

## ROADS FOR NATIONAL DEFENSE

(Notes for an article to appear in the Engineering News Record)

Mature consideration of defense highway requirements developed the necessity of improvements of various classes, as follows:

1. Improvements of roads serving as links in the 75,000-mile network of strategically important routes designated by the War Department.
2. Improvement of roads essential as accesses to reservations and mobilization points of the army and navy, to new and expanded defense industries and to airports and rail terminals and depots.
3. Improvements of roads and streets within military and naval reservations and the construction of the additional streets necessitated by the greatly enlarged forces to be stationed at many of the reservations.
4. Improvement or possible new construction of a very limited mileage of road required mainly for definite tactical purposes.

Of these various classes of work those now most urgently required are the improvement of accesses to military and naval concentrations, the construction of roads and streets within the concentration areas, the improvement of accesses to, and other essential road changes in the vicinity of, defense industrial plants and areas. The greater urgency of these classes of improvements results from the recent passage of the national guard and selective service acts and the large appropriations

for armament, equipment and materiel, and the speed with which the defensive preparations they authorize are being put into effect.

Already units of the national guard are moving into designated posts in various parts of the country. Other units will follow in accordance with a schedule definitely established and these will be followed in a few months by an army recruited through the machinery of our first peace-time draft. As a result, army posts which since the World War have quartered only small skeleton organizations are being suddenly expanded to house and serve for the essential training of forces of from 40 to 60 thousand troops. The effect, from the standpoint of highways, is that of the sudden growth of many small village communities into cities of very substantial size and population.

On the industrial side of the defense preparation numerous new plants are being established and these, especially where they are for the manufacture of explosives, are located on large tracts of land the requirements of road access to which will be materially beyond that afforded by existing roads. In most cases, but especially in the case of explosives plants the needs of access to the plants are complicated by the necessity of rerouting and reconstructing existing roads and in some cases important main highways now passing through the tracts to be occupied.

In addition to the entirely new plants required, the industrial mobilization, as it is thrown into high gear, is necessitating the great enlargement of established industries and plants of almost every conceivable sort in all parts of the country, with consequent heavily

increased demands for highway service for the transportation of raw and finished products and also for the daily movement of employees to and from work.

Failure to supply promptly the new and improved highway facilities required for efficient access to, and movement within, the military and industrial mobilization areas will retard and partially defeat the effectiveness of defense preparations in their most fundamental and immediately important aspects. Hence measures to supply these essential access improvements are of first importance among all highway necessities.

Of similar character, but generally of a slightly lower priority in order of urgency is the needed improvement of access to rail terminals and civil airports at many points throughout the country.

Compared with the immediate demands that will be made upon reservation and industrial access and service roads, the defense utilization of the designated country-wide strategic network presents problems which are considerably less pressing, but which are much broader in scope and decidedly more difficult and expensive of adequate solution. Except as portions of the network take on immediate importance as a result of proximity to military and naval reservations and sites of defense industries, or as improvements of certain classes and in certain areas are found to be needed to provide for early movements of the newly motorized and mechanized army forces, the planning and execution of improvements on the strategic network are matters requiring and permitting deliberate action in accordance with a thoroughly considered long-time program.

Most immediate of the improvement necessities on the network is the strengthening or reconstruction of some 1,500 out of approximately 15,000 bridges on rural portions of the network which as now designed are inferior to the standard set by the H-15 loading specified by the American Association of State Highway Officials. To these weaker rural bridges should be added as a task of first importance the strengthening of a considerably smaller number of bridges on urban sections of the network to the A.A.S.H.O. H-20 standard as a minimum.

Problems of strategic network improvement divide themselves in respect to difficulty of solution and administrative and financial provisions required into two classes, one associated generally with rural sections of the network and the other with sections in and near cities, particularly the larger metropolitan areas.

In rural areas the strategic routes of highest priority are substantially identical with the interregional routes proposed by the Public Roads Administration in its report to Congress entitled "Toll Roads and Free Roads", and the type of improvement eventually desirable for strategic purposes is no different from that required for the normal purposes of civil transportation.

On these and other rural sections of the strategic network the principal improvement needs are a greater directness of location between controlling points, alignment adjusted to the requirements of safe operation at modern vehicular speeds, surfaces and foundations capable

of the year-round support of 9,000-pound wheel loads on low-pressure tires, pavement widths adequate for present and expected traffic volumes, a substantial and general lengthening of sight distances, the separation of grades at intersections with both highways and railroads where the volume of traffic warrants, and the development of lateral protecting and beautifying marginal strips within rights of way of adequate width.

In urban and metropolitan areas the strategic highway needs are virtually identical with the requirements of civil traffic as defined in "Toll Roads and Free Roads", and require the same type of improvement - namely express roads with adequate control terminal facilities associated with belt lines for distribution of the traffic between the radiating express facilities.

In the main these are improvements - both in rural and urban sections, but especially in the latter - that require the most mature consideration and planning, and are needed in at least the same degree for civil as for military purposes.

The special tactical roads required are few in number and small in mileage, and in comparison with other requirements present few problems.

For immediate improvements of roads of the several defense categories the only Federal funds now available are:

1. Federal-aid highway funds (including funds for secondary or feeder roads and railroad grade crossing elimination) administered by the Public Roads Administration in cooperation with the State highway departments.
2. WPA funds.
3. Funds appropriated to the War or Navy Departments and allotted for expenditure on contracts let by the Construction Quartermasters of the various posts. These are available at present only for certain roads to be improved or constructed within the reservations.

The recently enacted Federal-aid authorization act for the fiscal years 1942 and 1943 provides for expenditure of the authorized funds, with or without State matching, for the survey and planning of improvements on roads recommended as important to the National defense by any authorized defense agency. It also authorizes the Commissioner of Public Roads to give priority of approval to projects for the improvement of roads so recommended, to be constructed with matched Federal and State funds.

The 1941 WPA appropriation act authorizes expenditure of not more than \$25,000,000 of the appropriated funds to pay for supervision, equipment and materials in excess of the amounts normally expendable for these purposes on roads certified by the appropriate defense agency as strategically important.

The recommendation or certification of defense necessity required by these two acts as a basis for the preferential application of funds provided by them is furnished by the War and Navy Departments for improvements of accesses to military or naval reservations and for roads included in the strategic network. For the improvement of roads needed as accesses to defense industries the similar certification is given by the Advisory Commission to the Council of National Defense.

The two Federal appropriations mentioned and the preferential application authorized, constitute the only provision thus far made by the Federal Government with the exception of the money available for construction of streets in reservations under contracts let by the Construction Quartermasters. Expenditure of these funds, in accordance with law, requires in practically all cases the sponsorship or cooperation of State or local Governments; and all funds now available are together insufficient to meet the probable needs.

If serious delays of urgently needed improvements are to be avoided financial contribution by State and local governments will be essential, and the application to essential projects of all available funds is a matter requiring special consideration and disposition

appropriate to the circumstances of each particular project.

Determination of the detailed improvements needed and formation of financing schemes in each instance utilizing all available Federal and State or local funds will be worked out by local conferences of all governmental and other agencies involved in accordance with arrangements now being perfected in Washington.