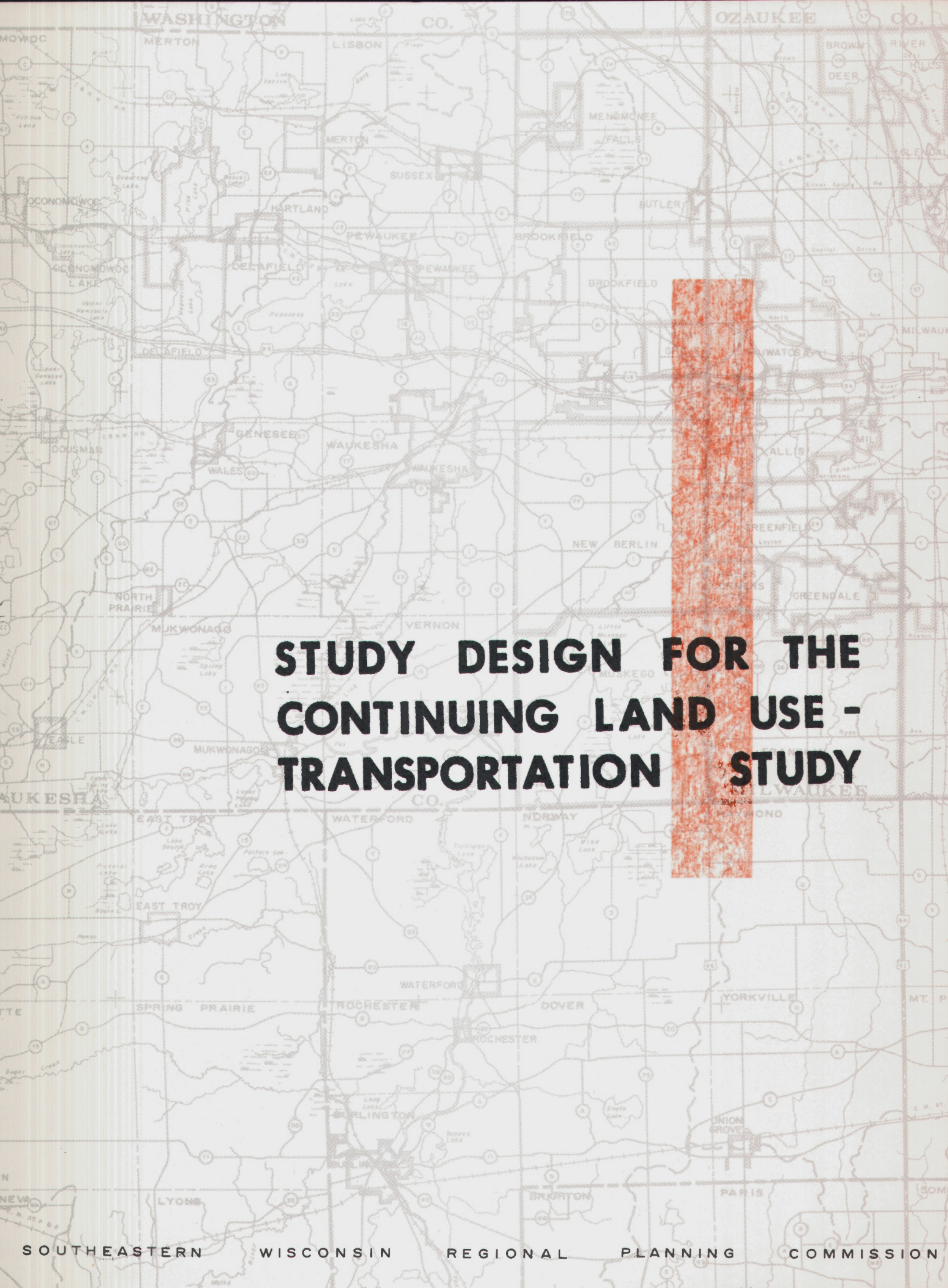

STUDY DESIGN FOR THE CONTINUING LAND USE - TRANSPORTATION STUDY

SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION

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STUDY DESIGN

CONTINUING REGIONAL LAND USE-TRANSPORTATION STUDY

PROJECT NO. WIS. P-70

SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION

August 1967

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Chapter I

INTRODUCTION

BACKGROUND

In January of 1963, the Southeastern Wisconsin Regional Planning Commission, in cooperation with the U. S. Bureau of Public Roads,[1] U. S. Housing and Home Finance Agency,[2] State Highway Commission of Wisconsin,[3] and the constituent local units of government within the seven-county planning area, undertook a three and one-half year regional land use-transportation study designed to provide two of the key elements of a comprehensive plan for the physical development of the Region: a land use plan and a transportation plan.

Ancillary objectives of the regional land use-transportation study included:

1. Establishment of the complete pattern of movement of people and goods within the Region by highway and transit.

2. Quantitative analysis of the existing and the probable future transportation supply and demand on both a local and regional basis and the quantitative assignment of future traffic demand to the developing regional freeway and major arterial street and highway and transit systems of the Region.

3. Establishment of a coordinated and uniform data collection and analysis system that would readily provide on a continuing basis summary data on population, employment, motor vehicle ownership, land use, soil and water capabilities, recreation-related resources, travel origins and destinations, transportation facilities, public utilities, and financial resources for the Region. These data were to be available in a form suitable to assist federal, state, and local agencies of government and private investors in making development decisions.

4. Promotion of better understanding by public officials, planners, and engineers of the interrelationships existing between land use and transportation and of the factors influencing residential, industrial, and commercial land development within the Region, thereby providing a better insight into local and regional growth patterns.

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[1]Presently a bureau of the U. S. Department of Transportation.

[2]Presently the Department of Housing and Urban Development.

[3]Presently the Division of Highways of the Wisconsin Department of Transportation.

5. Establishment of an increased awareness of the effect of each local community's plans on surrounding communities and on the Region and promotion of the coordination of the land use and transportation planning efforts of all levels of government within the Region.

6. Collection and analysis of data that would permit forecasts and recommendations to be made regarding future patterns of economic activity, population distribution, land use development, and long-term impacts of alternative transportation system arrangements; costs and benefits of alternative generalized transportation systems and specific transportation facility improvements; and programs for the best utilization of existing transportation facilities and for the construction of new transportation facilities as may be dictated by needs.

The initial regional land use-transportation study was essentially completed in December 1966 with the publication and adoption by the Commission of a land use plan and a transportation plan for southeastern Wisconsin, and the study generally met its primary and ancillary objectives.

Even prior to the completion of the initial regional land use-transportation planning effort, the Commission, its constituent local units of government, and the affected state and federal agencies gave consideration to the necessity of establishing a continuing land use transportation planning effort within southeastern Wisconsin. On October 11, 1965, the Commission approved and published a prospectus for a continuing land use-transportation study; and based upon this prospectus, the seven constituent county boards agreed to provide the local funds necessary for the conduct of the continuing planning effort from July 1, 1966, through December 31, 1969. The State Highway Commission of Wisconsin on behalf of the U. S. Bureau of Public Roads as well as itself and the U. S. Department of Housing and Urban Development subsequently entered into planning grant contracts with the Commission based upon the prospectus, and the continuing study was thereby fully funded.

This study design is intended to outline more fully the major work elements to be undertaken in the continuing regional land use-transportation study and to describe the work program of the continuing study in greater detail than did the prospectus. Where possible, a detailed design for the various work elements is provided. It should be recognized, however, that new techniques, methods, and approaches will have to be developed as the study progresses to deal with some aspects of work, not only to meet the unique problems inherent in the continuing study but also to add to the overall knowledge of regional land use-transportation planning. To this extent, this study design has been kept sufficiently general that certain latitude in the selection of specific techniques could be exercised by the study staff. Modifications may be necessary as the work progresses, and throughout the study conferences and meetings will be arranged and conducted periodically with public and private groups directly concerned with the study methods and results. The Technical Coordinating and Advisory Committee on Regional Land Use-Transportation Planning, to

be established under the continuing study, will play an important role in the consideration and approval of such modifications as may be required.

BASIC DEFINITIONS

As in the initial regional land use-transportation planning effort, the term "land uses" refers to the generalized human activities that group together to form the overall pattern of urban, suburban, and rural development considered at a regional scale. Particular emphasis is placed on those aspects of land use which either, through their individual or aggregate effects, are regional in scope and not only interact strongly with the need for major utility, recreational, and transportation facilities but also exert a heavy demand upon the natural resource base. These include large land-consuming uses, such as agriculture; regional park and open-space reservation; woodlands, wetlands, and surface waters; residential uses; and major commercial and industrial centers. Local land uses, as distinct from regional land uses, will receive attention only as to the aggregate area required and approximate spatial distribution desired but will not be considered as to actual site location as will the regional land uses.

Similarly, the term "transportation system" refers to the arterial street and highway facilities and to mass transit facilities considered at a regional scale. This transportation system, as identified in the initial study effort, is considered down to, but not including, the neighborhood level. Such transportation facilities as railways, airports, and seaports will be studied only to the extent that they directly affect arterial street and highway and transit system development. The term transportation will, therefore, be defined to include the intra- and inter-regional movement of people by highway and transit facilities and the movement of goods by truck.

It is intended that full use be made in the continuing study of all existing and available surveys, studies, and reports and other data which will influence or affect phases of the continuing study and that additional data collection activities be conducted only as necessary to develop original data unavailable elsewhere or to supplement or update existing data. Where the term "will" is used in subsequent chapters of this report relating to work elements to be accomplished, it is intended to indicate that the work elements referred to are considered to be essential to the objectives of the study and, therefore, definitely will be accomplished under the initial continuing study effort. Where the term "may" is used, the work elements referred to are either considered desirable, but not essential, and, therefore, will be done only if staff, time, and budgetary limitations allow, or the work elements are such that their necessity remains to be determined through completion of the other work elements of the study. Staff, time, and budgeting limitations cannot be fully established at this time because of the unknown demands which plan implementation activities may place on the study resources.

OBJECTIVES OF THE CONTINUING STUDY

The continuing regional land use-transportation study is intended to comprise an integral part of the total regional planning program in southeastern Wisconsin. As such, the continuing study has four specific objectives:

1. To meet the planning requirements of the 1962 Federal Aid Highway Act and of the 1964 Federal Urban Mass Transportation Act so as to continue to qualify the constituent state and local units of government concerned for federal aids in partial support of the development of highway and transit facilities within the Region, and to assist the Commission in meeting the planning review requirements of Section 204 of the Federal Demonstration Cities and Metropolitan Development Act.

2. To update and revise the data collected in, and the forecasts and plans prepared under, the initial regional land use-transportation study so that the full value of these data, forecasts, and plans can be realized and development decisions within the Region made intelligently upon current factual information.

3. To update and revise the plans prepared under the initial study effort in light of changing conditions within the Region.

4. To provide for the continued integration of the land use and transportation planning efforts within the Region with other elements of the comprehensive areawide planning effort, including the preparation of watershed development, sewerage and water supply, airport, park, library, and community shelter plan elements.

5. Finally, and perhaps most importantly, to convert the plans prepared under the initial study effort into action programs.

The attainment of the foregoing objectives will require a continuation of the close working relationships established under the initial study between the Commission and those agencies of government and private organizations responsible for land use and transportation system development within the Region. It will also require a continuing modification and adaptation of the plans and means of implementation to changing conditions. Local planning and plan implementation efforts must continue to be closely coordinated with each other and with the efforts of the state and federal agencies involved, using the evolving documented long-range regional plans as a basis for such coordination. Moreover, the data collected, the plans prepared, and the plan implementation policies recommended in the initial planning effort must be extended in a meaningful manner as a basis for making development decisions within the Region on a day-to-day basis.

To meet the foregoing objectives, the continuing regional land use-transportation study must perform the five basic functions as outlined in the following paragraphs.

Surveillance

Under the continuing regional land use-transportation study, regional development must be carefully monitored and analyzed in relation to the adopted regional land use and transportation plans. Definitive data must be collected on the amount and spatial location of changes in actual population and economic activity levels, land use development, automobile availability, trip generation, mode of transportation utilized, and on local land use and transportation plan development and plan implementation actions within the Region. These changes must be carefully analyzed in relation to the adopted regional land use and transportation plans in order to determine whether the forecasts and assumptions underlying the plans are holding over time and whether the plans remain valid. If changing conditions so dictate, the forecasts and assumptions underlying the plans, as well as the plans themselves, may require revision.

Reappraisal

Under the continuing regional land use-transportation study, the regional land use and transportation plans will have to be reappraised in light of changes in actual regional development as may be revealed by the surveillance function. Since the continuing regional land use-transportation study will be concerned with administering plan elements which were only recently completed and adopted and since it is unlikely that any significant changes in regional development will have come about in the short time since plan completion and adoption, it is not anticipated that any major changes will be required in the plans themselves. For the same reasons, the reappraisal process will not initially involve a setting forward of the plan design year.

The simulation models utilized in plan preparation and in plan test and evaluation must be periodically reexamined in order to ascertain whether the rationale and assumptions underlying the models continue to remain valid. Unless otherwise indicated by the reappraisal function, it is proposed that major reexamination of the simulation models be accomplished only at approximately 10-year intervals.

Service and Plan Implementation

If the regional land use and transportation plans are to be converted into action programs, these plans and the data and forecasts underlying these plans must be extended to the sponsoring agencies and constituent local units of government as a basis for day-to-day development decision-making. This is necessary in order to assure the full integration of state, regional, and local development plans and plan implementation efforts. Plan implementation activities not included under the continuing land use-transportation study, but important to its success, will include such major efforts as the prepara-

tion of subregional community plans and plan implementation devices and the preparation of additional regional plan elements, such as a regional sewerage system plan.

Procedural Development

Rapidly changing technology will require a continual reappraisal of the techniques and procedures used in the initial and continuing land use-transportation study phases and the development of new techniques and procedures as necessary. In order to avoid duplication of effort, the U. S. Bureau of Public Roads is encouraging each major metropolitan or regional transportation study in the United States to focus its procedural development efforts on one phase of the land use-transportation process. It is proposed, therefore, that major attention be focused in the southeastern Wisconsin study on developing better land use planning techniques, including the development of a land use design model.[4] In addition, it is anticipated that further progress will be made towards integrating land use and transportation planning and plan implementation. Better methods will be sought for use in land use and transportation plan design and for use in the collection of basic data concerning such elements of the natural resource base as soils, surface and ground water, woodlands, wetlands, and wildlife habitat.

Documentation

In order to properly present the results of the continuing land use-transportation planning process, an annual report summarizing the results of the surveillance, reappraisal, service, and procedural development efforts will be issued to the participating federal, state, and local units of government and to interested private citizens. The report will summarize any success or failure in plan implementation, as reflected in major land use and transportation facility development within the Region, and will recommend required changes in the forecast plans and plan implementation efforts. In addition, planning reports, technical reports, and technical records will be issued on a work progress basis as required.

Budgetary, staff, and time limitations preclude giving equal weight and attention to the foregoing five functions of a continuing regional land use-transportation study. During the initial continuing study period, it is proposed in southeastern Wisconsin to place major emphasis upon two of the five functions: 1) surveillance and 2) service and plan implementation. The surveillance function will be emphasized, not only because of its fundamental

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[4]The development of a land use design model by the Commission has been separately and fully funded through a planning research and demonstration grant from the U. S. Department of Housing and Urban Development (Project No. Wis. PD-1).

importance to any sound continuing planning operation but also because of its extreme importance to a planning function which is entirely advisory. If state, county, and local officials and private developers are to be expected to continue to seek the advice of the Regional Planning Commission on development decisions prior to making these decisions, then the Commission must continue to have a better fund of knowledge about factors affecting development than any other agency operating in the same geographic area. The initial regional land use-transportation study provided the Commission with just such a fund of knowledge. The continuing land use-transportation study must maintain the position of that fund of knowledge.

The service and plan implementation function will be emphasized because of the importance of converting the adopted regional land use and transportation plans to action programs. The success of the regional planning effort must ultimately be measured, not in terms of the technical excellence of the areawide plans that may be prepared or even by the scope and depth of the basic planning and engineering data which this effort may assemble, important as this latter function may be, but rather in terms of the ultimate effects that the areawide planning operation will have on the evolving regional settlement patterns. That effect can only come about through effective plan implementation. The attention given in comprehensive areawide transportation planning operations throughout the nation to the development of planning techniques and to the refinement of these techniques has, to date, been out of proportion to the attention given to implementation of the plans produced by the techniques.

Since, as already noted, the continuing study will be concerned with the implementation of regional land use and transportation plans recently produced and adopted, the reappraisal function should not require emphasis unless the surveillance function indicates that changing conditions require a major reappraisal of the plans produced and adopted under the initial study effort. Similarly, the primary emphasis under the continuing study on plan implementation, coupled with the fact that the Commission is an operating and not a research and development agency, requires that only limited attention be devoted to the procedural development function. Finally, the very nature of the continuing study operations is such to require a limited documentation function. Unlike the initial land use-transportation planning effort, which produced two planning reports published in four volumes, five technical reports, and 12 technical records, totaling 2,119 pages of formal printed report material, the output of the continuing study will have to be more concerned with directing development decisions on a day-to-day basis and will, therefore, be more apt to require informal documentation in the form of letter reports, staff memoranda, and oral presentations before governing bodies than in the form of formal printed reports, although some of the latter will be issued.

OVERVIEW OF THE LAND USE-TRANSPORTATION PLANNING PROCESS

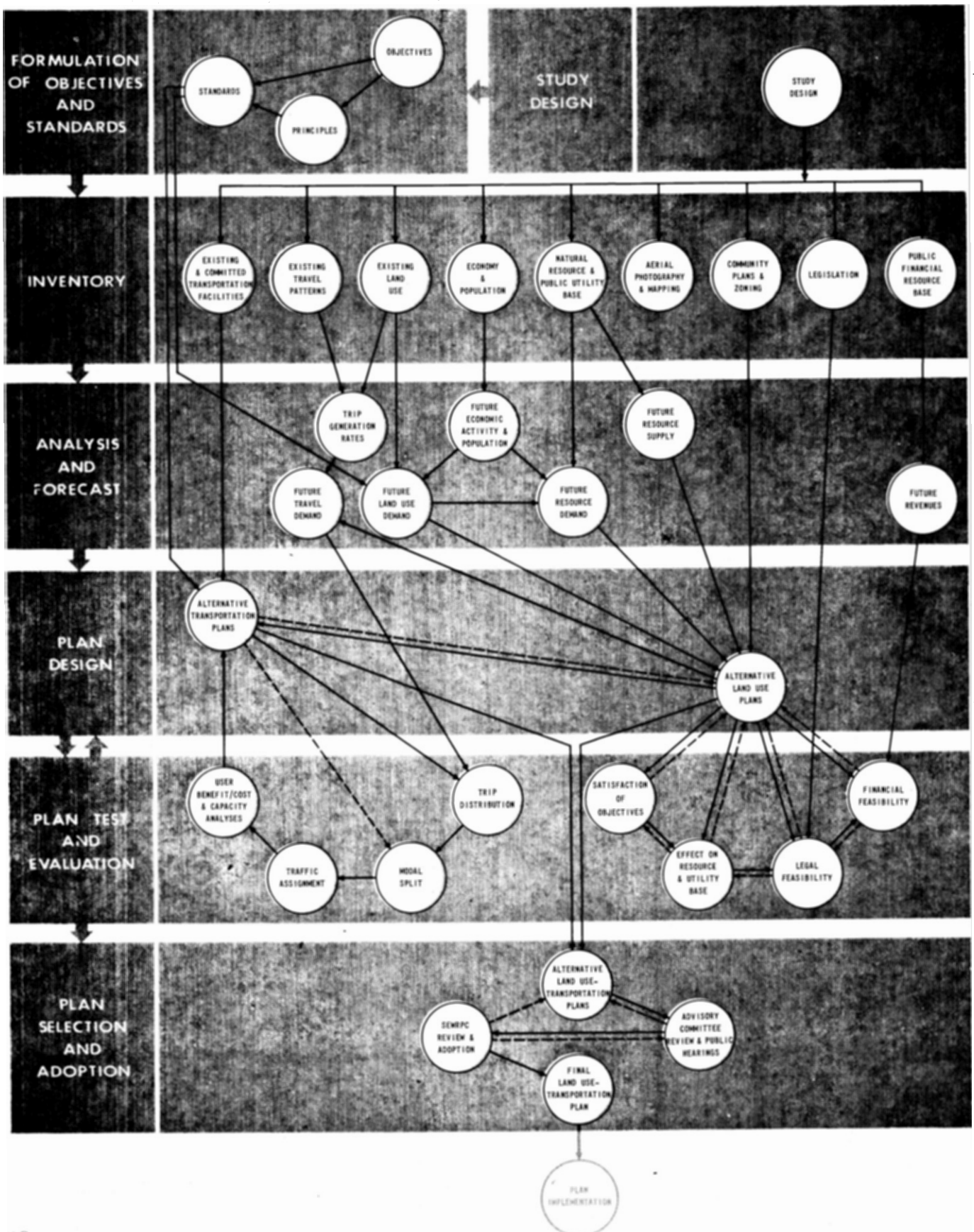
The initial regional land use-transportation study employed a seven-step planning process by which the Region and its principal functional relationships could be accurately described both graphically and numerically, the complex movement of people and vehicles over highway and transit facilities simulated, and the effect of different courses of action with respect to regional land use and transportation system development evaluated. The seven steps involved in this original planning process were: 1) Study design, 2) formulation of objectives and standards, 3) inventory, 4) analysis and forecast, 5) plan design, 6) plan test and evaluation, and 7) plan selection and adoption. Each step in this planning process included many individual operations which had to be carefully designed, scheduled, and controlled to fit into the overall process (see Figure 1). These steps were fully described in Chapter II of SEWRPC Planning Report No. 7, Volume 1, Inventory Findings--1963, May 1965.

The end results of this planning process were not only regional land use and transportation plans scaled to future land use, travel, and resource demands and consistent with regional development objectives, but the beginning of a continuing planning process that permits modification and adaptation of the plans and the means of implementation to changing conditions. The continuing regional land use-transportation planning effort must, therefore, be designed to permit the continued application of the initial planning process by maintaining the inventories, analyses, and forecasts in a current state; revising the development objectives and standards; and revising the plans and the recommendations concerning plan implementation as necessary.

This report constitutes the first step of the seven-step planning process for the continuing land use-transportation study. Work proposed to be accomplished in each of the other six steps and, in addition, toward plan implementation is described in the succeeding sections of this study design.

Figure 1

THE LAND USE - TRANSPORTATION PLANNING PROCESS



Chapter II

OBJECTIVES, PRINCIPLES, AND STANDARDS

Since planning is a rational process for formulating and meeting objectives, the formulation of regional development objectives was a necessary task under the initial regional land use-transportation study effort. The advisory committee structure created by the Commission for the regional land use-transportation study[1] provided a practical and effective means by which public officials, technicians, and citizen leaders could become involved in the regional planning process; and it was through this committee structure that the initial formulation of the regional development objectives was channeled. As described in Volume 2 of Planning Report No. 7,[2] the proposed regional development objectives were augmented by supporting principles and their quantification and relationship to the physical development plans facilitated by the preparation of detailed land use and transportation system planning standards.

The application of the land use and transportation system planning standards, along with an assessment of the extent to which the standards were satisfied and, therefore, the development objectives achieved under each of the alternative plans, was instrumental in facilitating the final selection of the recommended land use and transportation plans. Thus, the objectives and standards served a most significant purpose in the plan design, evaluation, and selection phases of the initial planning process.

The regional development objectives formulated under the initial regional land use-transportation planning effort were necessarily conditioned by then existent knowledge of conditions within the Region, as well as by the then present state of planning at the state, regional, and local levels. It is, therefore, possible that with the passage of time, with the attainment of additional knowledge about the Region, and with the fulfillment of certain of the adopted regional development objectives through plan implementation, as well as with the failure to fulfill others, a major reevaluation of the regional development objectives may become necessary. No such major reevaluation of the regional development objectives or of their supporting principles is, however, contemplated before 1970. The elapsed time since the formulation of the objectives and supporting principles will have been too short to provide the necessary base of experience from which to make such a major reevaluation.

Instead, it is proposed to continuously monitor and reevaluate the standards which support the regional development objectives. This continuous monitoring and reevaluation process can be accomplished by two means. The first

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[1]See SEWRPC Planning Report No. 7, Volume 1, Inventory Findings--1963, pp 7-9.

[2]See SEWRPC Planning Report No. 7, Volume 2, Forecasts and Alternative Plans--1990, Chapter II.

would involve the annual comparison of the recommended planning standards with the current inventory data obtained under the surveillance function of the continuing land use-transportation study in order to assess the continued validity and relevance of the recommended standards, as well as the degree of progress being made toward the meeting of the standards. The second would grow out of the service and plan implementation function of the continuing study, in which the recommended standards will necessarily be refined and expanded as more detailed planning and engineering studies are made to reflect more precisely the objectives and principles which they support, as well as to incorporate the effects of changes in technology.

Chapter III

INVENTORIES

Reliable basic planning and engineering data collected on a uniform, area-wide basis is absolutely essential to the formulation of workable development plans. If these plans are to be implemented and, as necessary, adapted to changing conditions, this inventory data must be maintained in a current state through a surveillance function. Thus, a continuing data inventory operation becomes the major and most important element of the necessary surveillance function. The data inventory operation described herein entails the collation of data collected by other operating agencies, as well as the collection of new data by the Commission itself. In order to avoid duplication of effort, secondary data sources will be used wherever possible. The necessary surveillance function of a continuing regional land use planning operation requires that factual data must be maintained current on the existing land use pattern, on the potential demand for each of the various major land use categories, on the major determinants of these demands, and on existing local development objectives and constraints, as well as on the underlying natural resource and public utility base and the ability of this base to support land use development.

The necessary surveillance function of a continuing regional transportation planning process requires that factual data must be maintained current on the existing and potential demand for transportation between various points within the Region and outside the Region, on the relative demand for alternative modes of transportation, and on the major determinants of these demands, as well as on the existing and potential supply of transportation system capacity.

MAPS

General Base Maps

General base maps of the Region are required to provide a medium for recording and presenting in graphic form the results of the planning studies, as well as the natural and man-made features of the Region. A secondary purpose of the general base maps is to permit the information collected in the various studies to be related on a continuing basis to the geographic area from which it is taken; and particularly to permit geographical identification of data by machine methods.

General purpose regional base maps have been prepared by the Commission and are available for the continuing study. These maps portray each county in the Region at scales ranging from 1:24000 to 1:96000. In addition, a great many special purpose maps have been prepared by the Commission, including large-scale topographic, planimetric, and cadastral maps of certain subareas of the Region. All maps prepared by the Commission under any of its several planning programs will be available to the continuing study. It will be necessary, however, under the continuing study to update certain of the general purpose base maps in order to reflect changes brought about by street and highway construction, transit service extensions or abandonments, revisions in corporate limits lines, and changes in certain topographic features.

In addition, certain of the special purpose maps derived from the base maps may have to be adapted to changing conditions and techniques. Specifically, the maps showing traffic analysis zones and districts will be updated to reflect changes or additions to the arterial street and highway and transit systems and revisions in the zone and district boundaries necessitated by changing conditions and analytical techniques. The node numbering scheme used for the base year network maps will be revised to conform with the scheme used for the design year maps and to take maximum advantage of the diagnostic data summaries available from the current battery of traffic assignment computer programs. State plane coordinates of all link intersections (nodes) in the updated arterial street and highway and transit networks will be determined and appropriate procedures developed for application of automatic data plotting. Finally, the network mapping system will be revised to provide maximum compatibility with the overall base mapping scheme for the Region and to provide for easier and more efficient graphical analyses and data retrieval operations.

Special maps will be prepared displaying such data as current traffic volume counts, count station location, travel time band, link capacity, and average trip lengths by link as required for the continuing transportation planning effort.

All updating of the general purpose base maps will be accomplished by the Cartographic Division of the Commission staff. Revisions in corporate limits lines will be made annually from municipal plat maps, furnished by the Division of Highways of the Wisconsin Department of Transportation, showing current corporate limits lines and streets and highways open to traffic. Changes in cultural features, such as stream and lake shorelines, street and highway pavements, railway, airport, and harbor facilities, will be made in 1967 from ratioed and rectified aerial photographs provided by the Division of Highways at a scale of 1" = 2000', having a date of photography of April 1966 and an original negative scale of 1" = 6000'. Updating of special purpose maps will be accomplished either by the Commission's Cartographic Division or in certain cases by the Land Use and Transportation Divisions.

Aerial Photography

New aerial photography of the entire Region has been taken in the spring of 1967 at a negative scale of 1" = 1600'. Ratioed enlargements of this photography will be prepared on stable base material at a scale of 1" = 400' in order to provide the basic data source for the necessary updating of existing land use information and of basic data concerning certain elements of the natural resource base.

Detailed Planning Base Maps

In order to carry out the plan implementation recommendations set forth in SEWRPC Planning Report No. 7, Volume 3, Recommended Regional Land Use and Transportation Plans--1990, additional 1" = 100' scale, two-foot contour interval maps, based upon a monumented control survey network relating the

U. S. Public Land Survey system to the state plane coordinate system, will be prepared in conjunction with the continuing study, and under special agreement with the State Highway Commission of Wisconsin, for portions of the proposed Belt and Bay Freeways. Such maps were prepared under the initial study for the proposed Lake, West Bend, and Oconomowoc Bypass Freeways. The maps are intended to provide the basis for the official mapping of these proposed freeways by local municipalities and the Division of Highways of the Wisconsin Department of Transportation and will thereby provide a most important plan implementation device essential to the advance reservation of right-of-way for these important freeway facilities.

INVENTORY OF EXISTING HIGHWAY FACILITIES AND SERVICE LEVELS

The inventory of the existing arterial street and highway system and of the existing surface levels on that system, carried out under the initial regional land use-transportation study, will be maintained current on an annual basis. The functional classification of the total existing street and highway system, which classifies all streets and highways within the Region into the following categories: freeways, expressways, parkways, and standard arterials, will be reviewed and maintained current. The classification will be reviewed as an integral part of the preparation of jurisdictional highway plans for each county within the Region as recommended in SEWRPC Planning Report No. 7, Volume 3, Chapter VIII; and any necessary changes in the network maps will be made.

In addition, the following data will be maintained current on an annual basis for each link in the arterial network: facility type; number of traffic lanes; jurisdictional system designation; link location by zone, district, county, minor civil division, and U. S. Public Land Survey quarter section; link length; speed limit; right-of-way width; average running speed; traffic volume; curb-to-curb pavement width; turning lanes; vertical alignment; area type; link capacity; and vehicle miles of travel.

Characteristics indicative of the level of service provided by the arterial street and highway facilities will also be monitored on an annual basis. These characteristics include a congestion index, defined as the ratio of traffic volume count to operational capacity (volume-capacity ratio); accident rates; and speed and delay rates. Special studies will be carried out to ensure that certain data is maintained within the levels of accuracy and precision required for the continuing transportation planning effort. As resources permit, these studies will include a determination of factors affecting capacity, such as directional split, peak-hour factors, percentage of commercial traffic factors, load factors, turning movement percentages, and traffic signal splits, and will be conducted in cooperation with state, county, and city traffic engineering operations to ensure that the basis for the calculation of facility capacity continues to represent average urban and rural use conditions at reasonable levels of service. Traffic count adjustment factors will also be developed for varying subareas of the Region and for various facility types, to be determined after initial analysis of the traffic volume count data, to permit the conversion of column volume count data to annual and monthly average weekend as well as annual and monthly average weekday levels.

INVENTORY OF EXISTING TRANSIT FACILITIES AND SERVICE LEVELS

The inventory of existing transit facilities and levels of service, conducted under the initial regional land use-transportation planning effort, will be maintained current. Transit network maps will be updated to reflect changes in the transit routes and levels of service within the Region. The following data will be maintained current on an annual basis for each link in the transit network: type of route; frequency and regularity of service; route number; link travel time based upon stop spacing, and average running speeds; walk-wait time based upon headways, zone size, and population distribution within the stop service area; transfer time based upon headways of intersecting routes; link length; quantity of service based upon seats per bus and service frequency for total 24-hour service and morning and evening peak-hour service periods; and link location by zone, district, county, minor civil division, U. S. Public Land Survey quarter section, and by state plane coordinates of the nodes.

Special transit service studies may be conducted, including special origin-destination surveys, to monitor changes in transit utilization habits and to obtain data on the impact of improved service on transit utilization.

INVENTORY OF AUTOMOBILE PARKING AND TRUCK TERMINAL FACILITIES

The inventory of the supply and type of automobile parking facilities available in the central business districts of the cities of Milwaukee, Racine, and Kenosha, carried out under the original regional land use-transportation effort, will be maintained current by utilizing data from the files of the traffic engineering departments of the cities concerned. Data to be maintained current for each block within the central business districts will include: the total number of on-street spaces, the number of short-term on-street spaces and attendant utilization costs, the number of long-term on-street spaces and attendant utilization costs, and turnover rates. Similar data will be maintained current for off-street public and private spaces.

The updating of truck terminal locations and sizes will be accomplished through the land use survey. If analyses of the results of the land use survey updating so indicate, special studies will be made on the location and relocation of truck terminals.

INVENTORY OF EXISTING LAND USE

The existing land use inventory completed under the initial land use-transportation planning effort will be updated once during the initial continuing study effort, for the year 1967, in order to determine the current amount, type, intensity, and spatial distribution of all land uses within the Region and to monitor changes in the patterns and trends. The updating will utilize the same land use categories used in the original inventory. Certain categories may, however, be subdivided in order to obtain a greater detail and in

order to assure greater compatibility with the types of zoning districts recommended in the model zoning ordinance.[1]

The updating of the land use inventory will be accomplished primarily from low-altitude large-scale aerial photography flown in the spring of 1967 and described in a previous section of this study design. Field checks similar to those used in the original land use inventory will be carried out in order to assure the accuracy of the data acquired through photo interpretations, and all data will be reduced to a form suitable for consolidated machine data processing. Where applicable, recently completed local land use inventories, such as those carried out by the Commission for the Kenosha Planning District, will be incorporated into the updating process. Particular attention will be paid to the peripheral urban area expansion patterns in order to monitor development in this area and to determine its compatibility with regional plan proposals. Quantitative and qualitative comparisons will be made of land use changes and the proposals embodied in the adopted regional land use plan, and appropriate graphic displays will be developed for publication. By combining the information acquired through the land use inventory updated with revised population and employment estimates by small geographic area, appropriate measures of the changes in land use intensity will be produced.

In addition, preparations will be made for a more detailed regional land use inventory to be carried out early in 1970 to coincide with the U. S. Census of Population. This land use inventory, to be carried out beyond the period of the presently funded continuing land use-transportation study, is envisioned as a complete parcel-by-parcel survey which would permit the complete correlation of land utilization with population and employment size, characteristics, and distribution within the Region. Work toward the conduct of such an inventory will include the collection, under the continuing land use-transportation study, of all available cadastral maps. In addition, the design of a means for assigning state plane coordinates to the parcels shown on these cadastral maps may be undertaken.

INVENTORY OF COMMUNITY PLANS AND ZONING

Data collected in the initial regional land use-transportation study efforts on adopted county and local land use plans and zoning ordinances will be maintained current under the continuing study in order to permit assessment of changes in local community development objectives, assessment of the compatibility of these changes with adopted regional development objectives, and assessment of the impact of changes on the implementation of the regional land use plans.

The updating will encompass two primary work elements. The first will involve an actual resurvey of the present status of community plans and zoning documents through personal interviews with responsible public officials and analysis of all changes revealed through the interview process in local plans and

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[1]See Appendix A, SEWRPC Planning Guide No. 3, Zoning Guide, April 1964.

zoning documents from the 1963 base year. The second work element will entail a complementary inventory of historic land subdivision activity within the Region in order to evaluate changing land subdivision practices in terms of subdivision size, lot size, street frontage, sewer and water service extension requirements, and location of land subdivision activity in relation to existing development and the regional land use plan proposals.

The results of both of these work elements will be analyzed in the light of their influence on implementation of the regional land use and transportation system plans and upon the regional resource base.

INVENTORY OF EXISTING TRANSPORTATION MOVEMENT AND BEHAVIORAL FACTORS AFFECTING TRAVEL HABITS AND PATTERNS

A complete survey of the daily travel within the Region was carried out as a part of the initial land use-transportation study effort, including volume and classification counts, determination of points of travel origin and destination, trip lengths, frequencies and purposes, modes used, and reasons for selecting modes used through home interview, postal questionnaire, and roadside interview survey techniques. No new major origin-destination surveys are recommended before September-October of 1970 or April-May of 1971 for the following reasons:

1. Surveys conducted in 1970 or 1971 will benefit from the U. S. decennial census findings and may be related to a statewide transportation survey being considered by the State Highway Commission of Wisconsin.

2. Surveys conducted before 1970 will not measure the effects of the completion of the freeway network on the central business district of the City of Milwaukee.

3. Changes in the amount and distribution of travel since the 1963 surveys will probably be insufficient to warrant any major new origin-destination surveys before 1970.

Because of the many factors involved, proper surveillance of the battery of traffic simulation models used in the initial and continuing land use-transportation studies will require more than a periodic comparison of actual traffic flow volumes with simulated network volumes. Proper monitoring of the basic assumptions underlying the models and of the continued validity of these assumptions over time will also require comparison of actual and simulated trip generation, trip distribution, and modal split, as well as of traffic flows. To do this properly may require a sizable origin-destination survey effort beyond the reach of the budgetary limitations imposed upon the initial continuing study. It is, therefore, proposed to conduct special small-scale origin-destination surveys to monitor changes in travel habits and patterns in certain selected subareas of the Region. These subareas will be selected to represent typical land uses, such as urban renewal areas, stable and newly developed residential areas, major shopping centers, and industrial districts. The results of these special surveys should indicate whether or not the basic

assumptions and relationships underlying the traffic simulation models are remaining stable over time. If they are not, major resurveys may have to be recommended.

It should be noted in this connection that the 1963 origin-destination survey conducted within the Region provided information about the travel habits and patterns within the entire Region at only one point in time. It may be necessary to conduct a major resurvey in order to provide information about the travel habits and patterns within the Region at a second point in time. Such a resurvey may be necessary to provide the basis for forecasting changes in the underlying factors affecting trip production, distribution, and modal split if such changes are found to be taking place through special surveys proposed herein. Such need, if it materializes, should be recognized and considered in the design of the extension of the continuing study effort after 1969.

It should also be noted here that the initial travel surveys were concerned entirely with average weekday travel and that no information was collected on weekend travel patterns, which for certain facilities within the Region may dictate facility design. Unfortunately, the conduct of a complete weekend travel survey is beyond the budgetary limitations imposed upon the continuing study. This need should, however, be recognized and considered in the design of the extension of the initial continuing study effort after 1969 and in the consideration and design of other Commission planning programs, such as the preparation of a regional park and outdoor recreation plan.

INVENTORY OF ECONOMIC ACTIVITY AND TRENDS

Under the initial work programs of the Commission, including but not limited to the initial regional land use-transportation study effort, an extensive amount of detailed information about the economy of the Region was collected and analyzed. To maintain this data current will require the development of a continuous, reliable, and low-cost economic data collection procedure. Heavy reliance will be placed upon existing primary data sources which can be periodically reviewed for data relevant to the description of the current level of economic activity within the Region. The economic data which must be maintained current includes data on the size, skills, productivity levels, and employment and unemployment rates of the labor force; on the number, type, and location of jobs; on the changing volumes and location of retail sales; on changing levels of income; and on industrial linkages in the chain of supplies, services, raw materials, processes, and markets.

Under the continuing study, it is anticipated that close working relationships will be established with such primary data collection agencies as the Wisconsin Department of Industry, Labor, and Human Relations,[2] the Wisconsin Department

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[2]Formerly the Wisconsin Industrial Commission.

of Revenue,[3] and the Wisconsin Department of Health and Social Services[4] in order to utilize information collected routinely by these agencies. In addition, it is anticipated that periodic review of changes in national and regional economic activity patterns will be made in order to assess the impact of such changes on the economy of southeastern Wisconsin. This review procedure may entail in-depth analyses at the macro-economic and micro-economic scales of each of the major industry groups within southeastern Wisconsin.

Under the continuing study, it is also anticipated that an in-depth analysis of the pattern and volume of retail trade activity within the Region will be conducted. This detailed study will focus primarily on the retail trade activity of shopping centers, discount centers, and the central business districts of the larger communities within the Region.

INVENTORY OF POPULATION FACTORS

Under the initial work programs of the Commission, including but not limited to the initial regional land use-transportation effort, an extensive amount of detailed demographic information was collected and analyzed. To maintain this data current will require the development of a continuous and reliable demographic data collection procedure, as well as the development of a periodic check procedure whereby different estimates of current population size, composition, and distribution can be reconciled. It is proposed under the continuing study to investigate several techniques which, in southeastern Wisconsin, appear to offer a great potential for reliability. The first of these entails the development of a historic series of local building permit issuances and the correlation of this series with population growth and change. The second technique entails a cooperative effort between local units of government, local school districts, and the Commission whereby the information required to be obtained for annual school enrollment reports to the Wisconsin Department of Public Instruction can be expanded to include an enumeration of the total population within small geographic subareas of the Region. A third technique entails the monitoring of electric power utility meter installations and disconnections. It is anticipated that each of these techniques will provide a means for not only assessing population increases and decreases in component parts of the Region but also will provide an indication of immigration into and emigration from the Region as a whole.

In addition, a series of periodic checks on the Commission methods will be made utilizing the ABC Method[5] developed by the Commission utilizing newspaper circulation as an indicator, the Metropolitan Milwaukee Association of Commerce current population estimates for the surrounding trade area, the Milwaukee Journal Annual Consumer Analysis Survey Reports, the University of

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[3]Formerly the Wisconsin Department of Taxation.

[4]Formerly the Wisconsin Department of Public Welfare.

[5]See SEWRPC Technical Record, Volume II, No. 2, December 1964-January 1965.

Wisconsin special reports on population growth and change, and estimates provided by local health authorities and by the Division of Health[6] of the Wisconsin Department of Health and Social Services.

The changes in the size, composition, and distribution of the regional population will be compared with, and related to, the land use and transportation system plan forecasts and proposals. These comparisons will be based on such relevant inventory information as the number, size, income, age, sex, and occupational characteristics of households. In addition, such factors as family formation rates, educational attainment, home ownership trends, and automobile ownership trends will be evaluated in order to assess potential changes in trip generation.

INVENTORY OF PUBLIC FINANCIAL RESOURCES

Under the initial study, a complete review of the public revenue and expenditure patterns of the 153 constituent units of government and of the various school districts within the Region was accomplished. Particular attention was focused on the revenues available and monies expended for highway purposes in order to make a proper assessment of the financial feasibility of alternative transportation plans. Under the continuing study, it is anticipated that the data collected initially will be maintained current through the establishment of a close working relationship with the Bureau of Municipal Audit[7] of the Wisconsin Department of Administration, which routinely collects such data. In addition, it is anticipated that a review of the federal, state, and local aid structure for financing highway improvements will be conducted. This review may also concentrate on such factors as bonding, legislative appropriation, user taxes, and any other relevant financing methods which could affect land use and transportation plan implementation.

INVENTORY OF THE NATURAL RESOURCE AND PUBLIC UTILITY BASE

Under the initial study, an extensive amount of information about the quality, extent, and future development potential of the natural resource base of the Region was collected, analyzed, and incorporated into the land use and transportation plan designs. In order to maintain this data current and to assess the status after several years of urban growth within the Region, the inventories of existing scenic, scientific, and historic sites; existing and potential park sites; and existing prime wildlife habitat areas, forest and woodlands, wetlands, and prime agricultural lands will be reevaluated once during the initial continuing study period. In addition, special studies may be undertaken in order to develop ways and means by which the resource base might be protected and preserved. The preparation of special soil suitability maps will be continued as necessary. Some of these inventories will be

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[6]Formerly the State Board of Health.

[7]Formerly the Wisconsin Department of State Audit.

achieved through cooperative agreements with the Conservation Division[8] of the Wisconsin Department of Natural Resources.

A considerable amount of information concerning the public utility base of the Region was collected, analyzed, and incorporated into the regional planning process. Many of the existing sanitary sewerage, public water supply systems, and private utility systems have expanded their service areas and increased their capacities since the base years of the original inventories. Under the continuing study, the initial public utility inventory will be updated once and the problems reevaluated in light of current conditions and trends and scaled against the proposals contained in the regional plan.

INVENTORY OF PLANNING LEGISLATION

As an integral part of the initial land use-transportation study, an inventory was made of the legal framework for planning and plan implementation existing within the Region. The results were presented in SEWRPC Technical Report No. 6, Planning Law in Southeastern Wisconsin. Because of the continual changes occurring in the law through statutory amendments and court decisions, it will be necessary to periodically update this data on the legal framework within which plan preparation, modification, and implementation must be carried out. It is proposed that the planning law inventory under the continuing study focus on the specific means by which the various levels of government operating within the Region can refine and preserve the two major types of corridors identified in the adopted land use and transportation plans. These two corridor types--travel and natural resource or environmental--are essential elements of the adopted plans and, as such, deserve thorough, specific consideration. The proposed inventory and evaluation of the means available to refine and preserve these corridors will serve as a guide to the various governments in their implementation efforts.

[8]Formerly the Wisconsin Conservation Commission.

Chapter IV

ANALYSIS AND FORECAST

DATA CONVERSION, FILING, AND RETRIEVAL

Under the initial land use-transportation study, more than 92 million individual items of planning information concerning past, present, and probable future conditions within the Region have been recorded and stored in the Commission's basic data files. Most of this information is contained on machine punch cards; some is contained on magnetic tape, and some is contained on printed forms. Much of these data will have to be maintained in a current state; and, therefore, an effective system for data conversion, filing, and retrieval will be absolutely essential.

The basic geographic data collection unit generally adhered to under the data collection programs of the initial study was the U. S. Public Land Survey one-quarter section. There are, however, many necessary and useful geographic configurations which do not coincide with the one-quarter section unit, such as the civil division boundary line, the census tract boundary line, the school district boundary line, the traffic analysis zone and district, and many others. In addition, areas such as the central business districts of cities within the Region have required a more refined (smaller) unit for information organizing and analysis purposes. Consequently, the data system must permit the ready collation of data for various geographic units so that the information on file can be aggregated or disaggregated in an efficient and timely manner. Under the continuing study, it is anticipated that the conversion of punch card and magnetic tape records to a master-file information system (planning data bank) be accomplished using an IBM System 360 Model 30 card-disc-tape oriented system. The conversion is intended to result in a planning data bank which will permit the efficient conversion, filing, and retrieval of the planning and engineering data essential for areawide comprehensive planning. The creation of this data bank will be an important part of the surveillance and reappraisal functions.

DATA FORECASTS

Forecasts of possible and probable future events and conditions are necessary to any planning operation. It is also imperative, once plans have been prepared on the basis of such forecasts, that the continuous monitoring of changing conditions be accomplished in order to determine the continued relevance of the forecasts. It is anticipated that the forecasts prepared under the initial study program will, as a part of the surveillance and reappraisal functions, be monitored and updated as necessary. These forecasts are: population, employment, public financial resources, land use demand, automobile and truck availability, and travel demand.

Population

Under the initial land use-transportation study, eight methods of forecasting future population were utilized; and from among their results, a "single best"

estimate was selected for plan design purposes.[1] Under the continuing study, in addition to the monitoring of the forecasts, as described in Chapter III of this study design, the availability of more recent birth, death, and migration statistics for both the national and state population may stimulate a reevaluation of several of the forecast methods discarded earlier. Also, because of the continuous need for current, long-range, and reliable small area demographic data, it may be necessary to develop population forecast techniques applicable to areas smaller than the county, such as the minor civil division and the traffic analysis zone.

Employment

Under the initial land use-transportation study, four methods of forecasting future employment levels for the Region were utilized; and from among these, a "single best" estimate was selected for plan design purposes. Under the continuing study, in addition to the need for the monitoring of the forecasts in light of current knowledge, the need for small-area information will require the development of a new employment forecasting technique to meet this need.

Public Financial Resources

Under the initial land use-transportation study, two basic forecasts of public revenues were prepared: one of total local government revenues and one of total highway revenues available for use within the Region by all levels of government. Under the continuing study program, it is anticipated that, in addition to monitoring changes in total public revenue and expenditure patterns, particular efforts will be made to continually evaluate highway expenditure patterns to determine their effectiveness towards implementing the regional plan.

Land Use Demand

Under the initial land use-transportation study, land use demand for the unplanned alternative to the recommended regional land use plan was forecast by applying existing (1963) population to land use ratios to forecast future population levels. Under the continuing study, it is anticipated that these forecasts will be monitored and reevaluated in light of more recent inventories, such as the historic platting study, the community plans and zoning study, and the land use inventory described earlier. It is desirable to review current development in terms of these land use forecasts, in order to determine whether the trends reflected in the forecasts are continuing or whether the land use development in occurring in accordance with the plan which proposes modifications to these trends.

Automobiles and Trucks

Automobile and truck availability forecasts prepared under the initial land use-transportation study will be monitored by county and by civil division on

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[1]See SEWRPC Planning Report No. 7, Volume 2, Forecasts and Alternative Plans--1990, Chapter II.

an annual basis. The primary source of information will be the fiscal reports on motor vehicle registration published by the Division of Motor Vehicles[2] of the Wisconsin Department of Transportation.

Travel Demand

Under the initial land use-transportation study, trip generation equations were developed which could be used to forecast travel demand within the Region through the year 1990. No major modification or refinement of these regional equations is considered necessary or feasible until such time as a major update of the trip file developed under the initial origin-destination survey is accomplished. With respect to certain small areas within the Region, however, the continued validity of the basic equations will be evaluated insofar as possible, utilizing data collected by the special origin-destination surveys and the base year trip inventories. The results of these analyses will be used in conjunction with the application of the regional equations to refine the estimates of future travel demand within certain subareas of the Region and to determine the need for future more complete origin-destination surveys.

SIMULATION MODEL APPLICATION

The Regional Economic Simulation Model

Under the initial land use-transportation study, a series of long-range regional economic forecasts were made using a dynamic input-output Regional Economic Simulation Model that generated a synthetic history of the regional economy based on forecasts of national consumer, government, and export spending. The base year used for data collection and the subsequent determination of the model parameters was 1963. A great deal of economic history has taken place since 1963, and the model results will be five years old in 1968. To provide continuing economic forecasts as checks on conventionally prepared forecasts, the model data may be updated and a new series of economic forecasts prepared using 1968 as a base year. The data categories that would require updating before new forecasts can be made are:

1. Input-output parameters, national and regional, relating the sales and purchases of all of the industries in the model.

2. Internal resource parameters in each industry relating material purchases, capital spending, employment, and wages in each industry to the output of that industry.

3. Updated history of the exogenous variables of consumer purchases, federal government purchases, and gross exports for the years 1964-1967 and forecasts of these same variables for 1970, 1980, and 1990.

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[2]Formerly the Wisconsin Motor Vehicle Department.

In addition, some minor changes are contemplated in the structure of the model itself in terms of regrouping certain industries and modification of some equations.

The Land Use Simulation Model

A Land Use Simulation Model was developed and applied in the initial land use-transportation study to aid in the formulation of land development and public works program policies necessary to implement the selected regional land use plan. In the model runs, residential land development was simulated, based on a planned transportation network and prelocated employment and commerical areas. The model was run on an IBM 7090 at C.E.I.R., Inc., Bethesda, Maryland, using the LP 90 linear programming package. A set of policies emphasizing the crucial nature of sanitary sewer planning was developed as a result of the simulation test runs. Under the continuing study program, with the introduction of more current data on land development costs and development trends, it is anticipated that the simulation model may again be applied as a test of plan effectuation.

The Travel Simulation Models

Under the initial land use transportation study, basic models were developed which could be used to simulate modal split, trip distribution, and traffic flow within the Region through the year 1990. The models developed in the initial study will continue to be used under the continuing study. The output of these models, namely, future traffic volumes, will be reviewed and refined within certain subareas of the Region, in light of the analysis of data provided by the special origin-destination studies and detailed investigations conducted within these subareas to check the reasonableness and accuracy of the results of the travel simulation models.

Chapter V

PLAN DESIGN, TEST, AND EVALUATION

Work with respect to plan design, test, and evaluation will, under the continuing regional land use-transportation study, be centered in plan implementation and will be concerned primarily with plan refinement and detailing. The major work effort in this respect will be devoted to the planning studies required for the conversion of the functional highway system plan produced under the initial regional land use-transportation study to a jurisdictional plan and to the planning and engineering studies required to achieve advance reservation of rights-of-way for the major freeway and transit facilities recommended in the adopted plans through corridor refinement and official mapping.

JURISDICTIONAL HIGHWAY PLANS

Because a total street and highway system must serve several important functions and because two of the most important of these functions--traffic movement and land access--are basically conflicting, the total street and highway system of the Region was, under the initial regional land use-transportation study, divided into functional subsystems according to the primary character of service which the individual facilities comprising each subsystem was expected to provide. Three functional groups of facilities were recognized in the necessary functional classification: arterial, collector, and minor (local land access). Only the first of these groups was considered to be of direct concern in areawide planning; and, therefore, the initial land use-transportation planning effort divided the total highway system into only two classes: arterial and "all other." The arterial system included freeways, expressways, and certain parkways, as well as standard surface arterial streets and highways, which together comprised an integrated areawide system. Thus, the initial regional land use-transportation planning effort produced a "functional" plan which identified the existing arterial street and highway system, determined its existing and probable future deficiencies, and recommended specific additions and improvements required to adequately serve existing and forecast travel demands.

One of the first and most essential tasks in converting the functional plan produced under the initial land use-transportation planning effort to an action program is the conversion of the functional plan to a jurisdictional plan. This requires the assignment of jurisdictional responsibility for the various facilities comprising the total arterial street and highway system, as identified in the plan, to the various levels and units of government concerned. Just as a functional classification of highway facilities is essential to transportation plan preparation, a jurisdictional classification is essential to plan implementation. In addition, the assignment of jurisdictional responsibility for the various portions of the total arterial street and highway system is essential to:

1. The efficient management of the total arterial street and highway system and the attainment of the intergovernmental coordination necessary to avoid conflicts over, and duplication in, the design, construction, maintenance, and operation of individual facilities which must comprise integral parts of a total system.

2. The integration of the various arterial facilities into subsystems which combine in each such subsystem the facilities which should logically be under the same governmental jurisdiction because of similar design, construction, maintenance, and operation standards.

3. The most effective use of total public resources in the provision of highway transportation, permitting the appropriate capabilities to be focused on the corresponding areas of need.

4. The equitable distribution of both highway system development costs and revenues among the levels and agencies of government concerned, including the necessary realignment of the Federal Aid Systems in the area to assure the best utilization of Federal Aid Highway funds.

The jurisdictional plan thus specifies the governmental level and unit which should have responsibility for acquiring, constructing, maintaining, and operating each of the existing and proposed facilities which comprise the total physical system.

SEWRPC Planning Report No. 7, Volume 3, Recommended Regional Land Use and Transportation Plans--1990, Chapter VII, "Plan Implementation," recommends that the functional plans produced under the initial land use-transportation study effort be converted to jurisdictional plans on a county-by-county basis through a cooperative effort involving the Division of Highways of the Wisconsin Department of Transportation, the county highway committees, the local units of government, and the Regional Planning Commission. It is, therefore, proposed to initiate jurisdictional highway planning operations in each of the seven counties under the continuing regional land use-transportation planning effort. The work will be done in each county under the aegis of the county highway committee, and a special intergovernmental technical advisory committee will be created in each county to assist in the jurisdictional planning operation.

The planning operation itself will require the development of a set of criteria which may be used as a basis for the assignment of jurisdictional responsibility. The criteria deemed most significant to a jurisdictional classification will be related to three basic characteristics of the facilities: trip service, area service, and operational characteristics of the facilities themselves. The plans produced will assign jurisdictional responsibility to

three levels of government--state, county, and local; and the finished jurisdictional plans will recommend for each county, within the context of the adopted state and regional highway plans, a system of state trunk and county trunk highways. The plans will, in addition, recommend any realignment of the various federal aid systems necessary to implement the adopted functional and jurisdictional plans.

CORRIDOR REFINEMENT

The transportation facilities shown on the recommended regional transportation plan represent general locations, either on and along existing rights-of-way or on new locations, within traffic corridors varying from one-quarter up to two miles in width. Once the jurisdictional responsibility for a facility has been assumed by the appropriate state, county, or local units of government, it will become necessary to refine these traffic corridor locations within the context of the continuing transportation planning process as a prerequisite to any reservation of the necessary right-of-way for the facilities.

This corridor refinement requires the preparation of precise and definitive plans by the state, county, or local units of government having jurisdictional responsibility, working in close cooperation with the other agencies and local units that have related transportation system and land use development responsibilities. Such plans must ultimately set forth proposals for the precise centerline location and ultimate right-of-way width required for each facility, for frontage road treatment and alterations in related existing facilities, for types of access control, and for the types and locations of grade separations and interchanges.

Surveying, mapping, and electronic computing techniques now available make the preparation of such definitive plans along new locations feasible without the need of resorting to expensive and time-consuming field location surveys. Such plans can be developed entirely upon photogrammetrically compiled topographic and cadastral maps when the horizontal control for such maps consists of relocated and monumented U. S. Public Land Survey corners related to the State Plane Coordinate System. Such maps and monumented survey control permit precise and accurate field identification of the proposed facility location, as well as land acquisition, without the need for traditional, time-consuming, and expensive centerline location surveys.

The preparation of such definitive plans will do much to allow state and local officials to bring the full weight of plan implementation devices at their disposal to bear upon the reservation and advance acquisition of the necessary rights-of-way, as well as to assist county and local planners in making intelligent recommendations on desirable highway-related land use development alternatives.

The adopted regional transportation plan includes recommendations for approximately 291 miles of new freeways, 8.5 miles of new expressways and parkways,

67 miles of improved existing freeways, 192 miles of new standard arterials, and 929 miles of reconstructed standard arterials. The adopted plan also includes recommendations concerning 89 miles of modified rapid transit lines and approximately 4.3 miles of rapid transit line. Staff and budgetary limitations preclude simultaneous action on all of these recommended major traffic corridors contained in the regional transportation plan. It is, therefore, proposed that the necessary corridor refinement be limited initially to the recommended freeway, expressway and parkway, and rapid transit facilities and proceed in a two-stage operation consisting of preliminary corridor refinement studies followed by precise mapping and exact centerline location studies. The work will require the joint efforts of the Division of Highways of the Wisconsin Department of Transportation, Milwaukee County Expressway Commission, the seven county highway committees, the local units of government, and the Regional Planning Commission. The Regional Planning Commission will coordinate such work and upon request make necessary traffic assignments and administer precise mapping contracts. The Division of Highways and the Milwaukee County Expressway Commission will provide the necessary engineering studies needed to determine centerline locations and right-of-way requirements of the freeways and rapid transit facilities.

In the first step of the corridor refinement studies, the one-quarter mile to two-mile wide major transportation corridors shown on the adopted regional transportation plan will be narrowed to a one-quarter mile wide corridor. In the second step, the necessary topographic and cadastral maps of the refined corridor will be prepared and the centerline location and right-of-way requirements delineated on these maps. The location maps produced by the second stage will provide the basis for advance reservation of right-of-way through official mapping, subdivision control, and zoning.

TRANSIT PLAN IMPLEMENTATION

It is anticipated that the initial efforts, with respect to transit plan implementation, will be directed at initiating the corridor refinement studies necessary to preserving the rights-of-way required for the busway proposed in the adopted regional transportation plan. This will require close cooperation between the staff of the Regional Planning Commission and the staffs of the Division of Highways of the Wisconsin Department of Transportation and the Milwaukee County Expressway Commission. The procedures to be followed will be similar to that envisioned for the freeway corridor refinement studies. It is anticipated that portions of this work will be carried out under special inter-agency agreements and special federal assistance grants.

TRAFFIC ENGINEERING

Under the continuing study, assistance to local units of government will be provided, upon request, for the preparation of traffic operations plans designed to increase the traffic-carrying capacity of arterial street and highway facilities so that through a systematic application of traffic engineering principles and techniques a more efficient and safer transportation system might be created. Certain data needed to prepare these traffic

operations plans, such as arterial street and highway facility inventory data, traffic count data, and estimates of future traffic volumes, can be made available to the local units of government from the SEWRPC file maintained current under the continuing study.

SUMMARY

It will be seen from the foregoing that the plan design efforts contemplated under the continuing regional land use-transportation study will be most closely related to the service and plan implementation function. They will, moreover, provide important feedbacks to the surveillance and reappraisal functions.

Chapter VI

SUMMARY OF SCOPE, TIMING, STAFF, AND EQUIPMENT REQUIREMENTS

SCOPE

The scope of the work program recommended to be accomplished under the continuing land use-transportation study as described herein is summarized briefly in Table 1. As indicated, data sources, the level of detail to be sought, and the frequency of collection or analysis are outlined for each work program element. From a review of this table, the comprehensiveness and potential usefulness of the continuing study and its anticipated results becomes more readily apparent.

TIMING

Since the proposed planning program is a continuing one, any time schedule must recognize that certain work elements will be accomplished on an annual basis, while others will be accomplished on a project basis involving one major work element during the period extending from July 1966 through December 1969. Work elements of the former type will include the population inventory, economic inventory, automobile and truck availability, traffic volume counts, arterial street and highway network revisions, and transit network revisions. Work elements of the latter type will include the land use inventory, the natural resources inventory, the public utility inventory, the community plans and zoning inventory, the special travel pattern studies, and the planning law inventory (see Figure 2).

STAFF REQUIREMENTS

The broad scope of the proposed study requires a staff trained and experienced in many different skills and professional disciplines. The present table of organization for the continuing study is shown in Figure 3 and reflects primary reliance for the performance of the necessary work on permanent staff. To accommodate certain variable workloads encountered for the project-type work elements, particularly the land use and special travel pattern studies, the staff will be augmented by the assignment of personnel from cooperating agencies and by the temporary employment of technical and clerical personnel.

EQUIPMENT

The equipment assembled in the initial land use-transportation study has, under the terms of the contract governing the continuing study, been made available to the continuing study and is deemed fully adequate to meet the needs of this study. In addition to the usual office equipment, a data processing center will be required. The center will be equipped with an IBM system 360 Model 30 computer and necessary support equipment consisting of the following unit record equipment: three 029 keypunches, two 059 verifiers, an 088 collator, and an 083 sorter. Thus equipped, the data processing center should be able to perform all of the necessary data reduction and processing operations and all of the necessary analyses and forecast computation

Table 1

SUMMARY TABLE OF CONTINUING LAND USE-TRANSPORTATION STUDY WORK PROGRAM ELEMENTS

Work Element	Data Sources	Level of Detail	Frequency
Objectives, Principles, Standards (Monitor)	Planning & Engineering Studies for Plan Implementation, Inventory Findings		Annually
General Base Maps (Update)	Current Aerial Photographs, State Department of Transportation, State Division of Conservation, Municipal Records, Public and Private Utility Company Records	1:24000 to 1:96000 Scale	Annually
Aerial Photography (New)	Contract	1:4800 Scale	Spring, 1967
Detailed Planning Base Maps (New)	Contract	1:1200 Scale, Two Foot Contour Interval	As Prepared for Plan Implementation
Inventory of Transportation Facilities:			
Highway Facilities and Service Levels	State Department of Transportation, Municipal Records, Field Survey	Freeways, Expressways, Parkways and Standard Arterials	Annually
Transit Facilities and Service Levels	Private Transit Company Records	All Transit Lines with One Hour Service Frequency	Annually
Automobile Parking and Truck Terminal Facilities	Municipal Records Field Survey	All Public Parking Areas, All Private Parking Areas with a Minimum of 50 Spaces	Once During the First Continuing Study Period
Inventory of Existing Land Use (Update)	Current Aerial Photographs, Field Survey, Local Communities	U. S. Public Land Survey Quarter Section using Approximately 55 Land Use Categories	Once During the First Continuing Study Period

Table 1 (Continued)

Work Element	Data Sources	Level of Detail	Frequency
Inventory of Community Plans and Zoning (Update)	Local Community Plans and Zoning Documents, Personal Interview, Postal Questionnaire	Seven Major Land Use Categories	Once During the First Continuing Study Period
Inventory of Existing Transportation Movement and Behavioral Factors Affecting Travel Habits and Patterns	Personal Interview, Field Survey, Postal Questionnaire	Urban Renewal Areas, Stable and Newly Developed Residential Areas, Major Shopping Centers, Industrial Districts	Special Studies Conducted Periodically During the First Continuing Study Period
Inventory of Economic Activity and Trends (Update)	State Department of Industry, Labor, and Human Relations, State Department of Revenue, State Department of Health and Social Services, Milwaukee Journal Consumer Analysis Survey, Wisconsin Economic Indicators, Miscellaneous National Publications such as Survey of Current Business, the Censuses of Business and Manufactures, and County Business Patterns	National, Regional, and Minor Civil Division	Once During the First Continuing Study Period
Inventory of Population Factors: Size, Composition, Distribution (Update)	U. S. Census Bureau, State Department of Health and Social Services, Milwaukee Journal Consumer Analysis, Annual Public School Censuses, Local Community Estimates, Building Permit Records, Public and Private Utility Company Records	U. S. Public Land Survey Quarter Section, Traffic Analysis Zones, Census Tract, Minor Civil Division, Region	Annually

Table 1 (Continued)

Work Element	Data Sources	Level of Detail	Frequency
Inventory of Public Financial Resources (Update)	State Department of Revenue, State Department of Transportation, State Department of Administration, Local Municipalities	Minor Civil Division, Region	Once During the First Continuing Study Period
Inventory of the Natural Resource and Public Utility Base (Update)	State Public Service Commission, Local Communities, Private Utility Company Records, State Department of Natural Resources, Field Survey	Service Area, Resource Site and Environs	Once During the First Continuing Study Period
Inventory of Planning Legislation (Update)	Court Decisions, Statutory Amendments		Once During the First Continuing Study Period
Data Conversion, Filing, and Retrieval	SEWRPC Data Files	U. S. Public Land Survey Quarter Section, Origin and Destination Data by Trip, Highway Network Links, and Transit Network Links on Disk, Tape, and Cards	Day-to-Day
Data Forecasts:			
Population (Monitor)	Inventory Findings	Region, Minor Civil Division, Traffic Analysis Zone, U. S. Public Land Survey Quarter Section	Once During the First Continuing Study Period

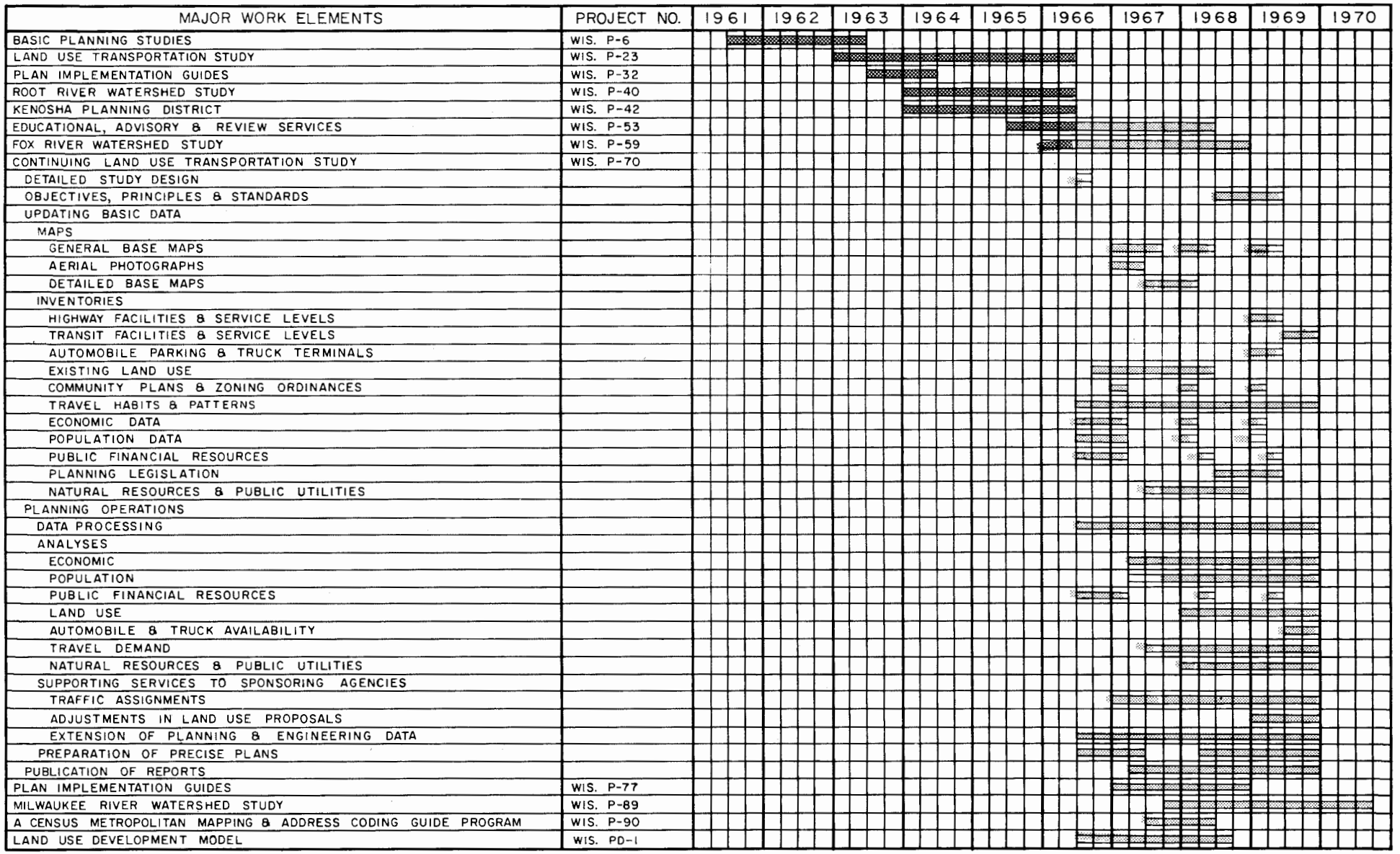
Table 1 (Continued)

Work Element	Data Sources	Level of Detail	Frequency
Employment (Monitor)	Inventory Findings	Region, Minor Civil Division, and Small Geographic Area where Practicable	Once During the First Continuing Study Period
Public Financial Resources (Monitor)	Inventory Findings	Region, Minor Civil Division, and Small Geographic Area where Practicable	Once During the First Continuing Study Period
Land Use Demand (Monitor)	Inventory Findings	Region, County	Once During the First Continuing Study Period
Automobiles and Trucks (Monitor)	State Department of Transportation	Region, County	Once During the First Continuing Study Period
Travel Demand (Monitor)	Inventory Findings, State Department of Transportation, Special Studies	Region, Regional Boundaries, and Selected Subregional Areas	Once During the First Continuing Study Period
Regional Economic Simulation Model (Monitor)	Inventory Findings, Special Studies	Region	Once During the First Continuing Study Period
Land Use Simulation Model (Monitor)	Inventory Findings	Region	Once During the First Continuing Study Period
Traffic Model (Monitor)	Inventory Findings	Region	Once During the First Continuing Study Period

Figure 2

TIMING OF MAJOR WORK ELEMENTS *

SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION



MAJOR WORK ELEMENTS	PROJECT NO.
BASIC PLANNING STUDIES	WIS. P-6
LAND USE TRANSPORTATION STUDY	WIS. P-23
PLAN IMPLEMENTATION GUIDES	WIS. P-32
ROOT RIVER WATERSHED STUDY	WIS. P-40
KENOSHA PLANNING DISTRICT	WIS. P-42
EDUCATIONAL, ADVISORY & REVIEW SERVICES	WIS. P-53
FOX RIVER WATERSHED STUDY	WIS. P-59
CONTINUING LAND USE TRANSPORTATION STUDY	WIS. P-70
DETAILED STUDY DESIGN	
OBJECTIVES, PRINCIPLES & STANDARDS	
UPDATING BASIC DATA	
MAPS	
GENERAL BASE MAPS	
AERIAL PHOTOGRAPHS	
DETAILED BASE MAPS	
INVENTORIES	
HIGHWAY FACILITIES & SERVICE LEVELS	
TRANSIT FACILITIES & SERVICE LEVELS	
AUTOMOBILE PARKING & TRUCK TERMINALS	
EXISTING LAND USE	
COMMUNITY PLANS & ZONING ORDINANCES	
TRAVEL HABITS & PATTERNS	
ECONOMIC DATA	
POPULATION DATA	
PUBLIC FINANCIAL RESOURCES	
PLANNING LEGISLATION	
NATURAL RESOURCES & PUBLIC UTILITIES	
PLANNING OPERATIONS	
DATA PROCESSING	
ANALYSES	
ECONOMIC	
POPULATION	
PUBLIC FINANCIAL RESOURCES	
LAND USE	
AUTOMOBILE & TRUCK AVAILABILITY	
TRAVEL DEMAND	
NATURAL RESOURCES & PUBLIC UTILITIES	
SUPPORTING SERVICES TO SPONSORING AGENCIES	
TRAFFIC ASSIGNMENTS	
ADJUSTMENTS IN LAND USE PROPOSALS	
EXTENSION OF PLANNING & ENGINEERING DATA	
PREPARATION OF PRECISE PLANS	
PUBLICATION OF REPORTS	
PLAN IMPLEMENTATION GUIDES	WIS. P-77
MILWAUKEE RIVER WATERSHED STUDY	WIS. P-89
A CENSUS METROPOLITAN MAPPING & ADDRESS CODING GUIDE PROGRAM	WIS. P-90
LAND USE DEVELOPMENT MODEL	WIS. PD-1

LEGEND

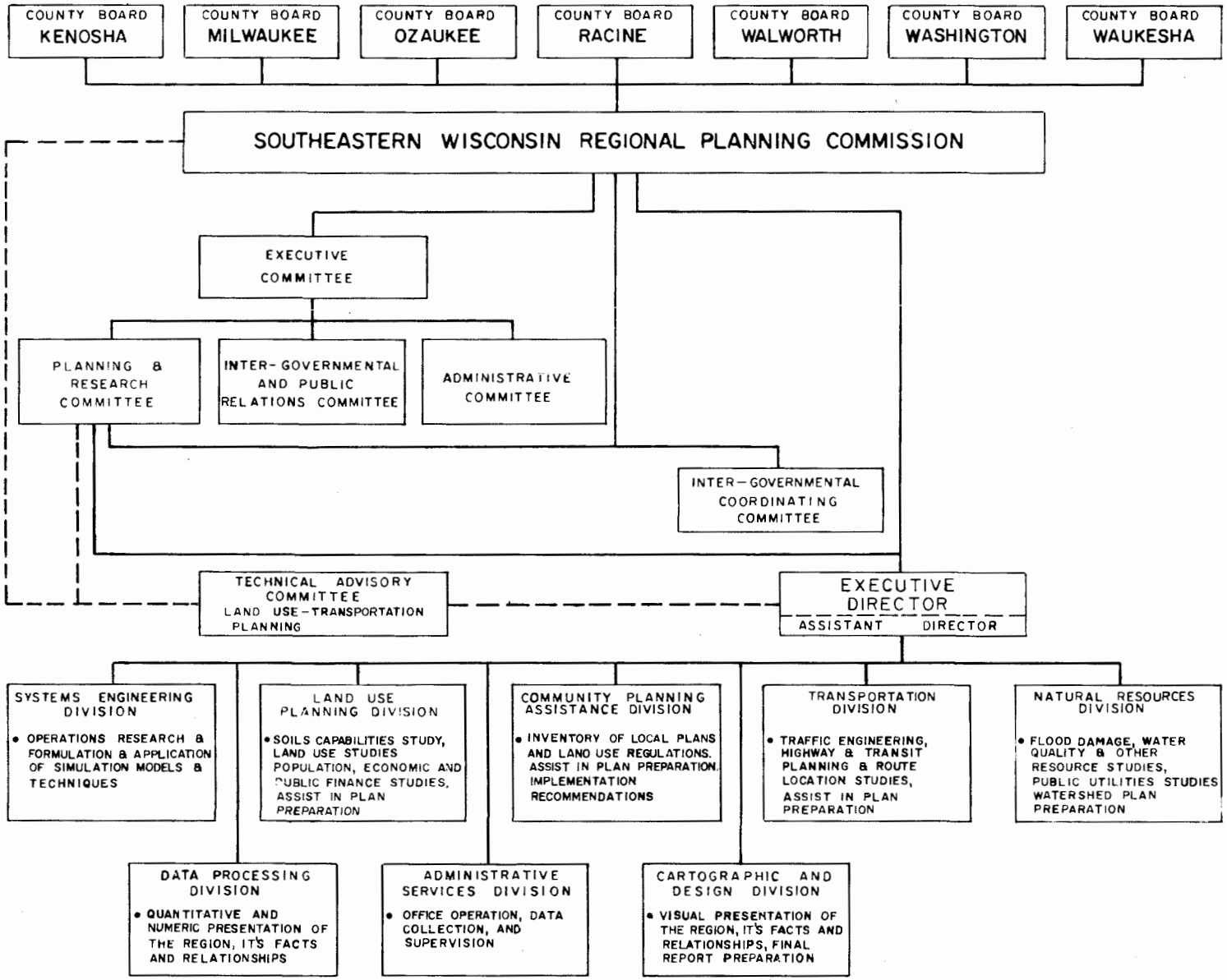
COMPLETED WORK

SCHEDULED WORK

* ELEMENTS PARTIALLY OR WHOLLY SUPPORTED BY FEDERAL GRANTS

Figure 3

EXISTING STAFF & COMMITTEE STRUCTURE



requirements except complete traffic assignments, which will require time on an out-of-house computer.

COST ESTIMATES

Estimated study costs are set forth in Table 2 and are based upon the scope of work, time schedules, and study organization set forth in this design. The costs were prepared by estimating time and personnel requirements necessary to complete the various subcategories of the work and adding necessary equipment, data processing, and report costs to obtain total costs.

COMMITTEE STRUCTURE

The committee structure outlined in the Prospectus for a Continuing Land Use-Transportation Study is proposed to be implemented as the basis for actively involving the various governmental bodies, technical agencies, and private interest groups in the continuing land use-transportation study effort. The Intergovernmental Coordinating Committee established under the initial land use-transportation planning effort will be continued with its present composition for the continuing study. The Technical Coordinating and Advisory Committee will be reorganized in order to reflect certain changes in personnel within the Region, as well as to permit the addition of representation from certain agencies, such as the Federal Aviation Agency. In addition to the foregoing, technical coordinating and advisory committees will be established in each county to coordinate the necessary jurisdictional highway plan preparation work.

Table 2

CONTINUING REGIONAL LAND USE TRANSPORTATION STUDY COST ESTIMATES

Work Element	Study Funding: Source of Funds: HUD	SHCW-USBPR	Local	Total
A. Study Design	$ 1,833	$ 2,338	$ 1,329	$ 5,500
B. Objectives, Principles & Standards	667	850	483	2,000
C. Updating Back Data				
1. Maps				
a. General Base Maps	6,999	8,925	5,076	21,000
b. Aerial Photographs	9,332	11,900	6,768	28,000
c. Detail Base Maps	7,499	9,563	5,438	22,500
Subtotal	23,830	30,388	17,282	71,500
2. Inventories				
a. Highway Facilities & Service Levels	6,166	7,863	4,471	18,500
b. Transit Facilities & Service Levels	4,666	5,950	3,384	14,000
c. Automobile Parking & Trunk Terminals	3,833	4,887	2,780	11,500
d. Existing Land Use	25,664	32,724	18,612	77,000
e. Community Plans & Zoning Ordinances	8,333	10,625	6,042	25,000
f. Travel Habits and Patterns	24,997	31,875	18,128	75,000
g. Economic Data	8,499	10,838	6,163	25,500
h. Population Data	7,133	9,095	5,172	21,400
i. Public Financial Resources	5,166	6,588	3,746	15,500
j. Planning Legislation	667	850	483	2,000
k. Natural Resources & Public Utilities	11,165	14,237	8,098	33,500
Subtotal	106,289	135,532	77,079	318,900
D. Planning Operations				
1. Data Processing	95,224	121,422	69,054	285,700

Table 2 Continued

Work Element	Study Funding: Source of Funds: HUD	SHCW-USBPR	Local	Total
2. Analyses				
a. Economic	5,999	7,650	4,351	18,000
b. Population	3,500	4,462	2,538	10,500
c. Public Financial Resources	3,500	4,462	2,538	10,500
d. Land Use	6,499	8,288	4,713	19,500
e. Automobile & Truck Availability	3,167	4,037	2,296	9,500
f. Travel Demand	4,000	5,100	2,900	12,000
g. Natural Resources & Public Utilities	6,499	8,288	4,713	19,500
Subtotal	33,164	42,287	24,049	99,500
3. Supporting Services to Sponsoring Agencies				
a. Traffic Assignments	14,498	18,488	10,514	43,500
b. Adjustments in Land Use Proposals	6,999	8,925	5,076	21,000
c. Extension of Planning & Engineering Data	10,999	14,025	7,976	33,000
Subtotal	32,497	41,437	23,566	97,500
4. Preparation of Precise Plans	3,333	4,250	2,417	10,000
Total Planning Operations	164,217	209,397	119,086	492,700
E. Publication of Reports	6,666	8,500	4,834	20,000
F. Office Expenses, Rent & Equipment				
1. Rent	13,999	17,850	10,151	42,000
2. Material & Supplies	11,199	14,280	8,121	33,600
3. Reproduction	4,200	5,355	3,045	12,600
4. Telephone & Postage	5,999	7,650	4,351	18,000
5. Travel	2,800	3,570	2,030	8,400
Subtotal	38,197	48,705	27,698	114,600
Total Office Expenses, Rent & Equipment	38,197	48,705	27,698	114,600
G. Administrative Costs	20,998	26,775	15,227	63,000
Total Project Costs	$362,697	$462,485	$263,018	$1,088,200
Percent of Total	33.33	42.50	24.17	100.00

COMMISSION STAFF

Kurt W. Bauer. . . . . Executive Director

Harlan E. Clinkenbeard . . . . . Assistant Director

Dallas R. Behnke . . . . . Chief Planning Illustrator

William E. Creger. . . . . Chief Transportation Planner

James W. Engel . . . . . Data Processing Manager

William J. Kockelman . . Chief Community Assistance Planner

Eugene E. Molitor. . . . . Chief Land Use Planner

Kenneth J. Schlager. . . . . Chief Systems Engineer

Sheldon W. Sullivan. . . . . Administrative Officer

Lawrence E. Wright . . . . .Chief Natural Resources Planner