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**ECONOMIC INTELLIGENCE REPORT**

**THE ROLE OF TRANSPORTATION  
IN THE ECONOMY OF COMMUNIST CHINA  
1950 - 62**



**CIA/RR 117**

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ECONOMIC INTELLIGENCE REPORT

THE ROLE OF TRANSPORTATION IN THE ECONOMY OF COMMUNIST CHINA  
1950-62

CIA/RR 117  
(ORR Project 43.1601)

CENTRAL INTELLIGENCE AGENCY  
Office of Research and Reports

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FOREWORD

This report presents an analysis of the growth of the Chinese Communist transportation system during 1950-56 and contains tentative estimates and predictions for 1957-62.

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It examines the transportation situation in the light of persistent reports of congestion in transportation beginning as early as 1954 and evaluates these statements in terms of the current and projected performance of the system. In view of the role that transportation will play in Communist China during 1957-62, this report should be useful to those in the intelligence community concerned not only with transportation but also with general economic matters.

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THE ROLE OF TRANSPORTATION IN THE ECONOMY OF COMMUNIST CHINA\*  
1950-62

Summary

By 1953, at the start of the Chinese Communist First Five Year Plan (1953-57), the transportation system of China was ready to embark on an expansion program keyed to the demands of other sectors of the growing economy. The transportation system of China was operated at much less than capacity by the Chinese Nationalists, but under the regime of the Communists it has been forced to perform at close to capacity. Since 1950, all branches of the transport sector have experienced high annual growth rates, but the railroads, with their high percentage of the traffic load, have been primarily responsible for the over-all success of the sector.

In 1956 the transportation system of Communist China\*\* hauled approximately 145 billion ton-kilometers (tkm) compared with only 42.2 billion in 1950. It is estimated that by 1962 the economy will require approximately 244 billion tkm. The estimated distribution of freight traffic in Communist China, by type of transport, in 1950, 1956, and 1962 is as follows:

<u>Percent of Total Freight Ton-Kilometers</u>			
<u>Type of Carrier</u>	<u>1950</u>	<u>1956</u>	<u>1962</u>
Railroads	93.2	82.8	79.5
Highways	0.9	2.4	2.7
Inland waterways	4.0	8.9	10.6
Coastal shipping	1.9	5.9	7.2
Total	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>

\* The estimates and conclusions contained in this report represent the best judgment of ORR as of 15 August 1957.

\*\* Limited to modern transport and excluding municipal transport, wooden sailing vessels and junks, and other forms of native transport.

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Up to the present time the transport sector has supported rapid advances in the economic growth of Communist China and, except for local dislocations, has not appreciably inhibited the industrial growth of the economy. A substantial rate of growth in the transport sector will be required during the Second Five Year Plan (1958-62), however, if planned economic growth in other sectors of the economy is to be supported. This is particularly true of the overburdened railroads, the only medium of transportation whose progress will significantly affect the attempts of China to increase its economic potential through accelerated industrialization. Conscious that increased railroad capability is essential to plans for increased industrialization, the Chinese have been exerting much effort to strengthen the railroad system. Although there have been reports of an appreciable amount of congestion on certain parts of the railroad system, particularly in 1956, it is estimated that investment will be sufficient to enable transportation to keep pace with growing traffic demands.

Transportation in Communist China made considerable progress in operating efficiency during 1950-56. The efficiency of the railroad system, for example, is indicated by the attainment of an estimated 4-day turnaround time in 1953. This figure, which compares favorably with a 6.7-day turnaround time in the USSR for a somewhat longer average haul, is a significant indication of Chinese ability to attain high levels of performance. Although the technological innovations necessary to overcome physical limitations in highway transport have not been forthcoming to an appreciable degree, considerable effort has been directed toward reducing inefficient hauling. The efficiency of inland water fleet operations has been increased by improved organization and by centralization of dispatch control and cargo allocation.

In all branches of the Chinese Communist transport sector, maximum output has been squeezed from existing plant and equipment. It now appears that Chinese transportation has reached a near-maximum operating efficiency within existing technology and facilities and that in the near future large-scale expansion and renovation of existing plant and equipment will have to be made, particularly of railroads. An awareness that this situation exists is indicated by the fact that the proportion of rail investment allocated for improvement of existing lines was increased considerably in the 1957 Plan in spite of a cut in total railroad investment. During the Second Five Year Plan an increased proportion of rail investment will also be allocated for rehabilitation

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of existing lines, construction or restoration of double tracks, development of additional yard facilities, and installation of communications equipment.

The possibility of a traffic crisis in the transport sector of Communist China similar to the one which occurred in the USSR in the early 1930's seems remote at this time. Recently published information indicates that the Chinese are thoroughly cognizant of the fact that the transportation system must be continuously improved and expanded in order to cope with demands of other sectors of the economy. Although this effort requires extensive allocations of resources which in large measure must be generated by the Chinese economy, it would be dangerous to assume that shortcomings in transportation will be permitted to impair industrial growth, because the power of the regime to allocate labor and capital resources on a priority basis points to the contrary.

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I. Introduction.

The most notable feature of the internal transportation system of Communist China is the extent to which rail services currently predominate. Their rise from a minor to a major role is not necessarily a direct achievement of the Communist regime but is in line with a long trend for which favorable geographical factors and Japanese influence are also responsible. A few mountain barriers and other natural obstacles do impede railroad construction to some extent, but on the whole they have proved less serious for railroads than for other carriers. Furthermore, the unique qualifications of the railroads as instruments of mass transportation have helped to assure their primacy. 1/\*

Since the Communists gained control of the China mainland in 1949 the transport service has shown marked increases in performance, so that by 1956 total traffic in terms of metric tons\*\* originated was more than 230 percent greater than in 1950. During 1953-55 the total

\*\*\* Tonnages are given in metric tons throughout this report unless otherwise indicated.

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volume of freight originated by modern transport increased by 112 million tons. In 1956 alone the increase was 91 million tons. In some cases the magnitude of annual increases has been a result of the depressed levels of production of the economy in 1949 and the accompanying underutilization of transport capacity. In any event, gains in transport performance have been impressive, particularly in the railroad sector.

In terms of tons originated, the railroads' share of total traffic rose sharply from slightly less than 50 percent of the volume carried by all modern forms of internal transportation in 1937 2/ to 89 percent of total inland and coastal traffic in 1950 and then declined progressively to 66 percent in 1956 as highway carriers began to gain a greater share of the total and water carriers again became relatively more important. Although rail traffic had increased by 147 percent in 1956 above the level of 1950 in terms of tons originated, highway traffic increased more than 10 times, modern inland water traffic nearly 8 times, and coastal shipping traffic 13 times. In 1956, modern motor carriers originated 21 percent of total traffic, ranking second only to railroads in this respect. Inland water traffic, although increasing at a rate greater than rail tons originated, by 1956 had reached a level only slightly more than half its prewar peak performance, originating about 10 percent of total traffic.

The predominance of the railroads in the transportation system of Communist China is even more striking when their performance is viewed in terms of ton-kilometers. The railroads' share of total traffic in this category was about 93 percent in 1950. This proportion declined gradually thereafter but still remained between 82 and 83 percent in 1955 and 1956. In the period immediately before the Sino-Japanese war, modern inland water transport accounted for roughly one-half of total ton-kilometer performance in China. 3/ At present, however, inland water transport comprises only about 10 percent of total ton-kilometer performance. Although it is growing rapidly, motor transport in Communist China is still an insignificant carrier of freight in terms of ton-kilometers, accounting for only 2 to 3 percent of the total in 1956. Probably the chief curb to the growth of motor transport is the condition of the road system, which, in spite of improvements, remains quite primitive. Consequently, motor trucks have been used primarily in a feeder type of operation handling traffic to and from railheads and ports and therefore have a relatively short average length of haul of 50 kilometers (km) or less. Motor vehicles, however, are quite

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significant in the long-haul movement of goods in the western provinces, although even here length of haul may decrease as new rail lines reach these areas and begin full operation.

Throughout the period 1956-62, railroads are expected to continue carrying the predominant share of freight moving within Communist China. In terms of tons originated the railroads' share will decrease slightly to between 60 and 65 percent of the total. In terms of ton-kilometers it will remain relatively constant at about 80 percent of the total. The contribution of inland water transport to the total will remain about 10 percent in terms of both tons originated and ton-kilometers. Highway transport will produce a slightly larger share of total tons originated (23 percent in 1962) but will not improve significantly its relative ton-kilometer position, which will remain at 2 to 3 percent of the total. The transportation performance of Communist China, by type of carrier, for selected years, 1950-62, is shown in Table 1\* in terms of ton-kilometers and in Table 2\*\* in terms of tons originated.

During 1953-56 the Chinese Communist transportation system received considerable assistance from other Sino-Soviet Bloc countries. The Chinese have imported both freight cars and trucks and, within the last 3 years, have increased considerably their vessel purchase program. The inventory of the Chinese civil air fleet is now made up almost entirely of new aircraft manufactured in the USSR. The Chinese have also been leaning heavily on the USSR for guidance in planning and construction techniques, and much of their increased capability in railroad construction can be ascribed to this technical aid. Chinese shipbuilding has also advanced rapidly, largely as a result of significant material and technical aid from the USSR.

Although the Chinese Communists have been carrying out an ambitious rail construction program to improve the existing system and to service future planned demands, growth of rail capacity has barely kept pace with requirements of the growing industrial economy. Increased utilization of facilities and increases in freight car inventory have largely overcome limitations because of rolling stock availability, but traffic over several sections of line has recently been approaching capacity, with the result that local congestion has become a continuing problem. During 1957, some investment originally\*\*\*

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\* Table 1 follows on p. 6.

\*\* Table 2 follows on p. 7.

\*\*\* Continued on p. 8.

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Table 1

Communist China: Transportation Performance in Ton-Kilometers, by Type of Carrier a/  
Selected Years, 1950-62

Year	Railroads		Highways		Inland Waterways <u>b/</u>		Coastal Shipping <u>b/</u>		Total Amount (Billion Ton-Kilometers)
	Amount (Billion Ton-Kilometers)	Percent of Total	Amount (Billion Ton-Kilometers)	Percent of Total	Amount (Billion Ton-Kilometers)	Percent of Total	Amount (Billion Ton-Kilometers)	Percent of Total	
1950	39.4	93.2	0.373	0.9	1.68	4.0	0.822	1.9	42.2
1951	51.5	89.3	0.503	0.9	2.66	4.6	3.01	5.2	57.7
1952	60.2	86.6	0.678	1.0	3.64	5.2	5.00	7.2	69.5
1953	78.1	87.2	1.18	1.3	5.63	6.3	4.65	5.2	89.5
1954	93.2	84.0	1.87	1.7	7.89	7.1	8.04	7.2	111
1955	98.1	82.2	2.52	2.1	10.4	8.7	8.38	7.0	119
1956	120.4	82.8	3.50	2.4	12.9	8.9	8.60	5.9	145
1957	126.5 (Plan)	80.6	4.02 <u>c/</u>	2.6	15.8 <u>c/</u>	10.1	10.5 <u>c/</u>	6.7	157 <u>c/</u>
1960 <u>c/</u>	168	79.9	5.58	2.7	21.9	10.4	14.7	7.0	210
1962 <u>c/</u>	194	79.5	6.63	2.7	25.9	10.6	17.5	7.2	244

a. Excluding air transport performance, which is negligible by comparison. Totals and percentages are derived independently from unrounded figures in Tables 6 through 9, Appendix A, and do not always agree with the above figures, which have been rounded, in general, to three significant digits.

b. Modern water transport, excluding wooden sailing vessels and junks.

c. Estimated.

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Table 2

Communist China: Transportation Performance in Tons Originated, by Type of Carrier <sup>a/</sup>  
Selected Years, 1950-62

Year	Railroads		Highways		Inland Waterways <sup>b/</sup>		Coastal Shipping <sup>b/</sup>		Total Volume (Million Tons Originated)
	Volume (Million Tons Originated)	Percent of Total	Volume (Million Tons Originated)	Percent of Total	Volume (Million Tons Originated)	Percent of Total	Volume (Million Tons Originated)	Percent of Total	
1950	99.5	88.6	7.45	6.6	4.50	4.0	0.828	0.7	112
1951	110.5	82.7	12.6	9.4	6.96	5.2	3.58	2.7	134
1952	132.1	78.6	20.7	12.3	9.41	5.6	5.76	3.4	168
1953	160.4	75.6	30.4	14.3	15.3	7.2	5.92	2.8	212
1954	192.6	72.3	43.5	16.3	20.5	7.7	9.91	3.7	267
1955	193.4	69.0	50.1	17.9	26.3	9.4	10.4	3.7	280
1956	246.0	66.2	79.1	21.3	35.4	9.5	10.8	2.9	371
1957	256 (Plan)	63.9	91.1 <sup>c/</sup>	22.7	40.6 <sup>c/</sup>	10.1	13.2 <sup>c/</sup>	3.3	401 <sup>c/</sup>
1960 <sup>c/</sup>	351	63.5	127	23.0	56.0	10.2	18.4	3.3	552
1962 <sup>c/</sup>	416	63.5	151	23.0	66.3	10.1	21.8	3.3	655

a. Excluding air transport performance, which is negligible by comparison. Totals and percentages are derived independently from unrounded figures in Tables 6 through 9, Appendix A, and do not always agree with the above figures, which have been rounded, in general, to three significant digits.

b. Modern water transport, excluding wooden sailing vessels and junks.

c. Estimated.

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planned for new line construction will be reallocated for increasing capacity of existing lines by such measures as double tracking, enlarging yards, and the like. The tense transport situation does not seem to be confined entirely to the railroads, as numerous references to serious congestion on the Yangtze River have also been observed, and truck transport is in chronic short supply. During the Second Five Year Plan, all types of transport, including primitive carriers, are to be improved in order to cope with increasing distribution requirements.

Recently published information indicates that the Chinese Communists are thoroughly cognizant of the fact that the transportation system must be continuously improved and expanded in order to cope with demands of other sectors of the economy. In the words of one of their own writers, "the basic function of transport planning is to assure that the needs of the national economy and of the people for freight and passenger transportation are fully met through the most rational use of the various modes and means of transportation ... . One of the most important obligations in shaping the plans for volume of freight transport [metric tons originated] is to make certain that the plans accurately reflect the increasing proportion between the total volume of traffic and the total national product during the period covered by the plans." <sup>4/</sup> Once transportation plans are prepared based on the economic needs of the country, they are compared with the maximum capacity of the various types of modern transport. Where government-operated transport facilities are unable to provide the required transportation, plans are formulated to make use of the various private means of transportation. <sup>5/</sup> What the Chinese are attempting to effect with their planning mechanism is a balance between transport capacity and the estimated amount of transportation needed so that the correct amount of transportation can be determined with some assurance that it will be realized. <sup>6/</sup>

Because they are motivated by this philosophy, the Chinese Communists must have considered carefully the capability of the transportation system while formulating their 1962 Plan goals for the manufacturing and extractive industries. No figures for planned transportation performance for 1962 have been released as yet, nor have any investment goals for transportation been divulged. However, based on the goals of the Second Five Year Plan (1958-62) for new rail line construction, it has been estimated that investment in railroads during the Second Five Year Plan will be approximately double

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that of the First Five Year Plan (1953-57). If this turns out to be the actual situation, it is estimated that growth in transportation performance will be adequate during 1958-62 to support planned production increases in other sectors of the economy. Estimates of transportation performance appearing in Tables 1 and 2\* are based on this premise. The possibility still exists, of course, that the underdeveloped nature of transportation in China and its resultant inflexibility may in fact impede economic growth in some areas. Such a judgment cannot be lightly made, however, considering that the allocation of material and human resources is entirely controlled by central planning.

II. Railroads.

A. Pattern of Operations.

Railroads in Communist China have borne the burden of increasing economic activity, particularly in industrial areas. Manchuria, with about 9 percent of the total area of China, originates far more traffic per capita than the remainder of China. The Peking-Tientsin area and the regions around Tsingtao (Ch'ing-tao), Shanghai, Hankow (Han-k'ou), and Canton are also important, but as yet the rest of China generates relatively little rail traffic.\*\* 7/

Since the Chinese Communists gained complete control of China in 1949 the railroads have been the most significant interior transport connection in international trade. In 1955, well over 95 percent of the total tonnage of international trade over interior routes crossed the border by rail. Rail service is available between China and the USSR, North Korea, Kowloon (Hong Kong), and North Vietnam. 8/ More than 80 percent of all trade with the USSR was moved by rail. The Trans-Mongolian Railroad, opened to traffic during January 1956, has provided an appreciable increase in transport capacity supporting Chinese foreign commerce through Siberia. It is estimated that in 1955 rail connections with the USSR handled nearly 5 million tons of freight. About 90 percent of this was in trade with the USSR and the remainder in trade with the European Satellites. 9/

The pattern of transportation between Communist China and North Vietnam was changed in late 1955 by the completion and official opening

\* Pp. 6 and 7, above.

\*\* See the map, Figure 1, inside back cover.



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of the Hanoi - Nam Quan line linking the North Vietnam rail system with that of China. This line became the principal transport route for conveying the increasing volume of aid to North Vietnam, which in 1955 amounted to about 60,000 tons. 10/ The Chinese are presently working on the Pi-si-chai - Ho-k'ou section of the Hanoi - K'un-ming line, which when completed (probably in the fall of 1957) will facilitate the export of Yunnan mineral resources through the ocean terminal at Haiphong.

Within Communist China in the prerevolutionary period, nearly half of the railroads were concentrated in the northeast. Consequently, the northeast has a well-developed communications system. This system facilitates the export to the rest of China and to the world of coal, manufactures, and foodstuffs and the import of industrial raw materials, complex capital goods, and some textiles. The eastern section of the country possesses a network of railroad, highway, and inland water transport which facilitates the extensive inter-regional trade of the area, with consumer goods and medium engineering products being exchanged for raw cotton, foodstuffs, and coal from other parts of China. The transportation facilities of the central and southern area are more diversified than those of other regions, with a major trunk rail line running north and south and the largest navigable waterway in China, the Yangtze River, running east and west. Standing at the center of this transportation network is Wu-han, a transshipment point for waterborne cargoes from the northeast and southwest and for rail cargoes from Peking and Canton. Completion of the Yangtze River bridge at this point in late 1957 will increase Wu-han's importance as the main pivot of rail transport between north and south China.

The southwestern part of the country, which experienced a rapid rate of economic growth during World War II, has received little emphasis in the Chinese Communist industrialization program during the period of the First Five Year Plan. One reason for this has been the need to develop first of all a modern transportation system. With Ch'eng-tu in western Szechwan as the hub, rail lines have been or will be extended north to Pao-chi, southeast to Chungking, and south to K'un-ming. Moreover, the construction of a second Yangtze River bridge above Chungking and of the Szechwan-Kweichow Railroad will permit through traffic to Fort Bayard (Chan-chiang) on the south China coast. In the northwest, most of the investment to date has been devoted to the development of transportation facilities and to the large-scale prospecting of the abundant mineral resources of the region. Lan-chou, in Kansu Province, traditionally a communications focus for Central

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Asia, is becoming in addition an important rail center, with rail lines completed or in various stages of construction extending to the east (to join the Lung-Hai Railroad), to the north (to the planned new iron and steel combine at Pao-t'ou), to the northwest (to Sinkiang and the USSR), and to the west (to the newly developing petroleum area in the Tsaidam Basin).

Domestic rail operations in Communist China consist largely of the movement of a few bulk commodities from a relatively small number of places of origin to a few principal destinations. Transport of coal, the largest single item shipped, makes up about one-third of total rail tons originated, whereas agricultural products and construction materials each make up about 20 percent, and ores and semiprocessed metals about 5 percent. As the level of the economy rises, shipments of machinery, chemicals, and other manufactures are becoming of increasing importance. Petroleum is still a relatively minor item in transit, but can be expected to increase in volume as the oilfields in western China are further developed.

There has been a considerable advance by the Chinese Communists in the manufacture of transportation equipment. Steam locomotives have been produced of parts entirely manufactured within China, 11/ and an increased efficiency of operation has been achieved at locomotive and car shops. New techniques, such as welding, have been introduced for construction of freight cars, and quality control is being improved. Production of railroad equipment has been concentrated at three main shops, at Ch'i-ch'i-ha-erh, Ssu-fang (near Tsingtao), and Dairen (Ta-lien). The Chinese have imported rolling stock on a very limited scale, but domestic production has reached a rate such that expansion of freight car carrying capacity based on indigenous resources is possible for the rail lines. 12/

Based on the relationship between traffic and operational data as well as on marking analysis and Chinese Communist announcements, it is estimated that at the end of 1954 the Chinese possessed about 3,420 locomotives, 6,240 passenger cars, and 73,100 freight cars. It is estimated that as of the end of 1955 these figures had increased to 3,500 locomotives, 6,420 passenger cars, and 78,500 freight cars. The end-of-1957 park is planned to include approximately 3,700 locomotives, 7,960 passenger cars, and 90,800 freight cars. 13/

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In spite of these advances, there have been indications since 1954 that the Chinese Communist railroad system has not been improved at the same rate as the increase in the traffic which it has been obliged to carry. The fundamental limitation on sections of the present system appears to be track capacity rather than the availability of rolling stock. A net general transport shortage does not yet exist, but local rail congestion and local inability to handle requirements can be expected to continue. During 1956, references to congestion and the lack of adequate transportation increased, and an official of the central transport planning staff stressed the point that the volume of freight transport requirements in 1956 would approach or exceed the level originally planned for transport for 1957. <sup>14/</sup> Most of the recent trouble has been reported on sections of two key intersecting rail lines: the north-south Peking-Hankow and the east-west Lung-Hai Railroads. Additional investment in track and facilities on lines with heavy traffic density such as these will be necessary during the immediate future to insure that rail transport will continue to be capable of supporting the planned expansion of the economy. Double tracking of main lines, increasing the capacity of key rail junctions and yards, and installation of automatic signaling systems on certain main lines are reportedly to be emphasized in 1957 and during the initial phases of the Second Five Year Plan.

B. Investment.

Since the end of 1949, when the Chinese Communists had only 21,700 km of operable rail lines, they have allocated a large part of their available investment resources to the expansion of the railroad system and to bolstering existing facilities. The First Five Year Plan originally allocated a total of 5,670 million yuan\* for investment in rail transport. This represented about 13 percent of new capital investment for all purposes and 69 percent of the 8,210 million yuan reserved for investment in all forms of transportation and communications. Distribution of the 5,670 million yuan by the Ministry of Railroads was planned as follows <sup>15/</sup>:

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\* Yuan values in this report may be converted at the official rate of 2.46 yuan to US \$1.

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	<u>Investment</u> (Million Yuan)	<u>Percent of</u> <u>Total Rail</u> <u>Investment</u>
New lines	2,364	41.7
Improvement of existing lines	1,854	32.7
Increase in rolling stock park	1,219	21.5
Planning and design	233	4.1
Total	<u>5,670</u>	<u>100.0</u>

Table 3\* shows the value of completed capital construction in transportation and posts and telecommunications, 1953-55 and the 1956 Plan.

The estimated value of completed capital construction in railroads as a percentage of yearly total basic construction expenditure, 1953-55 and 1956 Plan, was as follows 16/:

<u>Year</u>	<u>Total Investment</u> (Million Yuan)	<u>Rail Investment</u> (Million Yuan)	<u>Rail Investment</u> as a Percent of <u>Total Investment</u>
1953	6,506	724	11.1
1954	7,498	1,035	13.8
1955	9,360	1,354	14.5
1956 Plan	14,000	2,013	14.4

By way of comparison, during the same period, investment by the state for highways, waterways, civil air transport, and posts and telecommunications as a percentage of yearly total basic construction expenditure was considerably less than that for railroads, as follows 17/:

<u>Year</u>	<u>Percent</u>
1953	6.4
1954	7.0
1955	5.8

\* Table 3 follows on p. 14.

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Table 3

Communist China: Estimated Value of Completed Capital Construction in Transportation and Posts and Telecommunications a/ 1953-55 and 1956 Plan

Sector	Total Planned Expenditures 1953-57 (Million Yuan)	1953		1954		1955		1956 Plan	
		Expenditures (Million Yuan)	Percent of 5-Year Goal	Expenditures (Million Yuan)	Percent of 5-Year Goal	Expenditures (Million Yuan)	Percent of 5-Year Goal	Expenditures (Million Yuan)	Percent of 5-Year Goal
Railroads	5,670	724	12.8	1,035	18.3	1,354	23.9	2,013	35.5
Other <u>b/</u>	2,540	418	16.5	523	20.6	546	21.5	811	31.9
Total	<u>8,210</u>	<u>1,142</u>	13.9'	<u>1,558</u>	19.0	<u>1,900</u>	23.1	<u>2,824</u> <u>c/</u>	34.4

a. 18/

b. Investment of both central and local governments in highways, waterways, civil air transport, and posts and telecommunications.

c. Assuming that railroads have the same proportion of total transport investment as in 1955.

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Although the First Five Year Plan allocated 41.7 percent of total rail investment for the construction of new lines, the actual portion going into this activity during 1953-55 reached 47.8 percent. 19/ In March 1956 the Minister of Railroads, T'eng Tai-yuan, stated that total investment for basic construction of railroads during 1953-57 would be increased by 38.3 percent, from 5,670 million yuan to 7,840 million yuan. 20/ He estimated that the original investment of 5,670 million yuan would be reached by 31 March 1957. 21/ In February 1957 it was announced that 60 percent of the 1957 investment in railroad construction would be assigned to improving the freight-carrying capacity of older routes 22/ and to the procurement of additional locomotives and freight cars. 23/ A later announcement indicated that the proportion of investment allocated for improvement of existing lines alone would be increased from 26.4 percent in 1956 24/ to 35.8 percent in 1957. 25/ Because of the serious traffic congestion existing on certain trunklines, the decision to put more emphasis on improving the capacity of existing lines was not unexpected. New line construction in turn is to be cut drastically compared with previous years -- which means that the 38.3-percent increase in rail investment has also been revised downward. The apparent cut in total investment is in line with the general move to reduce 1957 spending as a result of material shortages which became serious in late 1956. 26/ Figures in Table 4\* confirm the shift of investment in 1957 from new line construction to double tracking of existing lines and in addition point up the drastic cut in over-all railroad construction. 27/

From proposals of the Second Five Year Plan presented at the Eighth Party Congress in September 1956 it is apparent that capital construction expenditure is planned to be about twice the size of that laid out under the First Five Year Plan, or about 85 billion yuan. Industrial capital construction is to constitute about 60 percent of total expenditure. The proportion allocated for transportation in the Second Five Year Plan was not announced, but with respect to rail investment a reasonable assumption can be based on the statement that 8,000 to 9,000 km of new rail lines will be built. Because this total is twice the length of track originally projected under the First Five Year Plan, it is assumed that rail investment during the 1958-62 plan period will be approximately double the planned expenditure of the 1953-57 plan period. Thus rail investment will continue to be about 13 percent of total planned investment expenditure. 28/

\* Table 4 follows on p. 16.

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Table 4

Communist China: Railroad Construction, by Type of Line  
1953-56, 1956, and 1957 Plan

Type of Line	1953-56 <sup>a/</sup>		1956 <sup>a/</sup>		1957 (Plan) <sup>b/</sup>	
	Kilometers	Percent of Total	Kilometers	Percent of Total	Kilometers	Percent of Total
New	4,387	58.2	1,747	56.2	535	28.8
Restored	324	4.3	285	9.2	152	8.2
Double track	776	10.3	210	6.8	533	28.7
Industrial branch	2,045	27.2	866	27.9	640	34.4
Total	<u>7,532</u>		<u>3,108</u>		<u>1,860</u>	

a. 29/  
b. 30/

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The allocation of total rail investment during the Second Five Year Plan among new lines, improvement of existing lines, increase in rolling stock park, and planning and design has not been announced. The Minister of Railroads has indicated, however, that 57 percent of investment in railroads will go into improvement of existing lines during 1958-62. 31/ If this is literally true, it represents a sizable increase over the 32.7 percent allocated for this purpose in the First Five Year Plan. However, in view of the extensive plans for new line construction during 1958-62, it can be assumed that the 57 percent figure also includes the allotment for increase in rolling stock park. Comparison should then be made with the 54.2 percent originally allocated and the 50.5 percent actually achieved 32/ in the First Five Year Plan for improvement of existing lines and increase in the rolling stock park combined. If the 57 percent figure includes the rolling stock allocation, then 43 percent of the total will remain for new line construction and planning and design as against 45.8 percent originally allocated and 49.5 percent actually achieved in the First Five Year Plan. 33/

1. Construction of New Lines.

During the past 6 years the Chinese Communists have carried on an impressive railroad construction program. The task of building a railroad system to meet the growing requirements of the existing industrial sector and to service the areas into which Chinese industry and mining are expanding is a monumental one, and apparently improvements have hardly been sufficient to cope with the increases in generated traffic. During 1950-55 the reported length of railroads built was about 4,000 km. 34/ Some 1,200 km of railroads were restored and 1,100 km of double track were laid or restored. 35/ During 1953-55, about 2,640 km of new railroads were built. 36/ Hence, of the 4,084 km of new lines originally scheduled to be built during the First Five Year Plan, about 65 percent of the goal was completed by the end of 1955.

In March 1956 it was announced that the amount of track to be laid on new railroads during 1953-57 was to be increased from 4,084 to 7,592 km. 37/ Early in December 1956 the Chinese Communists reported that the First Five Year Plan for new trunk and branch railroad construction had been overfulfilled by 20 km, 13 months ahead of schedule. 38/ This announcement referred to the original plan figure. From 1953 to the end of November 1956 a total of 4,104 km of new rail lines had been constructed. 39/

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Speaking at the Eighth Party Congress in September 1956, Premier Chou En-lai reported that new and restored rail lines would approximate 5,500 km during the First Five Year Plan. <sup>40/</sup> Even if the assumption is made that this figure referred only to new lines, it still was considerably less than the revised goal of 7,592 km announced in March and seemed to indicate a considerable scaling down of plans for new construction activity in 1956 and 1957. This conclusion was borne out by the announcement in July 1957 that track-laying on 1,747 km of new railroads had been completed in 1956, making a total of 4,387 km for the first 4 years of the First Five Year Plan. <sup>41/</sup> Although the 1,747 km figure represents more than a 40-percent increase above the 1955 figure of 1,220 km, it still is considerably less than the original 1956 Plan figure of more than 2,000 km. A further indication that new line construction was not proceeding according to the revised plan of March 1956 was the announcement that in 1957 it would approximate only 600 km. <sup>42/</sup> Simultaneously the announcement was made that more than 600 km of lines would be double tracked during 1957. <sup>43/</sup> These 1957 Plan figures were later reduced to 535 km of new line construction and 533 km of double tracking, as indicated in Table 4.\* Completion of 295 km of new railroad track during the first 6 months of 1957 <sup>44/</sup> indicates that these modest 1957 construction targets probably will be fulfilled. Thus during the period of the First Five Year Plan, new line construction will total slightly less than 5,000 km, in contrast to the original plan figure of 4,084 km and the March 1956 revised plan figure of 7,592 km.

The Second Five Year Plan target of 8,000 km of new railroads <sup>45/</sup> represents a sizable increase above the anticipated performance of 5,000 km during the First Five Year Plan. It probably means that the Chinese Communists expect to shift a sizable portion of their resources back into new line construction in 1958 and beyond if they manage to bring the present imbalance between the rate of increase of transport capacity and transport volume into equilibrium during 1957. The recent completion of aerial surveying of 2,000 km and the initiation of aerial surveying of 3,000 km of new lines in addition indicate an intention on the part of the Chinese to continue large-scale activity in railroad construction, even though new line construction will be kept to a minimum in 1957. The Second Five Year Plan also calls for 2,000 km of lines to be reconstructed and raised to the level of first-class lines, and from 500 to 1,200 km of lines to be electrified. <sup>46/</sup>

\* P. 16, above.

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A major part of the new railroad construction has been concentrated in the western areas of Communist China, remote from major centers of economic activity. Extension of the railroad system into these areas hitherto inadequately served by modern transport apparently is designed to enable the Chinese to exploit undeveloped mineral resources; to establish an efficient transport service to support planned industrial centers, power developments, and agricultural stations; and, to a lesser extent, to provide for more effective political control over greater areas of population. Construction of the Trans-Sinkiang line northwestward from Lan-chou, by way of Yu-men and Urumchi, to connect with the Soviet system near Aktogay, and the projected line into the Tsaidam Basin are prime examples of this effort. It is estimated that the 2,400-km Trans-Sinkiang line, which was nearly half completed by the end of 1956, can be fully completed in 1959. Although plans call for tracklaying on this line to reach only to the Kansu-Sinkiang border by the end of 1957, 47/ it is possible that the tracks will be extended well beyond this point before the end of the year.

By April 1955, tracklaying was completed on the Chinese Communist section of the Trans-Mongolian line, which provided another link with the USSR. This line represented a continuation of work on an additional north-south trunkline which will run parallel to and 250 km west of the Peking-Hankow-Canton line. This line, which will pass through Pao-t'ou, Lan-chou, Ch'eng-tu, Chungking, and K'un-ming, will ultimately provide a Chinese inner belt line linking North Vietnam and the USSR. It will be connected with lateral east-west routes and will provide a flexibility of rail movement never before available in China. Various sections of this line were completed or approached completion in 1956. Tracklaying on the 668-km Pao-chi - Ch'eng-tu Railroad, which links southwest China with northwest China was announced as completed in the middle of July 1956, 48/ but because of structural deficiencies which had to be corrected, this line was not opened even for limited through traffic before October. Repair of the Pi-si-chai - Ho-k'ou portion of the Hanoi-Yunnan Railroad on the North Vietnam border was started early in August 1956. 49/ When completed before the end of 1957, this portion will be linked to the Hanoi - Lao Kay section, which was opened to traffic in mid-1956. Reopening of the entire Haiphong - K'un-ming line will permit the import of supplies and equipment for railroad construction northward from the K'un-ming area toward Ipin 50/ and will provide an outlet to the sea at Haiphong and to south China by rail by way of Hanoi for raw materials produced in the Yunnan area. Another railroad is under construction which will connect K'un-ming with the Burma

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border. 51/ This projected rail line has doubtful economic value but will significantly increase Chinese logistic capability to the Burma border. It will, moreover, strengthen Chinese control of Yunnan Province and may facilitate the spread of Peiping's influence in Southeast Asia. Other important lines which were completed before 1957 were the Li-t'ang - Fort Bayard line in south China and the Ying-t'an - Amoy (Hsia-men) line in Fukien Province, both of which greatly increased Communist military potential in the coastal area.

In addition to trunkline construction, forestry railroads are being extended in the Greater Khingan Mountains of the northeast, 52/ and numerous branch lines are being constructed to service new or enlarged industrial and mining installations and to exploit sources of construction materials.

The over-all quality of railroad construction has been relatively good. Although defects have occurred, they can be attributed in most instances either to rugged terrain, accelerated construction to meet completion goals, or a combination of the two factors.

The Chinese Communists are leaning on the USSR for guidance in planning and construction techniques, and much of their increased capability in railroad construction can be ascribed to this technical aid. Basically, however, the gains made in railroad construction have been largely a result of the intensity of labor involved. Hundreds of thousands of corvée and conscripted workers, plus 11 divisions of the Peoples Liberation Army, have permitted the relatively small nucleus of skilled railroad construction workers to achieve the goals established by the state.

The present outlook is for some further progress in 1957 and significant accomplishments during the Second Five Year Plan. Lines scheduled in the latter period include the completion of the inland north-south axis, the Trans-Sinkiang line, and numerous other interconnecting and branch lines. It is also possible that the projected Golmo-Lhasa line currently under aerial survey may be started during this period. Construction of this line would be through some of the most rugged terrain to be found in China.

In order to meet the plan for 1958-62, problems of materials supply, skilled labor supply, and cost reduction will have to be solved. Based on records of past performance and on the

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expectation of continued high-priority treatment of the sector, it is estimated that these problems will engender only local and temporary dislocations in the program.

2. Improvements in Existing Facilities.

Much attention has also been directed toward strengthening the existing railroad system of Communist China. Nearly one-third of planned rail investment under the First Five Year Plan was allocated for rehabilitation of existing lines, construction or restoration of double tracks, development of additional yard facilities, and installation of communications equipment.

In terms of line rehabilitation and improvement the original Five Year Plan allocated 1,854 million yuan for work involving 5,806 km of track, which would amount to an average cost of about 320,000 yuan per kilometer. No data are available to indicate how this average figure would vary among projects for double tracking, rebuilding lines, construction of sidings, and building of yards. The original plan goal for double tracking of existing single-track lines was 1,514 km, or about 26 percent of the total length to be rehabilitated and improved. In the first quarter of 1956 this goal for double tracking was revised upward by 22.8 percent to a figure of 1,859 km. <sup>53/</sup> During the first 4 years of the First Five Year Plan, however, only 776 km of double track were laid or rebuilt -- which explains in part some of the congestion problems which arose in 1956.

In February 1957, Peiping announced that more than 600 km of railroad lines would be double tracked during 1957, a figure that was later reduced to 533 km. Railroad yards in Peking, Wuhan, and 12 other key locations are to be expanded. <sup>54/</sup> The reconstruction work will have the main objective of increasing the capacity of several major trunklines in the area bounded by the Peking-Hankow line on the east and by the Lung-Hai Railroad on the south and will include both these lines. <sup>55/</sup> During the Second Five Year Plan, double tracking of the entire Peking-Hankow Railroad is to take place. Peking estimates that once these lines are double tracked, their capacity "may be 1 to 1.5 times greater than that of a single-track line." <sup>56/</sup> In 1957 the Chengchow Railroad Administration plans to lay double tracks on four rail lines in the vicinity of Chengchow. Once these projects are completed, "the number of trains to be dispatched daily from both ends of the Peking-Hankow Railroad will be increased from the present

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32 pairs to 41 pairs," and on the Lung-Hai Railroad the number "will be increased from the present 26 pairs to 40 pairs." 57/ These measures should do much to alleviate the localized congestion problems which have occurred recently on the Chinese Communist railroads.

It is readily apparent that the Chinese Communists have embarked on a major program of construction. It is noteworthy, moreover, in view of the large commitments of capital resources necessary to implement such a program, that more than 20 percent of total rail investment during the First Five Year Plan is being devoted to the manufacture of rolling stock and motive power. During the first 4 years of the First Five Year Plan this investment was translated into more than 500 locomotives, 27,000 freight cars, and 1,900 passenger cars newly built or repaired. 58/ It is estimated that more than 25,000 freight cars out of the 27,000 mentioned above and 335 locomotives out of the 500 mentioned above represent new production. Since 1953, Chinese production of freight cars has been made up of 50-ton cars (except for a limited number of 30-ton refrigerator cars) rather than the 30-ton cars formerly produced. This means that the total freight-carrying capacity has increased substantially more than the increases in number of cars would indicate.

In order for the railroad system to continue to grow concurrently with the economy as a whole, relatively large investments for improvement of the system's capacity, for extension of the system, and for increases in the inventory of locomotives and freight cars will have to be continued. The economy will have to generate a large measure of the resources required for this expansion, and a failure to do so will impair the growth of the over-all economy -- more particularly the growth of the modern industrial sector.

#### C. Operating Efficiency.

In their quest for increased traffic capacity, the Chinese Communists have emphasized maximum utilization of available rolling stock. Particular emphasis has been placed on decreasing freight car turnaround time and increasing the load per car, which, individually, affect operating efficiency and, combined, determine minimum requirements for freight cars at given traffic levels. Success is apparent in both these areas. It is estimated that between 1950 and 1953 turnaround time was reduced from 4.7 to 4.0 days.\* 60/

\* Turnaround time as a measure of rail efficiency is defined in the US as the average time which elapses between one loading of a freight car and its next loading. In spite of footnote continued on p. 23

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Reductions in turnaround time are not likely to continue, however, as new lines extended into remote areas will tend to offset gains made elsewhere, especially if economic activity is thereby stimulated to any great extent. 61/

By 1955 the average load per loaded car had reached 32.4 tons, an increase of 22 percent above the 1950 figure of 26.6 tons. 62/ Recent announcements indicate that the net weight per carload is to be increased to 34.7 tons by the end of 1957. 63/ Although the 32.4 figure may seem high, it is believed to approximate closely the actual average load per loaded car. Chinese Communist success in this respect may be attributed to the increasing relative proportion of new cars of 40- and 50-ton capacity as well as to the considerable volume of heavy loading freight which the railroads are currently moving. 64/ Any continued increases in net weight per car probably will result from increases in the capacity of cars rather than from improved methods of loading.

At the moment, major attention is being directed to increasing the operational efficiency of locomotives through a campaign of increasing gross freight train weights. It is planned to obtain an average gross weight per freight train of 1,480 tons by the end of the Five Year Plan. 65/ The Ministry of Railroads has promoted competition among various railroad bureaus and stations for moving record-breaking trains, thus achieving an increase in train weight on a given line. From all reports, considerable success is being

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the existence of Chinese Communist definitions of turnaround time which appear to be identical with the US definition, an exhaustive analysis of Chinese literature bearing on the subject indicates that the Chinese are referring to a loaded car turnover rate, which is a lower figure than conventional turnaround time. The actual relationship existing between loaded car haul (kilometrage) and empty car haul (kilometrage) is believed to be about 3 to 1 -- that is, 25 percent of total car movement in the complete turnaround cycle, including both empty and loaded movement, is accounted for by the empty move. Applying this relationship to the announced turnaround figures for each year during 1953-57 yields a set of figures varying slightly above or below 4 days. In view of the margins of error involved in any calculation of turnaround time, it is felt that these figures can best be expressed by being rounded to 4.0 days. For a complete discussion of the derivation of the 4-day turnaround time figure, see 59/.

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obtained in this campaign. The movement of heavier trains will permit an increase in the tonnage moved on a line without requiring substantial increments of investment in line improvements other than lengthening yard tracks and sidings and increasing the weight of rails as needed.

The Chinese Communists also report that railroad communications and signaling equipment have been greatly improved during the past 4 years. Automatic switches and other electric signaling equipment were installed on a number of railroads in 1956. 66/

Previously Chinese Communist rail operations were limited largely by the availability of rolling stock. In view of the success of campaigns to increase the average net load per car, to decrease turnaround time, and to increase the freight car inventory by production of additional units, limitations of traffic imposed by freight car inventory are believed to have been largely overcome. However, as a result of the continuing increase in traffic, limitations on further growth in the number of trains are being imposed by available track capacity in certain areas. In part, the campaign to move heavier trains is an attempt to alleviate this situation, but even the Chinese themselves have recognized somewhat belatedly that the over-all effect of the heavier train movement will not be adequate to solve the problem. Additional continuing investments in track and track facilities appear to be needed if the basic congestion problem is to be rectified.

D. Performance.

Since the Communists gained control over the China mainland in 1949 the railroads have shown progressive gains in performance consistent with the requirements of a growing economy. The large annual increases in tons-originated traffic can be accounted for not only by the depressed level of performance of the economy in 1949 but also by the ability of the Chinese Communists to obtain maximum efficiency from existing equipment and facilities and to expand facilities where the need for rail service is greatest. 67/ This achievement has resulted in part from the fact that the railroads, now operating on a national scale, have apparently developed an effective centralized, but flexible, administration which has permitted intensive exploitation of the railroad system.

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There is a direct relationship between production data for basic sectors of the Chinese Communist economy and transport performance. This is especially true for the railroads, whose growth has consistently paralleled increases in production of basic commodities. 68/ Table 5\* contains indexes of the growth of selected economic sectors in Communist China during 1950-56 and compares them with indexes of rail freight performance in terms of both tons originated and ton-kilometers. Each of the basic industries listed, as well as gross national product (GNP), is a fairly representative measure of the economic activity of a country. The table shows that in Communist China the increases in these economic indicators parallel the increases in both ton-kilometers and tons originated on the railroads during the same period. This correlation reflects the fact that the increased demand from production of goods and services has both supported and made necessary the growth of rail transport during the period of Communist control. 69/ Figure 2\*\* is a graphic representation of the indexes in Table 5.

For the 5 years following 1949, when traffic was at a low of 48.2 million tons originated because of the economic and political disorganization following the civil war, the Chinese Communists announced annually sizable gains in tons originated. 70/ By 1954, freight traffic was four times as great as in 1949. 71/ As of 1954, however, when tons originated reached 192.6 million, 72/ there were indications that the railroads were operating under an increasing strain which might soon become acute for both the economic and the military sectors of China. 73/

The best criterion for comparing increases in ton-kilometer performance with increases in tons originated on the Chinese Communist railroads is the average length of haul, which is obtained by dividing ton-kilometers by tons originated. 74/ Figures for the average length of haul on Chinese railroads, as derived from official statistics for 1950-56, are as follows:

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\* Table 5 follows on p. 26.

\*\* Following p. 26.



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Table 5

Communist China: Indexes of Growth of Selected Economic Sectors  
1951-56

1950 = 100

Year	Coal	Timber	Cement	Electric Power	Ferrous Mining	Industrial Production <sup>a/</sup>	Gross National Product <sup>b/</sup>	Rail Freight Tons Originated	Rail Freight Ton-Kilometers
1951	124	103	179	127	113	139	114	111	131
1952	156	108	207	160	145	185	132	133	153
1953	163	127	279	202	223	230	145	161	198
1954	195	140	329	242	300	269	155	193	237
1955	227	156	321	270	329	281	165	194	249
1956	263	164	457	336	461	337	179	247	306

a. Excluding individual handicraft industry.

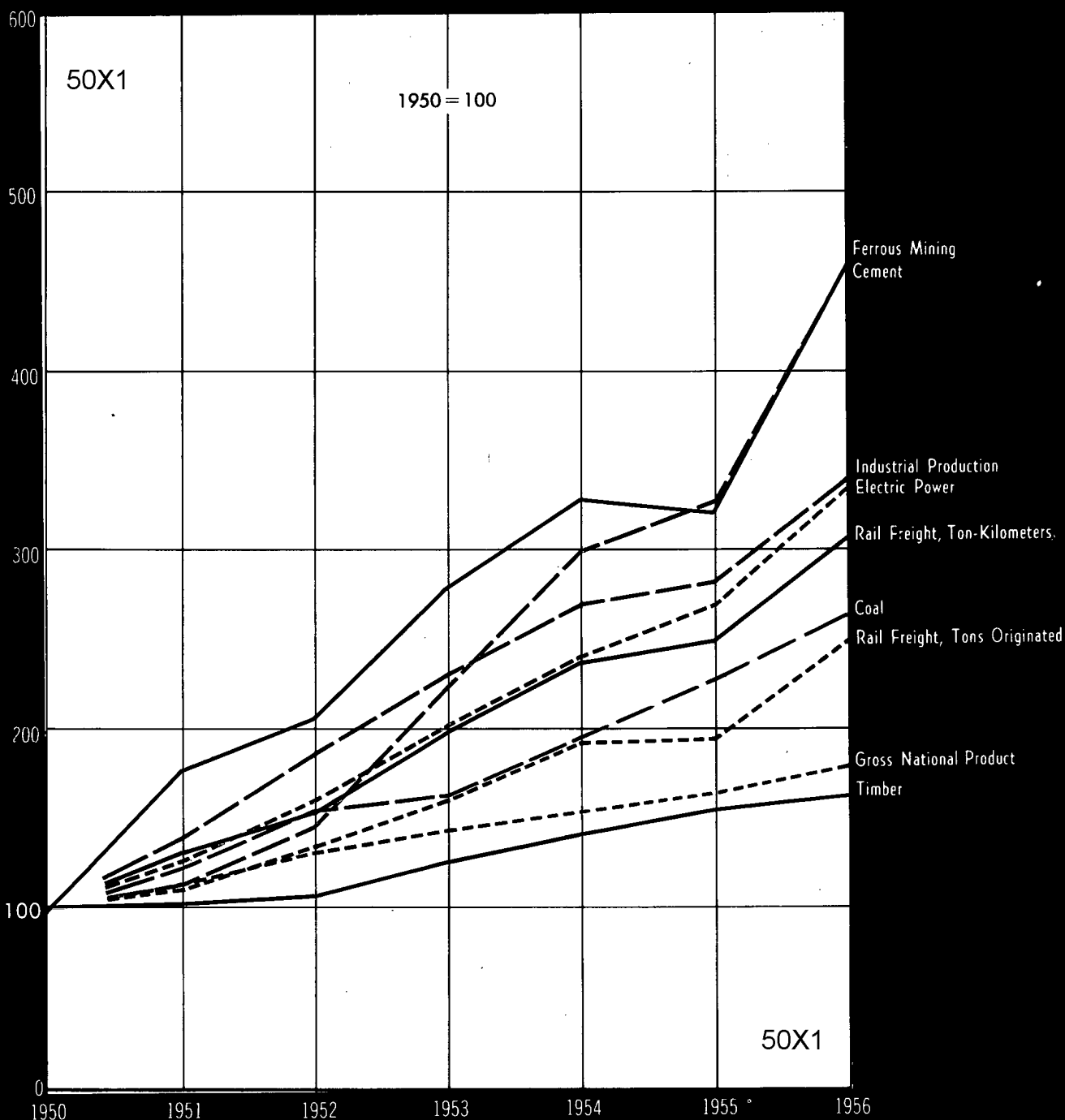
b. At factor cost in 1955 prices.

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Figure 2

# COMMUNIST CHINA

## PATTERN OF GROWTH OF SELECTED ECONOMIC SECTORS, 1950-56



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<u>Year</u>	<u>Length of Haul (Kilometers)</u>
1950	396
1951	466
1952	455
1953	487
1954	484
1955	507
1956	489

The indicated increases in average length of haul are in some measure attributable to the reorientation of internal Chinese Communist traffic which followed the Communists' rise to power. Because of the curtailment of international ocean trade and the reduction of coastwise water movement, internal rail traffic has been reoriented from an east-west to a north-south pattern. This reorientation has had the effect of increasing long-haul traffic density and thus the average length of haul. Another factor tending to increase the average length of haul has been the powerful Chinese effort to develop the economy of China proper at a relatively greater pace than that of Manchuria. There is clear evidence of this movement in the relatively greater allocation of resources to capital construction projects in China proper than to projects in Manchuria. 75/

As noted above, the length of haul increased from 396 km in 1950 to between 455 and 487 km during 1951-54 and then reached a high of 507 km in 1955. Although it fell to 489 km in 1956, the 1957 Plan goal indicates that it may again rise slightly to about 494 km in 1957. Because the kilometrage of railroad lines in Communist China is increasing continuously, it would be logical to expect a gradual increase in the average length of haul during the Second Five Year Plan period. On the other hand, increased traffic on existing lines, especially in north China, resulting from the large investments being channeled into their improvement could largely offset the influence of new line construction tending to increase the average length of haul.

Given the expansion of the economy called for under the First Five Year Plan, the growth in rail tons originated in 1955 was expected to be similar to that during 1950-54. The announced figure

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of 193.4 million tons originated in 1955 indicates, however, that the latter did not advance as anticipated. In fact, the increase in 1955 above the level of 1954 was less than 0.5 percent and can be considered negligible. The increase in ton-kilometer performance of 5 percent, therefore, resulted almost entirely from the increase in average length of haul. In May 1956 it was announced that the ton-kilometers of freight to be moved on the railroads in 1956 would be 9.9 percent greater than in 1955 and that the tonnage of freight to be moved would increase 13.8 percent above the level of 1955, 76/ indicating a significant reduction in the planned average length of haul for 1956. Early in 1957, however, Peking reported that the First Five Year Plan target for rail transport had been fulfilled in 1956, 1 year ahead of schedule. 77/ In July it was announced that during 1956 the Chinese Communist railroads had attained a level of performance of about 120.4 billion tkm while originating slightly more than 246.0 million tons of freight. 78/ The average length of haul was 489 km. The ton-kilometer figure represents an increase of nearly 23 percent above the level of 1955 and 11.6 percent above the level of the 1956 Plan. The tons-originated figure is about 27 percent above the level of 1955 and 11.8 percent above the level of the 1956 Plan. Planned performance goals for 1957 call for a 5.1-percent increase in ton-kilometers, to 126.5 billion, and a 4-percent increase in tons originated, to 256 million. 79/ The planned increases for 1957 are relatively modest when compared with the actual increases in 1956. If the plan goals are realized, the average length of haul in 1957 will be 494 km, a 1-percent increase above the level of 1956.

Although the increased performance figures for 1956 are impressive, they should be interpreted in the light of the much smaller increases in 1955. Actually it is almost impossible to find a satisfactory explanation for the varying increases between 1954, 1955, and 1956. It is difficult, for example, to reconcile the negligible increase in rail freight tons originated in 1955 with the increases in production in 1955 in the extractive and industrial sectors of the economy. With the exception of cement, all important commodities showed sizable production increases in 1955 above the level of 1954. The decrease in production of cement, however, was not enough by itself to affect so drastically the increase in rail tons originated. It is possible, however, that there was a proportional drop in haulage of all types of construction materials because more than adequate amounts were on hand at most building sites. Another factor in 1955 could have been the inability of local mines to furnish adequate coal to newly developed centers of demand. If the latter were forced to order from distant mines, longer turnaround time could have reduced

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the number of freight cars available for reloading. The Chinese Communists themselves have said that the increases in 1956 in rail transport performance were caused by the rapid progress of industrial production and capital construction. The western section of the Lung-Hai Railroad, for example, which carried an average of 10 freight trains per day in 1953, carried 17 per day in 1956 80/ -- a 70-percent increase. Several hundred thousand tons of goods needed for new construction projects were shipped to northwest China each month on this line, 81/ and petroleum began to move in an easterly direction from the Yu-men oilfields to the refineries in the coastal areas. In the country as a whole, rail freight shipments of coal, coke, iron ore, steel, petroleum, petroleum products, construction materials, timber, and machinery increased greatly. 82/ It is significant that there was enough slack in the Chinese railroad system in 1956 for it to handle the increased amounts of traffic in spite of the congestion which developed in numerous rail centers throughout the country. The Chinese realize now, however, that there is little slack left and that they must expand existing facilities in order to keep up with increased traffic demands. The year 1957 apparently will be a year in which the Chinese pause in their new construction program and give primary attention to immediate and pressing problems on the established rail lines.

Rail transport performance goals for the Second Five Year Plan have not yet been announced. Based on the Second Five Year Plan goals for new rail line construction, however, it has been estimated that investment in railroads during the Second Five Year Plan will be approximately double that of the First Five Year Plan. If this turns out to be the actual situation, it is estimated that growth in rail transport performance will be adequate during 1958-62 to support planned production increases in other sectors of the economy. Estimates of rail transport performance appearing in Table 6\* are based on this premise.

During 1957-62, rail tons originated will increase by almost 70 percent and ton-kilometers by about 60 percent above the level of 1956 if 1950-56 trends continue. This will mean a slight decrease in the average length of haul of about 5 percent, resulting from the relatively heavier amounts of traffic moving over the expanded and rehabilitated rail lines in the older established sections of the country. Railroads will continue to carry the predominant share of freight moving within Communist China during this period. The railroads' share of tons

\* P. 45, below.

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originated will decrease slightly to between 60 and 65 percent of the total, but rail ton-kilometers will remain relatively constant at about 80 percent of the total. During the Second Five Year Plan period, railroads and all other types of transport, including primitive carriers, are to be improved in order to cope with increasing distribution requirements.

III. Highways.

A. Pattern of Operations.

Except in the northeast, where several important highways run parallel to rail lines and provide supplementary service, motor vehicle transport in Communist China provides feeder service for railroads and waterways and also performs short-distance, intercity freight movements. Motor transport has facilitated the growth of commercial centers in rural areas not served directly by railroads or waterways. New feeder roads which join many scattered farming communities to the established transportation network enable the marketing by vehicle of commodities that previously were dependent on animal or coolie carriers. <sup>83/</sup> The demand for motor transport has also been increased with the centralization of grain procurement and distribution under state control. In spite of appreciable increases in motor traffic, however, the amount of goods moved by truck does not bulk large in the total overland transport of China -- of the tonnage hauled annually, animal and coolie transport probably still haul as much as if not more than motor trucks.

A major emphasis has been placed on the extension of the highway network to the border areas where only primitive means of communication formerly existed. Construction of roads in these areas has assisted the economic and cultural development of racial minority districts and has tied them more closely to the central government. <sup>84/</sup> Roads provide the only means of direct transportation between Communist China and Tibet and between Communist China and the neighboring countries of Laos, Burma, India, and the Soviet Central Asian republics. Because of intense Chinese interest in Tibet as well as the Chinese policy of strengthening border positions, motor transport has received considerable expansion in these areas. A further stimulus to motor transport has resulted from the increased tempo of construction undertaken by the Chinese, especially in areas where rail service either does not exist or where it remains relatively undeveloped. Truck transport in the western oilfields has been of prime importance.

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Traffic congestion which affected the railroads in 1956 extended also into highway transport. Although the tieup was not so vital, it seems to have been proportionally worse in trucking than on the railroads. Blame was placed on the shortage of trucks; on the practice of using drivers on two shifts only, which left trucks idle part of each day; and on a low proportion of operable vehicles because approximately 25 percent of all vehicles were under repair at a given time. The tendency of rail congestion to back up into highway transport was also recognized. 85/ The problem was further compounded in the southwest and in Sinkiang, where petroleum products were in short supply, thus increasing the difficulty by immobilizing trucks just when they were most needed. The remedies proposed involved the production of small trailers to increase the capacity of each truck, the training of more drivers, and the introduction of the three-shift system wherever possible. 86/

B. Investment.

The Chinese Communists have placed considerable emphasis on road rehabilitation and on new construction, which is accomplished primarily by manual labor because only limited mechanical equipment is available. The First Five Year Plan is estimated to have allocated 900 million yuan for highway construction, or about 10 percent of the total investment of new capital in transportation and communications, 87/ but by far the greater part of the total kilometrage of road building, mostly on secondary roads, is done by local governments.

The Chinese Communists have made considerable progress in their highway construction program. The kilometrage open to traffic was expanded from 104,000 km in 1950 88/ to 180,000 km by the latter part of 1956. 89/ Statistics released by Peking on highway construction are very difficult to assess because of the number of classifications (there are six different classes of motor highways) and a tendency to obscure the distinction between new construction and rehabilitation of existing roads. 90/ However, it appears that the Chinese will have constructed about 9,270 km of state-built trunk motor roads by the end of 1957, a figure which they have announced will exceed their First Five Year Plan goal by 88 percent. 91/ During 1957, new highway trunk lines totaling about 1,120 km will be built and opened to traffic. An important highway along the western border of China between Sinkiang and Tibet will be completed, as well as highways near the Vietnam border and in Fukien and Shantung Provinces. 92/

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Continued efforts to modernize Chinese Communist highway transport seem probable. Plans continue to provide for the survey and construction of new roads, mainly in industrial and mining areas or in national minority regions. 93/ The Sikang-Tibet, Tsinghai-Tibet, and K'un-ming - Ta-lo roads are examples of this trend. The thorough reconditioning and expansion of the Fukien network, providing a means of logistic support in the area opposite Taiwan, has strategic as well as economic significance. The road to Ta-lo on the Burmese border may prove particularly significant along with the projected railroad if it facilitates Chinese economic penetration of Burma. 94/ Transportation facilities in Yunnan Province, particularly in the southwest, have received increasing attention since 1952-53. As a result, by early 1955 there were in existence or under construction three principal through motor routes from K'un-ming to the Burmese border, with a substantial number of alternate branch roads in the border area. Most points along the frontier south of the Burma road are now accessible by road from China. At present, construction work is continuing on the Sikang-Tibet highway, and the Tsinghai-Tibet road, which was completed and opened to traffic in 1954, is undergoing reconstruction so as to raise its standard. 95/ When the entire network is completed in this area some years hence, facilities will exist for considerably more effective control of the whole Sikang-Tibet area. 96/ Peking has plans to link up all county seats in the country by the end of 1962; so the pace of the highway construction program will probably be stepped up considerably starting in 1958. 97/

In addition to increasing and modernizing the road network, the Chinese Communists have also been investing heavily in their motor vehicle park. Mainly as a result of large imports of vehicles from the Soviet Bloc, the nonmilitary park increased to more than 70,000 units by the end of 1956. 98/ The continued import of vehicles, coupled with domestic manufacture beginning in 1956, is expected to bring the total park to more than 150,000 units by the end of 1960. 99/ Indigenous production of 4-ton Soviet-designed ZIS-150 trucks was initiated in 1956 at the No. 1 Automobile Plant at Ch'ang-chun. It is estimated that, in spite of present difficulties, this plant may reach full production of 30,000 units per year by 1960. 100/ One of the US nonrepatriate prisoners of war who left China recently has indicated that the imported Soviet trucks are not as efficient as those which the Chinese themselves are producing. The latter are built from a basic Soviet design (ZIS-150) which has been modified to provide an improved suspension and an engine better suited to the Chinese climate. 101/



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C. Operating Efficiency.

The efficient utilization of highway transport in Communist China is hampered on many roads by physical restrictions such as low-capacity bridges, numerous ferries, and inadequate road construction and maintenance. A report of road conditions in the Hankow area (provided by the US prisoner of war mentioned above) indicates, however, that the Chinese have achieved some measure of efficiency in their roadbuilding operations. This prisoner of war was employed as a truck driver in the late summer of 1956 and on some occasions hauled loads as far as 200 km from Hankow. Although the roads he traveled had a gravel surface, they were kept in excellent repair, and he was able in many places to drive safely at a speed of 80 km (50 miles) per hour. 102/

Lack of adequately trained personnel has also been a problem. The same US prisoner of war stated that in addition to his regular monthly pay he received bonuses which were based on his savings in the consumption of gasoline and oil and necessary repairs on the truck assigned to him. Most of the Chinese in his unit were such inefficient motor vehicle operators that, by driving carefully and by providing for necessary maintenance on his truck, he was able to perform more efficiently than his coworkers and thus receive considerably higher bonuses. 103/ The need for more technically trained personnel was realized by the Chinese Communists as early as 1952, but the building of adequate training facilities, for the most part, is still in the planning phase. Technical advice provided in many cases by the USSR, however, overcomes this deficiency to some extent. 104/

Although the technological innovations necessary to overcome physical limitations in highway transport have not been forthcoming to an appreciable degree, considerable effort has been directed toward reducing inefficient hauling. Provincial transport companies were established under central control of the government, and a rigid system of traffic control was introduced to allocate trucking properly. Administrative reorganization, coupled with the introduction of heavier loading vehicles, has undoubtedly resulted in some improvement, but commodity distribution is such that trucks are still required to operate empty about half the time. 105/

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D. Performance.

In 1952 the Chinese Communists, as a result of limitations imposed both by the sparse network of motorable roads and by truck shortages, originated only 20.7 million tons of freight. 106/ Ton-kilometer performance for the same year was reported to be slightly more than 678 million. The average length of haul was thus about 33 km. By 1954 these figures had increased to 43.5 million tons originated, 1.87 billion tkm, 107/ and an average length of haul of 43 km. The First Five Year Plan goals of 67.5 million tons originated and 3.21 billion tkm for 1957 108/ were fulfilled during 1956, more than 1 year ahead of schedule. 109/ Actual performance in 1956 amounted to 79.1 million tons originated, 3.5 billion tkm, and an average length of haul of 44 km. 110/ Between 1950 and 1956, motor transport experienced an increase of more than tenfold in tons originated and more than ninefold in ton-kilometers. This pronounced rate of growth resulted largely from the increasing demand placed on motor transport services and from the somewhat improved position of roads and of truck inventories during these years. Based on past trends, highway tons originated could increase more than 160 percent and ton-kilometers nearly 250 percent during 1956-62. Lack of good motorable roads, however, and possible shortages of motor fuel may prevent increases of this magnitude. It is estimated that highway traffic in terms of both tons originated and ton-kilometers will increase by no more than 90 percent during this period. The average length of haul should remain fairly constant midway between 40 and 50 km. In 1956, motor trucks produced only 2 percent of total ton-kilometers in China but originated about 21 percent of total tonnage. It is estimated that by 1962 these figures will increase only to about 3 percent and 23 percent, respectively. Table 7\* contains estimates of highway traffic performance.

IV. Inland Waterways.

A. Pattern of Operations.

The inland waterway system of Communist China is one of the most extensive in the world. Approximately 100,000 km 111/ of inland waterway routes are now open to navigation, although most are suitable only for shallow-draft vessels. In general, inland water transport in China fulfills its usual role of carrying bulk cargoes where speed

\* P. 46, below.

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is not of major importance. The heaviest volumes of traffic are carried on the Yangtze River system, the Pearl River in the south, and the Sungari River system in the northeast. In spite of the great length of such main routes as the Yangtze, inland water transport is essentially local in nature; in 1956 the average length of haul of the modern inland water transport sector (excluding native craft) was only 364 km. The transportation of agricultural produce, coal, and building materials is most important on the inland waterways, but, as the level of the economy rises, the movement of industrial raw materials and produce is becoming relatively more important.

The inland waterways fleet has grown through domestic salvage and new construction rather than through imports. Powered vessels and barges have received special attention. The self-propelled fleet, for the most part confined to the main arteries, is estimated to total only about 750 vessels, 112/ ranging from passenger-cargo vessels of 4,000 gross register tons (GRT\*) to smaller tugs and launches. The nonpowered fleet still consists of a large number of small junks and native craft which, in the aggregate, have a freight capacity of nearly 4 million tons. 113/ On major waterways, such as the main stream of the Yangtze and the Sungari, tug-barge units are replacing the junk to some extent, especially on long-haul routes. On river inlets, canals, lakes, and tributary streams, however, the shallow-draft junk is still supreme. More than 80 percent of the junks of Communist China operate in the Yangtze basin, along the Huai and Han Rivers, through the Poyang Lake and Tung-t'ing Lake areas, and among the numerous canals. Throughout the Yangtze basin and along the Pearl River system in south China the junk is the primary means of contact between market centers and the countryside. The junk operates largely in support of the Chinese agricultural economy and is essential in the role of collecting grain and other agricultural produce and in local distribution. In addition, junks have been used in large numbers to move literally millions of tons of dirt and fill in support of various construction programs, such as water conservancy projects.

B. Investment.

Investment in inland waterways in Communist China has greatly increased during the past few years, largely because of construction

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\* Gross register tonnage is a measure of the cubic capacity of the cargo space of a ship expressed in tons at the rate of 1 long ton per 100 cubic feet.

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of new self-propelled ships and barges. Before 1954, relatively little investment went into new vessels, most of it going to salvaging vessels and rehabilitating the existing fleet. Since 1954, emphasis has been on new construction. Relative investment for channel improvement and similar projects is small, but appropriations for construction projects have increased several times yearly and are especially important on the local level. The sum allocated to the development of river transport in 1957 will be 2.6 times as great as that allocated in 1953. 114/

C. Operating Efficiency.

Efficiency in river fleet operations in China has been increased under the Communists by improved organization and by centralization of dispatch control and cargo allocation. Voyage time for vessels operating on scheduled runs has been reduced, in some instances from one-third to one-half. On the Yangtze, routing of barges through the entire voyage, instead of transshipping the cargo several times, has improved transit of bulk cargoes.

During the summer and early fall of 1956, however, ports along the Yangtze handling freight to or from Szechwan Province experienced volumes of passenger and freight traffic which they were unable to handle. Other inland waterways seem not to have been affected in the same degree. Failure to increase loading and unloading facilities in the Yangtze ports as the traffic expanded led to an increase in the length of time vessels spent in port and created a shortage of vessels along the river. Delays on the part of the limited number of vessels with sufficient horsepower to enable them to navigate the difficult Yangtze gorges presented a special problem. Slowdown of operations because of inclement weather, delays in vessel repairs, and a lack of warehouse and lighter space also affected the handling of freight. Concerted efforts toward ameliorating the situation were put into effect, and some improvement was noted, but undoubtedly conditions became worse again when cargoes from the fall harvest were ready for shipment. Because traffic is increasing faster than the capacity of facilities, transportation along the Yangtze is likely to be a problem for some time unless greater efforts are made to improve the efficiency of port loading and unloading facilities and to expand the river fleet. 115/

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D. Performance.

The increased emphasis on rail transport in Communist China has reduced the relative importance of water transport, and river traffic still has not reached pre-Communist levels. Inland water operations have steadily improved under the Communists, however, and inland water ton-kilometer performance (excluding traffic carried by junks) in 1956 was nearly eight times that of 1950. The exclusion of traffic carried by junks minimizes the importance of inland water traffic. There is some doubt that the Chinese know how much traffic is moved by junks. Statements about junk traffic, although usually vague and inconsistent, suggest that junks account for approximately three-fourths of total inland water ton-kilometer performance. The statistics shown in Table 8,\* based on Chinese announcements, do not include junk traffic. It is estimated, however, that in 1955 junks possibly carried about 22 million tons of traffic in support of the general economy and, depending on the extent to which essentially local-haul traffic is also included, could possibly have carried more than 100 million tons. 116/ Thus inland water traffic in 1955 in terms of tons originated, including junk traffic, may have been from 25 to 65 percent of the amount carried by railroads.

With continuation of the present emphasis on water transport, the achievement of further plans for development now under way should bring continued increases in performance. It is estimated, therefore, that inland water transport will continue to hold the position attained in 1955 and 1956, as a result of the recent strain on rail transport, the new nationwide joint land-water shipping agreements 117/ which are currently being implemented, and recent statements about the outlook concerning the development of highway transport. During 1956-62, inland water tons originated will increase by nearly 90 percent and ton-kilometers by about 100 percent. Thus by 1962 it is expected that inland water traffic will regain its prewar peak performance, but, with the growing dependence on railroads, inland water transport is likely never to regain its relative position among Chinese freight carriers.

\* P. 47, below.

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V. Coastal Shipping.

A. Pattern of Operations.

Operations of the Chinese Communist merchant fleet are generally confined to serving the domestic coastal trade. Recently there has been an insignificant amount of commerce with North Vietnam. 118/ Chinese Nationalist interdiction of coastal shipping has diminished and at present is effective only in the Taiwan Strait area, especially around the port of Amoy. North of Taiwan the Chinese Communists operate unobstructed trunk and feeder passenger and freight routes servicing all coastal ports from Foochow (Fu-chou) northward. The largest segment of the Chinese coastal fleet is concentrated in this area; shipments of coal and grains and other agricultural products; petroleum products; and industrial goods comprise the bulk of traffic. A smaller segment of the fleet operates out of Canton in south China to Swatow (Shan-t'ou) and to ports in the Liuchow Peninsula - Hainan Island area, providing local support for military and economic activities.

The powered merchant fleet is considerably augmented by a large number of coastal trading junks which handle the bulk of local service operations, particularly on the coast south of Taiwan. Presently, foreign-flag vessels (mainly of British registry) operate on liner service between Hong Kong and Swatow and between Hong Kong and various north China ports, and in 1956 some British vessels operated point-to-point along the China coast for extended periods without touching a non-Bloc port. Soviet vessels occasionally engage in Chinese domestic shipping from Shanghai north, particularly during the winter months.

The Chinese Communists are completely dependent on foreign registered vessels, both Bloc and Free World, to handle longer international trade. During 1956, non-Bloc tonnage accounted for 86 percent of all arrivals in mainland China ports, an increase of 5 percent above the previous year. The remainder were mainly Soviet- and Polish-flag vessels. There is reason to suspect, however, that about half of the 28 Polish ships on the Baltic-China run are effectively controlled, if not owned, by the Chinese-Polish Shipbrokers Corporation (CHIPOLBROK).

Chinese shipbuilding has advanced rapidly, largely as a result of significant assistance of material and technical aid from

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the USSR. At the principal yards at Dairen and Shanghai, vessels of larger and more complex types have been constructed. Medium-size merchant vessels have been produced since 1954. The Chinese Communists have announced that they plan to begin producing 10,000-ton (probably deadweight tonnage\*) freighters in 1958, 119/ in keeping with the trend toward the building of larger and more complex steel vessels.

Between 1950 and the end of 1956, with salvage efforts, foreign purchases, and new construction, the Chinese Communist merchant fleet increased from about 79 vessels of 175,000 GRT to about 117 vessels of 285,000 GRT. Within the last 3 years the Chinese have stepped up their foreign purchase program and presently have, or have had, orders for new vessels with Finland, Poland, East Germany, and Hungary. It is estimated that by 1960 the Chinese could have a coastal fleet of 350,000 to 400,000 GRT. This would still be less than half the size of the merchant fleet of Nationalist China in 1949.

Communist China has few good harbors. Dairen, Tientsin - Ta-ku/Hsin-k'ang, Tsingtao, Shanghai, Swatow, Canton/Whampoa, and Fort Bayard, which combined can discharge approximately 115,000 tons daily, possess about 65 to 70 percent of the total cargo-handling capacity of Chinese ports. Ying-k'ou, Ch'in-huang-tao, Chefoo (Yen-t'ai), Ningpo (Yin-hsien), Wenchow (Yung-chia), Foochow, Amoy, Hai-k'ou, and Yu-lin, all of relatively minor size, are important terminals for domestic coastal trade. Amoy and Foochow, opposite Taiwan, are currently of singular importance as possible staging areas for an offshore island offensive against the Chinese Nationalists. 120/

B. Investment.

Investment in the merchant marine service of Communist China apparently has been devoted in large part to modernizing the existing fleet and improving port facilities. Terminals of importance to foreign trade have received special attention, as indicated by construction of a new deepwater port at Ta-ku in north China 121/ and more recently at Fort Bayard in south China. Work on the development of Fort Bayard began in April 1955. 122/ In early December 1956 the announcement was made that the first stage of construction had been

\* Deadweight tonnage is the carrying capacity of a ship in long tons -- that is, the difference between the displacement light and the displacement loaded.

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completed, giving the harbor a capacity of 1.6 million tons per year. 123/ Construction of the harbor is continuing with the ultimate goal of reaching a cargo-handling capacity of 4.6 million tons per year. 124/ Efforts to reduce the dependence of Communist China on foreign-flag shipping for overseas and domestic trade will involve added expenditure for the purchase and construction of additional vessels.

C. Operating Efficiency.

A comparison of the growth indexes for the merchant marine inventory of Communist China and its performance shows that great strides have been made in increasing the utilization of the coastal fleet. Much of the progress was undoubtedly due to the growing demand for shipping services, the increasing level of economic activity, and the reduction of ocean freight charges. 125/ The Chinese continue to emphasize efficiency as a primary goal and claim some success in its attainment. Efforts have been directed toward a more efficient use of labor by the mechanization of cargo handling at ocean terminals, which shortens the time vessels must spend in port, and by closer supervision of traffic operations. Installation of radar on vessels 126/ is a recent development which will expedite ship movements during periods of limited visibility. Shipping developments in the last half of 1956 undoubtedly will cause greater attention to be paid to the problem of efficiency because cargoes offered during that period were greater than the capacity of the fleet. 127/

D. Performance.

The available merchant fleet of Communist China apparently was able to handle all shipping requirements before the last half of 1956. Coastal shipping performance has grown steadily; ton-kilometer performance in 1956 was more than 10 times the 1950 figure, as shown in Table 9.\* The growth of merchant shipping traffic since 1949, however, has been hampered by the extensive loss of merchant shipping tonnage to the Nationalists and the radical shift in international trade routes from sea to rail through the northeast, which accompanied the reorientation of Chinese foreign trade toward the Soviet Bloc. 128/ During 1956-62, both coastal shipping tons originated

\* P. 48, below.



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and ton-kilometers will increase by about 100 percent. In spite of this increase, coastal shipping tons originated will remain at 3 percent of total tons originated and ton-kilometers at 7 percent of the total in 1962.

VI. Civil Aviation.

A. Pattern of Operations.

Air transport in Communist China as yet plays a very limited role in freight movement, but it is important in the movement of high-value, low-tonnage cargo and for the transportation of high-priority personnel. The acquisition of new aircraft of greater capacity and better performance and the adoption of international standards and operating procedures undoubtedly will enhance the importance of civil aviation in the economy of Communist China.

During 1955 and early 1956 the unduplicated basic civil air network of Communist China increased more than 21 percent from the 1954 figure of 15,700 km. to more than 19,000 km. New routes were opened from Canton to Hanoi in North Vietnam, 129/ from K'un-ming to Rangoon in Burma, 130/ from Urumchi to Khotan, 131/ and from Fort Bayard to Hai-k'ou on Hainan Island. 132/

The inventory of the Chinese civil air fleet has undergone an almost complete changeover in type of aircraft. The US-built aircraft which formed the nucleus of the inventory used on the domestic network have been largely replaced by new aircraft of Soviet manufacture. The only US-built types which remain are the post-World War II Convair 240, an occasional C-46, and a few C-47/DC-3's now converted with Soviet engines to Ts-62's. All the other aircraft of the expanded fleet are Il-12's, Il-14's, or Li-2's, types which predominate in the Soviet civil air fleet: 133/

On 2 December 1956 the new Soviet twin-engine jet, Tu-104, inaugurated scheduled service on the Moscow-Prague-Peking route. 134/ This jet aircraft, carrying 50 passengers in a luxury version and 70 for tourist service, makes the flight at an average flying time of 800 km (500 miles) per hour, cutting the flight time approximately in half. The additional capacity may be compared with the 14- to 18-passenger aircraft used within Communist China.

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In the past it has been customary for the USSR to make available to each Satellite country sharing a route with it the same type of equipment used by Aeroflot. Three Tu-104 transports have been purchased by Czechoslovak Airlines. 135/ If Czechoslovakia and the USSR both use the jet over the three-country route, it is likely that the Chinese Communists also will receive the aircraft for their use on the jointly flown portion of the route. 136/

B. Investment.

During the period of the First Five Year Plan, 101 million yuan were to be invested in civil aviation in Communist China. The increase of invested capital from 1950, the year of organization of the Chinese civil airlines, in terms of index numbers is as follows: if 1950 invested capital equals 100, then 1952 and 1955 invested capital equal 206 and 519, respectively. 137/ No information is available on allotments for the period of the Second Five Year Plan. It is probable, however, that new equipment from the USSR will be paid for on a long-term basis, under an arrangement similar to that which was made on the return of the Soviet interest in SKOGA\* to the Chinese as of 1 January 1955.

C. Operating Efficiency.

The operating efficiency of civil air transport in Communist China is believed to have suffered at first by the conflict in ideologies between the US-trained managerial group which defected from the Nationalists and the Soviet-influenced Peking organization. Political reliability apparently was placed before technical training as a requirement of responsibility, a Communist practice which in many cases compounds inefficiency. 138/ The conflict may have been resolved to some extent by the standardization on Soviet equipment and the consequent training of Chinese Communist personnel in Soviet operational procedures.

D. Performance.

Civil air transport in Communist China has never regained its importance as either a domestic or an international carrier since its peak performance in 1948. Under the Nationalists the routes flown were five times the 1954 total. They consisted of an extensive

\* The Soviet-Chinese Joint Stock Company for Aviation, which provided air service between Communist China and the USSR.

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domestic network and international routes to adjacent countries as well as to the US. In 1956, however, the Communist network began to expand, and the January 1957 announcement of plans spoke of 16,015 km of new domestic routes to be added. 139/ Projected international services between Communist China and India, Ceylon, Cambodia, and Japan have been rumored. 140/ The total volume of air transport during the first half of 1956 is reported to have increased 72.5 percent above the level of the same period of 1955. 141/ During the 12 months ending 15 December 1956, air transport of passengers, mail, and freight in terms of ton-kilometers was reported to be almost 4 percent above the 1957 target. 142/

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APPENDIX A

STATISTICAL TABLES

Table 6

Communist China: Estimated Performance  
of Rail Transport  
1950-62

<u>Year</u>	<u>Amount (Billion Ton-Kilometers)</u>	<u>Volume (Million Metric Tons Originated)</u>	<u>Average Length of Haul (Kilometers) <u>a/</u></u>
1950	39.375 <u>b/</u>	99.519 <u>b/</u>	396
1951	51.500 <u>c/</u>	110.500 <u>c/</u>	466
1952	60.153 <u>b/</u>	132.064 <u>b/</u>	455
1953	78.057 <u>b/</u>	160.437 <u>b/</u>	487
1954	93.223 <u>b/</u>	192.603 <u>b/</u>	484
1955	98.127 <u>d/</u>	193.396 <u>d/</u>	507
1956	120.350 <u>e/</u>	246.050 <u>e/</u>	489
1957	126.500 (Plan) <u>f/</u>	256.000 (Plan) <u>f/</u>	494
1958	141.637 <u>g/</u>	289.614 <u>g/</u>	489
1959	154.644 <u>g/</u>	319.454 <u>g/</u>	484
1960	167.673 <u>g/</u>	350.526 <u>g/</u>	478
1961	180.723 <u>g/</u>	382.830 <u>g/</u>	472
1962	193.795 <u>g/</u>	416.366 <u>g/</u>	465

a. Calculated by dividing ton-kilometers by tons originated.

b. 143/

c. 144/

d. 145/

e. 146/

f. 147/

g. Projection, 1958-62, based on a second-degree parabola fitted to 1950-57 data. 148/

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Table 7

Communist China: Estimated Performance  
of Highway Transport  
1950-62

<u>Year</u>	<u>Amount (Billion Ton-Kilometers)</u>	<u>Volume (Million Metric Tons Originated)</u>	<u>Average Length of Haul (Kilometers) <u>a/</u></u>
1950	0.373 <u>b/</u>	7.448 <u>b/</u>	50
1951	0.503 <u>c/</u>	12.575 <u>d/</u>	40 <u>e/</u>
1952	0.678 <u>f/</u>	20.718 <u>b/</u>	33
1953	1.182 <u>f/</u>	30.393 <u>b/</u>	39
1954	1.867 <u>f/</u>	43.538 <u>b/</u>	43
1955	2.517 <u>f/</u>	50.068 <u>f/</u>	50
1956	3.500 <u>g/</u>	79.130 <u>g/</u>	44
1957	4.021 <u>h/</u>	91.077 <u>h/</u>	44
1958	4.542 <u>h/</u>	103.024 <u>h/</u>	44
1959	5.063 <u>h/</u>	114.971 <u>h/</u>	44
1960	5.584 <u>h/</u>	126.918 <u>h/</u>	44
1961	6.105 <u>h/</u>	138.865 <u>h/</u>	44
1962	6.626 <u>h/</u>	150.812 <u>h/</u>	44

a. Calculated by dividing ton-kilometers by tons originated.

b. 149/

c. Average annual increase of 34.8 percent.

d. Ton-kilometer figure divided by estimated average length of haul of 40 km.

e. Estimated to be approximately midway between the 50-km figure for 1950 and the 33-km figure for 1952.

f. 150/

g. 151/

h. Straight-line projection, 1956-62, based on the average of the absolute increases between 1950 and 1956.

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Table 8

Communist China: Estimated Performance  
of Inland Water Transport a/  
1950-62

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<u>Year</u>	<u>Amount (Billion Ton-Kilometers)</u>	<u>Volume (Million Metric Tons Originated)</u>	<u>Average Length of Haul (Kilometers) <u>b/</u></u>
1950	1.677 <u>c/</u>	4.504 <u>c/</u>	372
1951	2.658 <u>d/</u>	6.956 <u>d/</u>	382
1952	3.638 <u>c/</u>	9.407 <u>c/</u>	387
1953	5.631 <u>c/</u>	15.338 <u>c/</u>	367
1954	7.891 <u>c/</u>	20.476 <u>c/</u>	385
1955	10.425 <u>e/</u>	26.322 <u>e/</u>	396
1956	12.900 <u>f/</u>	35.420 <u>f/</u>	364
1957	15.802 <u>g/</u>	40.573 <u>h/</u>	389
1958	17.820 <u>i/</u>	45.726 <u>h/</u>	390
1959	19.838 <u>i/</u>	50.879 <u>h/</u>	390
1960	21.856 <u>i/</u>	56.032 <u>h/</u>	390
1961	23.874 <u>i/</u>	61.185 <u>h/</u>	390
1962	25.892 <u>i/</u>	66.338 <u>h/</u>	390

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a. Modern transport, excluding wooden sailing vessels and junks.

b. Calculated by dividing ton-kilometers by tons originated.

c. 152/

d. Straight-line projection, 1950-52.

e. 153/

f. 154/

g. The 1957 Plan for the ton-kilometer performance of inland water and coastal shipping combined was announced to be 26.336 billion tkm. 155/ This figure was divided according to the 1956 breakdown: 60 percent to inland water and 40 percent to coastal shipping.

h. Straight-line projection, 1956-62, based on the average of the absolute increases between 1950 and 1956.

i. Straight-line projection, 1957-62, based on the average of the absolute increases between 1950 and 1957.

S-E-C-R-E-T

Table 9

Communist China: Estimated Performance  
of Coastal Shipping a/  
1950-62

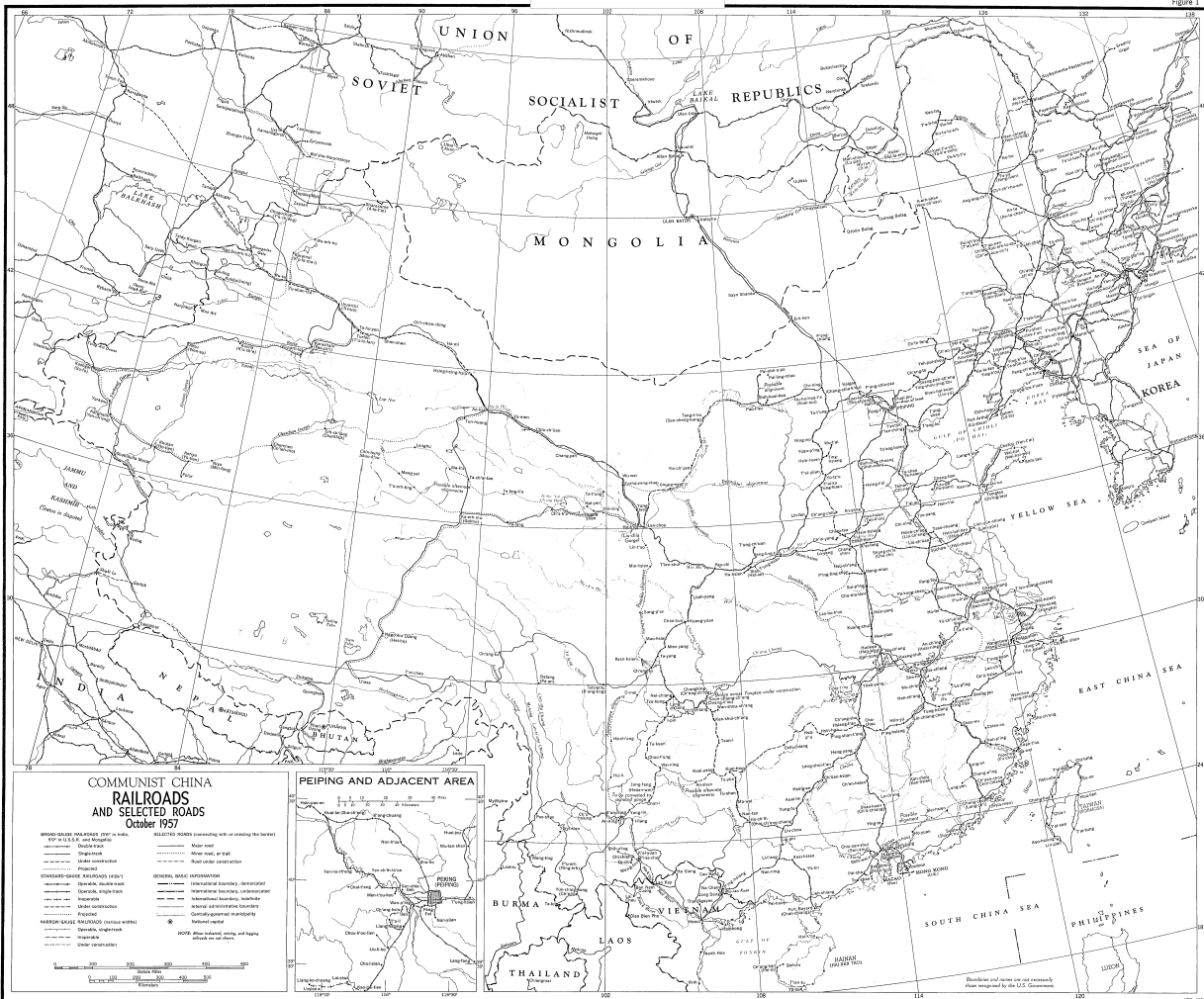
<u>Year</u>	<u>Amount (Billion Ton-Kilometers)</u>	<u>Volume (Million Metric Tons Originated)</u>	<u>Average Length of Haul (Kilometers)</u>
1950	0.822 <u>b/</u>	0.828 <u>b/</u>	993 <u>c/</u>
1951	3.012 <u>d/</u>	3.581 <u>d/</u>	841 <u>c/</u>
1952	5.000 <u>b/</u>	5.765 <u>b/</u>	867 <u>c/</u>
1953	4.654 <u>b/</u>	5.925 <u>b/</u>	785 <u>c/</u>
1954	8.040 <u>b/</u>	9.907 <u>b/</u>	812 <u>c/</u>
1955	8.384 <u>e/</u>	10.450 <u>e/</u>	802 <u>c/</u>
1956	8.600 <u>f/</u>	10.850 <u>f/</u>	793 <u>c/</u>
1957	10.534 <u>g/</u>	13.168 <u>h/</u>	800 <u>i/</u>
1958	11.921 <u>j/</u>	14.901 <u>h/</u>	800 <u>i/</u>
1959	13.308 <u>j/</u>	16.635 <u>h/</u>	800 <u>i/</u>
1960	14.695 <u>j/</u>	18.369 <u>h/</u>	800 <u>i/</u>
1961	16.082 <u>j/</u>	20.102 <u>h/</u>	800 <u>i/</u>
1962	17.469 <u>j/</u>	21.836 <u>h/</u>	800 <u>i/</u>

- a. Modern transport, excluding wooden sailing vessels and junks.  
b. 156/  
c. Calculated by dividing ton-kilometers by tons originated.  
d. Calculated from an announcement that in 1952 tons originated were 161 percent of the level of 1951 and ton-kilometers 166 percent of the level of 1951. 157/  
e. 158/  
f. 159/  
g. The 1957 Plan for the ton-kilometer performance of inland water and coastal shipping combined was announced to be 26.336 billion tkm. 160/ This figure was divided according to the 1956 breakdown: 60 percent to inland water and 40 percent to coastal shipping.  
h. Calculated by dividing ton-kilometers by average length of haul.  
i. The years 1953-56 reveal a tendency for the average length of haul to level off at about 800 km. In the absence of additional information, it is assumed that this pattern will prevail until the situation in the Taiwan Strait region is settled.  
j. Straight-line projection, 1957-62, based on the average of the absolute increases between 1950 and 1957.

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