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TRANSPORTATION IN NORTHEAST CHINA

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Transportation in Northeast China

This publication gives the complete text of Volume XV of the Economic Encyclopedia of the Northeast (Tung-pei Ching-chi Hsiao-ts'ung-shu), published by the Northeast China Resources Investigation Committee, in Mukden, February 1948.

The information, given in three books, discusses the history, facilities, and administration of transportation in the Northeast, including rail, highway, inland water, and ocean transportation. Information up to October 1947 is included, but statistical data generally goes only up to the early 1940s.

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TRANSPORTATION IN NORTHEAST CHINA

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I.

TRANSPORTATION SYSTEM BEFORE THE 19TH CENTURY AND THE CONSTRUCTION OF RAILWAYS

Long before the development of modern civilization there were land and waterway transportation systems in Manchuria. After the opening of the five main highways under the Empire of Po Hai in Manchuria the succeeding dynasties of Liao, Chin, Yuan, Ming and Ch'ing made continuous efforts to establish a system of communications for building up military, administrative and economic strength. The population in Manchuria was at that time, however, very small, and consequently passenger and freight traffic on land or by the rivers was light. Although the Manchu Imperial Government lifted its ban on Chinese immigration into Manchuria at the end of the 19th Century the population in Manchuria was at that time less than 10,000,000. When Ying-k'ou was opened as a port in 1658, the total tonnage of imports and exports was less than 100,000. It is safe to say that the volume of trade was small in the past several centuries although it is taken for granted that it may have fluctuated with changes in political and economic conditions.

At present we are concerned not so much with transportation volume as with the methods of transportation and the organization of the transportation system. This would lead us to a full understanding of the transportation system in modern Manchuria and would provide us with a background knowledge for future planning and policy making. The following is a brief description of the land and river transportation system in Manchuria before the construction of railways:

I. Waterways

Both the Sungari and the Nonni flow toward Miao-chieh (Nikolaevsk) in Amur Province under Russian control and enter the frozen Tatar Strait. These two rivers had no direct contact with the provinces south of the Great Wall and those provinces in the southern part of Manchuria. Nor did they have economic ties with the various areas in the northern part of Manchuria. Besides, the south part of the Sungari valley and the Liao Ho is separated by mountains which render transportation between the north and the south more difficult. Consequently, all sorts of goods sent to Manchuria either from China proper or from overseas had to be first transferred at Ying-k'ou. It was from there that goods were transferred to sailing boats which sailed up the Liao Ho. At certain places along the upper Liao Ho, these goods were transferred to horse carts and traveled 150 to 200 kilometers to cities on the Sungari and the Nonni Rivers. It was at these cities along the rivers that goods were transferred from wagons to sailing boats and sent to various places located on the tributaries of the two rivers. This shows that the navigation system in Manchuria had been established almost exclusively along the meridians. Ying-k'ou was a transfer port from where all of the sailing boats sailed northward along the main course of the Liao Ho and its tributary, the East Liao Ho. From the East Liao Ho to I-tung Ho by land, and from the I Tung Ho, one of the tributaries of the Sungari River, they dispersed in three directions: one leading eastward to Kirin, another leading northeast toward the lower stream of the Sungari River and its tributaries and leading to cities including I-lan and Hu-lan, and the third leading to the northwest as far as Tsitsihar.

II. Highways

The striking feature of roads in Manchuria was that they lay north and south. There were four main roads leading from the south to the north. (See Map 1)

1. The East Trunk Route. This was the earliest in its opening and operation and the safest of all. Mukden and Kirin were linked by this road. When it entered Kirin province, it divided into three directions. The first road led eastward to Ning-an, the second northwestward to Fu-yu, and the third northward to A-ch'eng (Ah-shih-ho). From A-ch'eng there were two roads, the Right Road and the Left Road. That which led to Fu-chin through Pin-hsien and I-lan is called the Right Road; while that which crossed the Sungari River and reached Hu-lan is called the Left Road.

In addition, there was a short cut linking Mukden and A-ch'eng. This road is short in distance and convenient for communication. Subsequently a south-north railway was built along this line.

2. The Central Trunk Route. It started from Hsin-min located on the lower Liao Ho, traveled along the east bank of that river and terminated at Fu-yu in the north. It connected cities and towns by land and river transportation. In other words, it reached A-ch'eng in the east, Ch'i-ch'i-ha-erh in the northwest along the Nonni River, and Hei-ho in the far north.

3. The Western Trunk Route. It began at Hsi-feng-k'ou moved onward along the East Hsin-an-ling Mountain, penetrated the Mongolian Grass Land, crossed the Tao-erh Ho, and then advanced northward along Nonni and terminated at Ch'i-ch'i-ha-erh.

4. The West Foot Hill Trunk Line. It started from Peiping, crossing the Outer Mongolian deserts and terminated at Hailar.

In summary, it is clear that most trunk routes were built from south to north. There were a number of east-west routes. All in all, there were roads leading to all directions in Manchuria. These roads contributed a good deal toward political and economic development and also to trade with China proper and with oversea countries. Besides the four routes already mentioned, there was another between Peiping and Shen-yang via Lin-yu (Shan-hai-kuan), Chin-hsien and Hsin-min. It runs from west to east. As far as military affairs, administration, and economic development are concerned, it is a route of foremost importance. It is the main artery between Inner China and Manchuria.

As the modern railway lines have been constantly improved with the advance of time, the usefulness of these lines has been greatly diminished. They have been reduced from main transportation lines to auxiliary ones.

II.

THE TRANSPORTATION SYSTEM AFTER THE CONSTRUCTION OF RAILWAYS

Before the nineteenth century the Manchu Government restricted Chinese immigrants into Manchuria. Consequently, few Chinese entered the forbidden place beyond the Chinese Great Wall. At the end of the nineteenth century when the ban was lifted, a great number of Chinese immigrants poured into Manchuria. They discovered that the resources there are much richer than those in China proper. Subsequently they started to devote themselves to agriculture, livestock raising and forestry. Roughly, 130 years ago (1820), Chinese immigrants established soybean oil pressing firms in Ying-k'ou. When Ying-k'ou was opened for foreign trade in 1861, the staple products of Manchuria including tussah silk and soybeans gradually received high reputation in the world market and became international commodities. Ever since then Manchuria has captured much attention from China and the world.

The construction of railways in Manchuria was first started in 1893 when the British extended the Peking-Mukden Line beyond Shan-hai-kuan. Five years later, Czarist Russia constructed the Tung-ch'ing Railway. The completion of the Tung-ch'ing Railway in 1920 marked a great event in the history of transportation in Manchuria.

The Peking-Mukden Railway line was extended into Manchuria in 1894. In comparison with the first American railroad which was built from Stockton to Darlington in 1825, the Chinese undertaking occurred 71 years later. In comparison with the first Japanese railway line built from Tokyo to Yokomaha in 1872, the construction of the first railway in Manchuria took place twenty-two years later, and the first Chinese railway between Shanghai and Wu-sung was built eighteen years later in 1887.

It has been more than fifty years since the first railway was built in Manchuria. Many political changes have taken place since then. The railways in Manchuria have made great contributions to the progress of trade and to the development of economic resources. It becomes necessary for those who want to make a study of the modern transportation system in Manchuria to begin with the study of the history of railway development in that area. For the sake of expediency, we will describe the development of transpo tation in Manchuria in three periods.

I. <u>The First Period: The Rivalry of Great Britain and Czarist Russia</u>

The first period which covers thirteen years was marked by the construction of the Peking-Mukden Line in Manchuria by the British, by the construction of the Tung-ch'ing Railway by Czarist Russia

TABLE 1. DEVELOPMENT OF MODERN TRANSPORTATION IN MANCHURIA BY PERIODS

Periods	Date	Duration	Duration in Terms of Historical Events	Major Events
The First Period (The Rivalry of Great Britain and Czarist Russia Before the Russo-Japanese War)	1893-1906		Beginning with the Extension of the Peking Mukden Line into Manchuria to the construction of the Southern Manchuria Railway.	The Sino-Japanese War and the Russo-Japanese War
The Second Period (The Rivalries of Japan, China and the Soviet Union After the Russo-Japanese War)	1906-1931	25 years	From the founding of the South Manchuria Railway Company to the Mukden Incident	The Founding of the Republic of China; World War I; The Washington Conference; The Occupation of Manchuria by Japan
The Third Period (The Time of Pupper Manchukuo)	1931-1945	14 years	From the Mukden Incident to the Japanese Surrender	The Founding of the Puppet Manchukuo; The Lu-kuo-ch'iao Incident; World War II

and by the founding of the Southern Manchuria Railway Company under Japanese control. The outstanding features in this period were the completion of the Tung-ch'ing Railway, the penetration into Manchuria by the Japanese after the Russo-Japanese War and the rivalries of Japan and Russia.

To expand further and safeguard its military and political interests in Manchuria, Czarist Russia intended to put Manchuria within its sphere of influence. It planned to build a railway which would link Vladivostok, its only base in the Far East with the home country in the shortest possible distance. In 1896 by a secret agreement with the Manchu Government, the Russian Government acquired the right to build the Tung-ch'ing Railway (from Man-chou-li to Sui-fen-ho). In 1897 under the pretext that Germany had taken possession of Chin-u Wan, the Czarist Government forced the Manchu Government to sign a treaty by which it obtained the lease of the Liaotung Peninsula to Russia. By virtue of this treaty the Czarist Government acquired also the right to build a railway from Harbin to Dairen (the southern portion of the Chinese Ch'ang-ch'un Railway). In 1898 the Russian Government sent a railway construction Corps to Harbin to build the Tung-ch'ing Railway and a line from Harbin to the west and to the south in the direction of Port Arthur and Dairen were built simultaneously. In 1901 2,400 kilometers of railways had been completed. All the newly completed railways were put into operation in 1903.

To compete with Russian influences in Manchuria, Great Britain concluded a treaty with the Manchu Government to extend her line from Shan-hai-kuan to Mukden. Subsequently, there were many disputes and conflicts between the Russians and the British regarding their rights and privileges in Manchuria. After consultations and compromises between the two powers, Czarist Russia recognized the extension of the Peking-Mukden Line beyond Shan-hai-kuan as a right of the British, and thereby allowed them to build the intended line. Thus the Peking-Mukden Railway's main line to Hsin-min and a branch line to Ying-k'ou were completed in 1903.

From the above description it can be seen that at the beginning of the railway era in Manchuria the powerful Czarist Russia had been building the Chinese Eastern Railway for strategic reasons; while in the south the British had endeavoured to extend the Peking-Mukden line for economic purposes. The two powers were opposing each other in Manchuria across the Liao Ho. Each of them tried its best to strengthen its influence in Manchuria. In 1904 Japan was at war with Russia. The Japanese constructed a light railway line from Antung to Mukden for military reasons. Later, on the basis of the Portsmouth Treaty, the Japanese acquired the rights for the Southern Manchuria Line from Ch'ang-ch'un (K'uan-ch'eng-tzu) to Port Arthur and its branch lines. In 1907, the South Manchuria Railway Company was formed by the Japanese. After that Czarist Russia retreated to the north of Ch'ang-ch'un, while Japan began to take Russia's place in the south. Railways built at the later part of the first period are given in Table 2.

TABLE 2.

RAILWAYS IN MANCHURIA IN THE LATER PART OF THE FIRST PERIOD
AT THE TIME OF THE FOUNDING OF
THE SOUTH MANCHURIA RAILWAY COMPANY

Under the control of:	Name of Railway Line:	Terminals	Length	Date of Operation
Japan (1,111.2 kilometers)	The Main Line of the South Manchurian Railway Line	Dairen Wharf to Ch'ang-ch'un	704.3	1903
	Ying-k'ou Line	Ying-k'ou to Ta-shih-ch'iao	22.4	1904
	Fu-shun Line	Su-chia-t'un to Fu-shun	52.9	1903
	Port Arthur Line	Chou-shui-tzu to Port Arthur	50.8	1903
	Yen-t'ai Coal Mine Line	Chefoo Coal Mine	15.6	1903
	Hun-ho Yu-shu Connecting Line	Hun-ho to Yu-shu	4.1	1903
	An-tung-Mukden Line	From An-tung to Su-chia-t'un	261.1	1905
Russia (1,823.3 kilometers)	The Chinese Eastern Railway	Harbin to Lu-pin	934.8	1903
	The Chinese Eastern Railway	Harbin to Sui-fen-ho	546.4	1903
	The Chinese Eastern Railway	From Harbin to Ch'ang-ch'un	242.1	1903
Britain (510.7 kilometers)	Hopeh Line	Kou-pant-tzu to Hopeh	91.1	1900
	Shen-yu Line	Hsin-min to Shan-hai-kuan	359.8	1903
	Shen-yu Line	Mukden to Hsin-min	59.8	1905
Total Mileage			3,345.2	

II. The Second Period: The Rivalries of China, Japan and the Soviet Union After the Russo-Japanese War

The second period was classified to cover a quarter of a century, starting from the formation of the South Manchuria Railway Company and ending with the Mukden Incident. There were three major events during this period.

1. Relations between Japan and the Soviet Union, possessing respectively the Southern Manchuria Railway and the Chinese Eastern Railway became more critical;

2. The United States showed its intention to share the rights of constructing railways in Manchuria;

3. The Chinese Government started a movement to restore sovereignty in railway construction and planned to build new lines to encircle the Southern Manchurian Railway.

The first and the second events took place in the first half of this period. It should be pointed out that Japan had used the railways as bases to plot aggression which finally led to the Mukden Incident.

After it took over the control of the Southern Manchuria Railway from Russia according to the Portsmouth treaty, Japan succeeded during the battles with Russia in building the An-tung-Mukden Line, thereby linking the line with the Peking-Mukden Line. In addition, Japan built two railways: one between Ch'ang-ch'un and Kirin and the other between Ssu-p'ing and T'ao-nan.

During this period China, Russia, the United States, Britain and France had constantly made public their respective policies toward Manchuria. The U.S. for example: 1. proposed to buy the South Manchuria Railway Company; 2. announced the Open Door Policy and Equality of Opportunities; 3. proposed the neutralization of the Manchurian Railways; 4. asked for the right to build a railway from Chin-chou to Ai-hui (Aigun).

To counteract the above-mentioned policies and to strengthen its economic interests in Manchuria, Japan constructed local railway lines.

The description given above covers the first half of the second period. During the second half of the first period, the Chinese started a campaign to restore the rights they had lost. It was an anxious moment for the South Manchuria Railway Company. Since the conclusion of World War I, the principles of equality of nations and self-determination had been very popular. The complete control of railways in Manchuria by foreign powers was regarded as a humiliation and shame of the Chinese nation. As this kind of feeling was widespread in Manchuria, there arose the movement for restoring China's sovereignty. At that time the Manchurian Transport Committee had drafted plans for building three railways with Chinese capital and technique. They were:

1. The Eastern Line: Hu-lutao - Mukden - Hai-lung - Kirin - Hai-lin - I-lan - T'ung-chiang - Fu-yüan

2. The West Line: Hu-lu-tao - Ta-hu-shan - T'ung-liao - T'ao-nan - Ch'i-ch'i-ha-erh - Ning-nien - Nen-ch'eng - Hei-ho

3. The South Line: Chao-yang - Ch'ih-feng - To-lun

It was due to the gradual implementation of these plans that transportation in Manchuria has been developed into three networks:

1. The Japanese South Manchuria Railway Network with Dairen as its center.

2. The Russian Chinese Eastern Railway Network with Vladivostok as its center.

3. The Chinese Four East Railway and the Four West Railway Network with the Harbor of Hu-lu-tao as its center.

The construction of the Hu-lu-tao Harbor by China made the Japanese feel that their interests in Manchuria were threatened. Accordingly, Japan changed its policy in Manchuria from moderate penetration to aggressive attacks. This was indicated by the Mukden Incident.

The following is an outline of the Manchurian Railway transportation system before the Mukden Incident:

TABLE 3

RAILWAY TRANSPORTATION IN THE LATER PART OF THE SECOND PERIOD (BEFORE THE MUKDEN INCIDENT)

A. Railways under Chinese Management (1,063.2 kilometers)

Name of Railway	Terminals	Length (kilometers)	Date of Operation	Remarks
Ch'i-Ang Line	Ch'i-ch'i-ha-erh to Ang-ang-ch'i	29.0	1908	
K'ai-Feng Line	Sun-chia-t'ai to Hi-feng	63.7	1926	Narrow Gauge, Privately owned, one meter
Ho-kang Line	Lien-chiang-k'ou to Hsing-shan	56.0	1926	Management under Civilians; Broad Guage (Soviet Type)
Hi-an Line	Mei-ho-k'ou to Pei-feng	73.6	1927	
Hu-hai Line	Ma-ch'uan-k'ou Hai-lun	221.1	1928	
Shen-hai Line	Mukden - Chao yang-chen	252.6	1928	
Chi-hai Line	Kirin - Chao-yang-chen	183.9	1929	
Yü-shu Line	Yu-shü-tun-Ang-ang-hsi	6.4	1929	
Ch'i-K'o Line	Ch'i-ch'i-ha-erh - T'ai-an	128.9	1930	
Na-ho Line	Ning-nien - La-ha	48.0	1930	

B. Under Japanese Management (1,130.0 kilometers)

Name of Railway	Terminals	Length (kilometers)	Date of Operation	Remarks
The Main Line of the South Manchurian Railway	Dairen Wharf to Ch'ang-ch'un	704.3	1902	
Ying-k'ou Line	Ta-shih-ch'iao to Ying-k'ou	22.2	1902	

Name of Railway	Terminals	Length (kilometers)	Date of Operation	Remarks
Port Arthur Line	Chou-shui-tzu to Port Arthur	50.8	1902	
Fu-shun Line	Su-chia-t'un to Fu-shun	52.9	1902	
Yen-t'ai Coal Mine Line	Yen-t'ai to Yen-t'ai Coal Mine	15.6	1902	
Hun-hu Connecting Line	Hun-ho to Yu-shu-tai	4.1	1902	
An-shen Line	An-tung to Su-chia-t'un	261.1	1904	
Wu-ch'i Line	Dairen to Wu-ch'i	2.9	1931	
Kan-ching-tzu	Kan-ching-tzu to Nan-kuan-ling	11.9	1930	
Wharf Line	Sha-ho-k'ou to the Dairen Railway Station	4.0	1932	
C. Railways With Japanese Investment (1,316.1 kilometers)				
The Chi-Ch'ang	Kirin to Ch'ang ch'un	127.7	1911	
Hsi-ch'ien Line	Pen-hsi-hu to Niu-hsin-t'ai	14.9	1914	
Ssu-Cheng Line	Ssu-p'ing to Liao-yuan	92.9	1918	
Cheng-T'ung Line	Liao-yuan to T'ung-liao	114.5	1922	
Cheng-chia-tun to T'ao-nan Line	Liao-yuan to T'ao-nan	228.1	1924	
T'ien-T'u Line	K'ai-shan-t'un to Yen-chi	11.0	1924	
T'ao-Ang Line	T'ao-nan to San-chien-fang	220.1	1926	
Chin-Fu Line	Chin-hsien to Ch'eng-tzu-t'uan	102.1	1927	

Name of Railway	Terminals	Length (kilometers)	Date of Operation	Remarks
Chi-Tun Line	Kirin to Tung-hua	210.5	1928	
T'ao-So Line	T'ao-nan to Huai-yuan-chen	84.4	1928	
Nai-tzu-shan	Ch'iao-ho to Nai-tzu-shan	10.0	1929	
D. Railways With Russian Investment (1,788.8 kilometers)				
The Chinese Eastern Railway	Harbin to Lu-pin	934.8	1902	
The Chinese Eastern Railway	Harbin to Sui-fen-ho	546.4	1902	
The Chinese Eastern Railway	Harbin to Chang-ch'un	242.4	1902	
Li-shu Line	Hsia-ch'eng-tze to Li-shu-chen	58.9	1925	
Other Lines		6.6		
E. Railways Under British Control (889.9 kilometers)				
Hopeh Line	From Kou-pang-tzu to Hopeh	91.1	1902	
Shen-yü Line	Hsin-min to Shan-hai-kuan	59.8	1904	
Huang-ku-t'un Connecting Line	Huang-ku-t'un to Mukden	2.8	1910	
Hu-lu-tao Line	Chin-hsi to Hu-lu-tao	12.1	1910	
The Pei-piao Line	Chin-Hsien to Pei-piao	112.6	1924	
The Ta-t'ung Line	Ta-hu-shan to T'ung-liao	251.7	1927	

The Grand Total 6,188.0 kilometers

III. The Third Period: (Under the Puppet Manchukuo Regime)

The Manchukuo regime was founded in March 1932 after the Mukden Incident in 1931. Consequently, all the railways formerly owned by foreign powers were taken over by the Japanese. With the exception of the South Manchuria Railway, the North Manchuria Railway (formerly Chinese Eastern Railway) and some light railways, all the railways in Manchuria were nationalized and put under the control of the Ministry of Transportation. On 9 February 1933, the Manchukuo regime signed a contract with the South Manchuria Railway Company according to which the company would control the existing nationalized lines, the shipping enterprises along the Sungari River formerly owned by the government, and new railway projects. In March 1935 the North Manchuria Railway, which had been sold to Manchukuo by the Soviet Union, was also nationalized and put under the control of the South Manchuria Railway Company. Thus, all the railway lines in Manchuria were completely controlled by the South Manchuria Railway Company.

The condition of the railways under a single administrative system and after the outbreak of the World War II will be described later. In short, the third period marks the highest stage of transportation development with transportation facilities equal to modern standards.

Railway transportation plays a very important part in culture, economy, industry, government administration, military affairs and national defense. It is of particular importance in view of the fact that Manchuria is rich in resources. The reason that Manchukuo had been able to develop the resources in Manchuria was simply because it had an efficient railway system. Therefore, future Manchurian development will depend, in a larger sense, upon the development of transportation. Date on the railways built during the third period are as follows:

A. The Manchukuo New National Railway Lines (6,421.3 kilometers)

Date of Construction	Name of the Line	Terminals	Length (kilometers)
1933	The Tun-T'u Line	Tun-hua to T'u-men	191.9
1933	The Hai-k'o Line	Hai-lun to K'o-shen	162.3
1933	The T'ai-k'o Line	T'ai-an to K'o-shan	30.8
1933	The La-ha Line	La-ha to Na-ho	38.8
1934	The Chao-Ka'i Line	Chao-yang-ch'uan to Kai-shan-t'un	62.3
1934	The La-pin Line	From La-fa to San-k'o-shu	307.9

Date of Construction	Name of the Line	Terminals	Length (kilometers)
1935	The Pei-Hei Line	Pei-an to Hei-ho	302.9
1935	The Yeh-Feng Line	Yeh-po-shou to Ch'ih-feng	146.9
1935	The Ch'ang-Pai Line	Ch'ang-ch'un to Pai-ch'eng-tzu	332.6
1936	The Lin-Mi Line	Lin-k'ou to Tung-an	170.9
1936	The Ssu-hsi Line	Pei-feng to Ssu-p'ing-chieh	82.5
1937	The T'u-chia Line	T'u-men to Ch'ia-mu-ssu	592.8
1937	The Na-Mo Line	Na-ho to Nen-ch'eng	93.5
1937	The Mi-hu Line	Tung-an-Hu-lin	164.8
1937	The Pai-A Line	Pai-ch'eng-tzu to A-erh-shan	266.0
1937	The Hsin-i Line	Hsin-li-t'un to I-Hsien	131.5
1938	The Chin-Ku Line	Chin-ling-shih to Ku-pei-k'ou	447.4
1938	The Lung-Feng Line	Lung-t'an-shan to Ta-feng-man	22.4
1939	The Mei-Chi Line	Mei-ho-k'ou to Ch-ian	259.5
1939	The Sui-ning Ling	Ho-hsi to Tung-ning	91.1
1939	The Ch'i-chien Line	Kung-yuan to Tien-shih-fu	86.0
1940	The Sui-chia Line	Sui-hua to Chia-mu-ssu	385.3
1940	The Mo-huo Line	Mo-er-ken to Huo-lung-men	102.7
1940	The Hsing-ning Line	Hsin-hsing to Ch'eng-tzu-kuo	216.1

Date of Construction	Name of the Line	Terminals	Length (kilometers)
1940	The Ta-li-tzu Line	Ya-yuan to Ta-li-tze	113.0
1940	The Lung-Ch'ing Line	Lung-ching to Ch'ing-tao	51.0
1941	The Li-Chi Line	Li-shu-cheng to Hsi-chi-ning	44.5
1941	The Heng-shan Line	Chi-ning to Heng-shan	12.4
1942	The A-Tu Line	A-erh-shan to Tu-lu-ern	39.5
1943	The Kao-hsin Line	Kao-t'ai-shan to Hsin-li-t'un	60.6
1944	The Kirin Line	Lung-t'an-shan to Shu-lan	47.4
		Total:	5,057.4 kilometers
	2. Railways Operating on a Temporary Basis		
1945	The Liao-Kung Line	Liao-yang to Kung-yuan	69.0
1945	The An-jen Line	Feng-huang-ch'eng to Kuan-shui	78.2
1945	The An-ta Line	An-tung to Nan-an-tung	7.3
1945	The Hun-San Line	Hun-chiang to San-cha-tzu	23.0
1945	The Fu-ch'eng Line	Fu-shun to Fu-shun City	4.0
		Total:	181.5
	3. Railways Under Construction (As of V-J Day)		
1945	The Lu-pai Line	T'ai-p'ing-ch'uan to Lu-pei	192.3
1945	The Ya-K'u Line	Ya-k'o-shih to Shang-Ku-li	165.0

Date of Construction	Name of the Line	Terminals	Length (kilometers)
1945	The Hsün-ho Line	Sun-wu to Hsun-ho	62.0
1945	The An-jen Line	Kuan-shui to Huan-jen	103.0
1945	The T'ung-Jen Line	T'ung-hua to Huan-jen	98.0
1945	The Chien-jen Line	Pei-tien to Huan-jen	118.0
1945	The An-ta Line	Nan-an-tung to Ta-tung-chiang	20.0
1945	The Huo-Lun Line	Huo-lung-men to O-lun	102.9
1945	The Sung-Fu Line	Sung-shu-chen to Fu-sung	38.0
1945	The Huo-mo Line	Huo-lung-men to Lu-shen	245.7
1945	The Tung-Tang Line	Tungan to Tang-pi-chen	37.5
		Total	1,182.4
Combined total of all new lines:			6,421.3

B.. The New Railway Lines Under Private Ownership (709.9 kilometers)

1. Railways Already Built and in Operation:

Unknown	The Tung-man Railway	Hsun-chieh to T'u-men tzu	58.0
Unknown	The Chin-hsi Railway	Chin-hsi to Yang-chia-Chang-tzu	36.2
Unknown	The Hsi-man Railway	Shuang-t'ou to Ta-miao	22.6
Unknown	The Hsi-man Railway	Nu-erh-ho to Chao-chia-t'un	38.4
Unknown	The Yü-shu Railway	T'ao-lai-chao to T'uan-shan-tzu	75.9

Date of Construction	Name of the Line	Terminals	Length (kilometers)
Unknown	The T'ien-li Railway	San-k'o-shu to T'ien-li-ts'un	15.3
Unknown	The Sha-Sung Line	T'uan-lin to Sha-sung-kang	42.0
Unknown	The Sai-ma-chi Line	Suan-shui to Sai-ma-chi	28.0
Unknown	The Sung-wan Line	San-cha-tzu to Feng-yeh-ling	22.0
	Total		338.4

2. Railways Under Construction:

Unknown	The Tung-man Railway		48.3
Unknown	The Ya-pei Railway	Kuan-shui to Ch'ang-tien-ho-k'ou	77.2
Unknown	The Sung-wan Line	Feng-yeh-ling to Sung-shu-chen	37.0
Unknown	The Kuang-i-Line		33.0
Unknown	The Chia-fu Line	Chia-mu-ssu to Kuang-shan-t'ai	96.0
Unknown	The Hsing-lung-Line	Shang-pan-ch'eng to Hsing-lung	80.0
	Total:		371.5
Combined total of privately-owned lies			709.9

C. National Railway Lines, Double Track Lines

1. Railway Lines Already Built and in Operation (1,681.6 kilometers)

1940	T'u-chia Line	Ho-shui to Hsin-hsing	31.5
1942	The Hu-lin Line	Hsi-chi-ning to Tung-an	90.1

Date of Construction	Name of the Line	Terminals	Length (kilometers)
1943	The Pin-sui Line	Tung-men to Sui-yang	517.0
1943	The Shen-yu Line	Yu-kuo to Kao-t'ai-shan	43.0
1944	The Ch'ang-ha Line	Ch'ang-ch'un to Harbin	239.9
1944	The Shen-yü Line	Chin-hsi to Shan-hai-kuan	133.0
1944	The An-shen Line	Su-chia-t'un to An-tung	252.0
	Total:		1,306.5

2. Double Track Lines Operating on a Temporary Basis

1945	The Shen-yü Line	Mukden to Yu-kuo	11.6
1945	The Shen-yü Line	Kao-t'ai-shan to Chin-hsi	202.0
1945	The Pin-chou Line	Fu-la-erh-chi to Ch'iao-liang	4.0
	Total:		217.6

3. Double Track Lines Under Construction

1945	The Pin-sui Line	Sui-yang to Sui-fen-ho	24.0
1945	The Hu-lin Line	Tung-an to Hu-lin	101.2
1945	The T'u-chia Line	T'u-men to Ho-shui	8.3
1945	The Ch'ang-ha Line	Harbin to Ku-hsiang-t'un	4.0
1945	The Shen-yü Line	Kao-t'ai-shan to Chin-hsi	30.0
	Total		167.6
	Combined Total:		1,691.6
	All Railway Lines in Manchuria		8,822.8
	All Except Double Track Lines		7,131.2

BOOK II. TRANSPORTATION FACILITIES IN MANCHURIA

I. HIGHWAY TRANSPORTATION

Section 1. A Review of the Highways in Manchuria

Highways are essential to a nation's military affairs, government and economic development as the nerve system is to a human body. Not only are they closely connected with the living of human beings, but they also play a decisive role in shaping the destiny of a nation. All the political states which have risen and fallen in Manchuria during the past centuries did their best to develop highway transportation. Consequently, roads and highways in Manchuria have continued to grow since the beginning of the Chinese history. In the Yuan, Ming and Ch'ing dynasties there were postal station systems and official highways. Means of conveyance included horses, oxen, donkeys and wagons for land transportation and boats for river transportation. Even now many place names still have the names of the postal stations affixed to them. See the Map of Manchurian Transportation System Before the Construction of Railways in Book I.

However, the highway system in Manchuria is still in a backward stage in comparison with that of other countries. This is due to the following factors:

1. Climate. Manchuria is dominated by a continental climate: cold in the winter and hot in the summer. The coldest period is between November and March during which the rivers, plains, mountains and fields are all covered by snow and ice. This creates very good roads. Furthermore, the volume of snowfall is comparatively small. Only 3 or 4 inches of snow cover the ground. In mountain areas the snow may accumulate to one foot deep. But this does not hinder transportation. On the contrary, it helps since the snow becomes frozen with the sweeping wind. In fact, the ice-frozen ground is suitable for sleighs. But in summer during the rainy season the roads become muddy, thereby creating difficulties for wagons and horses; while in the dry seasons the dust and dirt fly sky-high whenever there is wind, making traveling the more difficult. Furthermore, the lack of bridges also makes river crossing a hazard. Thus transportation conditions are the worst in summer.

Winter provides Manchuria with frozen natural roads. It is estimated that winter brings about 300,000 kilometers of frozen roads. Because of the emergence of good roads in the winter time, there is no urgent need for mad-made highways.

2. Agriculture. Most of the cart drivers in Manchuria are farmers who utilize their carts for transporting goods in the winter time as a means to earn additional income. Since they are busy with farming in the summer, and have no time to transport goods, there is not a great demand for good roads in that season. Moreover, the low cost of horse-cart transportation in the winter is another factor causing merchants to transport goods in the winter time.

3. Social Stability. In the summer time the growing vegetation serves as a natural hiding place for bandits. Traveling in rural regions is dangerous in that season. This accounts for the small quantities of goods transported in the summer time. Hence there is no need to build good roads in the summer.

4. Characteristics of the Horses. Horses bred in Manchuria are conditioned to cold rather than warm weather. Overwork in the summer would shorten their life. Thus, there is no need for building good roads in summer time.

5. Soils. Valleys of the two great rivers, the Sungari and the Liao, are mostly composed of alluvial soil. It is soft. Other regions are dominated by mountains and rivers. Therefore, bridge construction is very costly. In view of this, the governments in Manchuria hesitated to build bridges for fear they might increase the tax burden of the people.

6. Politics. The highways and railways in Manchuria were built mainly for military uses. Not until modern times have there been highways, railways and ports for industrial uses. Since Manchuria had been free from numerous social uprisings and wars, and since the industry there was not highly developed, the development of roads and railways for military and civilian uses was slow.

In conclusion, the existence of poor roads and the indifferent attitude toward it on the part of the people are attributed to the backward culture and industrial development there and also to geographical and climatic factors.

Section 2. A Classification of the Means of Highway Transportation In Manchuria

Land transportation in Manchuria consisted mostly of carts before the appearance of automobiles. The following is a description of various transportation means. (Automobile transportation will be dealt with in another chapter.)

A. Passenger Transportation:

1. Draft Animals. Horses, camels, donkeys and mules can be ridden and used for pulling wagons and carts. An ordinary horse is capable of traveling 120 kilometers per day. On a long distance journey a cart owner refrains from overusing his horse and thus makes traveling average 60 kilometers daily. Camels are used for travel in Mongolian deserts. The average distance a camel can cover is not more than 40 kilometers.

2. Sedan Chairs. Sedan chairs are mostly used in official business, weddings, funerals, and various ceremonies. An ordinary sedan chair is carried on the shoulder by two, four, six or eight persons. Sedam chairs are used exclusively by rich and influential persons. Very rarely are they used by ordinary people. Sedan chair carriers can travel four kilometers a day.

3. The Sedan-Chair Cart. It is also known as "Small-Cart." It was the only means of transport in mountain areas before the construction of railways in Manchuria. Besides the cart driver, there was room for two persons in the sedan chair. Luggage was limited to 100 kilograms. It is pulled by one horse or donkey. Express and long-distance carts required the use of two or three animals. The daily traveling mileage of the sedan-chair cart depends largely upon the season of the year and road conditions. In the wonter when the roads are favorable for travelling, the daily travelling mileage may be 50 to 60 kilometers. This kind of sedan-chair cart was very suitable for urgent travelling.

4. Mule Sedan Chair. A sedan chair was hauled by two mules travelling 60 kilometers daily. In the past this kind of sedan chair was widely used in Mongolia. It has become obsolete.

5. Camel Wagon. This was a big wagon pulled by two camels and once popular in Mongolia. It has enough room for two persons. Few people could afford wagons of this type, except the wealthy people. This kind of wagon has been rarely seen recently. Its daily mileage was 40 kilometers.

6. Camel Sedan Chair. This was a kind of sedan chair used in Mongolia. Two sedan chairs were put on the back of the camel, one on each side. Each sedan chair had room for one person. Its daily mileage was 40 kilometers. It is very seldom used nowadays.

7. Cave-Like Wagon. This is a vehicle for both freight and passengers. It resembles a large freight wagon and travels at similar speed.

8. Sledges. Sledges in various forms are used in the northern part of Manchuria where ice and snow are comparatively heavy and in the northeastern forest region. The native type of sledge is common in Kirin Province and the upper Sungari River. The sledge found along the lower Amur River is of the Russian type. It is larger than the native type and is composed of two removable parts. A sledge is usually pulled by one or two horses. The maximum daily travel is 80 kilometers, while the average is 60 kilometers. There are not many heavily built large sledges in Manchuria.

9. Russian-Type Carriage. This is drawn by one or two horses. The shape of the Russian-type carriage is somewhat like the European four-wheel carriage. There are some light carriages of the Russian type seen mostly in Harbin. The heavy-type carriage can be seen in the cities and towns in Manchuria. A carriage has room for two to four persons.

10. Automobiles. Automobiles of American or European make have been very popular in Manchuria, since the cities in Manchuria are modern cities with good roads. In city suburbs driving is more comfortable in the winter than in the summer because road conditions are better. Automobile traffic in the large cities like Mukden, Ch'ang-ch'un, Dairen, Harbin, Chin-chou, Kirin is just as heavy as it is in the large cities in the world.

B. Means of Freight Transportation:

There are several kinds of vehicles for freight transportation as follows (see Table 5 for detailed description):

1. Wagons. In Manchuria, with the exception of Port Arthur, Dairen and Mongolia, freight is largely transported by wagons. In fact, roads in that area were developed mainly for wagons. Names of the wagons vary with their body structure and the number of animals in use. With their structure as a basis for classification there are three types of wagons: the Number 1, the Number 2 and the Number 3. On the basis of the number of animals there are the 10, the 7 and the 5 animal wagons. A wagon has wooden wheels with iron tires and wooden axles. The spokes of the wheel are not radial, but made with one vertical and two horizontal wooden bars. The wheels are usually fastened to the axle and move with it.

2. Flor-wheel Wagon. The shape of the flower-wheel wagon resembles the sedan-chair charriage while its body structure is similar to that of the wagon. There are fourteen or sixteen spokes radiating from the center of the wheel. The axles are made of metal or wood. This type of wagon is used mostly along the railways, especially in Shenyang and Changchun.

3. Rubber-Tire Freight Cart. It uses air-filled rubber tires or solid rubber tires. It is a vehicle nearest to the modernized means of conveyance. With Shenyang as a center it is used to transport goods to the cities in Manchuria.

4. Improved Freight Cart. In 1938 the Manchukuo regime published a new design to standardize freight carts. The new design would result in better protection of the roads and in greater efficiency. There are radial spokes from the center of the wheel. They are clad with iron strips 7.5 millimeters in width. The body of the cart is of two kinds: one is made of wooden boards and the other made of steel bars. An improved freight car carries one to two tons.

5. Ox Cart. This is a cart which is usually pulled by one or two oxen. Its body and wheels are similar to those used in the wagons, the flower-sheel wagons, and the improved cart. It is commonly used by farmers in Yen-chi and in Korea. It has a hauling capacity of 0.7 to 1.5 tons. In Mongolia there is the wooden, bulky and heavily built ox cart. The various types of ox carts will be discussed under the heading Wooden Cart.

6. Sedan Chair. Besides being used for passenger transportation, sedan chairs are also used in freight transportation because they are faster than ordinary wagons.

7. The Wooden Cart. This is another name of the ox cart used in Mongolia. It includes two kinds: the White Awning and the Rolling Wheel.

a. White Awning Cart. This is usually pulled by one ox. Its structure is similar to that of the common wagon, although its construction is rather crude. All the components are made of wood except the wheel spokes which are made of iron. A man can drive a team of five or six carts. Here is how it works: one end of the rope is tied to the horn of the ox, while the other end of the rope is connected with the rear of a cart immediately before the ox. In this manner five or six carts may be controlled by one driver. The daily haulage of an ox cart is 25 kilometers in the summer time and 3 kilometers in the winter. A strongly built cart has a capacity of 500 kilograms, while a small cart has a capacity of 150 kilograms.

b. The Rolling-Wheel Type. There are two types of this cart: the four and the two wheel carts with wheels of varying size. The structure of this cart is similar to that of a flower-wheel wagon, except that it is crude. West of the Hsing-an Mountains in the pasture land the nomads usually use horses to pull the carts instead of oxen. A horse-drawn cart is much faster than that pulled by an ox. The large-wheel carts are practically the only means of conveyance for the nomads. For example, the transport of tents, the taking up of water from wells and the collection of hay are all done by ox carts. The small-wheel carts are exclusively used for transporting travelers. The four-wheel carts are generally common in the Hsing-an Mountains, Tsitsihar and Hei-ho.

8. The Camel Cart. This kind of cart is very popular in Hai-la-erh and Man-chou-li. There are two types: the four-wheel and the two-wheel types. The four wheel type is more useful than the two-wheel type. Loading of the two-wheel cart is difficult because the back of the camle is too high and the angle between the base of the cart and the camel is too steep. The hauling capacity of a camel cart is around 500 kilograms, while its average speed is 50 kilometers per day. In Chin-chou, Hsi-hai-k'ou, Ch'ih-feng, Lin-hsi and K'ai-lu, where the terrain is dominated by mountains and rivers, it is necessary to use camels as draught animals. Camel haulage depends largely on the distance. When the distance is short, (a 20-day journey) a camel carried 150 kilograms; but when the distance is long (50 or 100 days) it carries usually 200 kilograms /sic/.

9. Four-Wheel Cart. There are two types of these carts: The Japanese type and the Russian type. Carts used in Dairen, Port Arthur, Ying-k'ou and Liao-yang are of the Japanese type. The two front wheels in the Japanese type are smaller than the rear ones. It is usually pulled by a horse, hauling 1,000 kilograms. The Russian type is popular north of Ch'ang-ch'un and in Harbin and particularly along the Chinese-Russian border. The structure of the Russian type is similar to the Japanese type. The only difference is that they are built stronger than the Japanese type. In addition, the wheels are removable from the body. The body of the cart may be changed according to the goods to be hauled. For example, in transporting goods within a city, a flat-car-type body is used and pulled by one horse. When coal, sand, and farm produce are to be transported the cart body is built like a gondola car. When used for hauling timber, no body structure is atop the wheels. Thus the haulage of a four-wheel cart varies with its body construction. The horse used for hauling is usually the tall, Russian breed type.

10. Sledges. Since a sledge is made by very primitive methods, it cannot haul as much as wagons can, which is more than 2,500 kilograms at one time. However, a sledge hauled by one horse can carry 500 kilograms of goods and still travel at top speed. A sledge drawn by one horse can carry the same amount of goods as a wagon hauled by three or four horses, since the speed of a sledge is 70 to 100 percent faster than the wagon. However, sledges can be used in the winter only and in the ice-bound areas north of Kirin.

11. Truck. Truck transportation is popular mainly in cities and towns along the railways. Recently, trucks have also been used in the countryside during the winter. When the Manchurian economy is prosperous and the roads are improved, truck transportation will have a bright future. A more comprehensive analysis of truck transportation will be given in the latter part of the book.

In short, there is a great variety of means of transportation in Manchuria of which the horse wagon is the most popular. Other means of conveyance are used only locally. This conclusion serves as a basis upon which we proceed to analyze the transportation situation in Manchuria.

/See table on following page/

TABLE 5

Types of Vehicle	Characteristics of Structure	Uses	Geographical Distribution
1 Wagon	Iron Clad Wheels, Wooden Axles; Wheels fixed on Axle; no radial spokes; one longitudinal bar; two cross bars	Transporting crops in the summer; long distance freight transporting in the winter	Manchuria except Kuan-tung Chou and the Mongolian Gobi
2 Flower	The body structure is similar to that of a wagon; but the materials used are finer Wheels are radial. Two kinds of axle: Iron and Wood. Axle is fastened to the body	Used in the harvesting; medium distance transport	Along the railway lines, particularly in Mukden and Chang-chun
3 Rubber Tire Freight Cart	Air-filled Rubber Tire; Solid Rubber Tire	Used for transportation: 1. Cities; 2. Medium Distances Used in Agriculture	Mukden and other localities. Used on the public roads; military Highways
4 Iron, Improved Cart	Wooden radial Wheels; iron axles; the width of tire is 7.5 millimeters	Used for transportation: 1. In Cities; 2. In Middle Distance	Manchuria, not yet popular
5 Ox-cart	Wheels and body are similar to those of flower wagons and the improved cart but the cart is pulled by an ox.	Used both in transportation and agriculture	In Chien-tao and Korean settlements
6 Sedan Chair Carriage	Iron wheels with wooden axles; the structure of the wheels is radial	Used for transporting goods and passengers	Underdeveloped areas

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Draught Animals and Hauling Mileage	Hauling Capacity (in catties) Kinds of Carts	Plains Winter	Plains Summer	Mountains	Number of Vehicles
Horse, donkey 40-50 kilometers in plains, 30 kilometers in mountains	No 7	3,000	2,500	10% to 20% less than figures at left	1926 350,000 to 400,000 1940 422,238 1943 385,984
1-3 horses or mules	0.8 metric tons				1940 86,943 1943 73,700 (Iron Axle) 63,000 (Wooden Axle)
1-2 horses or mules	(1) 1.5 to 2.0 metric tons (2) 0.8 to 1.0 metric tons				1940 37,064 1943 56,870
1-2 horses or mules; 2-3 horses or mules in villages	1-1.2 tons				1943 13,630 pulled by native horses; 1,031 by Japanese-bred horses
1-2 oxen	0.7 to 1.5 tons				1940 133,232 1943 110,458
A horse or a mule. In winter on good roads, 50-60 kilometers	In addition to the accomodation of two passengers, there is capacity for hauling 60 kilograms of goods				1940 1,608 1943 3,834

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7 Wooden Wagon	Crudely built large or small type	Used for transportation by nomads; In moving tents	In nomadic areas
8 Camel Wagon	Four or two-wheel type	Used for transportation	Hailar, Manchou, Tsitsihar, Chinhsien and Jehol
9 Four-Wheel Car: a. Japanese Type; b. Russian Type	The Japanese Type: Two front wheels can be steered; good only in the movement in cities. The Russian Type: The wheels and the body of the removable. All sorts of bodies interchangeeable	1. Transportation within a city 2. Used in plowing; 3. Used in the transport of timber	North of Changch'un, in Harbin and on the Chinese-Soviet Border
10 Sledge	Good only in ice-bound areas, structure is simple. Only one horse is needed	Used for transporting goods and passengers	North of Kirin and in the east part of Manchuria where snow is heavy

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Either a horse or an ox 35-40 kilometers (in summer) 40-50 in winter	0.2-0.3 tons	1940	53,375
		1943	84,498
Camels 50 kilometers a day	0.6 metric tons	1940	1,878
		1943	864
Usually one horse, but may be increased to 7	Usually from 2-4 metric tons, but when heavy freight to be carried, the power of hauling may be increased to 20 tons	1940	16,596
		1943	23,548
1-2 horses	From 1-.15 tons	1940	
		1943	
One horse only	.6-1 ton	1943	23,003

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Section 3. Amount and Capacity of Transport Equipment

1. Number of Freight Carts. The freight cart is a vehicle most frequently used in Manchuria. Because of the lack of statistics it is difficult to ascertain the exact number of carts in Manchuria. The South Manchuria Railway Company, by using various methods described below, estimated that there were 400,000 carts in Manchuria in 1928.

1. Date from surveys made in 1925 and 1926 as follows:

Type of Carts

Province	Large-Type Carts	Small-Type Carts	Total	Date of Survey
Liao-ning	84,922	11,569	96,491	at the end of 1926
Kirin	158,888	1,815	160,703	end of 1926
Heilungkiang	50,539	265	50,804	April 1925
The Kwan-tung Chou	2,561	64	2,625	end of 1926
Total	296,910	13,713	310,623	

2. Another estimate of the number of carts in cultivated areas was made. In 1925 and 1926 the area of arable land in Manchuria was 19,865,000 hsiang (one hsiang equals ten mou or roughly two acres.) Assuming there was one cart for every 50 hsiang in an area of 19,865,000 hsiang there were 400,000 carts.

3. One may also estimate the number of carts from the population of Manchuria. In 1925 and 1926 the population was 26,080,000. It was assumed that in large cities every one hundred persons had one large freight cart (identical with the conclusion reached in the surveys conducted in Dairen and other large cities in Manchuria) and that in villages every thirty persons has a freight cart. In other words we assume that 65 persons have a freight cart. Therefore, the number of carts was 400,000.

4. The number of carts may also be estimated from the number of draught animals. The ratio of carts to draught animals varied with provinces.

FREIGHT CARTS IN MANCHURIA

Province	Number of Draught Animals	Ratio of carts to Animals	Freight Carts
Liaoning	1,905,000	10%	190,500
Kirin	938,000	7%	134,000
Heilungkiang	903,000	6%	150,500
Totals	3,746,000		475,000

On the basis of the four methods listed above it was not difficult to come to the conclusion that the freight carts in Manchuria in 1925 or 1926 was roughly 400,000. Ten years later in 1936 the Manchukuo regime made a field survey and came up with the number as being 434,420. Of this figure 347,841 were horsecarts and 86,579 ox carts. At the end of 1943 lightweight carts were estimated at 817,340. Of this figure 800,000 were horsecarts. The number of oxcarts, horsecarts and sledges from surveys conducted by the South Manchuria Railway Company is given as follows:

TABLE 6

HORSECARTS, OXCARTS AND SLEDGES

Date	Number of Oxcarts and Horsecarts	Sledges	Remarks
1936	434,420	59,052	Horsecarts, 347,841 Oxcarts, 86,579 Kuan-tung Chou not included.
1937	641,263		Kuan-tung Chou not included.
1938	701,914		
1939	756,829		
1940	752,934		
1943	817,340		

II. Transporting Efficiency of Freight Carts. Transportation efficiency is estimated on the basis of local capcity, haulage and speed.

1. The Loading Capacity: This depends upon the season of the year, the types of goods transported and the condition of the roads. For ax example, if there are two carts, one carrying soybeans, moving along the mountainous roads from Mukden to An-tung, while the other moves from Mukden to Tsitsihar on the flat Manchurian plain, their load capacities are of course different.

2. Haulage: The hauling capacity varies with the road conditions, the number of horses in use, and the types of goods to be hauled and the skill of the driver.

Table 7. LIGHTWEIGHT VEHICLES IN MANCHURIA IN 1944 BY PROVINCE

Types of Cart / Provinces or Municipalities	Large Carts	Iron Wheel, Improved Horsecarts: Japanese Horse	Iron Wheel, Improved Horsecarts: Native Horse	Flower Wagon: Iron Axle	Flower Wagon: Wooden Axle
Changchun Municipality	821	4	213	642	1,133
Mukden	55,578	3	1,552	18,450	14,527
Kirin	77,134	13	1,040	5,927	6,172
Ch'i-ch'i-ha-erh	24,608	78	2,459	4,515	2,477
Jehol	8,328	—	192	1,135	60
Harbin	50,516	104	2,102	4,458	5,100
Chin-chou	32,007	—	—	5,134	—
An-tung	30,692	19	2,923	2,521	3,434
Chien-tao	59	62	364	2,059	18
San-chiang	7,998	513	382	5,314	822
T'ung-hua	1,710	—	66	1,607	3,645
Mu-tan-chiang	1,410	—	—	4,822	—
Tung-an	1,769	204	26	6,698	2,932
Pei-an	29,036	29	356	1,601	1,249
Hei-ho	1,207	2	261	250	89
West Hsing-an	20,097	—	50	2,108	540
South Hsing-an	3,566	—	183	330	7,953
North Hsing-an	121	—	130	—	—
East Hsing-an	468	—	998	451	4,011
Ssu-p'ing-chieh	38,859	—	333	5,690	8,839
Total	385,984	1,031	13,630	73,712	63,001

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Freight Carts (Rubber Tire)	Oxcart Iron Wheel Iron Axle	Sedan Chair Carriages	Wooden Carts	Camel Carts	Four Wheel Carts
4,334	—	7	239	—	63
24,271	10,728	77	7,531	—	790
3,191	2,411	45	967	—	1,041
2,803	6,524	359	6,121	1	165
1,739	3,762	268	7,423	76	4
3,156	2,246	3	589	—	1,377
5,078	8,361	51	2,569	—	—
4,230	294	0	38	—	4
69	27,487	17	25	—	2,013
1,652	2,102	1	163	—	2,356
1,070	1,466	—	259	—	5
709	2,417	18	87	—	2,343
102	920	4	109	—	2,700
99	1,392	—	2,168	—	58
139	883	1	5,826	—	1,749
461	4,086	81	9,707	4	101
160	—	74	33,678	19	—
—	34,067	2,847	6,157	764	7,156
—	68	—	108	—	1,426
2,713	1,244	1	736	—	107
56,870	110,458	3,834	84,498	864	23,458

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Totals	Sledges	1940	1939	1938	1937
7,456	--	2,446	1,798	1,686	1,605
133,507		173,695	164,492	163,723	144,001
97,941	1,168	101,124	103,001	104,948	86,830
50,110	295	58,794	58,449	86,401	101,128
22,987	—	24,805	27,267	21,540	18,993
69,651	1,651	65,937	67,439	68,165	86,680
53,200	—	53,830	56,648	55,658	66,396
44,155	106	42,047	41,343	38,187	28,457
32,173	--		27,825	28,081	27,413
21,303	1,671	16,643	15,944	10,332	14,095
9,828	181	6,574	4,937	5,307	3,762
11,806	175	7,841	8,070	13,202	9,297
15,464	1,344	6,700	5,472	—	—
36,882	2,405	45,281	50,394	?	?
10,407	297	4,984	5,003	4,684	4,348
37,215	48	26,489	27,026	26,817	12,084
45,961	—	32,757	35,506	35,816	29,088
51,242	7,941	47,895	48,016	29,322	2,649
7,530	5,265	7,185	7,943	8,242	4,437
58,522	?	?	?	?	?
817,340	23,003	752,852	756,829	701,924	641,263

3. The Traveling Speed: The speed is dependent upon the weight of the load, the number of horses used and the conditions of the roads. The average speed of horsecarts in Manchuria is four kilometers per hour. In the winter time the speed can be increased to five kilometers per hour.

This is roughly the efficiency of the horsecarts in Manchuria. A further analysis of its efficiency under various types of terrain is as follows:

[See table 8 on following page]

Section 4. Accomplishments of Horsecart Transportation

What has been said above is a general description of the roads in Manchuria and also of the horsecart transportation. This chapter deals with the significance of land transportation in Manchuria with special emphasis on the development of natural resources.

A. Horsecart Transportation As a Substitute for Rail ways. The transport of goods by horsecarts has been more and more popular as the frontier lands were gradually opened. Take, for instance, horsecart transportation around Tsitsihar before the construction of the Peking-Mukden Line and the Chinese Eastern Railway. At that time horsecarts made full use of the winter roads. They transported goods along the Kirin National Highway to T'ao-nan, Hsin-min T'un and Hu-lan. Goods transported included cereals from Sui-hua, Hu-lan, Pa-yen and A-shih-ho and textiles and sundries from Peiping, Mukden and Ying-k'ou. Horsecart traffic between Mukden and Peiping, between Mukden and Port Arthur, between Mukden and Kirin was as heavy as the present day railway traffic. In southern Manchuria there were 360 kilometers of horsecart roads between Mukden and Lin-chiang; 300 kilometers between K'ai-yuan and Meng-chiang; and 400 kilometers between Kirin and Yen-chi. In the North Manchuria there were 270 kilometers of roads between Harbin and K'o-shan and 600 kilometers between Tsitsihar and Hei-ho.

Most of the transportation business in Manchuria was operated by farmers simply because they could make use of the draught animals in their possession. Furthermore, farming was a profession which gave them leisure time for going into the transportation business. Thus they could afford to charge a low freight rate. This explains why horsecart transportation had become a rival to rail transportation.

B. Competition Between Horsecarts and Railways in Manchuria: In the past, because of the low efficiency of the railways, the lack of enough freight cars and the high freight rates, even long-distance freight transportation was handled by horsecarts. Two factors accounted for the horsecart's ability to compete with the railways:

TABLE 8

CART EFFICIENCY IN THE WINTER TIME

(Estimate on the Basis of: 1. Number of Horses in Use;
2. Loading Capacity
3. Speed.)

		7 Horses or Mules	5 Horses or Mules	4 Horses or Mules	2 Horses or Mules
Flat Land, Slope Less Than 3 Degrees	Haulage:	2,601 kilograms	1,834 kilograms	1,272 kilograms	809 kilograms
	Distance Per Day:	40 kilometers	40 kilometers	40 kilometers	40 kilometers
Mountain Terrace, Slope Over 3 Degrees	Haulage:	2,023 kilograms	1,445 kilograms	817 kilograms	578 kilograms
	Distance Per Day:	30 kilograms	30 kilograms	30 kilograms	30 kilograms

1. Low Cost. As mentioned before farmers engaged in horsecart transport as a supplementary occupation. Thus it was not uncommon that a farmer was satisfied with a fee that merely covered the cost of feeding the draught animals. In other words, there was a greater elasticity in formulating the charges.

2. Safety. Horsecart transport was safe. Merchants who wanted their goods transported needed only to tell the transport agencies which in turn contacted the cart drivers and made the deals. If the merchants found the drivers suspicious, they might ask for references to find some guarantee or sureties. Meanwhile, the traveling armed guard system and the insurance system were simple to use but offered good protection on the highways.

During World War I (1914 to 1920) there existed a serious competition between the railways and carts in areas south of the Chinese Eastern Railway. Before World War I horsecart transport in areas along the Chinese Eastern Railway had not been highly developed. As soon as the war broke out, all sorts of cars of the Chinese Eastern Railway were used for military transportation, resulting in the accumulation of goods at the railway stations. Merchants suffered serious losses because of the tie-up. Since they deeply felt the

TABLE 9

COMPARISON OF THE TRANSPORT EFFICIENCY OF HORSECARTS AND SLEDGE ON SNOWBOUND ROADS

				7 Horses or Mules	5 Horses or Mules	2 Horses or Mules
Large Horsecart	Flat Land	1-foot snow	Haulage	2,300 kilograms	1,300 kilograms	Difficulty in moving
			Distance per day	35 kilometers	35 kilometers	Same
		1.5-foot snow	Haulage	2,000 kilograms	1,200 kilograms	Same
			Distance per day	30 kilometers	30 kilometers	Same
Sledge	Mountain Terrace	1-foot snow	Haulage	3,000 kilograms	1,800 kilograms	850 kilograms
			Distance per day	60-70 kilometers	60-70 kilometers	60-70 kilometers
		1.5-foot snow	Haulage	3,000 kilograms	1,800 kilograms	850 kilograms
			Distance per day	60-70 kilometers	60-70 kilometers	60-70 kilometers

need for long-distance horsecart transportation, they organized an association, mobilized draught animals and handled freight traffic between Ch'ang-ch'un and Harbin and between An-ta, Ch'i-ch'i-ha-erh and Ch'ang-ch'un. The sharp rise in railway freight charges in 1919 by the Chinese Eastern Railway increased tremendously the demand for horsecarts.

Since the autumn of 1920 the Chinese Eastern Railway had very slow business because of the competition from horsecarts. In December 1920 about 44,722 metric tons of cereals were transported southward by carts as compared with 18,722 tons by railways. In January 1921 cereals transported by carts amounted to 73,111 metric tons, while those handled by the railways were 20,342 tons. In February 1921 the carts transported 35,242 metric tons of goods, while the railways transported less than 29,610 metric tons. On returning trips, the carts carried northward 150 metric tons of goods per day. From these figures listed above, it is obvious that horsecart transportation played a dominant role in Manchuria's transportation system.

The chief reason for the cart owners to charge very low fees in comparison with that charged by the railways was that in 1920 and 1921 there had been serious famines in Shantung Province. A great number of refugees migrated to Manchuria which resulted in an execssive supply of labor, and therefore in very low wages. Furthermore, it was at this critical period that the railways raised their freight schedules several times. The suprisingly high freight rate by rail naturally encouraged the merchants to employ horsecarts.

Let's now look into the freight charges in 1919. At that time the charge for 30 tons of goods between Harbin and Ch'ang-ch'un by rail was 600 to 1,000 yuan while it was 400 to 900 yuan by horsecart. In 1920 the railways charged 390 to 530 yuan, while the horsecarts charged 280 to 430 yuan for the same amount of goods. This factor alone obviously led to the rapid growth of horsecart transport trade. But there were additional factors as described below:

1. At that time the Chinese Eastern Railway lacked sufficient freight cars. Merchants had to bribe the railway officials with much money to obtain freight quotas. Even then the freight took at least a month to reach its destination as compared with eight days if horsecarts were used.

2. The Chinese Eastern Railway did not exercise good care in handling goods. Commodities were often damaged.

3. The Chinese Eastern Railway lacked waterproof cloths. Merchants were required to furnish them at their own expense.

4. Shippers were required to go through red tape and repair any damaged packages before they were admitted to the railway warehouses.

5. Before agricultural products were admitted to the South Manchuria Railway Company for safekeeping, there were considerable warehouse expenses to be paid.

What has been said above is the main reason that the merchants preferred carts to railways in transporting goods to the south. Indeed, horsecart transport trade has made a great contribution to Manchuria's transportation system. It was not until the Chinese Eastern Railway and the South Manchuria Railway Company lowered their freight rates and improved the management of freight traffic that horsecart trade began to decline.

Horsecart transport was once very prosperous in Ch'ang-ch'un and Harbin as shown by the following data:

TABLE 10

DATA ON HORSECART TRANSPORT OPERATING BETWEEN CH'ANG-CH'UN AND HARBIN

Year [1]	Number of Horsecarts [2]	Freight in Metric Tons [3]	Remarks [4]
1914	38,000	92,000	One horsecart hauling two tons
1915	46,000	92,000	Fiscal Year: From April to March of next year
1916	51,000	102,000	
1917	60,000	120,000	
1918	75,000	150,000	
1919	150,000	300,000	
1920	125,000	250,000	

TABLE 11

COMPARISON OF FREIGHT BY RAIL AND BY HORSECART, 1920-1921 (in short tons)

Date	By Rail		By Horsecart	
	Total	Average Per day	Total	Average Per Day
December 1920	19,020	613	44,722	1,442
1-12 January 1921	4,839	322	35,558	2,371
16-31 January 1921	15,504	969	37,552	2,348
February 1921	29,610	1,184	35,242	1,762

All these data prove the strength of the horsecart transport trade which enabled it to compete with the railways.

C. Relation Between Horsecart and Railway Transportation. In Manchuria horsecarts were used to transport farm products to railway stations. They carried mainly daily necessities on their return-trips. This has been so for a long long time. Thus, except for huge amounts of goods which must be handled by railways, the transport of small amounts of goods for short distances is handled mostly by horsecarts. It is clear that the horsecarts supplemented the function of railways.

There are two destinations to which farm products are transported by horsecarts: one is the railway stations where farmers sell direct and the other is the market places in towns and cities. The volume of freight destined for the railway stations is usually smaller than that destined for the market places since the distance between the production area and the stations is much longer.

Horsecart transport trade is active between September and April of the following year. Of these months November to January are the most prosperous. After January the business becomes slow. In the summer time, because of the road conditions and of the high cost of transportation, very few farm products are transported by horsecarts.

II. WATERWAY TRANSPORTATION

Section 1. A General Description of the Waterway Transportation in Manchuria

There is a Chinese proverb which says that "Rivers and streams are the womb of civilization." Certainly, there is some truth in it. History proves that rivers and streams have been the nursery beds of civilization. This applies to China and to any country. On the other hand, modern civilization has added much progress to inland river transportation. Take the geography of Manchuria as a subject for discussion. Since there are rivers running in all directions, Manchuria has been renowned for its long history of inland river navigation. For instance, the cities of Chiu-lien-ch'eng and Chi-an along the Ya-lu Ho, Liao-yang and other cities along the Fu-tai-tzu Ho are reported to have had inland river navigation in the Han Dynasty. Niu-chuang of Hai-ch'eng Hsien and the city of Tung-ching along the Mu-tan River are recorded as having had a prosperous inland river traffic under the Empire of Po Hai in the T'ang Dynasty. In the Sung and Chin dynasties A-ch'eng along the A-shih Ho, Wu-la-chieh and Po-tu-na (Fu-yu) along the Sungari River are reported to have been prosperous river ports. In the Ming Dynasty there were shipbuilding yards in Kirin Province. Hui-ning and Ch'ing-hsing located along the T'u-men River had been opened as ports as early as the Ming Dynasty. The examples listed above are taken from ancient books on geography and history.

In the Ch'ing Dynasty, inland river navigation had been best developed in the southern part of the Liao River Valley. The next would be the navigation of the Yalu and the T'u-men rivers. However, the rivers and streams in the southern part of Manchuria are only deep enough for small boats. Accordingly, the volume of transportation is limited. Along the Amur River in North Manchuria it is recorded that since the first appearance of a Russian steamer in 1854 the number of steamers has increased yearly. In 1872 there were 10 steamers. The Russian steamers sailed up the Sungari purely for expedition or for small-scale trade. In 1898 when the Russians made tremendous uses of Sungari navigation for the transportation of roughly 650,000 metric tons of railway building materials, for the construction of the Chinese Eastern Railway, the navigation achieved an unprecedented prosperity. The railway materials were transported from European Russia to Vladivostok by sea. Then, the Russians used the Ussuri Railway, built in 1897, to ship the materials to Khabarovsk and Iman. From there 18 river steamers, four small steamers, and 60 sampans were used for transporting the materials first along the Amur River and then along the Sungari River to Harbin.

Another outstanding event was the completion of the Chinese Eastern Railway, the Ussuri Railway and the Amur Railway. Not only did the completion of these railways create favorable conditions for the exploitation of the natural resources in areas along the rivers and railways, but it also changed the outlook of the navigation of the three rivers, the Amur, the Sungari and the Ussuri. In fact, the foundation of modern inland river navigation in that area was built with the completion of the railways mentioned above.

All of the materials used for the building of steamers came from Europe to the shipbuilding yards located in Iman, Khabarovsk, Blagoveshchensk, Nipuchu, and Harbin. Occasionally there were a few steamers which were manufactured in Europe or in Shanghai and came to the Amur Region through the Okhotsk Sea. Sailboats and tugboats increased in great number. All of the shipbuilding yards located along the coast were doing their best to produce boats.

The Sungari, Amur, and Ussuri rivers are main waterways for inland river navigation in Manchuria. Among the three the Sungari River Rates first in importance. It is recalled that in 1858, according to the Aigun Treaty, Czarist Russia obtained the rights of navigation along the Sungari River. Subsequently, navigation along the three rivers was controlled exclusively by Czarist Russia. All boats sailing on the rivers belonged to Russia. There were several dozen boats. Although the Chinese had started their navigation as early as 1907, the number of boats they had was so small that it could hardly compare to that owned by Russia. After the Russian Revolution in 1917 the rights of navigation became the focus of disputes between Russia and China. For the purpose of safeguarding the sovereignty of China, the Chinese Government had issued an order in 1907 to ban navigation of Russian boats between Sungari, Kirin and Lao-shao-kou. In 1924 Chinese restriction was further enlarged to exclude the Russians from all the rivers, including those rivers in the territory of the Chinese Eastern Railway. As a result, the Russian ship owners competed with each other to sell their ships to the Chinese. In 1926 when the Chinese Government with great determination took over all the piers, the Sungari navigation came once more under Chinese control. Subsequently, the Chinese Government established the Northeast Navigation Bureau for controlling and operating the boats confiscated. The shipping agencies also included the Northeast Shipyard, the Kuang-hsin Navigation Office, the Sungari and Amur Postal Boat Bureau, the Northeast Commercial Navigation School, the Harbin Navigation Bureau and the River Conservation Bureau. At that time there were 40 boats under the control of the Chinese Government. The total tonnage was 14,308 long tons.

At the time of the Mukden Incident there were more than 120 boats sailing along the Sungari River. The tonnage which has been ascertained was more than 30,000 tons. This included about 1,500 tons of large steamers.

A detailed description of the three river systems, the Liao Ho system; the Sungari, Amur and Ussuri river systems; and the Ya-lu Ho system, will be given in the following sections. Table 12 shows the names of the principal rivers in Manchuria.

TABLE 12

RIVER SYSTEMS IN MANCHURIA

River	Area Covered (Square Kilometers)	Percent	Navigable From	Mileage (Kilometers)
Amur River (Hei-lung Chiang)	288,300	22.1	Chilalin to its Confluence with with Ussuri River	227
Sungari	523,200	40.1	Sanchaho to its Confluence with the Amur River	937
			Kirin to Sanchaho or its Confluence with the Nonni River Nen-Ch'eng to Sanchaho	665
Ussuri River	45,400	3.5	Tung-Chiang to Hulin	596
			Hulin to Mishan or Mu-lin-ho	362

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Table 12 (continued)

Liao Ho	224,700	16.2	Yingk'ou to Chüliu Ho	286
			Yingk'ou to Ma-feng-kou	400
			Yingk'ou to T'ung-Chiang-k'ou	466
			Yingk'ou to Chengchiatun	828
			Sanchaho to Hsiaopei Ho (T'ai-tsu-ho)	246
			Sanchaho to Hanchiatien-tzu (Hun Ho)	232
Tumen River	22,350	1.7		
Yalu River	30,800	2.4	Mouth to Shihsantaokow	684
			Mouth to Hun-Chiang	207
The Large and the Small Ling Rivers	28,200	2.1		
Luan River	24,900	1.9		
Others	115,290	9.0		
Total	1,303,140	100		

Section 2. Transportation Along the Liao Ho

A. The Characteristics of Liao Ho Navigation: The Liao Ho comes from the high plateau in western Inner Mongolia. In Manchuria it flows in a north-south direction through the south Manchurian plain and enters into the Po Hai at Ying-k'ou. Along the banks of the Liao soils are fertile and agricultural crops are abundant. The population there is heavily concentrated. The main course of the Liao Ho is 1,300 nautical miles or roughly 2,500 kilometers. From Ying-k'ou to Cheng-chia-t'un 493 nautical miles or roughly 900 kilometers are navigable. There are numerous large and small sailboats operating between the two ports. From Yingkow upstream to Tien-chuang-t'ai there are 35 kilometers navigable for steamboats. The tributaries of the Liao, like the T'ai-tzu Ho and the Hun Ho, are navigable to some extent, but no prospects of further development are expected. The navigation characteristics of the Liao River are as follows:

1. Soils in the area along the upper part of the Liao River are composed of sand an mud. The river banks are often washed off or immersed in the river. Thus the Liao River forms a snake-like curved line, constitution an obstacle to navigation.

2. Most of the rivers in Manchuria are shallow. This makes navigation very difficult. But the Liao Ho is deep enough for navigation. Even when a boat is stuck in the sand it will float again when the sand is washed away by the current.

3. The volume of water of the Liao Ho is rather small, but it varies greatly with the seasons. This is due to the fact that there are forests near the sources of the river. At the time the volume of water is contracted, sailing is difficult. This is particularly true in the cases of the T'ai-tzu Ho and the Hun Ho.

4. The water level of the Liao Ho is affected by tides. Whenever the tide rises, navigation may be extended for 66 miles beyond T'ou-t'ai-tzu. When the tide reaches its climax, navigation along the course of the Liao may be further extended for ten miles. Both the T'ai-tzu Ho and the Hun Ho are particularly subject to the influences of tides.

5. At Erh-lang-tung located along the main course of the Liao River, a part of the Liao River flows into Shus-i-tzu Ho. Because of the resulting decrease in its volume, it is very difficult for a boat to sail between Erh-lang-tung and San-cha-ho. To overcome this difficulty, the Liao River Engineering Bureau spent a great amount of money in 1928 to build a canal linking Erh-tao-ch'iao-tzu of the Shuang-t'ai-tzu Ho with Chia-hsin-tzu, a place located six miles below San-cha-ho. The length of the canal is 14 miles. As the situation exists today, there are two routes of different length linking Erh-lang-tung and Chia-hsin-tzu. One is the main course of the Liao Ho, 29.1 miles long, while the other is through the newly constructed canal, 24 miles long.

The distance between Erh-lang-tung, where a part of the Liao Ho flows into the Shuang-t'ai-tzu Ho, and the mouth of the Liao Ho is 95 miles, while that between Erh-lang-tung and the month of the Shuang-t'ai-tzu Ho is 45 miles. Because the river bed of the Shuang-t'ai-tzu Ho is at a lower level it takes up most of the waters from the Liao Ho leaving little water for the lower parts of the Liao Ho. In view of this, a dam

380 meters long with seven gates was constructed at Erh-tao-ch'iao-tzu for the purpose of controlling the water volume of both the Liao and the Shuang-t'ai-tzu Ho. In addition, on the right bank of the Shuang-t'ai-tzu Ho there is a lock with three gates serving as the passage for boats. These gates can be opened and closed to facilitate the movements of boats. Under ordinary conditions, the dam is opened four hours daily so the water level of the Shuang-t'ai-tzu Ho will rise to facilitate the passage of sailboats at Pan-shan. When the dam is closed, the water level in the Liao Ho increases one meter in dry seasons, and increases roughly 3 meters in rainy seasons.

B. Navigation Along the Liao Ho, Types of Boats and Number of Boats.

1. Navigation Along the Liao River:

Because of the characteristics mentioned above, only one third of the river is navigable. Its navigable season lasts eight months, from March to December. The water level of the Liao Ho reaches a maximum height in July and August of the Chinese calendar, reaches a fair height in March and April and declines to a very low point in the freezing season. The rise and fall of the water level accordingly affects the navigation between certain points along the river.

2. Types of Boats Sailing on the Liao Ho

a. Steamers. In the past there was a 23-ton steamer, the Jui-hsing, which operated between Ying-k'ou and Tien-chuang-t'ai. It was a passenger boat carrying 10,000 to 30,000 passengers from April to November.

b. Barges. Barges were used in the transportation of goods between Ying-k'ou and Tien-chuang-t'ai and between Tien-chuang-t'ai and Hopei. Sometimes they sailed to Tientsin or to Shantung. Most of them were used by the oil pressing shops and grain dealers.

c. Sailing Boats. Sailing boats were often used in the transportation of goods along the Liao River. The boats are square-shaped with flat bottoms and sails. Their freight capacity was from 50 to 105 tan. They usually carried 80-90 tan. Since their draught is greater than that of the ox-boat, they sail mostly in waters south of the Chu-liu Ho.

d. Ox-boats. There is no furndamental difference in structure between a sailing boat and an ox-boat. Since its cost of construction is lower and its operation easier due to its light draught, the ox-boat is popular in the upper parts of the Liao Ho and its tributaries. Its load capacity varies from 30 tan to 90 tan. Ordinarily it carries 60-70 tan.

e. Sampans. These are in most cases used in the neighborhood of Ying-k'ou. The load capacity of a sampan is usually around 1,000 kilograms. Sampans are operated by oars or by sails.

f. Small Barges. They are used either as ferries or in short-distance freight transportation. If a large quantity of goods were to be transported, two of them would be tied together with the decks covered with wooden boards. They are handy vessels.

TABLE 13

THE DATES OF FREEZING AND THAWING OF THE LIAO RIVER AT YINGKOW

	Freezing	Thawing	Navigation Beginning
1926	25 December 1926	20 March 1927	24 March 1927
1927	4 January 1928	9 March 1928	22 March 1928
1928	5 January 1929	15 March 1929	18 March 1929
1929	22 January 1930	13 March 1930	24 March 1930
1930	5 January 1931	6 March 1931	14 March 1931
1931	8 January 1932		13 March 1932
1932	15 January 1933	24 March 1933	12 March 1933
1933	11 January 1934	16 March 1934	24 March 1934
1934			22 March 1935

3. Number of Boats and Crafts

As already mentioned above, transportation in Manchuria before the construction of railways depended largely on the Liao River. Thus the Liao River had made great contributions to the economic development in Manchuria. Although there were no accurate records concerning the number of boats on the Liao Ho, the river traffic was believed to be heaviest before the Russo-Japanese War. It is estimated that the number of boats on the Liao Ho at that time w as more than ten thousand. Subsequently, the number decreased greatly. In 1909 the Customs Office of Ying-k'ou licensed 4,580 vessels. The number of boats operating in 1923 is given in Table 15.

[Adjoins page 50 here.]

TABLE 14

NAVIGATION ALONG THE LIAO HO SYSTEM

Liao Ho

Intervals	Sources (Liao-yuan -- T'ung-chiang-k'ou	T'ung-chiang-k'ou -- Ma-feng-k'ou	Ma-feng-k'ou -- Erh-lang-tung	Erh-lang-tung -- San-cha-ho (or Lo Ho)	San-cha-ho -- T'ien-chuang-t'ai	T'ien-chuang-t'ai -- Ying-k'ou
Distance (kilometers)	207	35	139	24	31	19
Width of the river (meters)		100	120 -250	40 -250	250-400	700
Depth of the river at low ebb (meters)		2.8-3.0	2.8- 3.0	3.0- 3.5	9- 10	11
Flow	The rate of flow changes with seasons. In July, August, March, and April of the lunar calendar when the ice in the rivers is melted, the greatest flow is recorded.			Records of flow: cubic meters per second at Erh-lang-tung: 5,134 (1926) 2,500 (1927) 4,030 (1928)		
Speed of the currents	At the ebb: (above the middle reaches) 2 miles per hour; 4 miles per hour when tide begins to rise.			In the lower reaches under the influence of the tide -- maximum speed: At Ying-k'ou, 7 miles (per hour) At T'ien-chuang-t'ai, 9 miles At San-cha-ho, 2 miles		

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			Hun Ho		T'ai-tzu Ho	
Erh-lang-tung -- Erh-tao-ho-tzu	Erh-tao-ho-tzu -- Chia-hsin-ho	Erh-tao-ho-tzu -- Pan-shan	San-cha-ho -- Ch'ang-t'an	San-cha-ho -- Hsiao-pei-ho	Hsiao-pei-ho -- Liao-yang	Liao-yang -- Pen-hsi-hu
11	14	13	100	83		
250	70			70 -100		
3	5			2.5		
			5,794 (1926)	2,491 (1926)		
			The speed is slow in comparison with that of the Liao Ho.	The speed is slow in comparison with that of the Liao Ho.		

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Range between high tide and ebb		2 feet at San-cha-ho 9 feet at T'ien-chuang-t'ai 11.5 feet at Ying-k'ou				
Navigation	It flows through the desert. The flow is great, and the river is wide, but its depth is uncertain.	Favorable for navigation.	Navigation safe.	60 percent of the water flows into the Shuang-t'ai-tzu Ho. The minimum width is 40 meters. The depth is 3 meters. It is difficult for navigation.	Safe for navigation if good use is made of tides.	Navigation safe.
Navigation facilities	Small boats; alkaline soils, few food grains produced.	Sail boats capable of carrying 50-60 tan of grain. Carrying grain downstream, miscellaneous cargo upstream.	50-60 tan sailboats. Sailing in the summertime.	Sailboats cannot pass here. They have to to to Erh-tao-chiao-tzu for passage.	Mostly large type boats.	Mostly large type boats.
Navigable seasons	Usually, the week before or after 23 November, there are some ice floes. Consequently, it is very difficult to navigate.				Because of the tide, the freezing is late and thawing is early.	

[Adjoins page 52 here.]

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Half of the strength of a full tide. One hour later every 15 miles. Taken at the mouth of the Liao Ho.

40 percent flows into the Lo Ho. The flow is therefore rather small.	Safe navigation through the canal.	As the volume of water at Erh-tao-ho-tzu is under control, the volume of water can be increased or reduced. Ordinarily it is very difficult to sail at this part.	West of Hsiao-pei Ho, in the neighborhood of Hou-lou-po, there are some sailboats in operation.	Safe in the summer when flow increases.	In the summertime sailboats are used for navigation.	The currents are rapid. With the exception of the sailing of small boats, sailing is difficult.
Sailboats; greatly in use.	Sailboats	Sailboats	Data not available.	Sailboats are used.	Sailboats are used.	Sailboats are less useful.

Sailing is possible one month before freezing and ten days after thawing.

[Adjoins page 51 here.]

TABLE 15

SAILING VESSELS IN THE LIAO RIVER IN 1923

Types of Vessel	Steamer	Barger	Junks	Ox-boats	Sampans	Crafts	Total
Number	1	80	300	150	690	111	1,330

C. Effects of Railways on the Navigation of the Liao Ho

It is true that the Liao Ho has made a great contribution to the development of transportation in Manchuria. Since the Peking-Mukden Line, the South Manchuria Line, the Ssu-p'ing-chieh--Cheng-chia-t'un Line, the Cheng-chia-t'un--Tung-liao Line, and the Mukden-Hailung Line were completed, the importance of the Liao navigation has been greatly reduced. This was due to the fact that the South Manchuria Railway Company used Dairen as a center and adopted a low-rate policy for competing with the inland shipping along the Liao Ho. In the meantime, the prosperity of Ying-k'ou was greatly affected. Furthermore, the failure to dredge the river made navigation along the Liao Ho extremely hazardous. It was full of rocks and sand. Banditry was also another obstacle to traveling by boat. Consequently, the number of vessels decreased yearly. Along the tributaries of the Liao Ho, such as the Hun Ho and the T'ai-tzu Ho, there were only two or three boats operating at flood seasons only. The prosperity of the old days has gone.

The reasons for the decline of the Liao Ho navigation are summarized as follows:

1. Adverse effects of the railways in Manchuria, inland river navigation declined sharply. Inland water navigation with Ying-k'ou as its center could hardly compete with railway transportation with the port of Dairen as its center.

2. Lack of dredging. South of the middle course of the Liao Ho only light repair work had been done under the direction of the Engineering Bureau. North of the middle course no dredging has been done. As time passed the sand and mud accumulated at the bottom of the river and made navigation very difficult.

3. Lack of modernized vessels. Most of the boats and crafts operating on the rivers and streams in Manchuria have been constantly improved for greater efficiency except those on the Liao Ho. Vessels operating on the Liao Ho are almost exclusively sailboats. Their capacity is small while their operating expenses are high. Sailing takes more time because the boats in use are not propelled by motor. All this accounts for the high transportation cost along the Liao Ho. In short, shipping facilities in the Liao Ho do not meet modern standards.

4. Unreliable service and lack of working capital. As an established practice, ship operators are liable for the loss of goods they transport. However, most of them failed in this because of insufficient capital. Frequent disputes resulted. Furthermore, the long voyages and the lack of working capital on the part of the operators created trouble en route. Consequently, most of the merchants were very cautious and seldom used river transportation.

5. Banditry. Social order in the Liao Ho area was bad. Bandits and robbers frequently attacked from ambush. Normal life was disturbed. Under such circumstances, moral standards of the local populace became lower and lower. All this constitutes a menace to boat travel.

6. Shift of trade routes. Most of the imported goods are discharged at Dairen instead of Ying-k'ou. The result is that business in Ying-k'ou has declined. What makes the situation worse is that few daily necessities are transported by ship. Thus many merchants have shifted their headquarters from Ying-k'ou to Mukden and Dairen.

Data in Tables 16 and 17 show the sharp decline in river traffic at Cheng-chia-t'un in 1918 after the opening of the Ssu-cheng Railway.

From the figures given in Tables 16 and 17, it can be seen that in 1914, 70 percent of the crop exports from Cheng-chia-t'un was handled through the waterways, while 30 percent was transported by carts. When the Ssu-p'ing-chieh-Cheng-chia-t'un Railway was put into operation in 1918, carts were no longer used, while the waterways and the railways handled respectively one half of the traffic. In 1919 most of the exports were handled by the railway administration with 3.5 percent handled by boat. In 1914 56 percent of the daily necessities incoming to Cheng-chia-t'un were transported by boat as compared with 8 percent in 1919 after the railway from Ssu-p'ing-chieh to Cheng-chia-t'un was opened.

The advantages and disadvantages of river transportation and of railway transportation are as follows.

TABLE 16. FARM PRODUCTS TRANSFERRED FROM CHENG-CHIA-TUN BY YEAR (IN SHORT TON)

Means of Transportation

Year	Total	Consumption (Local)	Exports	By Boat Along the Liao Ho to Ying-k'ou	Through the Ssu-p'ing-chieh Cheng-chia-t'un /Liao-yuan/ Railway	By Horse-cart to Ssu-ping	Remarks
1914	109,000	39,000	70,000	50,000		20,000	Before the opening of the railway
1918	75,990	30,450	45,500	23,500	22,000		one year after the railway opening
1919	123,930	32,430	91,500	3,300	88,200		Two years after the railway opening

TABLE 17. INCOMING GOODS TO CHENG-CHIA-T'UN

Means of Transportation

Year	Total	Rivers	Railways	Horsecarts	Remarks
1914	17,100	9,600		7,500	Before the opening of railways
1919	24,284	1,971	22,313		After the opening

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1. Advantages of river transportation

a. Freight charges and other expenses are lower.

b. No maximum or minimum limits on freight quantity.

2. Disadvantages

a. It takes more time than by rail.

b. Navigation on the Liao Ho is difficult since it has not been dredged for a considerable time.

c. There are not enough sailboats. Vessels now available are small in capacity and thus cannot handle large amounts of freight on one voyage.

d. The operators of the vessels lacked a sense of responsibility in offering their services.

e. Banditry is a threat to boat travel.

It was due to the facts listed above that river transportation could not compete with railways.

D. Goods Transported Along the Liao Ho

The transport of goods downstream along the Liao Ho to Ying-k'ou by oxboat or sailboat is known as Ho-tai or "river transportation." The so-called Wai-tai or outgoing freight refers to the transport of goods in the Tung-ho-k'ou and San-chiang-k'ou areas, while Li-tai refers to the river traffic in Hun-ho, Yao-yang-ho and south of T'ai-tzu-ho. The types of goods transported are given as follows:

1. Goods transported downstream along the Liao Ho:

Goods transported downstream to Ying-k'ou and localities near the railways include kaoliang, soybeans, barley, wheat, sesame. They also include soybean oil, bean cake, and wine.

2. Goods transported upstream along the Liao Ho:

They include mostly the products of the neighborhood of Ying-k'ou like salt, reed mats, cooking pans, and crude potteries. The amount of goods transported upstream along the Liao Ho is small.

TABLE 18

GOODS TRANSPORTED ALONG THE LIAO HO BY YEAR

(In Metric Tons)

Year	Downstream Toward Ying-k'ou	Upstream
1930	63,000	Unknown
1931	56,000	Unknown

Year	Toward Ying-k'ou	Upstream
1932	40,000	Unknown
1933	36,000	Unknown
1934	47,000	Unknown
1935	38,000	Unknown
1936	40,000	4,000
1937	30,000	7,000
1938	18,000	7,000

Section 3. Transportation Along the Sungari and the Nonni Rivers

A. The Characteristics of Navigation Along the Sungari

The Sungari River, the biggest river in Manchuria, originates from the T'ien Ch'ih in the Ch'ang-pai Shan. It flows along the gorges of the Ch'ang-pai Shan, and traverses the northwest plains of Manchuria. After it meets the Nonni River, it flows in a northeast direction, flanking the big town of Harbin. The Sungari River is about 1,927 kilometers long. The Sungari River area has been known for its fertile soils and rich agricultural, forestry, and mining resources which are vital to the improvement and development of the local economy. The principal characteristics of the Sungari River are as follows:

1. The climate in Manchuria is dominantly a continental climate. The temperature, the atmospheric pressure, the rainfall, snowfall, the direction of the wind, the thawing and freezing of the river are all factors which play a decisive role in navigation. During a period of six months from November to April, the temperature is constantly below zero. The long winter freezes the rivers and streams and brings the river traffic to a halt. The navigation season lasts only seven months. In the remaining five months ship operators spend their time repairing and overhauling their ships. The duration of the navigation season along the Sungari River near Harbin is shown in Table 19.

TABLE 19

NAVIGATION SEASON ALONG THE SUNGARI NEAR HARBIN BY YEAR

Date	Beginning	Ending	Duration (days)	Water Level at Beginning (Meters)
1928	Apr 7	Nov 30	237	129.59
1929	Apr 14	Dec 5	235	131.24
1930	Apr 9	Nov 16	221	130.34
1931	Apr 20	Nov 27	221	128.36

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Date	Beginning	Ending	Duration (days)	Water Level at Beginning (Meters)
1932	Apr 15	Dec 11	240	129.69
1933	Apr 21	Nov 24	223	130.37
1934	Apr 22	Nov 29	221	
1935	Apr 18	Nov 19	215	

2. The Sungari River has a more abundant supply of water since its source is a forest region having a greater rainfall and situated on a higher plateau. However, the volume of the Sungari is subject to great changes because of rain and snow.

At the beginning of the navigation season when ice breaks and melts, the water level of the Sungari is high. But after the ice has melted completely, the water level goes down very rapidly. This is a natural phenomenon. The Sungari and a number of other rivers and streams flow in a northward direction. The rivers begin to thaw from their upper courses in the south. However, the increased water volume due to thawing of ice and snow is often obstructed by the half-frozen ice in the lower couse, resulting in the temporary rise in the water level. If there is a great difference in the temperatures of the upper and of the lower courses of the Sungari, the water level will increase greatly during the thawing period. On the other hand, if the temperatures in the upper and lower courses are about equal, the water level will decrease rapidly and navigation is difficult. An icebound river may thaw gradually or rapidly. The gradual melting of ice is called by natives "gentle thawing," while the rapid melting is called "militant-like thawing."

Since the increased volume of water gradually flows away after the ice melts, the water level of the Sungari becomes very low and renders sailing very difficult in late June and in early July. The water level becomes very high in the rainy season of July and August but drops to a low mark and even ends navigation in September and October.

3. The banks of the Sungari are completely composed of sands and clay. There are almost no rocks at all. This is why it is so easy for the currents to cause the collapse of the banks. In addition, because of erosion and accumulation of sand and mud from its tributaries, there are numerous shoals in the Sungari which are dangerous to navigation. Among the shoals and sandy bars the Shoal of San-hsin located 315 to 342 kilometers northeast of Harbin is the biggest. It is 27 kilometers long. The water depth there averages 3 or 4 meters. It is only 1.5 meters deep in some places. Since dredgings has been done, and buoys have been established, danger is minimized so that boats may even be operated at night.

4. The Feng-man Dam in Kirin was built to utilize the rich hydro-electric resources of the Sungari. The reservoir demonstrates that the water flow in the lower parts of the Sungari can be kept under control. In fact, it has eliminated floods, minimized the possibility of river freezing in dozens of miles in the lower parts of the river and facilitated the navigation of boats and craft.

TABLE 20. NAVIGATION ALONG THE SUNGARI RIVER SYSTEM

Name of the River	The main course of the Sungari River	The navigation area in the upper parts	
Area of Navigation	The mountainous area in the upper parts of the river	Mountainous area	Plain area
	From the source to Kirin	Kirin to Lao-shao-kou	Lao-shao-kou to the Nonni River
Distance (kilometers)	595	219	194
Topography	The volume of water flow is small, and the movement of the current is fast. There are a great many shoals. Following the completion of the Kirin Lake, the situation has undergone some great changes.	The topography is like a terrace. The plains along the two banks are rich in fertile fields.	There are many curves, and the current is slow. Sedimentation is great, and there are a great many sand bars and shoals.
Depth of water	The flow is small, and the speed of the current is great. There are many of shoals. Following the completion of the Kirin Lake, the situation has undergone some great changes.	In the period of thawing, the depth is 5-15 meters; in the low water period, the depth is 2.7-2.8 meters.	In the period of thawing; the depth is 4-8 meters; in the period of freezing, the depth is below 2 meters.
Width of the river		At the time of thawing the width is 250-800 meters. When flow declines, the width is from 150-550 meters.	350-2,200 meters

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The navigation area in the middle parts	The navigation area in the lower parts		
From the confluence with the Nomi River to Harbin	The upland navigation area Harbin to I-lan	The mountainous navigation area I-lan to La-ha-su-su [sic]	The plains navigation area I-lan to T'ung-chiang
324	340	345	
There are traces of increasing accumulation of sand and mud. The course of the river is split. The two banks are not yet exploited.	The slope of the river is 2 to 4 percent. The shoal at San-hsing is 27 kilometers long.	The flow of the Mu-tan-chiang and others is plentiful, and there are a great many shoals.	The river beds have undergone some great changes. Water volume is great.
When flow declines, the depth varies from 4-20 meters.	The depth varies from 7-10 meters. In the shoals the depth is from 3-4 meters.	In the shoals the depth varies from an average of 3-4 meters. At low water, the depth is 1.5 meters.	Five meters and up.
370-2,000 meters. In the neighborhood of Lang-chien-tzu the width is from 80-150 meters	At ordinary times the width is 375 meters.	At ordinary times, 375	100-300 meters.

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Speed of currents		The degree of decline is small. The movement is slow, and speed is from 40-90 meters per minute.	Slow. 35-55 meters per minute.
Beds of the river		Stones in the upper course, sandy in the lower course.	Light sandy mud.
Navigation conditions	After the artificial Lake of Kirin had been created, navigation became possible. Small steamers can sail in this part.	In the navigation season, a large number of small steamers and junks are found.	There are a great many shoals. Changes of bed are frequent. Navigation difficult.
Navigation Period	From April to November covering all the sections		
Points linking to railways	Near Kirin	Lao-shao-kou	Bank opposite the city of Fu-yu
Volume of traffic	Fair	Small	Small
Goods transported	Timber		

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37-90 meters per minute	Slow	Slow	Slow
Fine sand and clay	Sandy	Sandy	Shifting all the time
At ordinary times steamers can sail up to Yuan-chia-wo-p'ing. From that point upward only junks can sail.	There is the I-lan Shoal, located 315 kilometers to 342 kilometers northeast of Harbin. When flood water declines, sailing requires more precautions. Safe at ordinary times.	Navigation safe. Buoys and lighthouses installed.	Dangerous for navigation
Harbin		Chia-mu-ssu	
Small	Greatest	Greatest	Great
	Coal and grain from Ho-li-kang	Coal and grain	Grain

[Adjoins page 61 here.]

TABLE 21

NAVIGATION ALONG THE SUNGARI RIVER SYSTEM

Names of rivers	The Nonni River or Nun Kiang			Mu-tan-chiang	Hu-lan Ho	A-shih Ho
Area	Upper course	Middle course	Lower course	Middle course		
Sections	Source -- Nen-ch'eng	Nen-ch'eng -- Ch'i-ch'i-ha-erh	Ch'i-ch'i-ha-erh -- Confluence with the Sungari	Ch'ing-po Lake		
Distance (kilometers)	485	230	435	475	375	
Topography	Flowing along along branches of the Greater Khingan and Smaller Khingan ranges. Lots of tributaries.	Plains	Plains	Navigation is limited to the portion between Ching-po Lake and the cities of Ning-an and Mu-tan-chiang.	Soils are fertile.	Soils are fertile.
Depth of rivers	In the neighborhood of Nen-ch'eng, 5-6 meters; in the rising period, 12-14 meters.	No shoals	4-6 meters; when flood water declines 2 meters. The deepest place is 30 meters.	In the neighborhood of Ning-an, 3-5 meters in depth.	From the mouth to Hu-lan Hsien, 3-3.5 meters.	

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Width of rivers	The nearer to the lower parts, the greater the width.	150-420 meters	380-900 meters	Near the mouth, the width is 720 meters.	In the upper parts the width is from 25-30 meters. In the neighborhood of Hu-lan, it is near 100 meters.	
Speed of the current	Very fast	Fairly fast	Slow	Very fast	Slow	
Bed of the river	Full of rocks	Full of sand and stone	Sandy	Full of rocks	Sandy	
Navigation conditions	No possibility of navigation, only rafts are used.	In flood season it is possible to sail in all parts. But boats are few.	It is possible to sail, but there are lots of shoals.	Traffic is heavy up to the Ching-po Lake. Lots of rafts are there. Between the two cities of Ning-an and Mu-tan-chiang there is a limited number of boats in operation.	From the mouth of the Hu-lan Ho to the city of Hu-lan there are small steamers sailing. The mouth is 23 kilometers from Harbin.	Fifty kilometers from the mouth navigation is possible.
Duration of navigation	April to November for all the rivers mentioned above.					

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Points linking to railways	Nen-ch'eng and La-ha	Ch'i-ch'i-ha-erh	Fu-la-erh-chi and Chiang-ch'iao	Ning-an and Mu-tan-chiang	Hu-lan
Volume of goods transported	Small	Small	Small	Small	Small
Types of goods transported					

B. Survey of Navigation of the Sungari River and Types of Boats and Crafts

1. Navigation. Navigation is possible between the mouth of the Sungari River and Kirin, a distance of 1,332 kilometers. However, conditions of navigation vary in different parts of the river. Navigation in the lower parts (from Harbin down) is the easiest of all. Although the middle course is suitable for navigation between its confluence with the Nonni River and Harbin, night sailing is hazardous because of inadequate traffic facilities and the length of time involved. Navigation along the upper parts of the Sungari in the Manchurian plain, between Lao-shao-kou on the Chinese Ch'ang-ch'un Railway and the confluence of the Nonni Railway and the Sungari, is most difficult. In flood season boats can sail between Kirin and Lao-shao-kou, but when floods recede, all river traffic comes to an end in the upper parts of the Sungari near Kirin. However, navigation is possible again in the upper parts beyond Kirin with the help of the Feng-nan Dam. The dam facilitates the floating of timber particularly.

Among the navigation sections mentioned above those between Harbin, Lien-chiang-k'ou, Chia-mu-ssu, Fu-chin and T'ung-chiang are most suitable for navigation. The river along these port cities varies from 200 to 300 meters in width. There are very few places where the river is narrower than 100 meters. Consequently, when the flow of the Sungari is great, there are almost 200 days which are suitable for navigation. In a year when the flow is small, boats with a draught of 4 to 5 feet can have safe sailing for 150 days. When the flow of the Sungari is extremely small, there are about 50 days suitable for sailing of boats with a draught of 3 feet or less. However, those boats of a draught above 2.5 feet /sic/ have to suspend operations for a short time. In the whole course there are buoys marking the depth of the river. With the exception of the shoal located at San-hsing or I-lan, where sailing should be conducted with care, there are 20 hours or more per day for navigation. In summary, navigation along the lower parts of the Sungari offers great prospects for future development.

2. There are several kinds of boats operating on the Sungari:

a. Steamboats

1. Passenger - freight boats. The chief purpose of the boat is to transport passengers. The decks are used for passengers; below the decks is cargo space. A smaller steamer can carry 200 tons while a large one can carry 1,800 tons of goods. The bottom of the ship is flat. It is operated by one or two paddle-wheels.

2. Tugboats. The tugboat is a power boat used for pulling freight boats and barges.

3. Barges. Most of the barges are made of iron. Few are made of wood. They have no propellers and must be pulled by tugboats. The capacity of a barge ranges from 400 to 1,000 tons.

b. Sailboats

1. Wind Boat. When the wind is blowing in the direction of travel, canvas is used. Oars are used when sailing against the wind. Large boats are capable of carrying 70 tons. Both the stern and the bow

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of the boat are square in form. There are two masts. However, the wind boats sailing between Kirin and Harbin are one-mast boats. The storage room is built near the center of the boat. On the two sides and at the rear of the boat there are planks for protection against water, but not for the accommodation of goods.

2. Freight Boat. It is similar to the wind boat in structure, but it is larger and has a very flat bottom. It sails mostly on the upper parts of the Sungari near Harbin.

3. Paired Boats. They are also called the pulling boats. Two small boats are tied to each other. At the center there is one mast without decks or planks. Their draught is very shallow and thus they can sail in shallow waters. However, they are not safe. They are good for the transportation of goods over short distances, but unsuitable for long-distance transportation.

In summary, the structure of the vessels sailing along the Sungari River must meet the following requirements because the flow and the river bed of the Sungari are peculiar.

1. The bottoms of the vessels must be flat.

2. The draught must be shallow even when loaded with a large amount of goods. Thus, the body of the vessel should be wide and spacious.

3. A vessel must be airtight and waterproof.

If a boat meets these requirements, there will be no danger in its sailing along the Sungari, and it will eliminate the difficulty in the operation of boats, and the unnecessary slowing down of speed.

C. Data on Navigation Along the Sungari

It has been mentioned above that the Sungari has played a decisive role in the development of Manchuria. This can be further illustrated by its passenger and freight services in the past.

1. Passenger Transportation

More and more people moved northward each year. This shows that the once desolated northern part of Manchuria has been exploited at a super speed.

TABLE 22

NUMBER OF PASSENGERS TRANSPORTED ON THE SUNGARI BY YEAR

Date	1929	1930	1931	1932	1933	1934	1935
Northbound Passengers	101,000	79,000	72,000	72,000	75,000		
Southbound Passengers	106,000	80,000	100,000	33,000	86,000		
Totals	207,000	159,000	172,000	105,000	161,000	383,000	500,000

2. Freight Transportation

The total volume of goods transported over rivers and streams in North Manchuria was roughly 800,000 metric tons in 1933. A breakdown of this figure by rivers is given below:

Main course of the Sungari River	740,000 metric tons
Upper parts of the Sungari	30,000 metric tons
Amur River	23,000 metric tons
Ussuri River	7,000 metric tons
Total	800,000 metric tons

We may also have this figure broken down into types of goods (in metric tons).

Agricultural products	400,000
Coal and mineral products	240,000
Lumber	70,000
Miscellaneous	90,000
Total	800,000

Most of the agricultural products were transported upstream to Harbin. A small part of these products was consumed in the Municipality of Harbin, while a large part of them was shipped from there to the south by railroad. Coal, minerals and timber were mostly consumed in Harbin (a very limited amount of timber was shipped to the south). The reverse is true of miscellaneous goods. They were shipped downstream from Harbin to the valleys of Amur and Ussuri. It is obvious that 80 percent of the goods (except miscellaneous) transported by waterways was concentrated at Harbin both from the lower and the upper parts of the Sungari.

The total volume of freight transported by waterways with Harbin as a center was 610,000 metric tons in the navigable period of the Sungari (from April to November) in 1933, while the freight tonnage handled by railroads in south, north, and west Manchuria was 2,510,000 metric tons during the 12-month period (October 1932 to September 1933). In other words, of the combined volume of freight traffic, or 3,120,000 metric tons, 20 percent was handled by waterways while 80 percent was handled by railroads.

The volume of freight traffic along the Sungari, the Amur, and the Ussuri rivers between 1928 and 1935 is as follows:

TABLE 23

FREIGHT TRAFFIC ALONG THE SUNGARI, USSURI AND AMUR RIVERS BY YEAR

(in metric tons)

	Grains	Coal	Lumber	Minerals	Fuel Wood	Miscel-laneous	Total
1928	569,000	55,000	53,000		24,000	87,000	788,000
1929	468,000	36,000	43,000		18,000	42,000	607,000
1930	474,000	134,000	31,000		29,000	48,000	716,000
1931	470,000	177,000	18,000		23,000	51,000	739,000
1932	391,000	59,000	68,000		11,000	44,000	573,000
1933	320,000	154,000	20,000		32,000	87,000	613,000
1934	482,000	208,000	68,000	24,000	14,000	82,000	878,000
1935	337,000	233,000	59,000	15,000	27,000	82,000	753,000

D. Navigation of the Nonni River

The Nonni River originates in the southern part of the I-la-hu-li Mountains. When it passes the Kan Ho, it turns in a southwest direction toward Ch'i-ch'i-ha-erh. From there it turns in a southeast direction and meets the main course of the Sungari. The length of the river is 1,170 kilometers.

From the source of the Nonni to Nen-ch'eng the current is rapid, and the river bed is full of rocks. This makes navigation very difficult. This section of the river is used only for floating timber. On the middle section from Nen-ch'eng to Ch'i-ch'i-ha-erh there are a number of sailboats. River traffic is heavy on the lower parts between Ch'i-ch'i-ha-erh and the confluence with the Sungari River because the volume of the river in this section is very favorable for navigation.

Chiang-ch'iao, Fu-la-erh-chi and La-ha along the Nonni are connected to the Ssu-p'ing-Ch'i-ch'i-ha-erh, the Northern Manchurian, and the Ch'i-ch'i-ha-erh-Pei-an lines. Thus the Nonni River supplements the function of the railroads. For instance, in 1933 when there was a record breaking flood in Manchuria, the railroad lines between La-ha and Harbin, between Ch'ang-ch'un and Harbin and between Ssu-p'ing and Ch'i-ch'i-ha-erh were interrupted suddenly. Accordingly, the Nonni River with Chiang-ch'iao as its shipping center was utilized for the transportation of relief goods to Harbin. In 1934, a group of vessels carried soybeans from the lower part of the Sungari to Chiang-ch'iao on its upper part. On their return trip they were loaded with construction materials for the Harbin-Pei-an Railway and miscellaneous goods. The volume of freight transported both upstream and downstream was about 70,000 metric tons.

E. Amur Navigation

The section of the Amur River from the mouth of the Argun River to the mouth of the Ussuri is 1,865 kilometers. This is a section where navigation is possible. The shallowest place is above 3 feet, while the deepest place is as much as several tens of feet. The width is usually more than 250 meters. The widest place is almost two kilometers. River freezing usually takes place in the last ten days of October or in the first ten days of November. The melting is usually in progress in the middle of April or in the last ten days of the same month. There are five months in a year in which navigation is possible.

The Amur River is connected with the railway at Ai-hun. Thus it supplements the railroads in Manchuria. Its outstanding services to Manchuria is timber floating. Boats whose draught is 2 or 3 feet can sail from the mouth of the Argun River to a place located 860 kilometers up river.

F. Ussuri Navigation

The Ussuri is 900 kilometers long. Its volume is very great and the current is rather slow. It has many tributaries. The width of the river in the upper part is from 100 to 200 meters, while it is greater in the lower part. It is suitable for navigation. The main navigable section is from the mouth of the Ussuri to Hu-lin, the length of which is 600 kilometers. In addition, the Ussuri is connected with the railroad line between Hu-lin and Lin-k'ou.

TABLE 24

NAVIGATION OF THE AMUR AND THE USSURI RIVER SYSTEMS

Name of river	Argun River			Amur	Ussuri
Sections of navigation	Upper parts	Middle parts	Lower parts	From the mouth of the Argun River to the Ussuri	—
	From A-pa-hai-t'u village to the confluence with the Ken Ho	From the confluence with the Ken Ho to the mouth of the Wu-ma Ho	From the Wu-ma Ho to the Shih-lo-k'o Ho		
Length	860 kilometers covering the three sections			1,865 kilometers	905 kilometers
Topography	As these two sections are located near the Mongolian hills, the current is slow and the river is winding.			In the neighborhood of A-erh-pa-hsin, the Greater Khingan Mountains and the vicinity of Huma Ho, there are some level places. In the neighborhood of Ta-hei-ho and the Smaller Khingan Mountains the topography is level.	There are a great many tributaries.

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[Adjoins page 71 here.]

Depth of water	4- 30 meters			3- 10 meters	Great in volume
Width of rivers	30-100 meters	about 100	200-300	350-2,000	100-200 in the upper course; much wider in lower stream.
Speed of current	Slow	Slow	Slow	Slow	Slow
River bed	Clay	Sandstone	Rocky, hidden rocks	Unavailable	Unavailable
Navigation	Boats, the draught of which is from 2-3 feet, can sail.	Same	Same	Navigable for the	Navigable upstream to Hsing-k'ai Hu. Its main navigation section is from T'ung-chiang to Hu'lin, 596 kilometers.
Season for navigation	May-September	May-September	May-September	May-September	May-September
Connected with railroads at				Ai-hun	Hulin
Volume of transportation	Small	Small	Small	Fair	Small

Section 4. Transportation on the Yalu River

A. The Characteristics of Ya-lu Navigation:

The Ya-lu Ho originates in the Ch'ang-pai Shan, and forms the boundary between China and Korea. After meeting its tributary, the Hun Chiang, it flows past An-tung and Sinuiju, and into the Yellow Sea. The length of the river is 800 kilometers. Its navigable section is from its mouth to a place called Erh-shih-ssu-tao-kou. River traffic is heavy from the mouth of the Hun Chiang to An-tung, 200 kilometers in distance. Soils are fertile in the neighborhood of the Hun Chiang. The navigation is more thriving in this part than in the main course of the Ya-lu Ho. From the mouth of the Ya-lu Ho to Pa-tao-kou there are some sailing vessels.

The harbor at the mouth of the river is the gate to An-tung. It is there that navigation thrives. However, upstream sailing from there is very difficult. Large steamers cannot sail upstream. Vessels of 2,000 tons to 2,500 tons can sail upstream to San-tao-lang-t'ou. 1,000-ton vessels can sail upstream to An-tung Railroad Bridge.

The Shui-feng Dam was built in 1941. This has changed the prospects of navigation on the Ya-lu Ho. The increase in the depth of water is very favorable for navigation. Meanwhile, the volume of the Ya-lu Ho in its lower parts is also under control. There is a part of the river which is not frozen in bitterly cold winter. However, the water level is low in the lower parts of the river and navigation there is difficult. Therefore, the building of the Ta-tung harbor is necessary.

Some special features of the Ya-lu navigation are as follows:

1. The navigation of the Ya-lu River occupies an extremely important position in politics, industry, and economics. It is also known as an international river.

2. The current in the upper parts of the river is rapid because it flows along mountain and valleys and because there are a great number of hidden rocks. Thus navigation in the upper parts is difficult. Accordingly, traffic on the Ya-lu Ho is usually concentrated between the mouth of the Hun Chiang and An-tung. The lower parts of the river below An-tung are valuable for international traffic.

3. The Shui-feng dam has made great contributions to the development of hydroelectric power. Transportation on both the upper and lower courses is greatly benefited by the dam.

4. In the upper parts of the Ya-lu Ho there are rich forest resources. In the middle parts there are the tributaries, the Hun Chiang, the Ch'ang-tien Chiang and the Ai Ho. Since the nineteenth century, flocks of immigrants have come to this part from Shantung Province and developed a prosperous agricultural economy. This created a demand for transportation services and in turn enabled the An-tung Port to become a prosperous harbor.

B. Ya-lu Ho Navigation and the Types of Vessels in Use

A rough picture of the navigation along the Ya-lu Ho may be found in the map attached at the end of this chapter. Vessels sailing on the Ya-lu Ho are as follows:

1. Dugout Boats. They are good for short distance transportation only. They are found mostly on the Korean Bank.

2. Sailboats. Their draught is very shallow. The body of the boat is bulky and heavy but is strongly built. The boats are propelled by wind. Before the introduction of the flat-bottom boats, they were the only vessels used for freight transportation. The weakness of these boats is that they are unfit for upstream sailing. Consequently, they are rapidly diminishing in number. According to a rigid classification, sailboats include large sailboats, small sailboats, Ta-chien, Hsiao-chien, Tui-wei, Hsiao-p'o, Ch'ang-k'ou, K'o-chien, and sampan.

3. Flat-bottom Boats. They are so named because they have flat bottoms. Their draught is not very deep. Their bodies are light and good for upstream sailing. They were first used in Korea in 1905. Since then the number has increased yearly.

4. Motor Boats. Their draught is very shallow, and they are best for sailing in shallow waters. They are used for transporting passengers and mail between An-tung and Chin-hua-chen. The boats are made of wood and weigh about 10.46 metric tons. They are driven by internal combustion engines. Their speed is 16.36 knots. Their passenger capacity is 32 persons. The draught of an empty boat is 10 centimeters forward and 30 centimeters aft. The length of the boat is 18.2 meters and its width is 2.11 meters.

C. Goods Transported on the Ya-lu Ho

In the past goods transported on the Ya-lu varied with the direction of movement. Goods transported upstream were miscellaneous, salt, flour, fuel, and other daily necessities. Commodities transported downstream were mainly soybeans, cereals, and soybean cakes. All of them were transported from the districts of Lin-chiang, Chi-an, T'ung-hua, Huan-jen, and K'uan-tien. The volume of these goods is listed as follows:

TABLE 25

GOODS TRANSPORTED ON THE YA-LU HO

(in metric tons)

	1928	1929	1930	1931	1932	1933
Downstream	130,000	138,000	320,000	220,000	142,000	186,000
Upstream	8,000	9,000	15,000	5,000	10,000	7,000

Lumber produced on the upper Ya-lu was floated to the lower parts from Erh-shih-ssu-tao-kou. The shapes of the rafts varied. Rafts arranged by the Japanese method traveled at a faster speed than that arranged according to the Chinese method. To float the raft arranged according to the Japanese method takes 15 to 20 days from Ch'ang-pai or Hui-shan Chen to An-tung, while it takes 60 to 80 days by the Chinese method. The number of rafts floated at one time varies with the locality.

Five or six rafts are floated from Erh-shih-ssu-tao-kou, ten rafts from Shih-san-tao-kou, 20 to 25 from Lin-chiang, and 30 to 35 from Chi-an and Kao-shan-chen. Rafts are then moved by tugboats when they reach An-tung. Part of the lumber is transferred to boats after it reaches San-tao-lang-t'ou.

III. SEA TRANSPORTATION

Section 1. Seaports in Manchuria

The coast line of Manchuria is extremely short. There are the commercial ports of Dairen, An-tung, Ying-k'ou, and Hu-lu-tao, and several fishing ports. These ports, although limited in number, have played an important role in the economic development of Manchuria.

The oldest harbor in Manchuria is Chiu-wan located below Lao-t'ieh Shan at Port Arthur. Archaeological research shows that Chiu-wan was a commercial port in the Han Dynasty. It shows also that Port Arthur, Dairen, and Ta-tung-kou had communication with Shantung Province during the Han Dynasty. Kai-p'ing, Hsi-hai-k'ou (Chin-chou), and Niu-chuang had uninterrupted navigation with Shantung and Hopei provinces in the Sung Dynasty. In the Ming and Ch'ing Dynasties, Tiao-yu-t'ai (Hsing-ch'eng), Ch'ang-tzu-k'ou (Sui-chung), Niang-niang-kung, Chin-chow, Pi-tzu-wo, Pu-lan-tien, Chuang-ho, and Ta-ku-shan were valuable commercial ports. The migration of the Chinese people to the north was the major factor for the growth of these ports.

The Port of Ying-k'ou has long been an international port. Since its opening as a port its history is divided into two periods. In the first period it was under the domination of Britain, while in the other period it was under Japanese control.

The port of Ying-k'ou was below sea level in the seventeenth century. Due to the continued formation of bars at the mouth of the Liao Ho, Ying-k'ou gradually rose to sea level. Since 1830 the commercial activities in Niu-chuang and Tien-chuang-tai have shifted gradually to Ying-k'ou. In 1858, according to the Tientsin Treaty, Ying-k'ou was opened as an international port. At first the Tientsin Treaty stipulated Niu-chuang as an international port. But the British Consul at Niu-chuang considered the potentiality of Ying-k'ou to be much greater than that of Niu-chuang. Accordingly, Ying-k'ou was chosen as a commercial port and was opened for trade.

Since its opening as a port in 1872, Ying-k'ou has developed a prosperous shipping industry. When Dairen was opened as a port, and when the Ssu-p'ing Railway was opened to traffic, Ying-k'ou suffered a setback. Despite this, it is still a port of great importance. The volume of its annual imports and exports amounted to 100,000,000 custom taels of silver.

At the beginning of the twentieth century, Dairen was nothing but a small village located on the Gulf of Chihli. In 1898 Czarist Russia began to build a commercial port there. Before construction was completed, war broke out between Russia and Japan. Since Japan won the war, it inherited the Russian rights and continued the harbor construction. After years of unceasing efforts under the administration of the

South Manchuria Railway Company, Dairen has become a world famous harbor and played an important role in economics, communications, and national defense. After the conclusion of World War II it was occupied by the USSR. We have not yet taken it over.

Let us now discuss the Harbor of An-tung. An-tung was opened as a port in March 1907. Before its opening to international trade it had only a small scale trade with ports on the upper Ya-lu Ho and on the coast of South China. An-tung has been considered a domestic port.

In addition to the three ports already listed above, there are some small ports including Hsi-hai-k'ou, Sun-chia-wan (Chin-hsien), Tiao-yu-t'ai, Sha-hou-so-nan-t'an, Niang-niang-kung (Hsing-ch'eng), Fu-chou, Sung-pen-tao, P'an-shan, Ta-tung-k'ou, Pei-ching-tzu, Huang-t'u-k'an (Feng-ch'eng-hsien), Ta-ku-shan, Ching-tui-tzu, Chuang-ho, etc. They are scattered here and there along the Gulf of Chihli and the Yellow Sea. Besides these there are some ports worthy of our attention. They are Vladivostok in the USSR and the three ports of North Korea.

The port of Vladivostok has become prosperous since the construction of the Ussuri Railway. In fact, after Russia lost Dairen to Japan in the Russo-Japanese War, it tried hard to build Vladivostok into a center of trade with Manchuria. At that time, almost all goods exported to the north were transferred there. Due to the revolution in Russia, Vladivostok was in turmoil. Consequently, all goods produced in North Manchuria were sent southward and exported through Dairen. Business in Vladivostok was on the decline. It was not until the Chinese Eastern Railway reiterated its policy in support of Vladivostok as a commercial port that Vladivostok became prosperous again.

The port of Vladivostok is located 245 kilometers from the Chinese-Soviet Border. The distance between Vladivostok and Harbin, center of the North Manchurian economy, is 794 kilometers. In comparison with the distance between Harbin and Dairen, which is 942 kilometers, the distance between Harbin and Vladivostok is much shorter. The following is a list of the distance between world famous ports and Vladivostok and Dairen.

TABLE 26

DISTANCES BETWEEN WORLD FAMOUS PORTS AND VLADIVOSTOK AND DAIREN

From	To Dairen	To Vladivostok
Shanghai	875 kilometers	1,598 kilometers
Kobe	1,398 kilometers	1,294 kilometers
San Francisco	8,840 kilometers	7,475 kilometers
New York via the Panama Canal	20,491 kilometers	17,678 kilometers
London	17,482 kilometers	18,064 kilometers
Rotterdam	16,970 kilometers	18,331 kilometers
Hamburg	17,482 kilometers	18,843 kilometers

The three ports in North Korea mentioned above are Unggi, Najin, and Chongjin. Both Unggi and Chongjin were ports located along the coast of the Japanese Sea, and they were ports of local importance. They had trade mainly with the Yen-chi region. In view of transportation, the network including the La-ha to Harbin Railway Line, the Kirin to Hui-ning Line, and the Eastern Lines in North Korea, the Tumen to Chia-mu-ssu Line, which were completed after the Mukden Incident, and in view of the plan for building Najin into a modern harbor, the three ports listed above will have a closer tie with the commerce of Manchuria.

Section 2. Ying-k'ou Harbor

a. A Brief Review of the Commercial Activities in Ying-k'ou is located 13 miles from the mouth of the Liao River. Its principal piers are located on the south bank of the Liao River. All of the piers are owned by the South Manchuria Railway Company, the Manchukuo Customs Office, or private corporations. There are also two or three piers on the north bank of the Liao which are connected with the railway stations of the Peking to Mukden Railway Line.

Although the water level is high and the river is wide, the depth of the Liao River at its mouth is only 7 to 8 feet because of the existence of bars there. Thus the largest ship that can enter the harbor is of 7,000 tons. Most of the vessels entering the harbor are of 2,000 to 3,000 tons. The weak point of this harbor is that it is frozen in the winter. Harbor traffic stops from the last ten days of November of mid-December to the last ten days of March the next year.

b. The Growth of Ying-k'ou is a Port

Readers may get a general picture of the ocean transportation in Manchuria if they take notice of the speed of economic development in Manchuria and of the historical development of international trade in that area. Ying-k'ou was opened as a port in 1858. In the first thirty years it was not discovered that Ying-k'ou was valuable as a port for international trade. Although there were foreign ships calling on this port, trade was conducted on a small scale. Goods were conveyed mostly by small vessels. This is a latent period.

When the two powers, Britain and Russia, competed with each other in building railroads in Manchuria, Ying-k'ou became prosperous rapidly. Thus, the years between 1892 and 1901 marked Ying-k'ou's most rapid growth. Imports and exports transferred at Ying-k'ou at the end of the nineteenth century are given in Table 27 (unit: 10,000 customs taels).

Chief imports were the sundries from Japan, cotton and silk articles produced in India or Japan, metals, hemp bags, coal, American flour, matches made in Japan and Europe, sugar, tobacco, and a large quantity of railway construction material from the US.

Regarding the goods directly exported, i.e., the native products in Manchuria, the volume of export increased yearly following the Chinese-Japanese War and the Russo-Japanese War. Ninety percent of the exports were to Japan. Ninety percent of the exports to Japan consisted of soybeans and soybean products. Other exports included castor oil, sesame oil, tussah silk, etc.

Trade between China Proper and Manchuria had been in progress before the opening of Ying-k'ou as a port, at Niu-chuang and Tien-chuang-t'ai. After Manchuria's economy was developed, trade became improved. When soybean trade was firmly established between Japan and Manchuria, Manchuria's trade with China Proper was somewhat depressed. However, Manchuria's trade with China Proper was still equally large as its foreign trade in volume or in value. Thus Ying-k'ou played a decisive role in domestic trade. Since Dairen had been opened as a free port and since the Southern Manchurian Railway Corporation preferred Dairen as a transport center, Ying-k'ou shifted from a foreign trade center to a port of domestic trade.

Data on the shipping industry of Ying-k'ou are given in Table 28.

/See table on following page/

TABLE 27

IMPORTS AND EXPORTS VIA YING-K'OU AT THE END OF THE NINETEENTH CENTURY

	Vessels		Volume of Trade				
Date	Incoming Vessels	Tonnage (10,000 tons)	Imports From Foreign Countries	Imports From China Proper	Exports	Total	Volume of Trade Directly Handled by Foreign Powers
1872	258	9	221	116	200	537	48
1873	208	7	236	83	158	477	30
1874	256	9	164	79	175	419	32
1875	351	13	174	109	269	551	38
1876	318	11	297	134	264	695	26
1877	276	11	223	152	313	688	25
1878	435	19	363	175	439	977	52
1879	355	16	319	137	365	821	54
1880	337	16	208	130	335	673	41
1881	332	16	154	99	355	608	24
Average	313	13	236	121	287	645	37
1882	316	17	174	126	363	663	25
1883	326	19	181	129	391	701	22

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	Vessels		Volume of Trade				
Date	Incoming Vessels	Tonnage (10,000 tons)	Imports From Foreign Countries	Imports From China Proper	Exports	Total	Volume of Trade Directly Handled by Foreign Powers
1884	282	19	206	163	412	781	25
1885	316	20	226	146	457	830	28
1886	251	16	245	163	453	861	23
1887	302	12	275	123	548	1,036	28
1888	307	22	268	160	569	996	36
1889	253	19	220	168	557	945	33
1890	354	27	447	280	720	1,445	55
1891	433	33	606	293	807	1,706	84
Average	314	21	285	184	528	996	40
1892	428	33	517	213	907	1,636	153
1893	397	30	555	280	931	1,766	284
1894	400	30	534	254	853	1,642	240
1895	230	19	247	128	561	935	145
1896	411	33	811	338	1,128	2,277	544
1897	433	37	900	355	1,381	2,635	719

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	Vessels		Volume of Trade				
Date	Incoming Vessels	Tonnage (10,000 tons)	Imports From Foreign Countries	Imports From China Proper	Exports	Total	Volume of Trade Directly Handles by Foreign Powers
1898	486	41	1,058	442	1,745	3,244	863
1899	582	50	2,178	579	2,062	4,836	140
1900	378	32	773	282	1,147	2,202	660
1901	539	47	1,708	646	1,874	4,226	1,160
Average	428	35	928	354	1,259	2,540	616

TABLE 28

SAILING VESSELS IN YING-K'OU AREA

Types of Junks	Names of Junks	Capacity (in Shihtan)	Ports of Origin	Goods Exported to Manchuria	Remarks
Tientsin junks	Nan-ho, Chieh-ch'iao, Wei-ch'uan	100-1,300	Tientsin	Cowhide, native cotton articles, cotton shoes, straw mats, pans, and other articles	The sum of 300 catties is called a tan. The no. total of junks visiting Ying-k'ou at the beginning of the twentieth century was 2,000
Ning-ho	Pei-ho, Wei-ch'uan	100-1,300	Lu-tai, Pei-tang, Ning-ho	Ashes, mats of reeds, cotton boots	
Lin-yu junks	Pei-tao	100-700	Lin-yu, Lo-ting, Fu-ning, Luan-chou	Lobsters, dry shrimps, dry fish, walnuts, pears, fruit	
Teng-chou junks	T'ung-ch'uan T'eng-yu	100-1,000	Teng-chou Lung-k'ou, Wei-hai-wei, Ch'ing-chow, Laichow, Wu-ting	Wheat, flour, paper, pots large and small, cakes of oats, cakes of wheat	

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Types of Junks	Names of Junks	Capacity (in Shihtan)	Ports of Origin	Goods Exported to Manchuria	Remarks
Ying-k'ou junks	Yen-erh-fei, Kua-la, T'eng-yu, Hung-t'ou	80-350	Chefoo, Tientsin, Yang-ho, Hai-chou Ku-shan	Fish (dried, fresh, and salted), vegetables (fresh and salted), fresh apples, wheat flour, porcelain and pottery, dried dates, cork, salt	
Shanghai junks	The Shark, The South	500-2,200	Shanghai, Hai-chou, Kang-yu	Native cloths, bill folders and purses, fine porcelain, tea, red and green, salted eggs, sundries	
Amoy junks	The Bird, The Seagull	900-2,000	Amoy, Chuan-chou Hsing-hua, Fu-chou	Paper of grades A and B, greaseproof paper, tinfoil, porcelain, bamboos, cork, tea, red and green	
Ningpo junks	The Ning, The Ningpo	900-2,200	Ch'eng-hai, Ningpo	Paper, porcelain, alum, tea, red and green, drugs, mats, bamboos, bamboo articles, and other articles	

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Types of Junks	Names of Junks	Capacity (in Shihtan)	Ports of Origin	Goods Exported to Manchuria	Remarks
Sailing Boats Along the Liao River	Ts'ou-Ch'nan, ox-boats	60-120 60-70	Hsiao-pei-ho, Liaoyang Tieh-ling, Mukden, Hsin-min-t'un, Lou-tai-fang, Tung-chiang-k'ou	Soybeans, kaoliang, millet, grains, hemp and flax, potassium sulphuric acid, tobacco leaf, salt	At the beginning of the twentieth century the number was 10,000.

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Section 3. Port Authur and Dairen Harbors

a. A General Description of Dairen and Port Arthur

Originally the Port of Dairen was a small village located near the coast of the Gulf of Chihli. In 1898, an engineer, named Ko-erh-pei-chi, with the Tung Ch'ing Railway (the Chinese Eastern Railway) made a proposal that the port of Dairen should be so built that it might accommodate 100 ships of 1,000 tons each. He estimated that the Dairen harbor could handle 5,000,000 tons of freight annually. His proposal was finally accepted by the authorities of the Tung Ch'ing Railway. In 1899, 1,000,000 rubles were appropriated for the first construction period. In 1904, when the second period was to start, the Russo-Japanese War broke out. Since Czarist Russia was defeated by the Japanese, it gave Dairen to Japan as stipulated in the Portsmouth Treaty. Subsequently, the Southern Manchurian Railway Corporation made more comprehensive plans for the reconstruction of the port. The Corporation was very active in the building and management of the port. It has invested more than 100,000,000 yen in harbor development.

The port of Dairen is capable of handling 1,200,000 tons of freight yearly. It is considered one of eastern Asia's best ports. It is also the only port in Manchuria which is not frozen in winter. East, west, and north of the port there is a sea wall, 3,980 meters long. Inside the harbor there is an embankment 5,126 meters long. Forty-three steamers of 4,000 tons each can anchor there. The bridges in the harbor area total 1,823 meters. Freight loading and unloading platforms are 3,588 meters long. The Japanese completed the reclamation of an area of 3,640,000 square meters for the harbor. The harbor has 125,930 meters of roads and 232,172 meters of railroads. It also has 72 warehouses and 133 open-air storage places capable of accommodating 1,250,000 tons of freight.

In view of the shortage of piers caused by the heavy ocean traffic, the South Manchurian Railway Company planned to build its first pier at Kan-ching-tzu across the river from Dairen, the purpose of which is purely for loading and unloading coal. The project was started in September 1926 and completed in October 1930. It was a suspension bridge of the caisson type. Four large boats varying from 7,000-10,000 tons can be anchored there. On the bridge there are three lanes for automobiles. The Manchukuo Chemical and Industrial Corporation also built a bridge at Kan-ching-tzu 125 meters long and 12 meters wide for transporting 120,000 tons of minerals and 180,000 tons of ammonia sulfate annually. The bridge which was completed in September 1934 is also known as the Second Pier of Kan-ching-tzu or Manchukuo Chemical Corporation Bridge.

The South Manchuria Railway Company built three cement buoys on the breakwater near Kan-ching-tzu for the purpose of facilitating the transportation of the petroleum of the Manchukuo Petroleum Corporation. One 6-inch and one 12-inch pipe were also installed on the breakwater for the transportation of petroleum.

From the standpoint of harbor facilities, Port Arthur is generally considered as a supplementary port to Dairen. It was used since August 1923 by the South Manchuria Railway Company for the transportation of goods. Its chief exports were coal and salt. Inside the port there are dockyards.

b. Dairen as a Free Port

When Czarist Russia got the right of leasing the Gulf of Dairen, Dairen was opened to all traders as a free port. Even after the Japanese took it over, Dairen remained a free port. As a matter of fact, in April 1906 the Japanese Government notified the world that effective 1 September 1906 Dairen would be opened as a free port. From that time on, both imports and exports have been exempt from tax.

The control of Dairen was Japan's first step toward the invasion of Manchuria. Before the Mukden Incident, the Japanese used Dairen as a center for the exploitation of Manchuria and for the development of a transportation system, mainly the Southern Manchurian Railway. Japan's ultimate objective was the complete conquest of Manchuria. Soon after Manchukuo came to power, Najin, a modern port in North Korea, was built, World War II broke out, and the ocean routes passed through some great changes. Consequently, the policy of using Dairen as a traffic center administered by the South Manchuria Railway Company became obsolete.

Section 4. Hulutao Harbor

In view of the handicap of having only one port, Dairen, through which to transport Manchuria's farm products, Hsu Shih-chang, the governor general of China's Three Eastern Provinces, in 1908 invited, a British engineer to conduct a survey of Lien-shan Wan for the building of a modern port at Hu-lu-tao. When the plan was approved, civil war broke out in the different parts in China. Capital was lacking. As a result the plan was never executed. In 1929, a technical advisor of the Nationalist Government, Man-ti-erh, reiterated the necessity of building a port at Lien-shan Wan. In the meantime, the Peking-Mukden Railway Administration also voiced the same opinion. Subsequently, the Nationalist Government determined in 1930 to go ahead with the proposal of building Hu-lu-tao as a port. The construction part of the project was executed by the Peking-Mukden Railway Administration and the Holland Harbor Construction Corporation. The appropriation for the project was 6,400,000 US dollars. Construction was slated to be completed not later than October 1935.

The Port of Hu-lu-tao is located on Lienshan Wan north of the Gulf of Chihi. The distance between the port and Lienshan Railway Station is 12 kilometers. Hu-lu-tao is considered as the best port on Lien-shan Wan because it is not frozen in winter. However, in the coldest season there are floating masses of ice outside the harbor.

Now we may take a look at the size of the harbor according to the approved plan. It has concrete wharves 3,700 feet in length. It also has 5,700 feet of breakwater built of concrete and another 7,900 feet built of stone. The dredging of the port is 700 square feet in area [sic]. When the port is completed, it will be able to handle 5,000 metric tons of freight.

When the project was not yet completed, Manchuria fell into the hands of the Japanese. All the existing wharves were built by the South Manchuria Railway Company under the Manchukuo regime. Up to the time of the Mukden Incident, this is the progress made by the Peking Mukden Railway Administration with regard to engineering work:

1. The embankments had not been started;

2. 600 feet of the 700-foot long and 75-foot wide breakwater were completed;

3. 600 feet of the 900-foot suspension bridge (75 feet wide) were completed;

4. The excavation plan was one third completed. The rocks excavated from Pan-las Han were used for the building of the suspension bridge and the filling of the Pei Hai.

Section 5. Accomplishments of Harbor Transportation

Since Manchuria has a highly developed transportation system and is rich in resources, a great many Chinese immigrate to that area yearly. Trade is brisk. A great portion of the goods is handled through ports there. This was particularly true before the operation of railways in Manchuria.

Around 1931 the Chinese entering or leaving Manchuria were estimated at 1,500,000. Freight moving in or out of Manchuria amounted to 10,000,000 metric tons. Ninety percent of the freight traffic and 65 percent of the passengers used harbor facilities. Other freight and passenger traffic utilized railways along Shan-hai-kuan and An-tung.

Harbor traffic consists of freight and passengers:

1. Passenger traffic by sea

Before the introduction of railways most of the Chinese people came to Manchuria by sea from Shantung and Hopeh Provinces. They landed on the Liao-tung Peninsula or in the Gulf of Chihli. Then they sailed along the Liao River to the hinterland of Manchuria. After the railways were put into full operation, some of the passengers entered Manchuria from Shan-hai-kuan by the Peking-Mukden Line. Other passengers used the sea route and entered Manchuria via Dairen, Yin-k'ou and An-tung. Regarding the number of immigrants, those who landed at Dairen accounted for the greatest part of the immigrants through the sea routes. The next greatest was those who had landed at Ying-k'ou and An-tung. More immigrants came to Manchuria by railroad than by the sea routes. Besides, there were more than 100,000 people moving in and out the frontiers near Yeh-chi, most of whom were Koreans. Few People entered Manchuria from Vladivostok or from Lupin because of the immigration red tape involved.

There has never been an accurate figure of the population in Manchuria. Before the introduction of railroads into Manchuria, it was estimated that the population of Manchuria was between 11,000,000 and 12,000,000. However, from 1895 to 1944, or in half a century, the population has grown to 47,000,000 due to the natural growth and the immigration from China Proper. Chinese immigrants came mostly by sea. Not many of them came by railroad. Most of them stayed in Manchuria. This is considered a contributing factor in the development of Manchuria.

2. The Relations Between the Ports and the Hinterland

Before the Mukden Incident, the total volume of trade was composed 80 percent of exports and 20 percent of imports. In terms of monetary value, it was composed 60 percent of exports and 40 percent of imports. This shows that Manchuria is a large exporter of raw materials.

[See table on following page]

TABLE 29

PASSENGERS ENTERING OR LEAVING MANCHURIA BY LAND OR BY SEA

Unit: 1,000

Year	Entering Manchuria (A)			Leaving Manchuria (B)			Gain (A-B)	Remarks
	Sea Routes	Railway	Total	Sea Routes	Railway	Total		
1925	335	198	533	165	49	124	319	
1926	440	167	607	204	96	300	307	
1927	832	328	160	217	99	317	843	
1928	712	363	1,075	274	107	381	694	
1929	715	331	1,046	312	290	602	444	
1930	554	194	748	312	176	488	260	
1931	342	126	468	313	148	461	7	
1932	310	104	414	379	120	500	-84	Manchukuo founded
1933	516	107	633	347	150	497	136	
1934	608	149	757	438	109	547	210	
1935	335	177	512	272	227	499	20	

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Year	Entering Manchuria (A)			Leaving Manchuria (B)			Gain (A-B)	Remarks
	Sea Routes	Railway	Total	Sea Routes	Railway	Total		
1936			423			436	-13	
1937			362			297	65	
1938			574			283	291	
1939			1,162			448	714	

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The relations between ports and the hinterland may be described as follows:

1. Dairen

With the exception of western Jehol Province, the valley of the Ya-lu Ho, Chien-tao, and the border zones between China and the USSR in North Manchuria, all the localities are considered the hinterland of Dairen.

2. Ying-k'ou

In some respects Ying-k'ou is similar to Dairen but it is less attractive than Dairen as a seaport.

3. An-tung Port

With the valley of the Ya-lu Ho as its hinterland.

4. Ports located in North Korea

With Yen-chi and its neighborhood as their hinterland.

5. Vladivostok

Northern Manchuria as its hinterland.

6. Ching-huang-tao and Tientsin

With western Liaoning Province and a part of Jehol Province as their hinterland.

From the above description it can be seen that both Dairen and Ying-k'ou have the same hinterland. Before the establishment of railroads and before the completion of Dairen as a port trade in Manchuria was mostly carried on in Ying-k'ou. After the South Manchuria Railway Company opened Dairen as a free port in 1909, the center of freight traffic shifted there with freight rates for the two ports standardized. In 1911 when the An-tung harbor construction project was completed, a standard freight rate was also applied there. From then on, goods transported to Fan-chih-t'un and further north were charged a uniform rate regardless of whether they were from Ying-k'ou, Dairen, or An-tung. This made Dairen very prosperous. To stimulate business in Ying-k'ou, the South Manchuria Railway Company lowered the freight rate there in November 1919. Despite this, the volume of trade handled at Ying-k'ou could hardly match that at Dairen.

In freight transportation Ying-k'ou is inferior to Dairen for the following reasons:

1. The freight rate and other expenses are higher;

2. Shipping insurance is higher. In addition, shippers are required to buy fire insurance when the goods arrive on land;

3. Ying-k'ou is frozen in the winter time during which vessels cannot enter;

4. Vessels above 2,000 tons cannot enter Ying-k'ou;

5. Vessels making transit stops there are subject to customs inspection;

6. The price of silver is subject to great fluctuation. This has been a handicap to trade.

Among all the ports in Manchuria (including Vladivostok), Dairen is leading in the volume of exports. Next to Dairen are Vladivostok, Ying-k'ou and An-tung. Dairen also takes the lead in sharing the volume of imports. Next to it are Ying-k'ou, Vladivostok, and An-tung. Trade volume handled at other ports is insignificant.

3. Freight Traffic by Sea

The destinations of freight traffic at the ports in Manchuria are listed as follows:

1. Trade originated from Dairen is spread over the world with South China, Japan and Europe as its main destinations.

2. Trade from Ying-k'ou goes mainly to China Proper.

3. The main trade area for An-tung is Japan.

4. The main trade area for North Korean ports is Japan.

5. Vladivostok is a trading port with Japan and Europe. The volume of trade with Japan is greater than that with Europe.

Imports and exports from and to the above-mentioned ports are given in the following tables.

[See table on following page]

TABLE 30-A

PRINCIPAL IMPORTS AND EXPORTS THROUGH PORTS IN MANCHURIA (DAIREN)

		Exports Through Dairen									
				Native Products							
Year	Combined Total Not Including Coal for Ships	Total	Soybeans	Kaoliang	Cereals	Soybean Cake	Soybean Oil	Coal	Iron	Others	Coal for Ships
1907	173	168	77	4		87			5		
1908	661	539	260	16		258	5	19	103		26
1909	931	757	270	73		198	16	133	41		58
1910	913	702	270	81		325	26	174	37		63
1911	849	689	179	58		410	42	113	47		66
1912	1,229	778	161	110		459	48	380	71		140
1913	1,435	752	131	15	68	489	49	600	83		206
1914	1,722	1,098	342	35	158	509	54	525	99		262
1915	1,462	946	159	20	67	619	81	357	159		206
1916	1,711	1,053	179	53	83	633	105	510	148		215
1917	1,994	1,260	171	69	90	790	140	461	273		210

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Imports Through Dairen

Combined Total	Cereals	Sugar	Flour	Cotton Cloth	Lumber	Cement and Lime	Metals	Paper	Hemp Bags	Others
206			1	2	31	1	6	2		163
283	14	2	5	8	66	19	14	2		153
251	12	4	8	7	40	21	13	3		143
371	20	6	6	12	48	21	28	5		225
362	24	5	19	20	45	10	19	6		214
425	35	8	44	25	34	8	18	10		243
500	44	12	45	28	47	21	26	10	12	255
437	56	8	12	18	46	15	20	11	22	229
514	89	11	22	17	31	8	26	11	14	285
553	45	17	13	18	19	9	42	11	18	361
809	91	37	30	25	30	17	67	10	28	474

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1918	2,347	1,661	351	39	142	959	170	406	280		246
1919	2,645	2,096	566	54	294	995	187	211	338		190
1920	2,958	2,511	542	78	621	1,132	138	217	230		244
1921	3,274	2,248	501	200	354	1,085	108	708	318		430
1922	4,030	2,585	666	387	350	1,062	120	1,120	325		708
1923	4,140	2,356	670	140	212	1,216	118	1,424	360		636
1924	4,586	2,436	700	142	239	1,260	95	1,778	372		528
1925	4,960	2,554	773	222	311	1,143	105	1,978	428		548
1926	5,221	2,431	695	121	331	1,158	126	2,296	494		745
1927	5,996	2,796	1,109	246	334	997	110	2,613	220	367	627
1928	6,458	3,006	1,569	169	345	845	78	2,830	188	434	611
1929	6,965	3,637	2,160	89	383	889	116	2,696	165	472	605
1930	4,986	2,148	950	63	351	676	108	2,225	166	447	453
1931	5,973	2,969	1,441	146	317	925	140	2,400	217	387	507
1932	6,551	3,514	2,079	111	340	884	100	2,285	352	400	653
1933	6,698	3,277	1,863	69	568	717	60	2,689	327	405	727
1934	6,959	3,635	1,930	69	744	807	85	2,564	305	455	701

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944	52	64	27	44	29	34	74	15	22	583
1,370	94	20	30	46	76	56	101	18	34	895
754	32	14	10	27	60	24	62	7	26	492
689	35	28	36	35	9	33	58	15	55	385
657	29	20	48	40	7	29	68	19	18	379
821	43	15	127	28	12	38	73	18	25	442
853	46	27	132	35	12	8	84	31	28	450
938	29	34	144	29	26	17	76	36	39	508
1,006	29	26	133	21	50	33	93	32	43	548
976	47	29	50	26	59	19	153	30	47	516
1,252	28	40	112	38	119	12	190	37	46	630
1,447	35	49	164	38	161	23	230	47	60	640
886	50	30	78	27	59	12	99	40	33	458
874	24	66	103	41	62	15	94	36	46	387
1,465	31	72	248	62	97	17	185	54	55	644
2,326	84	90	265	61	216	140	406	87	56	921
3,074	74	70	388	56	270	220	609	99	54	1,234

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1935	6,070	3,045	1,607	54	553	733	98	2,079	199	747	782
1936	5,671	2,490	1,377	57	456	540	60	1,805	150	1,226	715
1937	5,746	2,823	1,424	69	650	608	72	1,585	157	1,181	726
1938	5,376	3,037	1,408	122	686	758	63	1,018	146	1,175	733
1939	4,802	2,564	830	148	583	941	62	796	300	1,142	625
1940	3,258	1,305	500	29	313	445	18	679	284	993	534
1941	2,978	787	274	23	209	268	13	646	510	1,035	535
1942	3,735	1,120	362	13	198	540	7	635	623	1,357	346
1943	2,198	540	51	18	190	273	8	365	102	1,191	212

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2,940	138	113	255	39	216	122	523	118	53	1,363
3,138	169	172	114	62	234	95	365	159	64	1,704
3,352	46	166	86	94	270	14	295	182	59	
4,333	90	138	140	92	480	119	894	205	81	
5,338	72	126	288	111	1,001	146	992	240	65	
4,382	130	70	194	65	295	301	653	141	36	
3,657	116	50	110	54	68	145	466	134	38	
3,379	13	68	39	56	35	7	329	92	31	
2,268	98	49	61	49	19	3	209	83	33	

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Vegetables and Fruit	Coal	Mineral Ores	Mineral Oils	Others
167	13	215	386	1,313
260	75	147	330	1,485
258	210	147	399	1,483
164	687	151	211	1,263
125	316	149	59	2,060
49	170	177	52	1,216

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TABLE 30-B

PRINCIPAL EXPORTS AND IMPORTS THROUGH PORTS IN MANCHURIA (PORT ARTHUR, YINGKOU AND ANTUNG)

Unit: 1,000 tons

Port Arthur

Year	Exports: Combined Total Not Including Coal for Ships	Exports: Coal	Exports: Granite	Exports: Salt	Exports: Others	Exports: Coal Used in Shipping	Imports: Combined Total	Imports: Salt	Imports: Saltpeter	Imports: Coal	Imports: Others
1910											
1911											
1912											
1913											
1914											
1915											
1916											
1917											
1918											
1919											
1920											
1921											
1922											
1923	75	61		8	6	14					

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Table 30-B (continued)

Yingkou

Exports

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Total Excluding Coal for Ships	Soy-beans	Cereal Seeds	Bean-cake	Coal	Granite	Saltpeter	Metals	Others	Coal Used in Shipping
27									
185									
231									
343	38	3	4	292				6	41
369	29	6	12	316				6	30
311	241							70	35
114	26	4	8	69				7	20
80	22	20	6	16				16	15
112	27	17	2	39				27	19
127	47	14	15	42				9	24
131	56	26	37	5				7	20
252	76	97	46	28				5	20
234	82	90	26	32				4	31
176	55	47	35	28				11	31

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Table 30-B (continued)

[Yingkou (continued)]

Total	Cereals	Lumber	Imports Salt	Flour	Sugar	Cotton Cloth	Metals	Paper	Mats	Others
1										
71										
73										
70	5									65
43	6				3	8				26
44										
38	3			1	3	7				24
41	3				4	7				27
69	17				3	8				41
91	26					7				58
87	9				1	10				67
29	1				2	7				19
18	1					4				13
36	2			3	1	7				23

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Table 30-B (continued)

Total	Antung Exports: Soybean	Cereals	Beancake	Coal	Lumber	Others	Coal Used in Shipping
4							
47	7	2	27	4	6	1	2
34	10	3	16	1	2	2	2
52	4	2	30	4	10	2	6
22	1	1	7	3	5	5	3
18		1	1	6	8	2	2
22		2	4	10	5	1	5
87	8	13	36	6	21	3	5
24	1	2	6	8	6	1	5
72		4	52	2	11	3	7
51		5	28	4	9	5	2
75		4	43	4	17	7	3

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Table 30-B

Antung

Imports

[Adjoins page 103 here.]

Total	Cereal	Lumber	Flour	Sugar	Cotton Cloth	Cement	Metals	Paper	Others
36									
43		20	11	1		2			9
36		25	3			1			7
66		56		1		1			8
192		184				2			6
268		264				1			3
150		147				2			1
258		252				2			4
163		157				3			3
179		173				1			5
175	1	167				1			6
188	2	178	2			1			5

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Table 30-B

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1924	268	251		10	7	17	9	9			
1925	400	371		20	9	31	11	11			
1926	358	332	10	14	2	25	15	15			
1927	365	321	2	42		26	27	25			2
1928	323	283	9	31		28	19	16			3
1929	482	440	11	31		32	24	18			6
1930	534	480	15	39		35	29	26			3
1931	342	304	8	30		26	23	23			
1932	199	155	12	32		16	27	26			1
1933	199	149	15	35		25	33	31			2
1934	251	193	17	40		27	20	15	2	2	1
1935	254	196	12	46		30	34	29			5
1936	228	173	8	47		23	28	24			4

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187	50	32	28	68				9	41
353	71	66	19	183				14	53
502	49	118	16	311				8	50
356	81	52	18	174			12	14	51
482	37	111	23	190			50	71	69
699	52	64	83	354			63	83	66
1,040	112	88	35	669	30	15	67	24	53
1,462	259	210	37	784	36	11	101	24	71
1,078	164	149	106	484	27	19	106	23	57
947	89	99	143	423	52	41	75	25	86
1,193	102	136	90	567	53	46	160	37	131
1,086	122	66	40	456	60	59	218	65	114
1,106	151	96	62	402	74	84	176	61	81

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27	4		7			3	1		3	9
48	2		9			5	4	2	5	21
84			38	1		2	10		9	24
73	1		54				3		7	8
53	6		6	13	2	1	4		3	18
127	4		48	30	5	2	3	3		32
69	23		3	10	4	2	3	2		22
71	19			8	3	2	2	1		36
98	15		10	32	1		1	1	2	36
220	22	46	5	41	2	2	2	5	1	94
354	39	114	14	49	6	2	5	7		116
279	35	62	8	59	10	2	2	9	1	91
278	58	36	20	30	8	1	2	12	4	107

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19		3	5	4	5	2	3
22	3	1	6	6	4	2	3
31		1	19	3	7	1	3
20	1	1	10	2	5	1	3
16	1	3	3	4	4	1	2
17		3	7	4	1	2	2
13		3	6	3		1	
12	2	3	1	3		3	
12		5		4	1	2	5
16	3	7	1	3		2	5
24	4	9	5	1		5	12
25	1	3	3		2	16	12
21	5	3	1	6	1	5	8

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85	4	79			1			1
107	4	90	1					4
148	1	138	1		1	1		6
143	2	132				1		8
114		103	1	1		1		8
104	1	87	6	1				9
46		30	3	2		1		10
47	1	30	3	1		1	1	10
50		25	10			1	1	13
164	3	113	23	1	1	1	2	20
199	6	146	19	1	2	1	1	23

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Table 30-B

1937		
1938	56	60
1939	91	133
1940	194	137
1941	94	174
1942	63	163
1943	110	100

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525 423 390 235 101 25

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349 471 214 290 131 12

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26
40
34
23
26
21

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146	3	92	25		2	2	3	19
143	6	90	11	1	2	1	2	30
125								
224								
73								
73								
61								
44								

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TABLE 30-C

PRINCIPAL EXPORTS AND IMPORTS THROUGH PORTS IN MANCHURIA (HOPEH, HULUTAO, CHONGJIN, NAJIN, AND UNGGI)

Hopei

Exports

Year	Total	Soybean	Kaoliang	Cereal	Beancake	Cotton Seeds	Cotton	Liquorice Root	Others
1933									
1934	184	72	31	43	20	7		2	9
1935	108	52	10	24	10	6		2	4
1936	131	46	19	36	10	8	2	4	6
1937									
1938	171								
1939	54								
1940	20								
1941	20								
1942	21								
1943	25								

TABLE 30-C

Hopei

Imports

Total	Cereals	Timber	Salt	Flour	Sugar	Cotton Cloth	Paper	Others
83		9	14	38	4	2	2	14
85	1	10	12	40	4	1	1	16
82	3	5	13	23	4	4	6	24
143								
113								
79								
63								
72								
42								

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Table 30-C

Hulutao

Exports						Imports						
Total	Soybean	Kaoliang	Cereals	Cottonseed	Mineral Ores	Total	Rice	Flour	Sugar	Metals	Groceries	Others
20	4		15	1		7		4	1		2	
6	3		3			17	1	8	1	1	5	1
28	8	4	12	1	3	21	1	6	6	1	2	5
55						44						
97						108						
147						43						
137						30						
42						9						
4						3						

[Adjoins page 118 here.]

Table 30-C

Chongjin

Exports

Total	Soybean	Cereals	Bean Oil	Fish Oil	Fish, Dried	Timber	Mineral Ores	Others
121	32	54		4	17	4		10
174	53	8	52	7	9	12	6	27
329	83	29	84	32	48	9	5	39
407	180	20	34	43	71	9	5	45

Table 30-C

Chongjin

Imports

Total	Cereals	Flour	Sugar	Vegetable and Fruit	Cotton Cloth	Cement	Metals	Others
33		5	1	1		4	5	17
120	3	30	4	8	3	16	6	50
268	21	24	6	24	4	14	23	152
327	25	9	5	31	5	19	37	196

[Adjoins page 117 here.]

Table 30-C

Najin

Exports						Imports							
Total	Soy-bean	Cereals	Beancake	Flour	Others	Total	Cereal	Flour	Sugar	Vegetable and Fruit	Cement	Metals	Others
17			16		1	9	1	1	1	1	1	1	3
158	141	1	10	4	2	32	1	2	1	3	4	7	14
709						133							
372						363							
184						286							
180						314							
377						305							
343						231							

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Table 30-C

Unggi

Exports

Total	Soybean	Cereals	Beancake	Perilla	Fish Oil	Fish, Dried	Timber
40	20	15				4	1
134	61	14	17			8	34
233	52	20	46	9	8	26	72
255	48	17	28	30	8	21	103
225							
177							
149							
72							
52							
43							

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Table 30-C

Unggi

Imports

Total	Cereals	Flour	Sugar	Vegetables and Fruits	Cotton Cloth	Cement	Metals	Others
47	7		3	1		17	12	7
81	2	12	1	2	1	17	4	42
123	5	15	1	4	2	19	23	54
109	6	5	2	4	2	27	36	17
72								
146								
62								
45								
2								
1								

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BOOK III. ADMINISTRATION OF THE TRANSPORTATION SYSTEM IN MANCHURIA

TRANSPORTATION POLICY OF MANCHUKUO

Section 1. Brief History of the Ministry of Communication of Manchukuo

After the Mukden Incident, with the exception of the South Manchuria Railway and its affiliated railways which were still in operation, other railway lines like the Mukden-Hai-lung, the Kirin-Hai-lung, the Ch'ang-ch'un-Kirin, the Kirin-Tung-hua, the Hu-lun-Hai-lung, the Ch'i-ch'i-ha-erh-K'o-shan, the T'ao-nan-Ang-ang-ch'i, the T'ao-nan-So-lun and the Ssu-p'ing-T'ao-nan were almost forced to suspend their operations. In October 1931 the chief executives of the lines just mentioned held a conference in Mukden in which it was decided that a Temporary Communications Committee be established so that the functions of railway administrations could be restored. In March 1932 Manchukuo was founded. It proclaimed the organic laws of the Manchukuo Government and of the State Council under Government Orders 1 and 6. Communications Temporary Committee was then dissolved. Its function was taken over by the Ministry of Communication.

The Ministry of Communications was authorized to be in charge of the operations of railways, highways, waterways, harbors and ports, navigation, aviation, postal administration, telephone and telegraphs. The chief of the Ministry of Communication was called the Director General. On 1 March 1934 the government system was changed to a monarchy and the directors general were called Ministers.

Section 2. Organization of the Manchukuo Ministry of Communications

A. Organization of the Ministry

Under the Ministry there were four divisions: the Division of General Affairs, the Division of Railways, the Division of Waterways and the Division of the Post Office. In 1933, the four divisions were reorganized into three divisions: the Division of General Affairs, the Division of Roads and the Division of the Post Office. In subsequent years, the administrative structure of the ministry was changed many times corresponding to changes in communication policies. In 1937 the Bureau of Civil Engineering formerly under the Ministry of Interior was incorporated into the Ministry of Communications. At that time the Ministry of Communications comprised the Office of the Minister, the Division of Railways, the Division of Waterways and the Division of Highways with the General Office of Postal Administration being an independent agency directly under the control of the Minister. In 1939, the system of one Minister's office, five divisions and one independent bureau was adopted. The new system consisted of the office of the Minister, the Division of Railways, the Division of Highways and Roads, the Division of Waterways, the Division of Aviation, the Division of City Planning and the General Office of the Postal Administration as an independent bureau directly under the Minister. Besides, the Central Observatory was also put under the control of the Ministry of Communications. In 1943, the Division of Highways as well as the Division of City Planning were abolished and a new division named the Division of Reconstruction was set up.

B. The Ministry of Communications had a number of agencies in charge of administration of communications at local level.

In 1933 navigation was established at Ying-k'ou, An-tung, Harbin. These bureaus had branch offices at Hei-ho, Chia-mu-ssu, Hu-lu-tao, Kirin and other localities.

In 1937 civil engineering offices were established at Tu-men, Mu-tan-chiang, Tung-an, Hei-ho, Hailar, Ying-kou, Chin-hsien to be in charge of the construction projects of the Ministry. In addition, there was the office of River Conservation and Survey at Ch'ang-ch'un, and the River Conservation Project Engineering offices established at Chang-wu, Ying-k'ou, and Chin-hsien.

In 1939 the Bureau of Reconstruction of Ta-tung Port was established at An-tung for the construction of the new port.

Aviation agencies were established at Ch'ang-ch'un, Mukden, Ch'i-ch'i-ha-erh, Ch'eng-te, Harbin Mu-tan-chiang. In addition to the Central Observatory, there were some local observatories. All of them were under the control of the Ministry of Communications, and were in charge of aviation meteorology and weather forecasting.

The bureaus, agencies, offices and organizations were all under the jurisdiction of the Ministry of Communications. At the provincial government level, there were the commissions of communications and the divisions of highways. In the municipalities, there were the offices of Communications or the divisions of Communications. In the hsien government of ch'i governments, there were the offices of civil engineering or the offices of Communications. All these agencies at various levels of the government constituted the administration of communications.

Agencies whose function corresponded to those in the Ministry of Communications included the subordinate agencies of the South Manchuria Railway Company like the bureaus of railways and the bureaus of Inland river navigation. All of them were scattered at various places. All in all, the organization structure of the communication system in Manchuria was highly developed.

Section 3. A Review of Manchukuo's Transportation Policy

A. An Outline of Manchukuo's Transportation Policy

On 1 March 1933, the Manchukuo regime issued the General Policy for Economic Reconstruction. The fourth section of the directive dealt with transportation policy which may be summarized as follows:

1. Railways:

The chief objective to be attained in the reconstruction of railways was the development of the rich resources in Manchuria, the strengthening of national defense, and the maintenance of peace and order. It was planned that a total mileage of 25,000 kilometers of railways in Manchuria will be built in the future. In the first ten-year period, 4,000 kilometers of railway will be built. At the end of the first ten-years, the total railway mileage will be 10,000 kilometers. The major railway lines will be under the control of the Manchukuo regime.

2. Ports and Harbors:

The administration of ports and harbors is vital to the development of natural resources. In addition to the utilization of the ports and harbors already built up in Manchuria, the Manchukuo Government attempted to use the facilities in the ports and harbors of its neighboring counties. The first step taken by the government was the rebuilding of the two ports Ying-k'ou and An-tung. When there is a need in the future, efforts will be made to rebuild Hu-lu-tao. With regard to ocean transportation, initial efforts would be made to develop coastal shipping. Transocean navigation will be developed by gradual steps.

3. Inland Rivers:

Because of the importance of inland river navigation, the greatest efforts would be made in the development of inland river navigation along the Amur, Sungari, Ya-lu-Ho and Liao Ho.

4. Highways:

It was planned that within ten years 60,000 kilometers of highways would be either newly built or repaired, so that automobile transportation would be brought to its full development. This would not only shorten the distance between cities, but also bring closer cities and villages and thereby facilitate the maintenance of social peace and order.

5. Telecommunications:

The government planned to install telecommunication network in Manchuria and to expand its telecommunication facilities with overseas. Communications facilities including telegraph, wireless, telephone, broadcasting would be put under a centralized administration.

6. Aviation:

Great efforts would be made to develop aviation. The Manchukuo Aviation Corporation, which was in possession of better facilities and techniques, would take up the responsibility in the development of aviation. It was decided that within three years, 3,500 kilometers of air lines would be put into operation. It was further planned that in the future, aviation lines linking with Europe and some important cities in East Asia, would be established.

7. City Planning:

It was decided that the old Ch'ang-ch'un would be completely reconstructed as a modern city. It would be a city of 250 square kilometers for a population of 500,000. In due course, Mukden, Harbin, Kirin, and Ch'i-ch'i-ha-erh would be rebuilt modern cities.

From the description given above, it could be seen that soon after the founding of Manchukuo, the government had concrete plans for the reconstruction of the transportation system in Manchuria. It planned to develop an adequate transportation network for the benefit of national defense, social peace and order, political and economic development. To ensure greater efficiency through a centralized control system, the Manchukuo Government entrusted the South Manchuria Railway Company with the management of all the railways in Manchuria. After the latter received such an assignment in February 1933, it mobilized all its financial, material and human resources for administering the railways.

In 1937 Manchukuo implemented its first Five Year Plan for the development of the rich resources in Manchuria. Since it planned to develop agriculture, forestry and mining, the need for better transportation was deeply felt. Because of the changes in international situation the Manchukuo regime was called upon to implement immediately its various plans for resources development in the north, f6r the increase of farm production for improving the living standards of the people and for strengthening national defense. The fulfillment of these plans would be to a great degree, dependent upon the capacity of transportation. Subsequently, efforts were made for reorganizing the transportation system. In 1941 when the Pacific War had broken out, Manchuria became the supply base of the Japanese military activities. Consequently, the transportation policy of the Manchukuo regime was reorientated upon as a wartime basis and the transportation system was put under military control until Manchukuo was returned to China on 15 August 1945.

B. Laws and Regulations on Transportation Administration in Manchuria:

Laws and regulations concerning transportation issued by Manchukuo are given in Table 31:

[See table on following page]

TABLE 31

RAILWAYS

Name of the Laws	Date of Publication	Serial No of Laws	Contents	Remarks
Railways Laws	9 Feb 1933	Message No 7	Policies on activization of railways	
Regulations on Railway Operations	11 Sep 1934	Mandate No 113	Standards for railway operations	On handling sick passengers and explosives
Regulations on Privately-owned railways	5 Sep 1935	Mandate No 109	On Private ownership in railways	(1) By-laws (2) Regulations on construction of privately-owned railways
Regulations on Subsidies to Privately-owned railways	2 Sep 1937	Mandate No 267		
Laws on Railways for Special Uses	11 Nov 1935	Ministry Order No 21		(3) On operations, signals and safety
Laws on the Operations of Railways for special uses (hauled by man or animal)	16 May 1936	Ministry Order No 16	Requirements for building special railways	(4) On the employment system

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		2. Automobiles		
Laws on Automobile Transportation	11 Mar 1937	Mandate No 27	Rules on Passenger and Freight Transportation by Automobiles	
Laws on Automobile Transportation	1 Oct 1941	Mandate No 220	Rules on Passenger and Freight Transportation by Automobiles	Rules on Restriction of Automobile Transportation. Rules on Restriction of Automobiles
		3. River Transportation		
Laws on Inland River Transportation	21 Jun 1933	Message No 49	Regulation of passengers and transportation	
Regulations on Shipping	29 Nov 1937	Message no 356		
Vessel Registration Act	1 Dec 1937	Mandate No 372		
Regulations for the Vessel Registration Act	1 Dec 1937	Mandate No 381		
		4. In Relation to the Operation of Ports and Harbors		
Harbor Standards Act	21 Apr 1938	Mandate No 63	Inspection of harbor operations in Ying-k'ou, An-tung and Hu-lu-tao	

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Regulations on Measuring Ship Tonnage	6 Jun 1940	Mandate No 151	Tonnage standards
		5. Rivers and Streams	
Laws governing The Nationalization of rivers	20 Dec 1938	Mandate No 292	Nationalization of Rivers and supervision of their use
		6. Aviation	
Laws Governing Aviation	27 May 1937	Mandate No 104	General rules on air transportation
		7. Transportation in General	
Transportation Law	4 Jun 1937	No 133	Rules on transportation firms of small size
		8. Laws and Regulation Related to Transportation	
Laws on Tonnage Tax	18 Jun 1934	Mandate No 48	
Laws Governing City Planning	12 Jun 1936	Mandate No 82	
Maritime Law	24 Jun 1937	Mandate No 135	

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Regulations for Maritime Law	25 Nov 1937	Mandate No 319
Customs Law	1 Dec 1937	Mandate No 319

The following sections deal with Manchukuo's policies on rail, automobile, river and air transportation.

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Section 4. Manchukuo's Policy Toward Railways

A. Nationalization of Railways

After the Manchukuo regime was founded, it recognized fully the significance of rail transportation in national defense and political and economic development and especially in social welfare, culture and industrial development. On 9 February 1933, the railway Law, Public Order Number 7 was issued in which the policy governing the operations of railways was stipulated.

According to the Law, with the exception of certain railways which would be allowed to remain under private ownership because they are either local railways or railways for special uses, all railways are to be nationalized. In addition, the gauge of all the nationalized railways must be of the same width, 1.435 meters. To standardize the operation of the railways already built, the Manchukuo Government took over the Mukden-Hai-lung line, the Hu-lan-Hai-lun Line, and the railway lines owned by the Ch'i-ch'-ha-erh - K'o-shan Line and all the affiliated enterprises of the railways mentioned. In the first year, the Laws on Railway Operations (Mandate 113) was promulgated protecting the interests of the owners of the railways and the users.

There were diverse opinions on what should be the best policy to govern railway management and what should be the criteria for building new lines. After a discussion it was agreed that on economic and technical grounds it would be much better to trust the South Manchuria Railway Company with the management of the railways since the corporation has years of experience in the management of railways. Thus, on 9 February 1933 the Manchukuo Government signed a contract with the South Manchuria Railway Company under which the Company was authorized by the Manchukuo regime to manage the nationalized railways, and the nationalized shipping lines of the Sungari River and its subsidiaries. The following is an analysis of the terms of the contract.

1. The properties and income therefrom of the Kirin-Ch'ang-ch'un Railway, the Kirin-T'ung-hua Railway, the Ssu-p'ing-T'ao-nan Railway, the T'ao-nan-Ang-ang-ch'i Railway, the Ch'i-ch'i-ha-erh-K'oshan Railway, the Hu-lan-Hai-lun Railway (including a part of the shipping line of the Sungari), the Mukden-Hai-lung Railway and the Mukden-Shan-hai-kuan Railway (including the Ta-hu-shan-Tung-liao Line and its affiliated port facilities would be used as security for the credit loans of 130,000,000 Japanese yen arising from the construction of these railways. Under this agreement the Company would administer these lines.

2. Debts the Manchukuo Government owed to a third party would be paid off upon consultation with the South Manchuria Railway Company, and be charged to the income from the railway operations. The loans borrowed from the Sino-British Company for the construction of the Shan-hai-kuan-Mukden Line would also be paid off from the operating income. However, operating income from the Shan-hai-kuan-Mukden Line would not be used as a surety for another new loan before the loans owed to the Sino-British Company were settled.

After the separation of the Mukden-Shan-hai-kuan Line from the Peking-Mukden Railway, the Manchukuo Government paid in 1932 to the Sino-British Company, 65,850 pounds to redeem its loan. The balance of the loan would be paid annually according to the schedule.

3. The Manchukuo Government entrusted the South Manchuria Railway Company with the construction of three railway lines: from T'ung-hua to T'u-men River; from La-ha to Harbin; and from Tai-tung to Hai-lung. The cost was about 100,000,000 yuan.

4. To facilitate the construction of the railway between T'ung-hua and T'u-men, the Manchukuo Government bought the Wei-ch'ang T'u-men Light Railway with a 6,000,000 yen loan from the South Manchuria Railway Company.

From the above analysis, it can be seen that the operations of the existing railway lines and the construction of new lines were controlled exclusively by the South Manchuria Railway Company. On 1 March 1933, the South Manchuria Railway Company assigned the Mukden Railway Administration to operate the trust railway lines, waterways and their subsidiary enterprises. In the meantime, a bureau of railway construction was created for planning and building new lines, ports and related enterprises.

The railways handed over to the South Manchuria Railway Company included seventeen lines operated by nine railway administrations with a total length of 2,949.6 kilometers. They were the Mukden-Shan-hai-kuan Line, the Mukden-Hai-lung Line, the Kirin-Hai-lung Line, the Kirin-T'ung-hua Line, the Hu-lan-Hai-lung Line, the Ch'i-ch'i-ha-erh-K'o-shan Line, the T'ao-nan-Ang-ang-ch'i Line, the T'ao-nan-So-lun Line, the Ssu-p'ing-T'ao-nan Line, and so on. Among them, the Mukden-Hai-lung Line, the Hu-lan-Hai-lun Line and the Ch'i-ch'i-ha-erh-K'o-shan Line were formerly owned by government and private individuals. Under the Railway Law, the Manchukuo Government purchased them by issuing a 12,000,000 yen, 6-percent bond. The Manchukuo Government also liquidated the financial losses incurred by the railways it purchased. After the purchase, debts owed by the Mukden-Shan-hai-kuan line to the Sino-British Company were also transferred to the settlement of South Manchuria Railway Company.

B. Policy Toward the Railways Under Private Ownership

Before the founding of Manchukuo and in addition to the South Manchuria Railway Company, there were nine railways privately owned. They were the Mukden-Hai-lung Line, the Hu-lan-Hai-lung Line, the Ch'i-ch'i-ha-erh-k'o-shan Line, the Kai-feng Line, the Ch'i-ch'i-ha-erh-Ang-ang-ch'i Line, the Hsi-hsueh Line, the Wei-ch'ang-T'u-men Line, the Ho-kang Line and the Mu-leng Line. There were also two railway lines in Harbin and Mukden which belonged to private owners. Since the founding of Manchukuo the Mukden-Hai-lung Line, the Hu-lan-Hai-lun Line, the Ch'i-ch'i-ha-erh-K'o-shan Line and the Wei-ch'ang-T'u-men Line were purchased by the government. Thus there were only seven lines remaining in private ownership.

The density of railway lines in Manchuria is small since Manchuria is a vast area and has rich resources. The existing railway lines are inadequate to meet the needs. Thus, in addition to taking direct control of the main railways the government encouraged private citizens to invest in local railways. Subsequently, the Ministry of Communications of Manchukuo started its surveys of the regional economic conditions for the planning of new railways, on the other hand, promulgated laws governing privately-owned railways and stipulated regulations on subsidies to privately-woned lines.

In accordance with the regulations governing the subsidies to privately-owned railways, the owner of a railway is entitled to a government grant for ten years from the date of registration. The amount of the grant is proportional to the paid-in capital collected each year. In other words, the subsidies are equal to one fourth of the annual paid-in capital before the railway is opened for traffic and equal to one sixth of the annual paid-in capital after the railway is put into operation.

The government also subsidized the new railways by giving them a grant to meet the payment of interest. The amount of subsidy corresponded to one quarter of the interest of a loan. The grant continued for ten years from the date of registration or from the date when the loan became effective. However, such a grant applied to railways of a 1.435-meter gauge only.

Despite that the policy of subsidizing privately-owned railways was implemented at a time when railway construction materials were extremely scarce, those who were enthusiastic in the development of local industry made steady efforts. Some of the privately-owned railways even merged for greater efficiency. Consequently, great successes have been made in the construction of railways.

/See table on following page/

A. RAILWAY LINES COMPLETED BEFORE MUKDEN INCIDENT

	Name of Railway Company	Terminals	Length (kilometer)	Gauge (Meter)	Date of Founding	Capital	Capacity of Transportation	Type of Motive Power	Remarks	Subsidiary Business
1	The Kai-feng Railway Company. Ltd.	From Shih-yu-tai to Hsi-feng	63.7 Kilo-meters	1.000	Starting in 1925; completion in 1926	2,820,000	1,100,000 tons	steam		Bus services in Sian and Hsi-feng
2	The Ch'i-ch'i-ha-erh Ang-ang-ch'i Railway Company	From Ch'i-ch'i-ha-erh to Ang-ang-ch'i-hsi	26.2	1.000	Starting in 1907; completion in 1908	320,000 ounces of silver		steam	suspended in 1926	
3	The Hsi-hsueh Railway Company	From Pen-hsi-hu to Niu-hsin-tai	24.0	0.763	1924	570,000 Japanese yen		steam		
4	The Wei-ch'ang T'u-men Light Railway	From Chao-yang-ch'uan to Yen-chiang	111.0	2.60	1913			steam		
5	The Ho-li Coal Company (in managing a Railroad)	From Lien-chiang-k'ou to Hsing-shan-chen	62.0	1.524	1924	6,000,000		steam		
6	The Mu-leng Coal Company (In Managing a Railway)									

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7	The Feng-tien Communication Company Limited	Electric railway in Mukden	7.1	1.435	1924	Electricity
8	The Bureau of Communications of the Harbin Municipal Government	The Electrified Railroad Inside the Harbin Municipality	12.9	1	1927	"
9	The Chin-fu Railway Company					
10	The Dairen Municipal Transit Corporation	The Electrified Railroad Inside the Municipality of Dairen				

B. RAILWAY LINES BUILT UP UNDER MANCHUKUO REGIME

	Name of Railway Company	Terminals	Length (kilometer)	Large (Meter)	Date of Founding	Capital	Capacity of Transportation	Type of Motive Power	Remarks	Subsidiary Business
11	The Eastern Manchurian Railway		106	1.435			603,730	steam	Coal from Hui-ch'un	
12	The Yu-shu Railway	From T'ao-lai-chao to T'uan-shan-tzu	76.0	1.435			365,438	steam	Agricultural products and stone	
13	The Ya-pu-ko-ni Railway	From T'u-ch'ang to Ya-pu-ko-ni	39.0	1.435				steam	Lumber	
14	The Western Manchurian Railway	From Nu-erh-ho to Chao-chia-t'un	38.0	1.435				steam	Minerals	
15	The Luan-p'ing Railway	From Shuang-t'ou-shan to Ta-ling	23.0	1.435				steam	Minerals (granite)	
16	The Chin-hsi Railway	From Chin-hsi to Yang-chia-chang-tzu	36.0	1.435				steam	Minerals (Aluminum)	
17	The Sai-ma-chi Railway	From Kuan-shui to Sai-ma-chi	28.0	1.435				steam	Coal	
18	The San-sung Line	From T'uan-lin to San-sung-kang	42.0	1.435				steam	Coal	

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19	The Sung-wan Railway	From San-cha-tzu to Sung-yeh-ling	22.0	1.435		steam	Lumber	
20	The Tien-li Railway	From San-ko-shu to Tien-li-ts'un	15.0	0.762	25,130	gasoline	Farm Products	
21	The Hai-lung Horse-drawn Railway	From Hai-lun to Wu-tao-ling	45.0	0.670		the stage coach		
22	The Ch'ang-ch'un Municipal Electrified Railway	Under the management of New Metropolitan Communication Corporation in Ch'ang-ch'un				Electricity	City transportation	The Ch'eng-ch'un Bus and Automobile Association

C. RAILWAY LINES UNDER CONSTRUCTION DURING THE PERIOD OF THE PUPPET MANCHUKUO

	Name of Railway Company	Terminals	Length (kilometer)	Large (Meter)	Date of Founding	Capital	Capacity of Transportation	Type of Motive Power	Remarks	Subsidiary Business
23	The Ya-chiang Railway	From Kuan-shui to the mouth of the Ch'ang-tien Ho	77.0	1.435				steam	This railway is the prolongation of the Sai-ma-chi Railway NC[17]	
24	The Sung-wan Railway	From Sung-yeh-ling to Sung-shu-chen	37.0	1.435				steam	The Prolongation of the Sung-wan Railway NC[19]	
25	The Chia-fu Line	From Chia-mu-ssu to Kuang-shan-t'ai	96.0	1.435			Transportation of coal	steam		
26	The Kuang-i Line		33.0	1.435			"	steam		
27	The Hsing-lung Line	Shan-pan-ch'eng to Hsing-lung	80	1.435			"	steam		

C. The Policy of the Puppet Manchukuo Toward the Specialized Railways

On 1 November 1935, the Ministry of Communications of Manchukuo published the Regulations Government the Operations of Specialized Railways. The purpose of the regulations was to supervise the operations of specialized railways owned by public organizations or by private citizens. However, the regulations did not apply to

1. Vehicles drawn by animal or by man;

2. Specialized railways installed inside a factory or a mine of the like which are connected with the main railways.

Subsequently, on 16 May 1936, Regulation governing the operation of specialized railways using human or livestock as motive power. The regulation of this type of traction was entrusted to the provincial governors in Manchuria.

The specialized railways in Manchuria operated mainly in forest or mining areas. This was particularly true of the railways operating in the lumber lands in Northern Manchuria. The mileage of forest railways in North Manchuria was fairly great.

These forest railways were built at the same time as the Chinese Eastern Railway. They were built in the forest areas in the north for transporting railway ties and fuel woods. The rail is of the same standard gauge as the Chinese Eastern Railway. Thus railway care in one railway can operate also on another line. The length of specialized lines varied from several dozens of kilometers to 100. After Manchukuo was founded, it nationalized all the forests. In view of the fact that forest resources are indispensable to industrialization, the Manchukuo Government made great effort to develop forest railways. Thus within a short space of one or two years, several hundreds of new railways were built in the forest areas.

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TABLE 33

LOGGING RAILWAYS

Name of Railway Line	Gauge in Meters	Length in Kilometers	Transit Terminals	Locomotive Steam	Locomotive Gasoline	Heavy Oil	Total
Ya-pu-li Line	0.762	32.8	(Liang-ho) (Ya-pu-ko-ni)		2	7	6
Ku-ch'e-chen	0.762	26.7	Ku-ch'eng-chen		5		5
Mu-tan-chiang	0.762	132.8	Ts'ai-ho	15	21		36
Tung-ching-ch'eng	0.762	25.8	Tung-ching-ch'eng		5		5
T'ien-ch'iao-ling	0.762	92.6	T'ien-ch'iao-ling		18	2	20
Sha-tung Line	0.762	26.8	Sha-tung		4		4
Shih-li-p'ing Line	0.762	20.5	Shih-li-p'ing		8		8
Lun-gan Line	0.762	121.5	Pa-chia-tzu	13	19		32
No-min-ho Line	0.762	54.6	Sui-leng	6		3	9
I-chi-mi Line	0.762	20.5	T'ieh-shan-t'un	6			6
The Sheng-lang Line	0.762	19.4	Sheng-lang and Chi-ling			4	4
The Tai-ling Line	0.762	26.0	Tai-ling		8		8
La-lin-ho Line	0.762	87.5	Shan-ho-t'un	3	9	3	15
The Wu-tao-kou Line	0.762	76.5	Wang-chiang-lou	2	11		13

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Rolling stock for Lumber Transportation	Volume of Goods Transported 1942-1943 (in cubic meters)	Lumber Production (in cubic meters)	Lumber Transported (in cubic meters)
188	15,000	76,000	550,000
97	54,000	54,000	550,000
821	216,000	194,000	1,600,000
400	57,213	66,000	1,130,000
758	79,000	125,000	600,000
55		50,000	1,160,000
304	66,000	86,000	750,000
493	74,000	240,000	800,000
450	56,052	84,000	3,000,000
140	39,000	60,000	600,000
128	54,000	50,000	200,000
88	49,000	130,000	3,000,000
493	26,000	133,000	1,000,000
280	52,000	63,500	510,000

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Heng-tao-ho-tzu Line	1.435	7.0	Heng-tao-ho-tzu	8			8
	0.750	58.9					
O-mu Line	0.762	81.6	Huang-ni-ho	4	7		11
Hsin-k'ai Line	0.762	34.7	Tun-hua	3	4		7
Sha-ho Line	0.762	36.6	Ta-shih-ch'iao	3	4		7
Chung-ho Line	1.524	78.7	Heng-ho	6			6
Erh-tao-hai-lin Line	0.762	40.0	Ch'ang-k'ou-hai-lin		4		4
Wu-cha-kou Line	0.762	35.0	Wu-cha-kou		4		4
Shui-wan-tzu Line	1.435	1.4	Shui-wan (The Eastern Manchurian Railway)				
Ta-lo-la-mi Line	0.610	30.7	The Bank of the Sungari				
Ma-an-shan Line	0.762	11.3	Ma-an-shan				
Sub-total		1,183.9		63	139	16	218
Ya-pu-lo-ni Line	1.435	101.5	Ya-pu-lo-ni	10			10
Lin-chiang Line	0.762	45.6	Lin-chiang	8			8
Hai-lin Line	1.435	54.0	Hai-lin	5			5

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183	60,000	43,000	200,000
364	112,154	123,000	700,000
156	55,402	26,300	400,000
92	25,273	64,000	20,210,000
70	87,525	97,000	20,210,000
50			400,000
520		50,000	400,000
6,130	1,177,619	1,814,800	57,970,000
45	380,000	218,000	350,000
300	1,500	80,000	1,300,000
	150,000	150,000	2,500,000

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T'ang-lin Line	1.435	127.0	Nan-cha	13			13
Hsiao-wang-ch'ing	0.672	73.0	Hsiao-wang-ch'ing	9	3		12
Ya-k'o-shih	1.435	136.0	Ya-k'o-shih	5			5
Po-k'o-t'u	1.435	125.0	Po-k'o-t'u	6			6
Sub-total		665.8		56	3		59
Combined Total		1,849.7		119	142	16	277

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	150,000	914,000	8,000,000
192	44,000	25,600	400,000
	71,000	127,900	3,000,000
	245,000	132,500	600,000
537	1,041,000	1,648,000	16,150,000
6,667	2,219,119	3,462,800	74,120,000

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D. The Planning of New Railway Networks

For the purpose of enlarging the railway networks in Manchuria, the Manchukuo government assigned a number of workers to make a field survey of the projected railways. The purpose of the survey was to see whether these railways are:

1. Helpful to the exploitation of the mining resources;

2. Helpful to the development of agricultural and forest resources;

3. Valuable in national defense;

4. Connected with the main railways and cities and towns of great military and economic importance.

The investigation was completed in 1942, and the plans for building new netowrks of railways were drafted. The combined total of the mileage of the projected lines was 10,392 kilometers to be undertaken in three Five - Year period.

A. The First Period

During this period twenty eight lines will be built, having a total mileage of 3,033 kilometers. The construction would be started from 1945 and expected to be completed in 1949.

/See table on following page/

TABLE 34

RAILWAYS TO BE BUILT IN THE FIRST PERIOD

Serial Number	Name of the Railway Line	From	To	Mileage in Kilometers	Purpose
1	The Shih-Tung Line	Ta-shih-ch'iao	Ta-tung-chiang	283	This line is designed as an auxiliary line to the Mukden-An-tung Railroad and to shorten the distance between the Industrial city of An-shan and the Port of Ta-tung-chiang.
2	The Ch'eng-T'uan Line	Ch'eng-tzu-t'ung	T'uan-tzu-shan	131	This line is designed to establish a connection between Korea and the Liaotung Peninsula. When the Ta-shih-ch'iao--Ta-tung-chiang line, the An-tung-T'ung-hua Line, and the T'ung-hua-Ming-yueh-kou Line are completed, it will be possible to operate a direct line between Ta-tung-chiang and Tung-pien-tao in eastern Kirin Province. If a harbor could be built at Chuang-ho, this line would become more important.
3	The Kao-Lung Line	Kao-ch'iao	Lung-wang-miao	61	The objective is to develop the rich resources in Tung-pien-tao. When the construction of the harbor of Ta-tung-chiang is completed, this line as well as the Ch'eng-t'uan Line will be very valuable in native products trade.
3	The Tien-Kuan Line	Nan-tien	Kuan-shui	89	This line is designed for strengthening the relations between Korea and Manchuria. In addition, it is valuable in developing the rich resources at Sai-ma-chi.

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5	The Chang-Tien Line	Chang-tang	Pei-tien	89	This line is designed to connect with the Tien-kuan Line and the Ya-pei Line so as to supplement the Mukden-An-tung Railway. In addition, it connects with the Chang-tang and T'ieh-ling Line to form a network.
6	The Ch'ao-Meng Line	Shu-lan	Meng-chiang	89	This line is valuable in the transportation of forest resources from Meng-chiang, and valuable also in the maintenance of peace and order in that area.
7	The Ch'ing-Mao Line	Ch'iang-tao	Mao-shan	63	To serve mainly the coal mines in Mao-shan and the iron plants in Ch'ing-chin. It is also indispensible for transporting coal produced in Ho-lung.
8	The Huan-Liang Line	Huan-jen	Liang-shui-ch'uan	88	To support the rail traffic between Korea and Manchuria.
9	The Ch'ao-Tun Line	Ch'ao-yang-chen	Tun-hua	271	Like the Tun-hua-Tung-ching-ch'eng Line, this line is a valuable short cut for the transportation of coal from Mu-tan-chiang to Mukden, Fu-shun and An-shan.
10	The Tun-Tung Line	Tun-hua	Tung-ching-ch'eng	139	Like the Ch'ao-yang-chen-Tun-hua line, this line is a valuable short cut for transportation of coal from Mu-tan-chiang to Mukden, Fu-shun and An-shan.
11	The Chin-Kung Line	Chin-hsi	Kung-ying-tzu	121	To link the Jehol area with the port of Hu-lu-tao. It is also valuable for the transportation of mineral materials and livestock from Jehol and Inner Mongolia.
12	The K'ou-I Line	Kou-pang-tzu	I Hsien	57	This line is designed for the transportation of coal from Pei-p'iao to An-shan, thereby making connections with the An-shan and P'an-shan line. By so doing, the distance between An-shan and Pei-p'iao will be shortened.

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13	The An-P'an Line	An-shan	P'an-shan	82	This line is designed for the transportation of coal from Pei-p'iao to An-shan and to the An-shan P'an-shan Line, thereby shortening the distance between An-shan and Pei-p'iao.
14	The Ch'eng-Lo Line	Ch'eng-te	Lo-wen-yu	118	This line is designed to make connection with the coal mining town of T'ang-shan and thence westward with the port of T'ang-ku, thereby making Ch'eng-te closer to the seaport.
15	The Ying-Hsing Line	Pei-ying-fang	Hsing-lung	31	This line is designed for the exploitation of the rich coal deposit of 300,000,000 metric tons found at Hsing-lung, Jehol.
16	The T'ao-Ch'ang Line	T'ao-lai-chao	Wu-ch'ang	103	The common objective of these four lines listed on the left hand side is to shorten the distance between Chia-mu-tzu and Ch'ang-ch'un. In addition, they facilitate the transportation of coal from Ho-kang and San-hsing to the south. The facilitate also the transport of coal from Ho-kang to Harbin. Since these lines pass through a rich farming area, they are very contributive to the agricultural economy of that region.
17	The Chang-Chu Line	Wu-chang	Chu-ho	79	
18	The Chu-Fang Line	Chu-ho	Fang-cheng	105	
19	The Fang-T'ang Line	Fang-cheng	T'ang-yuan	135	
20	The Wo-I Line	Wo-k'en	I-lan		This line is designed for the development of coal deposit reportedly amounting to 300,000,000 metric tons, in the district of San-hsing.
21	The Ho-Lo Line	Pei-ho-li	Lo-pei	105	Built for defense purposes. Less valuable for economic development.
22	The Pao-Fu Line	Pao-ch'ing	Fu-chin	115	Valuable for national defense and also for immigrant farmers.

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23	The Pei-Mo Line	Pei-an	Nen-ch'eng	181	This line is designed to be built with Nen-ch'eng as a base for the development of the forest resources in the western part of North Manchuria. It is also a valuable railway for national defense.
24	The Hai-Ch'ing Line	Hai-lun	Ch'ing-shan	120	Valuable for the utilization of the rich forest resources in the neighborhood of Ch'ing-shan.
25	The Ping-Fang Line	The East Station of Harbin	Fang-cheng	172	The shortest way to transport coal produced in Ho-kang to Harbin.
26	The Ying-T'ien Line	East Ying-k'ou	North T'ien-chuang-t'ai	27	If the Ta-shih-ch'iao-Ta-tung-chiang Line is completed, this line will be the shortest way to reach Korea from North China.
27	The Fu-shun connecting Line	The South Station of Fu-shun to the North Station of Fu-shun		4	Construction completed about 15 August 1945.
28	The Nan-T'ung Line	Nan-tsa-mu	T'ung-hua	143	For the transportation of the mineral resources of Tung-pien-tao to Mukden and An-shan.

RAILWAYS TO BE BUILT IN THE SECOND PERIOD

According to the plan drafted, twenty-three lines with a total length of 3,814 kilometers would be built. Construction would be started from 1950, and would be completed in 1954.

TABLE 35

RAILWAY LINES TO BE COMPLETED IN THE SECOND PERIOD

Serial No	Name of the Railway Line	From	To	Mileage in Kilometers	Purposes
29	Hai-Hsiang Line	Haicheng	Hsiang-suan	45	This line is a connecting line of the Ta-tung-chiang, and an auxiliary line to the Mukden-An-tung line.
30	Liao-Chuang Line	Liao-yang	Chuang-ho	210	When harbon construction is completed, Chuang-ho will be as valuable as Dairen in foreign trade.
31	Ta-yang Line	Ta-tung-chiang	T'ou-shih Island Korea	13	Helpful to reduce the increasing traffic jam in the neighborhood of An-tung and helpful also to strengthen the ties between Korea, Japan and Manchuria.
32	Ch'ang-Yen Line	The East Station of Ch'ang-ch'un	Yen-t'ung-shan	100	The line is one of the railways with Ch'ang-ch'un as the center. It is connected with the T'ung-hua-Meng-chiang line and the Hsin-ching-Meng-chiang Line. This line is to

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Serial No	Name of the Railway Line	From	To	Mileage in Kilometers	Purposes
					transport the rich forest resources in the neighborhood of Meng-chiang to Ch'ang-ch'un. Furthermore, it is valuable for develcping mineral resources in the railway area.
33	Liang-Mao Line	Liang-chiang-k'ou	Mao-shan, Korea	130	To strengthen the tie between Manchuria and Korea and to exploit the virgin forests of Pai-t'ou Shan.
34	Ch'ih-Ch'eng Line	Ch'ih-feng	Ch'eng-te	260	The objective in building this line is the exploitation of resources in Jehol Province. This line will link the biggest market, Ch'ih-feng, with the provincial capital Ch'eng-te. In addition, it connects with the Ch'ih-feng-To-lun Line, whereby a direct train can operate between ch'ih-feng and To-lun
35	Chin-Wa Line	Chin-ling-ssu	Hsia-wa	135	Built for the development of Jehol Province. This line and the K'ai-lu-Yu-huang Line are two railways in a network.
36	T'ung-K'ai Line	T'ung-liao	K'ai-lu	90	Helpful to economic development in K'ai-lu and T'ung-liao.

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Serial No	Name of the Railway Line	From	To	Mileage in Kilometers	Purposes
37	Liao-Cheng Line	Liao-yang	Cheng-chia-t'un	383	The main purpose of building this line is the development of agricultural resources. Its northern part penetrates right through the west plain of the Liao valley. Its Southern part runs through the flat land west of Mukden. It also connects with the Ssu-ping-Ch'i-Ch'i-ha-erh Line and the Wo-hu-tun-Pei-an Lines, thereby becoming the strategic line linking North Manchuria to South Manchuria.
38	Po-pao Line	Po-li	Liu-mao-ho	151	The line is of military and economic importance. It penetrates through the east part of North Manchuria which is a rich cereal-producing area. It is valuable for developing forest resources.
39	Ho-fo Line	Ts'ao-yang	Ch'ao-yang-chen	222	Valuable to national defense, and also to forest development since it reaches the rich forests in the Smaller Khingan Mountains in North Manchuria.
40	Ch'iao-Mu Line	T'ien-ch'iao Line	Mu-leng	161	It runs through Tung-p[illegible] tao area and connects [illegible] the Kao-ch'iao-Lung-wa[illegible]

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Serial No	Name of the Railway Line	From	To	Mileage in Kilometers	Purposes
					Line and the Ch'eng-tzu-tung-T'uan-tzu-shan Line, and thereby links together the Eastern part of North Manchuria, Dairen and Ta-tung-chiang to form a direct route.
41	T'ieh-Chang Line	T'ieh-ling	Ch'ang-tang	59	This line is an extension of the Nan-tien-Kuan-shui Railway and the Chang-tang-Pei-tien Line. It is also one of the railways in the proposed network.
42	T'ieh-Fa Line	T'ieh-ling	Fa-k'u	49	It links the T'ieh-ling-Chang-tang Railway in the east and the Liao-yang-Cheng-chia-t'un Line in the west thereby forming a circle around the industrial center of Mukden. In addition, it links Fa-k'u, trade center of the Mongolian area, with the Chinese Ch'ang-ch'un Railway.
43	Pien-To Line	Pien-ch'iang-shan	To-lun	168	This line, when completed, will link the biggest trade center of To-lun in Inner Mongolia with Ch'eng-te and Ch'ih-feng. In the future, an attempt will be

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Serial No	Name of the Railway Line	From	To	Mileage in Kilometers	Purposes
					made to link the line with Kalgan and To-lun so as to form a railway network in Jehol.
44	Chia-Yang Line	Chia-mu-ssu	Yang-pao	128	Valuable for defense and for economic development.
45	Fu-Fu Line	Fu-chin	Fu-yuan	250	As an extension of the Chia Yang Railway it is a line of military and economic importance.
46	Sun-Wu Line	Sun-Wu	Hsi-wu-yun	210	A military railway but valuable for forest development.
47	Wo-Pei Line	Wo-hu-t'un	Pei-an	614	It runs across the middle part of North Manchuria, and the granary of Manchuria. Since it goes through the Nonni Valley, it facilitates transport of agricultural products there. When the Cheng-chia-tun-Liao-yang Line and the Liao-yang-chuang-ho line are completed, it will become a principal line leading to the harbor of Chuang-ho or Hu-lu-tao.

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Serial No	Name of the Railway Line	From	To	Mileage in Kilometers	Purposes
48	Pan-cha Line	Pan-ta-kai	Cha-lai-no-erh	285	It is a part of the railway planned in 1925. The planned railway was between T'ao-nan and Lu-pin. The present line is designed as a defense line against aggression from Outer Mongolia, and designed also as an economic line for developing the livestock and the mineral resources in the district of Cha-lai-no-erh.
49	Ka'i-Hsi Line	Ka'i-yuan	Pei-feng	114	It is a standard-gauge railway rebuilt from the privately-owned, light railway named K'ai-feng Railway. A 52-kilometer railway between Hsi-feng and Pei-feng will also be built so that the distance between Pei-feng and the center of heavy industry located in South Manchuria may be shortened, and the agricultural resources may be further developed.
50	T'ao-Li Line	T'ao-nan	Li-ch'uan	95	For developing the coal mines in Li-ch'uan.
51	Ko-Lung Line	Ko-ken-miao	Erh-lung-so-k'ou	39	For serving the coal mines at Erh-lung-so-k'ou.

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It was planned that in the third period twenty railway lines would be built with a total mileage of 3,545 kilometers. The construction would be started in 1955 and completed in 1959.

TABLE 36

RAILWAY LINES TO BE COMPLETED IN THE THIRD PERIOD

Serial No	Name of the Railway Line	From	To	Mileage in Kilometers	Purposes
52	Fu-Hui Line	Fusung	Hui-shan-chen Korea	199	For strengthening the connections between Manchuria and Korea and also for exploiting the rich resources of the forests there.
53	I-Jao Line	I-shun	Jao-ho	112	Of military importance and of additional value in the exploitation of agricultural resources and forest.
54	Ming-shuang Line	Ming-yueh-kou	Shuanghocheng	100	An extension of the An-tung-T'ung-ming Railway in Tung-pien-tao linking Mi-shan and Ta-tung-chiang.
55	Lin-Man Line	Yen-t'ung-kou	Man-chiang	71	A part of the railway network south of Pai-t'ou Shan, valuable for forest development.
56	An-Meng Line	An-thiang	Meng-chia-ying-tzu	128	For developing the mineral resources deposited in the neighborhood of Meng-chia-ying-tzu.

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Serial No	Name of the Railway Line	From	To	Mileage in Kilometers	Purposes
57	K'ai-Yu Line	K'ai-lu	Yu-huang		Like the K'ai-lu-T'ung-liao, this line runs across East Mongolia. Built on virgin land, it is of great value for the development of culture, farming and animal husbandry.
58	Tui-Ch'i Line	Tui-t'ou-shan	Ch'i-k'o		Purely a military line.
59	Lai-T'ai Line	Ta-lai	T'ai-lai	133	For the purpose of forming a direct connection between Ch'ang-ch'un and Europe and for developing the agricultural resources in the lower part of the Nonni River and the forest resources in the western part of North Manchuria.
60	T'ai-Nien Line	T'ai-lai	Nien-tzu-shan	156	Same as 59.
61	Shih-Chuang Line	Ta-shih-ch'iao	Chuang-ho	158	This line intersects Liaotung Peninsula and connects the Gulf of Chihli and the Yellow Sea. Its main purpose is to link the port of Ying-k'ou located on the Gulf of Chihli with the port of Chuang-ho on the coast of the Yellow Sea.

[Adjoins page 158 here.]

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Serial No	Name of the Railway Line	From	To	Mileage in Kilometers	Purposes
62	Ch'ang-Hsi Line	The East Station of Ch'ang-ch'un	Pei-feng	135	The shortest way for transporting the coal produced in Pei-feng to Ch'ang-ch'un.
63	Ch'ang-Wo Line	Ch'ang-ch'un	Wo-hu-t'un	152	This line is connected with the T'ung-liao-K'ai-lu Line and the K'ai-lu-Yu-huang Line. In addition, it connects Ch'ang-ch'un with Inner Mongolia.
64	Ch'ih-Men Line	Ch'ih-feng	Tung-shih-men-tzu	285	It forms a direct connection between Hu-lu-tao and Inner Mongolia, thereby helping agricultural and livestock development in Inner Mongolia.
65	Lin-Wang Line	Lin-hsi	Ta-wang-miao	194	As the Ch'ih-feng-Tung-shih-men-tzu Line, this railway is helpful to defense and political development in Jehol and Chahar.
66	Tao-K'ai Line	T'ao-nan	K'ai-lu	251	In coordination with the K'ai-lu-Yu-huang Line and the Ch'ih-feng-Ch'eng-te Line, this railway brings about a direct connection between T'ao-nan and Ch'i-ch'i-ha-erh and Jehol Province. Forms a main line

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Serial No	Name of the Railway Line	From	To	Mileage in Kilometers	Purposes
					through Ai-hun and Ch'eng-te.
67	Lo-Sui Line	Lo-pei	Sui-pin	76	For national defense.
68	So-Wu Line	So-lun	Wu-nu-erh	333	For national defense.
69	Chia-Su Line	Wu-chia	Sa-ch'i-chi	354	It is a line of military significance. In addition, it runs through metal-producing and forest areas, thereby helping their development.
70	Chia-Lien Line	Wu-chia	Lien-chin		For national defense.
71	Sa-Ku Line	Sa-ch'i-chi	Shang-k'u-li		For national defense.

The tables listed above show that there are 71 projected lines, the length of which is 10,392 kilometers. The total railway mileage for the railways that have already been built and those now under construction is 26,000 kilometers.

Section 5. Manchukuo Policy Toward Automobile Transportation

1. Before the Mukden Incident:

Automobile transportation in Manchuria came into existence after World War I. In July 1918 the Chinese Government published the Regulation Governing long-distance automobile transportation and the Rules Governing the Operations of long-distance automobile transportation. These rules and regulations defined in detail operating territories and various requirements for operating freight and passenger services. Despite the rules and regulations, the roads and bridges were in bad shape. In monsoon season rivers and streams are greatly swollen and roads are muddy. Vehicular travel is difficult except in wintertime when roads are frozen. Moreover, traveling is dangerous because of banditry and social unrest. Thus, bus service existed in only a few cities.

It was not until 1928 when South Manchuria and North Manchuria were unified that the political situation in Manchuria became gradually stabilized. The stabilization in Manchuria marked the beginning of road building. Subsequently, automobile transportation flourished daily. Nevertheless, transportation capacity at that time was extremely low mainly because of insufficient capital and poor management. It was not unusual that there were dozens of companies operating the same bus line with each company having only two buses or trucks. This made it very difficult for the government to regulate automobile transportation.

2. After the Mukden Incident

After the occupation of Manchuria by the Japanese, the Puppet Manchukuo Regime was founded. Using Manchuria as a base for aggression, Japan gradually expanded its sphere of influence. For the purpose of consolidating the national defense, Japan spared no efforts in the exploitation of the rich resources in Manchuria. This, first of all called for the development of a mode of transportation. Consequently, the Manchukuo government, in addition to building railways made a great effort to build and overhaul the highway system. In May 1933, Manchukuo declared that the automobile transportation enterprise was subject to the supervision of the Ministry of communication in its public law Number 430. In addition, the Bureau of National Highways was created, an agency in charge, especially, of building highways. It was planned that during a period of ten years 60,000 kilometers of highway would be built. In fact, construction began in 1932.

Highway transportation operated by the government or by private citizens. The publicly-owned highways included:

1. Highways parallel with the railways:
2. Highways in place of railways:
3. Highways of political and economic significance.

With the exception of three types of highways operated by government capital, all other highways were operated by private capital.

Since the publicly-owned highways were subsidiaries of the nationalized railways system of Manchuria they were run by the South Manchuria Railway Company. In order to strengthen highway administration under a centralized authority, the South Manchuria Railway Company established specialized organizations at various levels of the railway administration. As a result, great success was achieved in the administration of automobile transportation.

3. A Further Analysis of Manchukuo Policy on Automobile Transportation

In 1937 the Ministry of Communications of Manchukuo issued the Regulations Governing the Automobile Transportation Enterprises. All automobile transportation firms were owned by the government or by private capital. The following is a summary of the policies dealing with automobile transportation:

1. All highways were under government control or under private management.

Highways which served temporarily as substitutes to national railways or those which were parallel in the railways or which were vital to the execution of a national policy were all operated by the government. All the other highways were open to private concerns.

2. With the exception of special cases, bus lines were operated by one company only.

3. For a greater efficiency, highway transportation industry will be gradually expanded.

4. Priority on new lines will be given to franchised operations to protect their interest against their competitors. Priority will also be given to the application from public organizations for operating highways in their territories.

5. Public enterprises operating on fixed lines would be supervised by the Ministry of Communications. City or local bus lines were licensed by city or local governments.

In 1937 the Regulation Governing the Expansion of Automobile Transportation Lines was issued for expanding bus services increasing the number of cars. In 1937 the Outline on Reorganization of Automobile Transportation Industry was proclaimed in which private ownership of bus lines was permissible in Fengtien, Kirin and Antung Provinces. Bus lines were also jointly operated by Dairen Municipality Transportation Association and the local authorities. In subsequent years the privately-owned automobile transportation enterprise was greatly enlarged. At that time the mileage of highways reached 30,000 kilometers in Manchuria. The number of automobiles and trucks was above 24,000. Data related to the operations of automobile transportation might be given as follows:

TABLE 37

DATA ON PRIVATELY-OWNED BUS LINES IN MANCHURIA IN 1935 AND 1940

Year	Number of Operators	Number of Highways	The Mileage of Highways (kilometer)
1935	30	77	4,710
1940	17	150	7,683

So far as the automobile transportation in Manchuria was concerned, the most prosperous year was 1941. Because of World War II the policy of communications underwent some changes. Freight traffic was given priority over passenger traffic. The Ministry of Communications issued regulations governing the operations of bus lines in 1941. The purpose of the regulations was to regulate the use of automobiles under public or private ownership, so that freight transportation may achieve a maximum efficiency. In addition, the government encouraged the use of charcoal as a substitute for gasoline so that gasoline might be used for the transport of vital materials.

4. Policy Toward Automobile Industry.

As regards the automobile industry in Manchukuo, there were some small-scale repair shops. As automobile transportation flourished, the South Manchuria Railway Company and other concerns jointly founded the Tung-ho Automobile Corporation in Mukden. The chief mission of this corporation was to assemble imported automobile parts into cars. The corporation manufactured car bodies and accessories. Besides, the corporation maintained repair shops in key cities to keep up a minimum number of cars in use. To strengthen the manufacturing division of the corporations it merged with the Manchukuo Automobile Manufacturing Corporation. Plans were made to expand the market and produce cars suitable for use in the climate and topography of Manchuria. Before these plans were carried out Manchuria was returned to China.

TABLE 38

AUTOMOBILE TRANSPORTATION IN MANCHURIA, 1936-1940

	Passengers (Unit: 1,000 persons)				Freight (Unit: 10,000 metric tons)			
	South Manchuria Co.	Cities and Municipalities	Others	Total	By the South Manchurian Railway Co.	Privately-Owned Companies	Totals	Remarks
1936	772	Unavailable	Unavailable	Unavailable	1	200	201	Same as on freight
1937	1,131	Unavailable	Unavailable	Unavailable	10	300	310	TRANSPORTATION ESTIMATES
1938	4,385	157,643	Unavailable	162,028	30	400	430	
1939	3,580	216,413	Unavailable	229,993	50	600	650	
1940	11,095	245,380	Unavailable	256,475	80	900	980	

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Section 6. Manchukuo Policy Toward Waterway Transportation

I. THE ADMINISTRATIVE MACHINE FOR WATERWAY TRANSPORTATION

The importance of waterway transportation in Manchuria has been described above. Under the Manchukuo regime much importance was attached to the waterway transportation. This can be seen from its policy on communications included in its economic reconstruction.

Before the Mukden Incident the administration of waterways was in charge of the Harbin Navigation Bureau, the customs offices in Ying-k'ou and Antung or local governments. After Manchukuo came into power, all these agencies were either combined or abolished and a centralized administrative organ was formed. In March 1932 the Ministry of Communications established the Division of Navigation which was in charge of the administration of waterways, ports and harbors, the licensing of vessels and crews, the erection of signals and buoys and other related matters. Although the name of the division had undergone changes a number of times, the sections remained the same. These sections were those on navigation, on inland rivers, on engineering and on investigation. The regular function of the navigation division was never interrupted.

In June 1933, the Manchukuo Government formulated a permanent administrative system for strengthening the local navigation administrative organs. In July of the same year navigation bureaus were established at Ying-k'ou, Antung and Harbin. The Harbin Navigation Bureau established a branch at Ai-hun, subbranches at Kirin, Hu-lin and Mu-ho, and assigned representatives to stations at Fu-chin and I-lan. The Ying-k'ou Navigation Bureau established branches at Dairen and Hu-lu-tao. The Antung Navigation Bureau sent officials to San-tao-lang-t'ou. The territories under the jurisdiction of these Bureaus are given in Table 39.

TABLE 39

DIVISION OF JURISDICTION AMONG THE THREE NAVIGATION BUREAUS

Name of the Bureau	Location	Territory under Jurisdiction
The Harbin Navigation Bureau	Harbin	The First Section of the Sungari; The Second Section of the Sungari; The Nonni River; The Ussuri River; The Amur River; The Argun River; The tributaries of the rivers mentioned above.
The Ying-k'ou Navigation Bureau	Ying-k'ou	The Gulf of Chihli The Liao River and its tributaries
The An-tung Navigation Bureau	An-tung	Yellow Sea; The Ya-lu Ho and The T'u-men Chiang; and their tributaries

II. SHIPPING ORGANIZATIONS

Before the Mukden Incident shipping service organizations in the Sungari included the Northeast Navigation Bureau, The Postal Shipping Bureau of the Sungari River and the Amur River, the Kuang-hsin (Shipping Company) and the Northeast Shipbuilding Company. These organizations still remained in business under the supervision of the Ministry of Communications after the Manchukuo government was founded. In February 1933, the Puppet Manchukuo Government and the South Manchuria Railway Company signed a contract according to which all matters relating to navigation were transferred to the corporation. Accordingly, the corporation established in March 1933, the Harbin Navigation Bureau in control of shipping along the Sungari and the Amur.

The public and private shipping companies along the Sungari organized a joint association in an attempt to eliminate cut-throat competition, promote and protect their mutual interest. The association was approved by the Ministry of Communications, and its activities were under the supervision of the Ministry. Similarly, ship owners' associations were also established in Ying-k'ou, An-tung, Kirin and Harbin. In March 1934 the Manchukuo Government reformed all the regulations relating to navigation. Under the new regulations, supervision of shipping which belonged previously to the departments of industry was transferred to the navigation bureaus. Subsequently, inland river navigation became more prosperous day after day, and the local industries were greatly benefitted from the progress in navigation.

In June, 1933 and in July 1934, the Manchukuo Government issued the Laws Governing the River Navigation and Regulations Governing the Navigation of small vessels. Under the laws and regulations shipping, tug-boat services and ship rental in rivers or lakes were subject to government control.

The following is a list of shipping associations in Manchuria.

TABLE 40

SHIPPING ASSOCIATIONS IN MANCHURIA

Names of the Organizations	Zones of Navigation
Harbin Joint Shipping Association	Sungari, Amur, Ussur, Nonni and Argun rivers
Shipping Association of Yalu and Hung Kiang Rivers	Ya-lu Ho and Hun Chiang
Yingkow Shipping Association	Liao Ho and its tributaries
The Harbin Shipping Association	The first section of the Sungari River and its tributaries
The Liao Ho Civilian Shipping Association	Along the Liao Ho and its tributaries
The Kirin Shipping Association	The second section of the Sungari River and its tributaries
The Harbin Sailing Boat Association	Along the first section of the Sungari River and its tributaries
The Ilan Sailing Boat Association	Along the courses of the Sungari, Mu-tan Chiang and Wo-k'en Ho
The Fu-chin Navigation Association	Along the course of the Sungari River and its tributaries

III. ACCOMPLISHMENTS IN SHIPPING ADMINISTRATION

Since it took over the Liao Ho Engineering Bureau, a bureau of international importance, the Ying-k'ou Navigation Bureau was very active in dredging and in constructing seawalls and embankments. It manufactured dredges for removing the silt accumulated at the mouth of the river. It also made plans for ice breaking. It rented some ice breakers from the Mu-la Co., Shanghai. At the end of February 1936, the Bureau spent one month in ice breaking operations. As a result, navigation was resumed three weeks before the arrival of the ice-melting season. Besides, the Bureau erected at the north cove of Chang-hsing Island in Fuchou Wan some third-class lighthouses (visible three or four miles away). This greatly facilitated navigation.

Shipping in the Ya-lu Ho was for a long time almost completely under the control of the Koreans. In view of the necessity that some signals and buoys be established in the lower parts of the Ya-lu Ho, the An-tung Navigation Bureau consulted with the Koreans and jointly established a technical committee for improving the navigation facilities in the lower part of the Ya-lu, especially those parts below Ta-tung-kou. In the meantime, rock excavating, dredging and surveying were undertaken between An-tung and Linkiang.

Accomplishments of the Harbin Navigation Bureau included:

1. The dredging of the bar located at San-hsing;

2. The excavation of rocks in the period of freezing;

3. The installation of signals and buoys along the Sungari R. and rivers on national borders, and

4. The development of night navigation.

IV. ACCOMPLISHMENTS IN VESSEL REGISTRATION

When Manchukuo was established in 1932, the shipping industry in Manchuria with Harbin as a center had 116 steamers with a total of 49,300 tons, and 134 tugs totaling 61,300 tons. The Manchukuo Government ordered that all vessels be registered in order to apply government control on navigation. The Manchukuo Government also inspected ships so as to eliminate accidents. In order to implement the policies mentioned above, Manchukuo issued the Laws Governing River Navigation, Regulations Governing Inland River Shipping and Regulations Governing the Qualifications of Ports.

Besides, Manchukuo issued Regulations Governing the issuance of Licenses, Regulations Governing Navigation Along Rivers by Small Vessels. All Manchukuo vessels had to be legally registered. In 1936 ships registered under Manchukuo nationality were: /See Table on following page/

TABLE 41

THE TOTAL NUMBER OF VESSELS REGISTERED IN MANCHUKUO, 1936

Year	Steamers		Sailing Boats		Tugs		Small Boats(Licensed)	
	Number	Tonnage	Number	Tonnage	Number	Tonnage	Number	Tonnage
1936	171	55,292	422	12,780	298	81,441	2,680	30,558

V. REGISTRATION OF CREW MEMBERS

The Chinese authorities in Manchuria had no specific law to register and protect crew members. In February 1934 the Ministry of Communications issued the Temporary Regulations Governing the Registration of Crews. After that crews were subject to government regulations. In addition to the issuance of licenses to the crews, an examination system was established for promoting crew members. Crew members were required to take a basic training course. By the end of 1936 there were 1,088 certified crew members.

Vessels operating in Ying-k'ou and Antung hired pilots according to their own systems before the Mukden Incident. After Manchukuo was founded, the government ordered all the pilots to join the Pilot association. Furthermore, it issued the Regulation Governing the Inspection of Pilots Along the Ya-lu Ho. The Ying-k'iu Port also introduced a pilot regulation law. It should be mentioned that in Antung there were four Japanese pilots and one Chinese, while in Ying-k'ou there were two Japanese with one alien.

VI. ACCOMPLISHMENTS IN RIVER CONTROL

The Ministry of Communications never interrupted its survey of the rivers and streams, particularly the Liao Ho, the Sungari and the Nonni. The function of the Division of River Control consisted of the following:

1. To facilitate river navigation;

2. To undertake flood control projects for cities;

3. To develop hydroelectric facilities and

4. To undertake irrigation projects for farm lands.

Before the Mukden Incident, the agencies in charge of river navigation in Manchuria were: 1. The two engineering bureaus located respectively in the upper and the lower parts of the Liao Ho whose function was to maintain the waters at Ying-k'ou at a certain depth and to facilitate navigation of the Liao Ho. The Northeast River Course Bureau's function was to keep the navigation routes in the Sungari River in good order. These bureaus were not river conservation bureaus. River conservation projects were undertaken mainly by local autonomous governments. These projects were mainly very simple dikes for flood control. There was no centralized planning in river conservation and, as a result, the achievement in river conservation was meager.

After Manchukuo was founded, Manchuria was affected by floods in 1932 and in 1934. Great damages were inflicted on the local populace. Because of the serious floods, the Manchukuo Government was forced to create a Second Technical Section under the Division of National Roads. This Section was responsible for investigating the river and for river engineering. In 1937 the Division of National Roads was abolished and replaced by the Civil Engineering Bureau under the jurisdiction of the Ministry of Welfare. In the meantime, a hydro-electric power reconstruction bureau was created under the jurisdiction of the Ministry of Industries. In July of the same year the Bureau of Civil Engineering was abolished, while its function was transferred to the Division of Navigation of the Ministry of Communications. In July, 1938, the Division of Navigation was reorganized into the Division of Waterways. In 1943 it was reorganized into the Division of River Improvement.

The next topic we are going to discuss is the law governing the use of rivers and streams in Manchuria. Right at the beginning of the founding of Manchukuo there were no new regulations governing the use of rivers and streams. Manchukuo adopted the laws issued by the Chinese government in 1930 with some additional stipulations of its own. Later, as the various industries concerned with river transportation greatly developed, and the economic significance of the rivers increased, the Manchukuo regime felt the need for a permanent system of river laws. Finally, in 1939, Manchukuo issued new laws governing the use of rivers and on river conservation, containing detailed stipulations.

River survey and improvement activities were undertaken step by step under the Regulations for River Control, Water Conservation and Land Improvement issued in 1937. In the same year, surveying activities were chiefly conducted on the Liao-Ho System. Surveys of the Sungari and other rivers would be conducted on a later date by the Division of Waterways.

In 1941 the Division of Waterways and the Agency of the Liao Ho Survey were reorganized into the River Control and Survey Bureau under the Ministry of Communications. The bureau was in charge of the survey of all the rivers in Manchuria. In 1942 the survey of the Liao Ho was completed and its control plan was drafted. After that, the center of river surveying activities was shifted to the Sungari. In 1945 most of the investigations and surveys of the upper parts of the Sungari, above Harbin, and its tributaries were completed leaving the control plans unfinished. Surveys of other rivers were only partially completed.

VII. THE QUESTION OF INTERNATIONAL RIVERS

Rivers which flow along the Chinese Russian borders are the Amur, the Ussuri, the Argun and Lake Hsing-kai. During the Manchukuo regime, attempts were made by Manchukuo to negotiate with the USSR for navigation freedom and safety. At that time, the Harbin Navigation Bureau was responsible for the negotiations with the Soviets concerning technical matters.

The Ya-lu Ho flows along the Chinese-Korean border. Matters related to navigation of that river were dealt with by a technical committee jointly organized by China and Korea.

A LIST OF RIVER CONTROL PROJECTS IN MANCHURIA

City Flood Prevention Projects:

Serial Number	Location	Time Limit for Completion	Remarks
1	Harbin	The First Period: 1935-1938 The Second Period:1939-1941	Prevention of Sungari floods and reconstruction of piers; Reinforcement of the two banks of the Sungari and flood prevention at Sha-chou.
2	I-lan	1935-1936	Embankment on the Sungari, Mu-tan-thiang and Wo-kenho.
3	Chia-mu-ssu	1940-1942	Prevention of overflowing and embankments on the Yin-ta-mu Ho and Ying-ko-tu-ho.
4	Fu-chin		Embankments on the Sungari and reconstruction of the piers.
5	Ch'i-ch-i-ha-erh	1943	Flood prevention of the Nonni River.
6	Mu-tan-chiang	1941-1945	Building of dikes for flood control on the Mu-tanchiang.
7	Tao-nan	1935-1937	Prevention of floods on the Tao-erhho and construction of dikes.

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8	Reconstruction of the Streets along the Sungari River at Kirin.	1934-1935	Construction of concrete walls along the bank of the Sungari.
9	Chi-ning	1933-1934	Prevention of floods on the Mu-leng River and reconstruction of the dikes.
10	Hai-la-erh	First Period: 1939-1941 Second Period: 1943-1945 (repairing of the canal)	Prevention of floods on the I-min Ho; The construction of dikes for the prevention of floods.
11	Mukden		Prevention of floods on the Hung Ho.
Fu-shun			The Flood Prevention on the Hun Ho.
Pen-ch'i			Flood Prevention on the Tai-tzu Ho.
Chin-chou			Flood Prevention on the Hsiao-ling Ho.
Suo-chung			Flood Prevention on the Liu-ku Ho.
Cheng-te			Flood Prevention in Wulieh Ho (Luan Ho)
Fou-hsin			Flood Prevention on the Ta-ling Ho

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Cha-oyang	Flood Prevention on the Taling Ho
Tung-liao	Flood Prevention on the West Liao Ho
Kai-lu	Flood Prevention on the Lao-ha Ho
An-tung	Flood Prevention on the Ya-lu Ho
Lin-chiang	Flood Prevention on the Yalu Ho
Tung-pei	Flood Prevention on the Hun Ho
Tu-men	Flood Prevention on the Tu-men Chiang
Yen-chi	Flood Prevention on the Pu-erh-ha-tung River.
Shih-hsien	Flood Prevention on the Ka-ya Ho
Hui-chun	Flood Prevention on the Hui-chun Ho
Tumen-tzu	Flood Prevention on the Hui-chun Ho

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PROJECTS FOR FARM LAND PROTECTION, RECLAMATION AND SOIL CONSERVATION

Serial Number	Location	Time Limit	Remarks
1	Flood prevention and soil reclamation (110,000 acres) in Pin-chiang Province		Embankments along the main course of the Sungari, A-shih Ho, La-lin Ho and Hu-lan Ho
2	Flood prevention on the T'ao-erh Ho	1942-1945	
3	Nao-erh Ho	1942-1944	
4	Improvement of the course of the Mu-leng Ho	1939-1943	Construction of embankments, dredging, opening of new waterways affecting 52 hectares
5	Improvement of the East Liao Ho	1944	The building of a reservoir at Ti-ta-tsui-tzu
6	Improvement of the Hai-cheng Ho		Partially completed
7	Improvement of the Ta-su-tai-Ho		
8	Improvement of the Ch'ing Ho		
9	Improvement of the Shuang-tai-tzu Ho		

HYDROELECTRIC POWER PROJECTS

Serial Number	Location	Time Limit	Remarks
1	The Fengman Dam (located in the second section of the Sungari river.)		The Volume of the Sungari River will be reduced from 10,000 cubic meters to 4,000 cubic meters.
2	Hydroelectric Power project at Ching-pai-Hu		
3	The Shui-feng Dam (or the Yalu chiang Dam)		The volume of the Ya-lu Ho will be reduced from 26,000 meters to 13,000 cubic meters.

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NAVIGATION AND RIVER CONTROL PROJECTS

Serial Number	Location	Time Limit for Completion	Remarks
1	Improvement of the bar at Sanhsin	1938-1943	
2	Improvement of the bar at Puya Ho		To facilitate embankment, irrigation and dredging
3	Improvement of the Liu Ho		For the purpose of preventing silt and sand and protecting the Mukden-Peking Railway line

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Section 7. Manchukuo Policy Toward Aviation

I. A GENERAL DESCRIPTION OF AVIATION BEFORE THE MUKDEN INCIDENT

Aviation in Manchuria has a short history. Before the unification of South and North Manchuria the Manchurian regime established a military aviation department and military aviation school. Although the National Government planned to open a civil airline from Pei-tai-ho to Ch'ang-ch'un via Chin-chou and Mukden, it never implemented its plan.

In April, 1929, the Japanese Aviation Company succeeded in opening an airline from Dairen to Tokyo with Sinuichow as a midway station. This line was considered the first airline in the history of Manchurian civilian aviation.

II. AVIATION ADMINISTRATION UNDER MANCHUKUO

In order to develop aviation the Manchukuo Government issued its economic reconstruction program in March 1933, in which it declared that an airline mileage of 3,500 kilometers would be established. It also declared its plans to establish airlines to Europe and Japan. In June of the same year it was decided that the Division of Highways of the Ministry of Communications would be in charge of the aviation administration temporarily.

In view of the peculiar nature of air transportation and for greater efficiency in management, the Manchukuo regime was in favor of the doctrine that civil airlines should be operated privately rather than by the government. In September 1932, the Manchuria Aviation Corporation, Limited, was formed. It was a special corporation which received a certain amount of governmental subsidy for following the national policy and bringing about a maximum efficiency. Since the corporation was directly and indirectly under permanent protection and support, it developed rather rapidly.

As the air transportation industry was growing daily, a division of aviation was established under the Ministry of Communications. The duties of the division were:

1. To regulate, promote and supervise air transportation;

2. To develop aviation techniques, guide and supervise the manufacture of aircraft, handle the inspection and registration of aircraft, train pilots, and control weather bureaus and astronomical observations;

3. To be in charge of the administration and construction of airport facilities and to construct and operate air communications and

4. To develop new airlines.

Besides, aviation stations were established in Ch'ang-ch'un, Mukden, Ch'i-ch'i-ha-erh, Ch'eng-te, Harbin and Mu-tan-chiag. There were agencies in charge of local matters such as:

1. The operation of airports and aviation facilities;
2. Aviation safety;
3. Air rescue operations and investigation of air traffic accidents.

In 1939 all the weather bureaus and observatories under the jurisdiction of the Central Observatory were transferred to the Ministry of Communications. The objective of the transfer was to strenghten climatic and astronomical observations and to enhance air safety.

III. A GENERAL DESCRIPTION OF THE MANCHUKUO AVIATION CORPORATION, LIMITED

The Manchukuo Aviation Corporation, Limited, was the sole organ in Charge of air transportation in Manchuria. IT was established on 26 September 1932. The capital of the corporation was jointly contributed by the Manchukuo Government, the South Manchuria Railway Company, the Mitsubishi Company and the Sumitomo Company. It was a limited stock Company with a paid-in capital of 8,500,000 yen. It was supervised and directed by the Manchukuo Government. The scope of the corporation's activities included:

1. Passenger, mail and freight services within the borders of Manchukuo and with neighboring countries;

2. The manufacture and repair of aircraft.

3. Aviation photography

4. Matters not elsewhere mentioned and approved by the government, including:

   1. The rental of airplanes and other related matters

   2. Matters related to aviation, including:

      a. Enterprises conductive to the development of aviation

      b. Dissemination of aviation information

The headquarters of the corporation was established at Mukden (then moved to Ch'ang-ch'un) It had a branch office in Tokyo. Its services reached Mukden, Ch'ang-ch'un and Harbin where there were branch offices handling passenger traffic.

IV. THE ACHIEVEMENTS OF MANCHUKUO IN ITS AVIATION

The airlines which had a regular flight shcedule were owned by the Manchukuo Aviation corporation. They grew up extremely fast. In the year of its extablishment in 1932 the total mileage of aviation lines was 995 kilometers, roughly 18 times the former mileage. The speed with which the airline developed was greater than originally planned. This was due to the favorable topographly, climate and air. In fact, these factors had reduced air traffic accidents to a minimum.

The rapid development of Manchukuo aviation may be seen from Table 42.

TABLE 42 DEVELOPMENT OF AIRLINES IN MANCHUKUO

	Airlines with Regular Schedules		
	Number of lines	Mileage in Kilometers	Remarks
1	2	3	4
1929	1	300	In April the Japanese Aviation Society opened the Dairen-Tokyo Line
1932		995	
1933		2,300	Manchukuo Aviation Corporation was established in September and operated in October
1934		5,480	
1935		6,155	
1936		8,920	
1940	20	12,400	
1942	30	18,575	

DATA ON OPERATIONS OF THE MANCHURIAN AIRLINES

Year	Mileage Covered by air-lines in Regular Schedules	Total Flight Mileage (1,000 Kilometers)	Flight Time (hours)	Passengers	Freight Transported (kilograms)	Mails (kilograms	Flight Turnover Percent	Accidents
1932	995	336	2,037	1,545	1,620	1,657	86	4.5
1933	2,300	2,618	16,810	16,509	18,986	15,663	89	3.5
1934	5,480	3,749	22,743	21,698	23,869	23,593	92	1.6
1935	6,155	4,606	27,275	30,945	91,933	44,859	92	1.4
1936	8,920	5,401	32,098	32,426	146,349	51,426	91	1.1
1937								
1938								
1939								
1940	12,400							
1941								
1942	18,575							

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Since its establishment the Manchukuo Aviation Corporation, Limited, had made arrangements with the Dairen-Tokyo Line under Japanese Aviation to operate an international airline with regular flight schedules and using Sinuichow as a transit point. Later, after a long time of planning, non-stop flight service between Chang-chun and Tokyo was opened in 1939. The flight took eight hours. (Five hours at top speed.)

II. ACCOMPLISHMENT ON TRANSPORTATION UNDER THE CENTRALIZED MANAGEMENT OF THE SOUTH MANCHURIA RAILWAY COMPANY

Section 1. A General Description of the Operations Under the South Manchuria Railway Company

In February 1933 the Manchukuo government entrusted the South Manchuria Railway Company with the management of all the national railways, the formerly government-owned Sungari shipping lines and the affiliated enterprises of the two (including the highways). Subsequently, the South Manchuria Railway Company reorganized all the transportation systems (particularly the railways). In March 1933 the General Railway Administration was established by the corporation for unifying the management of all the national railways. At that time the total mileage of railways was 2,946.6 kilometers. Under the General Railway Administration there were nine railway administrations respectively in charge of the business of the railways under their management. Each of the railways has its own background and functions and hence different organizations and policies. Furthermore, the equipment and facilities were obsolete, and inadequate for use. Since the establishment of the General Railway Administration all of the national railways in Manchukuo were unified under a centralized body. A thorough reorganization program was carried out in railways as well as other transportation systems for paving the way for defense, effective governmental and industrial development.

In March, 1935, after the purchase of the Chinese Eastern Railway from the Soviet Union, all of the railway lines in Manchuria were operated by the South Manchuria Railway Company. In October 1933, the General Office of the Railway Administration was changed into the General Office of the Railroad Administration. In the meantime, railway lines formerly under the corporation's direct control were put under the jurisdiction of the Railway Administration. Since then both the corporation's lines and the national lines were exclusively controlled by the Railway Administration. As a result of a centralized management system, transportation in Manchuria developed rapidly.

Data on railway operations under the administration of the South Manchuria Railway Company are shown in Table 44. Factors accounted for the accomplishment were mainly the following:

1. The South Manchuria Railway Company had more than twenty years of experience in railway operations. It had efficient operational structure and well trained and experienced personnel.

2. The Japanese who worked in the South Manchuria Railway Company were aspirants of Japan's continental policy and they worked hard.

3. Social order was relatively stable. Accordingly, the demand for transportation services increased daily. Besides this, Japan had done its best to supply capital, materials and techniques.

Table 44. DATA ON RAILWAY OPERATIONS UNDER THE SOUTH MANCHURIA RAILWAY COMPANY

Year	Mileage of Railways in Operation (kilometers)	Passengers (10,000 persons)	Passenger-Kilometers (10,000 passenger-kilometers)	Freight Transport (10,000 tons)	Ton-Kilometers (10,000 ton-kilometers)	Important Events
1907	1,135	161	22,600	134	39,600	Hai-t'ieh Railway founded
1908	1,134	186	22,000	236	74,900	
1909	1,142	217	24,700	323	91,700	
1910	1,134	234	24,300	355	98,400	
1911	1,113	315	33,700	426	107,700	
1912	1,113	390	40,700	424	130,700	The fall of the Ch'ing Empire; the opening of the Kirin-Ch'ang-ch'un Railway
1913	1,115	414	41,100	524	162,500	
1914	1,106	361	35,500	517	175,700	World War I
1915	1,105	370	41,000	531	167,600	
1916	1,105	441	50,400	565	190,600	
1917	1,105	584	64,500	659	220,300	Russian Revolution
1918	1,105	749	82,200	756	251,800	The opening of the Ssu-p'ing-Liao-yuan Railway

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1919	1,104	927	92,500	915	301,700	The Paris Peace Conference decided to put the Chinese Eastern Railway under international trusteeship
1920	1,103	812	84,700	921	333,600	
1921	1,103	692	71,100	943	346,300	Washington Naval Conference
1922	1,103	764	73,100	1,092	404,600	Washington Nine Power Treaty
1923	1,108	876	80,000	1,213	432,600	Chinese taking over the Tsingtao-Tsinan Line from the Japanese
1924	1,118	873	81,400	1,323	460,100	Declaration of Independence by Outer Mongolia
1925	1,118	910	89,200	1,364	484,100	
1926	1,111	829	97,000	1,500	532,100	The opening of the T'ao-nan Ang-ang-ch'i Railway
1927	1,111	826	106,300	1,671	573,800	The opening of the Mukden Hai-lung Railway
1928	1,111	970	110,800	1,753	395,900	Reorganization of the Manchuria Communication Committee
1929	1,111	1,041	108,700	1,856	632,300	The opening of Kirin-Hai-lung Railway
1930	1,125	811	71,800	1,529	476,500	
1931	1,125	633	58,700	1,545	537,400	The Mukden Incident

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1932	1,129	861	92,800	1,657	569,900	The founding of the Puppet Manchukuo
1933	1,459	1,237	117,900	2,827	808,700	The Establishment of the General Office of Railway Administration
1934	5,477	2,411	228,400	3,466	946,900	
1935	8,320	3,011	281,700	3,740	1,017,000	Purchase of the Chinese Eastern Railway
1936	8,884	3,500	331,600	4,209	1,074,800	
1937	9,655	3,842	413,000	4,012	1,290,300	The Establishment of the General Office of Railroad Administration
1938	9,846	5,005	544,800	4,785	1,625,900	The Lo-k'o-ch'iao Incident
1939	10,459	7,596	853,000	5,899	2,046,200	
1940	2,039	9,782	1,053,600	6,338	2,059,300	
1941	11,097	10,377	1,100,500	7,344	2,586,300	World War II
1942	11,140	13,215	1,403,400	8,316	2,795,700	
1943	11,270	16,355	1,672,000	8,462	2,809,000	
1944	11,285	17,005	1,737,800	7,755	2,671,200	

Section 2. Administrative Policy

From the time Manchukuo entrusted the South Manchuria Railway Company with the management of the railway lines in Manchuria (1933) to the time the Chinese Nationalist Government took over (1945), the history of the South Manchuria Railway Company in its management of the railways may be divided into three periods as follows:

Name of the Period	Name of the Agency in Control	Policy Management	Important Events
First Period, 1933-1936	The General Office of Railway Administration in control	Since the establishment of the General Office of the Railway Administration, the nine railways administrations were put under the control of the General Office. The purpose of the centralization of management was to modernize the railways in Manchuria.	In March 1933, the General Office of the Railway Administration was established. In April 1935, the Chinese Eastern Railway was taken over.
Second Period, 1936-1941	The General Office of Railway Administration in control	Since the establishment of the General Office of the Railway Administration until World War II, the national lines and the lines in the possession of the South Manchurian Railway Company were put under the exclusive control of the General Office of the Railway Administration.	In October 1936, the General Office of Railway Administration was established. In 1937, the first Five-Year Plan of Manchukuo was implemented. In 1939, there was the Lo-k'ou-ch'iao Incident, North China Communication Corporation was established.
Third Period, 1941-1945	Exclusively controlled by Japan for war	During World War II, Japan tightened its control of land transportation for war purposes and integrated all the railways in Korea, Manchuria, and North and Central China for efficiency.	Pearl Harbor, 1941. In March 1943, Japan held the First Continental Railway Transportation Conference. On 15 August 1945, Manchuria was reoccupied by China.

The first period was a period associated with the General Office of the Railway Administration. In this period the railway lines known as corporation lines were operated by the railway department of the South Manchuria Railway Company, while the national railways of Manchukuo were operated by the Railway Administration. With the General Office of the Railway Administration playing a major role, a centralized administrative system was established. Accordingly, the railway administrations were reorganized along the line of modern enterprises. In addition, new lines were built for strengthening the capacity of transportation. In March 1935 when the Chinese Eastern Railway was purchased from the Soviet Union, the capacity of railway transportation had been further strengthened. Enterprises affiliated with the railways including inland shipping lines, highways, harbors and ports, were put under centralized administration.

The second period associated with the General Office of the Railway Administration. In this period the national lines and the corporation lines were all put under the exclusive control of the General Office of the Railway Administration. As part of the First Five-Year Economic Plan many new lines were built. In fact, this period is considered as the most prosperous period in the history of railways in Manchuria. Since the outbreak of the Pacific War railway transportation declined. After the return of Manchuria to China the railways were repeatedly demolished. At present the situation of the railways in Manchuria is even far worse than before the Mukden Incident.

The third period associated with wartime control. After the Pacific War broke out, all the railways in Manchuria, North China, Central China and in Korea were put under Japanese control on a wartime basis. The Japanese established the Bureau of the Continental Railways at Ch'ang-ch'un for the control of wartime transportation. The Bureau was dissolved when the Chinese took over Manchuria. The following is a description of the railway administrative policies in different periods.

1. First Period

When Manchukuo entrusted the South Manchuria Railway Company with the management of the national lines, the South Manchuria Company established the Railway Administration. The purpose of the administration was to bring the national lines under a centralized authority. However, the national lines were operated independent of the railways owned by the corporation. In other words, there were two administrative systems for the railways. Under the Railway Administration there were nine railway administration i.e. the Kirin-Ch'ang-ch'un, the Kirin-Tun-hua, the Ssu-p'ing-T'ao-nan, the T'ao-nan-Ang-ang-ch'i, the T'ao-nan-So-lun, the Ch'i-ch'i-ha-erh-K'o-shan, the Hu-lan-Hai-lun, the Mukden-Hai-lung, and the Mukden-Shan-hai-kuan administrations. They controlled seventeen railways with a total mileage of 2,949.6 kilometers. In the past a railway in Manchuria, regardless of its being owned by government or by individuals, was operated as a personal property for profit. Road maintenance safety and road improvement were reflected. The public interest was forgotten. Despite the fact that all the railways were operated by one government, each railway administration acted independently of each other and established no coordination with others for joint use of personnel and facilities. Accordingly, the capacity of transportation was low. The railway at that time hardly lived up to a modern means of transportation. It was needless to say that the Railway Administration was serving the interest of the Japanese, but much attention should have been paid to the railways for the welfare of the people. Under the full support of the South Manchuria Railway Company the Railway Administration started its reform of the railway operations. In the meantime, it assigned its own staff to stations of the newly built railway lines to assist them in business operations. Furthermore, the railway administration also endeavored to keep the peace and order along the railway regions. It tried to promote industry and commerce as a step toward increasing the income of railway operations. It had reached its goal although its expenditures on operations, on expansion and construction of new lines were increasing yearly.

The General Office of the Railway Administration was established on the eve of the Mukden Incident. Tension was mounting everywhere. Even the Japanese staff in the Railway Administration was refrained from drastic reform in order to avoid agitation. The Japanese therefore gave preference to the improvement of railway facilities and offered better services to the public. In regard to the existing organization and employment system, the Japanese took a conservative attitude. The original nine railway administrations were so merged that their internal structure was not changed. This attitude was evidently used as a means to calm the Chinese workers. They claimed that all railway lines were owned by members of one family in order to bring about a friendly atmosphere favorable to reform.

At the beginning the Railway Administration adopted a policy of centralization. However, near the end of the first period all the railway administrations were given certain power to make decisions at their own discretion. In order to strengthen the railway lines for national defense, a supervisory agency was established which was in charge giving assistance to the railways.

During this period, in addition to the railways, enterprises affiliated with the railways like the shipping lines in the Sungari and the highways were brought under a centralized administration for greater efficiency.

2. Second Period

From the point of view of railway administration, the first period (under the Railway Administration) may be called a preparatory period for achieving unification. Since the reorganization of the Railway Administration into the Railroad Administration in 1936 and the consolidation of both the "Corporation Lines" and the national Lines" a centralized control of all railways in Manchuria was established. Since this then, not only the lack of coordination in the administration of railways had been eliminated, but the waterways, highways, airlines were all brought under a centralized administrative system with railways as the largest group among them. In short all the transportation systems functioned as an organic whole.

Having achieved unification in transportation systems, traffic moved in all directions, thereby bringing about the prosperity to cities and towns, to industry and agriculture, and strengthening national defense. In addition, government measures in relation to education, sanitation, prohibition of opium, prevention of pestilence and mail service reached all Manchuria. Above all, a great progress was made in developing hydroelectric power supply, fuel, electric supply, in forest development and in increasing agricultural, industrial and mining production. This on the other hand, became a temptation to Japan which then introduced a series of aggressive policies to Manchuria, including the Five-Year Industrial Development Plan, the Northern Frontier Development Plan, the Resettlement Policy and the Territory Expansion Plan.

At the end of the second period the mileage of the railways in Manchuria was more than 10,000 kilometers, which is greater than that included in Manchukuo's Economic Reconstruction Plan. In this period the volume of transportation had been greatly augmented. This can be seen from Table 44 in the preceeding section. The major administrative policies are described below.

1. All of the railways in Manchuria were controlled by a simple administrative organ. With the railways as a center of the system all the waterways, highways, harbors and ports, sea routes, were operated as an organic whole. The various types of transportation industries cooperated with each other in operations and in financial matters. In short, they were prepared for meeting the wartime situation.

2. To render its support of government's policies of developing the economy in North Manchuria and of expanding the heavy industry, the Railway Administration built new lines and in the meantime improved its services to the public through a set of reasonable rates.

In 1937 the South Manchuria Railway Company handed over the administrative power in the Kwantung Leased Territory to Manchukuo. In the meantime it handed over the heavy industry to the Manchurian Heavy Industry Development Corporation, Limited. Thus, the South Manchuria Railway Company concentrated solely on Manchuria's transportation.

3. For the strengthening of the "Economic Sphere" and in addition to the use of Dairen and Ying-k'ou, Japan operated the An-tung, the Korean Line and the three ports newly built in North Korea as trade routes with Japan. In 1937, the North China Communication Corporation, limited, was created. Since the creation of the corporation trade between North China and Manchuria was greatly stimulated through the Shan-hai-kuan and the Ku-pei-k'ou railways.

At that time the Manchurian transportation reached the standards established in the world. For instance, the Asian Express was safe, comfortable, accurate, fast, and its charge was reasonable. The distance from Dairen to Harbin is 940 kilometers. The Asian Express could cover it within twelve hours. The speed was the greatest in Eastern Asia. The reason that the Asian Express could set such a record may be seen from the following factors:

1. The composition of the cars (Safe and Comfortable)

1. locomotive (Pacific Type), maximum speed 110 kilometers per hour, average 80 kilometers per hour.

2. Luggage Car 1

Third-class car 2 Accommodation: 176 persons, 88 persons in each car

Dining Car 1 Accommodates 38 persons

Second-class car 1 Accommodates 68 persons

Observation car, first-class 1 Accommodates 46 persons

The formation of the train was in the following order:

Locomotive, luggage car, third-class car, third-class car, dining car, second-class car, and first-class car.

3. Special Features:

1. In order to reduce air resistance, the locomotive and the rear of the passenger cars were streamlined.

2. The axles had S.K.F. roller-bearings

3. In order to reduce the fatigue of the passengers when the train was at the highest speed, the train was equipped with cooling, heating, dust proofing and ventilation devices.

4. Near each window of 1-meter width there was a revolving chair for two persons.

II. The traveling (Fast and Accurate):

From Dairen to Harbin	12 hours
From Dairen to Ch'ang-ch'un	701.8 kilometers
From Ch'ang-ch'un to Harbin	242 kilometers

<u>Northbound Train</u>

Dairen:	Starting	09:00
Mukden	Starting	13:04
Ch'ang-ch'un	Starting	17:00
Arrival at Harbin		21:00

<u>Southbound Train</u>

Harbin	Starting	09:00
Ch'ang-ch'un	Starting	13:00
Mukden	Starting	16:30
Arrival at Dairen		21:30

III. Passenger Rates (very reasonable)

THE PRICE OF TICKETS BETWEEN HARBIN AND DAIREN (IN YEN)

	First Class	Second Class	Third Class
Basic gate ticket	43.00	26.90	15.30
Additional charge for express	7.50	5.00	2.50
Totals	50.50	31.90	17.80

3. The Direction of Management in the Third Period

In December 1941, the Pacific War broke out and Manchuria was overcast with war clouds. Following Japan, Manchukuo declared a state of emergency. The South Manchuria Railway Company began to take emergency measures. As a first step, it moved its planning and management sections to Ch'ang-ch'un so that it might coordinate its activities with those of the Manchukuo Government. Meanwhile, for the purpose of achieving a centralized control over the four major railway systems, the Korean Railway, the Manchurian Railway, the North China Railway and the Central China Railway, the Ch'ang-ch'un Bureau of the Continental Railway Transportation Consultative Conference was created. Since the all-important policies in connection with communications and transportation were formulated on the basis of the decisions made in the consultative conference.

During this period the directions once followed in the second period were abolished. Following the progress of war various emergency measures were taken. According to the emergency measures, war materials and supplies were given preference in transportation. Transport of civilian goods was greatly discouraged.

As the scope of the war was further enlarged, sea transportation was interrupted. This had forced Japan to send its war materials and supplies through the continental lines. Consequently, the traffic in the Mukden-Shan-hai-kuan line, the An-tung-Mukden Line, the Ch'ang-ch'un-Tu-men Line and the T'u-men-Chia-mu-ssu Line increased greatly. Since the South Manchuria Railway Company had achieved a centralized management system during the first and second periods, its transportation capacity had been sufficiently strengthened. Accordingly, during the third period, in addition to the transportation of tremendous quantities of war materials, it handled a very large volume of civilian goods. In 1943 the volume of transportation reached a record high.

As mentioned above transportation policies in the third period were determined by the Continental Railway Transportation Consultative Conference rather than by the South Manchurian Railway alone. Thus the third period was identified as the period of the Continental Railway Transportation Consultative Conference.

Section 3. Administrative Organization

Although there had been some changes in the organizational structure of the Manchuria railways, the organizational system generally followed the pattern of the South Manchuria Railway Company with some modification according to local circumstances. The middle-of-the-road, departmental system and the divisional system were adopted.

1. During the first period, i.e. the period of the Railway Administration, there were two administrative systems. a. The Department of Railways under the South Manchuria Railway Company in charge of the "Company Lines" with its two agencies in Dairen and Mukden; b. The head office of the Railway Administration in charge of the national railways of Manchukuo with its headquarters located at Mukden and with its agencies located at various places. In 1933, at the request of the Governor of Korea for the management of the railways located in North Korea, the North Korea Railway Administration was created in Manchuria. These three administrations were under the control of the general director of the South Manchuria Railway Company.

In addition, for the purpose of building new railway lines, a number of railway construction bureaus were established with branch bureaus at various centers.

In April, 1934, reorganization plans were carried out in the railway administrations in Manchuria. The original nine railway administrations were abolished, while four railway administrations, three agencies and one navigation bureau were established. The four railway administrations were the Mukden (later moved to Chin-hsien), the Ch'ang-ch'un, the Harbin, and the T'ao-nan (later moved to Ch'i-ch'i-ha-erh) railway administrations. The three railway agencies were the Chin-hsien, Ssu-p'ing and T'u-men agencies, while the navigation bureau was the Harbin Navigation Bureau in charge of the navigation facilities of the Amur and the Sungari.

In March 1935 the Chinese Eastern Railway had been taken over from the Soviet Union. At first, the railway was put under the management of the Harbin Railway Administration. In October of that year the railway administration reorganized and put the western part of the Chinese Eastern Railway under the Ch'i-ch'i-ha-erh Railway Administration.

After the reorganization, railway administration became more efficient. Subsequently, the centralized administrative system was changed to a new system under which the local railway administrations were given greater power. Sixteen supervisory agencies were established and inspectors were assigned to various railways for field duties. As a result, the railway operations showed a very satisfactory improvement.

TABLE 45

ADMINISTRATIVE ORGANIZATION OF THE SOUTH MANCHURIA RAILROAD COMPANY

AS OF END OF SEPTEMBER 1944

President

Vice-President

Directors

Supervisors

Counselors

Offices and Bureaus (followed by sections)

Office of Planning: Conference, general administration, mining and supervisory sections.

Bureau of General Administration: Secretary, stenography, personnel, training and health sections; European Affairs Division, Fengtien Railroad Academy, Railroad Vocational Schools (in Dairen and Mukden), grade schools for employees' children.

Bureau of the Budget: Secretary (in Dairen and Mukden), budget estimate, budget auditing, railroad materials control first and second and accounting sections; warehouse administrations (Dairen and Mukden) and their branches (in An-shan and Ch'ang-ch'un).

Bureau of Traffic: Secretary, freight, passenger, car distribution, car transfer, and passenger service sections; automobile transportation department (traffic and technical) and river shipping department.

Bureau of Construction: Secretary, planning construction, improvement, road maintenance, engineering, designing, civil engineering, sewage, port construction, and forest sections, department of electric power (general management, communication and electric power (general management, communication and electric power divisions) and civil engineering departments (in Mukden and Ch'ang-ch'un).

Bureau of Engineering: Secretary, planning, combustion engine, car and mechanic sections.

Bureau of Resettlement: Secretary, industry, resettlement, land and road protection sections.

Conferences

Bureau of Investigation: Secretary, special investigation, traffic investigation, Chang-chun investigation, and geological survey sections; Dairen Library.

Bureau of East Asia Economic Statistics: Secretary and statistical investigation.

Fu-shun Coal Mine: Secretary, manager, mining, civil engineering, industry, reconstruction and operation bureaus.

Welfare Bureau: Secretary, administrative, housing, operation and subsidiary enterprises sections.

Central Laboratory: Secretary, inorganic chemistry, metallurgical, organic chemistry, fuel, agricultural chemistry sections and laboratories.

Railroad Research Institute: At Dairen with branch in Tokyo.

Manchurian Railroad Higher Technical Academy.

Railway Administrations (in Mukden, Chin-chou, Kirin, Mou-tan-Chiang, Harbin, Ch'i-ch'i-ha-erh Lo-ching):

Secretary

Manager

Materials and Equipment

Automobile

Construction Engineering

Electric Power (except in Lo-ching)

Resettlement (except in Lo-ching)

Statistics

Conferences

Miscellaneous facilities:

Railroad Car yards

Train platforms

Train District

Office District

Engineering District

Electric power District

Automobile Services

Electric Work Shops

Telephone and telegram Offices

Cafeteria

Hotels

Railway work shops, railway supervision bureaus

Engineering bureaus, statistics bureaus

Welfare, maternity and child care hospitals, general hospitals, Harbin Railroad Academy, and railroad vocational schools.

Kairen Port Authority: Secretary, manager, traffic, operation, engineering, electric power supply, port construction, statistics sections.

North Manchurian River Transportation Bureau: Secretary, traffic and ship divisions; Harbin Ship Yard, Pilot Training School; wharves.

Dairen Railway Plant: Secretary, manager, planning, inspection, locomotive, freight and passenger car, iron work, machine tool divisions; school for technicians.

Department of auditing and statistics, two divisions

Departments of railroad construction (in Mukden, Tunghua, Harbin and Tsitsihar)

Manchuria Medical College: Affiliated hospital and library

South Manchurian Industrial College

South Manchurian High School

TABLE 46

A LIST OF THE NAMES OF RAILWAY STATIONS IN MANCHURIA

The Antung-Mukden Line

Mukden, Hung-ho, Su-chia-t'un, Wu-chia-t'un, Chen-hsi-ang-t'un, Yao-chien-hu-t'un, Wai-tou-shan, Shih-chiao-tzu, Kao-chia-sui, Huo-lien-tsai, Pen-chi, Kung-yuan, Chiao-t'ou, Chin-keng, Nan-wen, Hsia-ma-tang, Lien-shan-kuan, Chi-chia-pao, Pai-la-tzu, Tsao-ho-k'ou, Tung-yuan-pao, Lin-chia-tai, Liu-chia-ho, Chiu-mu-chuang, Chih-ho, Hsiao-chia-ya, Chi-kuan-shan, Szu-tai-tzu, Feng-huang-cheng, Cheng-chia-pao, Kao-li-men, Tang-shan-cheng, Wu-lung-pei, Lou-ku-kou, Ha-mu-tang, Sha-ho-cheng, An-tung.

The Chi-Hsien Line

Pen-chi, Ming-shan, Tui-chia, Niu-hsin-t'ai, Pien-ling, Wen-chuan-ssu, Hsiao-shih, Chuan-shui, Pei-tien, Nan-tien, Tien-shih-fu, Hsien-chuang.

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Hsia-pan-cheng, Shang-pan-cheng, Cheng-te, Shuang-tou-shan, Luan-p'ing, Lan-chi, Yao-kou-men, An-hsiang, La-hai-ling, Huo-t'ou-shan, Ku-pei-k'ou.

The Pei-piao Line

Chin-ling-ssu, Lo-to-ying, Pei-piao

The Yeh-pei-shou-Chih-feng Line

Yeh-pei-shou, Sha-hai, Tien-yi, Erh-lung, Hsi-tzu, Nei-lin, Ku-shan, Jeh-shui, Yu-huang, Chih-feng.

The Hu-lu-tao Line

Chin-hsi, Hu-lu-tao, pier in Hu-lu-tao.

The Mukden, Kirin Line

Mukden, Tung-ling, Chiu-tsuan, Ti-t'ai, Fu-shun-cheng, Chien-tien, Chang-tang, Ying-p'an, Yuan-shuo-lin, Nan-tsa-mu, Tsang-shih, Nan-kou-chien, Pei-san-chia, T'ou-hu-t'un, Yuan-yuan, Yin-o-men, Shui-lien-tung, Tsao-shih, Shan-cheng-chen, Ho-shan-t'ou, Mei-ho-kou, Lien-ho, Hai-lung, Chao-yang-chen, Kao-shan-t'un, P'an-shih, Yung-ning, Ming-cheng, Yin-tung-shan, Chu-tsai-ho, Shuang-ho-cheng, Hsi-yang, Kou-chien, Huang-chi-t'un, Pei-shan, Kirin.

The Mei-Chi Line

Mei-ho-kou, Hsien-chia, Liu-ho, Te-yao-ling, Wu-tao-kou, San-yuan-pu, Tung-kou, Kan-kou, Erh-mi-ho, Tung-hua, Tung-tung-hua, Shui-tung, Ya-yuan, Kou-sung, Shih-hu, Lou-ling, Hunag-pei, Yang-cha, Tsi-an.

Ta-li-tzu Line

Ya-yuan, Ku-yuan, Tao-ch'ing, Lao-ying, Lou-kuan, Hung-kiang, Shih-jen, Lin-tzu-tou, Yao-lin, Cheng-chu-men, San-tuan, Hua-shan, Lin-kiang Hsien, Wang-lu, Lin-kiang, Ta-li-tzu.

The Ssu-p'ing-Mei-ho-k'ou Line

Ch'ang-ch'un, The East Station of Ch'ang-ch'un, Hsing-lung-shan, K'a-lun, Lung-chia-pao, Yin-ma-ho, Hsiao-chiu-tai, Ying-cheng-tzu, T'u-men-ling, Ho-wan-tzu, Hua-pi-chang, Ku-tien-tzu, Chiu-tsuan, Ha-tai-ling, Kirin, Lung-tan-shan, Tang-fang, Chiang-mi-fen, Ma-wei-shan, T'ien-kang, Ta-tao-ho, Lou-yeh-ling, Hsiao-ku-chia, La-fa, Chiao-ho, Wei-tang, Liu-shu-ho, Erh-tao-ho, Huang-sung-tien, Wei-hu-ling, Ta-chuan, Huang-ni-ho, Chiu-li-kou, Tai-p'ing-ling, Tung-hua, Ta-chiao, Ta-shih-tou, Ha-erh-pa-ling, Nan-kou, Liang-ping-t'ai, Ming-yueh-kou, Cha-tiao-kou, Yu-shu-chuan, Lou-tou-kou, Tung-fu-ssu, Chao-yang-chuan, Yen-chi, Mo-pan-shan, Wei-tzu-kou, T'u-men.

The Lung-Feng Line

Lung-tan-shan, Ta-feng-men.

The Liao-Kung Line

Liao-yang, Tung-liao-yang, O-mei, Hsiao-t'un, An-ping, Han-ling, Pei-t'ai, Kung-yuan.

The Feng-Kuan Line

Feng-huang-cheng, Kuan-chia, Ta-pao, Shih-cheng, Pien-kou, Miao-yang, Kuan-shui.

The An-Nan Line

An-tung, Nan-an-tung.

The Mukden Shan-hai-kuan Line

The North Station of Mukden, Huang-ku-t'un, Yu-kuo, Ma-san-chia, Hsing-lung-tien, Chu-liu-ho, Kao-tai-shan, Hsin-min, Liu-ho-kou, Pai-chi-pao, Jou-yang-ho, Li-chia, Tang-chia, Ta-hu-shan, Kao-shan-tzu, Ch'ing-tuan-tzu, Chao-chia-t'un, Kou-pang-tzu, Yang-chuan-tzu, Shih-shan, Ta-ling-ho, Shuang-yang-tien, Chin-hsien, Chen-chia-t'un, Kao-chiao, Ta-shan, Chin-hsi, Han-chia-kou, Hsing-cheng, Pai-miao-tzu, Sha-hou-shuo, Tung-hsin-chuang, Sui-chung, Huang-ti, Chien-wei, Kao-ling, Chien-shuo, Wan-chia-t'un, Shan-hai-kuan.

The Ta-hu-shan-Chengchiat'un /Liao-yuan/ Line

Ta-hu-shan, Ho-shan-hsien, Ch'ing-chia-t'un, Pa-tao-ling, Fang-shan-cheng, Hsin-li-t'un, Shih-chia-tzu, Pao-tzu, Wu-feng, Chang-wu, Feng-chia, Chang-ku-t'ai, Ah-erh-hsiang, Kan-chi-ka, Yi-hu-ta, Pa-hu-ta, Ya-men-ying, Mu-li-tu, Tung-liao, Chien-chia-tien, Ta-lin, Ta-han, Men-ta, Au-li, Pai-shih, Liao-yuan.

The Kao-tai-Hsin-li-t'un Line

Kao-tai-shan, Lo-chia, Hsiao-liang-shan, Yao-pao, Hsiao-tung, Hsin-li-t'un.

The Hsin-li-t'un-I-Hsien Line

Hsin-li-t'un, Tsang-tu, Ta-pa, Sha-la, Hsin-chiu, Fu-hsin, Ha-chou, Tung-liang, I-ma-tu, Ch'ing-ho-men, Li-chin, Chiu-tao-ling, I-hsien.

The Hopei Line

Kou-pang-tzu, Hu-chia, P'an-shan, Ta-wa, Tien-chuang-t'ai, Ta-tung Chuang, Hopei.

The Chin-hsien-Ku-pei-k'ou Line

Chin-hsien, Hsueh-chia, Shang-chi-t'ai, Chi-li-ho, Ni-ho-tzu, I-hsien, Chou-chai-t'un, Shang-yuan, Nan-ling, Chin-ling-ssu, Nun-chia, Chin-kou, Chao-yang, Ta-ying-tzu, Ta-ping-fang, Tung-ta-tao, Po-lo-chih, Kung-ying-tzu, Hsiao-ping-fang, Yeh-pei-shou, Hung-shih, Ho-tang-kou, Ling-yuan, Sung-chang-tzu, Shui-chuan, San-shih-chia, Lou-kuo, Yang-shu-ling, Ping-chuan, Hsiao-ssu-kou, Shang-ku, Yang-ho, Laping Line

La-fa, Hsin-tsuan, Liu-chia-tzu, Ma-an-shan, Shang-ying, Hsiao-cheng, Chun-ling, Ssu-chia-fang, Shui-chu-liu, P'ing-an, Shan-ho-t'un, Tu-chia, Wu-chang, An-chia, Pei-ying-ho, La-lin, Niu-chia, Chou-chia, P'ing-fang, Sun-chia, San-ko-shu.

The Chao-yang-chuan-Kai-shan-t'un Line

Chao-yang-chuan, Lung-ch'ing, Tung-sheng-yung, Pa-tao-ho, Huai-ch'ing-chieh, Kai-shan-t'un.

The Ho-Lung Line

Lung-ch'ing, Ho-lung.

The T'umen-Chia-mu-ssu Line

T'u-men, Shih-chin, San-tao-kou, Hsin-hsing, Wang-ch'ing, Ta-kuang-kou, Miao-ling, Tien-chiao-ling, Lo-to-shan, Chun-yang, Lou-ling, Lou-sung-ling, Lu-tao, T'ou-kou-tzu, Ma-lien-ho, Tung-ching-cheng, Shih-tou, Lan-kang, Ning-an, Wen-chun, Hai-lang, Mu-tan-chiang, Hua-lin, Tsai-ho, Wu-ho-lin, Hsieh-tung, Chi-hsin, Pao-lin, Chu-shan, Hsiang-yang, Lung-kua, Lin-kou, Ku-cheng-chen, Ya-ho, Ch'ing-shan, Hu-shan, Fu-ling, Tung-tien, Po-li, Hsin-shu, Wo-keng, Yen-chia, Chien-cheng, Pa-hu-li, Mi-yung, Chui-fen, Chang-fa-t'un, Chia-mu-ssu, Pier in Chia-mu-ssu.

The Lin-k'ou-Hu-t'ou Line

Lin-k'ou, Yang-mu, Kuei-shan, Ma-shan, Ch'ing-lung, Lan-ling, T'ien-tao, Chi-hsi, Chi-ning, P'ing-yang, Tung-hai, Mu-ho-shan, Hei-tai, Lien-chu-shan, Tung-an, Pei-te, Hsing-k'ai, Yang-kang, Hu-pei, Hui-tsai, Pao-tung, An-tung-cheng, Hu-lin, Ch'ing-ho, Ch'ing-ho, Shui-keh, Yueh-ya, Wan-ta, Hu-t'ou.

The Sui-hua-Chia-mu-ssu Line

Sui-hua, Fu-hsing, Tung-chin, Shih-yin, Lung-chuan, Ch'ing-cheng, Kao-lou, Tien-sheng, Wang-yang, T'ieh-shan-pao, Yen-shou, Shih-chang, Sheng-shu, Sheng-lang, Chi-ling, Hsiao-pai, Ta-li, Lang-hsiang, Tai-ling, Nan-cha, Hua-yang, Chen-ming, Liang-t'ai, Hao-liao-ho, Hsiang-lan, Tang-wang-ho, Fu-lung, Hsi-chia-mu-ssu, Lien-chiang-k'ou, Chia-mu-ssu.

The Ho-kang Line

Chia-mu-ssu, Lien-chiang-k'ou, Ho-li, Chun-te, Ho-kang.

The Hsia-ch'eng-tzu-Chi-hsi Line

Hsia-ch'eng-tzu, Pa-mien-tung, Li-shu-cheng, Chi-hsi.

The Sui-yang-Tung-ning Line

Sui-yang, Hsi-sui, Ho-tung, Tzu-yang, Sha-tung, Tao-ho, Tung-tin, Tu-pei, Cheng-tzu-kou, Tung-ning.

The Hsin-hsing-Ch'eng-tzu-k'ou Line

Hsin-hsing, Wang-ch'ing, Hsiao-wang-ch'ing, Hsi-ta-po, Chi-li-ping, Miao-kou, Tsang-lin, Huang-kou, Pei-huang-kou, Hsueh-ling, Chin-tsang, Feng-shao, Lou-hsi, Heh-ying, Lao-hei-shan-chuan, Tu-hsi, Sheng-tung, Ch'eng-tzu-k'ou.

The Harbin-Pei-an Line

San-ko-shu, Hsin-sung-pu, Hsu-chia, Hu-lan, Ma-chia, Shen-chia Kang-chin-ch'ing, Shih-jen-cheng, Pai-kuei-pao, Hsing-lung-chen, Wan-fa-t'un, Ni-ho, Sui-hua, Ch'ing-chia, Ssu-fang-t'ai, Chang-wei-t'un, Kao-chia-tien, Kio-yin-ho, Feng-yu-t'un, Tung-pien-ch'ing, Hai-lun, Chao-chia, Hai-pei, Tung-kang, Yang-chia, Li-chai, Tung-pei, Pai-chia, Pei-an.

The Pei-an-Hei-ho Line

Pei-an, Erh-ch'ing, Erh-lung-shan, Na-mu-erh, Lung-cheng, Wei-shan, Lung-men, Hsiao-hsing-an, Chen-ch'ing, Ch'ing-hsi, Sun-wu, Pei-sun-wu, O-erh, Chao-shui, Ai-hui, Huang-chin-tzu, Sheng-wu-t'un, Hei-ho.

The Ch'i-ch'i-ha-erh-Pei-an Line

Feng-tun, Ta-ha, Chung-ho, Ning-nien, Shu-lin, Fu-hai, Hsin-t'un, T'ai-an, T'ai-tung, Ku-cheng, Keh-shan, Kuo-chia, K'o-tung, Pei-an.

The Ning-nien-Huo-lu-men Line

Ning-nien, Chiang-wan, La-ha, Hsin-an, Na-ho, Lou-lai, I-la-ha, K'o-shan, Nun-chiang, Hua-feng, Huo-lu-men, Chin-shui, Leng-chuan, Hei-ho.

The Ssu-p'ing-ch'i-ch'i-ha-erh

Ssu-p'ing, Ch'uan-kou, P'ing-an-pao, Pa-mien-cheng, Chu-chia-tien, Fu-chia-t'un, San-chiang-k'ou, Chin-pao-t'un, Liao-yuan, Ta-tu-shan, Wo-hu-t'un, Po-li-shan, Pao-shih-tu, Mao-lin, San-lin, Pao-kang, Chin-shan, Feng-ku, T'ai-ping-chuan, Yu-hai-t'un, Pien-chao, Tung-chia-tien, K'ai-tung, Hu-chia-tien, Hung-hsing, Shuang-kang, Hei-shui, T'ao-nan, Mu-chia-tien, Pai-chang-tzu, Li-chia-tien, Pai-chang-tzu, Lung-shan, Ch'eng-tung, Yin-hua, Tung-p'ing, Tan-tu, Chieh-tsi, Tai-lai, K'o-li, Wu-miao-tzu, T'ou-hai, Chiang-chiao, Ta-hsing, Tang-chih, San-chien-fang, Yu-shu-t'un, Ya-men-t'un, Ch'i-ch'i-ha-erh.

The Ch'ang-ch'un-Pai-ch'eng-tzu Line

Ch'ang-ch'un, Hsiao-ho-lung, Wan-pao-shan, Hua-chia, Lung-an, Tsai-kang, Ha-la-hai, Wang-fu, Chi-chia-tzu, Chien-kuo-chi, Mu-t'ou, Hsin-miao, Pa-lang, Ta-lai, Lia-chia, Lung-chia, Lai-fu, She-li, Pai-chieng-tzu.

The Pai-ch'eng-tzu-Tu-lu-erh Line

Pai-ch'eng-tzu, P'ing-an-chen, So-ko-ying, Ko-keng-miao, Wang-yeh-miao, Hu-nan, Kuei-liu-ho, Ha-la-heh, Ta-shih-tsai, Te-shih-tsai, Te-pao-ssu, So-lun, Hsi-kou, Wu-huo-kou, Nui-feng-t'ai, Pai-lang, Ah-erh-shan, Tu-lu-erh.

The Yu-shu Line

Yu-shu-t'un, Ang-ang-ch'i.

The Ch'ang-ch'un-Dairen Line

Dairen, Sha-ho-k'ou, Chou-shui-tzu, Nan-kuan-ling, Yen-tao, Ta-fang-sheng, Chin-hsien, Erh-shih-li-tai, San-shih-li-pao, Shih-ho, Pu-la-tien, Liang-chia, Tien-chia, Wa-fang-tien, Wang-chia, Te-li-ssu, Sung-shu, Wan-chia-ling, Hsu-chia-t'un, Chiu-tsai, Li-shan, Hsiung-yao-cheng, Lu-chia-t'un, Sha-kang, Kai-ping, Pai-chi, T'ai-p'ing-shan, Ta-shih-chiao, Feng-shui, T'o-shan, Hai-cheng, Nan-t'ai, Nan-chuan-pu, Tang-kang-tzu, Chien-shan, An-shan, Li-shan, Shou-shan, Liao-yang, T'ai-tzu-ho, Chang-t'ai-tzu, Yen-t'ai, Shih-li-ho, Sha-ho, So-chia-t'un, Hung-ho, Mukden, Wen-kuan-t'un, Hu-shih-t'ai, Hsin-cheng-tzu, Hsin-tai-tzu, Luan-shih-shan, Te-sheng-t'ai, T'ieh-ling, Ping-ting-pao, Chung-ku, Kai-yuan, Chin-k'ou-tzu, Ma-chun-ho, Chang-tu, Man-ch'ing, Chuan-tou, Shuang-miao-tzu, Huan-kou-tzu, Mao-niu-sou, Ssu-p'ing, Yang-mu-lin, Shih-chia-pao, Kuo-chia-tien, Tsai-chia, Ta-yu-shu, Kung-chu-ling, Liu-fang-tzu, Tao-chia-t'un, Fa-chia-t'un, Ta-t'un, Meng-chia-t'un, Nan-chang-chun, Ch'ang-ch'un.

The Port Arthur Line

Chou-shui-tzu, Ko-cheng-pao, Hsia-chia-ho-tzu, Mu-cheng-tzu, Ying-cheng-tzu, Chang-ling-tzu, Lung-t'ou, Shui-shih-ying, Lu-shun (Port Arthur).

The Chin-Cheng Line

Chin-hsien, The East Gate of Chin-hsien, Kuang-ning-szu, Tsan-chang-t'un, Liang-chia-tien, Teng-sha-ho, Hsin-shu-t'un, Ch'ing-shui-ho, Li-chia-t'un, Pi-tzu-wo, Chia-hsin-tzu, Cheng-tzu-t'un.

The Ying-k'ou Line

Ta-shih-chiao, Lou-pien, Ying-k'ou.

The Yent'ai Line

Yen-t'ai, Yen-t'ai Coal Mine.

The Fu-shun Line

Mukden, Hung-ho, Yu-shu-t'ai, Ku-chia-tzu, Niu-hsiang-t'un, Sheng-chin-tzu, Li-shih-tsai, Piao-erh-t'un, Ta-kuan-t'un, Fu-shun.

The Ch'ang-ch'un Harbin Line

Ch'ang-ch'un, I-chien-pao, Mi-sha-tzu, Ha-la-ha, Pu-hai, Te-nui, Ta-chia-kou, Lou-shao-kou, The Sungari R, Tao-lai-chao, San-chaho, Tsai-chia-kou, Shuang-cheng, Wu-chia, Wang-kang, Ku-hsin-t'un, Harbin.

The Harbin-Manchuli /Lu-pin/ Line

Harbin, Miao-tai-tzu, Tuan-ch'ing-shan, Chiang-chia, Man-kou, Shang-chia, Sung-chia, An-ta, Sa-erh-tu, La-ma-tien, Tai-kang, The Harbin-Manchuli /Lu-pin/ Line (con't)

Yen-t'ung-t'un, Ang-ang-ch'i, Fu-la-erh-tsi, Hu-erh-hu-la, Tu-erh-chih-la, Nien-tzu-shan, Chen-chi-ssu-han, Tsa-la-t'un, Ha-la-so, Pa-lin, Ya-lu, Po-k'o-tu, Hsing-an, I-lieh-keh-teh, Wu-nu-erh, Mien-tu-ho, Ya-keh-shih, Tsa-lo-mu-teh, Ha-k'o, Hailar, Wu-ku-nor, Wan-kung, Hei-erh-hung-te, Ts'o-kang, Cha-lai-na-erh, Lu-pin.

The Harbin-Sui-fen-ho Line

Harbin, Cheng-kao-tzu, She-li-t'un, Ya-kou, Yu-chuan, Hsiao-ling, P'ing-shan, Mo-erh-shan, Mi-feng, Hsiao-wan, Wu-chi-mi, Chu-ho, Ma-yen, I-mien-po, Wan-shan, Wei-ho, Ch'ing-yung, Ya-pu-ko-ni, Liang-tzu-ling, Leng-shan, Kao-ling-tzu, Heng-tao-ho-tzu, Tao-lin, Shan-shih, Shih-ho, Hai-lin, Mu-tan-chiang, Ai-ho, Mo-t'ao-shih, Tai-ma-kou, Pei-lin, Mu-leng, I-lin, Hsia-cheng-tzu, Ma-chiao-ho, Tai-ling, Hsi-ling-ho, San-wang-kou, Hsi-sui-yang, Sui-yang, Sui-fen-ho.

The Pin-chiang Line

Harbin, Pin-chiang, San-ko-shu.

TABLE 47

RAILWAYS UNDER DIFFERENT RAILWAY ADMINISTRATIONS

Dairen Railway Administration

Names of Railway Lines	Terminals
Ta-shih-chiao to Dairen Line	Ta-shih-chiao to Dairen
Port Arthur Line	Port Arthur to Chou-shui-tzu
Chin-cheng Line	Chin-chou to Cheng-tzu-t'uan
Kan-chin-tzu Line	Na-kuan-ling to Kan-ching-tzu
Wu-chi Line	Dairen to Wu-chi
Ying-k'ou Line	Ta-shih-ch'iao to Ying-k'ou
Wharf Line	Sha-ho-k'ou to wharf

Fengtien Railway Administration

Names of Railway Lines	Terminals
Ch'ang-Ta Line	Ch'ang-ch'un to Ta-shih-ch'iao
An-Shen Line	Mukden-An-tung
Fu-shun Line	Su-chia-t'un to Fu-shun
Yen-t'ai Coal Mine Line	Yen-t'ai to Yen-t'ai Coal Mine
Liao-Kung Line	Liao-yang-Kung-yuan
Ch'i-chien Line	Kung-yuan-T'ien-shih-fu
Feng-Kuan Line	Feng-huang-ch'eng to Kuan-shui

Chin-chou Railway Administration

Names of Railway Lines	Terminals
Shen-Yu Line	Mukden to Shan-hai-kuan
Chin-ku Line	Chin-chou to Ku-pei-k'ou
Hopeh Line	Kou-pang-tzu to Hopeh
Hsin-I Line	Hsin-li-t'un to I-hsien
Ta-Cheng Line	Ta-hu-shan to Cheng-chia-t'un
Kao-Hsin Line	Kao-t'ai-shan to Hsin-li-t'un
Pei-piao Line	Chin-ling-ssu to Pei-piao
Yeh-Feng Line	Yeh-pei-shou to Ch'ih-feng
Hu-lu-tao Line	Chin-hsi to Hu-lu-tao

Kirin Railway Administration

Names of Railway Lines	Terminals
Sheng-Chi Line	Mukden to Kirin
Ping-Mei Line	Ssu-p'ing to Mei-ho-k'ou
Mei-chi Line	Mei-ho-kou to Chi-an
Ta-li-tzu Line	Ta-li-tzu to Ya-yuan
Ch'ang-t'u Line	Ch'ang-ch'un to T'u-men
Chao-k'ai Line	Chao-yang-chuan to Kai-shan-t'un
Lung-ch'ing Line	Lung-ch'ing to Ch'ing-tao
Lung-Feng Line	Lung-tan-shan to Ta-feng-man
Kirin Line	Lung-tan-shan to Shu-lan

Harbin Railway Administration

Names of Railway Lines	Terminals
Ch'ang-Ha Line	Ch'ang-ch'un to Harbin
La-pin Line	La-fa to San-ko-shu
Pin-sui Line	Harbin to Yi-mien-po
Pin-chou Line	Harbin to Ch'i-ch'i-ha-erh
Pin-pei Line	San-ko-shu to Pei-an
Pei-Hei Line	Pei-an to Hei-ho
Sui-chia Line	Sui-hua-chia-mu-ssu

Ch'i-ch'i-ha-erh Railway Administration

Names of Railway Lines	Terminals
Ping-chi Line	Ssu-p'ing to Ch'i-ch'i-ha-erh
Ch'ang-Pai Line	Ch'ang-ch'un to Pai-cheng-tzu
Pai-tu Line	Pai-cheng-tzu to Tu-lu-erh
Ch'i-Pei Line	Ch'i-ch'i-ha-erh to Pei-an
Ning-Huo Line	Ning-nien to Huo-lu-men
Pin-chou Line	Ch'i-ch'i-ha-erh to Lu-pin

Mu-tan-chiang Railway Administration

Names of Railway Lines	Terminals
T'u-chia Line	T'u-men to Chia-mu-szu
Pin-Sui Line	I-mien-po to Sui-fen-ho
Sui-Ning Line	Ho-hsi to Tung-ning
Hsing-ning Line	Hsin-hsing to Cheng-tzu-kuo
Cheng-chi Line	Hsia-ch'eng-tzu to chi-ning
Hu-lin Line	Lin-k'ou to Hu-lin
Hokang Line	Lien-chiang-k'ou to Ho-kang
Heng-shan Line	Chi-ning to Heng-shan

Section 4. Railway Transportation Facilities

When the Railway Administration was first established, it knew there were many defects and deficiencies in railway facilities. A careful survey discovered that the poor quality of the railway facilities was beyond imagination. Not only the rails and ties were rotten, but the macadamized layers were too thin for safety. In addition, most of the bridges were built of wood, incapable of carrying heavy loads or high-speed trains. Consequently, it was impossible to achieve accuracy in the operations. In rainy seasons the roadbed was often damaged. To make the situation worse, bandits raided the railway lines now and then. Many accidents occurred. Indeed the officers and workers of the railways were working in an extremely difficult situation.

The Railway Administration estimated originally that the annual railway maintenance expenses would be between 10,000,000 and 15,000,000 Japanese yen. Actually, it spent 30,000,000 yen yearly. The Increase was mainly due to the replacement of the light steel tracks with heavy ones, the addition of more sleepers and more macadamized layers. As these efforts were being made, the tracts had been improved yearly, and the lines within stations had been also augmented. Area occupied by the railway stations increased daily, and the signal facilities were further strengthened. Even water supplied for locomotives were completed within a short time. Accordingly, the capacity of rail transportation gradually increased, and the railways in Manchuria reached nearer to modern standard.

Telephone and telegram facilities were poor and insufficient in the past. In the first year under the centralized management of the Railway Administration, 6,000,000 yen was spent in the installation of single and double telephone lines. A network of telephone and telegraph exchanges was established with the General Railway Administration as its center. The completion of the communication has greatly facilitated railway operations, particularly in the transfer of cars in railway patrols.

When the General Railway Administration began to take over the management of the national lines, the total mileage of railways was 3,000 kilometers with 282 locomotives, 327 passenger cars and 4,030 freight cars. As the cars were of different make most of them were useless without reparing. The situation was a result of the lack of inspection and the shortage of repairing facilities. Although the General Railway Administration did its best to repair the cars, they were far from sufficient in meeting the needs. This was deeply felt in the winter time when the traffic increased tremendously. At that time, for the purpose of conquering the difficulties arising from the shortage of cars, both staff officers and cars were borrowed from the Korean Corporation and the South Manchuria Railway Company. In the meantime the Railway Administration ordered a great number of locomotives, freight cars and passenger cars, established newplants for producing railway vehicles and introduced an inspection system.

1. Railway Operating Mileage and Operating Agencies are given in Tables 48 and 49.

TABLE 48

RAILWAY OPERATING MILEAGE AND FACILITIES BY RAILWAY ADMINISTRATIONS

Name of the Railway Administration	Operating Mileage in Kilometers	Location of Administrative Offices	Number of Stations*	Number of Train District
Dairen Railway Administration	438	At Dairen and Ta-shih-chiao Total: 2		3
Liao-Yang Railway Administration	928	Mukden, Ch'ang-ch'un, An-tung Total: 3	192	9
Chin-chou Railway Administration	1,778	Ta-hu-shan, Chin-chou, Ch'eng-te, Fu-hsin Total: 4	179	4
Kirin Railway Administration	1,630	Mei-ho-k'ou, T'ung-hua, Kirin, Chao-yang-chuan Total: 4	167	3
Mu-tan-chiang Railway Administration	1,866	T'u-men, Mu-tan-chiang, Chia-mu-ssu, Tung-an Total: 4	226	4
Ch'i-ch'i-ha-erh Railway Administration	2,456	Hailar, Ch'i-ch'i-ha-erh, Pai-ch'eng-tzu Total: 3	143	3
Harbin Railway Administration	1,962	Harbin, Sui-hua, San-ko-shu, Pei-an Total: 4	193	4
Lo-ching Railway Administration	208		31	1
Total	11,266	24	1,131	31
Railroad Factories		Total: 8		
Railroading Agencies		Total: 4		

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Number of Locomotive District	Number of Car Inspection District	Number of Engineering District	Number of Electric Power District	Remarks
3	2	4	3	Data are as of 1944. *denotes 1942's data
10	9	11	5	
6	3	12	4	
8	4	10	4	
12	4	14	5	
8	3	15	6	
6	4	12	5	
1	1	1	1	
55	30	80	33	
				Dairen, Mukden, Ch'ang-ch'un, Harbin, San-ko-shu, Mu-tan-chiang, Ch'i-ch'i-ha-erh, Kirin. Mukden, T'ung-hua, Harbin.

TABLE 49

LOCATIONS OF OFFICES OF THE RAILWAY ADMINISTRATION IN MANCHURIA

Location	Train District	Locomotive District	Car Inspection District	Engineering District	Electric Power District
	Dairen Railway Administration				
Dairen	1	1	1	1	1
Piers in Dairen				1	1
Jih-ch'uan			1		
Wa-fang-tien	1	1		1	
Ta-hsin-chiao	1	1		1	1
Total	3	3	2	4	3
	The Mukden Railway Administration				
Ling-shan	1	1	1		
So-chia-tun	1	1	1	1	1
Mukden	1	1	1	1	1
Huang-ku-t'un		1	1		
Mukden				1	
(North Stati on Ssu-p'ing	1	1	1	1	
Ch'ang-ch'un	1	1	1	1	1
Ta-kuan-t'un			1		
Kung-yuan	1	1		1	
Pei-tien				1	
Tieh-ling	1	1		1	
Chi-kuan-shan	1	1	1	1	1
An-tung	1	1	1	1	1
Total	9	10	9	11	5

The Chinchow Railway Administration

Hsin-min				1	
Ta-hu-shan	1	1		1	1
Kou-pang-tzu		1		1	
Chin-hsien	1	1	1	1	1
Sui-chung				1	
Hsi-fu-hsin	1	1	1	1	1
Chang-wu				1	
Tung-liao				1	
Chao-yang				1	
Yeh-pei-shou	1	1		1	1
Ch'ih-feng				1	
Ch'eng-te		1	1	1	
Totals	4	6	3	12	4

The Kirin Railway Administration

Ch'ing-yuan				1	
Mei-ho-k'ou	1	1	1	1	1
T'ung-hua		1		1	1
Ta-li-tzu				1	
Lin-chiang		1			
Hsi-an		1	1	1	
Chao-yang-ch'eng				1	
Kirin	1	1	1	1	1
Hsin-tsuang		1	1	1	
Tun-hua	1	1		1	1
Chao-yang-chuan		1		1	
Total	3	8	4	10	4

The Mutankiang Railway Administration

T'u-men	1	1	1	1	1
Lu-tao		1		1	
Lou-hei-shan		1		1	
Tung-ning		1		1	
Mu-tan-chiang	1	1	1	1	1
Heng-tao-ho-tzu				1	
I-mien-po				1	
Mu-leng		1		1	
Sui-fen-ho		1	1	1	1
Lin-k'ou	1	1		1	
Po-li		1			
Chia-mu-sze	1	1	1	1	1
Hsi-chi-ning		1			
Chi-ning				1	
Tung-an		1		1	1
Hu-lin		1		1	
Total	4	12	4	14	5

The Harbin Railway Administration

Harbin	1	1	1	1	1
San-ko-shu	1	1	1	1	1
Te-hui				1	
A-ch'eng				1	
An-ta				1	
Sui-hua	1	1	1	1	1
Hai-lun				1	
Pei-lan	1	1	1	1	1

The Harbin Railway Administration

Sun-wu		1		1	
Ti-shan-pao				1	
Nan-cha		1		1	1
Tang-yuan				1	
Total	4	6	4	12	5

The Tsitsihar Railway Administration

Ch'i-ch'i-ha-erh	1	1	1	1	1
Ning-nien				1	
Tai-an				1	
Nun-kiang		1		1	
Ang-ang-ch'i		1		1	1
Cha-lan-tun				1	
Hailar		1	1	1	1
Lu-pin		1		1	
Chiang-chiao				1	
Pai-ch'eng-tzu	1	1	1	1	1
Ta-lai				1	
Ch'ien-kuo-ch'i				1	1
Po-k'o-t'u	1	1			
So-lun				1	
An-erh-shan				1	
Cheng-chia-t'un		1		1	1
Total	3	8	3	15	6

Najin Railway Administration

Najin	1	1	1	1	1
Shang-sha-fen		1		1	
Total	1	2	1	2	1
Combined Total	31	55	30	80	33

2. Distribution of Freight Transportation Capacity among Railway Lines

The total railway mileage in Manchuria was 11,266 kilometers as of April 1944. A breakdown of this mileage on the basis of annual freight transportation capacity is given in the following table.

TABLE 50. DISTRIBUTION OF FREIGHT TRANSPORTATION CAPACITY

(As of 1944, data on Lo-ching Railway not included)

Annual Freight Transportation Capacity in tons	Mileage in Kilometers	Percent	Name of Railway Line	Remarks
1,500,000	2,161	19.5	Ch'ang-ch'un-Pai-ch'eng-tzu Line; Pai-ch'eng-tzu-Tu-lu-erh Line; Hopeh Line; Chin-cheng Line	The South Manchuria Railway Company called them first-class lines
1,500,000-4,000,000	4,612	41.8	Mukden-Kirin Line; La-fa-San-ko-shu Line; Ch'i-ch'i-ha-orh-Pei-an Line; Pei-an-Ai-hun Line; Harbin-Lu-pin Line; Port Arthur Line	Second-class Lines (A)

4,000,000-7,000,000	1,559	14.1	T'u-men-Chia-mu-ssu Line; Ssu-p'ing-Mei-ho-k'ou Line; Ssu-p'ing-ch'i-ch'i-ha-erh Line; Harbin-Pei-an Line; Harbin-Sui-hua Line	Second-class Lines (B)
7,000,000-14,000,000	1,712	15.5	Mukden-Shan-hai-kuan Line; An-tung-Mukden Line; Chin-chou-Ku-pei-k'ou Line; Ch'ang-ch'un-T'u-men Line	Third Class Lines
Above 14,000,000	1,008	9.1	Ch'ang-ch'un-Dairen Line; Fu-shun Line; Ch'ang-ch'un-T'u-men Line; Harbin-San-ko-shu Line	
Total	11,052	100.		

Besides, the necessity for special water supply facilities for locomotives is one of the characteristics in the operation of the railways in Manchuria. Water supply becomes a critical problem in cold weather, especially in alkaline regions and during severe cold seasons. The distribution of railway water supply facilities is given in Table 52.

TABLE 51 - RAILWAY SPECIFICATIONS IN MANCHURIA - Road Construction

Serial Number	Name of the Railway Line	Terminals	Mileage in Operation in Kilometers	Classification of Lines	Tracks Single or Double	Rail Weight in Kilogram	Number of Ties /Per Rail/	Thickness of Roadbed in Centimeters	Capacity of Bridge in Tons
1	An-shen Line	An-tung-So-chia-t'un	260.2	3rd	Double	50	18	30-38	22.20
2	Ch'i-ch'ien Line	Kung-yuan to Tien-shih-fu	36.0	2ndA	Single	32	15	30	20
3	Liao-Kung	Liao-yang-Kung-yuan	69.0	2ndA	Single	40			20
4	Feng-Kuan	Feng-huang-Cheng-kuai-shui	78.2	2ndA	Single	32			
5	An-Nan	An-tung-Nan-An-tung	7.3	2ndA	Single	32			
6	Shen-yu	Mukden-Shan-hai-kuan	419.6	3rd	Double in most parts	50-43-42	17	25-45	14.2
7	Ta-Ch'eng	Ta-hu-shan-Liao-yuan	366.2	2ndA	Single	30	16	25-40	14
8	Kao-hsin Line	Kao-t'ai-shan Hsin-li-t'un.	60	3rd	Single	40	18	30	20

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Length of Stations in Meters	The Grade of the Railway Lines (percent) Northbound -	Percent	Southbound	percent	Minimum Radius of Curvature in meters	Capacity of Line (Number of Trains)	Average Number of Trains per day
500	To An-tung	1.45- 1.00	To So-chia-t'un	1.00	300	40	44.8
300	To Kung-yuan	1.14	To T'ien-shih-fu	1.94	300	12	10.9
500-300	To Liao-yang	1.25	To Kung-yuan	1.50	300	13	
300					300		
300							
650	To Mukden	0.60	To Shan-hai-kuan	0.84	600	30	42.9
500	To Liao-yuan	1.02	To Ta-hu-shan	1.02	275	11	12.6
650	To Kao-t'ai-shan	0.60	To Hsin-li-t'un	0.80	600	18	12.7

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9	Hsin-I Line	Hsin-li-t'un I-hsien	131.5	3rd	Single	40-32	16	30	20
10	Hopeh	Kou-pang-tzu-Hopeh	91.1	1st	Single	30	15	25-40	14
11	Chin-ku	Chin-hsien-Ku-pei-kou	542.3	1st; 2ndA;3rd	Single	40	15	25-45	20
12	Pei-liao Line	Chin-ling-Ssu-pei-liao	17.9	2ndA	Single	30	14	25-40	14
13	Yeh-feng Line	Yeh-pei-shou-Shih-feng	146.9	1st	Single	32	15	30	20
14	Hu-lu-tao Line	Chin-hsi-Hu-lu-tao	13.2	3rd	Single	40	14	25-30	20
15	Shen-chi Line	Mukden-Kirin	447.4	2ndA	Single	30-40	16	25-45	20
16	Mei-shi Line	Mei-ho-k'ou-Chi-an	255.5	2ndA; 2ndB	Single	32	15	25-30	20
17	Ta-li-tzu	Ya-yuan-Ta-li-tzu	113.0	2ndB	Single	40	15	25-30	20
18	Ping-Mei Line	Ssu-p'ing		2ndA					
		Mei-ho-k'ou	156.0	2ndB	Single	30-32	16	25-45	20

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500	To Hsin-li-tun	1.21	To I-hsien	1.25	360	17	19.6
400	To Kou-pang-tzu	0	To Hopeh	0	910	13	8.2
300-370	To Chin-hsien	22-32	To Ku-pei-kou	2.0-32	300-200	9	9.5
500	To Chin-ling-ssu	1.24	To Pei-liao	1.15	400	18	16.3
500	To Yeh-pei-shou		To Chih-feng	1.97	300	11	5.1
300	To Chin-hsi	0	To Hu-lu-tao	0	300	22	26.0
500	To Kirin	1.04	To Mukden	1.02	300	10	18.7
500-300	To Mei-ho-k'ou	2.50	To Chi-an	2.00	300	10	18.0
300	To Ya-yuan	2.53	To Ta-li-tzu	2.53	300	10	14.3
300	To Ssu-p'ing	1.25	To Mei-ho k'ou	1.96	300	11	13.3

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19	Chang-T'u Line	Ch'ang-ch'un T'umen	528.0	3rd	Single	40	18	25-45	20
20	Lung-Feng Line	Ta-feng-man-Lung-tan-shan	22.4	1	Single	32			20
21	La-pin Line	La-fa-San-ko-shu	265.5	2ndA	Single	40	15	20-40	20
22	Chao-kai Line	Chao-yang-Chuan-Kai-shan-t'un	62.3	2ndB	Single	40	15	25	20
23	Ho-lung Line	Lung-ch'ing to Ho-Lung	51.1	1st	Single	32	15	3	20
24	T'u-chia Line	T'u-men-Chia-mu-ssu	580.2	2ndA; 2ndB; 3rd	Single	40	15	15-20	20
25	Hu-Lin Line	Lin-k'ou-Hu-t'ou	335.7	2ndA; 2ndB	Single and Double	32	15	20-30	20
26	Sui-chia	Sui-hua-Chia-mu-ssu	369.1	2ndA	Single	40	15	30	20
27	Ho-kang Line	Lien-chiang-k'ou-Ho-kang	54.3	2ndA	Single	40	16	30	20
28	Cheng-chi Line	Hsia-cheng-tzu to Hsi-chi-ning	103.4	2ndA	Single	32-40			20

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500	To Ch'ang-ch'un	1.25	To T'u-men	1.25	360	17	29.8
150	To Lung-tan-shan	2.50	To Ta-feng-man	2.50	300	20	17.1
500	To San-ko-shu	1.21	To La-fa	0.80	400	12	17.8
300	To Chao-yang chuan	1.83	To Shang-san-feng	1.56	250	14	13.7
	To Lung-ch'ing	0.50	To Ho-lung	1.24		14	7.8
500	To T'u-men	1.25-2.15	To Chia-mu ssu	1.25 2.2	360	14	24.1
500	To Lin-k'ou	2.00	To Hu-t'ou	1.40	300	14	16.4
500	To Sui-hua	1.28	To Chia-mu ssu	1.33	300	13	15.8
500	To Lien-chiang-k'ou	1.10	To Ho-kang	1.10	1,000	17	16.8
500	To Hsia-cheng-tzu	1.00	To Hsi-chi-ning	0.85	200	12	7.8

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29	Sui-ning Line	Ho-hsi-Tung-ning	91.1	1st	Single	32	15	30	20
30	Hsing-ning Line	Hsin-hsing-Ch'eng-tzu-k'ou	216.1	1st	Single	32	15	20-45	20
31	The Pin-pei Line	San-ko-shu-Pei-an	326.1	2ndA; 2ndB	Single	32-40	15	15-35	20
32	Pei-hei Line	Pei-an-Hei-ho	302.9	2ndA	Single	32-40	15	25-40	20
33	Ch'i-Pei Line	Ch'i-ch'i-ha-erh Pei-an	231.5	2ndA	Single	40	18	25-40	20
34	Ning-huo Line	Ning-nien to Huo-lu-men	283-9	1st	Single	32	15	25-40	20
35	P'ing-chi Line	Ssu-p'ing to Ch'i-ch'i-ha-erh	571.4	2ndB	Single	40	18	25-45	20
36	Ch'ang-pai Line	Ch'ang-ch'un to Pai-cheng-tzu	332.6	1st	Single	32	15	25.40	20
37	Pai-T'u Line	Pai-cheng-tzu to T'u-lu-erh	376.5	1st	Single	32	15	25-40	20

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500	To Ho-hsi	2.50	To Tung-ning	2.50	300	12	10.4
500	To Hsin-hsing	2.50	To Ch'eng-tzu-k'ou	2.50	300	11	11.2
500	To San-ko-shu	1.25	To Pei-an	1.25	300	12	20.4
500	To Pei-an	1.25	To Hei-ho	1.50	300	10	12.7
500	To Ch'i-ch'i-ha-erh	0.70	To Pei-an	0.91	300	11	11.5
500	To Ning-nien	1.25	To Huo-lu-men	1.25	300	8	5.5
500	To Ssu-p'ing	0.67	To Ch'i-ch'i-ha-erh	0.70	400	17	20.1
500	To Ch'ang-ch'un	1.00	To Pai-cheng-tzu	1.00	400	7	8.0
500	To Pai-cheng-tzu	1.97	To T'u-lu-erh	2.15	300	7	8.0

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38	Yu-shu	Yu-shu-t'un to Ang-ang-ch'i	6.4	2ndA	Single	30			
	Sub-total		8,372.4						
39	Ch'ang-tai Line	Ch'ang-ch'un to Dairen	704.3	4th	Double and Single	50-60	18	30-45	18
40	Port Arthur Line	Chou-shui-tzu to Port Arthur	50.8	2ndA	Single	40	18	30-45	14
41	Chin-cheng Line	Chin-chou to Cheng-tzu-t'un	102.1	1st	Single	32	15	15	18
42	Ying-k'ou Line	Ta-shih-chiao to Ying-k'ou	22.4	2ndB	Single	50	18	30	18
43	Che-foo Line	Che-foo to Yen-t'ai Coal Mine	15.6	2ndB	Single	32	18		13
44	Fu-shun Line	Hung-ho-Fu-shun	52.9	4th	Double	50	18	30-45	20
45	Ch'ang-ch'un-Harbin Line	Ch'ang-Ch'un Harbin	242.0	4th	Double	50	18	30-45	16
46	Pin-chou Line	Harbin-Lu-pin	934.8	2ndA	Single and Double	30-32-40	15	20-40	16

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								29.9
750-600	To Dairen	0.83	To Ch'ang-ch'un	0.95	362	Single Double	25 60	79.8
450	To Chou-shui-tzu	0.92	To Port Arthur	0.92	300		15	21.3
300	To Chin-chous	1.50	To Cheng-tzu-t'un	1.85	300		13	9.8
500	To Ta-shih-chiao	0.55	To Ying-k'ou	0.25	604		20	28.2
200	To Che-foo		To Yen-t'ai Coal Mine		602			14.3
	To Hung-ho	0.23	To Fu-shun	0.33	600		36	39.8
600	To Ch'ang-ch'un	0.95	To Harbin	0.93	400		35	45.8
500	To Harbin	1.50	To Lu-pin	1.10	202		8	11.2

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47	Pin-sui Line	Harbin - Sui-fen-ho	546.4	2ndA 2ndB	Double	40-43	15-18	15-40	14
48	Pin-chiang Line	Harbin - San-ko-shu	8.8	4th	Double	50	17		
	Sub-total		2,680.1						
1	West Part of North Korea	Shang-san-fen-Nan-yang	36.0	3rd	Single	32			18
2	East Part of North Korea	T'u-men-Unggi	147.3	3rd	Single	32	17	25-35	18
3	Lo-ching Unggi Line	Unggi-Lo-ching	18.2	3rd	Single	40			20
	Sub-total		201.5						
	Combined Total		11,254.0						

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500	To Harbin	1.75	To Sui-fen-ho	1.75	256	17	25.4
							107.7
400	To Shang-san-feng	0.95	To Nan-yang	0.70	300	22	27.3
500	To Unggi	1.26	To T'u-men	1.26	300	17	21.9
500	To Najin	1.20	To Unggi	1.20	400		25.7

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TABLE 52. DISTRIBUTION OF WATER SUPPLY FACILITIES IN THE RAILWAYS IN MANCHURIA UNDER THE MANCHUKUO REGIME

Name of the Railway Administrations	Wells and Fountains	Water Purifying Pools	Water Pipe (in Meters)	Water Tanks	Water Towers
Dairen Railway Administration	56	3	73,147	16	51
Mukden Railway Administration	126	13	275,328	45	115
Chin-chou Railway Administration	104	3	119,570	73	113
Kirin Railway Administration	83		111,831	60	127
Mu-tan-chiang Railway Administration	74	3	169,227	67	148
Harbin Railway Administration	140	4	255,323	69	163
Ch'i-ch'i-ha-erh Railway Administration	167	4	138,529	97	171
Najin Railway Administration	15	5	84,895	7	18

1938 Mixed Trains	1938 Freight Trains	1937 Mixed Trains	1937 Freight Trains	1937 Mixed Trains	Average Number of Freight Cars Per Train 1942	1941	1940	1939	1938	1937
39.2	12.6	31.3	9.8		27.2	27.1	27.5	25.8	25.7	26.3
24.5	7.6	20.4	4.6	17.1	31.7	30.7	30.1	28.4	28.7	28.5
8.4	3.6	6.8	1.6	7.1	25.6	27.4	21.5	23.1	23.6	19.1
2.6	3.0	0.6	17.7		27.6	26.0	24.1	21.7	22.1	16.3
					34.2	31.4	28.2			
8.2	1.9	6.3	0.2	6.3	11.2	11.6	13.3	13.7	19.4	24.0
6.7	2.5	7.7	2.4	6.5	21.7	22.4	19.3	18.0	22.5	21.0
8.6	1.0	6.7		6.9	19.4	28.2	27.4	20.4	23.5	35.8
4.7	0.4	5.0	0.4	5.0	11.8	13.0	14.5	10.2	11.8	14.2
14.2	1.3	11.3		10.5	5.2	7.7	12.7	11.4	8.1	11.6
11.7	4.4	10.2	3.2	11.1	24.5	22.9	22.2	22.4	22.6	23.7

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Mei-ho-k'ou Chi-an Line	18.0	13.0	14.4	10.2	13.5	8.3	9.8	5.9
Ta-li-tzu Line	14.3	10.2	11.1	6.6	10.3	5.8		
Ssu-p'ing to Mei-ho-k'ou Line	13.3	6.9	12.1	7.0	12.1	5.8	10.4	4.2
Ch'ang-ch'un-T'u-men Line	29.8	16.6	24.6	13.5	25.6	12.4	22.4	10.0
Lung-tan-chan-Ta-feng-man Line	17.1	11.9	16.0	11.0	8.5	3.2	4.7	
Chao-yang-chuan to Kai-shan-t'un Line	13.7	3.4	15.3	4.2	8.7	2.5	17.0	3.0
Ho-lung-Lung-ch'ing Line	7.8	3.6	7.6	3.6	6.9	2.6		
Tu-chia Line	24.1	14.1	18.9	11.4	18.8	9.6	18.6	9.8
Hsing-ning Line	11.2	6.9	9.6	5.6	6.3	3.3		
Hu-lin Line	16.4	9.5	14.6	8.1	10.8	5.0	10.3	4.5
Ho-kang Line	16.8	11.1	13.2	8.8	12.3	6.7	3.2	1.7
Cheng-tsu Line	7.8	4.4	5.1	2.5	4.7	2.0	4.3	2.0
Sui-ning Line	10.4	6.2	11.0	6.5	8.8	3.8	2.5	1.6
La-pin Line	17.8	9.3	17.3	9.5	16.9	8.5	14.7	6.7

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4.9	2.4	3.9	1.3		16.3	14.7	14.6	14.7	18.8	13.2
					12.7	11.5	11.4			
8.8	3.2	7.7	2.3	8.7	25.1	25.8	24.9	23.3	22.0	21.5
20.3	8.4	18.1	6.5	17.1	24.7	25.5	25.5	25.7	25.7	24.9
4.0					10.2	8.7	7.8	8.1		
14.4	2.1	11.1	1.0	9.9	11.7	11.1	12.2	13.0	12.3	9.0
					13.4	13.1	13.8			
13.8	6.8	10.4	4.8	9.5	23.8	26.7	24.7	22.2	20.2	18.0
					13.9	15.3	9.1			
5.8	1.5	4.5	1.2	4.4	14.0	25.4	24.2	20.5	17.6	17.0
					25.7	25.7	23.3	15.2		
4.4	2.8	4.5			28.5	25.6	19.2	21.2	20.8	
					18.3	17.8	16.8	21.8		
12.8	4.9	11.3	4.0		24.6	23.1	25.4	24.0	26.5	21.8

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Pin-pei Line	20.4	10.5	19.5	10.2	19.1	8.4	16.4	7.1
Sui-chia Line	15.8	10.4	1.7	7.0	10.3	5.0		
Pei-hei Line	12.7	7.0	13.2	6.7	11.5	4.3	9.2	3.5
Ch'i-pei Line	11.5	4.3	10.1	4.1	11.7	3.5	11.4	3.7
Ning-huo Line	5.5	1.5	5.0	1.4	6.0	1.8	6.1	0.8
P'ing-chi Line	20.1	9.7	19.3	10.2	17.7	8.2	17.3	8.3
Chang-pai Line	8.0	2.8	6.7	1.8	6.4	0.7	6.8	1.3
Pai-t'u Line	8.0	3.6	6.5	1.9	7.3	2.0	6.9	1.8
Yu-shu Line	29.9	7.3	29.9	6.3	29.6	5.4	23.5	4.6
The Ch'ang-ch'un Dairen Line	79.8	40.5	75.3	38.6	75.7	36.1	74.3	37.4
Port Arthur Line	21.3	3.6	17.1	3.4	20.2	3.1	20.4	3.2
Chin-cheng Line	9.8	2.1	10.0	1.8	12.4	1.5	15.4	0.6
Ying-k'ou Line	28.2	5.2	28.2	5.4	35.9	6.4	34.7	5.6
Chefoo Line	14.3	4.0	14.2	3.9	16.0	4.0	15.8	4.0
Fu-shun Line	39.8	20.7	38.1	21.1	43.0	22.0	47.8	27.7
Ch'ang-ch'un-Harbin Line	45.8	23.6	42.7	21.7	43.3	20.0	39.8	19.8

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14.1	6.5	11.1	4.8	11.3	27.7	26.3	28.5	25.1	23.5	24.3
					22.6	22.0	23.3			
6.9	2.8	5.1	2.1	4.3	22.6	22.2	22.8	22.9	23.4	20.6
9.6	3.2	9.7	2.6	9.2	20.1	23.1	20.7	21.8	20.7	21.1
4.6	0.4	3.5	0.8	5.3	19.0	16.2	14.0	16.3	16.9	17.3
12.6	5.8	12.2	5.3	12.1	31.0	33.4	35.6	36.6	36.7	34.2
4.8	0.6	4.0	0.4	5.1	16.0	14.7	10.1	17.7	16.9	21.4
3.4	0.2	2.5	0.3	2.8	14.8	17.1	18.5	19.6	17.7	7.8
20.0	3.4	18.9	1.9	18.5	30.1	29.1	27.2	27.7	24.4	15.4
65.0	31.4	57.9	25.8	57.7	34.6	35.8	37.3	38.2	40.1	43.5
18.3	2.3	18.6	2.7	19.5	17.7	18.2	20.1	19.9	19.4	19.3
					9.8	8.6	9.8	12.5		
39.9	4.5	34.0	3.9	34.6	29.8	32.4	31.7	35.13	35.3	45.4
15.1	4.0	14.0	3.9	13.9	20.8	19.3	22.3	23.7	23.9	22.0
41.7	26.7	42.4	25.9		32.8	33.5	36.2	34.7	40.0	45.4
31.6	16.4	25.8	12.3	22.9	29.2	28.7	31.8	30.7	30.3	30.4

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Pin-chou Line	11.2	5.6	11.1	5.9	10.9	5.3	10.2	4.1
Pin-sui Line	25.4	15.0	24.5	14.3	21.2	11.0	20.3	10.9
Pin-chiang Line	107.7	45.2	91.9	33.8	99.3	20.0	96.6	27.1

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7.4	3.0	6.2	2.4	6.1	22.9	24.8	26.3	25.0	23.5	23.3
16.8	9.4	11.6	5.0	11.2	27.2	26.4	26.7	25.3	26.4	24.9
85.5	30.8	68.1	34.0		20.5	24.4	24.9	21.1	15.1	13.0

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3. Communication Facilities.

Since an adequate communication system was essential for centralized management of all railways in Manchuria, the General Railway Administration paid much attention to communication facilities. Great efforts had been made toward the establishment of communication networks.

The accompanying chart shows the railway telephone networks in Manchuria at the time Manchuria was restored to China on August 15 1945. It shows that there was direct telephone services among the headquarters of the South Manchuria Railway Company, the Changchun and the Mukden railway administrations and among the railway stations. Like a nerve system to the body, the telephone networks have greatly facilitated railroad operations (especially traffic and train management).

4. Railway Vehicles.

Railway vehicles refer to locomotives, passenger cars and freight cars. The number of the cars and the qualities of them are generally considered as the main factors in determining the capacity of transportation. Since the South Manchuria Railway Company was entrusted with the management of the railway lines, the number of cars had been increased annually. The South Manchuria Railway Company paid much attention to the maintenance and repairing of cars.

The number of railway vehicles in the possession of the Manchukuo is given in Table 54.

TABLE 54

RAILWAY VEHICLES OWNED BY RAILWAYS IN MANCHURIA, 1934-1945:

(Statistics collected yearly at the end of March)

Year	Locomotives	Passenger Cars	Freight Cars	Internal Combustion Engine Cars	Hand-cars	Remarks
1934	916	1,265	15,179	83	70	
1935	1,094	1,525	18,229	101	106	
1936	1,250	1,701	20,021	112	119	
1937	1,384	2,109	21,974	120	176	
1938	1,497	2,239	23,657	124	176	
1939	1,617	2,404	26,987	123	178	
1940	1,786	2,609	30,056	133	177	
1941	1,946	2,814	32,353	141	174	
1942	2,100	2,984	35,781	141	173	
1943	2,265	3,194	39,309	141	171	
1944	2,399	3,049	41,826	141	169	
1945	2,422	3,061	41,984	141	171	(As of July)

Railway vehicles existing as of 15 August 1945 were listed as follows:

A. Locomotives

In 1945 there were 2,422 locomotives of different types as shown in Table 55.

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TABLE 55

TYPES OF LOCOMOTIVE USED IN THE RAILWAYS IN MANCHURIA

Locomotives Used in Passenger Trains		Locomotives Used in Freight Cars		Locomotives for Other Uses	
Types of Locomotive	Number	Types of Locomotive	Number	Types of Locomotive	Number
Pacific Type (Yi)	177	Mikado Type (I)	1,115	Double Enders	67
Pacific Type (Sha)	46	Mikado Type (Lo)	309	Consolidated Type	64
Pacific Type (Hsi)	29	Mikado Type (Sha)	63	Mogul Type	50
Pacific Type (Ha)	17	Mikado Type (Ni)	41	Others	223
Pacific Type (Fe)	14	Decapod Type (I)	62		
Pacific Type (Na)	12	Decapod Type (Ni)	45		
10-Wheel Type	22	Others	31		
Others	35				
Total	352		1,666		404
Grand Total					2,422

The speed of the locomotive used in hauling passenger cars is higher than those used in hauling freight cars. Accordingly, the diameters in the moving wheels of the passenger-train locomotives are longer and the distance between the rotation axis is smaller. A locomotive used in the express train is equipped with a large water tank since the distance between the stops is comparatively greater. (For instance, water tanks in the Pacific Type locomotives.) A locomotive used in freight trains has a greater tractive power than those used in passenger or express trains.

The distribution of locomotives, locomotives on reserve and powered cars (including locomotives, cranes, internal combustion engine cars) in 1945 are given in Tables 56 and 57.

TABLE 56

THE DISTRIBUTION OF LOCOMOTIVES IN OPERATION AND LOCOMOTIVES ON RESERVE IN MANCHURIA

Name of Railway Administration	Locomotives in Operation	Locomotives on Reserve	Remarks
Dairen Railway Administration	155	74	In addition, there were 27 locomotives under the possession of the railway factories, 58 under the Construction Bureau, 156 loaned to the North China Transportation Company, and 75 loaned to Korean Railway lines.
Mukden Railway Administration	518	244	
Chin-chou Administration	239	94	
Kirin Administration	237	77	
Mu-tan-chiang Administration	309	172	
Harbin Administration	292	141	

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Name of Railway Administration	Locomotives in Operation	Locomotives on Reserve	Remarks
Ch'i-ch'i-ha-erh Administration	201	152	
Najin Administration	58	19	
Total	2,009	969	

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TABLE 57

THE DISTRIBUTION OF LOCOMOTIVES AND MOTORED CARS IN 1945

Location	Locomotives	Cranes Used in Rescue Work	Motored cars	Hand Cars and Armoured Track Cars
Dairen	99		12	
Wa-fang-tien	12			
Ta-shih-ch'iao	44	1	6	
Ling-shan	53			
So-chia-t'un	93	1		
Kung-yuan	35	1		3
Mukden	76		16	3
An-tung	70	1		1
Chi-kuan-shan				2
Ssu-p'ing	56	1		2
Tieh-ling	2			
Ch'ang-ch'un	54	1	10	1
Huang-ku-t'un	45			
Kuan-cheng-tzu	34			
Ta-hu-shan	33	1		
Ch'ang-wu			6	5
Tung-liao	20			1
Kou-pang-tzu	22		6	
Chin-chou	73	1		1
Lo-t'o-ying	7			
Hu-lu-tao	5			
Hsi-fu-hsin	43			2
Yeh-pei-shou	25		4	1
Ch'eng-te	11			5

Location	Locomotives	Cranes Used in Rescue Work	Motored cars	Hand Cars and Armoured Track Cars
Kirin	45	1	3	8
Hsin-chan	49		4	4
T'ung-hua	36			6
Chao-yang-chuan	19		5	1
Mei-ho-k'ou	31			4
Tun-hua	40	1		2
Hsi-an	17			1
T'u-men	49			
Hsiao-wang-ch'ing	1	1	7	8
Ti-tao	13			
Mu-tan-chiang	60			
Heng-tao-ho-tzu	3	1	3	12
Lin-k'ou	33			6
Po-li	8	1		12
Chia-mu-ssu	38			2
Ho-kang	2	1		5
An-tung	22			1
Hu-lin				1
Hsi-chi-ning	10			1
I-mien-po	15			2
Mu-leng	19			1
Tung-ning	10			
Sui-fen-ho	16			1
Lao-hei-shan	10	1		
Harbin	121	1	19	9
Te-hui	1			1
San-ko-shu	61			

Location	Locomotives	Cranes Used in Rescue Work	Motored cars	Hand Cars and Armoured Track cars
Wu-chang	1			2
Nan-tien	22	1		1
Hai-lun	1			2
Sh'eng-shu	1			1
Sui-hua	33			2
Pei-an	29	1		8
Sun-wu	14			2
Ai-hun	4			
I-ch'un	4			
Liao-yuan	10		8	2
Pai-ch'eng-tzu	52	1	12	3
Chieh-ku-chi	3			1
So-lun				1
Ch'i-ch'i-ha-erh	49			3
Nan-ho				
Huo-lung-men	6			
Nun-chiang	30	1	6	2
Ang-ang-hsi	15			
Po-k'o-tu	24	1		2
Hailar	7			
Lu-pin	5			2
Najin	56	1		
Shang-shan-feng	2			
North China Communication Corporation	156			18 on a rental basis.
Bureau of Installations	58			1 on a rental basis.
Others	199	1	14	3
Grand Total	2,422	23	141	171

B. Passenger Cars

At the time the Japanese surrendered in 1945, there were 3,061 Passenger cars.

TABLE 58

TYPES OF PASSENGER CAR OWNED BY THE RAILWAYS IN MANCHURIA

(As of June 1945)

Types of Car	Number
First Class	63
First and Second Class	36
Second Class Cars	362
Second and Third Class	202
Dining Cars	47
Luggage and Mail Cars	144
Luggage	211
Third	1,851
Others	145
Total	3,061

In 1945, the distribution of the passenger cars was as follows:

TABLE 59

THE DISTRIBUTION OF PASSENGER CARS AND NUMBER OF CARS ON RESERVE

Name of Rail-Administration	Number of Passenger Cars	Passenger Cars on Reserve	Reserve (Car Distribution Among Inspection Districts)	
Dairen Railway Administration	239	30	Dairen	194
			Tashihchiao	45
Mukden Railway Administration	932	150	Mukden	333
			Huangkutun	122
			Antung	40
			Szepingchieh	21
			Changchun	367
			Kungyuan	49

Name of Rail-Administration	Number of Passenger Cars	Passenger Cars on Reserve	Reserve (Car Distribution Among Inspection Districts)	
Chin-chou Railway Administration	206		Tahushan	39
			Chinchow	146
			Hsifushing	2
			Chengteh	9
Kirin Railway Administration	268	30	Meihokou	26
			Kirin	149
			Hsintsuang	35
			Tunghua	58
Mu-tanchiang Railway Administration	452	40	T'umen	40
			Mutankiang	242
			Hsitsining	46
			Kiamusze	97
			Suifenho	27
Harbin Railway Administration	545	66	Sankoshu	530
			Suihua	11
			Peian	4
Ch'i-Ch'i-ha-erh Railway Administration	332	36	Tsitsihar	228
			Hailar	14
			Paichengtzu	90
Najin Railway Administration	87		Rashin	87
Total	3,061			

TABLE 60

CLASSIFICATION OF PASSENGER CARS BY USES, JULY 1945

Classification of Cars	Number of Cars in possession
Revenue yielding cars	
First Class Sleeping cars	36
First Class observation cars	2
First Class sleeping cars and coaches	4
Sleeping Cars, First Class and Second Class	10
First Class, observation cars	11
First Class Cars	4
First Class Cars with Heating System	6
First and Second Class Cars	26
Second Class Cars	171
Second Class Cars with Heating System	37

Classification of Cars	Number of Cars in possession
Sleeping Cars, Second Class	90
Sleeping Cars and Luggage Cars, Second Class	5
Sleeping Cars, Second Class and Third Class	17
Sleeping Cars, Third Class	79
Sleeping Cars, Third Class with heating System	6
Luggage Cars with Heating System	28
Third Luggage Mail Cars	37
Luggage Mail Cars	144
Mail Cars With Heating Systems	11
Second and Third Class Attached Cars	6
Third Class Attached Cars	8
Third Class Cars Used as Controlling Cars	6
Total	2,955

Classification of Cars	Number of Cars in possession
Second and Third Class Cars	179
Third Class Cars	1,450
Third Class Cars with Heating System	160
Third Class Luggage Cars	91
Dining Cars	47
Second Class Kitchen Cars	10
Third Class Kitchen Cars	14
Luggage Cars	211
Cars for non-business use	
Special Cars	5
Special Cars with Heating System	4
Cars for transport of Coffins	2
Cars used as an emergency hospital with heating system	2
Radio Cars	4
Staff Officers' Cars	3
Test Cars	3
Patrol Cars	48
Cars of Education	1
Sanitorium Cars	8
Pioneering Cars	11
Pioneering Cars with Heating System	13
Health Preservation Cars	2
Total	106

Grand Total 3,061

C. Freight Cars

The total number of freight cars in the possession of the railways in Manchuria was 41,984. Among this figure, 41,435 were standard-track cars, and among the standard-track cars 39,762 cars were revenue-yielding cars consisting of 24,280 open-top cars and 8,876 box cars. The percentage distribution among the two types of freight car is given below:

Open-top cars	58.5%
Box cars	21.5%
Total	80.0%

Among the open-top cars there were 150 small-size and 40-ton cars. The rest of the open-top cars were cars of a capacity varying between 30 to 140 tons. Among the box cars, there were 80 cars of the small type, 230 cars of 40-tons, and 110 cars of 50-ton, and 5 cars of 60-tons in capacity. The rest were 30-ton cars (numbering roughly 8,450).

Coal cars possessed by the railways included 140 50-ton cars and 670 60-ton cars. A majority of them were 40-ton cars (numbering 1,160).

TABLE 61

FREIGHT CARS OWNED BY THE RAILWAYS IN MANCHURIA

(As of the end of July, 1945)

Types of Freight Car	Number of Cars
Box Cars	
Closed Box Cars	8,876
Refrigeration Cars	45
Heating System Cars	80
Thermo Controlled Cars	340
Ventilation Cars	92
Livestock Cars	93
Sub-Total	9,526
Open-Top Freight Cars	
Open-top Freight Cars	24,280
Mud Transportation Cars	908
Flat Cars	2,564

Types of Freight Car	Number of Cars
Limestone Cars	1,971
Minerals	78
Sub-Total	29,801
Tank Cars	
Water Tank Cars	46
Hydro-chloric Acid Cars	1
Soybean Oil Cars	52
Petroleum Cars	8
Heavy Oil Cars	88
Gasoline Oil Cars	148
Coal Tar Cars	59
Sulphuric Acid Cars	14
Candle Oil Cars	15
Ammonium Salts Cars	4
Sub-Total	435
Total of Cars	
Used in business	39,762
Cars for Guards	1,258
Electricity Generation Cars used in Engineering	5
Emergency Cars	348
Camp Cars	8
Snow Cleaning Cars	1
Ballast Cars	50
Patrol Cars	3
Sub-total	1,673
Total of Standard Guage Cars	41,435

Types of Freight Car	Number of Cars
Box Cars	176
Emergency Cars	16
Open Cars	152
Soybean Oil Tank Cars	20
Sub-total	364
Special Type Freight Cars	
Box Cars	60
Cars for Guards	8
Open Cars	56
Coal Cars	8
Soybean Oil Tank Cars	4
Sub-total	136
Freight Cars Used Only in Factories	
Box Cars	1
Open-top Cars	16
Mud Transportation Cars	27
Flat Cars	5
Sub-total	49
Total of Non-Standard Cars	549
Grand Total	41,984

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D. Car and Locomotive Maintenance

Adequate car maintenance and repairing facilities were essential to higher operating efficiency. The following is a description of these facilities under the Manchukuo regime.

1. Locomotive Inspection and Repairing Facilities:

The number of locomotives inspected and overhauled in Manchuria was 5,351 per month. The distribution of the monthly overhauled locomotives among the railways is shown in Table 62. According to the inspection system in Manchuria, A-Type inspection was held every six months, B-Type inspection every month and C-Type inspection every 10-15 days.

TABLE 62

DATA ON LOCOMOTIVE OVERHAULING CAPACITY IN MANCHURIA, JULY 1945

Equipment			Number of locomotives overhauled average monthly	
Beam Jacks	a.	Electrical, 51 units		
	b.	Hand-operated, 6 units		
			Inspection Type A (Held every six months)	251
			Type B (Held every month)	1,700
			Type C (Held every ten or fifteen days)	3,400
			Total	5,351

2. Facilities for Overhauling Passenger Cars and Freight Cars:

The number of passenger cars inspected or overhauled monthly during the Manchukuo period was 3,184 and that of freight cars was 24,176. The distribution of the monthly inspection and overhauling capacity among different districts is given in Table 63.

TABLE 63

AVERAGE MONTHLY CAPACITY OF OVERHAULING AND REPAIRING LOCOMOTIVES (JULY 1945)

Location	Beam Jack Electric	Beam Jack Manual	A-Type Inspection every 6 months	B-Type Inspection every 1 month	C-Type Inspection every 10-15 days	Total
Huang-ku-t'un	1		6	30	96	96
Mukden				10	20	30
Kung-yuan				20	40	60
An-tung	2		11	60	120	191
Ta-hu-shan	1		6	30	60	96
Kou-pang-tzu				20	40	60
Chin-chou	2		11	60	120	191
Hsi-fu-hsin	1		5	40	80	125
Tung-liao				20	40	60
Yeh-pei-shou	1		6	20	40	66
Ch'eng-te				10	20	30
Kirin	2		8	40	80	128
Hsin-chan	2		10	40	80	130

Location	Beam Jack: Electric	Beam Jack: Manual	A-Type Inspection every 6 months	B-Type Inspection every 1 month	C-Type Inspection every 10-15 days	Total
Tung-hua				30	60	90
Chao-yang-chuan				20	40	60
Mei-ho-k'ou	2		11	40	80	131
Pei-feng				10	20	30
T'ung-hua	1		3	30	60	93
Lin-chiang				10	20	30
T'u-men	2		9	40	80	129
Lu-tao				10	20	30
Lin-k'ou	1		5	30	60	95
Po-li		1	2	10	20	32
Chia-mu-ssu	2		8	30	60	98
Tung-an				20	40	60
Hsit-chi-ning				10	20	30
Tung-ning				20	40	60
Lao-hei-shan				10	20	30
Sui-hua	1		6	30	60	96

	Beam Jack					
Location	Electric	Manual	A-Type Inspection every 6 months	B-Type Inspection every 1 month	C-Type Inspection every 10-15 days	Total
Pei-an	1		6	30	60	96
Sun-wu				10	20	30
Man-tien				20	40	60
Liao-yuan				10	20	30
Pai-ch'eng-tzu	2		12	40	80	132
Ch'i-ch'i-ha-erh	2		11	40	80	131
Nun-chiang			11	20	40	60
Chien-kuo-chi				10	20	30
Total	26	1	136	930	1,860	2,926
Dairen	2		7	80	160	247
Wa-fang-tien	2		5	10	20	35
Ta-shih-ch'iao	2		7	40	80	127
Ling-shan	1		5	30	60	95
So-chia-t'un	2		8	80	160	248
Mukden	2		9	50	100	159

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Location	Beam Jack		A-Type Inspection every 6 months	B-Type Inspection every 1 month	C-Type Inspection every 10-15 days	Total
	Electric	Manual				
Tieh-ling			10	20		30
Ssu-p'ing	2		8	50	100	158
Ch'ang-ch'un	3		10	50	100	160
K'uan-ch'eng-tzu				20	40	60
Mu-tan-chiang	3		9	60	120	189
Heng-tao-ho-tzu		1	3	10	20	33
Mu-leng		1	3	20	40	63
Sui-fen-ho		3	8	20	40	68
Harbin	3		17	100	200	317
San-ko-shu	2		17	60	120	191
I-mien-po				20	40	60
Ang-ang-ch'i				20	40	60
Po-k'o-t'u	1		5	20	40	65
Hai-la-erh				10	20	30
Lu-pin				10	20	30
Total	25	5	115	770	1,540	2,425
Grand Total	51	6	251	1,700	3,400	5,351

TABLE 64

AVERAGE MONTHLY INSPECTION CAPACITY OF PASSENGER AND FREIGHT CARS IN THE RAILWAY ADMINISTRATION IN MANCHURIA

Types of Cars	Types of Inspection				Total
Passenger Cars		B. 6 months	C. 3 months	Repairing	
		310	2,444	430	3,184
Freight Cars	A	B	C	Repairing	
	1,251	4,350	15,076	3,499	24,176

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Table 65. DISTRIBUTION OF THE MONTHLY CAPACITY OF INSPECTION AND REPAIRING OF PASSENGER AND FREIGHT CARS (JULY 1945)

	Passenger Cars				Freight Cars				
Districts	Type B Once in 6 Months	Type C Once in 3 Months	Repairing	Totals	A (18 Months)	B (6 Months)	C (2 Months)	Repairing	Totals
Huang-ku-t'un	11	88	14	113	80	260	273	147	760
Kung-yuan	4	35	6	45	20	75	330	80	505
An-tung	4	29	5	38	20	75	300	80	475
Chin-chou	16	115	9	140	54	180	600	130	964
Ta-hu-shan	4	31	2	37	30	100	400	80	610
Hsi-fu-hsin		2		2	30	123	547	91	791
Ch'eng-teh	2	15	1	18		20	100	60	180
Mei-ho-k'ou	3	21	5	29	20	50	300	100	470
Pei-feng					20	150	450	100	720
T'ung-hua	6	49	5	60	20	80	148	50	298
Kirin	15	127	44	186	80	270	1,050	250	1,650
Hsin-chan	3	29	3	35	34	79	300	34	447
T'u-men	4	30	5	39	30	90	500	90	710

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Hsi-chi-ning	4	34	5	43	18	50	545	50	663
Chia-mu-ssu	9	73	11	93	20	180	500	120	820
Sui-hua	1	10	3	14	20	130	500	50	700
Pei-an		6	1	7	26	142	697	90	937
Pai-ch'eng-tzu	8	65	3	76	30	120	274	70	494
Ch'i-ch'i-ha-erh	21	163	8	192	50	200	800	150	1,200
Total	115	922	130	1,167	602	2,374	8,596	1,822	13,394
Dairen	39	306	45	390					
Li-ch'uan					100	300	1,000	450	1,850
Ta-shih-ch'iao					42	159	370	107	678
Mukden	30	238	39	307					
Ssu-p'ing	2	15	2	19	29	76	330	80	515
Ch'ang-ch'un	34	265	43	342					
K'uan-ch'eng-tzu					50	160	600	130	940
Ling-shan					50	180	600	100	930
So-chia-t'un					25	75	330	80	510

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Tien-kuan-t'un					80	248	900	200	1,428
Harbin					150	450	900	250	1,750
San-ko-shu	63	487	139	689					
Mu-tan-chiang	23	181	28	232	90	230	1,000	200	1,520
Sui-fen-ho	3	20	3	26	10	18	200	27	255
Hai-la-erh	1	10	1	12	23	80	250	53	406
Total	195	1,522	300	2,017	649	1,976	6,480	1,677	10,782
Grand Total	310	2,444	430	3,184	1,251	4,350	15,076	3,499	24,176

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In addition to the railway administrations, the railway workshops in various areas were also capable of repairing passenger and freight cars. This was shown in Table 66.

Table 66. MONTHLY CAPACITY OF INSPECTION AND REPAIRING PASSENGER AND FREIGHT CARS BY THE RAILWAY WORKSHOPS

	Passenger Cars				Freight Cars				
	Capacities of Examining and Repairing								
Name of the Factories Located At:	Overhauling	Partial Repairing	Repairing After Accidents	Totals	Overhauling	Partial Repairing	Repairing After Accidents	Type A Overhauling	Totals
	130	8	32	170	534	140	104	22	800
Dairen	29	2	11	42	123	24	30	6	183
Mukden	36	2	4	42	109	16	19	6	150
Ch'ang-ch'un	19	1	5	25	71	45	8	1	125
Harbin	33	2	9	44	90	27	27	6	150
Mu-tan-chiang					63	12	8	1	84
Ch'i-ch'i-ha-erh	13	1	3	17	78	16	12	2	108

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For the purpose of maintaining a sufficient number of cars in operation, each of the railway administrations had its own factories which manufactured new cars and repaired the cars already in existence. The facilities of these factories were given in Table 67.

Table 67. FACILITIES OF THE RAILWAY FACTORIES (1945)

Names of Railway Factories	Plant Area (square kilometers)		Workers (1,000)	Chief Business	Capacity			Remarks
	Buildings	Site			Locomotives	Passenger Cars	Freight Cars	
Dairen	84	992	6	Manufacturing and repairing of locomotives, passenger cars, freight cars	(40) 200	(20) 500	(300) 3,000	Figures in parentheses representing cars manufactured
Mukden	55	460	4	Repairing locomotives, passenger and freight cars; internal combustion or diesel engines	150	500	2,800	Figures without parenthesis denoting cars repaired
Ch'ang-ch'un	19	101	2	Repairing passenger and freight cars		300	1,500	
Mu-tan-chiang	37	435	1	Locomotive, passenger, and freight car repairing	220		1,000	

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Harbin	48	843	1	Locomotive, passenger, and freight car and internal combustion engine repairing	50	530	1,800
San-ko-shu	25	400	2	The repairing of locomotives	300		
Ch'i-ch'i-ha-erh	44	368	2	Locomotive, passenger, and freight car repairing	200	200	1,300
Kirin	24	850		Repairing locomotives	60		

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5. Port Facilities Under the Management of the South Manchuria Railway Company and Related Data

Port and harbor facilities were crucial to the operations of railways. Thus the South Manchuria Railway Company also put the ports in Manchuria and North Korea under its control. The transportation facilities in the principal ports in Manchuria are given in Table 68.

[Table on following page]

Table 68. TRANSPORTATION FACILITIES IN PRINCIPAL PORTS IN MANCHURIA

	The Port of Dairen								
	Dairen	Kan-ch'ingtzu	Totals	Port Arthur	The Port of Ying-k'ou	The Port of An-tung	The Port of Hu-lu-tao	The Port of Wo-ching	The Port of Unggi
Port capacity in charging and discharging	10,300,000 metric tons	3,000,000 metric tons	13,300,000 metric tons	400,000 metric tons	800,000 metric tons	200,000 metric tons	1,000,000 metric tons	2,500,000 metric tons	600,000 metric tons
Jetties	Dairen harbor 4,533 meters; Boat Entrance 1,000 meters; Hsiang-luch'iao 791 meters	973 meters	7,297 meters				666 meters	516 meters	665 meters
Embankment	Dairen 6,809 meters; West Harbor, 1,197 meters	140 meters	8,146 meters	255 meters			1,264 meters	2,451 meters	455 meters

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Suspension bridges	712 meters	303 meters	1,015 meters	273 meters	1,721 meters	30 meters		90 meters	40 meters
Unloading space	2,184 meters		2,184 meters			2,648 meters	470 meters	400 meters	385 meters
Camels		4	3				3		
Buoys	4		4						
Depth of water	Dairen 7-12 meters	9 meters		8 meters	6-8 meters	17-20 meters	6-8 meters	8-9.5 meters	6-7 meters
Storage facilities:									
Buildings			75		18	4	7	15	3
Storage space	383,414 square meters		383,414 square meters		24,004 square meters	5,426 square meters	17,321 square meters	39,566 square meters	6,444 square meters
Open storage space	728,494 square meters	111,496 square meters	839,990 square meters	31,681 square meters	155,255 square meters	21,601 square meters	194,717 square meters	161,228 square meters	43,000 square meters
Number of tanks	22 tanks		22 tanks						
Oil tanks capacity	33,721 cubic meters		33,721 cubic meters						

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Boats:									
Pilot boats	14 -- 1,534 tons		14 -- 1,534 tons	1 -- 102 tons	1 -- 74 tons			4 -- 515 tons	
Customs boats	2 -- 35 tons		2 -- 35 tons				1 -- 19 tons	1 -- 23 tons	
Liaison boats	2 -- 8 tons		2 -- 8 tons	1 -- 3 tons	box boats -- 3		1 -- 3 tons box boat -- 1	2 -- 6 tons	
Errand boats	3								
Sampans	18 -- 3,577 tons		18 -- 3,577 tons		11 -- 1,518 tons			1 -- 250 tons	
Wooden sampans	69 -- 6,382 tons		69 -- 6,382 tons				4 -- 400 tons	5 -- 420 tons	
Roads	163 kilo-meters	63.3 kilo-meters	199 kilo-meters	1.4 kilo-meters	29.5 kilo-meters	3.5 kilo-meters	13.2 kilo-meters	24.1 kilo-meters	7.6 kilo-meters

Section 5. Railway Traffic Regulations

Since the establishment of the Manchukuo regime in Manchuria, great efforts had been made by the government in the maintenance of order and peace, in the unification of monetary systems, and in the utilization of natural resources. As a result, the railway business was good and the railway system gradually became an efficient transportation network under centralized management. A description of the business policies of the railway administration is given below.

A. Policy Toward Transportation

1. Passenger Transportation

At the time the General Railroad Administration was established, there were fewpassenger cars. These cars were not uniform in standards and many of them were virtually useless. Thus, in addition, to overhauling and repairing old cars, the railway administration expanded the equipment and facilities in the workshops of the various railways established a car inspection system and added new cars into operation. During the winter season when traffic was heavy, it borrowed train engineers and cars from the South Manchuria Railway Company and the Korean Railway Administration.

A reorganization program was executed on the nationalized railways operated by the General Railway Administration. The speed of the train was increased. After the Chinese Eastern Railway was taken over by Manchukuo the wide gauge of that railway was narrowed and the Asia Special Express was able to operate between Dairen and Harbin. The amount of time for the express train between Dairen and Harbin was reduced by more than eight hours.

Owing to the great increase of passengers along all the railway lines in Manchuria, the existing hotels were far from meeting the actual needs. Subsequently, the General Railway Administration established one hot spring hotel at Hsingcheng and a number of hotels and restaurants in Hutlutao, Kirin, Harbin, Chengteh, Tsitsihar, Kiamusze and Mutankiang. In addition, dining cars were attached to all passenger trains.

In 1934 the unstandardized regulations governing the operations of railways and used by nine railway administrations during the period of the Chinese control were abolished and replaced by a system of new uniform regulations. Meanwhile, the General Railway Administration established through traffic with the South Manchurian Railway System and the Korean Railway System. Coordination in handling passenger and freight traffic was also worked out by the General Administration with Japanese railways, shipping lines and Korean railways.

2. Freight

Because the freight transportation policies and practice in the railways were not uniform, freight transportation capacity in Manchuria was meager. There was no provision for the protection of the shippers. Since there was no insurance system, merchants had to guard their merchandise en route. Under the new regulations issued in April 1934 the railway was responsible for the safe delivery of the freight. Freight charges and good classification were standardized. Furthermore, through freight traffic services with adjoining railways were introduced. The outstanding features of the new regulations were described below.

a. The railways instead of the owners, will be responsible for the safety of the goods on the route after the freight contract is signed;

b. A time limit for the delivery of goods is included in freight contracts;

c. The adoption of a certificate system under which the buyers of goods may collect the goods and pay the shippers through the railway agents;

d. The certification of merchandiseinvoice to facilitate transaction;

e. Reduction of freight chargesand fees to a minimum level.

In addition, railway facilities were improved, more trains were run, traffic was expedited and through traffic services were established among the railways.

Formerly, there had been no uniform regulations governing the through traffic among the railway lines in Manchuria. The railway staff workers were incompetent in operating through traffic. In February 1935 a centralized system was established for the distribution of freight cars among the railways and the former car lending and borrowing system was abolished. As a result, transportation efficiency was improved. Freight transportation facilities at the terminals were improved, more cars were added and safety measures were taken. For traffic safety, a training program was given to the railway workers.

The South Manchuria Railway Company also included warehousing as one of its business operations. In fact, it operated the mixed warehouse system since December 1919 throughout the railways under its control. That warehouse system was then applied to all the railways in Manchuria after the South Manchurian Railway Corporation became the only administrator of railways in that area. It contributed very much to the marketing of agricultural products in Manchuria.

The so-called mixed warehouse system worked in the following manner: upon the application for storage space submitted by the owner of merchandise, the railway examined the goods and issued accordingly a warehouse invoice with which after a certain time had elapsed, the owner or the holder of the invoice might draw the same kind and the same amount of merchandise from an appointed warehouse. Before the goods were collected, the warehouse invoice might be used as a mortgage for loan. Such a system offered great advantages to both the railways and the shippers. It contributed towards the improvement of the quality of the farm products (including mainly soybean, soybean cakes, wheat and bean oil) and to the increase of their commercial value.

Formerly, the number of warehouses attached to various stations of the railway lines was negligible. As the number of warehouses increased, the warehousing business brought much desirable effect on the development of resources and a commercial trade.

B. The Policy Toward Freight Rates

The cost of transportation was considered as one of the important issues in transportation.

A description of the rate structure after the establishment of a centralized control system is given below:

1. Policy on Railway Rates Under the General Railway Administration:

Any change in railway rates affected the social economy. It affected also the financial situation which was critical at the early days of the General Railway Administrations. Soon after the General Railway Administration was founded, the old rate was still in use. However, a study of the railway rate structure was under way. After two years of investigation and in February 1936 a uniform passenger freight rate schedule was adopted.

a. Passenger Rates

The basic rates once established in the four main lines were abolished and replaced by the rates in proportion to distance. The new rates were formulated on the basis of the old rates in Changchun-Tumen Line. The purpose of choosing those rates as a basis for the new rates was to lighten the burden of traveling in the inland of Manchuria.

2. Freight Transportation Rate

When the General Railway Administration took over the national lines under its management, there were four sets of freight transportation rates, as follows:

TABLE 69

RAILWAY PASSENGER RATE PER HEAD PER KILOMETER, REVISED IN FEBRUARY 1936

(In cent /1/100 of Chinese yuan/)

Old Rate	First-class	Second-class	Third-class	First-class	Second-class (Index)	Third-class
Mukden-Shan-hai-kuan Area	4.5	3.0	1.5	300	200	100
Ch'ang-ch'un-T'u-men Area	4.6	3.2	1.8	255	177	100
Kirin-Hai-lung Area	4.8	3.1	2.1	228	147	100
Other Areas	5.0	3.0	2.0	250	150	100
New Rate:						
For All Areas	5.0	3.0	1.8	277	166	100

TABLE 70

RAILWAY FREIGHT RATE (PER KILOMETER) IN MANCHURIA IN 1933

	1st-Class 1/10 cent	2nd-Class 1/10 cent	3rd-Class 1/10 cent	4th-Class 1/10 cent	5th-Class 1/10 cent	6th-Class 1/10 cent	Remarks
Ch'ang-ch'un-T'umen Line							
Less-than-carload	7.0	6.0	5.0	4.0	3.0	2.0	Unit for less-than-carload freight, 100 kilogram, for one full carload, one metric ton
Full carload	60.0	50.0	40.0	30.0	20.0	15.0	
Harbin-Pei-an Line							
Less-than-carload	8.0	7.0	6.0	5.5	4.5	4.0	
Full carload	70.0	60.0	50.0	45.0	35.0	30.0	
Mukden-Shan-hai-kuan Line							
Less-than-carload	7.8	6.6	5.4	4.3	3.1	1.9	
Full carload	60.0	51.0	42.0	32.0	23.0	14.0	
Other Lines							
Less-than-carload	7.5	6.5	5.5	4.5	4.0	3.5	
Full carload	65.0	55.0	45.0	35.0	30.0	25.0	

Note: Freight charges along the Mukden-Shan-hai-kuan line graduated at a regressive rate as to distance. The figures in the table were calculated on a distance of 300 kilometers.

In September, 1934, when the La-fa-Harbin Line was put into operation, the freight rate of transportation at the Harbin-Pei-an Line was lowered to the same level with that of other lines (Ch'ang-chun-T'u-men Line and Mukden-Shan-hai-kuan Line). The objective of rate reduction was to lighten the burden of the Chinese living in the national border area. Consequently, there were three freight rate schedules as compared with four schedules previously.

At the end of March, 1935, before the Chinese Eastern Railway was taken over by Manchukuo, it had had three freight rate schedules as follows:

1. A rate schedule for local freight;

2. A rate schedule for freight connected to the Southern Manchuria Railway;

3. A rate schedule for freight using the Ussuri Railway Line.

The second rate schedule was the highest, while the third was the lowest in comparison. The third schedule was a set of discrimination rates in favor of the freight going to or from Vladivostok. After the Chinese Eastern Railway was taken by Manchukuo, its freight rate was reduced to the same level as the national lines under the control of Manchukuo. The reduction of rates applied also to the transport of industrial resources in North Manchuria. Although the General Railway Administration suffered a loss of 6,000,000 yuan, because of rate reduction, yet the beneficial effects on industry were immense.

The new railway rate structure was determined after two years of study on its effect on industrial development and a railway expansion. The rate reduction introduced in February 1936 caused the railway to lose 4,500,000 yuan annually. The purpose of the revision of the rate structure was as follows:

1. Replacement of the treble local rate system and progress reduction of rate for long-distance freight.

Consistent with the objective of a centralized management administrative system, the freight rates which varied with districts (comprising the Ch'ang-ch'un-T'u-men Line, the Mukden Shan-hai-kuan Line, and other lines) were abolished, and the minimum rate practiced along the Ch'ang-ch'un-T'u-men Line was used as a standard rate for all the railway lines in Manchuria. In addition, the new rate was regressive as to distance as compared with the formerly straightline proportional rate. (The Mukden-Shan-hai-kuan Line was excluded from the new system). Subsequently, the favorable rate for long-distance freight produced excellent results for the exploitation of the hinterland of Manchuria.

2. Establishment of a special rate for encouraging the development of the hinterland of Manchuria.

Freight originated at or beyond stations located in the national border, Hai-lun, Ch'i-ch'i-ha-erh, Wang-yeh-miao, Fu-la-erh-chi or freight destined to some stations near the sea ports like Ta-hu-shan, Mukden, T'u-men, Shang-san-feng were given an extremely low rate in order that the exploitation of hinterland might be facilitated.

3. Revision of old regulations and reclassification of goods.

Since the revision the rates in Manchukuo achieved a unified rate structure. However, the "corporation lines" under the control of the Southern Manchurian Railway Corporation had not taken the same step toward rate reduction for fear of losses.

TABLE 71

A COMPARISON OF FREIGHT RATES BETWEEN THE MANCHUKUO RAILWAY LINES AND LINES UNDER THE CONTROL OF THE SOUTH MANCHURIA RAILWAY COMPANY

	Less-than-carload (per 100 Kilograms)					
	1st Class	2nd Class	3rd Class	4th Class	5th Class	6th Class
Corporation Lines	0.85	0.72	0.58	0.45	0.31	0.26
National Lines	1.00	0.84	0.65	0.50	0.38	0.28

	Full carload (per ton)					
	1st Class	2nd Class	3rd Class	4th Class	5th Class	6th Class
Corporation Lines	5.5	4.7	3.8	2.9	2.0	1.6
National Lines	6.7	5.4	4.2	3.2	2.4	1.7

The above figures were based upon the regressive rate according to distance from 200 kilometers up.

The freight rate in the railways under the control of the South Manchuria Railway Company had been raised in 1919 when the first World War just ended. The rise was due to high prices and high wages. (Figures are given in Table 72.) The rate schedule was revised in subsequent years on the basis of the metric system. Up to 1936, the rates remained unchanged.

TABLE 72

BASIC FREIGHT RATE OF THE SOUTH MANCHURIA RAILWAY COMPANY

1919-1935

(Unit: Cent or 1/100 yuan)

	Less-than-carload			
	1st Class	2nd Class	3rd Class	4th Class
1-100 miles	0.625	0.500	0.375	0.250
101-200 miles	0.600	0.480	0.360	0.240
201-400 miles	0.575	0.460	0.345	0.230
Beyond 401 miles	0.590	0.440	0.330	0.220

	Full Carload			
	1st Class	2nd Class	3rd Class	4th Class
1-100 miles		5.000	3.750	2.500
101-200 miles		4.800	3.600	2.400
201-400 miles		4.600	3.450	2.300
Beyond 401 miles		4.400	3.300	3.200

In 1936 when Manchukuo standardized the freight rate the South Manchuria Railway Company also changed its rate schedule for the company lines. To help develop natural resources, the company did its best to revise its rate schedule on the basis of the schedule adopted by the national lines. The revision (made in February 1936) consisted of the following provisions:

A. Ordinary Rate

1. Classification of Goods. Manchukuo reclassified goods into six categories as compared with four previously:

	1st Class	2nd Class	3rd Class	4th Class	5th Class	6th Class
Chief Items	Camera Musical Instrument	Measuring Instruments	Cotton threads, Cotton Articles Cars, Sheep wool	Soybeans, Rice, Maize Fruits, Iron & Steel products	Iron & Steel Coal, Paper Pulp, Vegetables	Mineral Ores and rocks

2. Long-distance freight rate was reduced at a greater rate. Seven percent reduction was applied to each 100 kilometers beginning from the second 100 kilometers.

3. The basic rate was modified as follows:

	Class A	Class B	Class C	Class D	Class E	Class F	Remarks
Full carload freight per ton per kilometer	5.50	4.58	3.66	2.74	1.82	1.40	Unit: cent

Note: A service fee was also required: 10 cents per 100 kilometers for less-than-carload freight and 55 cents per ton for full carload freight.
The rate for less-than carload freight was 1.5 times of the full carload freight rate.

4. Changes of the method of computation. The basic unit of two kilometers used in rate computation was modified. The basic unit for rate computation varied with distance. It was 2 kilometers for freight to be transported within 100 kilometers, 5 kilometers for the distance between 101 and 500 kilometers and 10 kilometers for the distance between 501 and 1,000 kilometers.

5. The revised freight rate schedule consisted of three different rates: the ordinary, the special and the reduced rates. It was provided that with the exception of very special cases such as the freight arrived from or delivered to overseas, there would be no reduction of freight charges in the special rate schedule.

B. Special Rates

The special rates practiced by the South Manchuria Railway Company applied to:

1. Goods arriving at or originating from ports;
2. Daily necessities;
3. Construction materials

These three categories of special rates covered a great variety of goods, especially the first category of rates.

The so-called special rates for goods arriving at an originating from Dairen, Port Arthur, Yingkow and Antung by the railway lines. They were part of the policy for the development of harbors, and were practiced soon after the South Manchuria Railway Company was founded. In February 1936 when the freight rates were revised agricultural products delivered to the ports in Southern Manchuria and in North Korea were also covered by special rates. This was taken as a measure to encourage the transport of agricultural products.

One point worthy of notice was that in the revision of freight rates effective February 1936, a lower rate was applied to the less-than carload freight above 5,000 kilograms in order that the transport of groceries would be facilitated.

Freight Rate Policy of Manchukuo During the Period of the General Railroad Administration.

In October 1937 the Puppet Manchukuo abolished the General Railway Administration and replaced it with the General Railroad Administration. The purpose of the reorganization was to put the national lines and the corporation lines formerly under the management of the South Manchuria Railway Company under the control of the General Railroad Administration. In the same year the Manchukuo regime implemented its first five-year plan industrial development, the Loukouchiao Incident took place. Also in the same year in order to meet the new situations the General Railroad Administration adopted a freight rate which applied to all railway lines under its control and those under the Korean Railway Corporation for developing the national resources in North Manchuria, for expanding commerce and industry and for stimulating the trade relations with foreign countries. The passenger rate was also revised in December 1940.

As a consequence of the Pacific War, the Manchurian economy was greatly weakened. Thus, the freight rate was raised repeatedly in the subsequent years.

Passenger Rates

The war of emergency put more restriction on passenger transportation than on freight transportation. This was because of the fact that the decrease of income from freight transportation forced the government to raise the passenger rate (passenger rates are listed in Table 73 below.) Measures for the unification of passenger rates throughout Manchuria were taken in December 1940.

TABLE 73

PASSENGER RATES (PER KILOMETERS) UNDER THE GENERAL RAILROAD ADMINISTRATION BY YEARS (IN JAPANESE CENTS)

Year	First Class Corporation Lines	First Class National Lines	Second Class Corporation Lines	Second Class National Lines	Third Class Corporation Lines	Third Class National Lines	Date of Revision
1936	4.4	5.0	2.8	3.0	1.55	1.8	Feb 1936
1940		5.0		3.0		1.8	1 Dec 1940
1942		6.0		4.0		2.1	1 Apr 1942
1943		6.5		4.5		2.6	1 Apr 1943
1944		12.0		9.0		5.5	1 Jan 1944

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Freight Rates

After the revision of the freight rates in 1936 by the General Railway Administration, the corporation lines under the management of the South Manchuria Railway Company and the national lines under the General Railway Administration and the Korean Railway Company have respectively their own rate schedules. Since the establishment of the General Railroad Administration in Manchuria railway administration was unified. In order to meet the new political situation to exploit natural resources and to introduce the five-year industrial development plan, the General Office greatly reduced the rates and drastically reformed the structure of freight charges in October 1938. The purpose of this revision was given below.

1. To establish a Single, Unified Freight Rate

The company lines formerly under the control of the South Manchuria Railway Company, the national lines under the management of the Manchukuo regime and the railway lines in Korea adopted a single, unified freight rate. A main feature of the uniform rate was that the charges decreased proportionally as the mileage increased.

2. To facilitate Industrial Development

In order to coordinate with Manchukuo's policies of resource development centering on the north, of fostering the heavy industry and of expanding foreign trade, the railway administration adopted a freight rate which decreased as the distance increased. In addition a very low rate applied to some vital materials. As a result, the annual deficit arising from the low-rate policy amounted to 20,000,000 yen. About 75 percent of the freight received a special rate. Freight rates for cereals, coal, minerals, lumber and livestock were extremely low.

A flat rate of 23 yen per ton applied to the transport of cereals. Freight rates for the other four categories of goods mentioned in the last paragraph decreased proportionally as the distance increased. This was obviously a measure for facilitating the economic resources in the hinterland of Manchuria. The previous rate schedule for goods produced at the border areas was abolished as the new rates came into effect.

Readjustment of Loading and Unloading Charges in the Ports and Harbors:

Special rates for loading and unloading goods in Dairen and An-tung were abolished except those governing the transportation of the export cereals and the imports. Furthermore, goods transported to the three North Korean ports were charged at a minimum rate regardless of distance in order to utilize fully the port facilities there.

In compliance with the policies listed above, the new revision provided:

1. A new classification of freight;

2. Specially reduced rates for goods received from or destined to Kuantung Province and were transported over 120 kilometers in distance;

3. A 25 percent discount applied to the less-than-carload freight weighing more than 2 tons apiece;

4. There were four categories of goods in the new revised schedule as compared with four for the corporation lines and six for the national lines. The basic freight rate used previously by the corporation lines was preserved in the revised schedule since it was a lower rate. In order to avoid drastic changes in freight operation, the formerly fifth and sixth categories of the Manchukuo's national lines were covered by a special low rate.

The volume of freight increased greatly in the subsequent years as the agriculture, industry and government enterprises rapidly developed. The composition of railway freight also showed a great change. More than half of the long-distance freight consisted of coal and minerals which paid very low freight charges. Thus the income from freight operations per ton per mile decreased (see the next section on railway transportation accomplishment) despite the increase in freight volume. On the other hand, the expenditures of the railways sharply increased because of the war, the high wages and high prices.

Since the freight rate played an important role in the determination of the general prices, Manchukuo strictly opposed to the raising of freight rate. Instead, it increased the passenger rate in order to compensate the losses from freight operations. This marked a great change in the railroad operations in Manchuria, for the railroad depended now mainly on passenger traffic as a main source of revenue rather than on freight traffic as it did in the past. Several new provisions were made with regard to freight rate, including:

1. The marginal mileage above which a proportional decreasing rate would be applied was changed from previously 120 kilometers to now 80 kilometers;

2. A 15 percent discount applied to the less-than-carload freight weighing more than 5 metric tons apiece as compared with 25 percent and 2 metric tons apiece previously stipulated.

Another revision on freight rate was made in January 1942 as a consequence of rising wages and other costs of operation. The new revision included the following changes:

1. Basic freight rate included the less-than-carload freight rate and the full-carload freight rate. The less-than-carload freight rate consisted of the ordinary, the weighed and the discount rates. The full-carload freight rate consisted of the ordinary and the discount (discount according to types of goods or a straight-line discount rate) rate.

The new basic rate may be tabulated as follows:

	Less-than-carload (cent per 100 kilograms)				Full-carload (cent per ton per 100 kilometers)			
	1st Class	2nd Class	3rd Class	4th Class	1st Class	2nd Class	3rd Class	4th Class
Basic rate	1.20	0.85	0.55	0.33	6.00	4.40	3.00	2.00

2. The following gives a comparison of the distance used as a unit for computing freight charges before and after the revision:

Limits:	-100 kilometers	-500 kilometers	-1,000 kilometers	-2,000 kilometers	+2,000 kilometers
Minimum unit before revision	5 kilometers	10 kilometers	20 kilometers	40 kilometers	50 kilometers
After revision	25 kilometers		50 kilometers	100 kilometers	

3. The minimum freight weight was 50 kilograms and the minimum charge was one yuan.

Provisions concerning the full-carload freight in the new revision included:

1. A revision of the basic rate (see above table)

2. Full-carload freight must have a minimum weight of 21 metric tons as compared with 18 tons previously (except domestic animals and explosives)

3. The minimum charge for one carload (30 tons) was 80 yen.

The newly revised freight regulation suspended the following freights from the list of goods applicable for special discount rate:

1. Merchandise, farm tools and exhibit articles originated from or delivered at the former Kwantung Leased Territory.

2. Cereals, timber and charcoal originated from or delivered to An-tung, rice and timber originated from North Korean railways and merchandise originated from or delivered at Najin.

Discount rates for the following goods were revised in the new regulation: Minerals including magnesium, alkali minerals and limestone, rocks and marble, railroad ties and telephone poles.

A merchandise to which the ordinary basic freight rate for the less-than-carload freight applied was charged in the same rate regardless of its grade. Freight rate for valuable goods was twice as much as ordinary goods and that for explosives was 5 to 10 times as great as that for ordinary goods.

Miscellaneous freight charges including pick-up and delivery fees, unloading fees and guard fees were increased in the new regulation.

In subsequent years as the war situation became worse and sea transportation met with more difficulties, railway traffic increased

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tremendously. Because the freight rate was low, railway income declined further. In order to put each operating department of the railway into good shape financially, the South Manchurian Railway Corporation again revised its passenger and freight rates in January 1945. The revision covered the following changes:

1. The basic freight rate for less-than-carload goods was 1 cent per kilogram per 100 kilometers regardless of grades;

2. Service charge for less-than-carload goods was 50 cents per 100 kilograms and 2 yen per ton for full-carload goods (one yuan for goods to which the categorical discount rate applied).

The new revision further lowered the discount rate for long-distance transport of less-than-carload goods.

Other features of the new regulation included:

1. Freight charge for less-than-carload daily necessities was 50 percent off from the ordinary freight rate and

2. The minimum charge on goods originated from or delivered at Dairen was eliminated.

Section 6. Accomplishment of Railway Transportation

Railway transportation records established under this centralized management system were excellent. This is shown by Tables 74 and 75.

Passenger Transportation

1. Data on Passenger Transportation

Data on passenger transportation (excluding the corporation lines under the direct control of the South Manchuria Railway Company and the railway lines under private ownership) between 1934-1944 are shown in Table 74:

TABLE 74

DATA ON PASSENGER TRANSPORTATION IN MANCHURIA, 1934-1944

(Data on the Company lines and Those Under Private Ownership Not Included)

	Passengers			Passenger-km			Income from Passenger Car Operation		
Year	1,000 Kilometers	Index	Annual Increase	1,000 Kilometers	Index	Annual Increase	Income in 1,000 Yen	Index	Annual Increase
1934	23,676	100		2,285,600	100		38,365	100	
1935	29,295	124	24	2,818,182	123	23	50,581	132	32
1936	33,226	140	13	3,319,922	145	18	57,972	151	15
1937	38,428	162	15	4,130,027	181	24	69,339	181	20
1938	50,051	211	30	5,448,798	239	32	94,538	247	36
1939	75,967	321	50	8,530,888	373	57	147,277	384	56
1940	97,822	413	29	10,536,602	461	24	190,685	497	27
1941	103,774	438	6	11,005,700	482	4	222,623	580	16
1942	132,154	558	27	14,034,768	613	27	306,909	800	38
1943	163,555	691	24	16,720,528	732	19	435,717	1,136	42
1944	170,050	718	4	17,377,552	760	6	601,331	1,568	38

Table 75. DATA ON PASSENGER TRANSPORTATION IN THE COMPANY LINES UNDER THE MANAGEMENT OF THE SOUTH MANCHURIA RAILWAY COMPANY AND THE NATIONAL LINES UNDER THE CONTROL OF MANCHUKUO

Year	(1,000 kilometers)	Index	Annual In-crease	Income in 1,000 Yen	Index	Annual In-crease	(1,000 kilometers)	Index	Rate of In-crease	Income in 1,000 Yen	Index	Annual In-crease
1934	1,116,144	100		18,400	100		1,169,456	100		19,000	100	
1935	1,531,548	137	37	27,500	150	50	1,213,681	104	4	22,600	119	19
1936	1,754,754	157	14	30,100	163	9	1,473,293	126	21	26,400	139	17
1937	1,900,144	170	8	51,000	169	4	2,119,878	181	44	36,500	192	38
1938	2,654,652	238	40	43,300	256	40	2,645,533	226	25	48,800	257	34
1939	3,985,871	357	50	66,000	359	52	4,324,242	370	64	77,800	410	54
1940	4,724,897	423	19	84,000	459	27	5,634,129	482	30	104,000	547	33
1941	4,996,483	448	6	100,600	537	18	5,885,142	504	32	119,600	630	15
1942	6,265,546	562	25	140,100	762	42	7,616,838	652	29	163,300	860	36
1943	7,216,876	674	15	192,500	1,045	37	9,338,625	798	22	238,800	1,257	46

2. Development of Passenger Transportation

After the Manchukuo regime was founded in 1933, all the national railways in Manchuria were entrusted with the South Manchuria Company for centralized control. In October of the same year the railway in North Korea were also operated by the Company. Since then through-traffic service was established between Najin and Ch'ang-ch'un.

Through-traffic service for all the railways in Manchuria and in North Korean was established in March 1934 soon after the South Manchuria Railway Company succeeded in standardizing the traffic regulations. In June 1934 the Eastern Travel Bureau was established for the service of travelers. Through-traffic service opened in July 1934 between Mukden and Peiping. The Asian Express train operated in September after a double track was built between Ch'ang-ch'un and Dairen. The Light Express train operated in November 1934 between Ch'ang-ch'un and Pusan. Since then traveling was more convenient than ever.

In March 1935 the controversial Chinese-Eastern Railway was taken over by Manchukuo. This in effect enabled the railways in Manchuria to make contacts with the railways in Europe. In September 1935 the Asian Express reached Harbin. More railways were built in the same year. Transportation in Manchuria grew rapidly. Najin Port was opened to traffic also in 1935.

In October 1936 the national lines of Manchukuo and the corporation lines of the South Manchuria Railway Company were put under a centralized control system. The transportation system in Manchuria began to be unified. The Harbin-Lu-p'in Railway charged from a previously narrow-gauge to a standard-gauge railway. The wide-gauge Harbin-Su-feng-ho Railway was also converted into a standard railroad in June 1937. Subsequently, all the railways in Manchuria were standardized and the passenger and freight traffic operated smoothly.

As the Manchukuo regime implemented its first five-year industrial development plan in 1937, it stepped up railway construction. Heavy industry began to grow and the passenger traffic in railroads increased greatly owing to the frequent movement of labor. Since peace and order was restored in the border area, Japanese and Chinese flocked to that area. As a result, railroad passenger traffic continued to be heavy. At the eve of the Lou-kou-ch'iao Incident traffic increased very rapidly.

In 1938 traffic between Manchuria, North China and Japan was very heavy. Laborers from North China and members of the Japanese Young Pioneers continued to pour into Manchuria. As a result, railroad passenger traffic showed a 30 percent increase over the past year. In view of the increase in the number of passengers, the railway authorities suspended part of their discount rates and restricted the issuance of free tickets. This probably did not solve much of the difficulties in traffic operations owing to the heavy volume of military traffic.

In 1939 more and more laborers migrated into Manchuria from North China, Japan and Korea including members of the Young Pioneers as a result of the rapid development of railroad and industry. Traffic between North China, Japan and Korea was extremely heavy. Short-distance traffic also increased greatly in Manchuria. The number of railroad passengers showed an increase of 50 percent over previous year. In order to reduce traffic jams, the issuance of free traveling tickets to railway workers and their independents was further restricted. Special discount for group traveling was also suspended. Train schedules were revised and train speed was reduced so as to increase the capacity of the railways. Furthermore, railway workers were trained so that they may lead the public to the observing of public spirit in time of difficulties. The railway operating mileage in that year amounted to 10,000 kilometers in October 1939.

In 1940 the rate of passenger increase was smaller than previous year although there was an absolute increase. In the same year the basic freight and passenger rates in the corporation lines were adjusted to keep in line with those in the national lines. In July 1940 the railway between Chongjin and San-feng (134 kilometers) and the Hui-ning Coal Mining Line (11 kilometers) were returned to the Governor of Korea and thereby relieving the Manchukuo's responsibilities in running them.

1941 was the last year of Manchukuo's first five-year industrial development plan. In June Germany attacked Russia and in December the Pacific War broke out. Manchukuo stepped up its efforts to improve the capacity of the railroad. It cancelled the pullman cars and dining cars. Traveling was indeed greatly restricted as the government issued in the preceding year regulations governing foreign exchange. The number of immigrants from North China decreased. The number of Japanese passengers also decreased since the passengers were required to take boats appointed by the government. The sinking of the Piki Steamer by torpedo in November discouraged traveling further. Thus railroad passenger traffic showed an increase of 6 percent only over the preceding year. However, revenue from passenger cars operation showed 16 percent increase owing to the increase in passenger rate.

In 1942 passenger traffic revived despite the fact that freight traffic was depressed. In the second half of 1942 the old time schedules for passenger trains were restored. More passenger trains were run. But the number of operating passenger trains declined again in January 1943 because the railways were busy in shipping war materials to Japan. Railway passenger traffic showed an increase of 27 percent and income from passenger operation increased by 38 percent over previous year.

In 1943 the freight traffic increased tremendously as a result of war mobilization and the shifting of ocean transportation to land transportation. For three times passenger service was suspended which involved a mileage of 14,000 kilometers. Passenger traveling met with more difficulties. The number of express train tickets was limited. Passenger regulation was tightened. Luggage was restricted. More cars were added to each passenger carrying train. Number of passengers in that year increased by 24 percent over last year. The index of passenger seat utilization rate was 73 percent in the preceding year and was 82 percent this year. As a result of the two boosts in fare in April 1943 and in January 1944, income from passenger train operations for the fiscal year 1943-1944 increased 42 percent over the preceding year.

In August 1944 the Manchukuo Government declared the Emergency Railway Transportation Regulation for the Decisive Year. The volume of war materials transported increased greatly. Owing to the threat of air raid in the south, passenger traffic was further limited. Despite this, the number of passengers transported in that year amounted to 17,005,000 and the income from passenger car operations was 60,133,000 yen. Both were the highest records in the railway history of Manchuria.

3. An Analysis of the Passenger Traffic by Types of Cars.

From the standpoint of types of passenger cars, the increase in the number of third-class-car passengers was most conspicuous. The next greatest increase was the second-car passengers. The number of railway passengers in 1944 was three times of that in 1937. Each year more and more people used second-class passenger cars. Thus the second-class car passengers constituted only 17 percent of the total passengers in 1937, but constituted 49 percent in 1944.

Table 76. PASSENGERS CLASSIFIED ACCORDING TO TYPES OF CARS

Year	First Class		Second Class		Third Class		Totals		Ratios Between Different Classes			
	Passengers	Index	Passengers	Index	Passengers	Index	Passengers	Index	1st	2d	3d	Total
1937	37,992	100	648,460	100	37,742,341	100	38,429,793	100	0.1	1.7	98.2	100
1938	48,555	128	963,768	149	49,038,230	130	50,050,553	130	0.1	1.9	98.0	100
1939	72,635	191	1,832,469	283	74,062,108	196	75,967,212	198	0.1	2.4	97.5	100
1940	96,960	255	3,076,290	474	94,648,927	251	97,822,177	255	0.1	3.1	96.8	100
1941	96,732	255	3,493,227	540	100,186,697	265	103,776,656	270	0.1	3.4	96.5	100
1942	115,511	304	4,349,190	672	127,688,850	338	132,153,551	344	0.1	3.3	96.6	100
1943	158,788	416	6,192,408	954	157,203,932	415	163,555,128	426	0.1	3.8	96.1	100
1944	289,673	762	8,412,343	1,300	161,347,556	427	170,049,572	441	0.2	4.9	94.9	100

4. Passenger-seat Mileage

Table 77-A shows the passenger-kilometers and the passenger-seat-kilometers by years.

Table 77-A. PASSENGER-KILOMETERS AND PASSENGER-SEAT-KILOMETERS BY YEARS (in 1,000,000 kilometers)

	Passenger-Kilometers by Types of Car				Passenger-Seat-Kilometers by Types of Car			
Year	First Class	Second Class	Third Class	Total	First Class	Second Class	Third Class	Total
1937	17	173	3,940	4,130	322	1,255	8,713	10,290
1938	21	259	5,168	5,448	318	1,408	10,231	11,967
1939	35	461	8,134	8,530	353	1,650	12,225	14,228
1940	47	666	9,823	10,536	300	1,789	14,604	16,693
1941	43	717	10,245	11,005	241	1,648	14,670	16,559
1942	50	861	13,123	14,034	271	2,045	17,010	19,325
1943	68	1,161	15,491	16,720	309	11,413	17,698	20,420
1944	117	1,512	15,748	17,377	--	--	--	--

Table 77-B shows the increase of passenger-kilometers and passenger-seat-kilometers since 1937.

Table 77-B. INDEX OF PASSENGER-KILOMETERS AND PASSENGER-SEAT-KILOMETERS

	Passenger Mileage Index				Passenger-Seat Mileage Index			
Year	First Class	Second Class	Third Class	Total	First Class	Second Class	Third Class	Total
1937	100	100	100	100	100	100	100	100
1938	126	151	131	132	98	113	117	116
1939	210	268	203	209	109	131	141	138
1940	261	387	248	255	93	142	168	162
1941	281	417	260	266	75	131	168	161
1942	298	502	333	340	84	163	195	188
1943	408	676	392	405	96	192	203	198
1944	702	880	419					

The above Tables show that the passenger-seat-kilometers increased much faster than the passenger-kilometers. The passenger-seat utilization rate was average 70 percent. The third-class-passenger-seat utilization rate increased by 80 percent in 1944. The overcrowded condition in passenger trains is very apparent.

Table 78 shows the efficiency in the use of passenger seats and the number of passenger cars.

TABLE 78. PASSENGER-SEAT UTILIZATION RATE (PERCENT)

Year	First Class Cars	Second Class Cars	Third Class Cars	Total	Passenger Cars in Operation: Number of Cars	Index	Rate of Increase
1937	5	14	45	40	1,701	100	
1938	7	18	50	46	2,109	124	24
1939	10	28	66	60	2,239	132	6
1940	16	37	67	63	2,404	141	9
1941	18	43	70	66	2,609	153	8
1942	18	42	77	73	2,814	166	5
1934	22	48	88	82	2,984	175	2

5. Average Traveling Mileage Per Passenger

The average traveling mileage by a person by types of passenger car is shown in Table 79.

TABLE 79. AVERAGE TRAVELING MILEAGE PER PASSENGER

Year	Kilometer Per Passenger: First Class	Second Class	Third Class	Average	Index: First Class	Second Class	Third Class	Average
1937	440	266	104	107	100	100	100	100
1938	436	269	105	108	99	102	101	101
1939	482	252	108	112	109	95	104	104
1940	483	216	103	107	110	81	99	100
1941	449	205	102	106	102	77	98	99
1942	433	198	102	106	98	75	98	99
1943	429	187	98	102	98	71	94	95

The above table shows that the average passenger-kilometers for second class cars dropped since 1939. This may be explained in the fact that the general economic condition in Manchuria was improved since 1939 and short-distance traveling increased. Since 1941 the average traveling mileage per passenger had greatly decreased because there were many difficulties in traveling and because the discount rates for long-distance traveling and for group traveling were suspended.

6. Income for the Passenger-Train Operations

1. The basic passenger rates during the period under the South Manchuria Railway Company are given in Table 80.

TABLE 80

PASSENGER RATE (1/100 YEN PER KILOMETER PER PASSENGER) BY YEARS

Year	Corporation Lines	National Lines	Corporation Lines	National Lines	Corporation Lines	National Lines	Remarks
1933	4.4	5.0-4.5	2.8	3.2-3.0	1.55	2.1-1.5	Beginning of the centralized control era
1936	4.4	5.0	2.8	3.0	1.55	1.8	Revised February 1
1940	5.0	5.0	3.2	3.2	1.8	1.8	Revised December 1
1942		6.0		4.0		2.1	Revised April 1
1943		6.5		4.5		2.6	Revised April 1
1944		12.0		9.0		5.5	Revised January 1

2. Income from passenger tickets of different classes and from coaches and other related data are shown in Table 81.

[See table on following page.]

Table 81. RAILWAY INCOME FROM PASSENGER-CAR OPERATIONS BY YEARS

Year	Income From Passenger Cars (in 10,000 yen)				Income From Coaches	Index of Income From Coaches	Index				Percent		
	First Class	Second Class	Third Class	Total			First Class	Second Class	Third Class	Total	First Class	Second Class	Third Class
1937	59	404	5,527	5,990	6,934	100	100	100	100	100	0.9	6.8	92.3
1938	76	607	7,420	8,103	6,454	136	128	150	134	158	0.9	7.5	91.6
1939	130	1,093	11,750	12,973	14,727	212	220	270	213	217	1.0	8.4	90.6
1940	195	1,736	15,313	17,244	19,067	275	330	429	277	288	1.1	10.1	88.8
1941	205	2,217	17,676	20,098	22,262	321	348	547	319	336	1.0	2.0	88.0
1942	274	3,161	23,810	27,246	30,691	443	467	783	433	455	1.0	11.6	87.4
1943	410	4,794	34,583	39,787	43,571	628	697	1,185	627	664	1.0	1.0	87.0
1944	878	8,388	48,296	57,562	60,133	667	1,490	2,075	878	958	1.5	14.6	83.9

Although the number of passengers increased by 441 percent in 1944, income from passenger cars increased by 958 percent (income from coach tickets increased by 667 percent). The tremendous increase in the income from passenger car operations was due to the fact that passenger tickets had been repeatedly increased. The increase in the number of passengers did not correspond to the increase in income because the railways modified their discount rates for group traveling and season tickets.

3. Comparison of income from Freight Traffic and From Passenger Traffic.

A comparison of the income from freight operations and from passenger operations is given in Table 82.

TABLE 82

RAILWAY INCOME FROM PASSENGER OPERATIONS AND FROM FREIGHT OPERATIONS

(In 10,000 yen)

Year	Passenger Trains	Freight Trains	Total	Percent From Passenger Trains	Percent From Freight Trains
1937	6,934	22,664	29,598	23.4	76.6
1938	9,454	27,551	37,005	25.4	74.6
1939	14,728	32,907	47,635	30.9	69.1
1940	19,069	31,067	50,136	38.0	62.0
1941	22,262	36,885	59,147	37.7	62.3
1942	30,601	42,157	72,848	42.2	57.8
1943	43,572	43,332	86,904	50.2	49.8
1944	60,133	45,561	105,696	56.9	43.1

As all the railway lines were built for the exploitation of the natural resources in Manchuria, the income from freight transportation was much greater than that from passenger operations. Take for instance in 1937 the income from passenger transportation accounted for only 23.4 percent of the total income while that from freight transportation constituted 76.6 percent. It is clear that the income from the passenger trains was low. However, in the wake of the rise of industrial and cultural enterprises, income from the passenger trains had gradually increased. In 1944 the income from freight transportation constituted only 43.1 percent while that from passenger transportation constituted 56.9 of the total income.

The increase in the income from passenger car operations was mainly due to the repeated increase in the prices of passenger tickets. It was also due to the low freight rates. In fact the freight rates for Manchurian railways were comparatively low, for these railways were primarily pioneer railroads or penetration railroads. Only until the cultural development improved as it did in later years that the railways shifted their business operations and encouraged passenger-train operations.

7. Data on passenger transportation by years.

The following is a table of the number of passengers served in one day per kilometer and the passenger-seat utilization rates.

TABLE 83. NUMBER PASSENGERS SERVED BY THE MANCHURIA RAILWAYS IN ONE DAY PER KILOMETER

Order	Railways	Number of Passengers per Kilometer per Day	Occupied Passenger-seats (percent)
	Average for all railways	4,096	82
1	Ch'ang-ch'un-Dairen Line	17,389	80
2	Mukden-Shan-hai-kuan Line		134
3	Ch'ang-ch'un-Harbin Line	11,675	85
4	Pin-chiang Line	11,456	40
5	An-tung-Mukden Line	11,044	95
6	Ying-k'ou Line	6,424	67
7	Fu-shun Line	5,864	62
8	North Korean Line	4,352	67
9	Port Arthur Line	4,322	69
10	Yu-shu Line	4,176	79
11	Pin-sui Line	4,125	79
12	Ch'ang-ch'un T'u-men Line	4,214	65
13	Ssu-p'ing-ch'i-ch'i-ha-erh Line	3,854	80
14	Mukden-Kirin Line	3,713	102
15	Harbin-Pei-an Line	3,618	79

16	T'u-men-Chia-mu-ssu Line	3,266	69
17	Hsin-li-t'un-I-hsien Line	2,312	51
18	Chin-chou-Ku-pei-kou Line	2,187	83
19	Chin-ch'eng Line	2,132	90
20	La-pin Line	2,182	82
21	Chao-k'ai Line	1,973	93
22	Chi-Pei Line	1,910	69
23	Ping-mei Line	1,882	86
24	North Korea Line	1,820	34
25	Pei-piao Line	1,731	76
26	Hu-lin Line	1,671	67
27	Yeh-Feng Line	1,648	97
28	Lo-hung Line	1,567	27
29	Pin-chou Line	1,512	71
30	Sai-chia Line	1,510	78
31	Hopeh Line	1,488	93
32	Ch'ang-pai Line	1,443	70
33	Ta-cheng Line	1,372	73
34	Mei-chi Line	1,371	79
35	Ch'i-chien Line	1,305	60
36	Pei-hei Line	1,276	50
37	Ch'ing-tao Line	1,267	115
38	Kao-hsin Line	1,242	44
39	Hu-lu-tao Line	1,158	35
40	Ta-li-tzu Line	1,117	87
41	Ho-kang Line	940	51

42	Chefoo Line	926	98
43	Ning-huo Line	719	54
44	Lung-feng Line	717	81
45	Sui-ning Line	706	42
46	Pai-tu Line	586	43
47	Hsing-ning Line	534	40
48	Heng-shan Line	403	68
49	Ch'eng-chi Line	351	46

Table 83 shows that the Ch'ang-ch'un-Dairen Line, the Mukden-Shan-hai-kuan Line, the Ch'ang-ch'un-Harbin Line and the An-tung-Mukden Line are the major railway lines in Manchuria. They have extension lines of varying lengths. All these railways listed above form a railway network in Manchuria.

8. Number of Railway Passengers

The number of passengers registered in the major railway stations in Manchuria.

TABLE 84

NUMBER OF PASSENGERS AT THE MAJOR RAILWAY STATIONS IN MANCHURIA

(Unit: 10,000 persons)

Outgoing		Incoming	
Name of Railway Station	Number of the Passengers	Name of Railway Station	Number of the Passengers
Mukden	1,113	Mukden	1,165
Ch'ang-ch'un	456	Ch'ang-ch'un	455
Dairen	376	Dairen	335
Harbin	321	Harbin	403
Chin-chou	258	Chin-chou	246
Kirin	240	Kirin	241
An-shan	231	An-shan	237
Mu-tan-chiang	224	Mu-tan-chiang	231
Ssu-p'ing	212	Ssu-p'ing	214

An-tung	212	An-tung	180
Pin-chiang (West Station)	199	Pin-chiang (West Station)	122
Liao-yang	186	Liao-yang	183
Shan-hai-kuan	183	Shan-hai-kuan	195
Mukden (North Station	173	Mukden (North Station)	120
Hai-ch'eng	123	Hai-ch'eng	127
Ying-k'ou	121	Ying-k'ou	117
Chin-chou	112	Chin-chou	122
Sha-ho-k'ou	109	Sha-ho-k'ou	100
Lung-chiang	106	Lung-chiang	111
So-chia-t'un	106	So-chia-t'un	108
Total	16,356		16,356

Note: Passengers registered at stations smaller than those mentioned are included in the total.

Table 84 shows that Mukden Station recorded the largest number of passengers with 11,130,000 outgoing and 11,650,000 incoming, totaling approximately 23,000,000. The second largest number of passengers was recorded in Ch'ang-ch'un Station with 9,000,000 incoming and outgoing passengers. The third was recorded in Harbin Station with 7,200,000 incoming and outgoing passengers. The fourth was recorded in Dairen Station with 7,000,000 incoming and outgoing passengers. Stations with more than 5,000,000 incoming and outgoing passengers were the Chin-chou, the Kirin, and An-shan and the Mu-tan-chiang stations.

9. Passenger Traffic with China Proper, Japan and Korea

Shan-hai-kuan, Dairen and An-tung were the gateways of Manchuria to China Proper, Japan and Korea. Table 85 shows the number of passengers transported at the border areas.

Table 85. INCOMING AND OUTGOING PASSENGERS AT CITIES NEAR NATIONAL BORDERS

Cities		1938	1939	1940	1941	1942	1943
	Incoming	29,955	48,517	54,851	49,122	24,151	5,016
	Outgoing	37,075	57,183	61,817	49,793	28,445	598
	Total	67,030	105,655	116,668	98,915	52,596	5,614
	Index	100	157	174	147	78	8
Shan-hai-kuan	Incoming	236,453	535,979	745,616	648,218	1,086,571	1,349,864
	Outgoing	345,980	578,176	1,219,938	1,030,773	1,106,785	1,380,678
	Total	582,433	1,114,155	1,965,554	1,678,991	2,193,356	2,730,551
	Index	100	191	337	288	376	468
Antung	Incoming	390,988	601,498	661,284	775,277	1,217,464	1,366,974
	Outgoing	242,851	453,078	571,179	566,461	1,023,600	1,146,824
	Total	633,839	1,054,576	1,232,463	1,341,738	2,241,064	2,513,798
	Index	100	166	194	212	354	396
Najin	Incoming	1,617	2,560	31,477	30,284	5,336	19,836
	Outgoing	1,202	4,119	27,399	21,341	5,731	16,925
	Total	2,819	6,679	58,876	51,625	11,067	36,761
	Index	100	237	2,090	1,833	393	1,305
Shang-shan-feng	Incoming			49,807	73,584	109,758	119,176
	Outgoing			61,872	77,347	106,332	114,326
	Total			111,679	150,931	216,090	233,502
	Index			100	135	193	209
T'u-men	Incoming			237,972	511,031	626,732	658,594
	Outgoing			279,010	384,679	677,531	712,071
	Total			516,982	895,728	1,304,263	1,397,665
	Index			100	173	252	270

The number of passengers transported at Dairen showed yearly increases before 1940. Since the outbreak of the Pacific War which gave rise to serious shortage of ships, it decreased beginning 1941. It dropped to 5,000 in 1943 and to a negligible amount in 1944.

A yearly increase in the number of incoming and outgoing passengers via Shan-hai-kuan was recorded before 1940. However, the number of passengers dropped 300,000 in 1940 as a result of the issuance of new foreign exchange regulations and of the heavy military traffic. In 1942 as a result of the naval blockade, Japan utilized mainly the railroads including the Korean Railway System, the An-tung-Mukden Line and the Peiping-Mukden Line to maintain contacts with North and Central China. Thus once again in the number of passengers transported via Shan-hai-kuan showed an increase. The number of passengers in 1943 was 498 percent of that in 1938.

The number of passengers transported via An-tung was small in 1941, but large in 1942 and 1944. This proved that Japan was making a great effort to utilize land transportation for war purposes.

The number of incoming and outgoing passengers transported at Najin showed rapid increases before 1941. In 1942 it reduced by 20 percent over the previous year as a result of the freightening incident in 5 November 1942 in which the Kipi Steamer was sunk by torpedoes. However, it picked up again in 1943 with passengers increased by 33 percent over the previous year because Dairen was paralyzed and the sea route via Pusan was menaced by US submarines.

The number of passengers transported via T'u-men and Shang-san-feng increased by the year. Traffic of East Manchuria especially the Ch'ang-ch'un-t'u-men Railway Area with Japan and Korea was becomming very heavy.

II. FREIGHT TRANSPORTATION

1. Introduction

Data on freight transportation by the railways in Manchuria (not including railways under the direct control of the South Manchuria Railway Company and those owned by private capital) are shown in Table 86.

Table 86. RAILWAY FREIGHT TRANSPORTATION IN MANCHURIA, 1934-1944

Year	Tonnage (in 10,000 tons)	Index	Annual Increase	Ton-Kilometers (in millions of kilometers)	Index	Annual Increase	Income From Freight Transportation: Unit (in 10,000 yen)	Index	Annual Increase
1934	3,466	100		9,469	100		15,450	100	
1935	3,740	108	8	10,170	107	7	17,954	116	16
1936	4,209	121	13	10,748	114	6	19,344	125	8
1937	4,012	116	-5	12,903	136	20	121,664	147	17
1938	4,736	137	18	16,260	172	26	27,551	178	22
1939	5,896	170	24	20,462	216	26	32,907	213	19
1940	6,339	183	8	20,594	217	1	31,067	201	-6
1941	7,344	212	16	25,864	273	26	36,885	239	19
1942	8,317	240	13	27,976	295	8	42,157	273	14
1943	8,462	244	2	28,090	297	1	43,332	280	3
1944	7,756	224	-8	26,708	282	-5	45,561	295	5

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2. Development of Freight Transportation

The General Railway Administration made every effort to unify its administrative system after it was entrusted with the management of all the Manchurian railways by Manchukuo in 1933. It ordered its Dairen Railway Bureau to build new lines. In September 1933 the Ch'ang-ch'un-T'u-men Railway opened to traffic. In October 1933 it was entrusted with the management of the North Korean Railway by the Governor of Korea. The through-traffic train began to operate between Ch'ang-ch'un and Chongjin in North Korea. Thus Manchuria was linked to Japanese Sea via Chongjin, a port opposite Vladisvostok.

In January 1934 the Southern Manchuria Railways introduced the mixed storage system for farm products (mainly soybean oil and bean cake) first to Dairen and then to everywhere in Manchuria. It transported free cereals for relief famine. In March of the same year it standardized the freight regulations in the national railway lines. The through-traffic trains began to operate between the national lines, the corporation lines and the North Korean Railway Lines in the middle of May. In 1934 the Chao-yang-ch'uan-K'ai-shan-t'un and the La-fa-Harbin railways opened to traffic. The opening of the La-fa-Harbin Railway strengthened Harbin as a market center at the north and thereby counteracted the obstacles in freight transportation resulting from the control of the Chinese Eastern Railway by the USSR. A national network of railways was formed. Also in 1934 the Pei-an-Hei-ho Railway built an extension line into the north.

All the railways in Manchuria fell into the exclusive control of the South Manchuria Railway Company after the company took over the Chinese Eastern Railway in March 1935. In July 1935 the T'u-men-Mu-tan-chiang Section of the T'u-men-chia-mu-ssu Railway opened to traffic. In November of the same year the Unggi-Najin Line began to operate and the port of Najin opened. Consequently, the cities in Manchuria were prosperous and industries especially lumber and paper industries were growing. The trading post with Japan included then not only Dairen and An-tung but included also Najin, Unggi and Chongjin in North Korea. In 1935 two more railway lines opened for traffic: the Ch'ang-ch'un-T'ao-an Line and the T'ao-an-T'u-lu-erh Line. Industry in Northwest Manchuria began to develop. The mixed storage system applied in that year to farm exports to North Korea and to soybean produced in the Sungari River area.

In February 1936 freight rate was revised. In March through-traffic trains between Japanese railways and the national railways of Manchuria were installed. In May through-traffic trains operated between Japanese railways and the Peiping-Mukden Line. Through-freight services between Manchurian railways and railways in Asia and Europe were worked out after the Conference on Through-Freight Services held its meetings in Moscow in September 1936. In September the Ssu-p'ing-Pei-feng Section of the Ssu-p'ing-Mei-ho-k'ou Line opened to traffic.

In 1937 Manchukuo's first five-year industrial development plan began. The South Manchuria Railway Company stepped up its effort to build new lines. In July the T'u-men-chia-mu-ssu Line fully opened to traffic. In September the Mi-shan-Hu-lin, the Hsin-li-t'un-I-hsien, and the T'ao-an-O-erh-shan railway lines were put into operation.

The Mei-ho-k'ou-T'ung-hua Section of the Mei-ho-k'ou-Chi-an Line also opened to traffic. But soon after the outbreak of the Lo-k'o-ch'iao Incident on 7 July 1937, the railroad freight transportation underwent many changes.

In 1938 the Sino-Japanese War was widespread. The Manchukuo regime revised its first five-year industrial development plan and took measures to strengthen its defense industry. Freight traffic was extremely heavy. In October the railway authorities made an overall revision of its freight rate policy and standardized the freight schedules throughout all the railways in Manchuria. Features included in the newly revised regulation included a sliding discount scale for long-distance freight, a categorial schedule providing reduced rates for cereals, lumber, coal, minerals and livestock and a special rate for the transport of daily necessities. In addition, through-traffic freight was established between Manchuria, Japan and Korea.

In 1938 the railway traffic was very heavy since Japan poured an immense quantity of military supplies into North China. Shortage of cars was deeply felt. The poor port facilities in Dairen and in ports in Korea and the shortage of labor had restricted greatly the transportation system. Measures taken to relieve the above-mentioned difficulties included: (1) operating the trains at higher speed and adding more trains into service, (2) centralizing the distribution of cars, (3) increasing the capacity of the freight cars, (4) improving the economy in the use of materials, (5) putting more freight cars into operation, (6) improving railway yards and freight yards operations, (7) the training of freight train workers, (8) forbidding the freight trains to make stopovers at night, (9) loading and unloading freight cars day and night, (10) shortening the time consumed in customs inspection and (11) increasing the efficiency of the workers.

In the early part of 1939 about 200,000 metric tons of goods were tied up in Dairen Harbor. In July 1939 the No-men-han Incident occurred and military transportation was very heavy. In September the World War II broke out. This prevented the export of soybean and other farm products to Europe and added more problems to the transportation system. In October the Mei-ho-k'ou-Chi-an Line, a railway for the development of the natural resources in Tung-pien-tao and for making connection with Korea, opened to traffic entirely. In January 1940 through-freight services between the Siberian Railway and the Manchuria railways were established and the export of soybeans to Europe was again possible.

In addition to the old railways like the one between Dairen and Harbin, new lines leading to Chia-mu-ssu, Mu-tan-chiang and Najin were opened for freight traffic. The railroad freight consisted of mainly imported goods and of very little amount of exported goods. Since then the heavy traffic condition in the south was eased and the railways assumed its proper place in freight transportation.

In 1940 Asia felt gradually the impact of the war in Europe. In order to prepare for the war, Japan tightened its control of industry. It reviewed its policy toward the semi-public companies. There was a depression in agriculture and in coal mining industry. Furthermore, imports dropped to a very low level because of rigid controls. Railway traffic was rerouted. All this explained the drop in railroad freight tonnage and in income in 1940. Despite the increase of 4,420,000 metric tons (or 8 percent) over the previous year, the income dropped 18,240,000 (or 6 percent) over the preceding year. This was explained by the fact that the composition of the freight was changed: it consisted of more lumber and minerals which paid a lower freight rate and consisted of less agricultural products which paid previously a higher rate. The drop in farm products amounted to 2,000,000 tons (or 28 percent) and the increase in lumber amounted to 630,000 tons (16 percent) and in minerals 1,920,000 tons (or 28 percent). In view of the changes in the composition in railway freight and the changes in the direction of freight traffic, a new transportation policy was worked out by the Southern Manchuria Railway Company.

In June 1941 the USSR was attacked by Germany. This had produced certain impacts on Manchuria. Seventy percent of the railway freight was military goods which paid very low freight rate. Furthermore, there was a sharp increase in long-distance freight. In order to prevent railway's freight income from shrinking, the freight rate was revised and put into force in January 1942.

In 1942 Japan and the US were at war. Railway transportation was greatly influenced by the war. Furthermore, it was the railways which transported the coal, iron, farm products and strategical materials. Railway traffic volume increased tremendously since there was a shortage of ships. Merchandise entering into the trade between Manchuria, North China and Korea was also transported practically all by rail. The railway freight in 1942 consisted mostly of goods which paid very low rate since it included 50 percent of government supplies and railway materials and 20 percent of minerals. This was undoubtedly very unfavorable to the railways with regard to their income.

In March 1943 Japan convened the first session of the Continental Railway Transportation Advisory Conference to determine measures related to wartime transportation. It laid great emphasis on those measures for expediting the movement of military goods once after they were shipped to Manchurian ports by Japan. The railways met with many difficulties including the traffic jam, the problem of utilizing the empty cars on the returning trip and the redistribution of cars among the railways. The flood in North Manchuria in that year caused some damages to the railways. Despite all the difficulties, the railways were able to handle a very great volume of traffic since they had experience for more than ten years in the centralized control of the railways. Freight volume in 1943 reached 84,620,000 metric tons and 2,809,000,000 ton/kilometer, the highest record in the history of railway transportation in Manchuria.

Raw materials and war supplies including coal, iron, minerals and foodstuffs which were transported via the An-tung-Su-chia-t'un Line and the Mukden-Shan-hai-kuan Line were handled according to the plans worked out by the Continental Railway Transportation Advisory Conference. Freight volume, particularly along the two railways just mentioned, increased tremendously as the war tempo was higher and higher. In 1943 the freight along the two railways amounted to 11,500,000 metric tons which constituted 20 percent of the total railway freight throughout the entire Manchuria.

In 1944 Japan felt the adverse impact of the war. Lumber, mineral and other lines of production in Manchuria dropped gradually.

Manchuria's exports to Japan could not longer utilize Dairen and the ports in North Korea. Instead, they had to go through An-tung and Korea. This worsened the transportation situation. In August the railway corporation announced the wartime emergency transportation measures to cope with the difficulties. The railway system in Manchuria became at that time the Major transportation network for Japan. The volume of freight in 1944 amounted to 77,560,000 tons, a decrease of 7,060,000 tons over the preceding year but a gain of 4,000,000 tons over 1941. The income from freight operations amounted to 455,610,000 yen, an increase of 22,000,000 yen over the 433,310,000 yen in 1943. In January 1945 another revision of the freight rate was made. The centralized control of railways in Manchuria ended with the reoccupation of Manchuria by China.

III. COMPOSITION OF RAILWAY FREIGHT

1. Freight Tonnage

The period from 1937-1943 inclusive was considered as the most favorable period for railway operations. The composition of the freight during that period is shown in Table 87.

TABLE 87

TONNAGE AND COMPOSITION OF RAILWAY FREIGHT 1937-1943

Composition of Freight

Items

Year	Total	Railway Materials and Supplies	Government controlled materials	Commercial Freight
1937	4,012	751	397	2,864
1938	4,785	789	707	3,290
1939	5,896	1,221	954	3,721
1940	6,339	1,398	1,190	3,751
1941	7,344	1,368	2,013	3,963
1942	8,317	1,724	2,154	4,439
1943	8,462	1,814	2,110	4,538
1944	7,756	1,746	1,988	4,022

Commercial Freight

Year	Agricultural Products	Minerals	Forest Products	Live-stock	Marine Products	Miscellaneous
1937	647	1,357	203	15	59	583
1938	735	1,539	250	19	65	681
1939	703	1,636	387	24	80	891
1940	504	1,829	450	20	80	868
1941	572	2,114	412	16	65	784
1942	563	2,472	463	15	85	841
1943	574	2,590	426	16	116	816
1944	529	2,345	332	19	103	694

Principal Commodites

Year	Soybean	Timber	Coal	Iron Ore	Limestone	Cement
1937	264	171	1,122	59	85	56
1938	295	209	1,207	81		68
1939	221	319	1,227	105	129	83
1940	135	357	1,360	123	131	87
1941	141	332	1,574	172	160	82
1942	142	348	1,727	247	189	37
1943	126	318	1,698	334	212	63
1944	--	--	--	--	--	--

Table 88. INDEX OF TABLE 87

Items / Year	Totals	Materials and Supplies	Government Controlled Materials	Commercial Freight
1937	100	100	100	100
1938	119	105	178	115
1939	147	163	240	130
1940	158	186	300	131
1941	183	182	507	138
1942	207	230	543	155
1943	211	241	532	158

Year	Agricultural Products	Minerals	Forest Products	Live-stock	Marine Products	Miscellaneous
1937	100	100	100	100	100	100
1938	114	113	124	125	110	117
1939	109	121	191	157	136	153
1940	78	135	222	133	135	149
1941	88	156	204	102	110	134
1942	87	182	229	98	144	144
1943	89	191	210	104	195	140

Year	Soybean	Timber	Coal	Iron Ore	Limestone	Cement
1937	100	100	100	100	100	100
1938	112	123	108	138		121
1939	84	187	109	179	151	147
1940	51	209	121	209	158	155
1941	53	194	140	292	185	145
1942	54	204	154	420	221	130
1943	48	186	151	567	249	111

Table 89. PERCENTAGE DISTRIBUTION OF ANNUAL FREIGHT

Year	Totals	Materials and Supplies	Government Controlled Materials	Commercial Freight
1937	100	19	10	71
1938	100	16	15	69
1939	100	21	16	63
1940	100	22	19	59
1941	100	19	27	54
1942	100	21	26	53
1943	100	21	25	54

Commercial Freight

Year	Agricultural Products	Mineral Products	Forest Products	Live-stock	Marine Products	Miscellaneous
1937	16	34	5	1	2	13
1938	15	32	5	1	1	15
1939	12	28	7	1	1	14
1940	8	29	7	1	1	13
1941	8	29	6	1	1	9
1942	7	30	6	1	1	8
1943	7	31	5	1	1	9

Principal Commodities

Year	Soybeans	Timber	Coal	Iron Ore	Limestone	Cement
1937	6.6	4.3	28.0	1.5	2.1	1.4
1938	6.2	4.4	25.2	1.7		1.4
1939	3.7	5.4	20.8	1.8	2.2	1.4
1940	2.1	5.6	21.5	1.9	2.1	1.4
1941	1.9	4.5	21.4	2.3	2.4	1.1
1942	1.7	4.2	20.8	3.0	2.3	0.9
1943	1.5	3.8	10.1	3.9	2.5	0.7

The above tables show that in 1943 the freight tonnage was 2.1 times that in 1937. Railway materials increased 2.4 times; government-controlled materials 5.3 times; and merchandise, 1.8 times. The increase in the volume of government-controlled material was remarkable particularly in 1941 when the Pacific War broke out. In the commercial freight category, minerals increased 1.9 times; forest products 2.1 times; marine products 2 times. But the volume of agricultural products dropped since 1939. It was 78 percent in 1940 and 89 percent in 1943 as compared with 1937.

Among the principal commodities, timber increased 1.9 times; coal 1.5 times; and iron ore, 5.7 times; limestone, 2.5 times; but soybeans decreased to 48 percent of that in 1937.

With respect to the composition of the annual freight in 1937, railway materials accounted for 19 percent; commodities, 71 percent; while government-controlled materials constituted 10 percent only. In 1943, railway materials accounted for 21 percent; government-controlled materials 25 percent; and commodities 54 percent. In other words, 1943 freight tonnage consisted of 46 percent of freight which paid a low rate. It is therefore conceivable that railway freight income was low in that year.

The agricultural products accounted for 16 percent in 1937 and accounted for 7 percent only in 1943. The decline in the volume of soybean transported was very noticeable. It accounted for 6.6 percent of the total agricultural freight in 1937 but was 1.5 percent only in 1943.

Timber, coal and rocks were the three major items included in the railway materials. Their relative importance as railway materials is shown in Table 90.

Table 90. TONNAGE OF THREE MAJOR GOODS

(Timber, Coal, and Rocks)

Year	Total	Timber	Coal	Rocks	Totals	(in 10,000 tons) Other Railway Material
		Major Goods				
1937	4,012					
1938	4,786	351	1,409	483	2,243	2,543
1939	5,896	562	1,651	756	2,969	2,927
1940	6,339	432	1,943	906	3,491	2,847
1941	7,344	711	2,347	843	3,901	3,443
1942	8,317	691	2,534	1,215	4,440	3,876
1943	8,462	657	2,568	1,269	4,494	3,968

The above table is converted into an index table as follows:

1937	100					
1938	100	7	29	10	46	54
1939	100	10	28	13	51	49
1940	100	10	31	14	55	45
1941	100	10	32	12	54	46
1942	100	8	31	15	54	46
1943	100	8	30	15	53	47

Table 90 shows that the three major goods accounted for half of the railway materials.

Railway materials used by the Southern Manchurian Railway Corporation and the government-controlled materials transported in 1942 and 1943 are listed in Tables 91 and 92.

2. Mileage of Freight

During the period of seven years from 1937 to 1943 the freight mileage for various types of goods and their respective ratios are shown in Tables 93 and 94.

3. The Average Mileage of Freight Transportation

The Average Mileage per ton of Freight along the railways in Manchuria is listed in Table 95.

Table 91. TONNAGE OF RAILWAY MATERIALS

Year	1942 10,000 Metric Tons	1942 Percent	1943 10,000 Metric Tons	1943 Percent
Total	1,724	100.0	1,814	100.0
Railway Ties	64	3.8	50	2.8
Timber	37	2.2	56	3.0
Coal	560	32.6	594	32.9
Rock	839	49.0	864	47.6
Cement	23	1.2	28	1.4
Liquid Fuels			1	0.6
Bricks and Tiles			19	1.0
Iron and Steel	65	3.8	70	3.8
Others	136	7.4	132	6.9

Table 92. TONNAGE OF GOVERNMENT-CONTROLLED MATERIALS

	1931 10,000 Metric Tons	1931 Percent	1932 10,000 Metric Tons	1932 Percent
Total	2,154	100.0	2,110	100.0
Grains	121	5.7	135	6.5
Fodder and Hay	307	14.4	194	9.3
Timber	306	14.3	283	13.5
Coal	248	11.6	276	13.2
Rock	204	9.5	228	10.9
Cement	77	3.6	73	3.5
Liquid Fuels	22	1.0	25	1.2
Bricks and Tiles	14	0.7	26	1.2
Iron and Steel	57	2.7	78	3.7
Others	798	36.5	792	37.0

Table 93. FREIGHT MILEAGE OF VARIOUS TYPES OF GOODS FROM 1937 TO 1943

		Categories of Goods				Commercial Freight				
Year	Total	Railway Materials	Government-Controlled Materials	Commercial Freight	Agricultural Products	Minerals	Forest Products	Live-stock	Marine Products	Others
1937	12,903	1,559	1,797	9,547	3,417	3,283	520	71	240	2,016
1938	16,260	1,797	3,217	11,246	4,058	3,736	726	89	296	2,341
1939	20,642	3,074	4,234	13,154	3,778	4,100	1,342	126	323	3,485
1940	20,594	3,372	4,343	12,897	2,427	5,067	1,581	96	312	3,396
1941	25,864	3,374	8,806	13,683	2,642	6,286	1,571	71	263	2,868
1942	27,958	3,728	8,421	15,809	2,472	7,490	2,253	70	398	3,126
1943	28,090	4,029	7,970	16,091	2,629	2,047	7,885	92	620	2,818

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Principal Commodities
(in 1,000,000 kilometers)

Soybeans	Coal
1,967	2,889
2,214	3,232
1,648	3,428
932	4,192
995	5,258
893	5,932
779	5,666

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Table 94. PERCENTAGE DISTRIBUTION OF RAILWAY FREIGHT MILEAGE BY TYPES OF GOODS AND BY YEARS

Year	Index / Percent	Total	Categories of Goods: Railway Materials	Categories of Goods: Government-Controlled Materials	Categories of Goods: Commercial Freight	Commercial Freight: Agricultural Products	Commercial Freight: Minerals	Commercial Freight: Forest Products	Commercial Freight: Live-stock	Commercial Freight: Marine Products	Commercial Freight: Others
1937	Index	100	100	100	100	100	100	100	100	100	100
	Percent	100	12	14	74	27	25	4	1	2	15
1938	Index	126	115	179	118	119	114	140	125	124	116
	Percent	100	11	20	69	25	23	5	1	2	13
1939	Index	159	197	236	138	111	125	258	177	134	173
	Percent	100	15	21	64	18	20	7	1	2	16
1940	Index	160	216	242	135	71	154	304	135	131	169
	Percent	100	16	21	63	12	25	8	1	2	15
1941	Index	200	216	490	143	77	191	302	101	110	142
	Percent	100	13	34	53	10	24	6	1	1	11
1942	Index	217	239	468	165	72	228	433	99	166	155
	Percent	100	13	30	57	9	27	8	1	1	11
1943	Index	218	259	443	169	77	240	393	130	259	140
	Percent	100	14	28	58	9	28	7	1	2	11

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Principal Commodities	
Soybeans	Coal
100	100
15	22
113	113
14	20
84	118
8	17
48	145
5	20
51	182
4	20
45	205
3	12
40	196
3	20

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Table 95. AVERAGE MILEAGE PER TON OF FREIGHT IN MANCHURIA

		Categories of Goods				Commercial Freight				
Year	Total	Railway Materials	Government-Controlled Materials	Commercial Freight	Agricultural Products	Minerals	Forest Products	Live-stock	Marine Products	Others
1937	322	208	453	334	529	242	257	462	405	346
1938	340	228	455	362	553	243	290	466	456	343
1939	347	252	444	372	537	251	347	523	402	391
1940	325	241	365	349	482	277	351	471	391	391
1941	352	247	437	376	462	297	381	455	381	366
1942	336	216	391	368	439	303	486	464	467	372
1943	332	222	378	354	458	303	481	575	537	345

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Principal Commodities
(per ton per kilometer)

Soybeans	Coal
745	261
750	272
747	284
691	320
707	344
630	353
616	343

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In the table given above the average mileage hauled per ton had increaded from 334 kilometers to 354 kilometers between 1937 and 1943, i.e. 6 percent. The chief staple product, soybeans, had dropped from 745 kilometers to 616 kilometers and became 83 percent of its previous mileage. On the other hand, the mileage for minerals increased 25 percent from 242 to 303 kilometers. It was particularly worthy of our notice that the mileage for coal had increased from 261 kilometers to 343 kilometers, an increase of 31 percent. The mileage for forest products increased from 257 to 481 kilometers, or an increase of 190 percent. All this pointed to the fact that the mileage for agricultural products which paid a higher rate dropped while that for minerals and forest products which paid a lower rate increased. The changes in the composition of the railway freight and their consequence had stirred up much discussion on the feasibility of the Manchurian railways' freight policy.

IV. INCOME FROM FREIGHT TRANSPORTATION

1. The Basic Freight Rates

The basic freight rates during the period when the railways in Manchuria were under the control of the South Manchuria Railway Company are given in Table 96.

[Table on following page]

Table 96. BASIC FREIGHT RATES IN MANCHURIA

(Unit: in cents)

		Categories of Goods						
		First	Second	Third	Fourth	Fifth	Sixth	Remarks
1933								
National Lines	Less-than-carload	0.70 0.78-	0.60 0.66-	0.50 0.55-	0.40 0.45-	0.30 0.45-	0.20 0.40-	per kilometer per 100 kilograms
	Full carload	7.00- 6.00	5.50- 5.00	4.50- 4.00	4.50- 3.00	3.50- 2.00	3.00- 1.50	per ton per kilometer
SMR Lines	Less-than-carload	0.625 0.59	0.50 0.44	0.375 0.33	0.25 0.22			(100 catties per mile)
	Full carload		5-4.4	3.75 3.30	2.5- 2.20			(one American ton per mile)
1 February 1936								
National Lines	Less-than-carload	1.00	0.84	0.65	0.50	0.38	0.28	per 100 kilograms
	Full carload	6.70	5.40	4.20	3.20	2.40	1.70	per kilometer
SMR Lines	Less-than-carload	is one and one-half times of the full carload freight						
	Full carload	5.50	4.58	3.66	2.74	1.82	1.40	one ton per mile
1 October 1938								
All railway lines	Less-than-carload	0.70	0.50	0.30				100 kilograms per kilometer

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	Full carload	4.58	3.66	2.74	1.82	ton per kilometer
All railway lines	Less-than-carload	1.20	0.85	0.55	0.33	100 kilograms
	Full carload	6.00	4.40	3.00	2.00	per kilometer

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2. Income from Freight Transportation by Types of Goods

The original purpose of the railways in Manchuria was for the development of the rich resources there. Thus the income of railways consisted mostly of income from freight operations as we have mentioned above. After Manchurian railways were entrusted to the South Manchuria Railway Company for control, not only the income from freight operations increased rapidly, but the composition of freight underwent great changes. In 1937 the railway freight included commercial freight 85 percent, and railway materials and government-controlled materials 15 percent. The commercial freight in turn consisted of 34 percent of agricultural products. In 1938 agricultural and forest products still constituted a fairly large portion of the railway commercial freight. However, income from agricultural products began to decline from then on. This was largely due to the political situation and to the progress of the first five-year industrial development plan.

In 1939 despite the decline of the income from agricultural products, the income from forest products and other sources increased greatly, owing to the import of machinery under the first five-year industrial development plan. In 1939 a proposal for the expansion of the Dairen Harbor was drawn. Because of the changes in international situation, the volume of government-controlled materials showed a great increase.

In 1940 there was an increase of the freight volume of government-controlled materials and railway materials due to the changes in the political situation. Agricultural products particularly soybeans declined most rapidly. The volume of coal and general merchandise on the other hand went up steadily. In short, during the war period railway freight in Manchuria consisted of at least 20 percent of government-controlled materials which paid a low freight rate. The volume of agricultural products which constituted previously a larger portion of the railway freight began to decline. This was a matter of great concern to the railway administration.

The combined average of freight income per ton of goods was 4.9 yuan in 1940, representing a drop of 14 percent from 1937. This was mainly due to the fact that the volume of agricultural products (which paid a higher freight charge) had declined and that the volume of minerals and forest products (which yielded a smaller income) had increased.

The upward trends of the freight income per ton of goods occurred since 1941 because of the heavy volume of freight traffic as a result of the political situation. The increase in freight income was also caused by the rate revision effective January 1942.

V. VOLUME OF RAILWAY FREIGHT BY RAILWAY LINES

The volume of railway freight handled by different railway lines is given in Table 100.

Table 97(a). RAILWAY FREIGHT INCOME BY TYPES OF GOODS

(in 10,000 yen)

Year	Combined Total	Railway Materials	Government-Controlled Materials	Commercial Freight	Composition of Commercial Freight: Agricultural Products	Minerals	Forest Products	Live-stock	Marine Products	Others	Staple Commodities: Soybeans	Coal
1937	22,664	1,626	1,782	19,256	7,707	4,533	1,016	200	452	5,348	4,209	4,045
1938	27,551	1,747	3,237	22,567	9,097	5,062	1,303	232	526	6,347	4,763	4,376
1939	32,907	3,097	4,235	25,575	8,302	5,083	2,126	255	664	9,145	3,455	4,260
1940	31,067	3,402	4,408	23,257	5,154	5,948	2,447	201	651	8,855	1,883	4,813
1941	36,885	3,376	8,913	24,596	5,872	7,414	2,490	157	600	8,063	2,074	6,066
1942	42,157	3,696	8,529	29,932	5,726	9,756	3,586	163	964	9,737	1,924	7,434
1943	43,332	3,971	9,229	30,132	6,019	10,445	3,210	189	1,596	8,675	1,716	7,126

Table 97(b). RAILWAY FREIGHT INCOME BY TYPES OF GOODS

(Index based on Part a)

Year	Combined Total	Railway Materials	Government-Controlled Materials	Commercial Freight	Composition of Commercial Freight: Agricultural Products	Minerals	Forest Products	Live-stock	Marine Products	Others	Staple Commodities: Soybeans	Coal
1937	100	100	100	100	100	100	100	100	100	100	100	100
1938	122	108	182	117	118	111	128	116	117	119	113	108
1939	145	191	238	133	108	112	210	128	147	171	82	105
1940	137	209	248	121	67	131	240	101	144	166	45	119
1941	163	208	502	128	76	163	245	78	133	151	49	150
1942	186	228	478	156	74	215	353	81	213	182	46	184
1943	191	244	518	157	78	230	316	94	354	162	41	176
					Ratios in Percentages							
1937	100	7	8	85	34	20	5	1	2	23	19	18
1938	100	6	12	82	33	18	5	1	2	23	17	16
1939	100	9	13	78	25	16	7	1	2	27	11	13
1940	100	11	14	75	17	19	8	1	2	28	6	16
1941	100	9	24	67	16	20	7	1	2	21	6	16
1942	100	9	20	71	14	23	8	1	2	23	5	18
1943	100	9	21	70	14	24	7	1	4	20	4	16

Table 98. AVERAGE INCOME PER TON OF GOODS TRANSPORTED

(in yen)

Year	Combined Average	Railway Materials	Government-Controlled Materials	Commercial Freight	Commercial Freight: Agricultural Products	Minerals	Forest Products	Live-stock	Marine Products	Others	Soybeans	Coal
1937	5.64	2.17	4.47	6.72	11.92	3.34	5.02	13.02	7.62	9.16	15.93	3.66
1938	5.76	2.22	4.58	6.46	12.38	3.29	5.20	12.16	8.10	9.32	16.13	3.68
1939	5.58	2.54	4.34	6.38	11.80	3.11	5.50	10.58	8.27	10.25	15.65	3.53
1940	4.90	2.43	3.71	5.60	10.23	3.25	5.43	9.92	8.15	10.20	13.95	3.67
1941	5.02	2.47	4.43	5.61	10.27	3.51	6.04	9.97	9.24	10.27	14.73	3.97
1942	5.07	2.14	3.96	5.83	10.18	3.95	7.74	10.83	11.31	11.56	13.64	4.43
1943	5.12	2.19	4.37	6.64	10.50	3.93	7.45	11.70	13.80	10.61	13.58	4.31

Table 99. AVERAGE INCOME PER TON PER KILOMETER

(in yen)

1937	1.75	1.04	0.99	2.01	2.26	1.38	1.96	2.82	1.88	2.56	2.14	1.40
1938	1.69	0.89	1.01	1.80	2.24	1.36	1.80	2.61	1.78	2.71	2.15	1.35
1939	1.60	1.01	1.00	1.71	2.20	1.24	1.59	2.02	2.06	2.62	2.10	1.24
1940	1.50	1.01	1.02	1.61	2.12	1.17	1.55	2.11	2.08	2.61	2.02	1.15
1941	1.42	1.00	1.01	1.49	2.22	1.18	1.59	2.19	2.28	2.81	2.08	1.15
1942	1.51	0.99	1.01	1.59	2.32	1.30	1.59	2.33	2.42	3.12	2.17	1.26
1943	1.54	0.99	1.16	1.87	2.29	1.30	1.57	2.03	2.57	3.08	2.20	1.26

V. RECORDS ESTABLISHED IN FREIGHT TRANSPORTATION ALONG THE DIFFERENT RAILWAYS IN MANCHURIA

Table 100

FREIGHT TONNAGE OF THE MAJOR RAILWAYS IN MANCHURIA

(Unit: 10,000 tons)

Names of Railway Line	1937	1938	1939	1940	1941	1942	1943
Ch'ang-ch'un-Dairen Line	2,255	2,526	3,004	2,946	3,375	3,700	3,736
An-tung-Mukden Line	342	382	429	501	570	745	1,065
Fu-shun Line	935	917	860	719	670	732	692
Mukden-Shan-hai-kuan Line	313	376	572	679	906	1,036	1,381
Mukden-Kirin Line	181	230	303	367	434	502	495
Mei-ho-k'ou-Chian Line	8	30	99	164	193	264	337
Ch'ang-ch'un-T'u-men Line	324	433	536	673	777	952	949
T'u-men-Chia-mu-ssu Line	209	253	482	725	783	857	852
Sui-hua-Chia-mu-ssu Line			37	127	331	468	528
Harbin-Sui-hua Line	280	465	635	707	998	1,245	946
Ch'ang-ch'un-Harbin Line	562	650	822	784	1,031	973	821
Harbin-Pei-an Line	168	198	256	291	398	453	499
Ch'i-ch'i-ha-erh Line	241	322	427	412	496	493	464
Total	4,012	4,785	5,896	6,339	7,344	8,317	8,462

All the railway lines except the Fu-shun Railway Line gained in freight tonnage. Two lines showed moderate increases in freight tonnage from 1937 to 1943: the Ch'ang-ch'un-Dairen Line increased 65 percent and the Ch'ang-ch'un-Harbin Line increased 46 percent. Other railway lines showed tremendous increases: the An-tung-Mukden Line increased to 3.1 times of that in 1937, the Mukden-Shan-hai-kuan Line — 4.4 times, the Ch'ang-ch'un-T'u-men Line — 3 times, the T'u-men-Chia-mu-ssu Line — 4.1 times. The decrease in the freight traffic in all the railways was to a greater extent the result of industrial prosperity in Manchuria. There were other factors which accounted for the sudden increase in freight tonnage in specific railway lines. For instance, the sudden rise in freight traffic in the Harbin-Sui-feng-ho and the T'u-men-Chia-mu-ssu lines was caused by war preparation and by Manchukuo's program for the development of the north. The increase in freight traffic in the T'u-men-Ch'ang-ch'un and the An-tung-Mukden lines was a direct result of the war: during that time the sea routes were blocked and these two railway lines became the major routes for trade between Manchuria, China Proper, Japan and Korea. Some railway lines were newly built for special purposes: the Sui-hua-Chia-mu-ssu Line was constructed for the coal and timber produced in Ho-kang and the Mei-ho-k'ou-Ch'i-an Line for the coal and minerals produced in Tung-pien-tao. These two lines will have a very prospective future.

Freight mileage of the various railway lines is given in Table 101.

TABLE 101. TON-KILOMETERS OF THE MAJOR RAILWAYS IN MANCHURIA

(Unit: 1,000,000 Kilometers)

Name of Railway Lines	1937	1938	1939	1940	1941	1942	1943
Ch'ang-ch'un-Dairen Line	6,217	7,156	8,227	7,420	8,657	8,537	7,578
An-tung-Mukden Line	569	561	627	605	745	1,046	1,678
Fu-shun Line	450	443	409	346	318	352	387
Mukden-Shan-hai-kuan Line	671	603	929	1,099	1,781	2,270	3,019
Mei-ho-k'ou-Chian Line	8	32	114	201	254	371	494
Ch'ang-ch'un-T'u-men Line	490	719	898	1,076	1,280	1,538	1,449
T'u-men-Chia-mu-ssu Line	348	622	843	1,085	1,175	1,385	1,381
Sui-hua-Chia-mu-ssu Line			37	199	480	757	810
Harbin-Sui-fen-ho Line	408	896	1,166	1,281	1,919	2,039	1,617
Ch'ang-ch'un-Harbin Line	749	988	1,330	1,192	1,616	1,688	1,531
Harbin-Pei-an Line	268	347	433	514	736	764	828
Ssu-p'ing-Ch'i-Ch'i-ha-erh Line	734	1,024	1,304	1,125	1,365	1,315	1,275

Name of Railway Lines	1937	1938	1939	1940	1941	1942	1943
Mukden-Kirin Line	231	307	375	453	562	752	773
Total	12,903	16,250	20,462	20,593	25,864	27,958	28,090

Average Tonnage Hauled Per Day

In order to visualize the degree of freight traffic of the railway lines Table 102 gives the average tonnage per kilometer per day.

TABLE 102 AVERAGE TONNAGE HAULED PER DAY OF THE RAILWAY LINES IN MANCHURIA

(Unit: in tons)

Name of Railway Lines	1937	1938	1939	1940	1941	1942	1943
Ch'ang-ch'un-Dairen Line	23,555	27,113	31,086	28,042	32,720	32,266	28,558
An-tung-Mukden Line	5,980	5,903	6,585	6,366	7,842	11,014	17,618
Fu-shun Line	21,608	21,294	19,611	16,670	15,303	16,896	16,136
Shan-hai-kuan Line	4,220	3,790	5,830	6,911	11,201	11,609	18,936
Mukden-Kirin Line	1,416	1,878	2,293	2,775	3,458	4,607	4,722
Mei-ho-k'ou-Kirin Line	455	665	1,609	2,157	2,728	3,982	5,278
Ch'ang-ch'un-T'u-men Line	2,238	3,226	3,947	4,739	6,269	7,535	7,074
T'u-men-Chia-mu-ssu Line	1,806	2,920	3,818	4,640	5,428	6,403	6,365
Sui-hua-Chia-mu-ssu Line			1,806	2,419	3,446	6,429	5,796
Harbin-Sui-fen-Ho-Line	2,048	4,340	5,263	5,799	8,429	8,596	6,232
Ch'ang-ch'un-Harbin Line	7,973	1,518	14,051	12,717	17,149	18,889	17,084
Harbin-Pei-an Line	2,223	2,912	3,626	4,317	6,183	6,416	6,939

Name of Railway Line	1937	1938	1939	1940	1941	1942	1943
Ssu-p'ing-Ch'i-ch'i-ha-erh Line	3,481	4,854	6,165	5,336	6,471	6,237	6,029
Combined Average	3,795	4,578	4,516	5,325	6,403	6,890	6,834

In 1943 the average tonnage hauled per day by the railway lines in Manchuria is listed in Table 103.

TABLE 103 AVERAGE TONNAGE HAULED PER DAY IN THE PRINCIPAL RAILWAYS IN MANCHURIA

(Unit: in Tons)

Order	Name of Railway Line	Tonnage
1	Ch'ang-ch'un-Dairen Line	28,558
2	Mukden-Shan-hai-kuan Line	18,936
3	An-tung-Mukden Line	17,618
4	Ch'ang-ch'un Harbin Line	17,084
5	Fu-chun Line	16,136
6	Pin-chiang Line	9,222
7	Ch'ang-ch'un T'u-men Line	7,074
8	Pin-pei Line	6,939
9	Ho-kang Line	6,933
10	Hsi-i line	6,398
11	T'u-chia Line	6,365
12	Pei-sui Line	6,232
13	P'ing-chi Line	6,029
14	Sui-chia Line	5,796
15	North Korea (West Line)	5,766
16	Mei-chi Line	5,278
17	Mukden-Kirin Line	4,722
18	Ssu-p'ing Mei-ho-k'ou Line	4,417

Table 104. VOLUME OF FREIGHT HANDLED BY THE PRINCIPAL RAILWAY STATIONS IN MANCHURIA

(Unit: in 10,000 tons)

Names of the Railway Stations	1937	1938	1939	1940	1941	1942	1943	Remarks
Piers at Dairen	1,041	661	721	587	663	539	363	
Kan-chi'ing-tzu Station		279	279	276	298	298	229	
Ying-k'ou Station	106	130	151	143	135	124	113	
An-shan Station	368	488	597	578	564	541	1,024	Li-shan and Ling-shan Stations included
Liao-yang Station	84	111	146	139	168	158	214	
So-chia-t'un Station	24	33	23	35	66	1,236	215	
Ta-kuan-t'un Station	910	886	816	661	624	680	629	
Mukden Station	328	378	439	477	525	544	465	
Ssu-p'ing Station	79	86	109	84	90	88	102	
An-tung Station	75	151	165	145	187	286	506	
Ch'ang-ch'un Station	232	272	337	342	363	359	335	
Pen-ch'i-hu Station	121	153	141	156	156	139	129	
Chin-hsien Station	53	86	82	85	104	104	133	
Shan-hai-kuan Station	114	68	66	81	238	356	541	
Kirin Station		70	90	104	107	100	100	
Pei-feng Station	88	117	132	152	166	143	171	
Mu-tan-chiang Station	97	153	197	214	303	298	231	

Names of the Railway Stations	1937	1938	1939	1940	1941	1942	1943	Remarks
Lin-k'ou Station	12	21	37	59	56	61		
Harbin Station	250	188	215	196	241	280	217	Including 8 small stations
San-ko-shu Station	38	41	50	62	59	75	82	
Ch'i-ch'i-ha-erh Station	67	91	131	138	163	167	160	
Shang-shan-feng Station	6	3	4	83	152	229	243	

VII. TRENDS IN IMPORT AND EXPORT FREIGHT

The volume of railway freight received from or delivered to the harbors in Manchuria has been discussed in the chapter on sea transportation. Table 105 gives the freight tonnage imported or exported via the principal harbors in Manchuria. The total trade volume for entire Manchuria and for Dairen had increased by the year prior to 1939, but declined rapidly in 1940 and 1941. It showed signs of recovery in 1942. Such a trend which was caused by the war was also true of other commercial ports in Manchuria except that it was not as remarkable as that in Dairen.

The volume of export showed declined for all the ports after 1937 except for Dairen and the two ports in North Korea which recorded an increase in exports after 1942. There had been an increase in imports before 1939. But the volume of import decreased rapidly after 1939. Since the volume of exports was larger than that of import before 1938, a discrepancy between the volume of coast-bound freight and that of hinterland-bound freight was created. Such a discrepancy was partially eliminated after 1939. However, the volume of freight handled by the harbors decreased remarkably after 1943 as sea transportation was paralyzed by war. War materials exported to Japan were mainly transported by railways. Emergency measures were then taken to ease the heavy traffic in railway transportation.

TABLE 105 FREIGHT TONNAGE OF IMPORT AND EXPORT VIA THE PRINCIPAL PORTS IN MANCHURIA

(Unit: 10,000 metric tons)

Exports

Name of Port	1937	1938	1939	1940	1941	1942
Dairen	578	538	480	326	298	373
Port Arthur	19	5	9	20	9	7
An-tung	4	3	4	3	2	3
Ying-k'ou	65	52	42	39	24	10
Hopeh	11	17	6	2	2	2
Hu-lu-tao	2	6	9	15	14	4
Najin	44	71	37	18	18	37
Unggi	25	22	18	15	8	5
Total	748	714	605	438	375	441

Imports

Name of Port	1937	1938	1939	1940	1941	1942
Dairen	344	433	534	438	366	338
Port Arthur	3	6	13	14	17	16
An-tung	11	13	23	7	7	6
Ying-k'ou	24	35	47	22	29	13
Hopeh	8	14	11	8	6	7
Hu-lu-tao	2	4	11	4	3	1
Najin	5	13	36	29	32	27
Unggi	6	7	15	6	5	1
Total	403	525	690	528	465	409

Freight Traffic in Frontier Railway Stations

A description of the freight traffic of Manchuria with China, Korea and Japan at the railway terminals near the borders is given below.

Sea transportation met with extreme difficulties after the Pearl Harbor in 1941. The Antung-Mukden and the Mukden-Shan-hai-kuan lines became therefore the most indispensable traffic route between Manchuria, China Proper and Japan. These two railways handled very heavy traffic. Moreover, the trade volume between Manchuria, China Proper and Korea increased gradually. In short, the transit freight in An-tung and in Shan-san-feng (North Korea) was extremely large.

In 1943 the freight originated in North China and exported to Korea and Japan via Manchuria amounted to 440,000 metric tons and that originated from Manchuria and exported to Korea and Japan amounted to 1,750,000 metric tons. About 1,510,000 tons of the freight from both sources were transported to Japan via the four North Korean Ports (Pusan, Ma-shan, Li-shui and Ma-pu).

Table 106 shows 1944 volume of freight exported to Japan and to China Proper: the volume of export originated in North China and transported to Japan amounted to 1,560,000 metric tons and that originated in Manchuria and transported to Japan amounted to 3,610,000 metric tons. All the freight mentioned here was handled by the railways in Manchuria.

Table 106. VOLUME OF FREIGHT TRAFFIC FROM MANCHURIA TO JAPAN AND TO CHINA PROPER IN 1944

(Unit: 10,000 metric tons)

	To Japan by Land			Imports from		Exports to			
	From North China	From Manchuria	Total	North China	Korea	North China	Korea	Total	Combined Total
Coal	105	56	161	165	16		170	351	512
Iron Ore		6	6	35	20		6	61	67
Other mineral ores				3	3		1	7	7
Nonferrous metals		2	2						2
Copper and pig iron	13	49	62						62
Metal products						1	1	2	2
Table salt	35	18	53				1	1	54
Soybeans		35	35						35
Grain		18	18		2	30	27	59	77
Oil seeds		3	3						3
Soybean cake		17	17			2		2	19
Cement						2		2	2
Coal tar		1	1						1

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[Adjoins page 335 here.]

Pulp						1		1	1
Timber					14	11	1	26	26
Charcoal						1		1	1
Others	3		3	7	35	9	9	60	63
Total	156	205	361	210	90	57	216	573	934

The transit freight at the frontier railway stations of An-tung, Shan-hai-kuan, Man-p'u and Shang-san-feng is given in Table 107. It amounted to 2,400,000 metric tons in 1939 but jumped up to 11,500,000 metric ton (by 4.8 times) in 1943. The transit freight in 1939 constituted 13.5 percent of the combined transit freight tonnage of all Manchurian railways (84,620,000 metric tons) or 25 percent of the combined merchandise tonnage (45,380,000 metric tons) of all railways in Manchuria. This indicated the extremely heavy traffic condition in the An-tung-Mukden and the Mukden-Shan-hai-kuan lines.

TABLE 107 TRANSIT FREIGHT ARRIVING AT FRONTIER RAILWAY STATIONS

(Unit: 1,000 metric tons)

	1939	1940	1941	1942	1943
An-tung Railway Station					
Metric Tons	798	572	987	1,888	4,008
Index	100	72	124	237	503
Shan-hai-kuan Railway Station					
Metric Tons	406	648	2,089	3,056	4,472
Index	100	160	515	753	1,102
Man-p'u Railway Station					
Metric Tons	87	66	83	255	653
Index	100	75	96	293	750
Shang-san-feng Railway Station					
Metric Tons	1,110	1,160	1,501	2,245	2,371
Index	100	105	135	202	214
Total Metric Tons	2,401	2,446	4,660	7,443	11,505
Total Index	100	102	194	310	479

Table 108. TONNAGE OF INCOMING FREIGHT AT THE RAILWAY STATIONS NEAR THE NATIONAL BORDERS OF MANCHURIA

(Unit: in 1,000 metric tons)

	1939		1940		1941		1942		1943	
	Tonnage	Index	Tonnage	Index	Tonnage	Index	Tonnage	Index	Tonnage	Index
An-tung Station	409	100	303	74	576	141	946	232	1,279	298
Shan-hai-kuan Station	135	100	427	316	1,778	1,315	2,651	1,961	3,910	2,892
Man-p'u Station	2	100	3	127	22	1,115	38	1,876	119	5,861
Shang-san-feng Station	488	100	399	82	731	150	626	128	774	159
Totals	1,034	100	1,132	109	3,107	301	4,260	412	6,081	588

Table 108 shows that the combined tonnage of imports via the frontier railway stations increased 6 times in five years. The volume of imports via An-tung increased 3 times and that via Shan-hai-kuan increased 29 times. Table 109 shows the tonnage of exports via Manchurian railway stations (equal to the amount of transit freight arriving at these stations).

As indicated by Tables 108 and 109, the total volume of imports increased 6 times and that of exports increased 4 times. Imports via An-tung increased 3 times and exports increased 7 times. Imports via Shan-hai-kuan increased 29 times and exports increased 2 times. Imports via Man-p'u were 120,000 tons and exports 530,000 tons in 1943. Imports via Shang-san-feng increased 1.9 times and exports increased 2.6 times.

Table 109. TONNAGE OF EXPORTS VIA FRONTIER RAILWAY STATIONS

(in 1,000 metric tons)

	1939		1940		1941		1942		1943		
	Tonnage	Index	Tonnage	Index	Tonnage	Index	Tonnage	Index	Tonnage	Index	Remarks
The An-tung Station	389	100	269	69	411	106	942	242	2,790	717	In 1943 the chief exports included: Government Controlled Materials 670,000 tons; Coal, 560,000 tons; Salt, 380,000 tons; Soybeans, 320,000 tons.
The Shan-hai-kuan Station	271	100	221	82	311	115	405	150	562	208	Grains (Kaoliang and Rice) 220,000 tons; Forest Products 230,000 tons.
The Man-p'u Station	85	100	63	74	61	71	217	255	535	628	Coal 370,000 tons; Grains (Soybeans and Rice) 110,000 tons; Iron and Steel 20,000 tons.
The Shang-san-feng Station	622	100	762	123	770	124	1,619	260	1,597	257	Coal 1,220,000 tons; Government-Controlled Materials 170,000 tons; Charcoal, 130,000 tons.

Section 7. Income and Expenditure of the Railways in Manchuria

Introduction

The income and expenditure of the railways in Manchuria (including the North Korean Railway) during the period under a centralized control organization are given in Table 110.

TABLE 110 INCOME AND EXPENDITURE OF THE RAILWAYS IN MANCHURIA

(Unit: 10,000 yen)

	Income from Operations		Operating Expenses		Profits from Operations	
Year	Yuan	Index	Yuan	Index	Yuan	Index
1934	19,310					
1935	22,730	100	11,988	100	10,742	100
1936	25,180	111	13,861	116	11,319	105
1937	29,590	130	15,870	132	13,720	128
1938	37,000	163	21,300	178	15,700	146
1939	47,640	210	29,101	243	18,533	172
1940	50,140	220	35,213	294	14,927	139
1941	59,160	260	43,309	362	15,851	147
1942	72,850	320	50,617	422	22,233	207
1943	86,900	383	61,351	512	25,547	238
1944	105,690					

Table 110 indicates that the financial condition of the railways was generally good before 1939. In 1940 income decreased while expenditure increased. As a result, the net profit for the year dropped 36,000,000 yen or 20 percent over the preceding year. However, the financial condition showed improvements in subsequent years. The net profit in 1943 was 2.4 times of that in 1934.

Table 111 shows the receipts from passenger service and those from freight service. The income from freight service increased 2.6 percent only from 1935 to 1944. The income from freight service in 1940 went down by 18,400,000 yen (5.6 percent) over the preceding year. On the other hand, the income from passenger service increased in 1944 11.7 times of that in 1935. Each year the income from passenger service seemed to increase in the same rate.

TABLE 111. ANNUAL RAILWAY INCOME

(Unit: 10,000 yen)

	Income from Operations		Income from Passenger Service		Income from Freight Service	
Year	Yuan	Index	Yuan	Index	Yuan	Index
1934	19,310		3,840		15,470	
1935	22,730	100	5,140	100	17,590	100
1936	25,188	111	5,800	113	19,380	110
1937	29,590	130	6,930	135	22,660	129
1938	37,000	163	9,450	184	27,550	157
1939	47,640	210	14,730	286	31,910	187
1940	50,140	220	19,070	370	31,070	177
1941	59,160	260	22,260	413	36,900	210
1942	72,850	320	30,690	596	42,160	240
1943	86,900	383	43,570	846	43,330	247
1944	105,690	465	60,130	1,170	45,560	259

In addition to the expenses in operating the dining cars, hotels, buses and other related enterprises, the railways' operating expenses include the accounts listed in Table 112.

Table 112. COMPOSITION OF RAILWAY OPERATING EXPENSES IN MANCHURIA

(Unit: 10,000 yen)

Year	Administrative Expense	Transportation Expense	Transit Service Expense	Car Repairing	Storage Expense	Total Operating Expenses	Total Operating and Other Expenses
1935	2,647	2,131	3,011	1,513	2,685	11,987	14,458
1936	3,252	2,164	3,292	1,880	3,273	13,861	16,695
1937	3,665	2,591	3,943	2,073	3,598	15,870	19,411
1938	4,030	3,393	5,336	2,901	5,640	21,300	27,416
1939	5,123	4,886	7,781	2,641	7,675	29,106	38,759
1940	7,228	541	9,942	4,221	8,420	35,213	46,504

Year	Operating Expense of the South Manchuria Railway Company	Operating Expense of the Bureau	Operating Expense of the Stations	Operating Expense of the Train Districts	Operating Expense of the Locomotive Districts	Operating Expense of the Car Inspection Districts	Operating Expense of the Engineering Districts	Operating Expense of the Electric Power Districts	Total Operating Expenses of All Districts and Office	Total Operating and Other Expenses
1941	4,715	3,475	7,243	1,474	13,128	2,562	8,640	2,073	43,309	59,284
1942	4,668	3,961	8,235	1,429	16,480	3,260	10,358	2,226	50,617	66,766
1943	6,660	5,142	9,342	1,854	19,429	3,978	2,769	2,769	61,351	79,264

Income by Railway Systems

Table 114 shows the income from railway operations of the three railway systems: the national railways, the SMR lines and the Korean Railway System. The figures are computed according to the following methods:

(1) The income from passenger operations in the aggregate of the receipts from passenger tickets of all the railways within a system;

(2) The income from freight operations of each railway system is a product of the total freight income of all the railway systems and the percentage of freight mileage of each railway system among the total freight mileage of all the railway systems.

(3) The amount of expenses for a railway is equal to the total expenses of a railway system times the percentage of train mileage among the total train mileage of the entire railway system.

Table 113. PROFIT AND LOSS OF MANCHURIA AND NORTH KOREAN RAILWAY SYSTEMS

(Unit: 10,000 yen)

	National Lines			SMR Lines			North Korean Lines		
Year	Income	Expenditure	Profit or Loss	Income	Expenditure	Profit or Loss	Income	Expenditure	Profit or Loss
1934	6,500			12,510			300		
1935	7,090			15,210			430		
1936	8,470			16,100			610		
1937	11,270	7,830	3,440	17,610	7,450	10,160	710	590	120
1938	14,580	10,720	3,860	21,530	9,820	11,710	890	760	129
1939	20,340	15,170	5,170	26,160	12,800	13,360	1,140	1,137	3
1940	25,900	19,470	4,430	25,500	14,790	10,710	740	953	(-)213
1941	28,960	24,550	4,410	29,560	17,930	11,630	640	829	(-)189
1942	37,410	29,900	7,510	34,670	19,800	14,870	770	917	(-)147
1943	48,140	36,900	11,240	37,930	23,400	14,530	830	1,041	(-)211

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Table 114. INCOME OF MANCHURIA RAILWAYS PASSENGER AND FREIGHT OPERATIONS

(Unit: 10,000 yen)

Year	National Lines			SMR Lines			North Korean Lines		
	Total Income	Income From Passenger Transportation	Income From Freight Transportation	Total Income	Income From Passenger Transportation	Income From Freight Transportation	Total Income	Income From Passenger Transportation	Income From Freight Transportation
1934	6,500	1,900	4,600	12,510	1,840	10,670	300	100	200
1935	7,900	2,260	4,830	15,210	2,750	12,460	430	130	300
1936	8,470	2,640	5,830	16,100	3,010	13,090	610	150	460
1937	11,270	3,650	7,620	17,610	3,100	14,510	710	180	430
1938	14,580	4,880	9,700	21,530	4,330	17,200	890	240	650
1939	20,240	7,780	12,560	26,160	6,600	19,560	1,140	350	790
1940	23,900	10,400	13,500	25,500	8,400	17,100	740	270	470
1941	28,960	11,960	17,000	29,560	10,060	19,500	640	240	400
1942	37,410	16,330	21,080	34,670	14,010	20,660	770	350	420
1943	48,140	23,880	24,260	37,930	19,250	18,680	830	440	390

As shown by Table 114 the income of the national railway lines increased annually. Taking 1937 as the base year, the income in 1943 reached 427. On the other hand, the SMR lines had a greater expenditure every year with its income in 1940 being lower than that of the preceding year. If we take 1937 as the base year, the income and expenditure of the SMR lines were respectively 215 and 314. This indicates that the financial position of the SMR lines was much inferior than that of the national lines. Such a phenomenon may be explained by the fact that the national lines were mostly railways for economic development and they were relatively young, while the SMR lines reached their old age and could hardly compete with their younger rivals.

Business Income and Expenditure by Railway Lines

A systematic analysis of the profit and loss of each railway line in Manchuria began in 1940. The profits and losses of each railway line are shown in Table 115. The table gives a clear picture of the financial position of each railway in 1940. Under the centralized control system, the railway lines which operated at a loss were in fact subsidized by those which operated at a profit. The deficits of one railway were compensated for by the surpluses earned in another railway and thereby the entire railway network was kept in operation. This is the advantage of a centralized management system which should be taken into account in formulating railway administrative policy for the future.

TABLE 115. NET PROFITS AND PROFIT RATE OF THE RAILWAY LINES IN MANCHURIA, 1940

(Unit: 10,000 yen)

Order	Railway Lines	Net Profits From Operation	Rate of Profit or Losses (Percent)
1	Ch'ang-ch'un-Dairen	8,843	28
2	Mukden-Shan-hai-kuan	2,167	30.7
3	Ch'ang-ch'un-Harbin	1,365	17.9
4	Ssu-p'ing-Ch'i-ch'i-ha-erh	866	12.8
5	Ch'ang-ch'un-T'u-men	714	8.1
6	An-tung-Mukden	716	12.0
7	Pin-sui	649	9.5
8	Pin-pei	370	8.2
9	Pin-chou	346	5.5
10	Fu-shun	302	25.3

Order	Railway Lines	Net Profits From Operation	Rate of Profit or Losses (Percent)
11	Mukden-Kirin Line	195	3.9
12	Ta-hu-shan-Cheng-chia-tun	160	6.5
13	Hsin-li-t'un-I-hsien	76	4.8
14	Ssu-p'ing-Mei-ho-k'ou	63	4.4
15	Sui-chia	32	0.6
16	La-pin	34	0.9
17	T'u-chia	14	0.1
18	Yen-feng	(-)23	(-)2.4
19	Li-shu	(-)25	(-)10.0
20	Ch'i-chien	(-)31	(-)1.8
21	Tsingtao	(-)34	(-)3.9
22	Ta-li-tzu	(-)45	(-)1.2
23	Hopeh	(-)51	(-)5.9
24	Mei-chi	(-)53	(-)1.2
25	Chin-k'ou	(-)69	(-)0.8
26	Chin-ch'eng	(-)85	(-)14.2
27	Chao-k'ai	(-)95	(-)6.4
28	Ning-huo	(-)95	(-)3.7
29	Ch'ang-pai	(-)105	(-)4.3
30	Chi-pei	(-)123	(-)6.8
31	Sui-ning	(-)130	(-)6.0
32	Pei-hei	(-)161	(-)4.2
33	Hu-lin	(-)165	(-)5.4
34	Pai-a	(-)174	(-)5.7
35	Hsing-ning	(-)216	(-)5.2
36	North Korean	(-)287	(-)11.9
Total		14,945	8.8

Arranged in the order of the profit rates (i.e. the earning per capital) as shown in Table 115, the following Table gives the income and expenditure per average operating kilometer of each railway.

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Table 116. INCOME AND EXPENDITURE PER OPERATING KILOMETER OF THE RAILWAY LINES

Serial Number	Names of the Railway Lines	Average Kilometers in Operation	Income and Expenditure Per Kilometer			
			Income	Expenditure	Expenditure as Percent of Income	Capital (1,000 yen)
1	Mukden-Shan-hai-kuan Line	421.5	98	47	48.0	167
2	Ch'ang-ch'un Dairen Line	847.2	208	103	49.8	371
3	Fu-shun Line	52.9	125	68	54.5	225
4	Ch'ang-ch'un Harbin Line	260.2	129	77	59.5	292
5	Ssu-p'ing--Ch'i-ch'i-ha-erh	577.8	45	30	67.1	117
6	An'tung-Mukden Line	260.2	88	60	68.9	228
7	Pin-sui Line	549.7	54	42	78.2	124
8	Pin-pei Line	326.1	42	31	73.3	139
9	Ch'ang-t'u Line	562.3	47	34	73.3	157
10	Ta-ch'eng Line	366.2	23	18	81.1	67
11	Pin-chou Line	934.8	24	20	84.8	67
12	Hsin-I Line	131.5	33	27	82.5	119
13	P'ing-mei Line .	156.1	22	18	82.4	92
14	Mukden Kirin Line	436.7	27	22	83.6	115

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15	La-pin Line	258.1	27	25	95.1	154
16	Sui-chia Line	213.1	21	19	92.2	168
17	T'u-chia Line	653.4	41	41	99.5	192
18	Chin-ku Line	560.2	14	16	108.3	152
19	Ta-li-tzu Line	32.8	12	26	208.3	346
20	Mei-chi Line	255.5	19	25	110.9	173
21	Ch'i-chien Line	86.0	15	18	124.3	207
22	Yeh-feng Line	146.9	6	7	125.1	79
23	Ning-huo Line	210.4	9	14	145.5	91
24	Ching-tao Line	38.4	9	18	195.2	167
25	Pei-hei Line	307.1	17	23	129.6	124
26	Ch'ang-pai Line	332.4	10	13	131.0	74
27	Hsing-ning Line	62.8	4	39	808.3	192
28	Hu-lin Line	335.7	19	24	125.2	90
29	Pai-a Line	337.0	7	12	169.4	90
30	Hopeh Line	91.1	7	13	175.3	93

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31	Sui-ning Line	91.1	9	23	254.1	241
32	Chao-k'ai Line	62.3	12	28	219.2	238
33	Chi-pei Line	231.5	17	22	130.2	77
34	Li-shu Line	58.9	7	11	158.8	43
35	North Korean Line	244.4	35	47	133.3	116
36	Chin-ch'eng Line	102.1	6	15	222.6	59
Total		10,594.6	49	35	71.3	154

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Section 8. Automobile Transportation

Introduction

Automobile transportation was regarded a subsidiary industry to the railways and thus was entrusted to the South Manchuria Railway Company for its operations. As a result, the automobile transportation industry not only avoided competition with the railways, but supplemented the function of the railways by extending its service to the border regions in Manchuria and thereby contributing to the development of the backward areas and to the maintenance of peace and order in Manchuria. Several special features were pertinent to the automobile transportation industry in Manchuria: (1) the mileage of the highway system was long; (2) as a supplementary industry to the railways, the automobile transportation industry must have a greater capacity; and (3) the industry was confronted with many difficulties in technique and in finance due to the peculiar geographical condition of Manchuria and social custom.

Following the precedent of other countries, Manchukuo nationalized those highways which might be competitive to the railways, are substitutes for the railways or are valuable to industrial development. These highways were entrusted to the South Manchuria Railway Company for operation. In the western world the highway transportation industry grew mostly after the completion of railways. The competition between the highways and the railroads was damaging not only to both transportation systems, but also to society. In view of this, the Manchukuo regime put both industries under a centralized administration.

The automobile transportation industry in Manchuria encountered many technical difficulties because of poor highway conditions. The highways were muddy in the rainy season and too dusty in the spring and fall. Automobiles wore out easily. Mechanical troubles developed easily in the cold weather. Furthermore, financial difficulties confronted the automobile transportation in Manchuria: (1) freight volume was small since the highway area was sparsely populated and was economically backward; (2) social order was poor and much money was needed to maintain traveling safety; (3) salaries and wages, fuels and other operating expenses were high; (4) automobile parts were expensive and not always available.

Data on Automobile Transportation

1. Organization

The organization of automobile transportation in Manchuria consisted of:

a. The Administration of Automobile Transportation

b. The automobile transportation divisions of the railroad administrations in Mukden, Chinchow, Kirin, Harbin, Moutanchiang and Tsitsihar.

c. Bus stations as shown in the following table:

Railway Administration	Location of Affiliated Bus Stations	Number of Bus Stations
Mukden	Mukden, An-tung, Hai-ch'eng, Ch'ang-ch'un, Fu-tung-chen, Fu-shun	6
Chin-chou	Chin-chou, Fu-hsin, Ch'ih-feng, Ch'eng-te, Tung-liao, P'ing-c ch'uan, Chao-yang	7
Kirin	Chien-tao, Kirin, Tun-hua, Chao-yang-chen, T'ung-hua	5
Mu-tan-chiang	Mu-tan-chiang, Tung-an, Tung-ning, Hui-ch'un, Po-li, Chia-mu-ssu, Sun-wu	7
Harbin	Harbin, Hu-lan, Chao-tung, Chu-ho, San-cha-ho, Hei-ho, Shuang-ch'eng	7
Tsitsihar	Ch'i-ch'i-ha-erh, Pai-chuan, T'ao-nan, Na-ho, Ch'ien-kuo-ch'i, Hai-la-erh	6
Rashin (North Korea)	Najin	1
Total (not including 118 branches)		39

2. Highway Mileage

	Kilometers
Mileage authorized for use	46,926
Mileage in operation	24,334
Mileage covered by bus lines	10,600

3. Staff

	Staff	Nationality of Employees		
Administration of Automobile Transportation	84	Japanese	2,180	37%
Automobile departments attached to the railway administrations	232	Chinese	3,202	54%
Bus stations	5,886	Korean	504	9%
Total	5,886		5,886	100%

Number of Drivers and Repair Workers

Drivers	1,527
Repair workers	957

4. Repairing Facilities

Railway Administration	Repair Shops	Car Pools	Repairing Capacity (Vehicles)	Car Pool Capacity (Vehicles)	Monthly Repairing Capacity (Vehicles)
Mukden	8	13	38	106	54
Chin-chou	15	16	45	80	60
Kirin	8	12	42	121	54
Mu-tan-chiang	9	16	98	145	81
Harbin	11	13	51	99	60
Ch'i-ch'i-ha-erh	14	13	49	64	54
Najin	1	1	3	13	0
Total	66	84	326	628	363

5. Number of Vehicles

Railway Administration	Classification			
	Buses	Trucks	Others	Total
Mukden	209	255	7	471
Chin-chou	170	161	3	334
Kirin	186	172	4	362
Mu-tan-chiang	136	425	57	618
Harbin	228	200	9	432
Ch'i-ch'i-ha-erh	221	118	17	356
Others	102	97	4	203
Grand Total	1,247	1,428	101	2,776

Note: The types of cars listed in the above table were:

a. Buses: A. Operated by gasoline
b
B. Operated by Kerosene

b. Freight Automobiles and Trucks

A. Operated by gasoline

B. Operated by kerosene

6. Bus and Truck Service

Table 117. DATA ON BUS SERVICE

A. Data on Passenger Bus Service

	1939	1940	1941	1942	1943	1944
(a) Ordinary Buses						
Mileage (kilometers)	14,578	18,262	18,859	19,877	19,803	19,803
Daily average number of buses in operation	93,820	131,210	144,700	138,966	96,719	
Mileage actually covered (10,000 kilometers)	1,136	1,565	1,798	1,781	1,196	
Number of passengers (millions)	7	10	12	13	9	
Passenger-kilometers (millions)	206	318	363	419	335	
Passenger rate per kilometer (cents)	3.2	3.2	4.9	5.0	5.1	
(b) Chartered Buses						
Traveling mileage (10,000 kilometers)	640	1,853	872	1,352	1,222	
Number of cars operating daily	327	471	789	1,219	989	
(c) Local Buses						
Number of cars operating daily	21,436	31,945	25,789	20,441	16,715	
Traveling mileage (10,000 kilometers)	177	279	220	173	143	
Number of passengers (millions)	5	11	8	7	2	

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B. Truck Service

(a) Ordinary Trucks					
Average number of cars in operation daily	23,576	32,871	26,920	25,757	35,919
Daily mileage (10,000 kilometers)	302	435	355	355	427
Tonnage hauled (1,000 tons)	69	67	66	69	270
Ton-kilometers (10,000 kilometers)	324	403	508	596	859
Freight rate per ton per kilometer (cents)		52.18		58.21	64.52
(b) Chartered Trucks					
Number of cars in operation daily	29,612	30,936	31,078	24,361	45,217
Traveling mileage (10,000 kilometers)	309	341	344	253	443

Table 118. INCOME FROM BUS AND TRUCK OPERATIONS OF NATIONALIZED BUS LINES

(10,000 yen)

	1937	1938	1939	1940	1941	1942	1943
Passenger Service:							
Total passenger service			709	1,152	1,995	2,333	1,966
Ordinary buses			643	1,011	1,772	2,074	1,707
Chartered buses			13	35	83	131	136
Local buses			53	106	140	128	123
Freight Service:							
Freight			76	126	265	347	554
Parcels				17	17	18	14
Chartered truck service			112	171	286	263	474
Miscellaneous income			3	35	27	122	80
Total truck service			191	349	595	750	1,122
Combined total			900	1,501	2,590	3,083	3,088

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Section 9. Data on River Transportation

After Manchuria was taken over by the Manchukuo regime, all the shipping lines along the Sungari River were nationalized and put under the management of the South Manchuria Railway Company. All the privately or publicly-owned shipping lines were supervised by the Harbin Navigation Bureau. The bureau operated shipping lines on the Amur and Sungari Rivers for developing river transportation in the border region of Manchuria. Shipping lines newly opened for traffic amounted to 3,800 kilometers. Thus vessels can sail from Amur River in East Manchuria to Ussuri River and to Hu-lan, from there onward to Mu-ling Ho, Mi-shan and to Hsing-k'ai Lake. They can sail also from the Hei Ho in West Manchuria, pass through the Amur River and reach Mo-ho and Chi-la-lin.

Shipping on the Amur, Sungari and Ussuri rivers is impossible for six months a year because of freezing. Thus the soybeans produced in Fu-chin, Chia-mu-ssu and I-lan and coal produced in Ho-kang and other resources must be transported to the market in six months after the river thaws. For this reason, river traffic on the Sungari River is very heavy in the summer. The business operations of the Harbin Shipping Bureau are therefore very heavy at that time. During the rest of the year, the bureau devoted much of its time in overhauling its ships. In addition, it ran long-distance bus services between Harbin, Fu-chin and Tung-chiang. The length of the bus line amounted to 600 kilometers. This was intended as a substitute for shipping services. Despite frequent highway robberies, the bus services had not been interrupted.

In July 1937 the T'u-men-Chia-mu-ssu Railway Line opened to traffic. It was constructed for the development of the economy of the frontier regions in Manchuria. It had been predicted before the opening of the railway that the railway would adversely affect the shipping industry in that area. But on the contrary the river traffic increased. This owed mainly to the coordination between river transportation and land transportation brought about by the centralized authority over both transportation systems.

Shipping along the Sungari River was prosperous. However, the shoal located near I-lan was a great menace to shipping. In the period when water level was low, a vessel whose draught was above 2 meters could not pass the shoal. In ordinary times vessels of larger capacity had also difficulties in sailing across that area. The condition there has been improved since the Ministry of Transportation of the Manchurkuo regime undertook a series of conservation projects there.

In compliance with the policy of Manchukuo, the Southern Manchurian Railway Administration organized the Harbin Shipping Association for the control of the public shipping agencies and thereby for the prevention of their competition with privately-owned shipping concerns. All the shipping companies under the jurisdiction of the railway administration joined the association. Wharves along the Sungari were however under the jurisdiction of the Harbin Navigation Bureau.

Data on Passenger and Freight Services

Harbin was the center of the shipping services in the Sungari River. As of March 1937 there were in operation 317 ships of total 120,000 metric tons. During the 200-day period between April and November 1937, these ships served 650,000 passengers and carried 850,000 metric tons of freight.

Table 119. THE CLASSIFICATIONS OF BOATS USED IN THE SUNGARI NAVIGATION LINE IN 1937

	Number of Ships in Sungari River 1937							
			Classifications of Crafts and Boats					
	Steamers		Tugs		Sailing Boats		Total	
Ownership	Tonnage	Number	Tonnage	Number	Tonnage	Number	Tonnage	Number
General Railway Administration	15,151	45	30,946	65	1,033	13	47,150	123
Under private ownership	35,191	70	32,003	66	4,903	58	72,097	194
Total	50,342	115	62,967	131	5,938	71	119,247	317

Table 120. SHIPPING LINES OPERATED BY THE HARBIN NAVIGATION BUREAU IN 1937

Shipping Lines	Distance in Kilometers	Types of Service	Sailing	Time Needed For Round Trip
Harbin-Fu-chin Line	623	Passenger	Once a day	10 days
Harbin--Ai-hun Line	1,418	Passenger and freight	Sailing every 8 days	Roughly 9 days
Harbin--Hu-lin Line	1,286	Passenger and freight	Sailing every 4 days	Roughly 21 days
Harbin--Ta-lai-fu-yu Line	332	Passenger and freight	Sailing every 10 days	Roughly 12 days
Harbin-Chiangchiao Line	508	Passenger and freight	No definite schedule	Roughly 12 days
Fu-chin--Ai-hun Line	795	Passenger and freight	Sailing every 9 days	Roughly 9 days
Fu-chin--Hu-lin Line	663	Passenger and freight	Sailing every 9 days	Roughly 10 days
Ai-hun--Mu-ho Line	827	Passenger and freight	Sailing every 12 days	Roughly 12 days
Mu-ho--Chi-la-lin Line	499	Passenger and freight	No definite schedule	Data not available
Hu-lin--Lung-wang-miao Line	272	Passenger and freight	No definite schedule	Data not available
Hu-lin--Mi-shan Line	335	Passenger and freight	No definite schedule	Data not available

Table 121. DATA ON SUNGARI SHIPPING SERVICE

	Statistical Units	1938	1939	1940	1941	1942	1943
Operating mileage	kilometers		3,938	3,805	2,822	4,056	3,778
Passenger transportation:							
Passengers transported	in 1,000 persons		729	738	692	611	692
Mileage	in millions kilometers		109	112	100	79	88
Income from passenger transportation	in 10,000 yen		112	118	148	123	140
Average mileage per passenger	in kilometers		150	151	145	131	128
Average fee paid by one person	in yen		1.54	1.60	2.14	2.03	2.04
Fee per kilometer per passenger	in cents		1.03	1.05	1.48	1.55	1.60
Freight transportation:							
Tonnage	in 1,000 tons		827	733	873	682	874
Mileage	in millions kilometers		244	172	174	164	295
Income from freight	in 10,000 yen		393	287	372	342	426
Average mileage per ton	kilometers		298	235	200	227	223
Average rate per ton	yen		4.76	3.12	4.27	5.02	4.88
Averate rate per ton	per kilometer		1.61	1.66	2.13	2.21	2.18

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Table 122. NUMBER OF SHIP PASSENGERS BY CLASSES OF TICKETS AND BY PORTS

(Unit: 1,000 persons)

	1937	1938	1939	1940	1941	1942	1943
First Class			1	3	3	2	3
Second Class			46	54	55	52	64
Third Class			650	670	608	530	601
Passengers on board from:							
Harbin			76	94	96	74	89
Tung-ho			36	45	47	40	39
I-lan			43	44	43	40	45
Lien-chiang-k'ou			89	65	8	5	4
Chia-mu-ssu			142	127	65	55	65
Hua-chuan			11	12	11	12	15
Fu-chin			44	25	21	20	21
Ai-hun			25	25	17	15	19
Mu-ho			1	4	2	2	3
Mu-lan			18	20	21	18	22
Sui-pin			7	9	6	6	4
Total			1,189	1,197	1,003	871	994

Table 123. SUNGARI RIVER CARGO BY TYPES OF GOODS AND BY PORTS OF ORIGIN

(Unit: 1,000 tons)

	1937	1938	1939	1940	1941	1942	1943
Cargo by types of goods:							
Soybeans			149	57	84	89	104
Wheat			8	17	24	4	5
Cereals			44	37	60	26	39
Coal			15	62	66	70	152

	1937	1938	1939	1940	1941	1942	1943
Rock and gravel			12	10	10	1	1
Timber			135	137	310	113	195
Fuel wood			33	26	7	30	19
Wheat flour			16	14	14	10	8
Others							53
Railway materials			122	111	69	94	61
Government-controlled materials			46	85	166	186	238
Cargo by ports of origin:							
Harbin			108	50	38	28	27
Tung-ho			99	67	94	50	53
I-lan			16	99	75	50	25
Lien-chiang-k'ou			204	108	104	77	69
Chia-mu-ssu			25	13	13	16	21
Hua-chuan			3	3	6	4	2
Fu-chin			51	49	60	32	26
Ai-hun			20	18	10	9	10
Mu-ho			1	1	1	1	1
Mu-lan			17	17	20	8	24
Sui-pin			23	14	22	10	12
Grand total			827	733	873	682	874

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Section 10. Data on Truck Transportation

Introduction

As described above, Manchukuo put the railroads and the shipping lines under a centralized administration for the development of an efficient transportation network in Manchuria. To supplement railroad and river transportation the Manchukuo regime also regulated truck transportation.

In 1937 the Ministry of Transportation issued the Regulations Governing Transportation Companies. In 1943 it appointed the International Transportation Company (a subsidiary of the South Manchuria Railway Company) to be responsible for the reorganization of the truck transportation industry.

International Transportation Company

The International Transportation Company was founded in 1923 with a capital of 3,000,000 yen (later increased to 100,000,000 yen), contributed solely by the South Manchuria Railway Company. It provided previously services to the railroads owned by the railway corporation. After the company received the custody of all the railroads in Manchuria, the company offered services to them. It maintained headquarters in Ch'ang-ch'un, service centers in principal cities, and representatives in the major railway stations for better coordination with the railroads. The business scope of the International Transportation Company is as follows:

1. Surface transportation

(A) Terminal Services: It was appointed as the sole transportation agency serving the railroad terminals. As an ordinary transportation company it offered pick-up and delivery services to passengers and shippers.

(B) Freight Transportation: It monopolized the freight service within each of the principal cities in Manchuria. In addition, it controlled 62 percent of the transportation services in 95 localities. It had its subsidiaries in Dairen, Ch'ang-ch'un and Mukden.

(C) Transport of Agricultural Products (to terminals): It was appointed the sole operator for transporting agricultural products to railroad terminals in 1943. Thus it maintained agencies in 301 (or 75 percent) of the 383 trade centers for agricultural products.

2. Shipping

It operated short-distance shipping services on the inland waters in Manchuria.

3. Labor Services

The International Transportation Company offered loading, unloading, packing and other services at the railroad terminals and at the wharves. It had about 80,000 porters and service personnel.

Previously the company rented its transportation facilities from others. Later on it purchased its own facilities and purchased those it rented from others.

Data on the company's transportation facilities as of 1945 and on its operations are given in Tables 124 and 125.

TABLE 124

VEHICLES OWNED BY THE INTERNATIONAL TRANSPORTATION COMPANY, 1945

Branch Office	Horse Wagons Operating	Horse Wagons In Reserve	Push Carts Vehicles	Trucks
Mukden	4,269	7,887	1,473	57
Chin-chou	1,572	2,249	85	21
Harbin	1,245	5,411	43	59
Kirin	1,593	2,480	267	45
Mu-tan-chiang	1,361	4,265	149	81
Ch'i-ch'i-ha-erh	903	3,713	8	24
Head Company	199		631	53
Total	11,141	27,005	2,656	340

Horses, Vehicle Depots

	1943	1944
Horses	2,670	6,191
Capacity of horse-wagon depots	4,927 (wagons)	6,047 (wagons)
Capacity of push carts depots	830 (vehicles)	830 (vehicles)
Capacity of truck pools	277 (trucks)	292 (trucks)

Table 125. TONNAGE OF GOODS HANDLED BY THE INTERNATIONAL TRANSPORTATION COMPANY

(in 10,000 tons)

Year	Goods Delivered to Railroad Terminals	Incoming Goods From Railroad Terminals	Loading and Unloading at Terminals	Wharf Terminals	Local Service
1926	86	58	460	47	
1927	130	88	550	70	
1928	180	125	600	63	
1929	270	160	620	140	
1930	330	155	440	130	
1931	400	165	700	54	
1932	230	90	850	49	
1933	260	115	970	45	
1934	235	162	200	80	155
1935	220	150	1,450	100	170
1936	250	160	1,700	105	200
1937	300	210	1,900	98	260
1938	405	450	3,200	180	420

[Adjoins page 370 here.]

[Adjoins page 369 here.]

1939	580	500	5,800	160	700
1940	1,500	1,300	5,000	200	980
1941	890	990	3,600	82	1,400

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CONCLUSION

We have just completed our review of the history, the development and the operations of the transportation system in Manchuria. Such a review will serve as a valuable reference for formulating our future policy dealing with railroad, harbor and industrial development in that area. Although this book is about to end, there is a lot more to be said about the subject.

At the end of the Russo-Japanese War, Japan took over the South Manchurian Railway and the privileges attached to the railway according to the Portsmouth Treaty. It utilized the Kuantung Army as a main force for the invasion of China and built the Kuantung Leased Territory into a strategical base. The South Manchuria Railway System was used as a pump for taking our blood. Various intrigues were used by Japan to execute its aggressive plan. After the Mukden Incident, Japan put all the railroads in Manchuria under the centralized control of the South Manchuria Railway Company which was chartered by the Manchukuo regime. All manpower and natural resources were mobilized to develop the transportation system under the supervision of the railway corporation. By the time Manchuria was returned to China a fairly good system of railroads, highways, harbors, and waterways was built. Japan built it primarily for the benefit of its future generations. It had little intention to serve the welfare of the Chinese people.

After 15 August Japan gave up all its transportation facilities in Manchuria which it had built in the past forty years. Japan may regret what it had to give up. As to the Chinese, they showed no sign of emotion; they deserved the repossession of what originally belonged to them.

Despite Japan's defeat in war, its comprehensive planning, the speed with which it pursued its plans, its efficiency in management, and its realistic approach to the solving of difficulties in transportation development are valuable lessons to us. We may not forgive Japan for its motive, but we ought to recognize their contribution to the transportation system in Manchuria. If the transportation facilities left behind by the Japanese were not destroyed, we could make very good use of them. The benefit we derive from using the facilities constitutes at least a part of the compensation for the tremendous sacrifice in life and property given by our people in Manchuria in the 8-year war of resistance.

At present (October 1947) the total mileage of the railroads in areas which have been taken over by the Chinese Government are less than 1,000 kilometers, a mileage smaller than that around V-J Day and still smaller than that existing before the Mukden Incident. As to the harbors, all except Hu-lu-tao and Ying-k'ou, were unable to be used. Highway transportation was interrupted. The scarcity of vehicles was serious. Consequently all traffic was crippled and economic activities came to a standstill. Military operations were adversely affected. Although the government made every effort to restore transportation, the situation remained critical. For no constructive work is faster than destruction. One feels deeply sorry for such a situation.

Nevertheless, recovery will come eventually. The transportation system must be restored, for it is the artery of a nation. Moreover, the restoration of the transportation is vital to the reoccupation and reconstruction of Manchuria. Our task is extremely urgent.

While our transportation system does not need to be constructed after the Japanese or Manchukuo pattern, we need not start an entirely new plan. We should make the choice according to merits. We should adopt what is good in the previous plans and discard what is inadequate in them. We should utilize fully the existing equipment and facilities and expand them in the light of future plans. Our final goal is to develop the transportation system so that it may produce the greatest benefit for national defense, economic and cultural development. This is the ultimate objective in the opinion of the people not only of Manchuria but also of entire China.

The territory in Manchuria has not yet been taken over and the transportation system is still subject to frequent destruction. There is a shortage of transportation equipment and facilities. Thus at present every effort should be made to prevent further destruction of the transportation system. Next we should concentrate our limited resources on the restoration of those railroads and highways which are of great military and economic value. Over-all restoration and further expansion will be attempted with the use of Japanese reparations or with aids from our allies.

All in all, the transportation system is vital to the life of a nation. It must not be interrupted for a single day. This would depend upon the teamwork between the military and the transportation authorities and between the people and the government. All efforts should be utilized to protect the railroads from further destruction and to build new ones that are urgently needed. We must conquer all the difficulties in order to pave the way for our long-run transportation construction program. Let us not give ourselves up to pessimism and defeatism. Let us march forward and devote our full efforts to the development of a better transportation system in Manchuria.

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