The Continuing Transportation Study for the Small City

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INTRODUCTION

The 1960 Bureau of Census report indicates that 69.9 per cent of the total United States population can be classified as urban. By 1970, this value should be close to 75 per cent. Where has this population increase occurred? The percentage change for central cities and urban fringes is shown in Table I. Most would agree that the largest percentage gain would be in the urban fringe area. Specifically in the past decade, large percentage growth has occurred in the urban fringes of places whose population is 10,000 to 25,000, 25,000 to 50,000 and 50,000 to 100,000.

These are the areas that need the urban traffic planner’s attention, starting immediately. It is only a matter of time until all the larger metropolitan areas will have underway a continuing transportation study. In the smaller communities, those less than 200,000 population, there has been only a limited number of special purpose traffic studies conducted. Furthermore, because of the techniques used, most of these cannot be updated. Since the Detroit study was completed in 1954, the transportation planning process has been developing rapidly. The traffic engineer can no longer attempt a transportation plan equipped with only an origin and destination triangular trip table, an existing desire line flow chart, and a lot of hunches.

The transportation study must be a continuing process. Forecasts, by their very nature, cannot generally stand the test of time. It is true that better forecasts can be made when the projection is based on a thorough analysis of the most complete, pertinent, and accurate data. Recent trends are much more valuable than those several years old. When next year’s data become available, they will be weighted heavily in a revised forecast. Trends are not the only items subject to review; many assumptions have been made to-date in this type of study and these must have a critical re-appraisal. When does this continuing study cease to be? Traffic planners speak of a 25 year plan or of a forecast for 1980. This does not infer that short range goals are not
satisfied or that one waits until that magic year before putting the plan into action. Improvements to the transportation system are programmed and actually constructed during the forecast period. During a period of high urban growth, it seems highly improbable that the continuing study could be disbanded because the city has satisfied its present and future transportation needs.

1962—HIGHWAY ACT

It is unfortunate that cities (large and small), like the people who live in them and administer them, have to be prodded into doing something that they should have initiated on their own. Each time the government enters a new field, great clamor follows. This is most certainly a reason for concern but more important is the lack of individual response until the government demands action. Just such action is required by Section 7 of the Federal-Aid Highway Act of 1962 (P. L. 87-866), pertaining to urban transportation systems for cities of more than 50,000 population.

“It is declared to be in the national interest to encourage and promote the development of transportation systems, embracing various modes of transport, in a manner that will serve the states and local communities efficiently and effectively. To accomplish this objective, the Secretary (of Commerce) shall cooperate with the states, as authorized in this title, in the development of long-range highway plans and programs which are properly coordinated with plans for improvements in other affected forms of transportation and which are formulated with due consideration to their probable effect on the future development of urban areas of more than 50,000 population.

“After July 1, 1965, the Secretary shall not approve under section 105 of this title any program for projects in any urban area of more than 50,000 population unless he finds that such projects are based on a continuing comprehensive transportation planning process carried on cooperatively by states and local communities in conformance with the objectives stated in this section.”

Transportation improvements are so costly and exert such an influence on the total urban environment that they should not be attempted without long range coordinate plans. Yet, in spite of this, it seems that a government prod is necessary to achieve some general acceptance of this philosophy.
RESPONSIBILITY

Large metropolitan transportation studies have and will continue to have large organizations utilizing specialists from a wide range of disciplines. Smaller cities can neither afford this type of staffing nor could they compete for the trained people. Because only a limited number of these comprehensive type surveys have been performed, there is not a sufficient supply of personnel available. Further as each study is completed, it will retain a certain number of the staff in the continuing operation.

This means that the task will fall to traffic engineers with only limited training in this type of study. As study director, you will be specifically assigned the responsibility of providing to the decision making group the best possible transportation service at the least cost. The two key words of your charge are “possible” and “costs.” Grandiose plans may stir men’s blood but they do little to endear themselves in the hearts of decision makers who are responsible for providing many public services from budgets which are far from adequate. Plans presented must realistically conform to the community’s resources.

Even though it can be simply stated, this is a tremendous undertaking, and not generally in line with the capabilities of any single individual. Much has already been accomplished to-date and future help is already programmed.

GUIDE MANUALS

The now disbanded National Committee on Urban Transportation has prepared a guide to the factual development of urban transportation plans. This guide was designed primarily for administrative officials. The technical details of carrying out each stage of the program are presented in a series of seventeen procedural manuals. The guide lists six steps of the planning program: organization, fact gathering, fact analysis, plan preparation, plan adoption and financing, and plan effectuation.

Organization

The extent and type of organization will depend on the size of the community. The study director in a large metropolitan area will spend most of his time on administration. In smaller cities, the director will perform many technical duties along with the necessary administrative tasks. To assist the director a transportation planning team should be formed. Included in this team, besides the traffic engineer would be a city planner, streets commissioner, city engineer, a police official, city
solicitor, controller, and transit representative. Since there are gener­ally several cooperating agencies involved such as other municipal­ities, the county, state, and federal governments, a coordinating committee should be formed to insure a complete coverage of the area problems.

Fact Gathering

The aforementioned procedural manuals were designed to present the technical procedures for this and succeeding phases of the study. The adequacy of these manuals for use in conducting a large metropolitan area study is strongly questioned. The manuals which were published in 1958 have not had the benefit of the large comprehensive studies completed since or in progress today. The field is dynamic and each study report brings the state of knowledge to a new peak. But for the smaller sized communities, the procedural manuals should be used in conjunction with the published reports of existing studies.

The data collection phase can be separated into two parts: a travel inventory and a survey of urban characteristics. The travel inventory will be established from an Origin and Destination survey. The type of O and D study required will depend upon the size and type of community. A small urban area, with a large percentage of outside traffic, could use a simple external cordon survey. For cities between 50,000 and 150,000 population, a comprehensive type home interview survey should be performed along with an external cordon line survey to check out of town vehicles. The amount of information sought will be influenced by the evaluation procedure to be used. As a minimum, the interviews will establish the generations and destinations of person and vehicular trips, model splits, trip purpose, and vehicle ownership. The sample rate for this size city would range between one out of ten and one out of eight dwelling units interviewed.

Urban characteristics can be established from the community’s comprehensive plan. If no plan exists, it is important that such a plan be initiated immediately. The comprehensive plan will provide basic information on population, economic activities, land use, and all types of transportation, both the operating and terminal facilities. Full use should be made of the city planner on the transportation planning team for this aspect of the study.

Fact Analysis

The analysis of the data collected will be the most important and most difficult phase of the study. The prime function of the analysis is to provide an estimate of future travel patterns at the design year. It is generally accepted that traffic generation is a function of land use.
Design year estimates of future urban growth must then be made. The planner is faced with a most difficult task for he must decide not only the amount of development but the form this growth might follow. He must also decide what tools of planning can be used to influence the growth pattern.

Trip generation rates are usually established from the analysis of the O and D trip production. Future estimates assume that the rate will remain constant for the same intensity of land use. Time and future research should clarify this assumption.

The future model split of trips will depend on the use that is made of mass transportation. In general, the large metropolitan areas recognize a place for this type of transportation facility. It is also obvious that mass transportation cannot function in the very small communities. What its future might be in cities of 50,000 to 100,000 population is extremely difficult to predict.

After one has established the number of trips and the percentage of vehicular trips made for each purpose, it is necessary to establish trip destinations. Computing the number of trips between the zones of the area will establish the future desire line flows. Several mathematical models have been developed for predicting the interzonal trips. The most sophisticated to-date is the opportunity model developed in the Chicago study. For smaller studies of the size discussed here, the gravity model will probably receive the greatest use. This model distributes trips on the basis of the relative attraction of the destination and the resistances in terms of travel time encountered in the trip. With an increased number of studies in this population range, it is not unlikely that a new model will evolve.

Interzonal trips are then assigned to existing facilities. In the larger studies, this assignment has required the use of electronic computers. It seems highly improbable that with smaller studies, the process would revert back to mechanical computations. If a large storage computer is used, more of the transportation network could be involved in the assignment computation. Whether this refinement would warrant the additional costs remains unanswered.

Plan Preparation

Proper assignments should reveal the inadequacies in the present transportation system. A plan or alternate plans can be developed and tested under the new network loading. The alternate solutions might reflect the relative importance given to the auto and mass transportation. A plan should be developed in light of its total effect on community growth as well as satisfying the transportation demand.
Updating the Plan

Although the NCUT manual presents procedures for adopting the preferred plan and financing, these recommendations are not unique to any particular size urban area. Their omission here does not infer any lack of importance but rather an indication of completeness of the manual's presentation. In carrying out the plan, priorities should be established on the basis of benefits and costs.

It is highly improbable that funds would be sufficient to complete the plan required. More important is the fact that urban transportation is dynamic. No plan regardless of how well conceived can be considered as final. This requires a continuing program of data collection and re-evaluation.

NEW PROGRAM

The interest in urban transportation is mounting and the next decade should provide an increasing number of continuing comprehensive transportation plans for smaller cities. To assist in this matter, the American Association of State Highway Officials, the American Municipal Association and the National Association of Counties have sponsored a new program. Their goal is to establish a continuing planning program for all communities over 5,000 population. Initial emphasis will be on communities of 50,000 to 250,000 population. Several other associations interested in urban transportation problems have joined with the above group to form the National Committee on Public Support. Regional conferences will be held to publicise the program and explain its details. Approximately fifteen pilot cities have been selected. These will serve as demonstration cities in their respective states in order to explain the techniques of urban transportation planning. In the State of Indiana, Ft. Wayne has been designated as the pilot city.

The demonstration program will establish plans, programs, and techniques for continuing comprehensive studies. Another goal of this program will be to establish and promote procedures which should lead to cooperative intergovernmental relationship in planning. On-the-job training is contemplated to insure the adequacies and availability of trained personnel. Lastly, as new studies are reported, their methods of data collection and analysis will be critically reviewed so that better techniques might be evolved.

CONCLUSION

In summary, traffic engineers and urban planners should be aware of the transportation and urban growth problem aggravated by this country's large urban population growth. They should concur and
support the provision of the 62 Highway Act. They should accept their responsibilities for providing smaller communities with the type of program which will meet the federal aid requirements. Better use should be made of the tools available. Cooperation and continued research during the demonstration programs should refine the procedural manuals and provide a knowledgeable cadre for continuing transportation staffs to meet the demands of cities of all sizes and especially the small city.

TABLE 1
Changes in U. S. Population, 1950-60

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<tr>
<th>Central Cities</th>
<th>Per cent Change</th>
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<tr>
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<td>500,000 to 1,000,000</td>
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<tr>
<td>under 50,000</td>
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<table>
<thead>
<tr>
<th>Urban Fringes</th>
<th>Per cent Change</th>
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<tr>
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