HIGHWAY LOCATION AS A SITE PLANNING PROBLEM

By A. R. Nichols

Consultant Landscape Architect, Minnesota

SYNOPSIS

Balancing of many controls is necessary. In weighing the influence of traffic needs as revealed by origin and destination surveys, there are two vital considerations: (1) commercial traffic needs, and (2) pleasure traffic needs. A second influence is the governing factor of topography in highway location, which should be studied on a broad base rather than by limited strip. Aerial surveys have advantages for this purpose, especially in the consideration of scenic assets. Existing land use is a third influence in determining highway location.

Influential factors in rural areas are sites for roadside parking, sites for historial markers, sites for scenic outlooks, and sites for recreational facilities. Related factors in urban areas within cities of concentrated population are civic centers, municipal buildings, state centers, government buildings, educational centers, universities and colleges, and retail business centers and shopping districts. All of these land uses are in turn related to available parking facilities.

The ideal location is best determined by a careful analysis of facts coupled with a vision of aesthetic values.

Analysis of the factors necessary for consideration to determine the proper location of a new highway will reveal that balancing of many controls is necessary. Some may be more important than others but no one control should dominate the decision before due weight is given to the other factors, the sum of which might well justify a compromise in the dominant factor.

Let us briefly consider some of these influences in their relation to the location and development of what this Committee has well defined as "The Complete Highway."

INFLUENCE OF TRAFFIC NEEDS AS REVEALED BY ORIGIN AND DESTINATION SURVEYS

Certainly we must put at the head as indeed primary, the matter of traffic needs as a governing influence. Traffic, however, divides itself into two somewhat divergent interests, namely: those meeting commercial needs and those meeting pleasure traffic needs. The origin and destination surveys very clearly define the needs with respect to "from where"—"to whence," and naturally the line of least resistance considering distance and gradient would be the governing factor determining the desired location for the commercial route. The same factors, however, would not be so dominant with respect to the most desirable route for pleasure traffic. The pleasure seeker is looking for the things between "from where"—"to whence" that will contribute to an accumulation of personal interest and pleasure: scenery, historical interest and way side recreation. These are admittedly somewhat at variance with the line of least resistance but are important and must be put into the balance.

INFLUENCE OF TOPOGRAPHY AS A GOVERNING FACTOR IN HIGHWAY LOCATION

This is obviously where topography as a governing influence acts as a mediator. Advance in technique possible in reconnaissance brings a much broader approach to the problem than was previously possible on the basis of trial line by ground survey. Aerial maps as emphasized give a much wider range of data for study than has previously been the case. There is an over-all revelation of conditions that may suggest alternates, each of which may have certain advantages and which is, therefore, worthy of consideration in the balancing of factors.

Certainly topography is the general form to which we must fit the circulation system in a practical, economical, and pleasing pattern. Aerial surveys will reveal the existing land use over a wide area, the existing area of vegetative cover, many of the soil and drainage conditions, the existing streams and logical

Figure 1. Existing Environment of State Capital, St. Paul, Minnesota

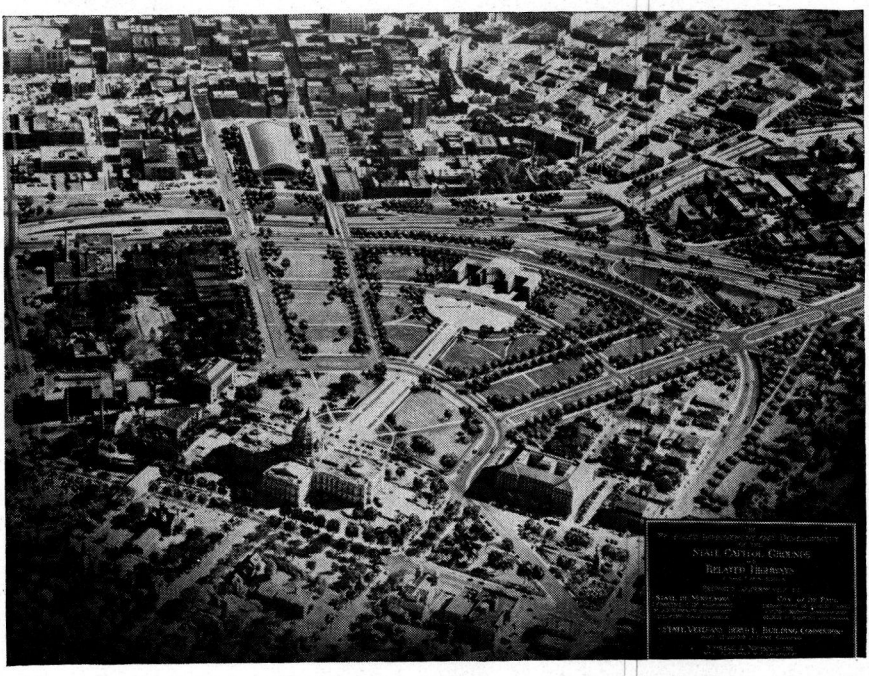

Figure 2. Co-operative Site Planning for Improvement of Capital Grounds and Tentative Location of a Highway, St. Paul, Minnesota

sites for bridge locations, and the scenic advantages that might be utilized in the location of turnouts and wayside development. Each and all of these factors are important in determining the route and should not be deferred to subsequent consideration. They are all part of the "Complete Highway" and as such should have study and correlation with each other from the beginning of initial studies by engineer and by landscape engineer.

also serve a valuable double function. They not only show the character of existing buildings but also serve as an excellent basis for superimposing in perspective the proposed line and its treatment. Officials, committees, and the public, not accustomed to engineering drawings and symbols, can better visualize the proposed development and usually greater interest and enthusiasm is developed by this before and after presentation.

Figure 3. Overall Study of a Tentative City Planning and Highway Program

Adaptation of the engineer's alinement to the topography with minimum construction areas of heavy cut or heavy fill, yet consistent with desired curvature, profile, and cross section, is the effort of all technicians cooperating in a site planning project. All are needed in the determination of an over-all plan. All must be the planners.

INFLUENCE OF EXISTING LAND USE IN DETERMINING HIGHWAY LOCATION

In the urban areas, aerial maps are of inestimable value. Land use and land values are even more strikingly important factors in determining highway location. Oblique views

Relation to Areas within Cities of Concentrated Population

In urban development, origin and destination studies indicate the need for areas of ingress and egress to concentrated centers. We usually think of these in terms of business and shopping districts but nearly every large city has its civic group and educational centers where public access and departure is an important traffic problem. In all of these cases, whether possible right-of-way is limited or is liberal, the problem becomes a site planning problem which needs the cooperation of many experts in the planning field. No one expert can solve adequately all the ramifications of

such a complication of interests. Again cooperation and coordination of engineer, architect, and site planner are essential to a successful solution.

Figures 1, 2 and 3, illustrate the development of plans for improvement of an important urban center.

Site planning must extend beyond the limits of the highway and its right-of-way to unite in an over-all plan the development of the environment affected. It is in this cooperative study of the over-all development that the landscape engineer and the highway engineer can achieve a coordination of planning that should provide safety, efficiency, economy and harmony of planning. Utility and aesthetics will combine not merely to accomplish the "Complete Highway" but will relate that completeness to its environment and adjacent areas it serves as a most important part of comprehensive city planning.

I have referred constantly to the necessity of balancing various ideas and influences that are pertinent to the solution of a highway location problem. Our studies and our research might well be extended to these broad planning opportunities that are now confronting the large highway program ahead.

What Is the Ideal Location?

The ideal location is best determined by careful analysis of facts coupled with a vision of Aesthetic Values. This demands careful coordination of the work of the engineer and that of the landscape architect. It is the combination of the experienced technique of the engineer and the sensitive imagination of the landscape architect that will bring the highway location and construction into a closer approach to the ideals of the "Complete Highway" serving the combined needs of utility, safety, and appearance.

DEPARTMENT OF MATERIALS AND CONSTRUCTION

C. H. SCHOLER, *Chairman*

SEVEN YEARS' PERFORMANCE OF A BITUMINOUS SURFACE TREATMENT TEST ROAD

BY W. H. GOETZ, *Research Engineer, Joint Highway Research Project, Purdue University*

SYNOPSIS

A performance survey of a bituminous surface treatment test road seven years old has recently been made. The test road is 10 miles long, is located in Northern Indiana on the State Highway system, and consists of 51 experimental sections constructed with three types of bituminous materials and aggregate from two sources. Other variables included the amount and method of application of bituminous material and size of aggregate. The results obtained during construction and through the first year of service were reported in the Engineering Bulletin of Purdue University in a paper by T. E. Shelburne entitled, "Bituminous Surface Treatment."

The performance survey after seven years of service was broad in scope and detailed in nature. Visual ratings were made of each section by two different methods. In one method, the various sections were given an over-all rating by a number of observers; in the other the same observers estimated the percentage area of failure of each of four types. Surface texture measurements were made of each section in at least two locations by means of a texture profilometer. Four specimens were removed from the road and were tested for stability on a minitrack machine. Two surface samples were taken at representative areas in each section, one in the wheel track area and one between wheel tracks. These samples were analyzed in the laboratory for bitumen content and grading of the bitumen-free aggregates. Surface-area values were calculated from the grading results.

The results of the survey show that the average surface area of the aggregates has increased about 500 or 600 percent over that at the time of construction (be