

Considerations and Methods for Developing Metropolitan Area Transportation Studies

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This paper relates the recent growth of metropolitan areas to the need for comprehensive transportation planning. With a number of post-war studies as a basis, it discusses the motives that brought about the studies, the ways in which studies were financed, study content, and the guidance and direction of study operations.

● SINCE 1940 and particularly since the close of World War II, many cities have conducted studies aimed at the development of master street plans. Because the cost for providing the needed street improvements have been so far beyond the financial ability of the cities, many plans were necessarily tabled. In some respects it may be fortunate that this has happened because most studies underestimated the tremendous growth that has taken place in metropolitan areas.

This unprecedented growth has also resulted in subtle but powerful changes in the very structure and economy of cities. Heretofore, city development has been dictated by the duration of the home-to-work trip. So long as mass transit was required for such a trip, residential areas were densely developed and comparatively close to the business district. The majority of industrial activity was also in proximity to the central business district. In all cities, however, there are residential areas characterized by single family dwellings with generous yards and gardens. Such areas are farther from downtown and most of the residents could elect to drive their car or use mass transit. Mass transit service in such areas is less frequent than in densely developed areas, and often requires a transfer to complete the trip.

Throughout this period of explosive growth, the country has enjoyed a booming economy, permitting people to purchase homes and automobiles on a scale never before possible. The automobile has made it possible for people to live greater distances from downtown in semi-rural environment which they seem to prefer to the conventional densely developed areas. Businessmen were quick to recognize the need of these areas for shopping conveniences. Accordingly, large shopping centers with diversified products were constructed to serve these new areas. Actually, these shopping areas not only serve the new areas, but frequently have reduced the volume of downtown buying.

Coincident to the suburban residential development, there is a revolution in industrial activity. Older multi-storied factories are giving way to one floor operations with automation. As new type factories are constructed, industry has been forced to the suburbs to obtain the required space. In addition to the areas required for buildings, industry has also acquired extensive sites for vehicle parking, thereby making it convenient for workers to drive to work.

In this way, suburban development has imposed new traffic patterns on the metropolitan areas and is having a forceful impact on the central business district.

Public officials and alert businessmen exhibit a growing concern for the welfare of not only the central city, but the suburbs as well. They want the answers to the following specific questions:

1. How can the tax base of the central business district be maintained?
2. How large and in what areas will future growth occur?
3. What can be done about the decay of old industrial and commercial areas adjacent to the business district?
4. What can be done to preserve and make better use of the mass transit system?
5. How is traffic congestion going to be solved?
6. How will suburban areas provide for schools, water, sewage, fire and police protection, adequate highways, and a host of other services essential to modern living?

7. With the multiplicity and overlapping of school districts, city governments, county governments, and special districts, how can an equitable basis be found to finance and accomplish the needs for proper development?

Broad-scale transportation studies are providing some of the answers. In order to recommend a transportation plan to satisfy the demands of 20 to 30 years in the future, it is essential that the probable growth of the area be carefully estimated. Such growth is related to the industrial potential, a firm plan of land use, the probable utilization of mass transit, provision of off-street parking and the economy of the region.

Motivation

The reasons for performing transportation studies have varied somewhat among the cities that have made them. They are an essential requirement for planning, management or legislative action. Primary motivation may stem from any of these facets. In Detroit the basic reason was to test the need for a freeway network previously planned. Detroit and Wayne County had proposed a freeway network based on knowledge of traffic and growth trends within the area. The State Highway Department believed that some of the routes did not justify freeway type of design. In view of the importance of reaching decisions for long-range planning, a study was undertaken.

In St. Louis traffic congestion, blight surrounding the business district, and mass transit operations demanded a thorough analysis to chart the way for comprehensive planning.

In Birmingham a study was conducted to determine the best location and capacity requirements for Interstate highway routes.

In Philadelphia and Pittsburgh transportation studies are now being formulated. In these cases the studies are regarded as essential to the development of broad plans to guide the growth and redevelopment of the area.

In Washington, D. C., the transportation study is the result of a congressional act appropriating funds and directing the National Capital Planning Commission and the National Capital Regional Planning Council to investigate the transit requirements of the area. In doing so, it is necessary to evaluate highway usage also.

In New York an origin-destination study was conducted to learn of changing trends in vehicle movement throughout the greater New York area. The study also hoped to relate changing vehicle movements to changes in land use.

Financing

The problem of financing transportation studies is frequently the most difficult to overcome. Probably the majority of recent studies have been carried out with planning funds from the U. S. Bureau of Public Roads. Since 1934, 1½ percent of Federal-aid funds may be spent for highway planning purposes. Under this plan a state highway department furnishes 50 percent of the cost on primary, secondary, and urban systems, and 10 percent on Interstate planning projects. Where a combination of Federal-aid systems are involved, it is customary to determine the Federal contribution by proportioning Federal allotments to the state for the various systems. In this way Federal participation in the cost of the project may approximate 70 percent (if the Interstate System is involved in the study area).

The state highway department's share of the cost may be paid in whole by the department, or the state may arrange with the city or county to pay a portion of the state's share.

It is seldom possible to obtain financial support from all of the political subdivisions within a study area. It is usual for the central city and the counties involved to reach agreement on sharing the cost. In such instances the county foots the bill for the small communities in the county.

Recent studies which have utilized Federal planning funds include Detroit, Chicago, St. Louis, Pittsburgh, Philadelphia, Birmingham, Montgomery, Gadsden, Boston and Providence.

A different financing plan is being utilized by Baltimore. Here the Urban Renewal Administration made a grant of \$100,000 to the Maryland Planning Commission to conduct

a study of the Baltimore area to include an economic study, land use and population projections, water and sewage requirements, and a transportation study. These funds must be matched in cash or in kind.

The New York origin-destination study was financed by each of the participating agencies doing a part of the work. The participating agencies included: the Port of New York Authority, the Public Works Department of the State of New York, the New Jersey State Highway Department, New York City, the Triborough Bridge and Tunnel Authority, the New York Thruway Authority, and the Bureau of Public Roads.

Study Guidance

In all studies there must be some agency, board or committee which first of all decides upon the scope of the study and thereafter, determines policy throughout the duration of the work. This agency is usually non-technical, but does reflect the interest of political subdivisions within the study area as well as state and Federal agencies involved in the study operations.

In addition to this policy agency, there is frequently a technical committee appointed by the policy agency. Its duty is to insure that the work of the study is carried on to produce valid results.

The policy agency will determine the geographic limits of the study and the study content. Study content embraces such items as economic studies to evaluate the potential development of the area; land use studies to determine the probable areas for residential, commercial, and industrial expansion; origin and destination studies to predict routes and traffic volumes; mass transit studies to indicate the probable usage of mass transit; a master street plan to satisfy the traffic demand; and some studies may include a fiscal study to explore how the recommended plans may be financed.

Study Operations

There is considerable variety in the ways in which the work may be accomplished between studies. The study content and existing data will influence the work to be performed.

A popular procedure is to engage a consultant to perform the work with his own forces. Cleveland, Boston, Providence, Mobile, Birmingham and Montgomery followed this procedure.

Another method is to engage a director to coordinate the working force. Detroit, Washington, Chicago, Pittsburgh, and Philadelphia have or plan to use this procedure.

In St. Louis three independent consultants were engaged—each to perform stipulated portions of the study. One consultant made the economic study, land use and population projections. Another consultant performed the origin-destination study and assigned traffic to a recommended network. The third consultant will investigate the mass transit requirements and prepare recommendations for such facilities.

In Baltimore the Federal grant of \$100,000 pays the out-of-pocket cost for operating the study and all of the participating agencies (Baltimore City, five counties, and the State Roads Commission) will collectively supply the manpower and equipment to collect and process the study data. A study director coordinates the work.

Table 1 indicates the ways in which some recent studies have been financed, their content, guidance and operations. In addition to these metropolitan area studies, there have been hundreds of studies in smaller cities all of which have advanced the development of transportation plans.

In almost all cases, there are some existing data that is useful to the study. Generally, such data require some work to bring them up to date or to test their validity. Most large cities have had previous studies or suggested plans. All such plans are worthy of consideration in any new study to be undertaken.

It becomes increasingly clear that a suitable transportation plan must be integrated with other plans for the metropolitan area. Plans for parks, industrial areas, residential areas, water and sewage will shape the growth of the area and, thereby, impose demands on the transportation plan. For this reason those in charge of developing the transportation plan seek the aid of local planning officials to learn of their plans for development.

TABLE 1

METROPOLITAN AREA	FISCAL PARTICIPATION				STUDY CONTENT				STUDY GUIDANCE				STUDY OPERATIONS											
	State	BPR	County	Sub. Areas	Central City	Land Use	O & D	Freeways	Arterials	Transit	City	County	State	Sub. Areas	BPR	Commission	Consultant	Director	City	County	State	Sub. Areas	Commission	
DETROIT	x	x	x		x	x	x	x	x	x	x	x	x		x			x						
CHICAGO	x	x	x		x	x	x	x	x	x						x		x						
WASHINGTON					1.	x		x	x	x						x		x						
MOBILE					x	x	x	x	x		x						x							
BIRMINGHAM	x	x					x	x	x				x				x							
ST. LOUIS						x	x	x	x	x						x	x							
KANSAS CITY	x							x								x			x	x	x	x	x	x
CLEVELAND			x		x	x	x	x	x	x	x	x		x				x		x	x	x		
BOSTON	x	x					x	x	x	x	x	x		x	x									
PROVIDENCE	x	x					x	x	x		x	x		x		x		x			x			
MILWAUKEE					x	x	x	x			x	x		x		x						x		
ATLANTA	x	x				x	x	x				x				x	x							
BALTIMORE			2.			x	x	x	x	x	x	x	x	x	x			x	x	x	x	x	x	x
SAN FRANCISCO					x	x	x	x	x	x	x					x	x		x					
PHILADELPHIA	x	x	x		x	x	x	x	x	x						x		x						
NEW YORK	x	x		3.	x		x									x			x		x			x
PITTSBURGH	x	x	x		x	x	x	x	x	x						x		x						

1. Congressional grants of \$400,000 2. \$100,000 grant from Urban Renewal Administration
3. Port of N. Y. Authority; Triborough Bridge & Tunnel Authority; and N. Y. Thruway.

SUMMARY

Metropolitan area transportation studies are being performed in more and more cities in order to provide guidance in overcoming many of the problems that beset the community. The study content may vary greatly between cities depending on why the study is made and available reliable data. The studies become a basic requirement for planning, management and legislative policy.

Financing arrangements are also variable. It is significant that when the need for such a study is generally recognized, ways are found to finance the undertaking.

In organizing as well as in study operations, it is important that all parts of the study area are represented and, if possible, to actively participate in the work. By making all areas a partner in the study, two purposes are accomplished. First, the study benefits from their plans and knowledge; and second, their acceptance of the recommended plan is easier to obtain.

Actual work on the study may vary all the way from a consultant doing all of the work, to doing the work with personnel from local agencies.

The cost for doing a complete transportation study is substantial. Having developed a plan, ways should be found to keep it current. Any plan for long-range development is necessarily based on estimates of future population and areas to be developed. Communities rarely develop precisely in accordance with estimates, thus necessitating changes in the plans from time to time.

A review of existing urban freeways reveals that in nearly all cases freeways carry in excess of their design volumes within a few years after opening. It is to be expected

that new freeways resulting from the present type of detailed studies will prove adequate for future traffic demands. However, it must be recognized that all studies are predicated on some estimates. The study findings are therefore influenced by the validity of such estimates. In view of the high cost of freeways, it would seem prudent to include a factor of safety to provide for possible future traffic volumes in excess of study findings. Here the factor of safety is space—space for additional lanes, and space for possible elevated facilities. This space can be provided at a nominal increase in the original cost.

The adoption of a broad plan is helpful to public officials for formulation of policy and also for charting improvement programs. Such a plan is also of great value to business and industry. When future land use and the transportation plan is known, development can be undertaken on an intelligent basis.

A suitable transportation plan is essential to the proper development of any metropolitan area. In turn, the transportation plan should be keyed to and a part of a broad plan for area development. Unfortunately, the broad plan is not always available when the need for decisions on the transportation plan is urgent. In such cases, the transportation plan must be formulated on the available information for the area.

The plan so developed, will furnish the basis for suitable development provided the work is done by competent engineers armed with sufficient data.