
3.7	133,800
3.5	126,500
3.3	119,300
3.0	108,500

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During 1959 the production of freight cars is planned to increase from the 1958 level of 11,000 to between 27,000 and 28,500, 52/ although it is currently estimated that no more than 20,000 units actually will be produced.* Thus the park at the end of 1959 may range from 117,000 to 125,000 freight cars and the midyear park from 107,000 to 111,000 cars. If the estimated midyear park is compared with freight car requirements, it appears that actual turnaround time will have to be reduced almost to 3 days if the 1959 plan for tons originated is to be fulfilled. The evidence indicates that reduction of turnaround time to this figure may have been attained in May. Further improvement may be possible during the rest of the year.

During 1960-70, continued increases in performance probably can be achieved only by sizable annual increases in the freight car and locomotive parks rather than by much further improvement in operating efficiency, where the limits appear already to have been reached or exceeded. Thus it will be necessary for the Chinese Communists to continue investment in rolling stock and in improvements of existing facilities at the 1959 rate for a number of years in order to keep up with increasing demand.

B. Locomotives

1. Performance

The Chinese Communists have published very few recent figures concerning locomotive performance. During 1958 the average daily kilometrage per locomotive was reported to be 391 km, 54/ 7.7 percent above the 1956 figure of 363.2 km. So far, no daily kilometrage figures for 1959 have been announced, which may indicate little or no improvement in this particular indicator.

Minister of Railroads T'eng Tai-yuan in February 1958 again called on all railroad workers to carry out the program for achieving 1 million tkm per locomotive per day. 55/ During the course of the 1 million-tkm campaign, the average for the country increased from 525,000 tkm per locomotive per day in 1956 56/ to 530,000 tkm in January 1958 57/ and to 698,000 tkm in June 1958. 58/ The average slipped back to 632,000 tkm per locomotive per day in January 1959 59/ but increased again to a new high of 755,000 tkm in May 1959. 60/

* According to the Chinese Communists, less than 40 percent of the goal for the production of locomotives and freight cars was accomplished during the first half of 1959. The Chinese have also indicated that limited supplies of raw materials and other components will make it impossible for freight car production to show a very big increase in the second half of the year. 53/

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2. Requirements

At the end of 1957 the Chinese Communists are estimated to have possessed a park of approximately 3,850 locomotives. This park amounted to 4.48 locomotives per 100 freight cars, or 22.34 freight cars per locomotive. During 1958 the Chinese produced 350 steam locomotives 61/ and imported 50 steam locomotives from the USSR, thus increasing the park to about 4,250 locomotives at the end of 1958, if retirements, estimated to be negligible, are ignored. The ratio of locomotives to freight cars declined to about 4.38 per 100 at the end of 1958, a continuation of the 1952-57 trend. Thus the Chinese apparently acquired enough locomotives during 1958 to meet both freight and passenger traffic requirements, inasmuch as passenger traffic has been increasing at almost the same rate as freight traffic.

During 1959 the locomotive inventory of Communist China probably will increase to about 5,200 units as a result of both production and imports. The ratio of locomotives to freight cars probably will remain about the same. Thus it is estimated that the Chinese will acquire enough locomotives during 1959 to meet traffic requirements.

IV. Investment

Since 1949, nearly all new capital invested in the railroads of Communist China has been allocated through the state budget of the national government. The railroads received about 12 percent of the 49.3 billion current yuan* invested by the state for all purposes in 1953-57. They are estimated to have received 9 percent in 1958 and 14 percent in the 1959 plan. Besides the capital investment by the state in 1958 and 1959, however, there may also have been considerable extrabudgetary investment by local and provincial governments.

Capital investment in the railroads of Communist China through the state budget for construction of new rail lines, improvement of existing lines, purchase of rolling stock, and planning and design is shown in Table 3.** Information released by the Chinese for 1953-57 reveals that railroads received between 60 and 70 percent of the investment made in transportation and post and telecommunications. 62/ The proportion of the investment in this sector going to railroads during 1958-59 has***

* Because of the difficulty of determining a valid exchange rate, yuan have not been converted into dollars. The rate of 2.46 yuan to US \$1 usually quoted is based on the yuan-sterling rate for telegraphic transfers, which is arbitrarily established and bears no relation to domestic price levels.

** Table 3 follows on p. 16.

*** Text continued on p. 18.

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Table 3
Communist China: Capital Investment in Railroads
Compared with Total Capital Investment
1953-58 and 1959 Plan

Year	(1)	(2)	(3)	(4)	(5)
	Total for the Economy (Million Current Yuan)	Transportation and Post and Telecommunications Amount (Million Current Yuan)	Percent of Total	Railroads Amount (Million Current Yuan)	Percent of Transportation and Post and Telecommunications
1953	6,506 <u>a/</u>	1,063 <u>a/</u>	16 <u>b/</u>	642 <u>a/</u>	60 <u>c/</u>
1954	7,498 <u>a/</u>	1,440 <u>a/</u>	19 <u>b/</u>	917 <u>a/</u>	64 <u>c/</u>
1955	8,632 <u>a/</u>	1,724 <u>a/</u>	20 <u>b/</u>	1,202 <u>a/</u>	70 <u>c/</u>
1956	13,986 <u>a/</u>	2,581 <u>a/</u>	18 <u>b/</u>	1,738 <u>a/</u>	67 <u>c/</u>
1957	12,700 <u>d/</u>	2,411 <u>e/</u>	19 <u>b/</u>	1,661 <u>f/</u>	69 <u>c/</u>
1958	21,400 <u>g/</u>	2,780 <u>h/</u>	13 <u>h/</u>	1,900 <u>i/</u>	69 <u>i/</u>
1959 plan	24,800 <u>j/</u>	5,550 <u>k/</u>	22 <u>b/</u>	3,800 <u>l/</u>	69 <u>i/</u>

a. 63/

b. Computed from figures in columns 1 and 2.

c. Computed from figures in columns 2 and 4.

d. During 1953-57, total capital investment was 49.3 billion yuan. 64/ The sum of the figures for 1953-56 subtracted from the total leaves about 12,700 million for 1957.

e. Investment in transportation and post and telecommunications in 1953-57 was 18.7 percent of total capital investment. 65/

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Table 3

Communist China: Capital Investment in Railroads
Compared with Total Capital Investment
1953-58 and 1959 Plan
(Continued)

-
- f. During 1953-57, total investment for railroads was 6,160 million yuan. 66/ The sum of the 1953-56 data subtracted from the total leaves 1,661 million for 1957.
- g. 67/. Investment through the state budget was 21.4 billion yuan. (Total investment, including that by local governments, was 26.7 billion.)
- h. 68/. Thirteen percent of the total was invested in transportation and post and telecommunications.
- i. Assumed to be about the same percent of the total as in 1955-57.
- j. 69/. The original plan for total investment was 27 billion yuan. When the revised plan total was announced, the proportion of the total going to each sector was not discussed.
- k. 70/

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not been announced, but, assuming that the proportion remains approximately the same as in 1955-57, railroad investment through the state budget for 1958 can be estimated to be about 1,900 million yuan and investment in 1959 to be nearly double that amount (about 3,800 million yuan). Investment in transportation and communications, as originally planned for 1959, represented the highest percentage of total investment ever given to that sector, probably reflecting the realization that a higher level of state investment is necessary to cope with a congested transportation situation of the type encountered in 1958. Total investment in the original plan was revised downward in August 1959 from 27 billion yuan to 24.8 billion yuan, with no indication as to which sectors have reduced goals.

Although the amount of rolling stock produced and track laid during any one year is to a certain extent the result of accumulated investment in previous years, the excellent achievement during 1958 in both of these categories makes it appear that actual railroad investment in 1958 was not limited to that included in the state budget. According to a report of the State Statistical Bureau from Peking in April 1959, total investment in capital construction amounted to 26.7 billion yuan, of which 21.4 billion was made through the state budget. In addition, the peoples communes built "a certain number of capital construction projects." The report goes on to say that 13 percent of investment for capital construction went to transportation and communications. 71/ Traditionally, the announced percentages of investment going to each sector of the economy apply only to the investment made through the state budget. Furthermore, railroad investment in past years has been the responsibility of the central government. If it is assumed, however, that the 13 percent allocated to transportation and communications applies to total budgetary and extrabudgetary investment combined, the amount of railroad investment can then be estimated to be 2.4 billion yuan in 1958. In view of the change in railroad administration which placed railroad construction under the supervision of the provincial railroad bureaus, 72/ extrabudgetary investment by the local governments may have contributed substantially to the 1958 achievements. In 1959 the provincial governments are being urged to contribute to the construction of "provincial" railroads. 73/

In addition to budgetary and possibly extrabudgetary investment, there was considerable labor investment by the communes, which helped to build the roadbeds for main and branch lines running through their areas. This innovation is described by Lu Cheng-ts'ao, a Vice Minister of Railroads, as follows 74/:

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Concerning railroad capital construction, a new situation arose after the implementation of the policy of the whole Party and the whole people engaged in railroad work. Millions of the population were mobilized in various areas to work on and repair several thousand kilometers of roadbed.

A. Railroad Network

Under the First Five Year Plan, during which state investment in railroads was 6,160 million current yuan, 75/ a total of 10,000 km of track was laid in Communist China. 76/ This addition resulted in a 22-percent increase, from 24,477 km to 29,862 km, in the length of main line in operation by the end of 1957. 77/ In 1958 a total of 3,564 km of line was laid, 900 km of which were conversions from single track to double track, 78/ and 1,300 km were new lines. 79/ The remainder, 1,364 km, apparently consisted of new branch and special lines. The amount of new and double-track lines laid in 1958 was more than double the amount completed in 1957, 80/ making 1958 the year of greatest achievement in track laying. The length of total rail line in operation at the end of 1958 was 31,193 km. 81/ Even more track probably would have been laid in 1958 had rails been readily available. 82/ In addition to the amount of line laid in 1958, the roadbed was completed for the double tracking of the Peking-Canton, Tientsin - P'u-k'ou, and Nanking-Shanghai lines. Only 500 km of double track were laid on these lines during 1958. 83/

Investment expenditures for construction of new lines in 1958 were directed toward extending the railroad network -- the construction of east-west lines to balance the predominantly north-south lines; lines to the transport-poor southwest; cutoff lines to avoid heavily used junctions such as those at Tientsin and Mukden; and branch and spur lines for industrial mining, forestry, and agriculture. 84/

The 1959 plan calls for 7,000 km of track to be laid, about double the 1958 total. 85/ Investment will be directed primarily toward the improvement of the existing network by reconstruction and double tracking and by the addition of branch and special lines. 86/ Po I-po, Vice Premier of the State Council, said that the transportation of coal, steel, and iron should be insured primarily through the construction of railroad branch and special lines for shipping coal, steel, and iron; through the improvement of existing railroads; and, particularly, through the double tracking of some railroads. 87/ Highest priority in double tracking is to be given to the Peking-Canton, Tientsin - P'u-k'ou, and Nanking-Shanghai lines, on which the roadbed was completed during 1958. It is planned that the remaining 2,342 km of these lines will be double tracked by the end of 1959. Also planned is double tracking of

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800 km of the Lung-Hai line, which runs from Lan-chou to the east coast, making the double tracking goal for 1959 at least 3,142 km. 88/ About 2,300 km of new branch lines also are to be built. 89/ The plan for track to be laid on new lines may be as high as 1,558 km, the difference between the total of 7,000 km and the sum of the double-track and branch lines.

About 400 km of "native" railroads were built in 1958, according to Lu Cheng-ts'ao, who urged the people to "walk on two legs in railroad construction." He explained that they should build "large and foreign-style" railroads as well as "small and native-style" railroads. 90/ The latter he divided into two types, as follows: one type feeds into the nationwide railroad network, and for these, standard-gauge rails are supposed to be used in order to facilitate their future conversion into "large and foreign-style" railroads; the other type does not connect with the railroad network, and its standards vary with local conditions. The "native" railroads are made mostly of locally produced cast iron and wood and are operated by diesel, gas, or steam engines; railroad motor cars; and even converted automobile engines. 91/ The labor to build these railroads is mostly "voluntary." They are said to be built with local investment, which almost certainly is extrabudgetary.

B. Rolling Stock

The allocation of total railroad investment in Communist China between construction of rail line and purchase of rolling stock during 1958 and 1959 has not been announced. The large increase planned for production of rolling stock, however, as shown in the following tabulation, may put into action the words of Po I-po, who stated that in capital construction equal attention should be paid to construction of railroads and to production of locomotives and freight cars.

<u>Year</u>	<u>Production of Locomotives (Units)</u>	<u>Production of Freight Cars (Units)</u>
1956 <u>92/</u>	184	6,380
1957 <u>93/</u>	167	7,500
1958 <u>94/</u>	350	11,000
1959 plan <u>95/</u>	555	27,000 to 28,500

Po I-po explained that the main problem in meeting the transportation needs of the people is the shortage of transportation equipment in the face of the demand for rapidly increasing tonnage. For this reason the central government placed a high priority on production

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of locomotives and freight cars in an effort to insure fulfillment of the plan. 96/ The increase of about 145 to 160 percent in the 1959 target compared with the 1958 achievement in production of freight cars is considerably higher than the less than 50-percent increase in 1958 compared with that in 1957. Most of the railroad cars to be produced in 1959 are open freight cars, suited for hauling coal and iron. 97/

V. Administration

A simplified organization of the Ministry of Railroads in Peking and a decentralized administration in the provinces also contributed in part at least to the performance of 380 million tons originated in 1958. The increase of 39 percent in tons originated coincided with an extensive but gradual reorganization of railroad administration which began on 1 January 1958. This reorganization abolished the more than 50 subbureaus which were responsible to about 15 regional administrative bureaus and changed the regional bureaus to about 30 provincial (or city) bureaus which in turn were made responsible to both the Ministry and the "provincial authorities." The "provincial authorities" are described as the "provincial Party committee" and as the "provincial or city people's councils." 98/ At the same time the Ministry in Peking consolidated its organization and reduced administrative personnel by as much as 40 percent in some units. 99/

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50X1

In the provinces the present railroad administrative organ is usually called simply a "railroad bureau" or "railroad control bureau," prefixed by the name of the city in which it is located, instead of a railroad administration or railroad administrative bureau. In addition to one railroad bureau in almost every provincial capital, there are bureaus known to be located in Shanghai 100/ and Pao-t'ou, 101/ possibly because of the large amount of traffic or construction these cities have, and in Ch'i-ch'i-ha-erh, Mu-tan-chiang, 102/ and Chin-chou, 103/ possibly because of the large area and extensive railroad system in the former Manchurian provinces. Except for the Manchurian provinces, the territorial jurisdiction of the provincial bureaus follows closely the provincial boundaries and is in contrast to the arrangement of the former 15 railroad administrative bureaus, the boundaries of which were fixed to control whole sections of main rail lines. 104/ With one bureau in almost every provincial capital, and others in special cities, there are probably about 30 railroad bureaus at present.

The first announcement of the change in administration came in November 1957, when the Ministry of Railroads made public the decision to place the administrative organs of rail transport under two authorities -- the Ministry and the provincial authorities. General planning, traffic rules, distribution of rolling stock, the establishment of technical standards, and the like -- that is, everything

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requiring standardization over the entire country and centralized guidance -- remained the prerogative of the Ministry. Questions of "concrete control" of railroad operations and construction were given to the provincial authorities. 105/ "Concrete control" apparently means that the railroad bureau actually operates the railroads in its territory without the former subbureaus as the final administrative arm.

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[redacted] Pre-
sumably traffic provided for in the state plan is controlled by the Ministry, and less important traffic and local traffic are controlled at the provincial level. It is safe to assume that the new provincial organization provided the mass labor to speed up loading and unloading time, to repair and maintain rail lines, to prepare roadbed for double tracking, to stockpile goods at the railheads, and the like. The authorities in Peking expect the new organization to effect a closer liaison at the local level between transportation and the expansion of all branches of industry and agriculture and to provide better results in rail operations and construction. 106/

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APPENDIX A

METHODOLOGY

The information used in the preparation of this report was based largely on announcements in the Chinese Communist press concerning rail transport performance in 1958-59. [redacted]

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[redacted] Wherever possible, the statistics were checked for internal consistency and for consistency with other available information. Multiple correlation analysis was used to assess the relationship between industrial production and rail transport performance, but even here reliance was of necessity placed on published figures.

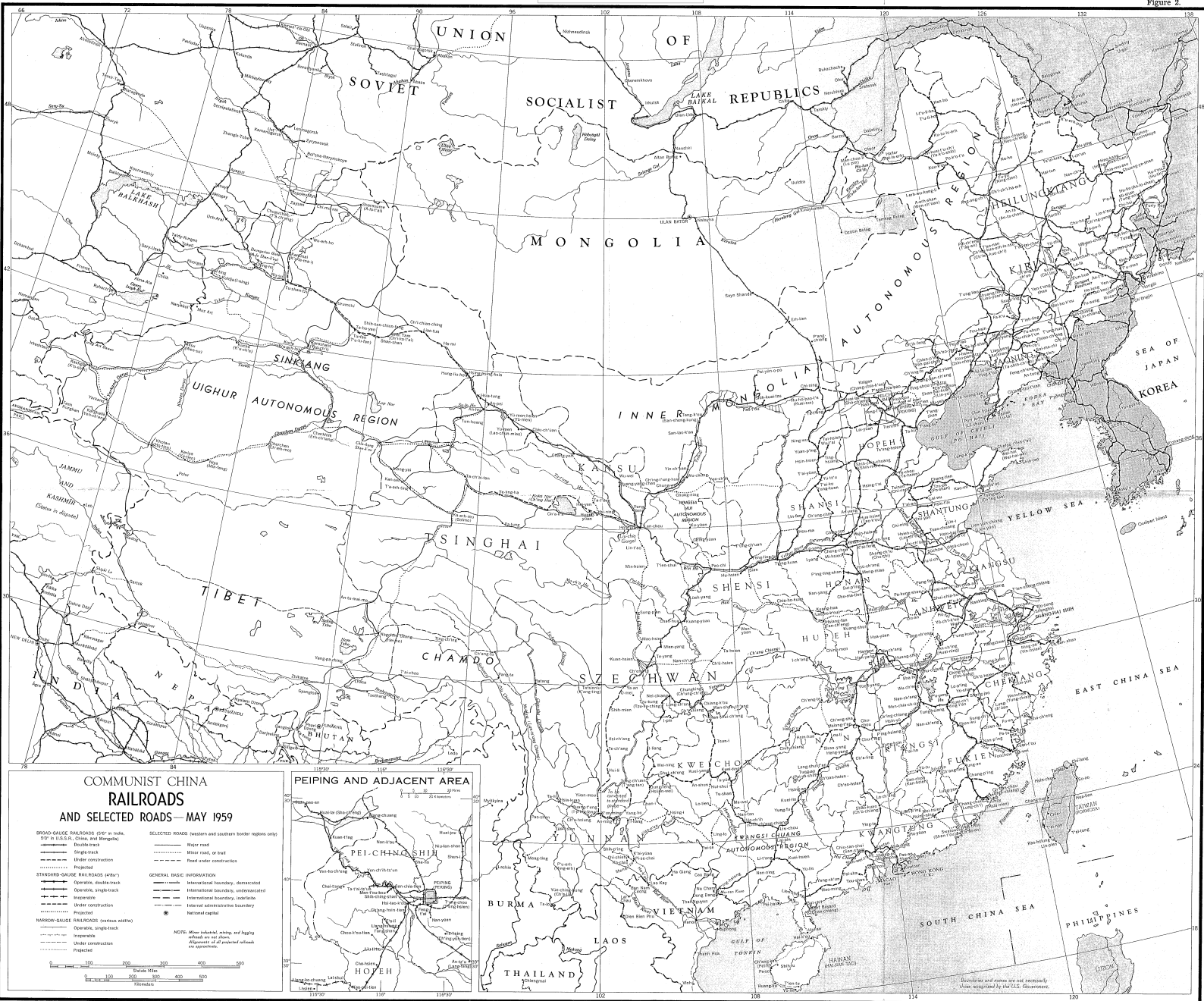
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