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The Planning Organization—Its Dual Role

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• THE LAST FIFTY YEARS have brought greater technological advancement than all the ages before them. Never before has so much scientific knowledge been commanded, and never has there been an era in which the concentrated effort toward even greater knowledge has been so intense and widespread. Despite the potential peril in this search, this is a wonderful and challenging age in which to live, and it is each man's task to contribute what he can to progress.

In the highway field of endeavorrelatively small, perhaps, but nevertheless vital-the amazing development of an intricate network of highways to serve the needs of a rapidly changing world has occurred. This highway system can be viewed merely as a great technical achievement, spanning the plains, the mountains, and valleys of the nation with efficient fabrications of steel, asphalt, and concrete. But it should also be noted what this system does to link the diverse sections of the country, unify the people, and nourish an economy unmatched throughout the world. However, much of the job still lies ahead and there are many and varied problems to be faced in trying to get the job done.

The tremendous increase in the number and use of motor vehicles has overloaded much of the American transportation system. The frequent changes in design of the vehicles themselves have contributed to the outmoding of highways only a few years ago considered adequate. The phenomenal growth of urban areas has brought an urgent need for more expeditious movement of goods and people.

It is true that the growth of motorvehicle use has brought with it an increase in road-user revenue for highways. Increased Federal taxes have been imposed to suport greatly augmented Federal-aid appropriations. And public and political interest in the highway program is at an all-time high.

Paradoxically, some of the problems arise from the fact that there is now more money available for highway improvement than ever before, while others stem from the parallel fact that highway improvement needs still exceed the public funds that can be expected for this purpose. With the money available much highway building can be done but because of the gap between revenue and need, that building must be accomplished with wisdom and thrift.

This circumstance makes it vitally important that highway administrators be fully informed of all relevant factors before they make decisions. Sound management of the highway program rests heavily on thoughtful planning for the present and the future.

BACKGROUND OF PLANNING IN HIGHWAY DEPARTMENTS

Since passage of the Hayden-Cartwright Act of 1934, 1½ percent of Fed-

eral-aid funds for highways has been reserved for engineering and economic surveys and investigations, for the planning of future highway programs and financing, and for necessary research in connection with the planning, design, construction, and maintenance of highways and highway systems, and the regulation and taxation of their use. As a result of this provision of the Hayden-Cartwright Act, planning surveys were initiated in nearly every State. Although various titles are used, every State now has in its highway organization a unit engaged in such studies, with much of its work formalized and directed along standard lines of research through the efforts of the Bureau of Public Roads.

The following excerpts from Articles II and III of the formal project agreement between the States and the Bureau of Public Roads for the use of $1\frac{1}{2}$ percent Federal funds state the objectives of the planning organizations:

The Highway Department, under the advice and direction of the Bureau of Public Roads, shall conduct statewide investigations, and shall make surveys, prepare plans and assemble engineering, economic and other data deemed necessary for the general planning of a complete highway system and program of highway improvement in the state... and ... shall assemble and analyze the results of the investigations and studies ... in such manner as to permit their use for the purpose of classifying highways according to their importance, preparing programs for future road construction and reconstruction, formulating a highway budget and determining the equitable sources of revenues for highway purposes.

The basic philosophy of highway planning is stated in the American Association of State Highway Officials Policy Statement on the subject of highways in a national transportation policy:

Throughout the period of growth and maturity of highway transportation, it has been the objective of highway engineers and administrators to build, maintain, and operate highways in accordance with the indicated desires of the American people. . . . The golden rule in all the planning work is to find out what people want and to make plans to satisfy those wants.

In other words, it is the job of planning units to determine the physical

condition of existing highways and who uses them, to what extent, and for what purpose, and how they are supported, in order to determine present and future highway needs. With this information at hand, planning can advise management how to provide efficiently for these needs, build economically, and spread the costs equitably.

ORGANIZATION OF PLANNING UNITS

The planning segment is essentially a service unit, operating for the benefit of State highway department management, the Bureau of Public Roads and other governmental agencies, private institutions and individuals. Its precise place within the highway department organization varies according to the responsibilities with which it is charged. For example, mapping, programing, or traffic engineering and operation may or may not be planning functions, de-pending on how the individual highway administration regards them. A glance at the State highway department organization charts reveals the diversity in the relation of planning to the chief highway engineer, as well as the various names given to the planning unit-Planning and Programing, Research and Planning, Planning and Traffic, Planning and Economics, Statistics and Analyses.

The structure of the New Mexico State Highway Department Planning Division is relatively simple and over the past 15 years has proved workable.

Certain phases of planning work are, by the very nature of the material and its use, best handled by continuing operations. These are, in brief:

1. A complete and current inventory of the entire highway transportation system of the State, recorded in the form of maps, charts, tables, logs, etc.

2. Information on the number, types, sizes, and weights of motor vehicles, and the use of the highways by each class of vehicle.

3. Historical and current records of income and expenditure for highways and streets at all jurisdictional levels, and accurate records of unit costs for construction and maintenance. These three phases of the work are therefore assigned to three separate sections within the Planning Division: Road Inventory and Mapping Section; Traffic Section; and Fiscal Section.

The task of gathering information from each of these sections for application to specific problems and for presentation of the material in acceptable form for a selected audience is assigned to a fourth unit within the Division: the Special Studies Section. This section also conducts a number of studies on its own and maintains some degree of control over the research done by other sections of the highway department and by consultants and universities for the department.

These units gather the facts, analyze the data, apply the results, and submit the findings. The first three operations comprise the research function of the Planning Division and the fourth is a part of the advisory function. Actually, the two functions are so closely interrelated that they cannot be so neatly set apart, but for the moment, the actual content of the Planning Division's research work as it has developed in New Mexico will be discussed in more detail.

Abraham Lincoln, in 1858, said in his "house divided" speech that "if we could first know where we are and whether we are tending, we could better judge what to do and how to do it." It seemed in New Mexico that if the answers to a series of specific questions could be found then the "where" and "whither tending" would be known.

The questions asked were these:

1. What highways exist and what is their condition?

2. Who uses them, how much, and for what purpose?

3. Who is paying for them?

4. What will be the future demand? 5. What facilities will be needed to meet the demand?

6. What will they cost?

7. Who should pay?

8. How much money will be available?

9. How large a highway system can the State afford?

10. When, and in what order, will construction be undertaken?

Tackling the basic problem posed by the first question, information was obtained by conducting a continual inventory of the State's roads. Field crews travel every traversable road, countyby-county, endeavoring to repeat the inventory of each county every 5 to 7 years. More frequent inventories are made of those areas in which extraordinary change may be occurring. Data obtained in the field are recorded on maps and in descriptive logs and tabulations showing road types, widths, administrative jurisdiction, and other details. Because of new development and changes in corporate limits. Planning Division city maps are frequently reviewed and revised.

To acquire the intimate knowledge of highway revenues and expenditures required for analyzing trends, predict-ing future financial status, and conducting economic studies, the Fiscal Section maintains contact with the Bureau of Revenue and other State offices concerned with the collection of motor-fuel and mileage taxes and motor-vehicle registration fees. Numerous monthly and annual reports reflect the trends in receipts from these sources of revenue. On the basis of material acquired through correspondence and field trips, an annual accounting is made to the Bureau of Public Roads on the road and street receipts and expenditures of each county and municipality.

The traffic section of the Planning Division maintains a continuing survey of highway and street usage, and endeavors to be in a position to develop on short notice a reasonable estimate of the annual average daily traffic on any section of road or street in the State. Data are collected by means of permanent and portable automatic traffic counters, and by manual counts made for the purpose of classifying vehicle types and recording turning movements at important intersections. Annual truck size and weight studies are conducted in order to follow trends in truck usage and loadings on principal highways. Speed studies are made at selected locations every two years.

The volume of traffic using a street or highway may include an appreciable number of vehicles which are there only because the route is the best available link between their origin and destination, although it may be considerably out of direction. Surveys are made by the traffic section to determine whether there is enough such traffic to justify rerouting of streets and highways or the provision of new routes.

Because highways involve so heavy an investment of funds, they must be designed structurally and functionally to achieve a maximum useful life. It is therefore essential to anticipate future traffic volumes, so that highway design will not become obsolete and thus accelerate depreciation. Traffic projection requires a study of population trends and of anticipated population curves as developed by the Bureau of the Census, university research groups, and other organizations. Relating population to motor-vehicle registration and to trends in motor-vehicle use makes it possible to formulate a rational estimate of future travel on a statewide basis. For specific road sections, it is necessary to define the areas which influence movement on the section and to evolve a factor of relationship between such areas and the statewide growth factor. Origin-destination surveys provide information from which areas of influence may be defined. They also furnish a means of determining diversion of traffic to a new or improved route. In addition to diverted and normal growth traffic, the future volume on a specific route will probably include an increment of entirely new or generated movements which come into being as a direct result of the improvement of the facility.

The special studies section of the Planning Division conducts investigations of such a nature as to require factgathering beyond the scope of the regular research sections. One such project was a survey of statewide motor-vehicle use to establish a thorough knowledge of annual patterns of travel. Other special studies include an investigation of methods for classifying roads according to their economic value to the State: a

study of the economic costs of motorvehicle accidents; and a fuel-consumption study in which employees of the Department and the Bureau of Public Roads were the respondents.

Also under the direction of the Planning Division, by reason of the Federal funds involved, but conducted by other units of the Highway Department or outside agencies, are the following:

1. Statewide survey of soils, geology, and geologic associations, and an inventory of sources of aggregate materials -materials section of the Department's Materials and Testing Laboratory. 2. An analysis of New Mexico law

relating to highways-legal section.

3. A before-and-after study of the value of severed parcels-right-of-way section.

4. A survey of archeological and historical sites that might be disturbed by future highway improvements-Muse-um of New Mexico.

5. Soils vibration research-New Mexico State University.

6. Study of the economic impact of highway relocation-New Mexico State University.

7. A study of roadside planting for prevention of erosion along highways-

New Mexico State University. 8. Flood-frequency study of the Rio Grande Basin—U.S. Geological Survey.

APPLICATION OF PLANNING DATA

Each section of the Planning Division makes various analyses and presentations of the basic information for which it is responsible. These are generally designed for specific purposes. Although each report or tabulation has a particular value for highway admin-istration, a greater value is usually realized by combination and correlation of the material.

For example, through the use of road inventory, traffic, and fiscal data, it is possible to prepare an estimate of revenue that can be expected to accrue from the use of a given section of road. With the further addition of data relating to the cost of operating motor vehicles under varying road and traffic conditions, comparative estimates of the cost of operation on suggested alternate alignments may be developed. The annual costs of motor-vehicle operation can be compared with computed annual costs of building and maintaining suggested routings to determine whether the proposals are feasible and which one of several alternates may be expected to show the highest ratio of savings to road-users per dollar of highway cost.

One of the most difficult tasks confronting the administrators of a highway system is that of determining the priority of improvement projects. Nearly all States now use one method or another to minimize the uncertainties of rule-of-thumb selection of projects. The most common of these is some variation of the so-called sufficiency rating, which places a numerical value on the relative sufficiency of such items as structural condition, geometrics, and safety. The items are rated against a par value, totaling 100 for all items, with an adjustment against the rated total based on the traffic volume of the section as compared to average traffic for the system. New Mexico has evolved a method of its own which is somewhat more selective than the standard procedure. Ratings are made annually on rural Federal-aid primary and secondary routes and are the basis upon which a 4-yr construction program is drawn up.

The above examples are more or less routine applications of planning data. Studies of greater scope and complexity may encompass such matters as the calculation of improvement needs of all roads and streets, in comparison with anticipated revenue for a future period, and the extensive urban studies conducted in cooperation with local authorities. All such reports of a general nature, together with annual traffic surveys, city traffic studies, road condition ratings, and various special studies suitable for lay consumption, are prepared for distribution to the public.

In summary then, the research function of the Planning Division is to obtain and analyze factual information bearing on highway economics and administration for the purpose of providing solutions to problems that confront State highway management. Through contacts with the Highway Research Board and its Correlation Service, the American Association of State Highway Officials, the Bureau of Public Roads, and other national and regional organizations, planning divisions are kept abreast of the newest developments in highway research. Clearly the combined efforts of all concerned can produce a wealth of information that may be utilized to determine whether a given course of action is wise and equitable.

PLACE OF PLANNING ORGANIZATIONS IN HIGHWAY DEPARTMENTS

With all the riches of fact and figure at its command and the experience and skill in interpreting the data, the planning organization cannot fulfill its advisory role unless the climate is favorable. Management must recognize the need for planning activities and be disposed to consider carefully the conclusions to be drawn from planning material. If such a climate does not prevail, planning reports will simply gather dust on library shelves and serve only a small fraction of the purpose for which they were prepared. Historical record is good and necessary, but builders of highways are deeply committed to today and tomorrow.

During a quarter-century in highway planning work, the author has witnessed the metamorphosis of small and struggling planning units, tolerated only because of Federal requirement, into influential and effective staff consultants whose opinions carry weight with top management. Consequently, firm ideas on the proper means of achieving this development have been developed.

It is of paramount importance that the planning director or engineer, or whatever other name he is known by, should hold a staff position immediately under the chief highway engineer. He has too much vital information of specific importance in its purest form to risk having it watered down, or in any other way rendered less effective, by its passage through an intermediate office. Furthermore, the planning director, who has been charged with the conduct of research and the development of its findings, is the person best qualified to make a strong and convincing presentation of the case.

A favorable climate for profitable development and use of planning data must also prevail within the planning organization itself. This means that planning units must be highly receptive to change. They must welcome new procedures and new techniques, while retaining the best of old methods. They must be alert and sensitive to the needs of management, and whenever possible, they must anticipate these needs. There are a number of ways in which these attitudes may be developed.

If it is to be effective, the planning organization cannot operate as an isolated cell within the highway department. It must itself have a sound knowledge of what constitutes proper highway administration and the problems involved. Highway planners should also be familiar with all department operations and have more than a casual acquaintance with department personnel at all levels. Only in this way can the planning organization fully know what research needs to be done and to what ends it should be directed. Suggestions for extremely valuable projects can emerge from such an exchange of ideas.

It is vital to the health of a planning organization to maintain contact with its opposite numbers in other highway departments, through national and regional associations as well as direct contact. The long-established cooperation with the Bureau of Public Roads, which has grown into a full partnership, has been of inestimable value to the Bureau and highway departments alike in making available to all a vast pool of experience, and in standardizing procedures and forms, so that a truly national picture can be assembled from the separate activities of highway departments across the country.

A legitimate extension of the planning organization's advisory function is the dissemination of planning data in a variety of forms. A fully-documented technical report may be suitable for the

engineer or fiscal expert but not very helpful to the busy administrator who needs the substance of the findings in brief and readily accessible form. And the abbreviated document prepared for a highway commission well versed in highway language and problems may be wholly unintelligible to the audience at a public hearing. Capturing the essence of a planning study in appropriate words and graphics, designed for a particular audience, is an unremitting responsibility. A single chart merits the same kind of concentrated effort to get the message across as does a sizeable booklet or a documentary film.

A comparable area in which planning can serve in an advisory capacity is that of public speaking—at public hearings, and at meetings of civic, church, business, and educational groups. The planning director and his top assistants are normally well informed on so many facets of highway department operation and transportation system requirements of the State, as well as current developments at the national level, that they can make ex-cellent ambassadors to the public. A forthright, factual, and courteous presentation of what the highway department aims to do, and why, can go a long way toward enlisting public acceptance of the highway program. The public welcomes reliable information, and the task of the highway administrator is made much easier when enlightened support replaces uninformed opposition.

Yet another opportunity is offered the planning organization to serve administration well. Oddly enough, this relates to an aspect of planning work which most take so much for granted that its potential force is not realized the integrity of research and the interpretations of findings. It would be naive to deny that political and financial pressures are, on occasion, exerted on highway department activities. If the planning unit slants or falsifies the information it furnishes to the highway administration, the unit's efficacy and its value are seriously impaired, if not forever lost. It is far more important for administration to trust the planning organization than to find its recommendations uniformly palatable.

Given the power to reason and make choices, man is obligated to act accordingly in whatever field of endeavor he engages. Highway planners have exceptional opportunities in this respect. For the most part, they can acquire the needed knowledge, interpret it, and select a just and sensible course of action. This part of the dual role has been widely acknowledged. But the successful fulfillment of the advisory role rests heavily on the manner in which findings are presented. This must be done with such imagination and honesty that planning will be universally recognized and accepted as an indispensable element of highway management.