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Economic Intelligence Report

GROWTH AND DEVELOPMENT
OF THE TRANSPORTATION SYSTEM
OF NORTH VIETNAM



CIA/RR ER 62-30

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CENTRAL INTELLIGENCE AGENCY
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North Vietnam: Transportation

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GROWTH AND DEVELOPMENT OF THE TRANSPORTATION SYSTEM
OF NORTH VIETNAM*

Summary and Conclusions

The transportation system of North Vietnam, which was badly damaged during the Franco - Viet Minh War (1946-54), has been partially rebuilt but is not yet up to the standard of the original French system. Although North Vietnam, like other underdeveloped countries, is emphasizing the rapid industrialization of its economy, the country remains largely agrarian (four out of five of its workers are engaged in agriculture), and its transportation is rudimentary.

The railroad network of North Vietnam, which was designed by the French for military purposes and for hauling agricultural products and minerals to the ports, is now being called on to support the country's embryonic program for industrial development. Consisting of five single-track lines radiating from the Hanoi area, the railroad network serves most of the urban and industrial centers in the northern part of the country and provides two links with Communist China. Performance by the railroads has increased dramatically during the period 1956-61 (the average annual increase was 63 percent in ton-kilometers and 43 percent in tons carried). These gains are more apparent than real, however, because they represent at best only incomplete recovery from the very low level of performance immediately following the war.

The highway network of North Vietnam consists of more than 10,000 kilometers (km) of roads, about 1,000 of which are all-weather. Badly damaged during the war, this network has not yet been fully restored. The civilian truck park consists of about 2,000 trucks, many of which are of French and US origin (plus a number of vehicles from the Bloc). The ton-kilometers hauled by highway transport increased from 93 per day in 1955 to 228 in 1960. This increase in performance probably was accomplished by overloading, multiple-shift operation, and the limited use of trailers. Operating efficiency in 1961, however, is estimated to have fallen short of that of 1960. The out-of-service rate increased sharply, there was a shortage of parts, and the short-sighted management practices of the preceding years took their toll.

* The estimates and conclusions in this report represent the best judgment of this Office as of 15 September 1962.

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Waterborne transportation in North Vietnam is no more advanced than the other modes of transportation and, compared with them, is declining in importance. The inland waterway network, which is concentrated in the Red River Delta, is about 5,440 km long, about 1,450 km of which are navigable by modern vessels during the entire year. Coastal shipping is restricted to traffic between Haiphong, the primary ocean port, and the lesser ports of Hon Gay, Cam Pha, and Ben Thuy. The entire fleet, inland and coastal, has no more than 30 or 40 modern vessels, the largest of which is about 900 deadweight tons. The rest of the fleet consists of tugs, motorized fishing vessels, junks, sampans, and rafts.

North Vietnam has been dependent on other members of the Bloc for assistance in developing the transportation sector of the economy. Since 1955, Communist China and the USSR have been the main contributors. According to the Five Year Plan (1961-65), aid from Communist China, the USSR, Poland, and Rumania is to be used (1) to rebuild a major part of the railroad network to conform to the Chinese standard gauge, (2) to expand the truck park, and (3) to develop facilities for the repair of trucks and rolling stock. By the end of the plan period, performance by rail transport is planned to be 140 percent above that of 1960, and performance by highway and inland waterway transport is to be 50 percent higher. Achievement of these goals is dependent on the extension of substantial aid to North Vietnam by other members of the Bloc.

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I. Introduction

The transportation system of North Vietnam was badly damaged during the Franco - Viet Minh War (1946-54) and has been only partially rebuilt and is not yet up to the standard of the original French system. North Vietnam,* like other underdeveloped countries, is emphasizing the rapid industrialization of its economy, but the country remains largely agrarian (four out of five of its workers are engaged in agriculture), and its transportation is rudimentary.

The development of modern forms of land transport generally has been restricted to the Tonkin and coastal plain areas because of the high cost of construction and maintenance in the mountainous terrain outside the plain region. In addition, modern inland water transport also has been largely restricted to the Tonkin Plain because of the large variation in the depth and flow of the major rivers. Nevertheless, for political and military as well as economic reasons, North Vietnam is pushing ahead with its program to improve transportation, primarily railroads and roads, outside the plain region.

II. Development of the Transportation Network

A. Railroads**

The pre-World War II rail network of North Vietnam, except for the large section between the Song Ma River and the frontier with South Vietnam at the 17th parallel, has now been rehabilitated. In 1954 the war-damaged rail system of North Vietnam comprised approximately 1,150 kilometers (km) of meter-gauge track, only 100 km of which were usable. By 1961 the rail system consisted of about 875 km of track,*** a density of 1 km of rail route to 181 square kilometers of land area. By comparison the rail route density in Communist China is 1 route-kilometer to 292 square km, whereas the route density in Burma is 1 route-kilometer to 211 square km.

The rail network of North Vietnam consists of five single-track lines radiating from the Hanoi area and serving most of the urban and

* The total area of North Vietnam is about 158,750 square kilometers, approximately the same size as the state of Florida.

** For the location of the railroad network serving North Vietnam, see the map, inside back cover.

*** All rail kilometrage in North Vietnam is meter-gauge track. The new Dong Anh - Thai Nguyen line, however, has been constructed with the roadbed prepared for standard-gauge track.

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industrial centers in the northern part of the country. An international rail connection with the rail system of Communist China is provided by the Hanoi - Dong Dang line, which extends northeast from Hanoi to the Kwangsi Chuang Autonomous Region of China. Because of the difference in rail gauge,* however, transloading is necessary at P'ing-hsiang, approximately 16 km inside Communist China.** A second rail line, paralleling the Red River, runs northwest from the Hanoi area through Lao Kay, on the North Vietnam - China border, to K'un-ming, the capital of Yunnan Province of China. This line, which also is meter-gauge track within Yunnan, requires no transloading at the border, but it does not connect with the main Chinese rail system. A rail line about 50 km long has been completed from Dong Anh (north of Hanoi) to the steel complex under construction at Thai Nguyen. This line is the only major new rail line in the North Vietnamese system. To the east of Hanoi, a rail line crosses the Tonkin Plain to the port of Haiphong. Southeast of Hanoi the Hanoi-Saigon Railroad has been reconstructed south as far as Ham Rong, on the north bank of the Song Ma River.

In general, construction of railroads in North Vietnam is inferior to the pre-World War II French construction, although the quality of construction varies considerably, apparently depending on the priority of the particular rail line. For example, the Hanoi - Dong Dang line, which is of vital importance to the North Vietnamese, was relatively well constructed, but the Hanoi - Lao Kay line, which is of more importance to the Chinese Communists than the North Vietnamese,*** appears to have been relatively poorly constructed. Construction materials such as steel rails and treated wooden crossties are in short supply in North Vietnam, and a great deal of track reconstruction was accomplished with used, and frequently mismatched, rails and wooden crossties that usually were untreated against rot.

The majority of rail construction during the Five Year Plan (1961-65) probably will consist of conversion of the Hanoi - Dong Dang, Hanoi - Lao Kay, and Hanoi-Haiphong rail lines to Chinese standard-gauge track and the extension of reconstruction southward toward the 17th parallel. At present, construction, reportedly leading to the widening of the track, is underway between Dong Dang and Hanoi 2/ [redacted]

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* The gauge of the Chinese rail system is 1.435 meters, or 4 feet 8-1/2 inches.

** The volume of traffic through the change-of-gauge point at P'ing-hsiang in 1961 is estimated to have been 1,000 to 1,500 tons per day passing south from Kwangsi to North Vietnam and about 770 tons per day passing north into Kwangsi. (Unless otherwise indicated, tonnages are given in metric tons throughout this report.) [redacted]

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*** See III, A, p. 7, below.

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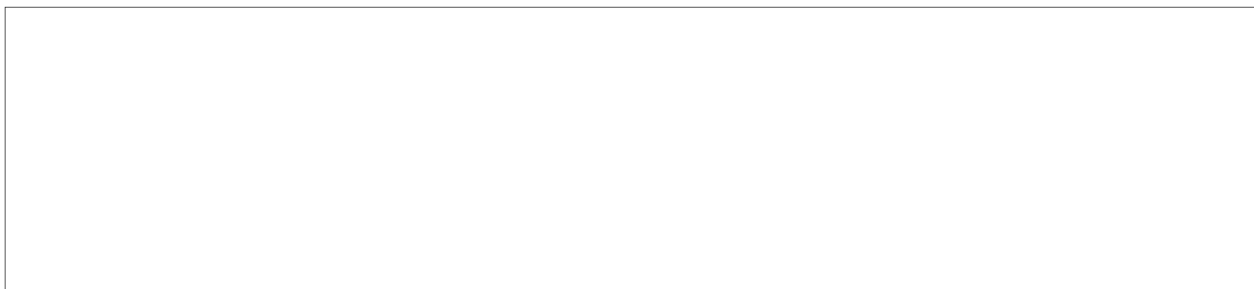
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B. Highways

The highway network of North Vietnam consists of more than 10,000 km of motorable roads, 4/ [redacted] [redacted] This network is fairly dense in the Tonkin Plain but has few roads extending into the mountainous regions beyond the plain area. During the Franco - Viet Minh War the road net was heavily damaged. Although considerable rehabilitation has been accomplished, the roads of North Vietnam have not been restored to the engineering standards of the original French construction.

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The primary highway network of North Vietnam consists of roads radiating from Hanoi either paralleling the railroad lines or extending into areas not served by rail -- to the north, the west, and the south. The most important and the longest highway in the country is route 1,* which runs from the 17th parallel through Hanoi to Dong Dang on the border of Communist China. Other important highways extend from Hanoi east to Haiphong (route 5); north through Thai Nguyen to Cao Bang (route 3); and northwest through Hoa Binh and Lai Chau to Ban Nam Cuong on the North Vietnam - China border. In addition to this primary road system, North Vietnam has numerous roads, tracks, and trails extending westward into Laos.**



At present, road construction in North Vietnam appears to be primarily improvements of the main routes through widening, surfacing, and strengthening of bridges and construction of "simple highways," earth roads or tracks suitable for oxcarts, jeeps, or trucks in dry weather. Most new construction of these earth roads or tracks has occurred outside the Tonkin Plain, particularly in the mountainous northern section and in the North Vietnam - Laos border area.

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* For the location of the primary roads of North Vietnam, see the map, inside back cover.

** A road has some form of improvement such as grading, drainage, or stabilization; a track is considered to be an unimproved road; and a trail is a path usable at best by animal carts.

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C. Waterways*

The inland waterway system of North Vietnam, which is concentrated in the Red River Delta, consists primarily of the Red River and its tributaries, the Black and Claire Rivers, and the Song Thai Binh waterway system. The inland waterways of North Vietnam total about 5,440 km, of which 2,400 km are navigable by modern vessels in the high water season (May to October) and 1,450 km are navigable by modern vessels perennially. 8/

The Red River, which flows southeast across the Tonkin Plain and empties into the Gulf of Tonkin, is the main inland water transport route of North Vietnam. This river, although affected by relatively large seasonal changes in water level and volume of flow, is navigable for its entire length lying in North Vietnam. During the low-water season, vessels of about 5-foot draft can reach Hanoi and Yen Bay. Between Yen Bay and Lao Kay in the low-water season, the Red River is navigable only by shallow-draft vessels. In the high-water season, however, it is theoretically possible for vessels with up to 7-foot drafts to reach Lao Kay on the Chinese border. The Black and Claire Rivers join the Red River in the area of Viet Tri. The Black River, the southern tributary of the Red River, is navigable to Van Yen by vessels with up to 2.5-foot draft in the low-water season. Vessels of 2.5-foot draft also can reach Tuyen Quang on the Claire River during this time of the year. Both streams are navigable farther upstream by native craft.

The Song Thai Binh system drains the Tonkin Plain north of the Red River. This system, which is connected to the Red River by the Canal des Rapides and the Canal des Bambous, is a relatively short system consisting of two streams joining to form the Song Thai Binh in the area of Sept Pagodes. During the low-water season, vessels of about 5.5-foot draft can navigate as far as Sept Pagodes, and vessels of 5-foot draft can reach Lang Lau.

Construction activity on the inland waterways appears to be mainly improvements of existing facilities rather than expansion of the network. This restriction is due primarily to the mountainous terrain, which generally limits usable waterways to the Tonkin Plain and to the extreme lower regions of larger rivers. Investment in the inland waterway network is mainly in the form of dredging, harbor improvement, and navigational aids.

* For the location of the primary waterways of North Vietnam, see the map, inside back cover.

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North Vietnam has 1 principal port, 2 secondary ports, and 10 minor ports. Haiphong, which is located approximately 21 km up the Cua Cam River, is the principal river and international shipping port, where normally between 30 and 50 foreign vessels call each month, about one-half being vessels from the Free World. At present it is reported that six Liberty-type vessels can be accommodated at the wharves simultaneously. The two secondary ports, Cam Pha and Hon Gay, are primarily coal export ports. Of the minor ports, Ben Thuy probably is the most important. This port, located on the Song Ca River, is reported to have been improved by dredging to allow the entrance of oceangoing vessels of 1,200 deadweight tons (DWT). 9/

III. Transportation Performance

Although the performance of the transportation system of North Vietnam has increased sharply since 1955, the system does not appear to be adequate for the needs of the economy. This inadequacy appears to be qualitative as well as quantitative. During 1955-61, although national transportation plans appear generally to have been fulfilled, the consumers of the service were not satisfied. Industrial construction and production reportedly were constricted by the lack of transportation facilities to haul needed materials. 10/ It was reported in 1960 that "transportation is still unable to keep pace with the development of the economy," 11/ and apparently, in spite of investment in transportation and communications amounting to 25 percent of the total state investment in fixed assets during 1955-60, the transportation system is still so rudimentary that it cannot adequately support the industrialization program. In addition, the inability of the transportation system to fulfill its requirements is also due to poor planning at the national and local levels as well as to the use of large numbers of unskilled personnel, the lack of equipment and storage facilities, and an uncoordinated and inefficient organization.*

A. Railroads

The most significant trend in transportation in North Vietnam has been the expansion of rail performance since 1955.** During 1956-61 the average annual increase in rail ton-kilometer performance was about 63 percent and in tons carried about 43 percent per year. By 1965, the end of the Five Year Plan, rail performance is expected to be about 140 percent above the level of 1960.

* In 1959 it was reported that three-fourths of the time of the various transportation activities was used for unloading, loading, and waiting for accounts to be settled. 12/

** See Tables 3 through 6, Appendix A, pp. 23 through 26, below.

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Railroads are the primary form of transportation in North Vietnam when the measure is ton-kilometers but in terms of tonnage carried are exceeded by highways and inland waterways. In 1955 the railroad system carried 14 percent of the total volume of goods transported and performed 22 percent of the total ton-kilometers. By 1961 the railroad share of the total probably amounted to about 22 percent of the tons carried and about 59 percent of the ton-kilometers performed. The high rate of increase in railroad performance during 1955-61 can be accounted for, first, by the relatively small amount of rail activity in 1955 and, second, by the reconstruction and improvement of the railroad network during the period that made it available for intensive use in the reconstruction of the economy and in the industrialization program. This rate of increase, however, is limited by aging equipment and concurrently an increasing out-of-service rate, the low technical ability of railroad personnel, construction and maintenance difficulties due to the mountainous terrain and heavy monsoonal rainfall, and the need to rely on imports for most equipment and spare parts.

The commodities carried by the rail system of North Vietnam are mainly construction materials, machinery, coal, petroleum products, mineral ores, foodstuffs, and consumer goods. Transit traffic moving from Kwangsi to Yunnan Province in Communist China by way of the Hanoi - Dong Dang and the Hanoi - Lao Kay rail lines consists of such commodities as petroleum products, industrial machinery and equipment, construction materials, and consumer goods moving into Yunnan. Tin, lead, phosphates, bamboo, timber, and agricultural products are transported over these lines from Yunnan into Kwangsi.

Roughly two-thirds of the import-export traffic carried on the Hanoi - Dong Dang line during 1958-61 was Chinese freight in transit across North Vietnam. The average density of freight traffic on the railroads of North Vietnam increased from more than 108,000 ton-kilometers (tkm) per route-kilometer in 1955* to about 933,000 tkm per route-kilometer in 1961. Between 1957 and 1958 this ratio rose sharply, probably reflecting the beginning of the use by the Chinese Communists of the North Vietnamese railroad system for transit traffic. Another indication of Chinese Communist use of North Vietnamese track as well as the progressive rehabilitation of the network is the increased length of haul. As shown in Table 7,** the average length of haul increased from 111 km in 1955 to 242 km in 1960, with the sharpest rise in 1958, when China-to-China rail operations began.

* Based on the assumption that the railroad network totaled 400 km in 1955.

** Appendix A, p. 27, below.

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The railroads of North Vietnam have accounted for 56 to 66 percent of the passengers carried and 46 to 61 percent of the passenger-kilometers performed by the transportation system since 1955. As shown in Table 5,* passengers transported by rail increased from 3.1 million in 1955 to about 16 million in 1961. During the same period, as shown in Table 6,** passenger-kilometers performed by rail increased from 148 million passenger-kilometers to about 723 million passenger-kilometers in 1961. Passenger traffic in the form of passenger-kilometers performed per route-kilometer increased from 370,000 passenger-kilometers per route-kilometer in 1955 to about 826,000 in 1961.

B. Highways

The highway transport of North Vietnam, both modern and primitive, also has recorded impressive increases in tonnage carried and ton-kilometers performed since 1955. As a percent of the total transportation performance, highway transport increased its share of the total tonnage carried from 23 percent in 1955 to about 38 percent in 1961 but recorded a decreasing share of the total ton-kilometer performance, dropping from 16 percent in 1955 to about 9 percent in 1961. In absolute terms the volume of highway tons carried in 1961 was slightly more than nine times that of 1955, whereas ton-kilometer performance was only about four times that of 1955, indicating through this decrease in the average length of haul that the performance of primitive forms of highway transport probably increased faster than that of the modern sector.

Truck transport serves as a long-haul carrier in the mountainous areas outside the Tonkin Plain not provided with rail facilities and provides local service in the plain area in the urban and industrial centers. In the mountainous northwestern part of North Vietnam it was reported that highway transport volume in 1960 was 13 times the volume in 1957. 13/ The commodities carried by highway transport consist primarily of foodstuffs, construction materials, handicraft products, and consumer goods.

Passenger traffic on highway vehicles increased from 1.4 million passengers in 1955, which was about 30 percent of the total passenger traffic, to about 8.3 million passengers in 1961, approximately 34 percent of the total. During this period, however, passenger-kilometers performed by highway transport declined from 49 percent of the total passenger-kilometers performed to about 36 percent of the total.

* Appendix A, p. 25, below.

** Appendix A, p. 26, below.

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Although modern transport has accounted for an increased share of the total highway performance in recent years, primitive road transport remains the primary method of short-haul transport. In 1961, primitive road transport carried about 61 percent of the tonnage and accounted for approximately 48 percent of the ton-kilometers performed by the highway sector. Most primitive road vehicles, although not owned by the government, are under government control. It is reported that 80 percent of the owners of pedicabs and carts are in cooperatives. 14/

By 1965, the end of the Five Year Plan, highway transport performance is expected to be 50 percent above the level of 1960. 15/ However, expansion of modern highway transport -- trucks and buses -- is limited by North Vietnam's need to import vehicles, parts, and petroleum products as well as skill in employing the resources that it already possesses. For example, in 1959 it was reported that an average of only 9.6 percent of the available trailers were used. 16/ On the other hand, it appears likely that primitive transport will continue to expand at a rapid rate, for the government is encouraging construction and increased use of primitive vehicles as well as construction of new roads, which appear to be primarily "simple highways," cart tracks, and trails of more advantage to the primitive than the modern vehicle.

C. Inland Waterways

The inland water transport of North Vietnam, which is centered in the Red River Delta, has declined in importance relative to the railroads and highways.* During 1955-61 the inland waterway share of the tonnage carried by the transportation system of the country declined from about 62 percent to about 37 percent of the total, and the ton-kilometers declined from about 60 percent to 26 percent. This relative decline in importance is due in part to the fact that the inland waterway system suffered less damage than other forms of transportation during the Franco - Viet Minh war and consequently increased its performance at a rate lower than the highway or railroad sectors, which received relatively large amounts of investment capital for reconstruction.

Most traffic on the inland waterways of North Vietnam occurs in the first, second, and fourth quarters of the year. In the third quarter, because of heavy rains, the waterways become swollen and dangerous for smaller craft, and less freight is available for transportation by waterways because of deteriorated feeder roads to and from port areas. The Hanoi-Haiphong waterway probably has the highest volume of traffic, accounting in 1958 for about 30 million tkm, approximately 17 percent of the total inland waterway performance. 17/ The commodities most commonly carried on the inland waterways are agricultural and forest products,

* See Appendix A, Tables 3 and 4, pp. 23 and 24, respectively, below.

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mineral products, and local manufactures. The transportation of passengers is of little importance on the inland waterways because most vessels are of small size. In 1955, passengers carried by the inland waterway system amounted to 200,000 and reached about 500,000 by 1961.

State-owned inland waterway transport accounts for only a small part of the performance of the inland waterway system. It is likely, however, that most nongovernment vessels are under some form of governmental control, for it was reported in February 1961 that 6,500 boat owners had joined cooperatives. 18/ In 1960, state-owned inland waterway transport carried only about 12 percent of the total tonnage carried by the inland waterways and performed about 26 percent of the ton-kilometers.

It appears unlikely that the performance of the inland waterway system will increase as rapidly as other modes of transportation. Aside from the lack of modern vessels, performance is limited by extreme fluctuations in the water level and volume of the rivers and by heavy silting, which requires constant dredging to keep open channels and ports. The government of North Vietnam has not invested heavily in the inland waterway system, and it is doubtful that it will shift scarce investment capital into long-term projects to improve the inland waterways.

D. Coastal Shipping

Limited by a small fleet, North Vietnam's ocean shipping is restricted to coastal transport. The tonnage carried by the coastal shipping vessels of North Vietnam has remained small, although relatively long hauls have increased its ton-kilometer performance to slightly more than half the performance of the highway sector.* In 1955 the depleted and war-damaged coastal shipping fleet** could carry only 21,000 tons, which was less than 1 percent of the total carried by the entire transportation system. By 1961 the tonnage carried by the coastal fleet amounted to about 286,000 tons, or 2 percent of the total. During this period, ton-kilometer performance increased from 5.6 million tkm (3 percent of the total) to about 78 million tkm (about 6 percent of the total).

The coastal shipping of North Vietnam centers around Haiphong, its primary inland waterway and ocean port, and the usual movement of coastal trade is between Haiphong, the coal ports of Hon Gay and Cam Pha, and the southern port of Ben Thuy.*** Most coastal traffic between North

* See Tables 3 and 4, Appendix A, pp. 23 and 24, respectively, below.

** Most undamaged vessels were removed before the Communists took control.

*** Ben Thuy is the port for the city of Vinh.

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Vietnam and Communist China probably is carried on Chinese vessels. Although the extent of this trade is not known, it has been reported that at least 55 motorized junks of between 80 and 100 tons augmented by an unknown number of smaller junks transport goods between Kwangtung Province, China, and North Vietnam. 19/ The passive posture of North Vietnam is more pronounced in its seaborne trade. At the present time, North Vietnam has no seagoing merchant fleet, all of its seaborne trade being carried in foreign merchant vessels. The usual pattern of seaborne freight traffic is imports through the port of Haiphong and exports from Haiphong and the coal ports of Cam Pha and Hon Gay.

The commodity composition of coastal traffic consists primarily of agricultural and forest produce moving toward Haiphong, with construction materials, machinery, and consumer goods being carried in the opposite direction. Coal is shipped southward along the coast from the coal ports located in the northern part of the country. Seaborne imports, which enter through Haiphong, consist of such commodities as machinery, steel, vehicles, petroleum products, fertilizer, and foodstuffs. Coal exported from the ports of Cam Pha and Hon Gay and apatite, cement, and mineral and agricultural products exported from Haiphong constitute the majority of the exports.*

IV. Inventory and Operating Efficiency of the Various Modes of Transportation

During 1955-61 the inventory of the equipment of all modes of transportation in North Vietnam increased significantly, although the shortage of equipment continued to restrict the performance of the transportation system. Railroads, motor trucks, and the inland and coastal fleets all attained decided improvements in almost every index of operating efficiency relative to their performance in 1955. In 1960, North Vietnam planned to reduce the cost of transportation an average of 9 percent and probably achieved it. 20/

A. Railroads

One of the principal weaknesses of the North Vietnam railroad system is the shortage of rolling stock. The rolling stock park is estimated to contain about 1,300 freight cars and 80 steam locomotives, which are believed to be generally in poor condition because of the limited repair facilities and the practice of keeping equipment on the rails for long periods of time without proper maintenance. In addition to the rolling stock park of North Vietnam, the meter-gauge rolling stock of the K'un-ming Railroad

* It is estimated that in 1961 the seaborne trade of North Vietnam amounted to about 1.7 million tons, consisting of about 400,000 tons of imports and about 1.3 million tons of exports.

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Administration of Yunnan Province, China, is used on the North Vietnam rail network, particularly on the Dong Dang - Hanoi, Hanoi - Lao Kay, and Hanoi-Haiphong lines. However, the extent of the interchange of equipment between North Vietnam and the K'un-ming Railroad Administration is not known.

The efficiency of the utilization of freight cars and locomotives has improved since 1955, but shortages of freight cars have been reported as well as a general lack of coordination of facilities. 21/ As shown in Table 8,* freight cars have been more heavily loaded since 1955, and turnaround time has decreased. At the same time, the average length of haul increased from 111 km in 1955 to 242 km in 1960, with the sharpest rise occurring in 1958, when the Chinese Communists began using the North Vietnam network for China-to-China operations between the Kwangsi Chuang Autonomous Region and Yunnan Province. Locomotives, which are predominantly French, British (of pre-World War II vintage), and Chinese models, recorded increased efficiency in the use of coal per 10,000 tkm during 1955-60, although the out-of-service rate probably increased in 1961, as it was reported that the rate of locomotive breakdown was "very high." 22/ At one time, for example, 49 locomotives required repairs at the same time. 23/

Repair facilities for locomotives and freight cars and manufacturing facilities for light freight cars appear to be centered at the Gia Lam factory, north of Hanoi. Limited production of light freight cars probably began about 1959, 24/ and production in 1961 was reported to have reached 422. 25/ In addition, repair and possibly limited manufacturing facilities exist at Hanoi** 26/ and at Haiphong. 27/

B. Highways

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The civilian truck park of North Vietnam is estimated to contain approximately 2,000 trucks.*** The composition of the park is varied, containing old French and US trucks as well as vehicles from the Bloc. It has been reported that North Vietnam's vehicle park consists of as many as 48 different makes and types of vehicles. 29/ Among the vehicles reported are Chinese Communist 3-wheel trucks 31/; and Soviet tank trucks. The most numerous of the trucks in North Vietnam probably is the 2-1/2-ton to 3-ton variety. In general, the trucks under civilian control probably are older than the trucks used by the military, for it appears that most recently imported trucks have been assigned to military rather than civilian control.

* Appendix A, p. 28, below.

** Probably located at Duong Son near Hanoi.

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As shown in Table 9,* North Vietnam's civilian truck park reported an increasing efficiency of operations during 1955-60. The average ton-kilometer performance per truck increased from about 93 tkm to 228 tkm per day, an annual increase of about 20 percent per year, and the operating capacity used increased from slightly more than 92 percent to almost 97 percent. It is likely that this increased efficiency was achieved by overloading, multiple shift operation, the availability of an improved road net, and the limited use of trailers. In 1961, however, efficiency appears to have declined. The out-of-service rate increased sharply, indicating that excessive use without proper maintenance and the poor roads have reduced the efficiency of the truck park as well as the in-service inventory. In addition, poor planning apparently misallocated vehicles, resulting in patches of surplus transport capacity while other areas suffered from the lack of truck transport. Trucks also were reported to be used for storage because of the lack of storage facilities. 32/

Aggravating North Vietnam's truck transport problem is the fact that all vehicles, spare parts, tires, and petroleum must be imported. Given the varied composition of the truck park, spare parts probably are in general short supply. Parts for US-manufactured vehicles usually are obtained by either cannibalizing or hand-making parts. 33/ Because of poor road conditions, tires, which usually are imported from the USSR, Communist China, or Japan, last only about 2,000 km. In addition, petroleum products, which are imported primarily from the USSR, are strictly rationed.

The inventory of primitive road transport equipment is less clearly defined. The government claims to have 10,000 animal carts. 34/ Oxen and buffalo are common throughout the country, and, in addition, it is estimated that 35,000 horses are available (primarily in the north and northwest provinces) for short-haul transport. It appears, however, that one of the most important factors limiting primitive road transport is the lack of animal power. Carts and wagons, which normally are pulled by domestic animals in South Vietnam, are pulled by manpower in North Vietnam. Another limiting factor is the lack of roads as well as the deterioration of earth roads and tracks during the wet season, particularly in the mountainous terrain outside the plain areas. These factors notwithstanding, primitive transport is estimated to have carried 61 percent of the freight hauled by highway transport in 1961 and performed an average length of haul of about 17 km.

C. Inland and Coastal Shipping

The waterborne transport of North Vietnam, both coastal and inland, has been seriously restricted by lack of equipment. In 1959, North

* Appendix A, p. 29, below.

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Vietnam had approximately 31 modern vessels (excluding barges and fishing boats) in addition to its fleet of native craft, 35/ and in 1961 the inventory of modern vessels may have been increased by imports of small coasters. 36/ At present the modern fleet is believed to consist primarily of small vessels (the largest of which is 900 DWT), tugs used on the inland waterways and along the coast, and motorized fishing vessels and barges. The remainder of the fleet consists of sail junks used along the coast and a multitude of small junks, sampans, and rafts employed on the inland waterway system.*

The ability of North Vietnam to construct its own vessels is very limited. There are at least five shipyards located in the Haiphong area capable of constructing small vessels, 38/ and a naval dockyard capable of handling 300-ton ships is in operation at Nam Dinh. Although North Vietnam has announced plans to construct a shipyard capable of producing vessels up to 5,000 DWT, the largest vessels produced in 1961 probably were small tugboats and barges. As North Vietnam provides its coastal and inland waterway fleets with additional units of modern equipment, the operational efficiency of the fleet will increase. In 1960 it is likely that the relatively high cost of shipping by inland waterway was reduced by the introduction of some units of modern equipment, but it is unlikely that the planned reduction in costs of 17.8 percent was achieved. 39/

V. Labor and Labor Productivity

As of March 1960 the transportation and communications labor force of North Vietnam consisted of approximately 102,000 persons, 40/ accounting for about 1.25 percent of the working population.** Of the total engaged in transportation and communications in 1961, it is estimated that 22,500 persons were employed in state-owned transportation and communications enterprises, with the majority of the remainder being engaged in primitive road, inland water, and coastal transport. The estimated composition of the labor force employed by the state-owned transportation and communications sector is shown in Table 1.***

During 1955-59 the productivity of workers in the state-owned transportation activities is reported to have increased by an average of

* The capacity of the inland waterway fleet in 1961 was reported to be 60,000 DWT. 37/

** The small percentage of the working population engaged in transportation is typical of Southeast Asia, where a large part of the working population is employed in agriculture. Of the total working population of North Vietnam as of March 1960, slightly less than 79 percent, or 6,377,024 persons out of a total of 8,119,286, were employed in agriculture.

*** Table 1 follows on p. 16.

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97 percent, 41/ and a further increase of productivity of 9.4 percent was expected in 1960. 42/ The rising level of labor productivity probably was due to the reconstruction of the transportation system and the introduction of newer equipment as well as the increasing technical skill of the North Vietnamese in the transportation field. Compared with other nations, however, the transportation labor force of North Vietnam is not particularly skillful or technically competent. 43/

50X1
50X1

Table 1

North Vietnam: Estimated Composition of the Labor Force
Engaged in State-Owned Transportation
and Communications Enterprises
1961

<u>Enterprise</u>	<u>Labor Force (Persons)</u>	<u>Percent of Total</u>
Railroad	14,000 <u>a/</u>	62
Highway	5,000 <u>b/</u>	22
Inland and coastal shipping	1,200 <u>c/</u>	6
Post and telecommunications	2,300 <u>d/</u>	10
Total	<u>22,500</u>	<u>100</u>

- a. Estimate
b. Estimate
c. Estimated.
d. Estimated.

50X1

From 1955 to 1959 the labor output per railroad worker reportedly increased 145 percent. 47/ It is estimated that the 14,000 persons engaged in rail transport in 1961 accounted for about 816 million tkm and 723 million passenger-kilometers, or about 110,000 combined tkm* per employee. By comparison, the 472,000 operating railroad workers of Communist China accounted for 480,000 combined tkm per worker in 1958.

* The term combined ton-kilometers refers to the simple addition of freight ton-kilometers and passenger-kilometers.

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It is estimated that about 5,000 persons were employed in state-owned highway transportation enterprises in 1961, an average of approximately 2.5 workers for each civilian motor vehicle. During 1955-59 it was reported that the productivity of these workers increased about 101 percent while the productivity per worker in state-owned inland water transportation enterprises increased 45 percent. 48/ Slightly less than 70 percent of the primitive transportation labor force in North Vietnam is in cooperatives or collectives.

VI. Investment

State investment* in transportation and communications in North Vietnam during 1955-60 was about 25 percent of the total state investment in fixed assets, an amount second only to investment in industry.** As shown in Table 2, however, the percentage of state investment in transportation and communications has declined since 1955 because absolute investment in transportation and communications has remained relatively stable while the total state investment has increased.

Table 2
North Vietnam: State Investment in Transportation
and Communications a/
1955-60

<u>Year</u>	<u>Total State Investment in Fixed Assets (Million Dong)</u>	<u>Transportation and Communications (Million Dong)</u>	<u>Transportation and Communications as a Percent of Total</u>
1955	140	88	63
1956	260	88	34
1957	251	60	24
1958	314	72	23
1959	494	109	22
1960	716	136	19

a. 49/

* State investment in fixed assets amounts to about 80 percent of the total investment in North Vietnam.

** The total state investment in fixed assets during 1955-60 amounted to 2,175 million dong, and investment in transportation and communications amounted to 553 million dong. Dong values in this report are given in current dong and may be converted to US dollars at a rate of exchange of 4 dong to US \$1. This rate does not necessarily reflect the value of the dong in terms of the dollar.

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Historically, investment in transportation and communications in North Vietnam can be divided into two phases: the reconstruction period (1955-57) and the Three Year Plan (1958-60). During the reconstruction phase, relatively large amounts of capital were invested to restore the war-damaged transportation system. During this period the transportation and communications sector was allocated the largest part of the state investment funds. During 1955-57, slightly more than 36 percent of the total state investment in fixed assets was used in this sector of the economy. Of the total transportation and communications allocation, almost 53 percent was used to rehabilitate the railroad system, and a large part of the remaining 47 percent probably was used to restore the road network. During the Three Year Plan, state investment was concentrated primarily in industry, with the allocation to transportation and communications being about 21 percent of the state investment in fixed assets. The investment in railroads during this period was slightly less than 33 percent of the allocation to transportation and communications. During this period it is likely that increased capital was made available for inland waterways, coastal shipping, and harbor development. In 1960, investment in transportation and communications was allocated primarily to construction of the Thai Nguyen - Dong Anh rail line; to road construction; and to the purchase of railroad cars, motor vehicles, ferryboats, and tugboats.

VII. Aid from the Sino-Soviet Bloc

North Vietnam has been dependent on other members of the Sino-Soviet Bloc for aid to the transportation sector of its economy and will continue to be dependent during the period of the Five Year Plan (1961-65). Because North Vietnam does not produce transportation equipment, except for the limited manufacture of light freight cars, virtually all of its transportation equipment must be imported. During 1955-60, almost two-thirds of these imports were financed by Bloc grants and credits. North Vietnam possibly could have imported additional units of transportation equipment without aid, but such imports would have reduced the number of imports of other high-priority equipment and materials.

Most members of the Bloc have contributed some aid to the transportation sector of North Vietnam since 1955, Communist China and the USSR having been the primary contributors. Generally, Communist China has centered its aid activities on railroads, in particular the reconstruction of the Dong Dang - Hanoi and the Hanoi - Lao Kay lines, and on road and bridge reconstruction. The USSR has contributed motor trucks and dredging equipment, and Czechoslovakia, East Germany, and Poland have contributed motor vehicles.

During the Five Year Plan the primary aid for the transportation sector will come from Communist China, the USSR, Rumania, and Poland. Communist China's aid in the transportation sector will be the widening

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of the Dong Dang - Hanoi rail line from meter gauge to conform with the Chinese standard gauge. It is planned that this line when reconstructed will be 156 km long, with 57 additional km at various stations. 50/ Work on this project, which is now under construction, is to be completed by 1964. In addition, the Chinese Communists will aid in the construction of a rail and road bridge,* a railroad station at Yen Vien,** and an airfield near Vinh. The Lao Kay - Hanoi and the Hanoi-Haiphong rail lines will be widened to standard gauge with credits extended by Rumania, this project being part of Rumania's aid program to expand apatite production in the Lao Kay area near the China - North Vietnam border. Construction on this project is now underway between Hanoi and Lao Kay. The USSR will extend aid in the form of a motor vehicle repair shop capable of handling 1,000 vehicles per year,*** along with a small automobile accessories plant, and Poland will enlarge the locomotive and freight car repair shop at Gia Lam. It is reported that the USSR will supply North Vietnam with 800 51/ to 3,500 52/ trucks during 1961-65 and that Communist China will provide about 2,000 trucks. 53/

VIII. Prospects for 1965

By 1965 the value of agricultural production in North Vietnam is planned to be 61 percent above the level of 1960, and the gross value of industrial production[†] is planned to increase by 150 percent. Rail transport performance, however, is planned to increase 140 percent above 1960. The performance of highway and waterway transport is planned to increase 50 percent during the same period. 54/ Although transportation performance in North Vietnam increased at the same rate as industrial production during 1955-61, much of this increase was the result of rehabilitation from the war and took the form of increased support to agriculture as well as to industry. Because a large part of the transportation capacity of North Vietnam is used to support agriculture and also Chinese transit traffic moving between Kwangsi and Yunnan, it is quite possible that the transportation goals announced for 1965 will be sufficient to support the planned increases in agricultural and industrial production.

* This construction will be over the Song Ma River, a major obstacle in the reconstruction of the railroad south toward the 17th parallel.

*** To be constructed at Haiphong.

† The gross value of industrial production for North Vietnam has been calculated by using constant 1956 prices. Because industrial commodities are weighted in proportion to their estimated gross value of production (physical output multiplied by price) in 1956, an increase of 150 percent in the gross value of industrial production does not necessarily imply an increase of 150 percent in output measured in tons.

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By 1965 the railroad network should be greatly improved by the planned widening of the meter-gauge track to conform with the Chinese standard gauge. This improvement should augment capacity and help to eliminate delays caused at present by the necessity to transload all traffic at the change-of-gauge point at P'ing-hsiang. The full impact of this improvement, however, will be dependent on such imponderables as the quality of the track construction and the extent of Sino-Soviet aid in the form of rolling stock and technical assistance. In other fields of transportation -- highway, inland water, and coastal shipping -- North Vietnam also will be dependent on aid and on its ability to import transportation equipment. In general, the long-term transportation problems probably will remain -- lack of transport capacity, dependence on imports for additions to the inventory of transportation equipment, poor planning and coordination, and a lack of trained personnel.

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APPENDIX A

STATISTICAL TABLES

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Table 3

North Vietnam: Tons Carried by the Transportation System a/
1955-61

Year	Thousand Metric Tons Carried					Percent of Total			
	Railroad	Highway b/	Inland Waterway b/	Coastal Shipping b/	Total	Railroad	Highway	Inland Waterway	Coastal Shipping
1955	392	626	1,671	21	2,710	14.5	23.1	61.6	0.8
1956	960	1,574	2,426	60	5,020	19.1	31.4	48.3	1.2
1957	1,016	2,238	2,137	70	5,461	18.6	41.0	39.1	1.3
1958	1,430	2,758	2,639	172	6,999	20.4	39.4	37.7	2.5
1959	2,230	3,916	4,047	236	10,429	21.4	37.5	38.8	2.3
1960	2,915	5,008	4,838	239	13,000	22.4	38.5	37.2	1.9
1961	3,378	5,806	5,610	286	15,080	22.4	38.5	37.2	1.9

- a.
 b. Including both modern and primitive transport.
 c. 56/
 d. Estimated.

50X1

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Table 4

North Vietnam: Performance of the Transportation System in Ton-Kilometers a/
1955-61

Year	Million Metric Ton-Kilometers					Percent of Total			
	Railroad	Highway <u>b/</u>	Inland Waterway <u>b/</u>	Coastal Shipping <u>b/</u>	Total	Railroad	Highway	Inland Waterway	Coastal Shipping
1955	43.4	32.5	119.8	5.6	201.3	21.6	16.1	59.5	2.8
1956	109.1	46.3	151.4	25.4	332.2	32.8	13.9	45.6	7.7
1957	135.8	45.3	161.8	24.2	367.1	37.0	12.3	44.1	6.6
1958	293.9	50.6	181.6	40.7	566.8	51.9	8.9	32.0	7.2
1959	517.5	78.4	242.7	64.9	903.5	57.3	8.7	26.8	7.2
1960 <u>c/</u>	704.2	107.5	313.6	67.6	1,192.9	59.0	9.0	26.3	5.7
1961 <u>d/</u>	816.4	124.6	363.9	78.4	1,383.8	59.0	9.0	26.3	5.7

- a.
 b. Including both modern and primitive transport.
 c. 58/
 d. Estimated.

50X1

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Table 5

North Vietnam: Passengers Carried by the Transportation System a/
1955-61

Year	Million Passengers				Percent of Total		
	Railroad	Highway	Inland Waterway	Total	Railroad	Highway	Inland Waterway
1955	3.1	1.4	0.2	4.7	66.0	29.8	4.2
1956	6.0	4.2	0.3	10.5	57.1	40.0	2.9
1957 <u>b/</u>	10.8	7.1	0.4	18.3	59.0	38.8	2.2
1958 <u>b/</u>	9.5	6.8	0.5	16.8	56.5	40.5	3.0
1959	10.3	7.5	0.4	18.2	56.6	41.2	2.2
1960 <u>b/</u>	13.8	7.2	0.4	21.4	64.5	33.6	1.9
1961 <u>c/</u>	16.0	8.3	0.5	24.8	64.5	33.6	1.9

a.
 b. 60/
 c. Estimated.

50X1

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Table 6

North Vietnam: Performance of the Transportation System in Passenger-Kilometers a/
1955-61

Year	Million Passenger-Kilometers				Percent of Total		
	Railroad	Highway	Inland Waterway	Total	Railroad	Highway	Inland Waterway
1955	148.1	150.3	7.7	306.1	48.4	49.1	2.5
1956	268.6	303.1	13.4	585.1	45.9	51.8	2.3
1957 <u>b/</u>	453.0	425.2	29.9	908.1	49.9	46.8	3.3
1958 <u>b/</u>	380.9	406.0	29.3	816.2	46.7	49.7	3.6
1959 <u>b/</u>	462.1	402.0	25.4	889.5	51.9	45.2	2.9
1960 <u>b/</u>	622.9	372.6	27.5	1,023.1	60.9	36.4	2.7
1961 <u>c/</u>	722.8	432.0	32.0	1,186.8	60.9	36.4	2.7

a. This information was [redacted] under the following title: "Volume of Round Trip Passengers (in million passenger-miles)"; however, [redacted] the total passenger-kilometers given for 1955-56 closely approximates the above data. It is assumed, therefore, that the information for 1955-56 listed above is passenger-kilometer performance.

b. 63/

c. Estimated.

50X1

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Table 7

North Vietnam: Average Length of Haul of Commodities and Passengers, by Mode of Transportation a/
1955-60

Year	Kilometers							
	Freight				Passengers			
	<u>Railroad</u>	<u>Highway b/</u>	<u>Inland Waterway b/</u>	<u>Coastal Shipping b/</u>	<u>Railroad</u>	<u>Highway b/</u>	<u>Inland Waterway b/</u>	
1955	111	52	72	267	48	107	38	
1956	114	29	62	423	45	72	45	
1957	134	20	76	346	42	60	75	
1958	206	18	69	237	40	60	59	
1959	232	20	60	275	45	54	64	
1960	242	21	65	283	45	52	69	

a. Computed from Tables 3 through 6. Appendix A, pp. 23 through 26, above.

b. Including both modern and primitive transport.

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Table 8

North Vietnam: Selected Operating Data on Railroad Transport a/
1955-60

Factor	Unit of Measure	1955	1956	1957	1958	1959	1960
Average gross tonnage per freight car <u>b/</u>	Metric tons	17.3	18.3	18.2	18.6	18.6	18.6 <u>c/</u>
Average turnaround time per freight car <u>d/</u>	Days	3.00	2.40	2.56 <u>c/</u>	2.26 <u>c/</u>	2.17 <u>c/</u>	2.28 <u>c/</u>
Average freight train speed, including stops	Kilometers per hour	N.A.	14.9	14.0	16.0	18.3	19.0 <u>c/</u>
Average freight train speed, excluding stops	Kilometers per hour	N.A.	22.3	21.2	22.3	26.1	27.1 <u>c/</u>
Average passenger train speed, including stops	Kilometers per hour	N.A.	16.2	17.2	18.4	21.0	N.A.
Average passenger train speed, excluding stops	Kilometers per hour	N.A.	23.1	23.8	24.4	27.8	29.1 <u>c/</u>
Average daily run per freight locomotive	Kilometers	175.4	205.2	213.1	239.6	263.5	262.3 <u>c/</u>
Coal consumption per freight locomotive	Kilograms per 10,000 metric ton-kilometers	814.0	525.5	441.3	371.0	324.5	354.1 <u>c/</u>

b. Given [redacted] as "average tonnage of one freight car."
c. 65/
d. Given [redacted] as "turnaround time for a freight train."

50X1

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Table 9

North Vietnam: Selected Operating Data on State-Owned Motor Vehicles a/
1955-60

Factor	Unit of Measure	1955	1956	1957	1958	1959	1960
Days in good condition	Percent	68.74	73.93	74.07	75.88	74.37	80.89 <u>b/</u>
Days in operation	Percent	59.17	59.50	60.32	62.29	65.18	71.29 <u>b/</u>
Operating capacity used	Percent	92.30	90.80	89.15	93.96	94.97	96.74 <u>b/</u>
Average length of haul per truck	Kilometers	38.56 <u>c/</u>	38.63 <u>c/</u>	36.20 <u>b/</u>	37.43 <u>b/</u>	47.90 <u>b/</u>	28.93 <u>b/</u>
Amount transported	Thousand metric ton- kilometers per truck-ton per year	11.7	12.3	13.5	16.2	20.5	24.4 <u>b/</u>
Average performance per truck	Metric ton-kilometers per day	92.51	98.44	108.57	129.95	177.63	228.39 <u>b/</u>
Average performance per passenger vehicle	Thousand passenger- kilometers per year	N.A.	N.A.	546.9	824.6	944.5	N.A.

a.

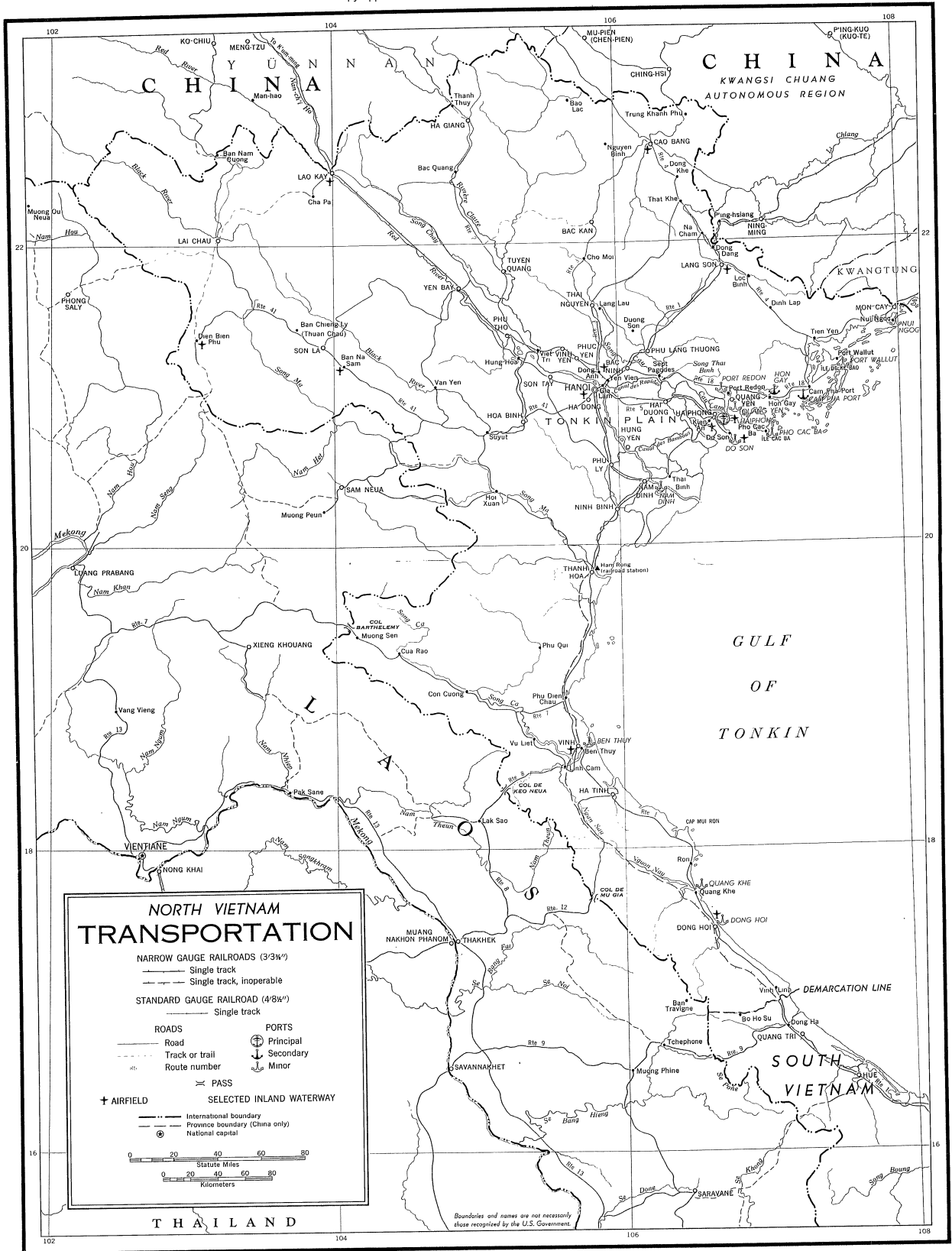
b. 67/c. 68/

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