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NORTH VIETNAM: STRENGTHENING THE TRANSPORTATION SYSTEM January 1962 – March 1965

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FOREWORD

The improvements made in the North Vietnamese transportation system since 1961 are described in this report, the relationship between the transportation system and the economy as a whole is analyzed, and the development of the transportation system in North Vietnam as it facilitates Communist aggression in the Indochina area is discussed. Section I provides a brief background of developments in transportation in North Vietnam since the beginning of Communist rule. Section II summarizes the performance of the transportation system since 1961. Section III discusses the relations between developments in transportation on the one hand and economic growth and military aggression on the other. Section IV describes the changed emphasis in the development of the transportation system. Appendix A gives details on the performance of each major mode of transportation -- railroads, highways, inland and coastal waterways, and airways. Appendix B contains 11 statistical tables.

In general, the report presents an analysis of the transportation system in North Vietnam as of March 1965. Only incidentally is information introduced concerning the damage caused by US and South Vietnamese bombing raids, which began in April, and their effect on the transportation system and the economy of North Vietnam. The analysis in this report, however, is basic to an understanding of the significance of the bombing and to an appreciation of the ability of the transportation system to cope with further damage. Finally, it should be noted that this report deals exclusively with modern means of transportation. No account is taken of primitive transportation, which is important in moving a large tonnage of agricultural and minor industrial products short distances.

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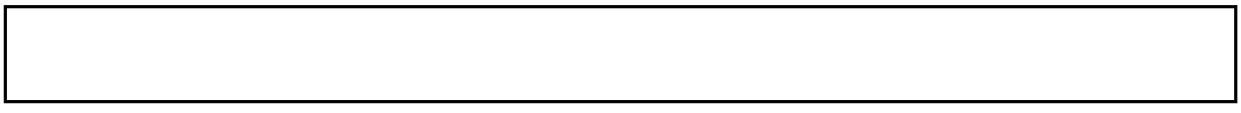

NORTH VIETNAM: STRENGTHENING THE TRANSPORTATION SYSTEM* JANUARY 1962 - MARCH 1965

Summary and Conclusions

From 1962 through the first quarter of 1965, the transportation system of North Vietnam was strengthened by

(1) the reconstruction of an additional 150 kilometers (km) of the main railroad line south of Hanoi, the section from Ham Rong to Vinh;

(2) the construction of new bridges and a general increase in the capacity of the rail line from Hanoi northwest to Lao Cai on the Chinese border;

(3) the improvement of facilities at P'ing-hsiang for transloading freight from the Chinese standard-gauge system to the North Vietnamese meter-gauge system;

(4) the building of new highway bridges and the replacing of low-capacity wooden bridges, notably on routes 7 and 15, the two most important roads used by the Communists to transport men and supplies to the Plaine des Jarres in central Laos and to southern Laos;

(5) the construction of several new roads in outlying areas northwest of Hanoi, in order to hasten the settlement and economic development of this inhospitable region;

(6) the acquisition of more than 2,000 additional trucks from the USSR and Communist China, with a substantial net gain in the truck fleet; and

(7) the completion of a large new wharf and other port facilities at Haiphong, the country's only major seaport.

These improvements were aimed primarily at facilitating support for Communist aggression in Indochina and only secondarily at building up the general economic strength of North Vietnam. The improvements were made from a rudimentary base, and much remains to be done if the

* The estimates and conclusions in this report represent the best judgment of this Office as of 15 September 1965.

transportation system is to give adequate support to the military and economic plans of Ho Chi Minh's government.

The small railroad network -- consisting of 950 km of single-track meter-gauge line radiating from Hanoi -- continued to account for more than one-half of the ton-kilometers performed by the transportation system. Earlier plans for converting to standard gauge the two lines to Communist China and the Hanoi-Haiphong line apparently have been abandoned. The Chinese are building their own rail line southwest to K'un-ming, and, when this line is completed, the importance of Chinese transshipments through North Vietnam will be greatly reduced.

The highway network of 10,000 km supplements the rail network as a feeder system and also is vital in the transport of men and materials to Communist forces in Laos and South Vietnam. Construction of bridges since 1961 increased the capacity of major strategic roads, but standards of maintenance for the road system as a whole improved little. Lack of spare parts and inadequate maintenance were the cause of the poor condition of many of the trucks.

Inland and coastal waterways, of primary importance to the movement of agricultural, forest, and mineral products, have been improved gradually in the last few years by the construction and repair of watercraft and by the improvement of terminal facilities. These waterways accounted for about 40 percent of both the tonnage of freight and the total ton-kilometers in 1964. Civil air traffic is only a negligible part of the total transportation performance and really serves as an adjunct to military and political activity in the movement of priority cargoes and high-ranking officials.

Freight carried by the North Vietnamese transportation system rose from 13 million metric tons (mt) in 1960 to nearly 19 million mt in 1964. Total freight performance, according to type of transport, is estimated as follows:

	Million Ton-Kilometers	
	1960	1964
Railroads	704	927
Highways	107	179
Inland waterways	314	490
Coastal waterways	68	156
Total	1,193	1,752

In recent years the North Vietnamese transportation system has provided important support to Communist aggression in Southeast Asia, and North Vietnam's military establishment of 232,000 men has first call on the relatively meager transportation resources. The Vinh - Ben Thuy

area, in the southern part of the country, which normally is served by rail, road, and coastal water transport, appears to be a major logistics base for Communist aggression in Laos and South Vietnam.

Supplies for Communist forces in Laos are moved across the North Vietnamese border principally by truck over route 7 into the Plaine des Jarres and over route 15 to route 12 and into southern Laos. In 1964 the daily average number of trucks counted by ground observers located along route 7 in Laos could have carried a sufficient quantity of supplies to meet the requirements of the Communist forces in the area. During December 1964 - March 1965 a great deal of traffic also moved from route 12 to route 23 which leads into southern Laos. Some of these trucks presumably carried men and supplies that were destined for infiltration over trails from southern Laos to the Viet Cong in South Vietnam. Other men and supplies for the Viet Cong are moved by coastal water transport to points along the South Vietnamese coast or by truck down route 1A toward the Demilitarized Zone, from where they are moved on trails running south through Laos. (A Demilitarized Zone that varies in width from somewhat less than 4 miles to almost 6 miles extends north and south of the Demarcation Line.)

I. Introduction

The transportation system of North Vietnam was constructed originally by the French and was designed primarily to assist colonial authorities in maintaining control and in facilitating the export of agricultural products and minerals. When Indochina was divided in 1954, the system lay in ruins because of World War II and the French-Viet Minh War (1946-54). By 1965 the new Communist government had succeeded in restoring most of the system. Except for some roads in frontier areas and the rail line to Thai Nguyen, no major extension had been made of the basic system inherited from the French.

The main railroad network radiates from Hanoi and in March 1965 totaled about 950 km of line in operation, all of which was meter gauge.* This network consisted of five single-track rail lines: (1) Hanoi northeast to Dong Dang, (2) Hanoi northwest to Lao Cai, (3) Hanoi east to Haiphong, (4) Hanoi north to Thai Nguyen, and (5) Hanoi south to Ham Rong and, since May 1964, to Vinh.** Several of these lines have some track in common. The Hanoi - Dong Dang line connects with the standard-gauge network of Communist China and has a transloading station at P'ing-hsiang in Kwangsi Province. The Hanoi - Lao Cai line connects with the Chinese meter-gauge line to K'un-ming in Yunnan Province. In 1963, about 24 percent of the rail traffic in terms of ton-kilometers was Chinese transit traffic.

The main highway network also radiates from Hanoi. Five roads connect with the Chinese road system, and several strategically important roads lead west to Laos and south to the Demilitarized Zone. The highway network consists of about 10,000 km of motorable roads, about 1,100 km of which have bituminous-treated surfaces. The remainder have surfaces of stone, gravel, or earth. The highway system acts as a feeder system to the railroads, provides access to remote regions, and serves to support Communist aggression in Indochina.

The inland waterway network consists of about 5,400 km of navigable rivers and canals on which shallow-draft river steamers can navigate about 2,400 km during half the year and 1,400 km throughout the year. With the exception of the upper reaches of the Red River and the Song Cau, these waterways are concentrated primarily in the

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

** Since the beginning of April 1965, bombing of bridges by the United States and South Vietnam has stopped through rail service on the line to Vinh from Dong Phong Thuong, which is located about 21 km north of Thanh Hoa. In addition, truck traffic south of the 20th parallel has been disrupted. For an analysis of the effects of the bombing of bridges on the economy and the logistics capabilities of the North Vietnamese,

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Red River Delta. Coastal shipping uses North Vietnam's only major seaport at Haiphong, two secondary ports at Cam Pha and Hon Gai, and ten minor ports, including one at Ben Thuy. Inland and coastal shipping serve to move in bulk agricultural, forest, and mineral products. The major and secondary ports also are used by ships in international trade. There is very little transportation by air.

II. Performance of the Transportation System

By 1965 the transportation system generally met the requirements placed on it by economic development in North Vietnam, but it was still rudimentary except for the areas served by the small railroad network and the developed sections of the inland waterway system. In 1963 and 1964, performance by the transportation system of North Vietnam surpassed planned goals for freight -- both in terms of tons carried and ton-kilometers -- in spite of the lack of fulfillment of plans for most other sectors of the economy. Freight traffic in 1963 increased 21 percent in terms of ton-kilometers and 9 percent in terms of tons carried compared with that in 1962 (see Table 1, Appendix B). Increases in 1964 were less than the comparatively high rates in 1963; freight traffic increased 9 percent above the volume in 1963 in terms of ton-kilometers and 7 percent in terms of tons carried.

Exceeding the plans for transport performance, in spite of not fulfilling the plan for the economy in general during 1963-64, probably reflects the inadequacy and imbalance of economic planning in North Vietnam. Spotty fulfillment of plans among the various sectors of the economy may have complicated distribution problems and contributed to an unnecessary increase in the average length of haul for total freight.

Total traffic in 1964 reached about 1.75 billion ton-kilometers (tkm) and 18.7 million mt carried. In 1963, the latest year for which details of total performance by mode of transport are available, railroads accounted for 53 percent of the total performance in ton-kilometers and inland waterways ranked next with only 28 percent. Performance in tons carried on the railroads was only 22 percent of the total, being surpassed by both inland waterways and highways, each of which accounted for 38 percent of the total (see Table 1). Only 2 percent of the total tons carried moved by coastal water, but because of the long haul, coastal water freight accounted for 9 percent of the total performance in ton-kilometers (see Table 2, Appendix B).

The total freight performance during 1961-64 not only increased at much lower rates than it did in the last half of the 1950's* but also failed to achieve the rates required to meet the goals for the first five-year plan (1961-65) as shown in Table 3, Appendix B. The average annual rate of increase for total performance in ton-kilometers during 1961-64 was about 10 percent, compared with almost 14 percent needed to fulfill the goal for 1961-65; the rate for tons carried was about 9 percent, compared with about 11 percent needed to meet the goal.

* Freight performance during 1956-60 increased at an average annual rate of 43 percent in terms of ton-kilometers and 37 percent in terms of tons carried. These rapid rates of growth resulted from the reconstruction of the main railroad and highway networks and the acquisition of transport equipment after the Communists gained control of North Vietnam in 1954. For further analysis of transportation in North Vietnam in the late 1950's, [redacted]

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Although these shortfalls probably are due chiefly to failures in the economy, civil transport itself has been beset with a number of problems. Most important are poor planning at the national and local levels, inefficiency and lack of coordination between the various modes of transport and between the transport sector and other sectors of the economy, and the use of unskilled labor especially for maintenance and repair. Civil transportation also has been hindered by the high priority given to military traffic and by shortages of equipment, spare parts, and fuels, almost all of which must be imported.

The share of total transport performed by state-owned means increased during 1961-63 because of a significant shift to state ownership of the means of transport on the highways and inland waterways. A comparison of Tables 1 and 4 (Appendix B) shows that, in terms of ton-kilometers, state-owned means of transportation accounted for 79 percent of the total performance in 1963, compared with 76 percent in 1960, and, in terms of tons carried, it accounted for 64 percent in 1963, compared with 44 percent in 1960.* Nevertheless, in 1963, highway performance by state-owned means accounted for only 65 percent of the total tons carried on highways, and inland water performance by state-owned means accounted for only 41 percent of the total tons carried by inland water.

The rate of increase in passenger performance during 1961-63 greatly exceeded both the rate required to meet the goal of the five-year plan** and the rate during 1958-60.*** Some of this increase in passenger traffic probably reflected the government program to resettle large numbers of people from the lowlands to the northern mountainous regions. About 40 percent of the total number of passengers were carried on highways, and passengers carried by this mode increased at an average annual rate of 33 percent during 1961-63, compared with a rate of 20 percent for railroads during the same period. The railroads, however, which would not be used significantly for resettlement, still carried the largest share of passengers. The share of total passenger performance accounted for by state-owned means of transportation remained about the same during the period. (For an analysis of transport performance by mode and area, see Appendix A.)

* The trend shows a considerable decrease in the rate of increase in the share of total performance achieved by state-owned means in terms of ton-kilometers during 1961-63 but a significant increase in the rate in terms of tons carried. This shift resulted from lower average lengths of haul during 1961-63 compared with those during 1958-60. For ton-kilometers, the share of total performance by state-owned means rose from 50 percent in 1957 to 76 percent in 1960, whereas for tons carried, it only rose from 30 percent in 1957 to 44 percent in 1960.

** See Tables 3 and 5, Appendix B.

*** During 1956-57, the number of passengers carried almost quadrupled because of the small starting base, but the increase leveled off to an average annual rate of 5 percent during 1958-60 compared with an average annual rate of 25 percent during 1961-63.

III. Support of the North Vietnamese Economy and Military Aggression

A. Increase in Transport Performance in Relation to Economic Growth

North Vietnam, a country of about 18 million inhabitants, most of whom are rice farmers living in the Red River Delta, is striving for rapid economic development under the first five-year plan. The achievement of its ambitious economic goals has been impeded by lack of technical and managerial skills and by poor performance in agriculture. Since 1960, lagging agricultural output has resulted in chronic shortages of food and of agricultural raw materials.

Because industrialization increases the scope of trade and the volume of heavy materials moved, transport requirements in a developing economy may increase at a considerably higher rate than the Gross National Product (GNP). 3/ Such a situation has characterized development in North Vietnam. For a comparison of the growth in transportation, both in tons carried and ton-kilometers, with the growth in population, GNP, industrial production, and agricultural production for 1956-64, see the chart, Figure 2.

The gross value of industrial production, excluding production of handicrafts, increased at a higher rate during 1957-64 than did freight tonnage carried because industry was expanding rapidly from a small base. The more rapid growth in ton-kilometers than in tons carried resulted mainly from the increase in the long-haul Chinese transit traffic during 1958-59* and from the development of outlying centers of industrial production in recent years. This trend was reversed in 1961-62 when transit traffic decreased.

In spite of its rapid growth, the transportation sector was criticized severely by the North Vietnamese press as a deterrent to economic progress, even in the early 1960's, when both indexes for transport performances had far surpassed that for GNP. As late as 1963 the press reported that "compared with the demands for a strong development of production, transport and communications are still clearly trailing far behind ... . A major cause of the above situation is our low standard of transportation management." 4/ Reported difficulties in transportation were less severe after major emphasis was given to administration and coordination in 1963. At that time, various programs were set up to promote coordination between the various modes of transport and between the transportation sector and the producing and consuming sectors of the economy. Shortcomings reported after 1963 usually occurred in the outlying areas of the country until the bombing began in April 1965.

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* The average length of haul for rail freight traffic increased 54 percent in 1958 and 13 percent in 1959 after the rehabilitation of the Dong Dang - Hanoi - Lao Cai rail lines.

B. Support for Agriculture

The North Vietnamese economy is based primarily on agriculture, which in 1963 employed about three-fourths of the total labor force. Only about 12 percent of the total land area of about 61,000 square miles is under permanent cultivation. A sharp contrast in the use of land exists between the thinly populated and almost uncultivated mountainous regions, comprising about two-thirds of the total land area, and the over-populated and intensively cultivated regions of the Red River Delta, which contains about 80 percent of the cultivated land. Transportation generally has met the requirements of agriculture in recent years because most of the population, agricultural production, and the transport network are concentrated in this small area of the country.

Two important trends in agriculture have necessitated the expansion of highway and inland water transportation. Of primary importance to transportation is the Communist plan to increase agricultural production in the country and to relieve the population pressure in the delta region by developing the mountainous regions of the country. As part of this program, the government planned to resettle in the mountainous regions during 1961-65 about one million people, including farm workers and dependents. Improvement of inland waterways and of the few existing roads and construction of new roads connecting these regions with the Red River Delta are required to support this agricultural development.

Another important trend in agriculture requiring increased support by transportation is the emphasis on socialization of agriculture. Before Communist control of the country, agriculture generally consisted of small private holdings and semiautonomous villages whose economic contacts with one another and with cities were at a minimum. The North Vietnamese reported that, by mid-1964, about 85 percent of the 2.9 million peasant households had been organized into nearly 30,000 agriculture cooperatives, which encompassed about 75 percent of the total area of cultivated land. Cooperative organization of farming requires more transportation than the previous private organization, both in movement of supplies and the distribution of output.

C. Support for Industry and Mining

Since 1955, the Communist government of North Vietnam has followed a policy calling for rapid industrialization of the economy. The industrialization actually achieved has been made possible by foreign financial and technical assistance, principally from Communist China and the USSR. The program has been moderately successful, both in comparison with previous efforts in the country and with industrial efforts in most other less developed countries in Asia. The development of light industry and industries supporting agriculture was emphasized during 1955-60, whereas the development of heavy industry predominated in the plan for 1961-65. In spite of this program, by

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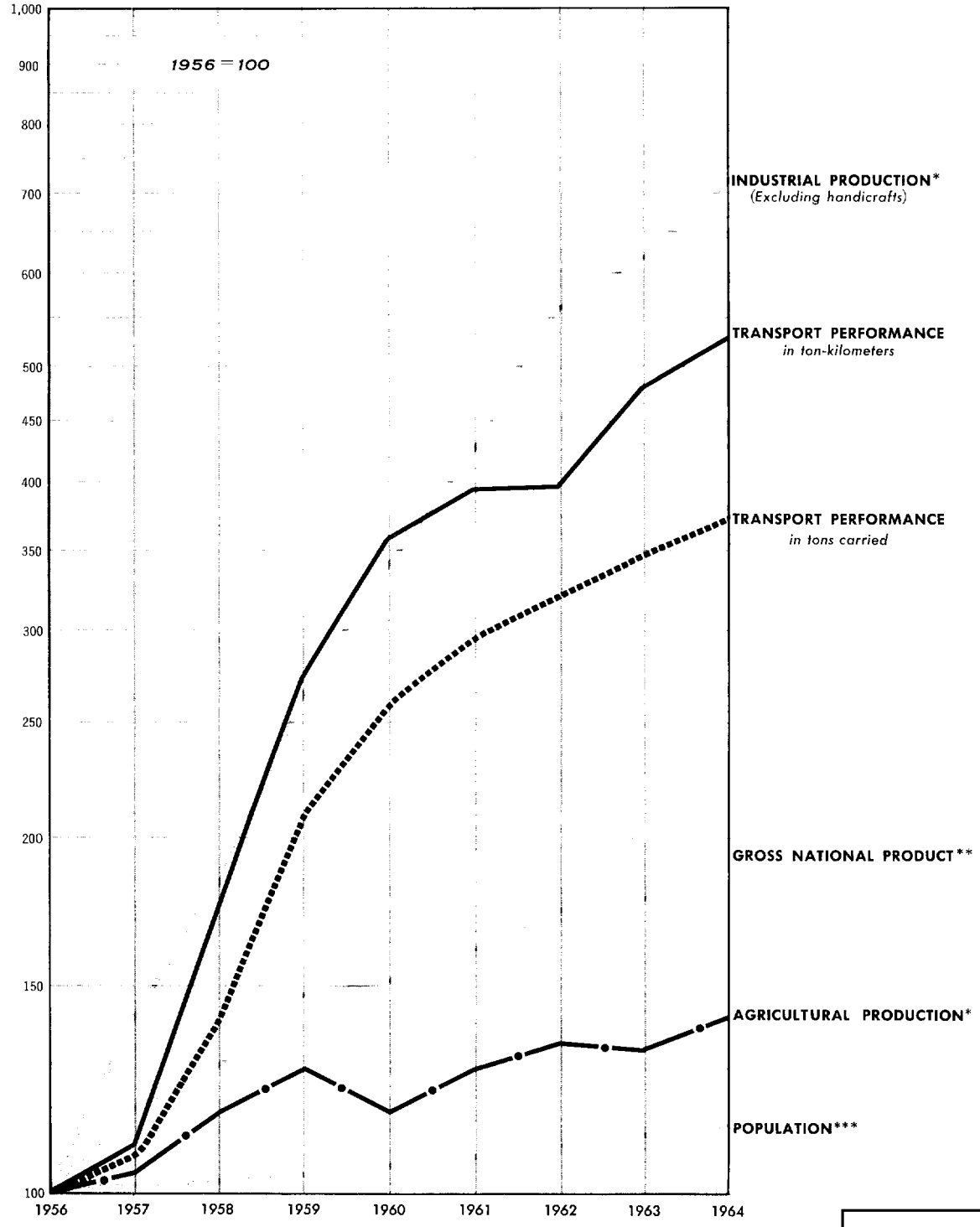
Figure 2

NORTH VIETNAM: INDEXES OF SELECTED ECONOMIC INDICATORS

1956-64



*Gross value in 1959 dong.

**At market prices in 1960 dong.

***Midyear data

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mid-1964 only about 10 percent of the labor force was employed in industry, and of this 10 percent nearly 80 percent was engaged in handicraft industries. Food processing is the major industry, followed by textiles, machine building, lumber, and chemicals.

North Vietnam has six important industrial centers. Three of these centers, Hanoi, Haiphong, and Nam Dinh (which is located on the rail line about 85 km southeast of Hanoi) were important industrial cities before the Communists gained control. The remaining three centers, Thai Nguyen, located about 75 km north of Hanoi, Viet Tri, located about 75 km northwest of Hanoi on the rail line to Lao Cai, and Lam Thao, located about 20 km west of Viet Tri on the Red River, are new industrial centers. The first integrated iron and steel complex in Southeast Asia is being built at Thai Nguyen, and the plant is now producing pig iron in two blast furnaces. A paper mill and a chemical plant have been constructed at Viet Tri, and the largest operating chemical fertilizer plant in North Vietnam is located at Lam Thao. All six industrial centers are located on inland waterways as well as on rail lines.

The major nonagricultural resources of North Vietnam are coal, iron ore, apatite, timber, and limestone and clay (needed for production of cement). Most of these commodities must be transported appreciable distances, primarily by railroad, for export or for processing in the Red River Delta. Coal is mined in an area northeast of Haiphong near the ports of Cam Pha and Hon Gai, and much of it is exported from these ports, mainly to Japan and Communist China. The coal for domestic consumption is carried by coastal ships and barges to ports along the coast of North Vietnam for distribution within the country. Iron ore is mined in the area of Thai Nguyen, where it is processed into pig iron. Coking coal used in production of the pig iron is imported mostly by rail from Communist China. A substantial amount of pig iron is exported through the port of Haiphong. Apatite is mined in the area of Lao Cai and normally moves by rail to the Red River Delta, where most of it is exported through Haiphong in raw or crushed form. Some apatite also is processed into chemical fertilizer at Lam Thao and Hanoi. Major supplies of timber are located in the northern mountains and must be transported -- mainly by water -- to processing plants in the Red River Delta. Limestone and clay are transported to Haiphong for processing in North Vietnam's only cement plant. About one-fourth to one-half of the cement produced is exported, and the remainder is distributed to construction sites throughout North Vietnam.

D. Support for Military Operations

In addition to supporting the North Vietnamese economy, transportation supports a relatively large internal military force.* Military trucks carry a vital flow of men and equipment for the support

* In March 1965, North Vietnam had about 232,000 persons in the armed forces, or 1.31 percent of the population. In comparison, Communist China had about 2.3 million persons in the armed forces, or 0.30 percent of the population.

of Communist forces in Laos and for infiltration to the Viet Cong in South Vietnam. Routes 6 and 7 are used to supply Communist forces in north and north-central Laos and routes 152/15* are used to supply forces in southern Laos. Route 8 once was a major supply route that served the Communist forces fighting in the Lak Sao area, but since 1963, when most of the Communist forces apparently moved farther south, the road has been less used.

Some of the men and supplies for infiltration into South Vietnam move by truck down route 1A and parallel roads toward the Demilitarized Zone, whence they move on trails. Other men and supplies apparently move by truck on routes 152/15 to Laos, through Mu Gia Pass on route 12, and down route 23 to the area southeast of Muong Phine and Sepone for infiltration into South Vietnam. Since mid-1964, most trucks on all of these roads in Laos have moved at night to avoid aerial observation and attack.

Route 7 leads from route 1A about 35 km north of Vinh to the Plaine des Jarres. Truck traffic observed in Laos on this route generally has been much greater than on any other road from North Vietnam. On days that the road was observed in 1963, traffic averaged about 55 trucks per day moving in both directions and in 1964 it averaged about 45 trucks.** Trucks on route 7 often travel in large convoys, some of which have totaled several hundred trucks. Traffic decreased considerably during July-September 1964 because of air interdiction and the effects of the rainy season. During October-December 1964 and January 1965 the volume of traffic was more than double that in September, although substantially lower than the traffic observed in the early part of the year.

Photographic analysis shows that during the dry season the trucks apparently were able to ford the streams and move over the entire road even though bridges in Laos had been bombed. During 1964 and the first quarter of 1965 the daily average number of trucks counted by ground observers located along route 7 in Laos could have carried a quantity of supplies at a rate sufficient to meet the requirements of the Communist forces in the area.

Route 152 leads from route 1A at Ha Tinh, about 45 km south of Vinh, to route 15, which joins route 12 at the Laotian border. Route 12 extends from the border to the area of Mahaxay, but the larger share of the truck traffic from North Vietnam on route 12 does not continue to Mahaxay during the dry season. Instead, it moves down route 23 -- which extends south from route 12 about 20 km inside the border between

* Route 152 joins route 15 to form the connecting road between route 1A in North Vietnam and route 12 in Laos. [redacted] 25X1

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** See Table 6, Appendix B. For further details of truck traffic from North Vietnam to Laos on this and other routes, [redacted] 25X1

Laos and North Vietnam -- into the southern part of Laos, where considerable Communist forces are located. Route 23 is not trafficable during the wet season, and apparently supplies are stockpiled during the dry season to last throughout the year. No observers reported during January and February 1964 -- normally months of heavy truck traffic -- but the level of traffic during the first part of 1965 indicated that more supplies could have been moved down route 23 than were needed to meet the annual requirements of the forces in the area (see Table 7, Appendix B). It can be assumed, therefore, that the excess was moved over the South Vietnamese border to the Viet Cong.

Truck traffic from North Vietnam to Communist forces in northern Laos moves from Hanoi on route 6 and on connecting roads to the town of Samneua and through Dien Bien Phu to Phong Saly Province. There is no connecting road from Phong Saly Province to Samneua, however, or from Samneua to the Plaine des Jarres, and men and supplies transported to these two areas are for local use only.* There is little information on truck traffic from North Vietnam to northern Laos, but generally the flow is believed to be relatively light, with occasional large convoys to support specific Communist military actions against Royal Laotian forces.

An indication of traffic on route 1A south of Dong Hoi is provided by a report that a daily average of 30 to 40 large, loaded trucks, some with four-wheeled trailers, moved south on this road during 1 through 25 September 1964. Most of the trucks probably carry men and supplies for military forces near the Demilitarized Zone in North Vietnam, but some carry men and supplies for the Viet Cong in South Vietnam. A number of Viet Cong have reported that they were transported by truck on route 1A to the area of the Demilitarized Zone and then infiltrated on the trails through Laos into South Vietnam. Some captured Viet Cong also revealed that the same general route is used for transporting supplies.

* Reports based on aerial photography and from ground observers indicate that a through route is being constructed between Samneua and Ban Ban, the latter of which is located on route 7 between the Laos - North Vietnam border and the Plaine des Jarres.

IV. Changing Emphasis in the Development of the Transportation System

A. Early Emphasis on Economic Purposes

The Communists were faced with an almost completely devastated transport system when they took control of North Vietnam in 1954. The railroad network, with the exception of the Hanoi-Haiphong line, was inoperable; large sections of the highway network were not serviceable because of war damage and lack of maintenance; and silt had accumulated in the inland waterways and harbors. In addition, most transport equipment and repair facilities were dilapidated or had been destroyed.

The North Vietnamese, with aid mostly from Communist China, immediately invested relatively large sums of capital to rehabilitate those sections of the transportation system that were most vital to the economy. During 1955-56, 44 percent of the total state investment in capital construction was allocated to transportation and communications,* a portion more than twice that allocated to industry and about three times that allocated to agriculture as shown in Table 8, Appendix B. Although the share of investment in transportation and communications declined by 1959 to about 21 percent of the total state investment, the absolute amount of investment in this sector had increased to a level greater than the average for 1955-56 as shown in the following tabulation 7/:

Year	Total State Investment in Capital Construction (Million Dong) a/	State Investment in Transportation and Communications (Million Dong)	Transportation and Communications as a Percent of the Total
1955-56 average	200.3	88.4	44.1
1957	251.0	59.2	23.6
1958	314.0	73.1	23.3
1959	494.2	106.1	21.5
1960	659.5	112.8	17.1
1962	731.7	87.1	11.9
1963	714.0	119.2	16.7

a. Unless otherwise indicated, dong values in this report are given in current dong and may be converted to US dollars at the rate of exchange of 3.7 dong to US $1. This rate does not necessarily reflect the relative internal purchasing power of the dong in terms of the dollar.

* Although the share was 44 percent during 1955-56, it was only about 25 percent during 1955-60. A share of 25 percent of the total state investment allocated to transportation is not uncommon in newly developing economies. 6/ The share of investment in communications was 7 percent of that in transportation and communications in 1963, the only year for which a breakdown is available.

A complete breakdown of investment in the transportation system by mode is not available, but it is estimated that a major share of the investment was allocated to railroads. Emphasis through 1958 was placed on reconstructing the rail lines from Hanoi to Dong Dang, to Lao Cai, and to Ham Rong; on rehabilitating route 1A and the main roads and inland waterways in the Red River Delta; and on dredging Haiphong harbor. Once the basic transport system had been reestablished, the rail network was extended in 1960 to include Thai Nguyen where North Vietnam's only integrated iron and steel plant was under construction.

During 1961-62, decreasing emphasis was given to the development of the transport network. The share of state investment allocated to transportation and communications declined from about 21 percent in 1959 to about 12 percent in 1962. Plans for several major improvements to the transportation system were completed during 1961, but little was done to implement them. Of primary importance were the plans for the reconstruction of the rail line from Ham Rong to Vinh and the conversion from meter gauge to standard gauge of the rail lines connecting Dong Dang and Hanoi, Hanoi and Lao Cai, and Hanoi and Haiphong. 8/ Conversion of these lines, in conjunction with the projected conversion of the rail line from Lao Cai to K'un-ming in Yunnan to standard gauge, would have increased considerably the capacity of the network and would have permitted Chinese traffic to move to and through North Vietnam without being transloaded at P'ing-hsiang.

The normal level of traffic on the Dong Dang - Hanoi, Hanoi - Lao Cai, and Hanoi-Haiphong meter-gauge rail lines, however, has never reached the capacity of the lines, and their conversion to standard gauge has not yet appeared to have economic justification. Plans for the conversion probably were made in conjunction with the vast railroad expansion program planned by the Chinese Communists under their "leap forward" program of 1958-60. Work was started on a new standard-gauge roadbed for the Dong Dang - Hanoi line, which was to be converted with aid from Communist China, but construction was discontinued late in 1961 or early in 1962, and even those sections of the roadbed that were completed have been left to deteriorate.

It is likely that North Vietnam started the construction work and then found that China would not help in the conversion of the lines after the collapse of the "leap forward" program. Construction work leading to the conversion of the Hanoi - Lao Cai and Hanoi-Haiphong lines probably never was begun. Furthermore, the Chinese Communists have made no effort to convert the Lao Cai - K'un-ming line to standard gauge. Instead, they are presently working on standard-gauge lines to connect K'un-ming directly with the main Chinese rail system in Kweichow and Szechwan Provinces.

B. Recent Emphasis on Military Purposes

From the beginning of 1963 to April 1965, emphasis on the development of the transportation system increased, and improvements had primarily military and political, rather than economic, implications. In 1964, for example, the segment of the rail network from Ham Rong to Vinh was restored, and improvement of several strategic roads to Laos was accelerated. The two most important recent developments, primarily for economic purposes, were the extensive improvement of the Hanoi - Lao Cai rail line to increase its capacity (which included the construction of new bridges) and the expansion of port facilities at Haiphong. About 60 percent of the Hanoi - Lao Cai line was rebuilt during 1964. 9/ Expansion of port facilities at Haiphong has been extensive but has fallen far short of the original plan to triple capacity for handling cargo.

1. Developments South of Ham Rong

During January 1963 - March 1965 the most significant expansion of the network with extra-economic justification was in the southern part of North Vietnam. Reconstruction of the rail line from Ham Rong to Vinh and the port of Ben Thuy was not warranted by existing levels of economic activity. Even less economic justification can be attributed to the reconstruction work done on the rail line south of Vinh nearly half way to the Demilitarized Zone. Although two major bridges and about 18 km of line were not reconstructed between Vinh and Duc Tho, near the Ngan Pho River, the North Vietnamese reported the operation of trains on the line from Duc Tho to Do Vang, about 30 km south of Tan Ap, the point where route 15 turns southwestward toward Laos. Reconstruction of the bridge over the Ngan Pho was underway early in 1965, but nothing had been done on a bridge over the Song Ca.

Aerial photography indicated that a spur line from Tan Ap running parallel with route 15 toward Laos was more heavily used than the main line south of the junction of Tan Ap. The rail line, therefore, probably was being used for military supplies that were being moved from the terminus of the spur line by truck over route 15 into Laos. The emphasis on rapid replacement of low-capacity, wooden bridges on routes 7 and 15 with concrete bridges -- a total of 15 was either completed or under construction between early 1963 and October 1964 -- also had important military implications.

The North Vietnamese claimed that this reconstruction was intended to open the mountain areas for economic development. More likely, however, reconstruction of the rail line and improvement of the roads contributed to a contingent plan to support anticipated large-scale Communist military activity in Laos and South Vietnam and eventually to provide a basis for trade within a reunified country.

2. Developments in the Northern Mountainous Regions

There is significant economic justification for the development during recent years of the transport network north of Hanoi, but this development also has important political and military implications. Since 1960 the North Vietnamese have emphasized strongly the need to tap the resources of the northern mountains. More than half a million persons were moved from the lowlands to the mountains during 1962-64, and more than 1,200 agricultural cooperatives were established. 10/ In conjunction with the migration, emphasis has been given to the improvement of route 6 and the construction of a road between route 6 and Lao Cai in the northwest.*

Road construction in the north has included the completion of roads connecting route 2 with Na Hang, Dong Van, and Hoang Su Phi, and, in the northeast, improvement of bridges is underway on the coastal route from Mong Cai to Hon Gai and to Bac Ninh where the road joins route 1A. The clearance of rocks and reefs from the Black River, which parallels route 6, also has been emphasized, and the North Vietnamese reported that navigation for 2.5-ton craft on this river was extended in 1963 as far north as Quynh Nhai. 12/

The development of the transport network and the resettlement of lowlanders in the northern mountains should facilitate tighter political and economic control of an area that formerly was inhabited largely by relatively autonomous minority ethnic groups. In addition, improvement of route 6 will facilitate the shipment of men and supplies to northern Laos from both China and North Vietnam. Improvement of the Black River will provide an important supplementary route for this traffic from Hanoi. The road from Lao Cai to route 6, when completed, will provide a more direct connection in the northwest between route 6 and the K'un-ming - Lao Cai rail line than is available at present.

3. Developments in Air Transportation

Developments in the air network during 1962-64 appeared to have been primarily for military purposes and may have come largely from the military budget rather than from state investment in transportation. The most important development was the construction of a large airfield at Phuc Yen, about 40 km north of Hanoi, which began in February 1962 and was designed for military rather than for civilian service.** There appears to be little economic justification for the

* For further details on road construction in the border area between North Vietnam, Laos, and Communist China, [redacted] 25X1

** The runway at Phuc Yen is 8,720 feet long by 90 feet wide, paved with concrete, and is capable of accommodating throughout the year modern jet fighters and bombers as well as transports. Although work had not been completed on all taxiways and petroleum storage facilities, this airfield was being used by aircraft at least as early as July 1964. 13/ To date, it has been used almost exclusively as a base for jet fighters from Communist China. 14/

Phuc Yen airfield because the previously existing airfields were more than adequate for North Vietnam's civil air fleet of piston transports and trainers and for foreign planes engaged in international air service to North Vietnam. North Vietnamese planes do not participate in scheduled international air service. Another development in the air network in 1963, the extension of the runway of the airfield at Vinh by about 25 percent, was not accompanied by an increase in civil air traffic at Vinh.*

* Improvement of the airfield to handle jet fighters increased its usefulness both for defense and for air support to Communist forces in Laos and in South Vietnam if the need arose.

V. Probable Future Developments in the Transportation System*

Emphasis on the development of transportation in the future is expected to consist primarily of improvement and consolidation of the present system for economic purposes and improvement and, depending on the course of the present hostilities, expansion of the system for military purposes. In order to accomplish these goals, the share of state investment allocated to transportation probably will continue to be large. On the economic front, better coordination among the various modes of transportation and between the transport sector and the production and consumption sectors of the economy will continue to be stressed.

A North Vietnamese report in March 1965 indicated the creation of an organization for establishing priorities in the movement of traffic and for allocating traffic among the various modes of transportation. 15/ The need for increased efficiency is indicated by the failure in the past to reach the planned average annual rate of increase in productivity for transport workers of 7.5 percent during the first five-year plan (1961-65). Increases in labor productivity have ranged from only 4 percent during 1961 to 5 percent during 1963. 16/

Improvements in the alignment of the Hanoi - Lao Cai rail line to eliminate sharp curves and steep grades is expected to continue, but conversion of this line and the Dong Dang - Hanoi and Hanoi-Haiphong lines to standard gauge probably will not take place in the near future. Until the North Vietnamese economy has developed considerably above its present level, a standard-gauge line through the country will not be needed, especially since Chinese transit traffic probably will decrease after a direct rail line, which is now being built, between Yunnan and the rest of China has been completed, probably within the next two years. Furthermore, conversion to standard gauge will yield benefits only in the long run, and North Vietnam has pressing short-run needs for its meager resources.

Facilities at P'ing-hsiang, in Communist China, for transloading freight between the Chinese rail system and the North Vietnamese

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* Future developments as analyzed in this section do not take into consideration the effects on the transport network of the continuation of extensive bombing that began in April 1965. Most large bridges destroyed or seriously damaged by bombing probably will not be rebuilt, and, in general, development of the transport network in the southern part of North Vietnam probably will cease for as long as extensive bombing continues. Instead, the North Vietnamese probably will rely on temporary measures for keeping open important routes for the movement of men and supplies to the southern part of North Vietnam and to Laos and for infiltration to South Vietnam. Temporary measures would include the minimum repair of some bridges and the additional construction of fords and ferries wherever possible.

system were expanded during 1963-64 and can be expanded still more without great difficulty if the need arises. Dredging of inland waterways in the Red River Delta and improvement and expansion of port facilities at Haiphong will continue to receive strong emphasis. Reportedly, traffic through the port surpassed the planned goal for 1963 by 5 percent, but congestion and delays of traffic persisted in 1964-65. Continued expansion of building and repair facilities for watercraft and expansion of the inland water fleet also are expected.

Major emphasis on the development of the transportation system in the future will be influenced very much by the course of the present hostilities. The desire of the Communists to bring South Vietnam and Laos under their control suggests continued improvement of route 6 to the border between Communist China and North Vietnam and construction of the road connecting that route with the rail line at Lao Cai. This work could be completed in 1965 or 1966.* Of even greater strategic importance is the expected continuation of improvement of routes 7 and 152/15 as well as improvement of route 1A and alternate routes from Vinh south to the Demilitarized Zone.**

Reconstruction of the rail line from Vinh to Duc Tho and improvement of the line from Duc Tho to route 12 probably will continue. It is not known whether North Vietnam intends to reconstruct in the near future the rail line from the area of route 15 to Dong Hoi and the Demilitarized Zone.*** There is little present economic or compelling military justification for extending the line to the Demilitarized Zone, but completion of the line would conserve the scarce supply of trucks, spare parts, and fuel particularly in the event that the infiltration of men and supplies from this area increased.

Because of the necessity for reconstructing a number of large bridges, reconstruction of the line to the Demilitarized Zone would take at least 3 or 4 years of concentrated effort even with assistance from Communist China in a period of no hostilities. Although reconstruction has progressed past route 15, rapid rehabilitation of the entire line would be a costly method of saving trucks, spare parts, and fuel. If North Vietnam and South Vietnam were united, connection of this line with the rail line to Saigon would improve political control over the country and facilitate the exchange of agricultural crops from the Mekong Delta for industrial and mineral products from North Vietnam. North Vietnam apparently has planned to develop its transport network so that it can be unified with that of the rest of Indochina in anticipation of the area eventually being under Communist domination.

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* Recent information indicates that route 6 to the China border has been improved to a point where trucks can now be used.

** Little improvement of these roads can be made by the North Vietnamese as long as extensive aerial bombing continues. Instead, construction efforts almost certainly will be directed toward the tempoary repair of bridges and the development of bypasses to maintain a flow of vital supplies.

*** It is unlikely that extensive reconstruction work on rail lines south of the 20th parallel will resume while the bombing continues.

APPENDIX A

TRANSPORT PERFORMANCE BY MODE AND AREA

I. Railroads

A. Rail Traffic

During 1961-63, rail performance in North Vietnam increased at lower average annual rates than performance by any other mode of transport, and these rates were considerably less than those required to meet the goals of the first five-year plan. Except for the railroads, all modes of transport generally surpassed the rates required to meet the goals -- a reversal of the trend during 1956-60, when rail performance generally increased at much higher rates than did performance by other modes of transport. The railroads, however, surpassed their annual plan goals for 1963 and 1964 and during that time apparently provided adequate service for the economy. Since the bombing of North Vietnam began, rail congestion on the Hanoi - Dong Dang line has resulted from the increased quantity of military supplies being shipped to North Vietnam.

1. Economic Significance of the Various Rail Lines

The Hanoi - Lao Cai rail line connects the industrial centers of Viet Tri and Lam Thao and the major apatite mines located near Lao Cai with Hanoi. Before the aerial attacks on this line, which began in July 1965, the volume of traffic probably was as large as that on any line in North Vietnam. A reported average of seven freight trains moving each way per day in December 1964 indicates the volume of traffic on this line between Lao Cai and Yen Bai, the latter town located about half way between Lao Cai and Hanoi. 17/ Probably about half of these trains were domestic and half were trains carrying transit traffic for Communist China. The rail line between Hanoi and the port of Haiphong also has a comparatively large volume of freight traffic. In addition to North Vietnamese imports and exports, some Chinese transit traffic to and from Yunnan Province normally moves on this line and through Haiphong. The average number of cars per train observed by aerial photography on the Hanoi-Haiphong line is about the same as that on the Hanoi - Lao Cai line and the density of trains probably is as great. Also from aerial photography, trains on the Hanoi-Haiphong line appear to travel at higher average speeds than those on any other line.

No major industrial centers or mining areas are located along the Hanoi - Dong Dang rail line, and the volume of freight carried on this line probably is normally a little less than that on the Hanoi-Haiphong and Hanoi - Lao Cai lines. By the end of 1964, however, the line carried a significant amount of transit traffic between Kwangsi and

Yunnan Provinces in China and international traffic between North Vietnam and China. Freight traffic on the Hanoi - Dong Dang line and on the rail line between Hanoi and the major industrial center of Thai Nguyen probably increased in December 1963 and again in September 1964 with the respective openings of the first and second blast furnaces at the Thai Nguyen iron and steel plant. Operation of the two furnaces requires about 500 mt of coal per day, most of which probably was being imported from China on these rail lines at the end of 1964. Iron ore used at Thai Nguyen is obtained locally. The pig iron produced at Thai Nguyen, a substantial amount of which is exported, probably is transported by rail, but some could move by barge down the Song Cau to Haiphong. The volume of freight carried on the Hanoi - Thai Nguyen line is a relatively minor part of the total tons carried by the rail system.

The Hanoi-Vinh rail line serves Nam Dinh, one of the six important industrial centers in North Vietnam. Traffic between Hanoi and Nam Dinh probably is relatively heavy, but in 1964 through traffic to Vinh consisted of only two scheduled mixed passenger and freight trains each way per day. The number of freight cars per train, as determined from aerial photography of the Hanoi-Vinh line, was less than that on the other rail lines, and the tonnage carried, like that on the Hanoi - Thai Nguyen line, probably was a minor part of the total tons carried by the rail system. (Through rail service on the Hanoi-Vinh line is no longer possible south of the 20th parallel because of US bombing.)

2. International Rail Traffic

An important share of the freight performance by railroads through 1964, especially in terms of ton-kilometers, can be attributed to Chinese Communist transit freight carried on North Vietnamese rail lines. Transit freight normally is carried between Kwangsi and Yunnan Provinces in China on the Dong Dang - Hanoi and Hanoi - Lao Cai rail lines and between the port of Haiphong and Yunnan on the Haiphong-Hanoi and Hanoi - Lao Cai lines. The estimated volume of transit traffic during 1960 and 1962-63, as derived from North Vietnamese data, is presented in the following tabulation*:

* The North Vietnamese have published data on the volume of total transport performance and also on the volume of domestic goods transported for 1960 and 1962-63. The difference between these two volumes, or the "non-domestic" goods transported, has an average length of haul which apparently is much too long to be anything but Chinese transit traffic moving on North Vietnamese railroads. In 1963, about 300 freight cars would have been required to carry this transit traffic.

Year	Transit Traffic: Thousand Ton-Kilometers	Transit Traffic: Thousand Tons Carried	Transit Traffic: Average Length of Haul (Kilometers)	Percent of Total Rail Traffic: In Terms of Ton-Kilometers	Percent of Total Rail Traffic: In Terms of Tons Carried
1960	267,300	617	433	38	21
1962	164,700	367	449	24	11
1963	201,900	420	481	24	11

The average length of haul in 1960 indicated that approximately half of the transit traffic moved by rail between Haiphong and Lao Cai and about half moved between Dong Dang and Lao Cai. After 1960 there apparently was a trend to shift transit freight to rail through Dong Dang rather than by sea through Haiphong. By 1963 the average length of haul approximated the entire length of the Dong Dang - Hanoi - Lao Cai rail lines, indicating that almost all of the transit traffic moved through Dong Dang.

Observations at Lao Cai indicate that the total transit traffic in 1964 could have reached 480,000 mt or about 1,300 mt per day. The average volume of traffic moving from Kwangsi into North Vietnam through Dong Dang during the latter part of 1964 is estimated at about 1,200 to 1,500 mt per day.* During the latter part of the year, about 600 mt of the 1,200 to 1,500 mt per day moving through Dong Dang probably represented North Vietnamese imports, which consisted mainly of coal from China for the two blast furnaces at Thai Nguyen. The remaining 600 to 900 mt per day moving through Dong Dang probably represented Chinese transit traffic moving to Yunnan Province. Petroleum products, almost all of which were destined for Yunnan Province,** accounted for about 350 mt per day of the traffic through Dong Dang and Lao Cai. Most of the freight cars returning through Dong Dang to Kwangsi were reported to be empty.

A further conclusion can be drawn from the above analysis of this information. If total transit traffic in 1964 amounted to about 1,300 mt per day and if 600 to 900 mt per day entered North Vietnam through Dong Dang and only a small amount left North Vietnam through Dong Dang, it can be concluded that most of the remainder of the transit

* Based on the estimated number of freight cars per day moving through Dong Dang and a net load of 15 mt per car, two-thirds of the reported average gross weight.

** North Vietnam imports the bulk of its petroleum products by sea through Haiphong.

traffic must have moved through Haiphong. Thus it appears that as much as 400 to 700 mt per day of Chinese transit traffic may have been shifted back to Haiphong.

Some shipments of military supplies for North Vietnam probably were transported from Kwangsi by rail before the withdrawal of observers from Dong Dang, but such shipments were never verified.* 25X1
Because [redacted] however, supplies could have moved undetected by rail. 25X1
25X1 [redacted] some military supplies may have been transported by rail to the transloading station at P'ing-hsiang and then moved by truck through Dong Dang to avoid detection.

B. Inventory and Operating Efficiency

25X1
[redacted]
North Vietnam probably had in operation in 1964 a minimum of 120 locomotives, practically all of which were steam powered. Possibly a few of these were Chinese locomotives used on North Vietnamese rail lines, but known Chinese locomotives were eliminated from the estimate. Also, North Vietnam is estimated to have had a minimum of 1,800 freight cars in operation in 1964.** The inventory of rolling stock is continually being expanded by imports, mainly from China, the USSR, and Rumania, of rolling stock and parts for assemblage. Although North Vietnam has no facilities for manufacturing the basic components of locomotives or freight cars in significant numbers, a small amount of rolling stock recently has been manufactured, apparently including most of the basic components. In January 1965 the North Vietnamese boasted that they had produced their first locomotive. 19/ Railroad shops are used primarily for assembling and repairing rolling stock, and most spare parts must be either imported or cannibalized from old rolling stock. The major rail shops are located at Hanoi, Gia Lam (5 km northeast of Hanoi), and Haiphong. 20/

25X1
* [redacted] in addition to the normal daily schedule of four freight trains, two trains carrying military supplies and usually consisting of about 15 freight cars per train moved from China through Lang Son (near Dong Dang). 18/

** An estimate of at least 1,800 freight cars in 1964 is obtained by assuming that North Vietnam probably had about 15 freight cars per locomotive. It is also estimated that about 1,800 freight cars would have been required to transport the tonnage carried in 1963. This estimate is calculated as follows: the number of freight cars required equals the average daily tons originated divided by the average tons carried per freight car times the turnaround time per freight car. Freight carried on railroads in 1963 amounted to 3.86 million mt, or an average of 10,600 mt originated per day. The average net load per freight car in 1963 is estimated at 15 mt, two-thirds of the reported gross weight, and the turnaround time per freight car was reported to be 2.6 days. Therefore, $\frac{10,600}{15} \times 2.6 = 1,800$ freight cars in operation.

The efficiency of the utilization of freight cars and locomotives probably did not change much during 1961-63. Data published by the North Vietnamese are conflicting and show increases in some indicators of efficiency and decreases in others (see Table 9, Appendix B). Freight cars reportedly continued to carry heavier loads, and the average consumption of coal per locomotive declined during 1961-63. On the other hand, the North Vietnamese also reported that tonnage per freight train remained the same during the period and that turnaround time for freight cars increased.* The average length of haul also was reported to have decreased, a situation that would have facilitated a decrease, rather than an increase, in turnaround time. Maintenance and repair of both railroad rolling stock and the rail network appeared to be adequate to meet the needs of the system before the bombing. The North Vietnamese reported that trains were checked thoroughly before starting a run to insure safe and efficient operation, and observers reported that rolling stock generally appeared to be in good condition. 21/ Maintenance of the rail lines was done primarily by hand, but observers reported that the lines were kept in good condition, and seldom was there any indication in recent years of disruption of the traffic flow resulting from faulty maintenance.

II. Highways

A. Highway Traffic

Highway transportation accounted for the largest share of the total tons of freight carried in 1963, but because of the short length of haul -- only 24 km or 11 percent of the length of haul for railroads -- highway performance was only about 10 percent of the total ton-kilometers. Ton-kilometer performance on the highways increased at a substantially higher rate than that required to meet the goal of the five-year plan, and the tonnage carried increased at about the required rate. Nevertheless, rates of growth during 1961-63 were considerably lower than those during 1956-60, when the primary road network was being rehabilitated and the truck inventory was being expanded rapidly.

The road network in North Vietnam is used primarily for carrying freight relatively short distances either as feeder service for

* The relationship between tonnage per freight train and tonnage per freight car does not appear reasonable. This relationship indicates that there was an average of about 34 freight cars per train in 1960 compared with about 29 in 1963, but reports by observers indicate that the number of cars per train, at least for international trains, increased rather than decreased during the period. Furthermore, even an average of 29 cars per train appears to be unreasonably high because information from both aerial photography and from observers indicates that only a small share of the trains has from 30 to 40 cars. It is possible that data for the tonnage per freight train include the weight of the locomotive, contrary to statistical practice in almost all countries.

railroads and waterways or as local service. Most of this traffic occurs in the area of the Red River Delta, where economic activity is concentrated and the road network is relatively extensive. Even in this area, highway transportation was characterized in 1964 as consisting of poor roads and a minimum of traffic, practically all of which was truck movement. Long-distance truck service is provided mainly to areas not otherwise connected with the Red River Delta, such as large parts of the northern and northwestern mountainous regions of North Vietnam, the southern part of North Vietnam, and Laos. Some of this traffic is for military rather than economic purposes and probably is not counted in data on transport performance published by the North Vietnamese. Military trucks are used sometimes for such economic purposes as transporting workers, food, fertilizer, and other materials to farm cooperatives and work sites in northwestern North Vietnam. 22/ Civilian trucks also are used sometimes for military purposes.

B. Inventory and Operating Efficiency

North Vietnam had about 5,000 civilian trucks and 1,200 passenger cars at the end of 1962. 23/ Operating statistics for 1962 indicated that about one-half of the total number of trucks were under the control of state-owned transport agencies in that year. A little more than 30 percent of the highway freight that moved by state-owned means of transportation was moved by trailers. Both trucks and fuel are imported; the trucks are supplied primarily by Communist China, the USSR, and Czechoslovakia, and the fuel is supplied primarily by the USSR. The total imports are not known, but the USSR alone supplied more than 1,300 trucks during 1959-63. Although the North Vietnamese claim to produce spare parts for motor vehicles, most of these parts also must be imported. The importance of spare parts is indicated by the fact that the value of spare parts imported from the USSR during 1959-63 was almost as high as that for trucks, automobiles, and buses combined. 24/ In 1964, petroleum imports -- mainly from the USSR -- amounted to about 140,000 to 150,000 mt.

Data on state-owned motor vehicles indicated that operating efficiency probably was less in 1963 than in 1960, although the statistics for 1963 appear to be inconsistent. The North Vietnamese reported a significant increase in the average performance per truck, but the amount transported in terms of ton-kilometers per truck-ton decreased during 1961-63, as did both the number of days that trucks were in good condition and the number of days that they were in operation (see Table 10, Appendix B). In 1963, state-owned trucks were in operation about 68 percent of the time, an increase above 1962 but less than in 1960.* In general, even before the bombing, civilian trucks

* The percentage of days in which state-owned trucks were in operation increased steadily during the latter half of the 1950's from 59 percent of the time in 1955 to a high of 71 percent in 1960.

were poorly maintained, not only because of a shortage of spare parts but also because of inadequate repair facilities and the lack of skilled personnel. Furthermore, using the trucks on poor roads undoubtedly increases the need for maintenance. Military trucks usually are maintained better than are civilian trucks, but even these some times have been reported as being in poor condition.

Unlike the railroad network, the road network generally was not well maintained. Maintenance was most nearly adequate on the main roads in the Red River Delta, on route 1A from Communist China through Dong Dang and Hanoi to the Demilitarized Zone, and on strategic roads leading to Laos, whereas usually only minimum maintenance was performed on most of the other roads. Even sections of route 1A were reported in poor condition, especially in the areas of Dong Dang, Vinh, and Dong Hoi, as were sections of routes 6, 7, and 15 leading toward Laos. The road from Hanoi to Haiphong was reported to be the best in the country, and the road from Hanoi to Thai Nguyen also was reported as being in good condition. Most road maintenance was performed by manual labor using simple tools and sometimes being aided by one or two old steamrollers. Much of the labor for road maintenance was performed by local people, including all types of workers from peasants to civil servants, who had to contribute a certain number of days per year for road work. 25/ Maintenance, therefore, was often inadequate both in quality and in quantity. One observer stated that, in general, the roads appeared to be in poorer condition in 1963 than they had been when he saw them in 1956.

III. Inland Water

A. Inland Water Traffic

By 1963 the tonnage carried on inland waterways had risen almost to the level of freight carried by highway transport. Rates of increase during 1961-63 for both tons carried and ton-kilometer performance were at about the level required to meet the goals of the five-year plan and were slightly above those for total transportation. Although rates of growth during 1956-60 were higher than during 1961-63, increases in performance by the inland waterways were considerably below those for any other mode of transport during the earlier period because inland water transport had been affected less by the war and had a relatively large starting base in 1955.

Inland water traffic is heaviest in the area between Hanoi, Haiphong, and Nam Dinh, but efforts are being made to remove obstructions in the Black River in order to facilitate traffic between Hanoi and the northwest mountainous regions. Major inland waterways outside the Red River Delta currently include only the upper reaches of the Red River to Lao Cai and Communist China and the Song Cau to Cho Moi, north of Thai Nguyen. The seasonal flow of traffic on much of the inland waterway network varies considerably because of climatic conditions. All six of North Vietnam's major industrial centers are served

by the inland water network. The major commodities carried are relatively heavy, low-cost goods, such as rice, coal, fertilizer, lumber, and other forest products, and sand, gravel, and stone. Data are not available to estimate accurately the number of boats used on the inland waterways, but there are possibly as many as 30,000 junks, as well as numerous smaller craft and some tugs, barges, and river steamers. 26/ The North Vietnamese reported in 1964 that junks carry about one-half of the total inland water traffic moved by modern and primitive means. 27/ Major complaints concerning the inland waterway system include the lack of adequate dredging, especially in the Red River Delta, the lack of adequate rock removal, and the lack of coordination between the production, transportation, and consumption sectors of the economy.

B. Boat Construction

Much emphasis has been given to the construction and repair of barges and junks for use in inland water and coastal water traffic as well as local construction of more primitive boats and rafts. The only significant shipyard in North Vietnam, located at Haiphong, was expanded during 1964, although there was no evidence of the construction of craft larger than barges and junks at this shipyard. The North Vietnamese reported the completion of a new shipbuilding section at the Haiphong shipyard in 1964. Construction of facilities was continuing in December 1964 as shown by photography that revealed construction of an L-head pier, measuring about 67 x 11 meters, which probably is a fitting-out pier for the shipyard, and the construction of two smaller piers, which also may be associated with the shipyard. During 1964 there was no expansion of the building ways, but a large new building -- probably a fabrication building -- was under construction at the end of 1964. Completion of this building will make a total of five fabrication-type buildings at the Haiphong shipyard with a total floorspace of about 16,500 square meters. Facilities for repairing boats at Haiphong, the most important in North Vietnam, also were being expanded. New graving docks were being added to at least three and possibly four boatyards, and a new boatyard may be under construction.

In mid-1964 the construction and repair of steel barges were being maintained on a 24-hour a day basis in Haiphong. The North Vietnamese announced the construction of 15,000 mt and the major repair of more than 7,000 mt of boats, presumably including barges, during 1963. North Vietnam reported earlier that, during the first 9 months of 1963, the river transport branch had constructed 7,100 mt of new junks and 20 new barges and had repaired 120 old barges.

IV. Coastal Water and Port Traffic

Coastal water performance in terms of ton-kilometers increased at a rate nearly double that for any other mode of transport during 1961-63, reflecting the large increase in the average length of haul in 1963.

The increase in tons carried, although much less than that for ton-kilometers, also was higher than that for any other mode of transportation. These increases continued the general trend that had developed during 1956-60, when coastal water performance expanded at higher rates than performance by any other mode except that of the railroads in terms of ton-kilometers.

In spite of its relatively small share of total transport performance, coastal water traffic is important in the shipment of heavy, low-cost goods -- such as coal -- between certain areas. Much of the coastal traffic is carried by junks and barges because the merchant fleet consists of only two small tankers and five dry cargo ships, the largest of which is 2,500 deadweight tons. Some coastal traffic also is carried by foreign ships. Coastal traffic, however, accounts for only a small part of the total port traffic at Haiphong, Cam Pha, and Hon Gai because the majority of North Vietnamese imports and exports flows through these ports.

A. Haiphong

The volume of dry cargo, the major part of which was international traffic, passing through Haiphong in 1963, and probably also in 1964, approached the capacity of the port. About 425 foreign merchant ships, including tankers, called at Haiphong in 1964. An estimated 250 of these ships were Free World ships, some of which were chartered by Communist countries. The importation of military equipment and ammunition through Haiphong has not been detected, but ships can easily anchor outside the harbor and unload these supplies on small craft to be taken elsewhere. Although congestion in the port apparently was not as acute in 1964 as in 1963, there were still reports of delays in off-loading, and port facilities were said to be in poor condition and in need of extensive repairs.

Photography during 1964 showed significant expansion of port facilities at Haiphong but not at the level of the agreement with the USSR in 1962, which provided for assistance to triple the cargo handling capacity of the port. 28/ 25X1

25X1

25X1

There was no expansion of the main wharf area. A possible facility for transshipment of cargo also was under construction in 1964 with two rail lines leading to the area. The basin is large, but the turn that must be navigated to enter it probably will restrict the use of the area to coastal ships or barges.

B. Cam Pha and Hon Gai

Cam Pha and Hon Gai, located on the coast northeast of Haiphong, handle the bulk of the estimated 1.5 million mt of coal exported annually from North Vietnam. Of the two ports, Cam Pha can accommodate larger ships and reportedly has better coal-loading facilities. 29/ In 1964, an average of about 10 to 15 foreign ships, including many Chinese Communist and Japanese ships, called at these ports each month. In addition, the most important coastal water traffic in North Vietnam is the shipment of coal by barge from Cam Pha and Hon Gai to Haiphong. 30/ The volume of this coal traffic is not known, but one barge berth in Hon Gai, at which barges were reported to be loading continually, is used exclusively for loading coal for Haiphong and other North Vietnamese ports. 31/ Several tugs at Cam Pha are used exclusively for hauling coal barges in coastal traffic. Coal for both coastal and export trade is carried to these ports from nearby mines on a small, meter-gauge rail system which is not connected to the main rail network. Although both ports are used almost exclusive for coal, they do have facilities for handling a small volume of general cargo. At Cam Pha, where one quay possibly is used in connection with off-loading goods, photography in 1964 revealed the construction of a small storage building. Hon Gai has a general cargo area with one small wharf, which is being widened, and a number of warehouses that are used for mining supplies and equipment. A small boat repair yard also has been constructed at Hon Gai.

C. Ben Thuy

Traffic at Ben Thuy, the most important of the southern ports, is primarily coastal traffic. In addition to barges and junks, an average of about 2 to 4 coastal ships per week, including a few of Chinese Communist origin engaged in coastal trade, apparently called at Ben Thuy during the first quarter of 1965. Coal transported from Cam Pha and Hon Gai by coastal ships and barges probably made up the bulk of the cargo entering Ben Thuy, and coal storage areas near the wharf were expanded by almost 80 percent. A spur line, which has been constructed from Vinh to a new railroad depot at Ben Thuy, was being extended to the wharf area, and the expanded coal storage yards may have been related to increased imports of coal for the railroad.* Other important goods entering the port included corn, fertilizer, steel products, and some construction materials. Logs and lumber were the primary outgoing products. Transportation of these goods by coastal water continued at about the same level after the completion of the rail line to Vinh, and water traffic at Ben Thuy apparently was

* Since the rail line south of the 20th parallel has been bombed, the requirements for coal in the Vinh area probably are much lower. This freight probably has been replaced by construction materials (for the temporary repair of bridges) and by other supplies, which have been shifted to coastal water transportation because of the bombing of land transport routes.

not replaced by rail traffic, because it was more economical to handle this type of goods by water transportation.

Warehouse space at Ben Thuy is much larger than at any port in the southern part of North Vietnam, and these storage facilities were being expanded in March 1965, whereas expansion of such facilities in other southern ports was insignificant. The Vinh - Ben Thuy area therefore probably is the most important logistics base in North Vietnam for transporting supplies to the Communist forces in Laos over routes 7, 8, and 15, and to the large North Vietnamese military force in the area of the Demilitarized Zone. Also, it is possibly one of the major bases for transporting supplies to the Viet Cong in South Vietnam. Storage buildings either recently constructed or under construction when the bombing began would have increased the storage facilities at Ben Thuy by about 10 percent. Although military supplies probably were transported by coastal ships or barges to Ben Thuy, such traffic never was observed.

V. Air

A. Air Traffic

Civil air transport accounts for only a negligible part of the total transport performance, and the North Vietnamese do not include it with the other modes of transport in their statistical reports. Although flight schedules are not available, regular air transport service during the first quarter of 1965 probably was flown on the Hanoi-Vinh - Dong Hoi and Hanoi - Na San - Dien Bien Phu routes. 32/ Transport flights on most of the other routes probably were not on a regular basis. Reports indicate that a large share of air activity in North Vietnam is connected with training flights rather than transport flights. North Vietnamese planes do not participate in scheduled international air transport, although two foreign airlines provide service for Hanoi. The Chinese civil airline provides at least two scheduled flights each way per week between Hanoi and Nanning, and, since May 1964, the Cambodian airline provides one scheduled flight per week between Phnom Penh, Hanoi, and Canton. 33/

Until recently, all aircraft in North Vietnam were publicly designated as civil aircraft, but in practice, air transport for military purposes probably has been more important than that for economic purposes. 25X1

B. Inventory and Maintenance

Until recently, aircraft in North Vietnam consisted primarily of piston transports obtained from the USSR in 1962 after the end of

the airlift to Laos. An estimate of the inventory of civil aircraft in North Vietnam at the end of 1964 is as follows 35/:

Aircraft Designation	Number of Aircraft	Type of Aircraft
Il-14 (Crate)	13 to 18	Twin-engine transport
Li-2 (Cab)	22 to 26	Twin-engine monoplane transport
An-2 (Colt)	10 to 12	Single-engine biplane transport
Yak-18 (Max) and Zlin-226	25 to 30 a/	Monoplane trainer
Mi-4 (Hound) and Mi-1 (Hare)	6 to 12	Helicopter

a. In addition, there may have been some Aero-45 trainers.

All aircraft, spare parts, servicing equipment, and aviation fuel are imported, mainly from Communist China and the USSR. Only minor maintenance and repair can be performed at Gia Lam in North Vietnam, and aircraft are flown to China for overhaul about once a year. Before the US bombing, North Vietnam had 21 usable airfields with runways at least 2,000 feet long. Two of these airfields -- Phuc Yen and Haiphong/Cat Bi -- could accommodate Il-18 Coot transports, much larger planes than the North Vietnamese Il-14 transports.

APPENDIX B

STATISTICAL TABLES

Table 1

North Vietnam: Total Freight Performance a/
1960 and 1962-64

Mode	1960	1962	1963	1964 b/	1960	1963
	Million Metric Ton-Kilometers				Percent of Total	
Railroads	704.2	699.1	846.9	926.8	59	53
Highways	107.5	148.3	164.0	178.7	9	10
Inland waterways	313.6	379.5	448.2	490.5	26	28
Coastal waterways	67.6	94.8	142.3	155.9	6	9
Total	1,192.9	1,321.7	1,601.4	1,751.9	100	100
	Million Metric Tons Carried				Percent of Total	
Railroads	2.92	3.22	3.86	4.13	22	22
Highways	5.01	6.53	6.71	7.18	39	38
Inland waterways	4.84	5.95	6.56	7.01	37	38
Coastal waterways	0.24	0.35	0.35	0.37	2	2
Total c/	13.00	16.05	17.48	18.69	100	100

25X1 a. [redacted]
25X1 b. Based on [redacted] the unrounded percentage breakdown of total performance in 1963.
c. Because of rounding, components may not agree with the totals shown.

Table 2

North Vietnam: Average Length of Haul for Freight and Passenger Traffic a/ 1960 and 1962-63

Kilometers

Mode	1960	1962	1963
	Total Freight Traffic		
Railroads	242	217	219
Highways	21	23	24
Inland waterways	65	64	68
Coastal waterways	283	272	407
	Freight by State-Owned Means		
Railroads	242	217	219
Highways	29	22	24
Inland waterways	136	98	75
Coastal waterways	292	297	404
	Total Passenger Traffic		
Railroads	45	46	48
Highways	51	35	34
Inland waterways	65	50	48

a. 38/. Calculated from unrounded data.

Table 3

North Vietnam: Planned and Actual Increases in Transport Performance 1961-65 Plan and 1961-63 Actual

Mode	Index (1960 = 100)		Average Annual Rate of Increase (Percent)	
	1965 Plan [a]	1963 Actual [b]	1961-65 Plan [a]	1961-63 Actual [b]
Total freight performance				
Ton-kilometers	190	147 [c]	13.7	10.1 [c]
Tons carried	170	144 [c]	11.2	9.5 [c]
Railroads				
Ton-kilometers	212	120	16.2	6.3
Tons carried	192	132	13.9	9.8
Highways				
Ton-kilometers	163	153	10.3	15.1
Tons carried	160	134	9.9	10.3
Inland waterways				
Ton-kilometers	163	143	10.3	12.6
Tons carried	172	136	11.5	10.7
Coastal waterways				
Ton-kilometers	219	211	17.0	28.2
Tons carried	181	146	12.6	13.6
Total passenger performance				
Passenger-kilometers	199	176	14.8	20.6
Passengers carried	200	196	14.9	25.3

a. 39/
b. Data are for 1963, unless otherwise indicated. 40/
c. Data are for 1964. 41/

Table 4

North Vietnam: Freight Performance
by State-Owned Means of Transportation a/
1960 and 1962-63

Mode	1960	1962	1963	1960	1963
	Million Metric Ton-Kilometers			Percent of Total	
Railroads	704.2	699.1	846.9	78	67
Highways	56.2	89.8	103.8	6	8
Inland waterways	81.1	160.5	202.4	9	16
Coastal waterways	59.2	73.6	116.7	7	9
Total	900.7	1,023.0	1,269.8	100	100
	Million Metric Tons Carried			Percent of Total	
Railroads	2.92	3.22	3.86	52	34
Highways	1.94	4.05	4.36	34	39
Inland waterways	0.60	1.63	2.70	11	24
Coastal waterways	0.20	0.25	0.29	4	3
Total b/	5.66	9.15	11.22	100	100

a. 42/
b. Because of rounding, components may not agree with the totals shown.

Table 5

North Vietnam: Passenger Performance a/
1960 and 1962-63

Mode	1960	1962	1963	1960	1962	1963
	Million Passenger-Kilometers			Percent Performed by State-Owned Transportation		
Railroads	622.9	1,032.5	1,155.2	100.0	100.0	100.0
Highways	372.7	503.2	582.9	25.7	26.5	31.7
Inland waterways	27.5	49.2	57.8	Negl.	5.5	10.4
Total	1,023.1	1,584.9	1,795.9	70.2	73.7	74.9
	Million Passengers Carried			Percent Performed by State-Owned Transportation		
Railroads	13.76	22.44	23.95	100.0	100.0	100.0
Highways	7.24	14.22	16.93	13.9	12.1	14.2
Inland waterways	0.42	0.99	1.21	Negl.	1.5	5.1
Total b/	21.43	37.65	42.09	68.9	64.2	62.8

a. 43/
b. Because of rounding, components may not agree with the totals shown.

Table 6

Truck Traffic Reported by Ground Observers on Route 7 in Laos a/
1963-64 and January-March 1965

Year and Month	Maximum Number of Trucks Moving in One Direction in Any One Day	Total Number of Trucks Reported Moving in Both Directions	Number of Days Covered by Reports	Average Number of Trucks Moving in Both Directions per Day b/
1963	500	8,310	151	55
January	200	1,003	27	37
February	53	332	8	42
March	180	926	13	71
April	68	233	21	11
May	106	692	19	36
June	150	888	15	59
July	200	971	14	69
August	c/	c/	0	c/
September	500	2,229	12	186
October	107	668	14	48
November	100	178	4	44
December	110	190	4	48
1964	350	5,094	114	45
January	c/	c/	0	c/
February	50	50	1	50
March	320	1,187	13	91
April	350	1,491	9	166
May	c/	c/	0	c/
June	57	151	4	38
July	62	73	3	24
August	19	56	7	8
September	80	314	21	15
October	116	729	22	33
November	120	508	15	34
December	93	535	19	28
1965				
January	90	491	15	33
February	50	308	15	21
March	30	191	18	11

a. Based on roadwatch reports of traffic and reports from other sources. Data may include some duplicate counting of the same trucks if the trucks passed more than one observation post along the route. Such duplication has been eliminated whenever possible.
b. Total number of trucks divided by the number of days covered.
c. No reports for the month.

Table 7

Truck Traffic Reported by Ground Observers on Route 12 and Route 23 in Laos a/
1964 and January-March 1965

Year and Month	Maximum Number of Trucks Moving in One Direction in Any One Day	Total Number of Trucks Reported Moving in Both Directions	Number of Days Covered by Reports	Average Number of Trucks Moving in Both Directions per Day b/
	Route 12			
1964				
January	c/	c/	0	c/
February	c/	c/	0	c/
March	4	25	10	2
April	36	141	16	9
May	35	154	22	7
June	7	35	13	3
July	27	63	28	2
August	4	43	22	2
September	7	46	26	2
October	6	56	30	2
November	10	88	30	3
December d/	55	203	31	7
1965				
January	30	182	31	6
February	13	135	28	5
March	6	93	31	3
	Route 23			
1964				
January	c/	c/	0	c/
February	c/	c/	0	c/
March	63	274	5	55
April	47	94	15	6
May	60	217	29	7
June	0	0	17	0
July	0	0	31	0
August	0	0	31	0
September	0	0	31	0
October	0	0	31	0
November	0	0	30	0
December	100	206	31	7
1965				
January	80	661	22	30
February	40	483	27	18
March	95	1,243	30	41

a. Based on roadwatch reports of traffic and reports from other sources along route 12 between its junctions with routes 23 and 8 and along route 23 between its junctions with routes 12 and 9. Route 12 in Laos joins with route 15 in North Vietnam at Mu Gia Pass. Data may include some duplicate counting of the same trucks if the trucks passed more than one observation post along the route. Such duplication has been eliminated whenever possible.
b. Total number of trucks divided by the number of days covered.
c. No reports for the month.
d. Including traffic through 10:00 a.m. on 1 January 1965.

Table 8

North Vietnam: Percentage Distribution of State Investment in Capital Construction, by Sector a/ 1955-56 Average, 1958-60, and 1962-63

Percent

	1955-56 Average	1958	1959	1960	1962	1963
Productive sector b/	87.8	82.6	82.8	81.3	84.8	86.9
Industry	20.5	35.4	37.4	38.8	45.2	43.5
Agriculture	14.8	15.2	11.5	10.7	21.3	23.4
Transportation and communications	44.1	23.3	21.5	17.1	11.9	16.7 c/
Construction	1.8	1.8	2.9	7.7	3.4	1.4
Trade	6.6	6.9	9.6	7.0	3.0	1.9
Nonproductive sector	12.2	17.4	17.2	18.7	15.2	13.1
Total	100.0	100.0	100.0	100.0	100.0	100.0

25X1 [redacted]

b. Because of rounding, components may not agree with the totals shown.

c. Including 1.2 percent of the total state investment allocated

25X1 separately [redacted] to communications.

Table 9

North Vietnam: Selected Operating Data for Railroad Transport a/
1960 and 1962-63

Factor	Unit of Measure	1960	1962	1963
Average gross tonnage per freight train b/	Metric Tons	637.8	613.7	637.8
Average gross tonnage per freight car c/	Metric tons	18.8	21.4	22.2
Average turnaround time per freight car	Days	2.3	2.6	2.6
Average speed of freight trains, including stops	Kilometers per hour	19.0	19.7	19.0
Average speed of freight trains, excluding stops	Kilometers per hour	27.1	28.5	28.0
Average daily run per freight locomotive	Kilometers	241.0	250.0	263.7
Coal consumption per freight locomotive	Kilograms per 10,000 metric ton-kilometers	354.3	385.8	338.2
Average speed of passenger trains, including stops	Kilometers per hour	21.8	22.6	22.8
Average speed of passenger trains, excluding stops	Kilometers per hour	29.1	30.4	30.6

a. 47/
b. Translated as "average total capacity" of one freight train.
c. Translated as "average capacity" of one freight car.

Table 10

North Vietnam: Selected Operating Data for State-Owned Trucks a/
1960 and 1962-63

Factor	Unit of Measure	1960	1962	1963
Days in good condition	Percent	80.9	67.7	73.6
Days in operation	Percent	71.3	62.7	67.9
Operating capacity used b/	Percent	96.7	96.0	96.3
Average daily length of run for one truck	Kilometers per day	146.1	140.4	138.6
Average annual performance	Thousand metric ton-kilometers per truck-ton per year	24.4	21.8	21.0
Average annual performance, including truck-trailers	Thousand metric ton-kilometers per truck-ton per year	N.A.	31.9	30.6
Average daily performance per truck	Metric ton-kilometers per day	226.4	229.5	375.0 c/

a. 48/
b. Translated as "rate of use of truck capacity."
c. The figure, 375.0 metric ton-kilometers, appears to be much too high to be consistent with other operating data for 1963. In order for this figure to be valid, North Vietnam would have had to add a considerable number of large trucks to its civil inventory during 1963. More than likely the figure is wrong.

Table 11

North Vietnam: Selected Economic Indicators
1956-64

Economic Indicator	Unit of Measure	1956	1957	1958	1959	1960	1961	1962	1963	1964
		Absolute Data								
Population a/	Million persons	15.0	15.2	15.4	15.7	16.0	16.3	16.6	16.9	17.3
Gross national product b/	Million 1960 dong	2,665	3,135	3,401	3,906	4,007	4,282	4,602	4,723	5,134
Industrial production (excluding handicrafts) c/	Million 1959 dong	245.8	344.6	447.4	648.1	840.4	1,046.8	1,372.6	1,513.5	1,750.1
Agricultural production c/	Million 1959 dong	1,743.4	1,816.9	2,039.1	2,224.9	2,046.2	2,224.9	2,349.2	2,309.3	2,464.0
Transport performance in metric ton-kilometers	Million	332.2	367.1	566.8	903.5	1,192.9	1,306.0	1,321.7	1,601.4	1,751.9
Transport performance in metric tons carried	Million	5.02	5.46	7.00	10.43	13.00	14.80	16.05	17.48	18.69
		Indexes (1956 = 100)								
Population		100.0	101.3	102.7	104.7	106.7	108.7	110.7	112.7	115.3
Gross national product		100.0	117.6	127.6	146.6	150.4	160.7	172.7	177.2	192.6
Industrial production (excluding handicrafts)		100.0	140.2	182.0	263.7	341.9	425.9	558.4	615.7	712.0
Agricultural production		100.0	104.2	117.0	127.6	117.4	127.6	134.7	132.5	141.3
Transport performance in metric ton-kilometers		100.0	110.5	170.6	272.0	359.1	393.1	397.9	482.1	527.4
Transport performance in metric tons carried		100.0	108.8	139.4	207.8	259.0	294.8	319.7	348.2	372.3

a. Midyear data.
b. At market prices in 1960 dong. Dong values may be converted to US dollars at the rate of exchange of 3.7 dong to US $1. This rate does not necessarily reflect the relative internal purchasing power of the dong in terms of the dollar.
c. Gross value in 1959 dong.