Perpetual Highway Needs Study

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● ALTHOUGH the necessity of keeping some type of a highway needs study and future program has been apparent at least since the time of the formation of state highway departments, the importance of data in this field has become of increasing significance with the passage of time. With the recent agitation for a more comprehensive program for the improvement of highways at a national level, the necessity for an accurate catalog of future needs has been brought into sharp focus.

The compilation of a needs program is complicated by many factors, one of the principal ones being changing conditions. Roads that were considered adequate 10 or even 5 years ago frequently become inadequate because of changing conditions or new standards such as those adopted for interstate highways. These roads demand an entirely new concept of standards, access control, and other features. In Oregon a future needs program is viewed as a changing inventory which is in a constant state of review and revision so that it may reflect as nearly as possible current needs.

All roads in the state are divided into the rough, general categories of adequate or inadequate. This, of course, entails the analysis of each highway or section of highway in the light of present traffic, anticipated changes in the traffic pattern, and changes in the type of traffic. As an example, frequently an area will be opened to logging and a road that carried a small load of traffic, much of it being passenger or light vehicles, will suddenly be burdened with heavy logging vehicles. This changes the concept of adequacy. All roads in Oregon are reviewed at least once a year applying the yardstick of adequacy.

Probably the largest problem that confronts a department in compiling data on future needs is the problem of cost estimates. The magnitude of this problem can be realized by pointing out that the study encompasses a period of from 10 to 30 years in the future and generally involves but little, if any, information as to possible future revenues.

Cost estimates fall into three categories given in descending order of their accuracy: (1) Jobs on which detailed surveys have been completed giving close estimates of cost if the job is not postponed too long;(2) Jobs on which reconnaissance or other field-type reports have been developed to a point where a reasonable degree of accuracy of estimates is possible; and (3) Estimates on other sections where no field data has been obtained and where estimates are made by the comparative or length-unit cost basis (study of past and present cost figures).

The problem of accurate estimates is complicated in the first type of estimate by changes in geometric standards between the time the survey was made and the job is contracted, addition of facilities (such as additional interchanges) and changes in the unit-cost items of work occasioned by economic considerations.

Similar problems are involved in the second or reconnaissance type of estimate. There is the further complication, however, that detailed surveys frequently indicate costs that exceed those developed from reconnaissance work unless the reconnaissance engineer is extremely careful to make allowances for additional items that inevitably creep into a job when details are finally developed.

The comparative cost type of estimate reflects accuracy of cost only to a degree commensurate with the skill and experience of the estimator. As a further means of assuring reasonable cost estimates, copies of all cost data by highway divisions are submitted to the field on an annual basis for checking and possible revision.

Many western states have seen a rapid rise in population in the last 10 years and the establishment of many new industries which have a direct bearing on the adequacy of highways in areas where these changes have taken place. Also, in most western states the use of trucks has shown an increase in the period since World War II. Both of these factors when applied to existing highways frequently shift them from the adequate to the inadequate column.

Right-of-way costs are handled in somewhat the same manner as are construction

costs. More accurate appraisals are bound to follow when better details of location are furnished to the appraisal section.

One of the principal difficulties found in the comparative type estimates is the chronic one of underestimating costs. For some reason, people making this type of a cost estimate are invariably too optimistic and a careful review is necessary if realistic estimates are to be had.

The assembling and cataloging of the data is a difficult, tedious job and is never completed because the program changes in detail from year to year. Cost estimates are carried in two different forms in Oregon. Projects are broken into units of reasonable length with breaks also at division and county lines for ease of use. Projects are segregated by class of highway, division, county and priority. Under the heading "priority," projects are classified on a 1-2-3 basis in the order of their importance to the over-all highway needs of the state, approximately one-third of the total being assigned to each grouping. This is to facilitate the preparation of construction programs commensurate with construction funds or anticipated funds. In this way a catalog is made of the complete future needs program.

The information is placed on straight line charts which are bound in atlases. Copies are furnished to the state highway engineer, his deputy and assistants and interested staff engineers. The straight line charts show in contrasting color cost items of all construction jobs which have been built after 1950. This information gives a quick and ready cost picture which is of great convenience. The state highway engineer, his deputy and assistants keep this atlas in the office and frequently refer to it when considering projects or answering inquiries that come in by letter or telephone. The information is given in the following detail: length of section, number of traffic lanes, cost of grading, surfacing and paving, structures, right-of-way and totals. In certain instances a slightly more detailed breakdown is used to include guard rail, right-of-way fence, or other items of cost. Where these items are substantial they are shown separately; otherwise, they are included in the grading and surfacing costs.

Once the complete catalog of highway needs is compiled it is possible to work out any type of future program by assembling appropriate cost data from the project lists. Summaries were invaluable in compiling statewide cost data for studies such as those undertaken in the summer of 1954 under Section 13: 1954 Federal-Aid Highway Act, Nationwide Highway Finance Study.

The present system in Oregon admittedly has some deficiencies, but it has proven adequate to needs and is the solution to a vexing and chronic problem.