

ROADSIDE IMPROVEMENT

Uncle Sam Considers Roadsides

By THOS. H. MacDONALD, Chief, Bureau of Public Roads

EDITOR'S NOTE.—The leadership which Mr. MacDonald has displayed in cooperating with the 48 States and Hawaii to improve, in little over a decade, 79,000 miles of roadway gives promise that the Bureau may, in the coming decade, be responsible for an equally stupendous program of roadside improvement which will affect the Federal-aid system directly and practically all other improved rural roads indirectly.

SOME of the more interesting phases of the work of the U. S. Bureau of Public Roads in 1929 were the planning of the Mount Vernon Memorial Highway, construction of which was begun in September, and the completion of some difficult and important road projects in National Parks and Forests.

It was in February, 1888, that the suggestion of a Mount Vernon highway culminated in the first Legislative act granting a State charter under the laws of Virginia for the Mount Vernon Avenue Association, to construct, maintain, and police such a new highway.

One year later, Congress directed the Secretary of War to make surveys and estimates for the road, and the report submitted in 1890 recommended that the highway start at the Virginia end of the Aqueduct Bridge. The various routes surveyed ranged from 13.8 to 16.2 miles in length, and the estimates provided for a 250-foot right-of-way, with a 60-foot driveway, and parking strips from 10 to 30 feet in width, together with rows of ornamental trees.

Nothing came of this early effort, and there was no renewal of the suggestion until 1926 when the Roads Committee of the House of Representatives directed the Bureau of Public Roads to make new surveys. The Bureau's report, submitted in January, 1927, outlined two possible routes, and interest in the approach of the bicentennial of the birth of Washington finally brought a definite decision to build the road as a memorial to be dedicated in the bicentenary year. The Commission, created by the act of May 23, 1928, to prepare for the celebration, was empowered to select a route, and the Bureau of Public Roads



Plan for Parking Cars at the Entrance to Mt. Vernon
Photograph by J. N. Hiker. Courtesy U. S. Bureau Public Roads

is authorized to make the additional surveys and plans for construction under an appropriation of \$1,500,000.

The route adopted by the Commission on January 24, 1929, what is known as the river route, and the Bureau immediately set to work to prepare plans for a memorial road of the highest type on that location.

By the close of the year, plans were approved and work was well advanced on portions of the grade along the Potomac shore that are to be constructed as hydraulic fills with bridges spanning estuaries in the river. Riprap work forming walls for hydraulic fills had been finished, and bids for grading and drainage and for bridge structures have since been received.

The Memorial Highway, slightly over 15 miles long, extends from a circle on Columbia Island at Arlington Memorial Bridge to the Mount Vernon estate, and follows the Potomac River as closely as possible. Except through Alexandria, the right-of-way has a minimum width of 200 feet, with a pavement 40 feet wide, except where flared or widened and divided roadways have been introduced, the better to serve traffic and to provide parking-spaces at particularly attractive spots.

The highway has been so designed that acquisition of areas on either side of the right-of-way will form a protective barrier against encroachment of undesirable structures of all kinds.

On the route are twelve bridge structures of reinforced concrete arch construction faced with native stone, five spanning estuaries of the river and seven serving as underpasses or overpasses, eliminating grade crossings at practically all important intersecting thoroughfares, except through Alexandria. Of particular note is the highway grade separation structure on the Alexandria road, which is one of the most attractive and efficient grade separations ever designed. It has four graceful ramps, permitting an easy and uninterrupted flow of traffic in four directions and eliminating all left-hand turns.

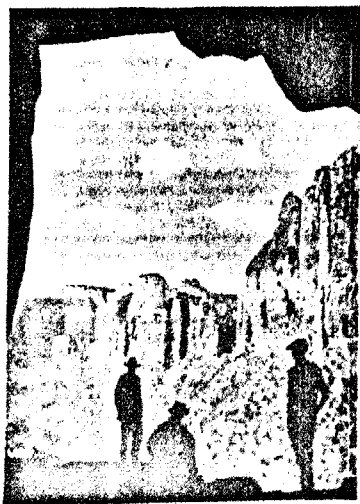
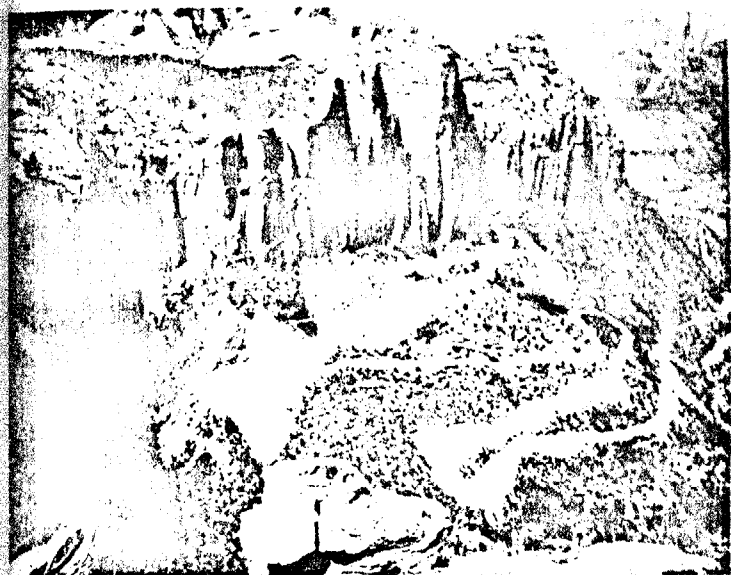
To care expeditiously for traffic at Mount Vernon, the highway terminates at a circle around which motor vehicles will flow easily and naturally to the loading and unloading platforms, and then to designated parking-spaces on either side of the approach road. It is planned, through design of roadway and planting of area, to capture for the approach to Mount Vernon the quiet charm of the estate beyond the entrance gates.

The Mount Vernon Memorial Highway will make possible one of the most beautiful drives in America—a drive from the Maryland State line through Rock Creek Park, through Potomac Park where is located the Lincoln Memorial and reflecting-pool, over Arlington Memorial Bridge, and along the Potomac over the memorial highway, passing through historic Alexandria and over ground familiar to Washington, to the Mansion House at Mount Vernon. The thoroughfare will be opened for travel in 1932 in time for the bicentennial celebration of the birth of Washington.

In National Parks where the Bureau, under agreement with the National Park Service, is supervising improvement of the more important roads, 100 miles of roadway were improved during the year. Completion of East Rim Road in Zion Park, in the southwest corner of Utah, and the west-side section of Transmountain Highway in Glacier Park, in northwestern Montana, were the outstanding projects. The Zion Park road is a link in the new route which will eventually connect the railhead at Cedar City, Utah, with the north rim of the Grand Canyon in Arizona, and thence by way of the House Rock Valley and the new Lee's Ferry Bridge with the Arizona road system south of the canyon. It will open up large areas in the upper and cooler levels and permit campers to escape the heat of the lower canyon. The Transmountain Highway will connect the two sides of Glacier Park and the adjoining country hitherto separated by the impassable mountain wall.

In the 4.6-mile stretch of Zion Park Road in Upper Pine Creek Canyon, there is more than a mile of tunnel. The tunnel is sufficiently near to the cliff face so that it has been possible to cut openings or galleries through the face from which views of the canyon may be obtained. The road below the tunnel winds through the canyon like a broad ribbon.

Before actual construction work began, much had to be done in preparation. A feasible route had to be found by which to climb from the floor of the valley, 1,400 feet in elevation, to the park boundary at 4,100 feet. Since no map of the country had ever been made (and only one or two men had ever been in Upper Pine Creek Canyon), it was necessary to make a map in order to pick out a possible route and make a survey. The survey involved weeks of arduous labor, climbing rocky slopes.



Zion-Mt. Carmel Highway with Mile-long Tunnel, Showing Entrance to Tunnel and View from One of the Observation Galleries
Courtesy National Park Service and U. S. Bureau Public Roads

cutting through dense thickets, hanging from hazardous points, and at all times maintaining an accuracy of measurement which would allow computations to be made closely enough for an accurate estimate of the work to be done. At one place it was necessary to use ropes to climb a steep cliff 300 feet high, and as this was the only way to get from the lower canyon to the upper, this rope was in use for several months, both during the survey and afterward when the contract work had been started.

In starting the tunnel work, it was necessary to begin at several points along the line and excavate the galleries first and then complete the tunnel between these points. All measurements had to be made from the outside, carried in, and projected through the tunnel. Scaffolds were built on the outside of the cliffs, and all supplies and materials were lifted to these galleries. At one point a wooden tramway was built up the face of the cliff to carry a small car for transporting men, machinery, tools, and supplies. The car was operated by a small air-hoist supplied by air from the main pipe-line at the base of the cliff.

To preserve the natural landscape, as little work as possible was done outside the lines of the roadway. The road between the entrance to the park and the tunnel was constructed at the same time as the tunnel, and machinery for tunnel-work had to be taken in before work could begin. A cableway was installed from the bottom of Pine Creek Canyon to a point near the camp over which were transported all machinery and materials for tunnel and roadway, as well as all camp supplies.

The Transmountain Highway, passing through the center of Glacier National Park from west to east, is some 12 miles long, and was designed primarily to make the interior of this scenic and rugged spot in the Rocky Mountains more easy of access to tourists and campers. Since the special items and requirements called for in the plans and specifications could be best explained on the ground, arrangements were made for prospective bidders to meet with the Bureau's engineers and Park officials to inspect the work prior to submitting bids. Cliffs were scaled and long steep snowslides climbed.

The work of the engineering party that staked the lines for clearing was not only difficult but dangerous at all times. Practically vertical cliffs, several hundred feet high, had to be surveyed, cross-sectioned, and staked. This work was done

in all kinds of weather—rain, hot sun, sleet, snow, and high winds. Ropes were used on the cliff sections, but it required skill, strength, and courage to do the necessary field-work.

Transportation facilities of all kinds were used to carry road materials and equipment and camp supplies—pack-horses, teams and wagons, trucks and tractors. Throughout the progress of the work, temporary trails were built to reach the various parts of the highway or to route the pack-strings around portions where heavy blasting made travel either impossible or too dangerous. This project, well up in the Rocky Mountains, is subject to heavy snowfall, with resulting deep and wide snowslides. Combating such slides was just another problem in road building.

In the National Forests the Bureau supervises construction of the more important highways which are necessary sections of the Federal-aid system and which serve the more important forest communities. As in the National Parks, these forest projects, which often scale the sides of mountains and cross them at high altitudes, entail difficult engineering problems. In some instances the projects are located in isolated sections, far from bases of supplies, and with no trails blazed over which to carry them. In 1929, 315 miles of these forest roads were completed, increasing the total length of improved roads to nearly 4,100 miles, about a third of the forest highway system of 14,000 miles.

Planting shade trees along highways is a necessary complement to surfacing of roadways, the Bureau believes. A number of States had started, with their own resources, improvement of road sides before passage of the amendment of the Federal Highway Act, authorizing Federal participation in planting shade trees along highways in the Federal-aid system. Recognizing that the first duty of the State Highway Departments is to surface highways, the Bureau does not wish to force States to resort to Federal aid in tree-planting nor to lead States to begin tree-planting until they are ready for it. But it will use its influence to bring about adoption of suitable provisions in all States to enable this work to be done.

Correlated with roadside beautification is the problem of ridding the main traveled highways of the blatant commercial advertising signs. While the Bureau has no authority to correct what often proves a menace to safe driving, it has done what

it could toward eliminating the billboards by developing popular sentiment against them. It is on the main traveled highways of the country that the billboards are concentrated.

In cooperation with the Bureau, 48 States and Hawaii improved a total of 9,390 miles of highways in the Federal-aid system in 1929, and had another 9,525 miles under construction. Forty-four miles of bridges and approaches were also built. The Federal-aid system comprises a total of 188,857 miles of main interstate and intercounty roads. At the close of 1929, the actual length of roads in the system improved with Federal aid was 78,096 miles, or about 41 per cent of the total mileage.

How Westchester Treats Its Roadsides

By JAY DOWNER, Chief Engineer Westchester County Park Commission

EDITOR'S NOTE.—Westchester County is actually doing the things which the "impractical dreamers" have been trying to persuade the "hard-headed business men" to undertake, and, as Mr. Downer related in last year's Annual, the investment is proving a profitable one for the property owners and the community at large, as well as a substantial contribution to the pleasure of all who use the parkways. In this article Mr. Downer tells how Westchester County is solving the roadside problem. Commissioners of three thousand-odd counties in the United States, please take note.

A BASIC principle in laying out what is now generally recognized as the Westchester County type of parkway is the establishment of a reservation, at no point less than 200 feet in width, which affords controlling strips of land on both sides of the 40- to 60-foot paved roadway. Under this principle there is no foothold for blatant billboards, and the panoramic hodge-podge of hot-dog dispensaries, barbecues, and so-called refreshment stands that unfold in offensive, jazzy patterns along countless miles of our American highways.

Broadly considered, arterial road-building has not yet emerged from the pioneering stages, even with the excellent structural standards for roadbeds, pavements, alignment, and grades which have been evolved by modern engineering practice. There is a rapidly growing public consciousness of the fact that although great advances have been made in the utilitarian essentials, our roadsides in general have lost the charm of their aspect in the bygone horse-and-wagon days. The old roads may

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