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DIRECTORATE OF  
INTELLIGENCE

# Intelligence Memorandum

POSSIBLE ALTERNATIVES TO THE ROLLING THUNDER PROGRAM

(THE CASE WHERE THERE IS A COMPLETE CESSATION  
OF BOMBING IN NORTH VIETNAM AND LAOS.) (NO. 9)

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24 APRIL 1968

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CENTRAL INTELLIGENCE AGENCY  
Directorate of Intelligence  
April 1968

INTELLIGENCE MEMORANDUM

POSSIBLE ALTERNATIVES  
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of Bombing in North Vietnam and Laos.) (No. 9)

Summary

This memorandum analyzes the anticipated effects of a cessation of the present Rolling Thunder program. Present geographic restrictions, which apply only to North Vietnam, permit attacks on targets below the 20th Parallel. This self-imposed US restriction has removed the main industrial areas and transportation centers of North Vietnam from exposure to bombing attacks. It has, in turn, given a clear-cut indication of Hanoi's probable actions in the face of a complete cessation of attacks. Since the present US geographic bombing limitations began, the North Vietnamese have been making temporary repairs to key rail and highway bridges in the northern areas and restoring the damaged, but repairable, portions of electric power generating capacity.

We believe that a full bombing halt against both North Vietnam and Laos would probably bring about the following short-term results:

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1. The extension into the Panhandle of the program for the full restoration of through service on the principal rail and highway links, by repairing key bridges which are currently out. Mines would also be removed from the inland waterways.

2. In consequence, this restoration not only would permit the more efficient movement of goods within North Vietnam, but also would improve the capability of moving war-supporting supplies into the North Vietnamese Panhandle, and into Laos. The efficiency of truck operations would be vastly improved because daylight movements would be greatly increased and the need for camouflage and evasive action would be ended. Much larger tonnages of logistic support and increased numbers of personnel could be moved through Laos to South Vietnam with no increase in the size of the truck inventory.

3. The improvement immediately of morale and living conditions of the North Vietnamese people would ensue. Within the six-month period, many civilians who had been evacuated from urban areas would return to their homes.

4. The redeployment of a small portion (perhaps 15 percent) of anti-aircraft strength to South Vietnam to afford protection for VC/NVA operations in that area would be possible. This might entail the movement of 1,500 weapons and about 6,000 men.

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5. North Vietnam would be capable of redeploying a few thousand additional troops to the south, but there would probably be no significant immediate redeployment since the initial logistic repair effort would absorb about the same size force as is currently employed on maintenance of lines of communication. Casualties, which reached a level of about 36,000 in 1967 as a result of the Rolling Thunder campaign, would come to a halt.

6. A clear-cut propaganda and political victory would be seen, in Hanoi's view. It would see the United States forced to take action as a result of political pressures. The regime would be encouraged in its belief that the United States would ultimately tire of the war and that Hanoi's firm policy had forced the United States to retreat.

In the long run, if the bombing halt persisted, Hanoi would be encouraged to move from a program of temporary repairs to one of full rehabilitation of industry and transportation. The regime is known to have developed detailed plans for the post-war period. A continuation of the bombing pause beyond six months would probably tempt Hanoi to put its long-term rehabilitation plans into effect, unless the state of the war were such that an early resumption of US air action appeared to be imminent. The long-term effects, apart from the increased possibilities of full economic restoration, would be:

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1. An improvement in agricultural output as more domestic fertilizer and agriculture equipment were made available. Given normal weather conditions, most, but not all, of the food deficit would probably disappear.

2. The addition of perhaps 100,000 to 150,000 men to the manpower pool as the restoration of the transportation system was completed. They would be available for military training and eventual redeployment to South Vietnam if Hanoi believed such redeployment could safely be carried out -- that is, if Hanoi believed that large-scale bombing against the north probably would not be resumed.

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I. Impact on the Economy of North Vietnam

A complete standdown of the Rolling Thunder program would afford the North Vietnamese an opportunity to begin a general program for restoration and reconstruction of economic damage. During the short run -- the first six months -- the primary effort would be to begin the restoration of the electric power industry. Evacuated civilians would return to the cities, and there would be a significant immediate improvement in living conditions and morale. Productivity would quickly improve, particularly in transport, construction, and manufacturing. A bombing halt would have little impact on agriculture in the short run, the fifth-month rice crop already being planted.

An extended standdown on the order of one to two years would result in major progress being made in repairing bomb damage throughout North Vietnam, but only if the Hanoi leadership believed there was no likelihood of the resumption of the bombing. The restoration of all damaged industries, and the planning of new industries, some of which are already contracted for, would probably be well advanced. Those manufacturing processes that have not operated efficiently under the dispersal program would be returned to urban areas. Agriculture might make some progress toward increased yields, but this is generally a longer range problem that involves changes of deep-seated practices. The speed with which the reconstruction effort progressed would be largely dependent upon the material and technical assistance the North Vietnamese obtained from the USSR, the Eastern European countries, Communist China, and Free World countries.

A. Industry

A cessation of the bombing probably would result in only nominal improvement of North Vietnam's industries in the short run. Full recovery would require from one to two years and involve reconstruction, some relocation from dispersed sites, and foreign technical and material assistance. North Vietnam lacks the necessary skilled labor force, raw materials, and finished goods to construct

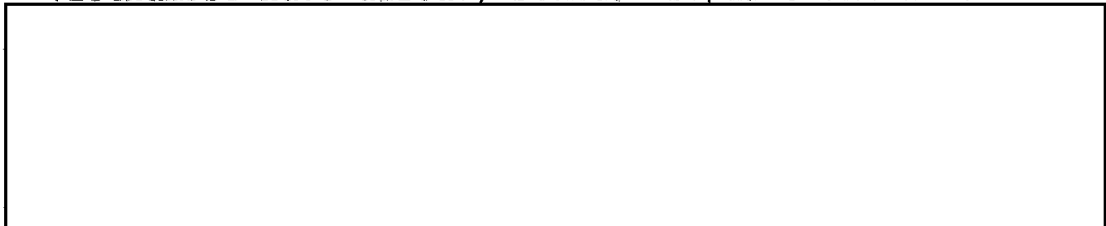
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modern industries by itself. Industries that supply essential services, support agriculture, and earn foreign exchange are most likely to be reconstructed first, and in that order.

Restoration of the electric power industry will be a formidable task because the power industry has sustained the heaviest damage of any North Vietnamese industry. At present, only about 40 percent of the total nationwide pre-bombing generating capacity is in operation. Moderately damaged equipment probably could be repaired within six months, and such repairs would increase serviceable capacity to about 60 percent of the pre-bombing national total. Much of the remaining equipment, however, is so severely damaged that increases of capacity beyond this level would require major reconstruction and time periods of up to two years for full restoration (see Table 1). Restoration of many undamaged industrial facilities presently not in operation can be accomplished by restoration of damage to electric power facilities. Several heavily damaged electric powerplants probably will be scrapped and entirely new electric power facilities constructed.

Some industrial plants would be back in partial production within six months, although several of the heavily damaged plants would require one to two years to be completely repaired (see Table 2).

The Haiphong Cement Plant was severely damaged by bombing raids in April and May 1967 and has been inoperative since that time, but the North Vietnamese have already started repairs and have



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about two years to restore the plant to original capacity.



Table 1

Estimated Restoration of Damaged Electric Power  
 Generating Plants Six Months after a Bombing Halt a/

Powerplant	Pre-Bombing Capacity (Megawatts)	Serviceable Capacity (Percent)	
		April 1968	Six Months Later
Hanoi	32.5	75	75
Haiphong West	10	0	50
Haiphong East	7	0	0
Viet Tri	16	25	50
Thai Nguyen	24	25	50
Bac Giang	12	50	100
Uong Bi	24	0	50
Hon Gai	15	20	33
Nam Dinh	7.5	33	67
Thanh Hoa	5	50	50
Ban Thach	1	100	100
Co Dinh	1.5	0	0
Ben Thuy	8	0	25
Subtotal	163.5	30	55
Other (undamaged)	23.5	100	100
<i>Total</i>	<i>187.0</i>	<i>39</i>	<i>60</i>

*a. Total restoration in most cases will require one to two years.*

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Table 2

Estimated Recovery Times for Selected Large Manufacturing Plants

	Current Status as of April 1968	Projected Operational Status	
		Six Months Later	One to Two Years Later
Thai Nguyen Iron and Steel Complex	Out of operation	Limited, one-third prestrike capacity	Full
Haiphong Cement Plant	Out of operation Construction work in progress	Limited, one-fifth capacity	Full
Nam Dinh Textile Plant	Finishing shops in operation	Limited, one-fourth capacity	Full
Hanoi 8th March Textile Plant	Partially dispersed; finishing shops in operation	Full	
Viet Tri Paper Plant	Out of operation	Full	
Bac Giang Chemical Fertilizer Plant	Out of operation	Full	

Frequent bombings of the Thai Nguyen Iron and Steel Complex during March-June 1967 destroyed or damaged much of the complex. A number of the workshops and fabricating buildings were destroyed or damaged; the coke by-product plant, the coke battery, the sintering building, all three blast furnaces, and a number of ancillary facilities were rendered useless. The incomplete open hearth and rolling mill buildings were also heavily damaged, as were research facilities and administrative

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buildings. Since the end of June 1967, the plant has been completely inoperative. The plant could be restored to one-third of its pre-strike capacity to produce pig iron in about six months, but complete restoration and the completion of steel making facilities previously under construction that had never been completed would take two years.

Relocation of dispersed shops of manufacturing plants probably would be one of the first steps in recovery. The only known dispersals of relatively large plants, however, include the Hanoi 8th March Textile Plant, the Nam Dinh Textile Plant, and the Haiphong Fertilizer Plant. Much-publicized claims of industrial dispersal appear to have referred to small and light industrial establishments such as handicrafts, repair shops, and some sections of the two textile mills.

Export of industrial commodities other than coal is not likely to change significantly in the short run. Resumption of pig iron and cement exports will require full reconstruction of damaged manufacturing facilities. Repair of bomb damage to coal-processing facilities, however, has allowed a steady increase in the export of coal since September 1967, bringing the current level to about 60 percent of that maintained during the first quarter of 1967. The pre-strike level of coal exports probably could be attained within six months.

The North Vietnamese apparently have already been preparing for the reconstruction that would follow a permanent cessation of bombing. During 1967, formal negotiations were conducted with Communist and non-Communist countries for assistance in rebuilding a number of destroyed plants. Most of the negotiations involved preliminary estimates and surveys, and frequently resulted only in agreements for the services of specialists and technicians or for training. Deliveries of machinery and equipment for basic industry under contracts signed in 1967 were usually deferred, in some cases until late 1968. A North Vietnamese industrial delegation visited Paris in the fall of 1967 to discuss post-war construction with a number of French firms. More substantial talks are expected when the war

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ends. In addition, about 20,000 North Vietnamese are expected to receive training in Communist schools and industries between now and 1969. These students will augment the technical labor force that will be required to operate the post-war economy.

B. Agriculture

A bombing standdown would have no noticeable effect on North Vietnam's agricultural output over the next six months. The fifth-month rice crop, supplying about one-third of the annual output of rice, has already been transplanted, with harvesting to take place in late May and early June. It is possible that the tenth-month rice crop could be improved if the preparation of the crop could be accomplished without the disruptions from bombing.

A continued bombing halt would permit the Vietnamese to increase agricultural output slightly, if the regime continues to import fertilizer and increases imports of agricultural machinery and if improvements are made on the water control system. However, agriculture has been tradition-bound in North Vietnam for centuries, and dramatic increases in output in the short run or even over a two-year period cannot be expected. Furthermore, immediate agricultural prospects are highly dependent on unpredictable weather conditions.

Rice production has declined during the last two years of the bombing from a normal level of 4.5 million tons in 1965, to an estimated 4.2 million tons in 1966 and 4.0 million tons in 1967. The decline in the last two years was due partly to adverse weather and a shift from rice to subsidiary crops.

Bombing has had only a marginal effect on agricultural output because of the low stage of agricultural development. North Vietnamese agriculture is extremely primitive and a majority of the large agricultural labor force is engaged in

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producing rice, the basic foodstuff. The agricultural labor force accounts for about 70 percent of the total labor force and includes a large percentage of women. Seasonal unemployment and underemployment are typical.

The primary detrimental effects of the bombing have been the diversion of manpower, particularly managerial cadre, to military and war-related activities; the daily interruptions of routine agricultural chores for manning antiaircraft guns or taking cover in shelters; and the disruptions to the manufacture and distribution of fertilizer and other farming input materials.

The level of agricultural imports would be little changed during the first few months of a bombing pause, but imports could decline substantially thereafter. North Vietnam has been heavily dependent on imports of food to supplement domestic output since late 1966. During an extended bombing halt, food imports probably would drop back to the pre-bombing level of about 200,000 tons from the high of about 450,000 tons imported in 1967. North Vietnam now imports about 160,000 tons of nitrogenous fertilizer a year. In the short run, this level of imports probably would continue. Over a one or two year period, as domestic facilities began producing nitrogenous fertilizer, the volume of fertilizer imports probably could be reduced. Phosphatic fertilizers are obtained from domestic sources and are not imported.

### C. Civilian Manpower

A cessation of the bombing will not immediately free large numbers of persons for military duties. The bombing has required the diversion of less than 200,000 full-time civilian workers, both men and women, young and old, to repair lines of communication (LOC's) and to move supplies. Only a small number of these workers are physically fit males of military age. A cessation of the bombing probably would not free the diverted full-time workers over the short run, in view of the amount of bomb damage already sustained which must be repaired and the ever-present

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possibility of a resumption of the bombing. Over the long run, some of these diverted full-time workers would be available for reassignment. An additional 300,000 to 400,000 workers are currently required part time for repair, reconstruction, transport, and civil defense when local conditions demand. An estimated 100,000 of these part-time workers are mobilized in their local areas to man civil and air defense posts and would not be needed during a bombing halt. Some of the remaining part-time workers are engaged in repairing LOC's and moving goods probably would continue this work during a bombing halt, at least in the short run. In the long run, perhaps 100,000 to 150,000 would be available for other purposes, including military duties.

D. Living Conditions

A bombing halt would immediately improve the morale and living conditions of the North Vietnamese people. North Vietnamese morale has been most damaged by the evacuation of non-essential persons from urban areas because the North Vietnamese have a strong sense of family. An estimated 50 percent of the population of Hanoi and 75 percent of that of Haiphong have been evacuated. It is probable that within six months most evacuated persons would have returned to urban areas. Other hardships, including interruption of normal work routines, personal injuries, loss of life, property damage, and the constant threat of bombing, would also be alleviated by a bombing halt.

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## II. Impact on Logistics

### A. Present Status of the Transport System

Despite the bombings the capability of North Vietnam's transport system remains adequate to meet the country's economic and wartime requirements, and in several important areas capacity has been substantially increased by the construction of new facilities and improvements to the old. Continuous air attacks over the past three years have destroyed key bridges, disrupted traffic, and destroyed large amounts of transport equipment, but the transport system continues to function with the assistance of numerous bypass facilities, extensive transshipments, night operations, importation of transport equipment, and the expenditure of substantial amounts of labor and material on repairs and countermeasures. Transport in the Hanoi and Haiphong areas has been hindered by damage to key bridges, but a number of rail and highway bypasses and the use of watercraft provide capacity far in excess of that available before the bombing. Through rail service from Hanoi south to Vinh has usually been impossible, but shuttle traffic continues. Highway traffic south of Hanoi is continually disrupted by the bombing, but large truck movements continue. The capacity of the transport routes is well in excess of the relatively small volume of goods required from North Vietnam to support the war in the south.

### B. Repair and Reconstruction

A bombing halt would result in a concerted effort to restore key rail and highway routes to full service. The most important aspect of these repairs would be the reconstruction of major bridges, including the Haiphong Railroad/Highway Bridge (only recently repaired), rail and highway bridges at Hai Duong and Ngoc Kuyet, and the Hanoi Railroad/Highway (Doumer) Bridge over the Red River. In addition, several important rail facilities would be repaired on the Hanoi-Vinh rail line and on the Hanoi-Dong Dang line.

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The first priority would be the improvement of through rail service to and from Haiphong. Preliminary analysis of [ ] photography reveals that the North Vietnamese have already taken advantage of the limited bombing halt to restore the main rail bridge at Haiphong. Imports can now move directly from Haiphong by rail, lessening the need for trucks in the area. Further west, restoration of damaged rail/highway bridges at Hai Duong and Ngoc Kuyet and the reconstruction of the Doumer Bridge would permit improved through rail service from Haiphong to Hanoi.

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The second priority would be the restoration of the rail and highway LOC's leading south of Hanoi to Vinh -- the heavily damaged Hanoi-Vinh rail line and highway Routes 1A, 15, 7, and 137. Through rail service to Vinh has been hindered by damaged bridges, although movement of rail traffic has continued by shuttling rail cars between interdicted points. Restoring through rail service to Vinh would greatly improve North Vietnam's capability to move goods into the Panhandle for storage or for further distribution into Laos or South Vietnam.

The third priority would be the repair of rail bridges and yards along the Hanoi-Dong Dang line, the principal rail connection to Communist China and the route over which most overland imports are moved.

During the early months of a bombing halt, construction crews would probably make only temporary repairs of rail and highway LOC's, relying mainly on materials available locally such as timber, stone, and bamboo; but if the bombing halt were extensive, permanent repairs and expansions of capacity could be accomplished in about two years. Temporary crossings could eventually be replaced with steel and concrete bridges. Some bridges, such as the Doumer Bridge, probably would be completely rebuilt because of extensive bomb damage. The rail network could be completely

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converted to dual or standard gauge. This would require the reconstruction of many major bridges that would not be adequate to carry heavier standard gauge equipment.

The primary restoration work required on the waterway system would be the removal of latent MK-36 mines sown in key waterway locations. Mined areas could be cleared shortly after a bombing halt by towing metal-laden rafts over areas in which the magnetically sensitive MK-36's have been sown. The waterway system has been intensively bombed, but the flexibility and primitive nature of the system have minimized bomb damage. Restoration of damaged port facilities in the south would eventually be undertaken, however.

### C. Logistics Flows Through North Vietnam

A complete cessation of the bombing of North Vietnam would result in an increase in the volume of military supplies, petroleum, and military related economic goods being moved into and through the North Vietnamese Panhandle. The Panhandle of North Vietnam would become even more important as a rear staging area for the war in South Vietnam. The number of storage sites, truck parks, petroleum storage areas, repair sites, and distribution centers probably would be increased. The initial increase in logistics activity would not be due to a lifting of a "ceiling" on the volume of traffic that had been imposed by bombing -- bombing has had little limiting effect on traffic flows in the past -- but would be due to a desire to take advantage of what may be a short-lived opportunity to move traffic with a minimum of cost and effort. After the first surge to improve stockpiles and resupply units in southern North Vietnam, Laos, and South Vietnam, the flow of supplies would depend on Hanoi's future intentions and the course of the war in South Vietnam.

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III. Impact on the Military

A. Air Defense Systems

During the first six months after a cessation of Rolling Thunder and the bombing in Laos, some redeployment of aircraft and antiaircraft artillery could take place, but there would be no demobilization of North Vietnamese air defense forces. Damage to important airfields would be repaired [redacted]

[redacted] A few MIG's might be relocated to an airfield near Vinh and later to an airfield near Bai Thuong now under construction in order to oppose Allied aircraft operating over northern South Vietnam. [redacted]

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Despite the heavy damage inflicted under the Rolling Thunder program, the North Vietnamese air defense system has been expanded and made more effective since the start of the bombings. Destruction of jet fighters has been particularly heavy, but replacements from the USSR and China have been sufficient to maintain the inventory at a relatively constant level since 1965. [redacted]

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[redacted] Damage to airfields has been repaired in relatively short periods of time and work continues on new airfields. [redacted]

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[redacted] Although air-strikes have necessitated frequent redeployment of SAM equipment, which probably has reduced the efficiency of the firing units and has complicated logistics, the North Vietnamese now have up to 30 SAM firing battalions, and new SAM sites are being built throughout the country.

As many as 1,500 antiaircraft weapons, about 15 percent of the total installed in North Vietnam, could be redeployed to South Vietnam without seriously impairing North Vietnam's air

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defense capability. About 60 percent of these could be 37-mm weapons or larger.

Significant changes in the North Vietnamese air defense system over a two-year span would depend on the North Vietnamese evaluation of the likelihood that air attacks would not be resumed.

#### B. Military Equipment Imports

During the first few months of a bombing pause, imports of military materiel probably would be maintained at current levels in order to build up stockpiles, but during an extended bombing halt, the import of air defense materiel could be drastically reduced since ammunition expenditures and equipment damage would be minimal. The current value of air defense related imports -- missiles, aircraft, AAA ammunition, and other materials -- may be as much as \$530 million per year. The emphasis of military imports could be shifted from air defense equipment to infantry weapons, and the heavy dependence on the USSR for military aid could be reduced substantially because the USSR is the chief donor of air defense equipment and supplies.

Almost all of the military materiel used by North Vietnam must be imported from other Communist countries. Since the bombing began, the USSR and Communist China have expanded their military aid to North Vietnam from an estimated \$270 million in 1965 to about \$660 million in 1967. The USSR has concentrated on air defense equipment including surface-to-air missiles, antiaircraft guns, radar, and fighter aircraft, including MIG-21's. Chinese military aid has concentrated on building up North Vietnamese ground forces and sustaining the military effort in South Vietnam. In addition, China apparently has supplied radar and MIG-17/19 aircraft. During 1967 the European Communist countries supplied small amounts of military related goods and some weapons.

#### C. Military Manpower

Under a bombing halt, military manpower availability would probably not be changed

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appreciably and the size of the North Vietnamese military establishment probably would not be altered. As long as the danger of an invasion or a resumption of the bombing exists and North Vietnam continues to supply manpower for the war in the south, it is unlikely that Hanoi would reduce military force levels (built up since 1965 from 240,000 to about 480,000). North Vietnamese air defense forces in the Laotian Panhandle probably would be kept in place as security for the lines of communication. About 6,000 air defense troops, however, could be freed for similar duty in South Vietnam without weakening North Vietnam's air defense. Of the North Vietnamese in-country ground forces, an estimated 50,000 are presently available to send to South Vietnam, irrespective of the level of bombing. In addition, more than 100,000 new recruits each year are available to augment or replace out-of-country forces.

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#### IV. Effects in Laos

A bombing halt in the Laotian Panhandle would make the movement of men and equipment into South Vietnam easier, but it would not necessarily result in a greatly increased flow of personnel and supplies. The level of military tonnages and personnel that could be moved through Laos by truck would increase the danger of an invasion of South Vietnam by a conventional large-scale military force. The Communists could with increased speed mass forces and supplies in four general areas of southern Laos -- opposite South Vietnam's Quang Tri, Thua Thien, Quang Tin, and Kontum Provinces. Bombing has not previously limited the flow of men and supplies in Laos, however, and traffic through Laos is and would be determined more by Hanoi's intentions in South Vietnam and Hanoi's estimate of what the United States would tolerate before resuming air attacks.

The Communists probably would continue to extend border crossing roads into South Vietnam, upgrade river crossings, and improve existing roads and their all-weather capability. There would be little expansion of the road network in Laos beyond that currently under way, however, because the network presently is adequate for any foreseeable Communist requirement.

The efficiency of truck operations would be vastly improved by an increase in daylight operations and by elimination of the need for camouflage and evasive action. Much larger tonnages of logistic support and larger numbers of personnel could be moved into or through Laos with no increase in the truck inventory.

Infiltration casualties and equipment losses would be eliminated. About 20 percent of the equipment and supplies transiting Laos are currently assumed to be lost from all causes while en route to South Vietnam.

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During an extended bombing halt, after reconstruction and repairs of bomb damage were completed, the requirement for manpower would be reduced. In the long run, about one-third, or 10,000, of the North Vietnamese used to maintain and protect infiltration routes could be made available for service in South Vietnam or could be returned to North Vietnam.

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