

THE AIMS AND INTENTIONS OF THE BUREAU OF PUBLIC ROADS

By Thos. H. MacDonald, Chief of Bureau.

A few months ago I stood by the side of the Appian Way where it crosses the Campagna toward the Alban Hills. It is preserved as an interesting historical monument; but the traffic of today flows over another highway. As I gazed upon this vestige of the most famous road of all the centuries the thought came to me that here is the complete answer to those of my countrymen who are a bit fearful of the wisdom of the expenditures for road improvement.

Here, I thought, is the answer to those gloomy prophets of the disaster that impends if our modern roads should fail to outlast the bonds issued for their construction. Here is the text of a little homily for the benefit of the luxury school of highway economists - those who believe that road improvement is all very well if it can be afforded.

The section by which I stood is one of the few visible remains of that great highway of ancient Rome, so expensively built, we are told, that its construction wrecked the Roman treasury. It is but the merest fraction of the great system of imperial arteries so vast that not one kingdom or one region alone, but all Europe, Asia, and Africa set their hands to the building of it. Of all that great design only this and a few lesser traces remain.

Was this first of the three greatest programs of road building a failure? Was it a colossal mistake? If it was, then we do, indeed, value lightly our great heritage of Roman law, and Greek art, and Hebrew religion, for they all came to us over these highways.

The Appian Way is gone; the whole Roman highway system is obliterated except as it serves as a foundation for the modern roads of Europe; scarcely a trace remains; but what tremendous service it rendered to the ancient and the modern world! Who will attempt to set a limit upon the value of the Roman highway system to the United States of America?

The Roman highways have been held up to the American people as wonderful works of permanence. That is not at all what I see in them. The wonderful works are destroyed; their service to the world while they lasted can never be destroyed. That is what I would like to impress upon every citizen of the United States, and particularly upon every road builder.

HIGHWAYS SERVE

The highway is a thing of service. The roads we are building in America today, the motor vehicles we are manufacturing in such great numbers are unfettering the people of America, releasing them to a new freedom of movement such as the world has never known before, and no other part of the present world has yet experienced.

In this new freedom of transportation the road surfaces and pavements we build are merely incidental. That they will be worn out is inevitable, as it is also inevitable that the automobile we buy today will wear itself out in service. The only thing that matters is that both the highway pavement and the vehicle shall be adequate to render the service that is expected of them at the lowest possible cost.

Against the hoary background of Roman antiquity the age of all things in the United States seems very trivial. Certainly the Bureau of Public Roads is not an ancient institution; yet it is one of the two or three oldest public agencies charged with the betterment of roads in the United States.

In the brief period of its existence it has seen tremendous changes, brought about by road improvement. It has seen cities which did not know their countryside, and a rural population depressed by isolation near to peasantry, and it has seen this provincialism and this poverty erased and ameliorated by improved highway communication.

It has seen the time when its agents, suggesting the expenditure of a thousand dollars a mile in a certain stagnant State, were frowned upon as dangerous agitators. And it has seen that same State, under its own brilliant leader, spending thirty times as much and growing rich and powerful, and, what is much more impor-

tant, casting off social, and intellectual, and spiritual bondage - all in great degree, as the recognized result of its highway adventure.

It has heard prominent officials of great railroad systems complain that the improvement of roads would destroy the business of their railroads; and it has seen those railroads grow in business and in profit times over, because of - rather than in spite of - the road improvement.

It has seen the motor vehicle, hated as the envied toy of the rich, become the useful servant of a whole people, and the people benefitted immeasurably by its service.

OPTIMISTIC ABOUT THE FUTURE

So the Bureau of Public Roads is inclined to view the future of road improvement in the United States with very optimistic eyes. It is able to see beyond the many little passing objections and obstacles that hamper progress for the moment. It can listen tolerantly when lingering provincialism expresses its fears of constructive expenditure because it has heard the same expression so many times before and has heard later the same voices raised in acknowledgement of the idleness of those fears.

The Bureau has always been more intimately concerned with the fostering and the dissemination of ideas and the development of the science of highway engineering than with the activities of con-

struction and maintenance. It has built roads as object lessons and as experiments; and, since 1916, it has completed 3,045 miles of roads in the national forests, including some sections which, for difficulties overcome, rank with the most spectacular highways of history. In the same recent period it has cooperated with the State highway departments in the building of 66,864 miles of Federal-aid highways as part of the largest single program of road construction ever projected. For the latter it takes no more than a lesser partner's share of the credit, believing that the greater portion should go to its State co-operators.

In the Federal-aid road work the bureau has endeavored to perform wisely its assigned role as correlator and harmonizer. It has not sought a purely arbitrary standardization of method of design for all the highways, believing the conditions of our large country to be too various. Rather it has endeavored to secure the adoption of certain fundamental principles and their proper application variously to the different conditions that obtain among the 48 States.

AN ADVOCATE OF PRINCIPLES

The bureau's advocacy in the early days, of the principles of engineering control of road construction and supervision of main roads by State highway departments was largely instrumental

in the general adoption of these basic necessities.

Its belief in the dual character of the service rendered by the principal interstate roads and its support of the system of cooperative State and Federal administration of such roads weighed heavily in preventing the Federal Government from assuming independent responsibility for such roads with the consequences of Federal and State competition and conflict that probably would have been involved in such a course.

As almost its first act after it was entrusted with the Federal-aid administration it urged upon the State highway departments the designation of limited systems of the more important roads capable of improvement with funds available in a reasonable period. This recommendation it has seen adopted by all States, and extended by the Federal highway act to the United States as a whole.

THE STAGE CONSTRUCTION PRINCIPLE

Recognizing the prime necessity of serving the traffic of all sections as promptly as possible, it has given expression to the principle of stage construction, and has applied it faithfully in its approval of Federal-aid projects in the face of some criticism of its wisdom in sponsoring low types of construction.

Happily, its ideas in this respect have been upheld by experience, and the criticism has now practically died out together with the

false economy upon which it was based.

The principle of stage construction or progressive improvement has much wider application than the simple one of anticipating the needs of the future surface or pavement in designing the lines and grades of earth roads. As recently remarked by the Secretary of Agriculture, the same foresighted policy suggests the location of the improved highways in relation to railroads at crossings in such manner as to provide satisfactorily for separation of grades, and it applies also to provisions for the construction of future by-pass highways around cities, and for the diversion of traffic from routes of growing congestion.

If I am not mistaken, these latter provisions constitute one of the most pressing highway problems at the present time. Traffic congestion in the metropolitan areas of the East is destroying much of the utility of the motor vehicle the principle superiority of which is its ability to save time. The areas in which such provisions for the relief of congestion are at present required are not large but the importance of the traffic to be served is very great. It was this problem that was attacked by the Bureau and the authorities of Cook County, Ill., in the survey of transportation made in that county a year or more ago; and I believe that the plan of improvements recommended will

provide at least a considerable measure of relief for that important area. Recently the same problem has been fearlessly met by Major Sloane in New Jersey, and the recommendations he has made will doubtless go far to better the very difficult situation which has arisen in that State. There is need for similar study and provision in a number of other areas and it is to be hoped that the need will be met by the proper authorities before the situation becomes acute.

INDEPENDENT SUPPORT OF STATE HIGHWAY PROGRAMS A NECESSITY

For several years the bureau has advocated the complete divorce of the State highway departments, in their administration of the Federal-aid and State road improvements, from county and local control. This desirable condition it believes can only obtain when the State agency is provided with adequate funds as well as legal authority to carry on the work assigned to it. With respect to the Federal-aid work a provision has been inserted in the law the intention of which is to accomplish this very purpose; but its operation has thus far been suspended, with the bureau's acquiescence, in order to give several of the States ample opportunity to amend their laws as necessary. In the interest of efficient highway service and economical administration the general adoption of this principle should not be longer delayed. Its efficiency has been abundantly proved; and while I am not in

sympathy with the idea of forcing sovereign States to adopt beneficial legislation, I feel that, in this case, the interests of the Federal Government demand that the full operation of the Federal highway act should not be delayed beyond the time now set.

From the Federal point of view, added importance is given to the general desirability of independent financial support of the State highway departments by the recent agreement on the system of principal interstate roads which is called the United States highway system. Provision has been made for the numbering of these through routes and for their marking with uniform caution and danger signs. The beneficial results of these measures will shortly be felt by all motorists whose travels take them across State lines. But the numbering and marking of the roads will be somewhat grotesque unless there is concerted action to bring all sections of these principal highways promptly to a condition adequate for the accommodation of the traffic they are expected to carry.

All United States highways are or will be included in the Federal-aid highway system, and it is the intention of the Secretary of Agriculture to urge, in every possible way, priority of consideration for these routes in the Federal-aid improvement program. But it will be difficult to carry out this plan com-

pletely so long as there is dependence in any State upon county sources for the necessary revenue.

It is so manifestly unfair to the counties themselves to expect them to participate in the cost of improving such interstate highways that it would seem that no objection should be raised to their relief from this burden by the county authorities.

It is scarcely necessary to add that another of the principles which the bureau has long advocated is that which insists upon the absolute necessity of constant and continuous maintenance of the constructed roads. There has been a gratifying improvement in the application of this principle in recent years; but there are still a few States in which its importance does not seem to be fully realized. The temptation to use as much as possible of the limited funds available for new construction is undoubtedly very great in the States which still have before them the problem of initial improvement of extensive mileages. But the lessons of experience, hard won by the pioneer States, are very clear as to the downright folly of permitting the dissipation of public funds invested in highways through failure to make the additional timely expenditures necessary to preserve these productive investments.

ENHANCED SERVICE AND ECONOMY THROUGH RESEARCH

The physical and economic researches of the Bureau have for their purpose always the promotion of economy in design and construction and the improvement of the service value of the highways. The State-wide traffic surveys that have been made in cooperation with the highway departments of a number of States have placed at the disposal of these departments exact information as to the present flow of traffic on the various roads of the systems and the probable future increases such as no highway officials have previously had. In the face of this exact information clashing opinions and political pressure lose their power to sway the course of improvement, and the highway program is placed solidly upon a scientific basis.

The studies of the efficiency of construction operations, also carried on during recent years have already shown that it is possible to make large improvements in the economy of such operations by the elimination of avoidable time losses, the proper adjustment of force and equipment to the work to be done, and by designing grades, pavements, and other features with a view to developing the greatest economy in the construction processes.

Many of the bureau's tests and investigations produce results which are capable of immediate application with beneficial

results. This is true of the construction efficiency studies and such tests as that recently made which has shown the possibility of using thinner brick. But we are taking the long-time view, and we are not dismayed if the problems do not yield an immediate result.

HIGHWAY IMPROVEMENT A CONTINUING PROCESS

Highway improvement must necessarily be a continuing process. The roads we build today are not the last we will have to build. We must go on improving and making changes indefinitely to keep pace with the enlarging needs of a growing and increasingly active people. It may be possible, for example, to complete the initial improvement of the Federal-aid highway system in a few years; but that will be just a beginning. The improvement of present surfaces by widening and strengthening, the relief of congestion to which I have already referred; in a word, the doing of all those things which are necessary to keep the service of the highways abreast of the growing need for service - these things will occupy us as long as people and goods are moved over the highways.

So we are not deterred from undertaking the solution of problems merely because they can not be quickly solved. In fact, we feel that some of our most important work is being done

In fields where quick results are impossible of attainment, typical of such long-time investigations is the work that is being done in the study of the characteristics of soils as highway subgrades. The variety of soils is limitless. Uniformity of subgrade support is the aim. How to deal with so wide a variety of materials and produce a condition of uniformity, or failing this, make suitable correction of the pavement or surface is a problem to which there is no hope of immediate solution.

We are carrying on such investigations for the future, piling fact upon fact, convinced that finally, by the analysis of a multitude of careful observations a solution will be obtained which will justify all the labor and the pains; and that it will not be too late for profitable application to the further enhancement of the service rendered by America's highways to America's industry and the ever-growing needs of America's people.