

Adapting Our Highway System to National Defense
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When the nation is suddenly confronted with a great emergency and its people generally are aroused to a realization of the situation which may gravely imperil its security, there ensues a period of confused public thinking. The attitude of the whole public then is not unlike that of the single individual who under comparable circumstances turns futilely in many directions with the hope of doing simultaneously all of the things that may occur to him to meet his problems quickly. His failure is the inevitable result. Not until he realizes that his one chance of success is to concentrate his energies upon "first things first," does he make progress toward the ultimate solution of his problems. This orderly process will take longer and more self-discipline, but it is the only sure way to reach the desired end. Certainly this is not a new thought or a new principle. It is a very homely statement of fact that is common knowledge, and it may be accented - common sense. Order and discipline become most important in the process of incorporating the program of adequate preparedness as a continuing element of our national life, since those charged with the responsibility of leadership need the help and encouragement that can only come from unity of purpose and from intelligent thinking through to the real objectives.

Just what is the nature of the highway problem in its relation to the national defense and what are the "first things first"? Fortunately in the general field of highway improvement there need be no confusion as to the necessary program and its logical sequences as a major defense element if a single purposed honesty of motive and disinterested counsel prevail in its conception. Self service must take second place to common service. The ideal is to do those things which will lift the nation's capacity to function efficiently to the highest level yet attained and to hold it at that level. This is the only sound conception of national preparedness. It means a continuing drive, not a hastily conceived shooting of skyrockets as an entertainment, but a long, consistent application of effort and available resources toward precise objectives.

Such a program embraces a wide variety of operations -- many of them of seemingly impossible proportions. To illustrate the demand upon certain industries, the statement of Mr. Wm. S. Knudsen, member of the Advisory Commission to the Council of National Defense, is highly illuminating. In a recent plea for the cooperation of industry, he indicated that at the moment machine tools were the bottleneck of defense production and their estimates of required output would mean the stepping up of production from a normal annual output value of about 130 million dollars to 500 million dollars. Not only this 400 percent increase in this single field of industrial production is required, but also the exclusive specialization in those types of machine tools needed for the manufacture of defense equipment and supplies. The implication of the

general and generous acceptance of this policy on the part of the automotive industry sets a new high in whole-hearted cooperation between industry and government. It establishes a new and higher plane in the underwriting of support for the common good by private industry. And to what purpose? That it is possible, through understanding and willingness, to prove the vigor and effectiveness of democratic principles.

When we come to the highway program, it is already certain that public officials charged with the responsibility and authority to expend public funds will be as responsive to the immediate needs of the nation as private industry.

After many years of experience in dealing with the highway officials of all the States, I am convinced of the certain response of the large majority. Just as in the case of private industry, confidence in the aim and direction of leadership is essential, so is it necessary to make certain that the highway program is clearly defined and that it is directed toward the most important objectives. To meet this latter condition, the efforts in Washington by the Public Roads Administration and other interested units of the National Government have been directed toward first, an analysis of the highway needs to fix the order of priority, and second, the establishment of procedures that will accomplish what is possible within the limits of the now available funds, and preparation of surveys, plans, and cost estimates for those projects of immediate importance, but which by their wholly defense character, justify new financing policies.

There are three principal defense agencies: The War Department, the Navy Department and the Advisory Commission to the Council of National Defense.

The defense program in all of its wide ramifications is generated by or flows through these agencies, so when we speak of the highway program for the national defense we must think in terms of the findings which have been made by one of these agencies, in which are lodged the sole power to determine the validity of the defense character of a project.

As of the present time approximately 175 military and naval reservations and industrial plants have been certified to the Public Roads Administration as areas in which the roads serving them are of defense importance. This list is constantly growing. These roads in general are the connections between the roads and streets within the reservations or plant areas, and the arterial roads in the vicinity and nearby communities. Within this category are numerous roads, most of them of relatively short mileage, but very important and necessary for the efficient functioning of the particular facility which they serve. The 175 posts which have been designated are scattered widely from coast to coast, but naturally the concentration is more marked along the Atlantic Seaboard.

In the field of traffic routes as distinguished from access roads, the War Department has certified a system of roads which we call the strategic network, consisting of approximately 75,000 miles, which incorporates the long-distance routes which are held to be important to the national defense.

From this brief description it will be noted that outside of the Federal reservations themselves, there are two main classifications of highways - access roads and the strategic network. The classification of all defense highways which has been adopted is as follows:

- (1) Strategic network - rural - including interregional routes.
- (2) Strategic network - urban - including extensions of the interregional system into and through metropolitan areas.
- (3) Access roads - urban and rural.
 - a. Army camps - mobilization points
 - b. Navy
 - c. Rail terminals
 - d. Airports
 - e. Industrial production areas
- (4) Defense reservation roads
- (5) Tactical roads

A few months ago it was thought that the improvement of this strategic network, because of its long mileage, and because, with minor exceptions, it coincided with the most important traffic routes of the nation, would be a matter of first concern. Now the situation is quite reversed. It has become apparent that the access roads are of immediate urgency and must be given first consideration. Since the strategic network was designated some months ago, Congress has provided for the mobilization of the National Guard and the selective draft of young men for military training. A vast program of essential equipment, ordnance

and military supplies, is under way, necessitating many new plants and the enlargement and transformation for new uses of many old ones. The partial estimates now available indicate that the Army and Navy alone have need for 2,900 miles of access and reservation roads which if adequately improved will cost around \$200,000,000. The job of planning these access roads is under way, and in many cases the actual construction with the regularly available Federal and State funds is going forward. The State highway departments are cooperating in making plans and surveys and supervising construction work.

Before discussing the strategic network in detail, it is desirable to look at the background of the now existing major highways. When the Federal-aid system was first selected by joint action between the State and Federal highway departments, the War Department was formally requested to prepare recommendations as to the roads which were most important to the national defense. The findings took the form of a map which we have long termed the Pershing Map, since it was signed in 1922 by General Pershing. All of the routes carried by this map were incorporated in the Federal highway system when it was first selected eighteen years ago. At intervals since then, there have been reviews by the War Plans Division of the General Staff. Modifications and additions to the system have been made in line with their suggestions through the intervening years. A more critical review extending over the past two years resulted in the approval by the War Department of a system of major routes which we call the strategic network. It is

thus apparent that the cooperative road program of the States and the Federal Government has since the legislation of 1921 been very largely concerned with the improvement of those roads now incorporated in the strategic network.

In the report "Toll Roads and Free Roads" recommendation was made for the improvement of a system of interregional highways to be designated and built as free-flowing arteries connecting and serving the important population areas of the nation. This system it was estimated would require about 30,000 miles. The selection of the particular routes was based upon the factual data of the State planning surveys, so that it is certain that the routes carrying the heaviest traffic throughout the nation were incorporated in this conception of an interregional system. Substantially all of this mileage is incorporated within the strategic network, and in addition about 45,000 miles, most of which mileage is coincident with the routes of the next order of importance, measured by the traffic which they are known to be carrying now. This states that the strategic network as designated comprises substantially the 75,000 miles of most heavily traveled highways of the nation.

When the first recommendations as to defense routes were secured from the War Department, careful consideration was given to the structural capacities of the road design required by military ordnance and equipment. These studies resulted in the conclusion that has become almost axiomatic - that the design specifications for highways and bridges

that would provide adequately for civil use would safely carry military loadings.

Provision for the national defense has been used through the years as one argument for the Federal Government to extend financial assistance to developing the major roads, but it could not conceivably have been foreseen to what extent this Federal aid has actually provided for the national defense. For example, on the strategic network there are 16,700 bridges. Due to the adoption of uniform specifications, less than 15 percent of these bridges are today inadequate to carry the heaviest loadings that it now appears our armed forces may wish to move over the highways. This does not mean, however, that our highways even approach adequacy. There are weaknesses in the strategic system which have been revealed by the highway planning surveys. These weaknesses include around 5,000 miles of road surface less than 18 feet in width, in excess of 14,000 miles deficient in structural strength, and a very considerable mileage inadequate to carry without congestion additional volume of traffic.

The immediate program then must concern itself, first, with the improvement of access roads of all kinds. While the needs of the Army and Navy establishments have been indicated rather closely, the industrial access roads in my judgment will add into rather large mileages as a total.

The production process which is certain to develop a large amount of transportation of materials locally in the plant areas, and a very large increase in the number of employees to be transported daily, forecasts congestion and delays that cannot be tolerated.

There is also another class we term tactical roads that will exist in rather large mileages in those areas where training and practice maneuvers are held, and which will require betterment and particularly maintenance during and succeeding their use for this purpose.

The program of eliminating the most pressing weaknesses in the strategic network will include shoulder widening, new surfaces and in particular the replacement of sub-standard bridges. It must be apparent, however, that the now foreseen increases in traffic on the major routes of the strategic network due to movement of military forces and supplies, must be small relative to the existing traffic which now congests these highways. There are now in the neighborhood of 4,500,000 trucks alone upon the highways, and while I do not have any exact figures as to the ultimate number of trucks that will be in service by the military forces, we may estimate for comparison around 200,000 as the probable maximum for the immediate future.

Perhaps the ratio of 4,500,000 to 200,000, or one to 23, does not give an exact picture, but it is indicative of the fact that we are using motor vehicles to such an extent in this country - now well above 30,000,000 that the additional military traffic, as such, does not create the problems which already exist but only intensifies them.

There was as large an increase in truck registration between the years 1938 and 1939 for civil use as the entire probable number of military trucks will reach within the immediate future. There is no escaping the fact that at least the top half of the 75,000 miles of strategic network which is coincident with the indicated 30,000 miles of the interregional

system is in serious need of replacement by highways of the free-flowing type, as a part of our national economy of operation including defense. The most serious phases of this necessary work are in the cities and metropolitan areas. The great expense and the certain far-reaching effect upon the area development which characterize the express highways within the metropolitan areas, necessitate the most intelligent master plan that can be formulated. The necessary engineering work and the securing of rights-of-way before any part of such a master plan can become a usable facility, are time-consuming operations which should be carried forward now against the day when active construction must be put under way.

A logical and necessary program is definitely evolving to meet defense requirements. The routine procedures that have been established have led to decentralization in the consideration of the problems in every State. A spirit of coordination and cooperation has been established and is rapidly growing. There is no thought on the part of the Federal organization of attempting to dictate programs or sequences of undertakings in any State. The highway departments are one of the most valuable defense organizations we have and are working wholeheartedly and efficiently upon "first things first."

Since defense is dependent to so great a degree upon mechanized, motorized operations, it is certain that roads must play an increasingly important part as the training and production programs gather momentum. In the improvement and maintenance of these roads the asphalt industry has and will continue to have a highly important place and as in the past I am confident of the full cooperation of the whole industry in every possible way.