



**LAND USE —  
TRANSPORTATION  
STUDY**



**RECOMMENDED REGIONAL  
LAND USE AND  
TRANSPORTATION PLANS  
1990**

**volume three**

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**Southeastern Wisconsin Regional Planning Commission**

**Land Use-Transportation Study**

Old Courthouse  
Waukesha, Wisconsin  
53186

Planning Report No. 7

in three parts

volume three

**RECOMMENDED REGIONAL LAND USE  
AND TRANSPORTATION PLANS**

**1990**

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November, 1966

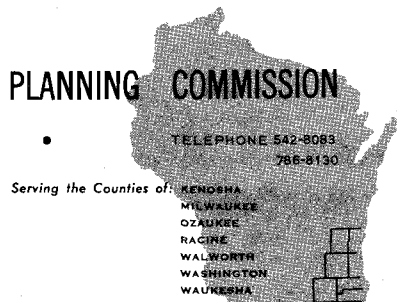
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# SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION

916 NO. EAST AVENUE

WAUKESHA, WISCONSIN 53186



December 2, 1967

## STATEMENT OF THE CHAIRMAN

This is the third and final volume of the regional land use-transportation study report. It presents a recommended land use plan and a supporting transportation system plan for the Region, as adopted by a unanimous vote of the full Commission at its regular Quarterly Meeting held on December 1, 1966. Additionally, it sets forth many specific recommendations looking toward the implementation of the recommended land use and transportation plans. Thus, this volume provides two of the key elements of an advisory, comprehensive plan for the physical development of the Region.

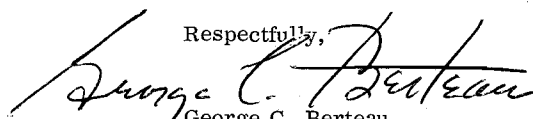
With the publication in May 1965 of Volume 1 of this report, Inventory Findings—1963, the Commission presented a summary of the factual findings of the many necessary planning and engineering inventories considered by the Commission to be a prerequisite to the right to hold and express an opinion on the matter of sound regional land use and transportation system development. With the publication in June 1966 of Volume 2 of this report, Forecasts and Alternative Plans—1990, the Commission provided the basis for public review and evaluation of three alternative plans and for the selection of a recommended regional land use plan and its supporting transportation plan from among these alternatives, which, when implemented, would best meet stated regional development objectives, principles, and standards.

The land use and transportation plans set forth herein were separately presented to the seven constituent county boards, the State Highway Commission of Wisconsin, the Streets and Zoning Committee of the Common Council of the City of Milwaukee, the Milwaukee County Expressway and Park Commissions, and the City of Milwaukee Plan Commission. Additionally, a public hearing was held on October 26, 1966, at which nearly 600 interested municipal officials, citizens, and public leaders attended and participated.

The plans, the implementation devices suggested, and the time table for the three-step staging of the plans are entirely advisory. They are not inflexible molds to which all new development within the Region must rigidly conform, but are designed to provide a point of departure against which regional development proposals can be evaluated as they arise on a day-to-day basis. The plans may be revised as newly discovered evidence may dictate and require.

The extensive participation in the formulation of the plans by municipal officials, technicians, and civic leaders, however, and the enthusiasm for and in support of these plans to date may well serve to bridge the gap between goal formulation and goal attainment. Today we are very close to the realization that regional planning will work—and work well within the same governmental and political framework into which the Commission was cast. The degree to which the gap is to be bridged now rests upon maintaining the effective communication between the units of government within the Region and this Commission and upon the understanding and implementation of these plans at the required operational level of government.

Respectfully,

  
George C. Berteau  
Chairman

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## ACKNOWLEDGMENTS

The completion of the regional land use-transportation study inventories, forecasts, and alternative plans; the evaluation of these alternative plans; the recommendation of a land use plan and a transportation plan for the Southeastern Wisconsin Region; and the publication of this report were made possible only through the cooperation and assistance of many individuals, agencies of government, and private business within the Region.

The genuine interest shown in the study and the courtesies shown to the Commission staff by the many municipal, county, state, and federal employees, elected governmental officials, business executives, and university faculty, who gave so freely of their time to the study through participation in the work of the Technical Coordinating and Advisory Committee and the Intergovernmental Coordinating Committee and through individual consultation, were most gratifying. Particular acknowledgment is due the governmental agencies which assigned resident staff to the study during preparation of forecasts and alternative plans, including the City and County of Milwaukee, the State Highway Commission of Wisconsin, and the U. S. Bureau of Public Roads. Particular acknowledgment is also due the county and municipal planning and engineering staffs within the Region and the Milwaukee & Suburban Transport Corp., for their invaluable assistance in plan preparation.

The assistance, encouragement, and courtesy of all these individuals and agencies are hereby gratefully acknowledged.

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# Chapter I

## INTRODUCTION

This report is the third in a series of three volumes which together present the major findings and recommendations of the SEWRPC Regional Land Use-Transportation Study. The first volume, published in May 1965, set forth the basic principles and concepts underlying the study and presented in summary form the basic facts pertinent to long-range land use and transportation planning in southeastern Wisconsin, which together described the existing state of the systems being planned.

The second volume, published in June 1966, presented regional development objectives, principles, and standards; provided forecasts of future growth and change in the Region; presented three alternative regional land use-transportation plans designed to meet the anticipated regional growth and change; and evaluated these plans on the basis of their ability to meet the stated regional development objectives, standards, and certain additional overriding criteria. The second volume was intended to provide the basis for the selection of a final regional land use-transportation plan from among the alternative development plans proposed.

This, the third and final volume of the series, presents the regional land use-transportation plan finally selected and recommended for implementation. It proposes staging for land use and transportation system development, recommends means for plan implementation, and sets forth detailed plans for certain selected corridors of transportation movement. In addition, this volume presents an alternative development pattern, that of continued existing trend development within the Region in the absence of any attempt to guide such development on an areawide basis in the public interest. This alternative is presented, not as a plan, but as a forecast of unplanned development, and is intended, not as a recommendation, but as a standard of comparison for the evaluation of the recommended regional land use-transportation plan.

This volume deals with the last step in the seven-step planning process utilized in the regional land use-transportation study: plan selection and adoption. The preparation of the final land use and

transportation plans for the Region required that a selection be made from among the three alternative plans prepared and presented in the second volume of this report. Final plan selection must be based upon consideration of many tangible and intangible factors, some beyond quantification or evaluation on the basis of the stated objectives and standards. Consideration of the tangible factors included quantitative evaluation of the feasibility of the transportation plans, through the application of traffic simulation models, in order to verify the workability and efficiency of the proposed transportation system networks and evaluation of the ability of both the land use and transportation plan elements to meet stated regional development objectives and standards. It was further recognized that the selection of the plan elements to be included in the final plan must ultimately be made by the responsible elected and appointed public officials concerned and not by planning technicians, although the latter may properly make recommendations based upon technical evaluation.

In order to facilitate consideration of all of the factors which might be considerations in plan selection and to facilitate the necessary participation by responsible public officials in the plan selection process, the degree to which the alternative plans met the stated regional development objectives, as indicated by a technical evaluation, together with the associated costs, was presented in Volume 2 of this report. A series of 11 public meetings were then held before the constituent governing bodies and interested elected and appointed governmental officials and citizen groups for the specific purpose of obtaining knowledgeable public reaction to the alternative plan recommendations. The meetings conducted by the governing bodies concerned were held as shown on the following page.

It should be noted that, while each of the meetings with the local units of government were presided over by the Chairman of the respective county board involved, all of the cities, villages, and towns within each respective county were invited to attend these meetings; and most of the 146 local

<u>Agency of Government Presiding</u>	<u>Place of Meeting</u>	<u>Date of Meeting</u>
Kenosha County Board	Kenosha County Courthouse Kenosha, Wisconsin	May 5, 1966
State Highway Commission of Wisconsin	Madison, Wisconsin	May 6, 1966
Walworth County Board	Walworth County Courthouse Elkhorn, Wisconsin	May 10, 1966
Milwaukee County Board	Milwaukee County Courthouse Milwaukee, Wisconsin	May 24, 1966
Waukesha County Board	Waukesha County Courthouse Waukesha, Wisconsin	May 26, 1966
Racine County Board	Racine County Courthouse Racine, Wisconsin	May 31, 1966
Washington County Board	Washington County Courthouse West Bend, Wisconsin	June 6, 1966
Common Council, City of Milwaukee	City Hall Milwaukee, Wisconsin	June 16, 1966
Ozaukee County Board	Ozaukee County Courthouse Port Washington, Wisconsin	June 30, 1966
Milwaukee County Expressway Commission and Milwaukee County Park Commission	Milwaukee County Courthouse Milwaukee, Wisconsin	July 11, 1966
SEWRPC	Red Carpet Inn Milwaukee, Wisconsin	October 26, 1966

units of government involved were represented at the meetings. In addition, the alternative plans were carefully reviewed by the Technical Coordinating and Advisory and the Intergovernmental Coordinating Committees on Regional Land Use-Transportation Planning and by the planning and engineering staffs of the State Highway Commission of Wisconsin and of many of the constituent county and local units of government.

The reaction of all of the reviewing agencies favored adoption of the Controlled Existing Trend Land Use Plan alternative as the final regional land use plan. The reaction of the elected public officials within the Region was particularly favorable to the adoption of this plan, thus reinforcing the technical evaluation of the alternative plans. Based upon review of the alternative plans, the State Highway Commission of Wisconsin and three

local units of government requested that certain alternative transportation facility proposals be explored in order to determine the desirability of incorporating these in the final regional transportation plan. These requests and their effect upon the final regional land use-transportation plan are discussed more fully in Chapter III of this volume.

Based upon this review procedure, and culminating three and one-half years of intensive planning effort involving careful study and assessment of the most comprehensive set of planning and engineering inventories ever carried out within the Region, the regional land use and transportation plans described in Chapters II and III of this volume are hereby recommended to the federal, state, and local units and agencies of government concerned and to private enterprise within the Region for adoption and implementation.

## Chapter II

# THE RECOMMENDED PLAN-LAND USE

### INTRODUCTION

Previous volumes of this report have presented in summary form pertinent data on the demographic, economic, and public financial resource base; the natural resource and public utility base; the historic and existing land use patterns; and the existing transportation facilities and travel characteristics of the Region. Also presented were forecasts of future population and economic activity levels, land use requirements, and automobile and truck availability within the Region, along with regional development objectives, principles, and standards, all as a necessary basis for the preparation of two of the key elements of a comprehensive plan for the physical development of the Region: a land use plan and a transportation plan. Finally, a series of three alternative regional land use plans, each with its supporting transportation system plan, was prepared and presented for public review and evaluation. Based upon this review and evaluation, the Controlled Existing Trend Land Use Plan, as described herein, is being recommended for adoption as the land use element of a comprehensive plan for the physical development of the Region.

The magnitude of the growth and change which is expected to occur within southeastern Wisconsin between 1963 and 1990 presents the Region with both a great challenge and a great opportunity. It presents the Region with a great challenge in that, within this 27-year period, an urban plant must be constructed within the Region which would be nearly equal in size and extent to the entire urban plant constructed over the previous 120 years of regional growth and development. Such an urban plant must consist of all the residential, commercial, industrial, and institutional buildings; all the bridges and viaducts, streets and highways; all the sewer, water, gas, power, and communication lines; and all the public facilities, such as schools and parks, libraries, fire and police stations, and hospitals, which together comprise the physical city. Public officials within the Region will be faced with the awesome task of deciding what form this new urban development should take and how it might best be served by necessary transportation, utility, and public facility services. Failure to

resolve these questions properly may result in irreparable damage to the land and water resources of the Region and in mounting problems of traffic congestion; air and water pollution; inadequate drainage; widespread and costly flooding; and inadequate sewerage and water supply systems, schools, parks, and other public utilities and facilities.

This growth, however, also presents the Region with a great opportunity in that past mistakes can be avoided and a better regional settlement pattern evolved; new growth and development can be adjusted to the underlying and sustaining resource base; the continued deterioration and destruction of that base can be avoided; safer, more efficient, and more convenient transportation, utility, and public facility systems can be provided; a highly desirable climate can be created for private as well as public investment and development; and a better environment for life within the Region can be created. To assist in meeting this opportunity, the Regional Planning Commission, after careful consideration by, and upon recommendation of, its advisory committees, adopted a series of regional development objectives and supporting standards which served as a guide to the preparation of the alternative regional land use and transportation plans. These objectives and standards have been described in detail in Chapter II, Volume 2, of this report. The Controlled Existing Trend Land Use Plan alternative was found to best meet these regional development objectives and standards. In addition, this plan met, to a considerable extent, the development objectives of the local communities comprising the Region, as expressed in locally adopted land use plans and zoning ordinances.

The recommended land use plan presented herein represents a refinement of the Controlled Existing Trend Land Use Plan presented in Volume 2 of this report. The former differs from the latter in only two respects. The recommended plan incorporates certain relatively minor adjustments in the spatial distribution of the major land use categories. These adjustments were made in order to bring the future population and employment levels implicit in the land use plan into closer agreement with

county forecast levels, to reflect changes in certain local development plans and proposals, and to incorporate suggestions made by the local units and agencies of government during the alternative plan review and evaluation process. The recommended plan also delineates the boundaries of possible planned residential development units. These units have been delineated on a preliminary basis as an aid to the major highway facility location studies required as an initial step toward regional transportation plan implementation. Wherever possible, the delineation of the units reflects local plan proposals. It should be recognized that the final delineation of the boundaries of the units will require careful study at the local level and will present a particularly complex planning problem in the older areas of the Region, which were developed without regard for the planned development unit concept.

The recommended land use plan represents a conscious continuation of historic development trends within the Region, with urban development proposed to continue to occur in concentric rings along the full periphery of, and outward from, existing urban centers. The plan places heavy emphasis on the continued effect of the urban land market in determining the location, intensity, and character of future development. It does, however, propose to regulate in the public interest the effect of this market on development in order to provide for a more orderly and economic regional development pattern and to avoid intensification of areawide developmental and environmental problems.

This chapter presents a description of the recommended land use plan, along with a summary analysis of the proposed population and employment distribution which would result from implementation of the plan.

#### PLAN DESCRIPTION

Commission forecasts indicate that the population of the Southeastern Wisconsin Region may be expected to reach a level of 2.7 million persons by 1990, an increase of approximately 1 million persons over the 1963 population level, while employment may be expected to reach nearly the 1 million level by 1990, an increase of almost 350,000 jobs over the 1963 level. The plan proposes to accommodate this growth in population and employment through the conversion of approximately 200 square miles of land from rural to urban use over the next 25 years. The future land use pattern proposed by the plan is summarized in Table 1 and shown

graphically on the plan map enclosed in the pocket attached to the back cover of this report.

#### Residential Development

As indicated in Table 1, the recommended land use plan proposes to add more than 71,000 acres to the existing stock of residential land within the Region in order to meet the housing needs of the anticipated population increase over the next 25 years. In 1963 the pattern of residential land use within the Region was characterized by a scattering of relatively low-density residential development around the periphery of concentrations of older, more tightly-knit, medium-to-high density residential development. Sprawling newer subdivisions were interspersed by large tracts of bypassed, undeveloped land; and much of the new residential development was located in areas which were not serviced by centralized public sanitary sewer and water supply systems and on soils which were poorly suited for utilization of septic tank sewage disposal systems.

The recommended land use plan proposes that about 75 percent, or 54,000 acres, of the new residential land be developed at medium densities, with lot sizes ranging from 6,300 to 19,800 square feet per dwelling unit, and with gross residential population densities ranging from 3,500 to 9,999 persons per square mile. An additional 21 percent, or 15,000 acres, would be developed at low densities, with lot sizes ranging from 19,800 square feet to 5 acres per dwelling unit and with gross residential population ranging from 350 to 3,499 persons per square mile. The remaining 4 percent of the new residential land, or 2,800 acres, would be developed at high densities, with lot sizes ranging from 2,400 to 6,300 square feet per dwelling unit<sup>1</sup> and with gross residential population densities ranging from 10,000 to 25,000 persons per square mile. The recommended plan proposes to serve all of the new medium- and high-density residential development with public sanitary sewer and public water supply facilities, so that by 1990 over 95 percent of the total urban area within the Region and about 95 percent of the total regional population would

<sup>1</sup> It should be noted that the gross development densities and lot sizes per dwelling unit recommended herein are intended to represent average values applicable to development which extends over subareas of the Region at least one-quarter square mile (160 acres) in areal extent. It is not intended that the use of smaller lot areas per dwelling unit be precluded in localized high-rise, multi-family structure developments, so long as the recommended average gross population density values over the larger area of which the development may be a part are met.

Table I  
EXISTING AND PROPOSED LAND USE IN THE REGION:  
1963 AND 1990 RECOMMENDED LAND USE PLAN

Land Use Category	Existing (1963)		Planned Increment		Total 1990	
	Acres	Percent of Major Category	Acres	Percent Change	Acres	Percent of Major Category
Urban Land Use						
<i>Residential</i> . . . . .	<i>129,358</i>	<i>44.6</i>	<i>71,187</i>	<i>55.0</i>	<i>200,545</i>	<i>48.0</i>
High-Density . . . . .	34,463	11.9	2,790	8.0	37,253	8.9
Medium-Density . . . . .	24,748	8.5	53,784	217.3	78,532	18.8
Low-Density . . . . .	70,147	24.2	14,613	20.8	84,760	20.3
Commercial <sup>a</sup> . . . . .	6,706	2.3	5,048	75.2	11,754	2.8
Industrial <sup>a</sup> . . . . .	9,746	3.4	5,123	52.5	14,869	3.6
Governmental <sup>b</sup> . . . . .	14,722	5.1	9,573	65.0	24,295	5.8
Transportation <sup>c</sup> . . . . .	96,117	33.1	28,623	29.7	124,740	29.8
Recreation . . . . .	33,262 <sup>d</sup>	11.5	8,718 <sup>e</sup>	26.2	41,980	10.0
Total Urban Land Use	289,911	100.0	128,272	44.2	418,183	100.0
Rural Land Use						
Agriculture . . . . .	<i>1,085,144</i>	<i>75.8</i>	<i>-102,837</i>	<i>- 9.4</i>	<i>982,307</i>	<i>75.4</i>
Prime Agriculture	443,952	31.0	- 21,267	- 4.7	422,685	32.5
Other Agriculture	641,192	44.8	- 81,570	-12.7	559,622	42.9
Other Open Lands <sup>f</sup> . . . . .	345,951	24.2	- 25,435	- 7.3	320,516	24.6
Total Rural Land Use	1,431,095	100.0	-128,272	- 8.9	1,302,823	100.0
Total	1,721,006	--	--	--	1,721,006	--

<sup>a</sup> Includes on-site parking.

<sup>b</sup> Includes institutional uses and on-site parking.

<sup>c</sup> Includes communications and utilities uses.

<sup>d</sup> Includes the entire site areas of public and nonpublic recreation sites.

<sup>e</sup> Includes only that increment recommended for public recreation uses.

<sup>f</sup> Includes woodlands, water, wetlands, and quarries.

Note: Figures in italics indicate subtotals.

Source: SEWRPC.

be served by such facilities. Consequently, the recent historic trend in land subdivision to utilization of very large lots, required by the reliance upon on-site septic tank sewage disposal systems, is proposed to be moderated. The low- and medium-density development proposed under the recommended plan, however, can still adequately satisfy urban land market demands for single-family housing. For example, the average lot size proposed in the medium-density range would be about one-third of an acre, only slightly less than the frequently used one-half acre lot.

In order to avoid further formless sprawl within the Region, the recommended plan proposes to concentrate all new urban residential development into 151 new planned development units. Insofar

as possible, each unit would be bounded by arterial streets; major park, parkway, or institutional lands; bodies of water; or other natural and cultural features which would serve to physically separate each unit from the surrounding units. Each unit is intended to provide housing for that population for which, by prevailing standards, one elementary school is required. Each unit is further intended to provide, within the overall density limitations, a full range of housing types and lot sizes; a full complement of public and semipublic facilities needed by the family within the immediate vicinity of its dwelling, such as church, local park, and local shopping facilities; and ready access to the arterial street system as a means of access to those urban activities which cannot always be located in the immediate vicinity

of all residential development, such as major employment centers, regional shopping centers, and major recreational facilities and cultural centers. The internal street pattern of the planned residential development units should be designed not only to facilitate vehicular and pedestrian circulation within the unit but also to discourage penetration by through traffic. Each planned residential development unit should have a central feature, or focal point, around which the design can be built so as to promote a sense of physical unity.

Through the use of the planned residential development unit, the recommended regional land use plan seeks to assure stability and the preservation of amenities in residential areas. The need to develop an urban area as a number of recognizable cellular units, rather than as a formless mass, is partly a matter of aesthetics, partly a matter of convenience in living and traveling within the urban area, partly a matter of efficiency in organizing and supplying public facilities and services, and partly a matter of bringing the size of the area in which a family lives into a scale within which the human individual can feel at home and within which he may take an active part in community affairs. The need to develop an urban area as a number of cellular units is also a matter of design. The proper relationship of individual land subdivisions to external features of areawide concern, to existing and proposed land uses, and to other subdivisions can best be achieved within the framework of the planned residential development unit.

The recommended plan provides for the ready provision of public sanitary sewer and water supply facilities to new residential areas by locating the planned residential development units within gravity drainage areas tributary to existing or proposed sewage treatment plants and within ready reach of existing or proposed public water supply systems. In addition, the plan seeks to discourage new residential development in areas covered by soils not suited to such development; in areas where the wise use of the natural resource base of the Region would be jeopardized, that is, within the primary environmental corridors; and in areas subject to periodic flooding.

#### Commercial Development

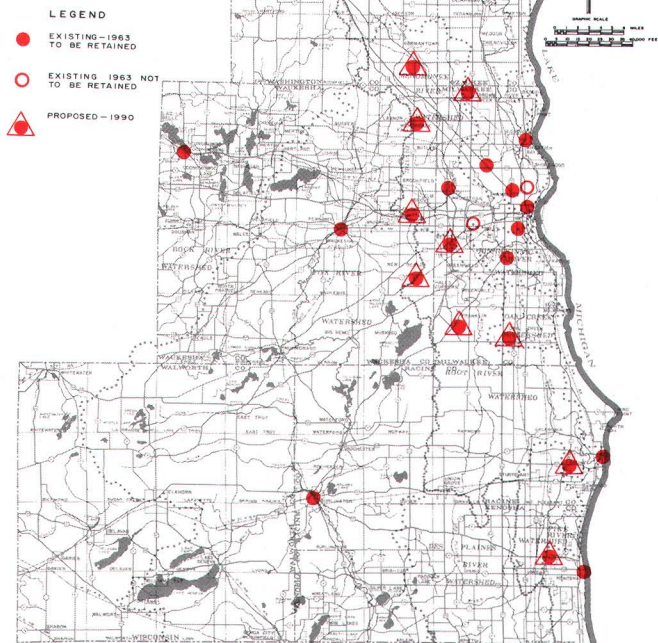
As indicated in Table 1, the recommended land use plan proposes to add by 1990 approximately 5,000 acres of new commercial land to the exist-

ing stock of such land within the Region. This increase would meet the area requirements of the anticipated increases in retail and service employment and the demands of a growing population within the Region and would be distributed so as to make the operation of a business and the provision of goods and services to the people of the Region both efficient and convenient. This is proposed to be accomplished through the development of planned, integrated commercial centers properly located with respect to the existing and proposed transportation system and residential areas; through the discouragement of spot commercial development along major streets and highways; through the encouragement of the provision of adequate off-street parking and loading facilities; and through the efficient provision of adequate utility services.

As indicated on Map 1, there were 15 major commercial areas within the Region in 1963. Thirteen of these are recommended to be retained as major commercial areas by 1990. These 13 areas comprise a total of 640 acres of commercial land uses, including off-street parking, and provide employment for over 80,000 persons, which accounts for about 38 percent of the total retail and service employment within the Region. The recommended plan proposes that by 1990 these 13 major commercial areas will provide employment for nearly 106,000 persons, an increase of about 33 percent, and be expanded to comprise a total area of about 710 acres. It should be noted that this represents a reduction of two such existing major commercial areas from those recognized in the alternative plans previously described in Volume 2 of this report. This reduction was the result of further analysis of the changing characteristics of the developed urban areas of the Region and conferences with local officials. In addition to providing land area for the expansion and improvement of the 13 existing major commercial areas, the plan proposes to add 10 new major commercial centers. These new centers would provide employment for over 14,000 persons and would be located in the cities of Brookfield, Franklin, Kenosha, Milwaukee, New Berlin, Oak Creek, Racine, and West Allis and in the villages of Germantown and Menomonee Falls. Each of these new centers would serve a market area containing between 75,000 to 150,000 persons. Each of the centers would have a site area of at least 70 acres and would be planned, developed, and managed as fully integrated units, with off-street parking for at least 5,000 cars, and would contain a full range of



Map I  
**MAJOR RETAIL AND SERVICE CENTERS  
 1990**



Anticipated growth and change within the rapidly urbanizing Region will result in a demand by 1990 for at least 10 new major retail and service centers. In addition, 13 of the 15 existing retail and service centers are anticipated to remain vital through at least 1990 and to retain areawide significance as concentrations of retail and service employment and activity.

commercial and service enterprises necessary to serve the surrounding trade area.

In addition to these major existing and proposed commercial areas, the plan provides for over 4,000 additional acres of commercial and service land for highway-oriented and local commercial development. This new highway service and local commercial area, together with the area in such existing use, would employ nearly 245,000 persons by 1990, an increase of more than 85 percent over the estimated 1963 level (see Table 2).

Industrial Development

As indicated in Table 1, the recommended plan proposes to add by 1990 more than 5,100 acres of industrial land to the existing stock of such land within the Region. This increase would meet the land requirements of the anticipated increases in manufacturing and wholesaling employment within the Region and would be distributed so as to protect and enhance the continued efficient operation of the principal component of the economic base of the Region. This is proposed to be accomplished through the development of planned industrial centers properly located with respect to the existing and proposed transportation system; through the protection and enhancement of existing industrial areas; and through the efficient provision of adequate utility services. The plan provides adequate sites for industrial development which meet the full array of criteria for such development, including ready accessibility to high-speed, all-weather arterial highway facilities; soils which are suitable for industrial development; adequate power and water supply; sanitary sewer service

Table 2  
 EXISTING AND PROPOSED COMMERCIAL<sup>a</sup> EMPLOYMENT DISTRIBUTION BY TYPE OF COMMERCIAL AREA: 1963 AND 1990 RECOMMENDED LAND USE PLAN

Type of Commercial Area	Existing (1963) <sup>b</sup>		Planned Increment		Total 1990	
	Number	Percent of Total	Number	Percent Change	Number	Percent of Total
Major Existing . . . . .	80,900	38.0	25,000	30.9	105,900	29.0
Local and Other . . . . .	131,800	62.0	112,800	85.5	244,600	67.0
New Centers . . . . .	--	--	14,300	--	14,300	4.0
Total	212,700	100.0	152,100	71.5	364,800	100.0

<sup>a</sup> Commercial employment includes retail and service industries excluding government and transportation and communication industries.

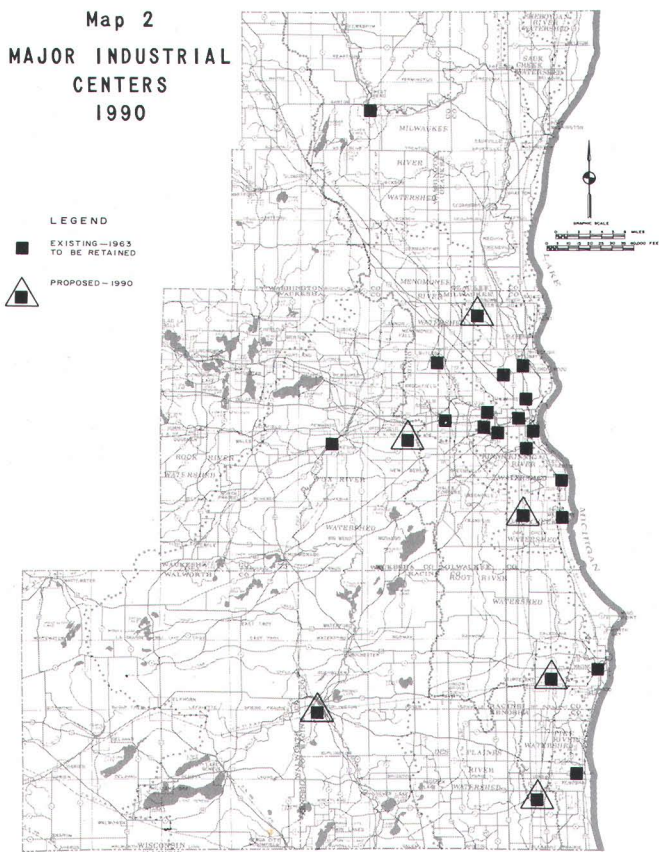
<sup>b</sup> Estimated from 1963 SEWRPC origin and destination travel surveys.

Source: SEWRPC.

and storm water drainage; reasonable access to airport and railway facilities; and ready access from residential areas.

As indicated on Map 2, there were 17 major industrial areas within the Region in 1963. All of these 17 areas are recommended to be retained as major industrial areas by 1990. These 17 areas comprised a total area of about 5,000 acres of manufacturing and warehousing land uses, including off-street parking, and provided employment for about 217,000 persons, or about 75 percent of the total regional employment in the manufacturing and wholesaling industries. The recommended plan proposes that by 1990 these 17 major indus-

trial areas will provide employment for about 236,000 persons, an increase of about 9 percent. In addition to providing for the expansion and improvement of the existing major industrial areas within the Region, the plan also proposes to add six new major industrial centers. These centers would be located in the cities of Burlington, Kenosha, Milwaukee, New Berlin, Oak Creek, and Racine. These centers would provide employment for over 35,000 persons. Each of these new industrial areas has been provided for in local as well as in the regional land use plans and would comprise an area of at least 640 acres designed and developed according to an integrated plan for use by a community of industries.



Rising levels of economic activity within the Region are anticipated to result in an increased demand for industrial land. The addition of six proposed new major industrial centers and the retention of the 17 existing major industrial centers as indicated on this map are in response to this demand. These 23 centers are anticipated to provide employment for about 74 percent of the 1990 regional industrial labor force. The remainder of that labor force will find employment in smaller industrial centers and locations throughout the Region.

In addition to the major existing and proposed industrial areas shown on the plan, the plan provides for more than 1,500 acres of new industrial land<sup>2</sup> for smaller industrial areas within local communities. This new industrial area, together with the area devoted to existing local industrial areas, would employ more than 95,000 persons by 1990, an increase of about 35 percent over the estimated 1963 level (see Table 3).

#### Governmental and Institutional Land Use

As indicated in Table 1, the recommended land use plan proposes to add by 1990 about 9,600 acres of new governmental and institutional land to the existing stock of such land within the Region. Most of this additional land will be required for such uses as new schools, hospitals, and churches; public facilities, such as libraries and police and fire stations; and for other governmental uses, such as new city, village, and town halls. Included also in this category is the land area required for the new University of Wisconsin campuses in Kenosha, West Bend, and Waukesha.

#### Transportation, Communications, and Utility Land Use

As indicated in Table 1, the recommended land use plan proposes to add by 1990 more than 28,000 acres of new transportation and public utility land to the existing stock of such land within the Region. Most of the additional land devoted to this category will be required for the rights-of-way for new and improved arterial, collector, and minor streets needed to serve new land use development or to

<sup>2</sup> Map scale limitations preclude identification of this acreage on the regional plan map. The necessary allocation is reflected, however, in the detailed quarter-section land use data files prepared under the regional land use-transportation study.

Table 3

EXISTING AND PROPOSED INDUSTRIAL<sup>a</sup> EMPLOYMENT DISTRIBUTION BY TYPE OF INDUSTRIAL AREA: 1963 AND 1990 RECOMMENDED LAND USE PLAN

Type of Industrial Area	(1963) <sup>b</sup>		Planned Increment		Total 1990	
	Number	Percent of Total	Number	Percent Change	Number	Percent of Total
Major Existing . . . .	217,200	75.4	18,600	8.5	235,800	64.4
Local and Other. . . .	70,700	24.6	24,400	34.5	95,100	26.0
New Centers. . . . .	--	--	35,100	--	35,100	9.6
Total	287,900	100.0	78,100	27.1	366,000	100.0

<sup>a</sup> Industrial employment includes manufacturing and wholesaling industries.

<sup>b</sup> Estimated from 1963 SEWRPC origin and destination travel surveys.

Source: SEWRPC.

provide adequate transportation service to existing urban development.

#### Open Space—Environmental Corridors

The most important elements of the natural resource base of the Region, including the best remaining woodlands, wildlife habitat, and surface water, together with the natural flood plains, wetland areas, and historic, scenic, and scientific sites, have been found to occur within the Region combined in linear patterns. These linear patterns of prime natural resource concentrations have been termed primary environmental corridors and have been described in detail in Volumes 1 and 2 of

this report. The preservation and protection of these environmental corridors in accordance with regional development objectives are essential to the maintenance of a wholesome environment within the Region and to the preservation of the unique cultural and natural heritage of the Region, as well as to its natural beauty.

About 311,000 acres of land and water, or about 18 percent of the total area of the Region, are contained within the primary environmental corridors. As indicated in Table 4, the net corridor area, which is proposed to be permanently protected and preserved under the recommended land use plan,

Table 4  
PRIMARY ENVIRONMENTAL CORRIDOR AREA IN THE REGION:  
1990 RECOMMENDED LAND USE PLAN

Corridor Component	Acres	Percent of Gross Corridor	Percent of Net Corridor
Gross Corridor <sup>a</sup>	311,593	100.0	--
Urban Development Within Corridor <sup>b</sup>	29,087	9.3	--
Net Corridor Area <sup>c</sup>	282,506	90.7	100.0
Water	40,168	--	14.2
Wetlands	87,809	--	31.0
Agriculture	85,837	--	30.3
Woodlands	61,603	--	21.7
Other Open Lands	8,089	--	2.8

<sup>a</sup> This total differs slightly from those presented in earlier volumes of this report because the availability of more detailed information permitted a refinement of the corridor delineation.

<sup>b</sup> Includes residential, commercial, industrial, governmental, institutional, recreational, and transportation uses.

<sup>c</sup> Does not include the land or water area of the major regional parks located within the corridor.

Source: SEWRPC.

includes nearly 88,000 acres of wetlands, about 86,000 acres of agricultural lands, more than 61,000 acres of woodlands, and over 40,000 acres of surface water. It should be noted that community and regional park and recreation areas are not included in the net corridor area. As indicated on the plan map, there are 26 major regional parks comprising over 9,500 acres located within the gross environmental corridor area. It is also anticipated and recommended that the need for additional community parks will be satisfied through the acquisition of lands included in the net environmental corridor area.

#### Open Space—Agricultural Land Use

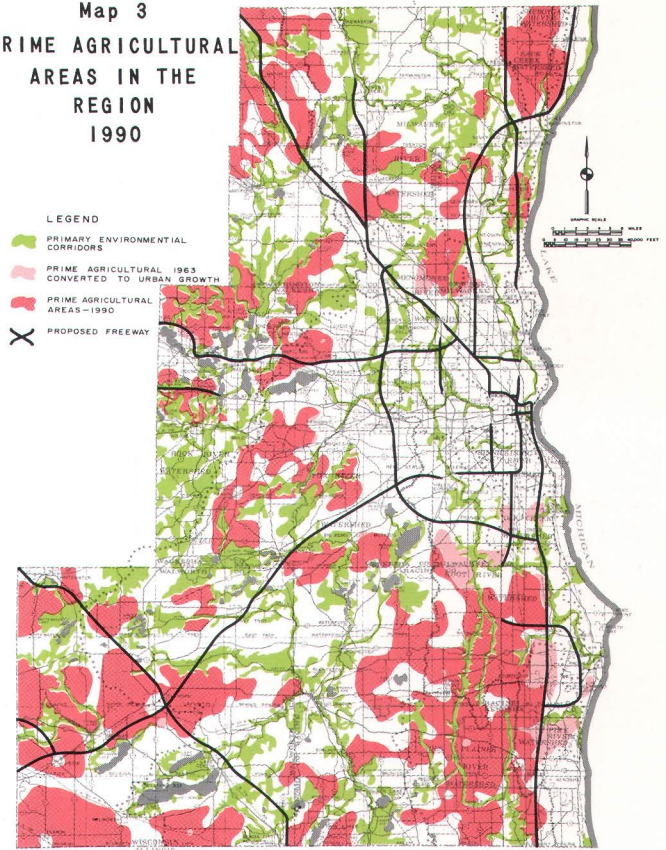
In 1963 more than 1,085,000 acres of land within the Region were devoted to agricultural use, and about 444,000 acres of this total were considered as prime agricultural land. Because agricultural land within the Region serves as a land reserve for urban expansion, as well as a base for an important economic activity, it is inevitable that the demands of a growing urban population will require the continued conversion of agricultural land to urban use. Under the recommended plan, urban expansion within the Region will require by 1990 the conversion of more than 102,000 acres of agricultural land; and, of that amount, over 21,000 acres will be converted from the prime agricultural acreage (see Map 3). The prime agricultural areas which the plan proposes to convert to urban use were generally committed to urban development as early as 1963 due to their proximity to existing and expanding concentrations of urban uses and the prior commitment of heavy capital investments in utility extensions.

In accordance with the regional development objectives, the recommended plan proposes to set aside nearly 423,000 acres of prime agricultural lands for preservation in permanent agricultural areas. These areas have been delineated on the basis of soils, the size and extent of the area farmed, and the historic capability of the area to consistently produce better than average crop yields. Certain other agricultural areas are recommended in the plan for permanent agricultural use because they lie adjacent to or surround important high-value recreational, cultural, or scientific resource areas.

#### Open Space—Other Open Lands

In 1963 nearly 346,000 acres of other open lands, comprised primarily of woodlands, water, wetlands, and quarries, existed within the Region. Like the agricultural lands, some of these other

Map 3  
PRIME AGRICULTURAL  
AREAS IN THE  
REGION  
1990



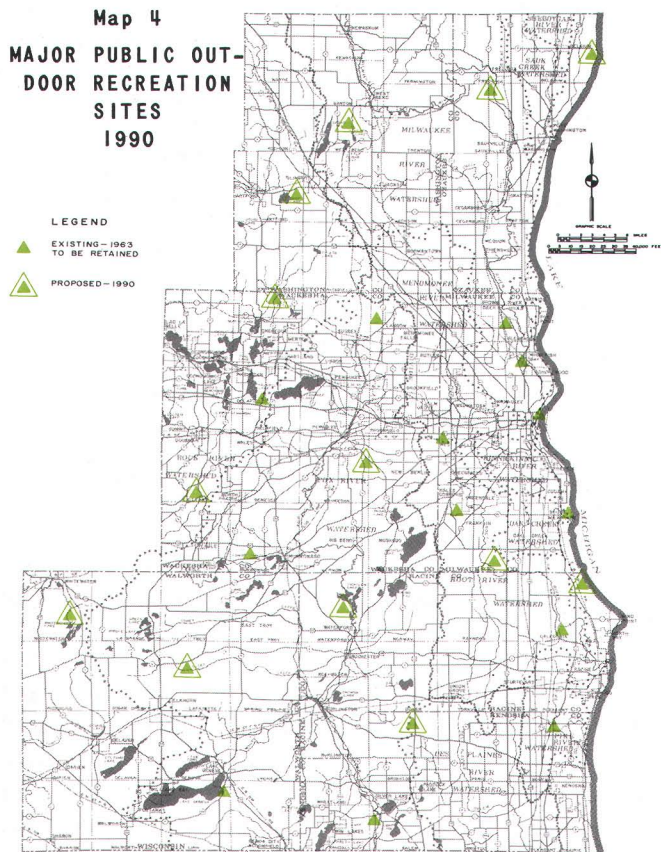
Although implementation of the plan recommendations will require the conversion to urban use within the Region by 1990 of 21,000 acres of prime agricultural land, nearly 423,000 acres of these highly productive lands would be protected from such conversion. Also shown on the map are the nearly 312,000 acres of primarily environmental corridor area which the recommended plan seeks to protect from incompatible rural and urban land use development.

open lands provide a ready land reserve for urban expansion, particularly the woodland areas which provide a particularly desirable aesthetic attraction for residential development. By 1990, under the recommended plan, about 25,000 acres of land in this category will have been converted to urban use. Most of this acreage consists of individual woodlots located directly in the path of urban growth, most of which are of insufficient size or quality to warrant permanent preservation. Careful land subdivision design, however, can preserve the full aesthetic and some of the ecological value of these woodlands and can, at the same time, provide more desirable and valuable building sites.

#### Open Space—Recreation Land Use

As indicated in Table 1, over 33,000 acres of

land distributed over 788 sites were actively used within the Region for recreation purposes in 1963. More than half of this amount was devoted to public recreation, and about 4,400 acres of this public portion were contained in the 13 existing major regional parks recognized by the plan. As indicated in Table 5, the recommended plan provides for more than 8,700 acres of additional public recreation land by 1990; and over 61 percent, or 5,300 acres, of this additional land would be used for 13 new major regional parks. As indicated on Map 4, the 26 existing and proposed major regional parks are proposed to be located as follows: 3 in Kenosha County, 7 in Milwaukee County, 2 in Ozaukee County, 3 in Racine County, 3 in Walworth County, 2 in Washington County, and 6 in Waukesha County. The number of acres in major regional parks per 1,000 population is proposed to be increased from 2.65 in 1963 to 3.65 by 1990.



The preservation for eventual major public park development of more than 9,700 acres of high-quality recreation land is proposed under the recommended land use plan. Thirteen of the major park sites shown on this map were already in public ownership in 1963. Thirteen additional major park sites have been recommended for immediate preservation and future development.

This increase is the result of the planned addition of more than 5 acres per 1,000 additional population added between 1963 and 1990.

#### Population Distribution

The 1963 regional population was estimated as 1,674,000 persons; and population forecasts, prepared by the Commission and presented in Volume 2 of this report, indicate that approximately 1 million additional persons will be added to the regional population by 1990. This population growth was forecast to be distributed by county as indicated in Table 6. The land use pattern proposed by the recommended plan would meet these regional and county forecast levels. The absolute increases in county population levels would range from 360,000 persons in Milwaukee County to 32,000 persons in Walworth County, while the relative increases would range from 155 percent in Ozaukee County to 33 percent in Milwaukee County. The proposed increase in the amount of land devoted to urban use within each county is compared to the proposed population increase within each county in Table 7. As indicated in Table 8, the population density within the developed urban area of the Region would continue to decrease, but at a significantly slower rate than formerly, decreasing from a density of 4,800 persons per square mile in 1963 to 4,350 persons per square mile by 1990. This important change in historic development trends would result from implementation of plan proposals which recommend that the majority of new residential land uses within the Region be developed at medium instead of low densities and be provided with public sanitary sewer service and public water supply facilities. As this regional development objective is achieved, residential development densities will become higher than those prevalent in the more recent past. Lot sizes per dwelling unit would be reduced somewhat in order to facilitate the more economical provision of sanitary sewer and water service, while meeting urban land market demands.

#### Public Sanitary Sewer Service and Water Supply

In 1963 about 217 square miles, or 64 percent of the total developed urban area of the Region, and about 1,419,000 persons, or 85 percent of the total population of the Region, were served by public sanitary sewer facilities; and about 200 square miles, or 59 percent of the total developed urban area of the Region, and about 1,372,000 persons, or 82 percent of the total population of the Region, were served by public water supply facilities.

Table 5  
PUBLIC RECREATION ACREAGE IN THE REGION PER THOUSAND POPULATION:  
1963 AND 1990 RECOMMENDED LAND USE PLAN

Public Recreation Lands	Existing (1963)		Planned Increment			Total 1990	
	Acres	Acres Per Thousand Population	Acres	Acres Per Thousand Population	Percent Change	Acres	Acres Per Thousand Population
Major Regional Parks . . . . .	4,432	2.65	5,334	5.32	120.3	9,766	3.65
Local Parks . . . . .	5,698	3.40	3,384	3.37	59.3	9,082	3.39
Other Public Recreation <sup>a</sup> . . . . .	6,588	3.94	--	--	--	6,588	2.46
<b>Total</b>	<b>16,718</b>	<b>9.99<sup>b</sup></b>	<b>8,718</b>	<b>8.69</b>	<b>52.1</b>	<b>25,436</b>	<b>9.50<sup>b</sup></b>

<sup>a</sup> In 1963 more than 60 sites comprising 6,588 acres had been developed as specialized single-purpose recreational sites, such as a golf course. The recommended plan proposes to retain these special-use sites, but not to add to them.

<sup>b</sup> The ratio of acres-per-thousand population is shown to decline between 1963 and 1990 because there was only a slight increment to the local park category and no increment to the other public recreation category recommended in the plan. It was thought to be in the province of local communities to provide for additional local and special-use recreation lands.

Source: SEWRPC.

Under the recommended plan, about 580 square miles, or 95 percent of the developed urban area, and about 2,547,000 persons, or 95 percent of the total population, would by 1990 be served by both public sanitary sewer facilities and public water supply facilities (see Table 9).

drainage centralized sanitary sewer facilities tributary to existing sewerage systems and by public water supply systems. The plan proposals should thus serve to reduce and control the amount of untreated and partially treated domestic and industrial wastes discharged into the streams, rivers, lakes, and ground water reservoirs of the Region; to permit a better adjustment of waste treatment and disposal facilities to the waste assimilation capacities of the streams and rivers; and to assure a pure supply of water for all existing and potential users within the Region.

The plan seeks to discourage the development of residential areas dependent upon on-site sewage disposal systems and shallow private wells and to encourage such development served by gravity

Table 6  
EXISTING AND PROPOSED POPULATION DISTRIBUTION IN THE REGION BY COUNTY:  
1963 AND 1990 RECOMMENDED LAND USE PLAN  
(Population in Thousands)

County	Existing (1963)		Planned Increment <sup>a</sup>		Total 1990	
	Number	Percent of Region	Number	Percent Change	Number	Percent of Region
Kenosha . . . . .	106.7	6.4	95.3	89.3	202.0	7.5
Milwaukee . . . . .	1,086.3	64.9	359.7	33.1	1,446.0	54.0
Ozaukee . . . . .	41.6	2.5	64.4	154.8	106.0	4.0
Racine . . . . .	150.6	9.0	132.4	87.9	283.0	10.6
Walworth . . . . .	55.5	3.3	31.5	56.7	87.0	3.2
Washington . . . . .	49.5	2.9	46.5	93.9	96.0	3.6
Waukesha . . . . .	184.2	11.0	273.8	148.6	458.0	17.1
<b>Regional Total</b>	<b>1,674.4</b>	<b>100.0</b>	<b>1,003.6</b>	<b>59.9</b>	<b>2,678.0</b>	<b>100.0</b>

<sup>a</sup> The planned increment is equal to the forecast increment because the recommended plan was designed to meet the forecast population level for each county.

Source: SEWRPC.

Table 7  
**URBAN LAND AREA AND POPULATION INCREASE IN THE REGION BY COUNTY:  
 1963-1990 RECOMMENDED LAND USE PLAN**

County	Increase 1963-1990			
	Urban Land Area		Population	
	Acres	Percent	Number	Percent
Kenosha . . . . .	13,113	50.5	95,300	89.3
Milwaukee . . . . .	40,725	40.8	359,700	33.1
Ozaukee . . . . .	10,405	53.3	64,400	154.8
Racine . . . . .	18,827	62.8	132,400	87.9
Walworth . . . . .	4,454	14.4	31,500	56.7
Washington . . . . .	6,113	28.7	46,500	93.9
Waukesha . . . . .	34,635	55.5	273,800	148.6
<b>Regional Total</b>	<b>128,272</b>	<b>44.2</b>	<b>1,003,600</b>	<b>59.9</b>

Source: SEWRPC.

Employment Distribution

In 1963 total employment within the Region was estimated at 634,900 jobs, and the employment forecasts prepared by the Commission and presented in Volume 2 of this report indicate that by 1990 total regional employment should increase to 984,000 jobs. As indicated in Table 10, implementation of the recommended plan would result in employment increases for each county in the Region, ranging from an additional 9,400 jobs in Walworth County to an additional 156,000 jobs in Milwaukee County. It should be noted that under the recommended plan only 50,000 jobs, or less than 15 percent of the total anticipated employment growth by 1990, will be provided for in new major commercial and industrial centers, while approximately 299,000 jobs, or 85 percent of the antici-

pated employment growth, will be provided for in existing employment centers or new local employment centers.

**SUMMARY**

The Southeastern Wisconsin Region of 1990 will be significantly different from the Region of today. There will be more than one million additional residents, nearly 350,000 additional jobs, and over 520,000 additional motor vehicles within the Region. This anticipated growth will generate massive demands for land and for improved transportation facilities and will press heavily on the limited natural resource base. The land use plan recommended in this report seeks to provide for this anticipated regional growth and development in a manner which will not only permit the efficient

Table 8  
**POPULATION DENSITY IN THE REGION: 1850-1963 AND 1970, 1980, AND 1990  
 RECOMMENDED LAND USE PLAN**

Year	Urban Population		Rural Population		Total Population	Area (Square Miles)		Persons Per Square Mile	
	Number	Percent of Total	Number	Percent of Total		Urban	Total	Urban	Total
1850	28,623	25.2	84,766	74.8	113,389	4	2,689	7,155.8	42.2
1880	139,509	50.3	137,610	49.7	277,119	18	2,689	7,750.5	103.1
1900	354,082	70.5	147,726	29.5	501,808	37	2,689	9,569.8	186.6
1920	635,376	81.0	148,305	19.0	783,681	56	2,689	11,346.0	291.4
1940	996,535	93.3	76,164	6.7	1,067,699	90	2,689	11,072.6	397.1
1950	1,179,084	95.0	61,534	5.0	1,240,618	138	2,689	8,544.1	461.4
1963	1,634,200	97.6	40,100	2.4	1,674,300	340	2,689	4,806.5	622.6
1970	1,830,730	97.9	39,270	2.1	1,870,000	407	2,689	4,498.1	695.4
1980	2,189,655	98.5	33,345	1.5	2,223,000	496	2,689	4,414.6	826.7
1990	2,651,220	99.0	26,780	1.0	2,678,000	609	2,689	4,353.4	995.9

Source: SEWRPC.

**Table 9**  
**EXISTING AND PROPOSED DEVELOPED AREA AND POPULATION SERVED**  
**BY PUBLIC SANITARY SEWER AND PUBLIC WATER SUPPLY IN THE REGION:**  
**1963 AND 1990 RECOMMENDED LAND USE PLAN**

Extent of Service	Existing (1963)		Planned Increment		Total 1990	
	Public Sewer Service	Public Water Supply	Public Sewer Service	Public Water Supply	Public Sewer Service	Public Water Supply
<b>Developed Area:</b>						
Total Square Miles. . .	339.7	339.7	269.3	269.3	609.0	609.0
Square Miles Served . .	217.0	200.0	362.9	379.9	579.9	579.9
Percent of Total Served . . . . .	63.9	58.8	--	--	95.2	95.2
<b>Population:</b>						
Total Population. . .	1,674,400	1,674,400	1,003,600	1,003,600	2,678,000	2,678,000
Population Served . .	1,419,025	1,372,480	1,127,645	1,174,190	2,546,670	2,546,670
Percent of Total Served . . . . .	84.7	81.9	--	--	95.0	95.0

Source: SEWRPC.

**Table 10**  
**EXISTING AND PROPOSED EMPLOYMENT DISTRIBUTION IN THE REGION**  
**BY COUNTY: 1963 AND 1990 RECOMMENDED LAND USE PLAN**

County	Existing (1963)		Planned Increment		Total 1990	
	Number	Percent of Region	Number	Percent Change	Number	Percent of Region
Kenosha . . . . .	41,900	6.6	38,100	90.9	80,000	8.1
Milwaukee . . . . .	471,700	74.3	156,000	30.9	627,700	63.8
Ozaukee . . . . .	10,800	1.7	15,700	145.3	26,500	2.7
Racine. . . . .	52,100	8.2	45,000	86.3	97,100	9.9
Walworth. . . . .	12,700	2.0	9,400	74.0	22,100	2.2
Washington. . . . .	12,100	1.9	14,000	115.7	26,100	2.7
Waukesha. . . . .	33,600	5.3	70,900	211.0	104,500	10.6
Regional Total	634,900	100.0	349,100	54.9	984,000	100.0

Source: SEWRPC.

provision of the necessary public facilities and services but which will meet the eight specific regional land use development objectives formulated and adopted by the Commission to the maximum extent possible.

Implementation of the recommended land use plan would:

1. Meet the social, physical, and economic needs of the future regional population by providing a balanced allocation of space to each of the various major land use cate-

gories. The plan allocates sufficient land to each of the various major land use categories to satisfy the known and anticipated demand for each use, meeting both the demands of the urban land market and approved land use plan design standards.

2. Achieve a compatible arrangement of land uses by providing a spatial distribution of major land uses which will avoid or minimize hazards and dangers to health, safety, and welfare and would, at the same time, maximize amenity and convenience in terms of accessibility to supporting land uses.



3. Protect and enhance the natural resource base of the Region, particularly the soils, inland lakes and streams, wetlands, woodlands, and wildlife habitat areas, and would assist in maintaining an ecological balance between the activities of man and the natural environment which supports him. The plan allocates new urban development only to those areas of the Region which are covered by soils well suited to such development. More particularly, the plan seeks to avoid urban development requiring on-site septic tank sewage disposal systems in those areas of the Region covered by soils unsuited to the utilization of such systems, thereby abating water pollution problems and avoiding the intensification of existing, and the creation of new, environmental problems within the Region. The plan seeks to protect the shoreline frontage of the lakes and perennial streams of the Region from incompatible development, to protect the floodways and flood plains of perennial streams and watercourses of the Region from urban encroachment, and to protect the remaining wetland areas from destruction through improper urban or rural development. The plan proposes to maintain appropriate levels of woodland cover and to maintain the remaining high-value resource areas of the Region in a wholesome state in order to assure a suitable habitat for the maintenance of wildlife within the Region.
4. Permit a more economical provision of public utility and municipal services to future urban development. The plan recognizes the interdependence between the land use pattern and the transportation and public utility systems which serve and sustain it. It seeks to encourage urban development in those areas of the Region which can be readily provided with gravity drainage sanitary sewer service and public water supply. It seeks to maximize the use of existing transportation and public utility facilities and to require the provision of transportation and utility services only to those areas of the Region which should be allocated to urban use. Most importantly, the plan seeks to mutually adjust the land use pattern and the demand this pattern creates for, and the loadings upon, transportation and utility facilities to the spatial location and capacities of these facilities.
5. Provide for the development and conservation of residential areas within a physical environment that is healthy, safe, convenient, and attractive. The plan proposes to allocate new residential development to planned development units which would be properly serviced by public sanitary sewerage and water supply facilities; would contain within the immediate vicinity of each dwelling unit the full complement of public facilities needed by the family in its daily activities, such as elementary school and church, local park, and convenient shopping facilities; and would provide ready access from residential areas to the regional transportation system. The plan would not only promote the efficient provision of community facilities and services to residential areas but would provide for the development of stable residential areas containing a wide range of housing types, designs, and costs and would provide a most desirable environment for family life.
6. Assure the preservation and provision of a variety of suitable industrial and commercial sites within the Region in terms of both physical characteristics and location. The plan proposes to meet the needs of increased commercial and industrial activity within the Region, not only through the provision of new planned industrial and commercial centers, but also through the expansion and improvement of existing commercial and industrial areas and through the provision of adequate transportation and utility services to both new and existing concentrations of economic activity.
7. Assure the preservation and provision of enough open-space land within the Region to enhance the total quality of the regional environment, lend form and structure to urban development, and facilitate attainment of a balanced outdoor recreational program providing a full range of facilities for all age groups. The plan seeks to preserve and protect the primary environmental corridors of the Region, which

contain the best remaining potential park and related open-space sites; the best remaining woodlands, wetlands, and wildlife habitat areas; many of the scenic, historic, scientific, and cultural sites; and most of the surface water resources of the Region. The preservation of these environmental corridors is essential to the preservation and wise use of the natural resource base; to the enrichment of the physical, intellectual, and spiritual development of the resident population; to the enhancement of aesthetic values; and to the maintenance of a sound ecological balance within the Region.

8. Assure the preservation of the best remaining agricultural areas within the Region for agricultural and open-space uses, thereby recognizing that agricultural areas in an urbanizing region serve not only to provide agricultural products to the resident population but also contribute significantly to maintaining the ecological balance, lend form and structure to urban development,

and provide an important land reserve for presently unforeseen urban and rural development needs.

That the recommended land use plan best meets the foregoing specific regional land use development objectives was demonstrated in Volume 2 of this report, in which the land use plan was specifically related to the stated development objectives through supporting land use planning standards. Because of the manner and degree to which the recommended plan meets the approved regional development objectives and standards and incorporates, to the maximum extent possible, local development objectives and standards, it met with the approval of the reviewing technical and inter-governmental advisory committees and is hereby recommended, within the context of a continuing planning effort, for adoption as the guide for land use development within the Region over the next two and one-half decades. As such, the land use plan is intended to serve as a point of departure against which development proposals within the Region may be evaluated.

## Chapter III

# THE RECOMMENDED PLAN-TRANSPORTATION

### INTRODUCTION

The Controlled Existing Trend Land Use Plan, as described in the preceding chapter of this report, is being recommended for adoption as the land use element of a comprehensive plan for the physical development of the Southeastern Wisconsin Region. The methodology used to design a transportation system to serve the recommended land use plan has been described in considerable detail in Volume 2 of this report. In this description the importance of quantitatively testing the transportation system plan by assignment of anticipated traffic loads, derived from the land use pattern to be served, and the evaluation of the transportation plan on the basis of these tests against rationally formulated transportation system development objectives and standards was stressed.

The transportation system plan being recommended herein to serve the land use plan seeks to achieve a balance between transportation modes; that is, between the provision and utilization of highway and transit facilities, as well as a balance between traffic loads and system capacities and service levels. Its design was dictated by existing and committed transportation facilities, by the transportation system development objectives and standards to be met, by consideration of system integration and continuity needs, and by attendant benefits and costs, as well as by the pattern of land use and travel demand to be served.

### TRAFFIC DEMAND

Commission forecasts indicate that the anticipated increases in population and economic activity levels within southeastern Wisconsin over the next 25 years will be accompanied by large increases in the number of motor vehicles within the Region and in personal and vehicular travel. By 1990 the number of motor vehicles within the Region is anticipated to increase by approximately 87 percent over the 1963 level of about 586,000, to a total of over 1,100,000. It is estimated that, when fully developed, the regional development pattern proposed by the recommended land use plan will generate a total of 6,022,000 internal person trips within the Region on an average weekday. This

represents an increase of 67 percent over the 3,603,000 internal person trips generated within the Region on an average weekday in 1963. This percentage increase in internal person trip production contrasts with an anticipated increase in population within the Region of about 60 percent and in automobile availability of about 92 percent over the same period of time. The anticipated future internal person trip production within the Region by trip purpose is indicated in Table 11. The largest proportion of the increase in internal person tripmaking is expected to occur in the home-based shopping, home-based other, and non-home-based tripmaking categories, which together are anticipated to increase by 84 percent. Home-based work trips are estimated to increase by 47 percent over the 27-year period from 1963 to 1990.

The average number of internal person trips generated per capita is anticipated to increase from 2.12 in 1963 to 2.25 by 1990, while the average number of internal person trips generated per household is anticipated to increase from 7.34 to 7.57. Average internal trip lengths within the Region, expressed in minutes of travel time, are expected to remain substantially unchanged for all trip purpose categories for both internal auto driver and transit person trips, as indicated in Table 12, while average trip lengths on the arterial network expressed in miles of travel distance are expected to increase substantially from 5.7 to 7.7. This increase is attributable in large part to the greatly improved accessibility to urban land uses within the Region afforded by the recommended transportation system improvements.

External vehicle trips crossing the boundaries of the Region are expected to increase by 154 percent, from about 102,000 trips per average weekday in 1963 to 258,000 by 1990. External person trips are expected to increase by 164 percent, from 195,000 trips per average weekday in 1963 to 514,000 in 1990, as shown in Table 13. External vehicle trips, which accounted for 4 percent of the total vehicle trips in the Region in 1963, are expected to account for 5 1/2 percent in 1990.

Table 11  
INTERNAL PERSON TRIP GENERATION<sup>a</sup> IN THE REGION BY TRIP PURPOSE:  
1963 AND 1990 RECOMMENDED TRANSPORTATION PLAN

Trip Purpose Category	Survey (1963) <sup>b</sup>		Total 1990		Percent Change 1963-1990
	Number	Percent of Total	Number	Percent of Total	
Home-Based Work . . . . .	1,008,000	28.0	1,478,000	24.5	46.6
Home-Based Shopping . . . . .	516,000	14.3	1,031,000	17.1	99.8
Home-Based School . . . . .	309,000 <sup>c</sup>	8.5	335,000	5.6	8.4
Home-Based Other <sup>d</sup> . . . . .	1,131,000	31.4	2,136,000	35.5	88.5
Non-Home-Based . . . . .	639,000	17.8	1,042,000	17.3	63.0
<b>Total</b>	<b>3,603,000</b>	<b>100.0</b>	<b>6,022,000</b>	<b>100.0</b>	<b>67.1</b>

<sup>a</sup> Trips generated on an average weekday.

<sup>b</sup> All 1963 origin and destination home interview survey data were increased by 17 percent to meet observed traffic volumes crossing selected screen lines.

<sup>c</sup> This total represents all home-based school trips made on an average weekday by all modes of travel, including approximately 60,000 home-based school trips made by school bus in the postal survey area of the Region not shown in Volume 2 of this report.

<sup>d</sup> Home-based other trips include personal business, medical, dental, social, and recreation trip purposes.

Source: SEWRPC.

Table 12  
AVERAGE TRIP LENGTHS IN MINUTES FOR INTERNAL AUTO DRIVER AND TRANSIT TRIPS IN  
THE REGION: 1963 AND 1990 RECOMMENDED TRANSPORTATION PLAN

Trip Purpose Category	Survey (1963) <sup>a</sup>		Total 1990		Percent Change 1963-1990	
	Auto Driver	Transit	Auto Driver	Transit	Auto Driver	Transit
Home-Based Work . . . . .	17.87	35.89	18.10	37.86	1.3	5.5
Home-Based Shopping . . . . .	9.20	28.50	9.75	25.52	6.0	-10.5
Home-Based Other <sup>b</sup> . . . . .	12.38	32.51	12.98	32.57	4.9	0.2
Non-Home-Based . . . . .	12.55	28.37	12.87	30.72	2.6	8.3
<b>Weighted Average</b>	<b>13.74</b>	<b>33.63</b>	<b>13.87</b>	<b>34.64</b>	<b>1.0</b>	<b>3.0</b>

<sup>a</sup> All 1963 origin and destination home interview survey data were increased by 17 percent to meet observed traffic volumes crossing selected screen lines.

<sup>b</sup> Home-based other trips include personal business, medical, dental, social, and recreation trip purposes, but not school trips.

Source: SEWRPC.

Similarly, external person trips, which accounted for 5 1/2 percent of the total person trips in the Region in 1963, are expected to account for nearly 8 percent in 1990. As in 1963, about one-half of the total of both external vehicle and external person trips are anticipated to be made by residents of the Region in 1990. The largest increases in external vehicle trip volumes are expected to occur on STH 30, STH 31, STH 57, USH 12, and USH 41, all of which are proposed to be upgraded to freeway status by 1990, and on IH 94 as indicated in Appendix A.

It is anticipated that, under the recommended land use plan, transit trip production within the Region on an average weekday will increase by about 9 percent, from 324,000 trips in 1963 to 353,000 trips by 1990 (see Table 14). The largest increase in transit trip production, 84,000 trips, is anticipated to occur in the home-based school trip purpose category. The largest decrease, 25,000 trips, is anticipated to occur in the home-based work trip purpose category. Home-based other transit trips are estimated to decline by about 21,000 trips; non-home-based transit trips are estimated to

**Table 13**  
**EXTERNAL PERSON AND VEHICLE TRIPS BY DIRECTION:**  
**1963 AND 1990 RECOMMENDED TRANSPORTATION PLAN**

Trip Classification	Inbound	External Trip Direction		Total
		Outbound	Through	
<b>Auto Driver</b>				
Survey (1963) . . .	39,742	39,996	5,869	85,607
Planned (1990) . . .	103,269	103,269	19,732	226,270
Percent Change . . .	159.8	158.1	236.2	164.3
<b>Auto Passenger</b>				
Survey (1963) . . .	47,820	48,127	10,076	106,023
Planned (1990) . . .	123,923	123,923	33,939	281,785
Percent Change . . .	159.1	157.4	236.8	165.7
<b>Truck</b>				
Survey (1963) . . .	7,063	7,168	1,713	15,944
Planned (1990) . . .	13,535	13,535	5,100	32,170
Percent Change . . .	91.6	88.8	197.7	101.7
<b>Truck Passenger</b>				
Survey (1963) . . .	1,473	1,607	208	3,288
Planned (1990) . . .	2,842	2,842	612	6,296
Percent Change . . .	92.9	76.8	194.2	91.4
<b>Total Person Trips<sup>a</sup></b>				
Survey (1963) . . .	89,035	89,730	16,153	194,918
Planned (1990) . . .	230,034	230,034	54,283	514,351
Percent Change . . .	158.3	156.3	236.0	163.8
<b>Total Vehicle Trips<sup>b</sup></b>				
Survey (1963) . . .	46,805	47,164	7,582	101,551
Planned (1990) . . .	116,804	116,804	24,832	258,440
Percent Change . . .	149.5	147.6	227.5	154.4

<sup>a</sup> Includes trips by persons 5 years of age or over traveling as an auto driver or as a passenger in an auto, taxi, truck, school bus, or other mass transit carrier.

<sup>b</sup> Includes autos and trucks.

Source: SEWRPC.

**Table 14**  
**INTERNAL TRANSIT PERSON TRIP GENERATION<sup>a</sup> IN THE REGION BY TRIP PURPOSE:**  
**1963 AND 1990 RECOMMENDED TRANSPORTATION PLAN**

Trip Purpose Category	Survey (1963) <sup>b</sup>		Total 1990		Percent Change 1963-1990
	Number	Percent of Total	Number	Percent of Total	
Home-Based Work . . . . .	154,000	47.5	129,000	36.5	-16.2
Home-Based Shopping . . . . .	30,000	9.3	31,000	8.8	3.3
Home-Based School . . . . .	60,000	18.5	144,000	40.8	140.0
Home-Based Other <sup>c</sup> . . . . .	55,000	17.0	34,000	9.6	-38.2
Non-Home-Based . . . . .	25,000	7.7	15,000	4.3	-40.0
<b>Total</b>	<b>324,000</b>	<b>100.0</b>	<b>353,000</b>	<b>100.0</b>	<b>8.9</b>

<sup>a</sup> Trips generated on an average weekday.

<sup>b</sup> All 1963 origin and destination home interview survey data were increased by 17 percent to meet observed traffic volumes crossing selected screen lines.

<sup>c</sup> Home-based other trips include personal business, medical, dental, social, and recreation trip purposes.

Source: SEWRPC.

decline by 10,000 trips, while home-based shopping transit trips are expected to remain at about the 1963 level. A smaller proportion of the total internal travel generated within the Region by 1990 may be expected to be made on transit facilities, with the proportion decreasing from approximately 9 percent in 1963 to approximately 6 percent by 1990, as indicated in Table 15. The total number of transit trips made within the Region is, however, expected to increase.

It is anticipated that the recommended land use plan would generate a total of 3,938,000 internal auto driver trips within the Region on an average weekday in 1990. This represents an increase of about 82 percent over the 1963 level of 2,166,000 such trips. This percentage increase in internal

auto driver trips is slightly higher than the anticipated 78 percent increase in internal person trips made by automobile (auto driver and auto passenger trips). The anticipated increases in internal auto driver trips by trip purpose categories are indicated in Table 16, while the anticipated increase in internal automobile person trips within the Region under the recommended land use plan is indicated in Table 17.

Total vehicle trip production on an average weekday in 1990 under the recommended land use plan is estimated to increase by 82 percent, from 2,568,000 vehicle trips in 1963 to 4,661,000 by 1990. As indicated in Table 18, the largest increases in trip production are anticipated to occur in internal automobile and internal truck

Table 15  
TOTAL INTERNAL PERSON TRIP GENERATION IN THE REGION BY MODE OF TRAVEL:  
1963 AND 1990 RECOMMENDED TRANSPORTATION PLAN

Mode of Travel	Survey (1963) <sup>a</sup>		Total 1990		Percent Change 1963-1990
	Number	Percent of Total	Number	Percent of Total	
Auto Driver . . . . .	2,166,000	60.1	3,938,000	65.4	81.8
Auto Passenger. . . . .	993,000	27.6	1,668,000	27.7	68.0
Transit . . . . .	324,000	9.0	353,000	5.9	9.0
School Bus. . . . .	120,000	3.3	63,000	1.0	-47.5
Total	3,603,000	100.0	6,022,000	100.0	67.1

<sup>a</sup> All 1963 origin and destination home interview survey data were increased by 17 percent to meet observed traffic volumes crossing selected screen lines.

Source: SEWRPC.

Table 16  
INTERNAL AUTO DRIVER PERSON TRIP GENERATION IN THE REGION BY TRIP PURPOSE:  
1963 AND 1990 RECOMMENDED TRANSPORTATION PLAN

Trip Purpose Category	Survey (1963) <sup>a</sup>		Total 1990		Percent Change 1963-1990
	Number	Percent of Total	Number	Percent of Total	
Home-Based Work . . . . .	699,000	32.3	1,104,000	28.0	57.9
Home-Based Shopping . . .	317,000	14.6	646,000	16.4	103.4
Home-Based School <sup>b</sup> . . . .	24,000	1.1	24,000	0.6	--
Home-Based Other <sup>c</sup> . . . . .	675,000	31.2	1,376,000	35.0	103.8
Non-Home-Based. . . . .	451,000	20.8	788,000	20.0	74.7
Total	2,166,000	100.0	3,938,000	100.0	81.8

<sup>a</sup> All 1963 origin and destination home interview survey data were increased by 17 percent to meet observed traffic volumes crossing selected screen lines.

<sup>b</sup> Home-based auto driver school trips were held constant over the plan design period because any increase would be insignificant in terms of the effect on the highway system and because there was no valid basis for distributing any increase in such trips.

<sup>c</sup> Home-based other trips include personal business, medical, dental, social, and recreation trip purposes.

Source: SEWRPC.

**Table 17**  
**INTERNAL AUTOMOBILE PERSON TRIP<sup>a</sup> GENERATION IN THE REGION BY TRIP PURPOSE:**  
**1963 AND 1990 RECOMMENDED TRANSPORTATION PLAN**

Trip Purpose Category	Survey (1963) <sup>b</sup>		Total 1990		Percent Change 1963-1990
	Number	Percent of Total	Number	Percent of Total	
Home-Based Work . . . . .	854,000	27.0	1,349,000	24.1	58.0
Home-Based Shopping . . . . .	486,000	15.4	1,000,000	17.8	105.8
Home-Based School . . . . .	129,000	4.1	129,000	2.3	0.0
Home-Based Other <sup>c</sup> . . . . .	1,076,000	34.1	2,101,000	37.5	95.3
Non-Home-Based. . . . .	614,000	19.4	1,027,000	18.3	67.3
<b>Total</b>	<b>3,159,000</b>	<b>100.0</b>	<b>5,606,000</b>	<b>100.0</b>	<b>77.5</b>

<sup>a</sup> Comprised of auto drivers and auto passengers.

<sup>b</sup> All 1963 origin and destination home interview survey data were increased by 17 percent to meet observed traffic volumes crossing selected screen lines.

<sup>c</sup> Home-based other trips include personal business, medical, dental, social, and recreation trip purposes.

Source: SEWRPC.

**Table 18**  
**TOTAL VEHICLE TRIP GENERATION IN THE REGION BY CLASSIFICATION OF TRIP:**  
**1963 AND 1990 RECOMMENDED TRANSPORTATION PLAN**

Trip Classification	Survey (1963) <sup>a</sup>		Total 1990		Percent Change 1963-1990
	Number	Percent of Total	Number	Percent of Total	
Internal Automobile. . . . .	2,166,000	84.3	3,938,000	84.5	81.8
External Automobile <sup>b</sup> . . . . .	86,000	3.4	226,000	4.8	162.8
Internal Truck <sup>c</sup> . . . . .	300,000	11.7	465,000	10.0	55.0
External Truck <sup>b</sup> . . . . .	16,000	0.6	32,000	0.7	100.0
<b>Total</b>	<b>2,568,000</b>	<b>100.0</b>	<b>4,661,000</b>	<b>100.0</b>	<b>81.5</b>

<sup>a</sup> All 1963 origin and destination home interview survey data were increased by 17 percent to meet observed traffic volumes crossing selected screen lines.

<sup>b</sup> Through trips counted once.

<sup>c</sup> Includes taxis.

Source: SEWRPC.

trips, while the largest percentage increases in trip production are anticipated to occur in external automobile and external truck trips. The proportion of trips by vehicle class would not, however, change significantly from 1963 to 1990 under the recommended plan.

Pattern of Future Vehicle Trips

The increased vehicular travel demand generated by the recommended land use plan would continue to be centered in and around the three largest urbanizing areas in the Region—Milwaukee, Racine, and Kenosha. The future regional traffic pattern would remain predominantly radial, centering on

the City of Milwaukee, with the heaviest movements occurring to the west and south (see Map 5). The highest future travel desire line densities are anticipated to occur in Milwaukee County and in eastern Waukesha, Racine, and Kenosha counties. This is in contrast to conditions in 1963 where travel desire line densities of similar magnitude were confined to the central area of Milwaukee County (see Map 6).

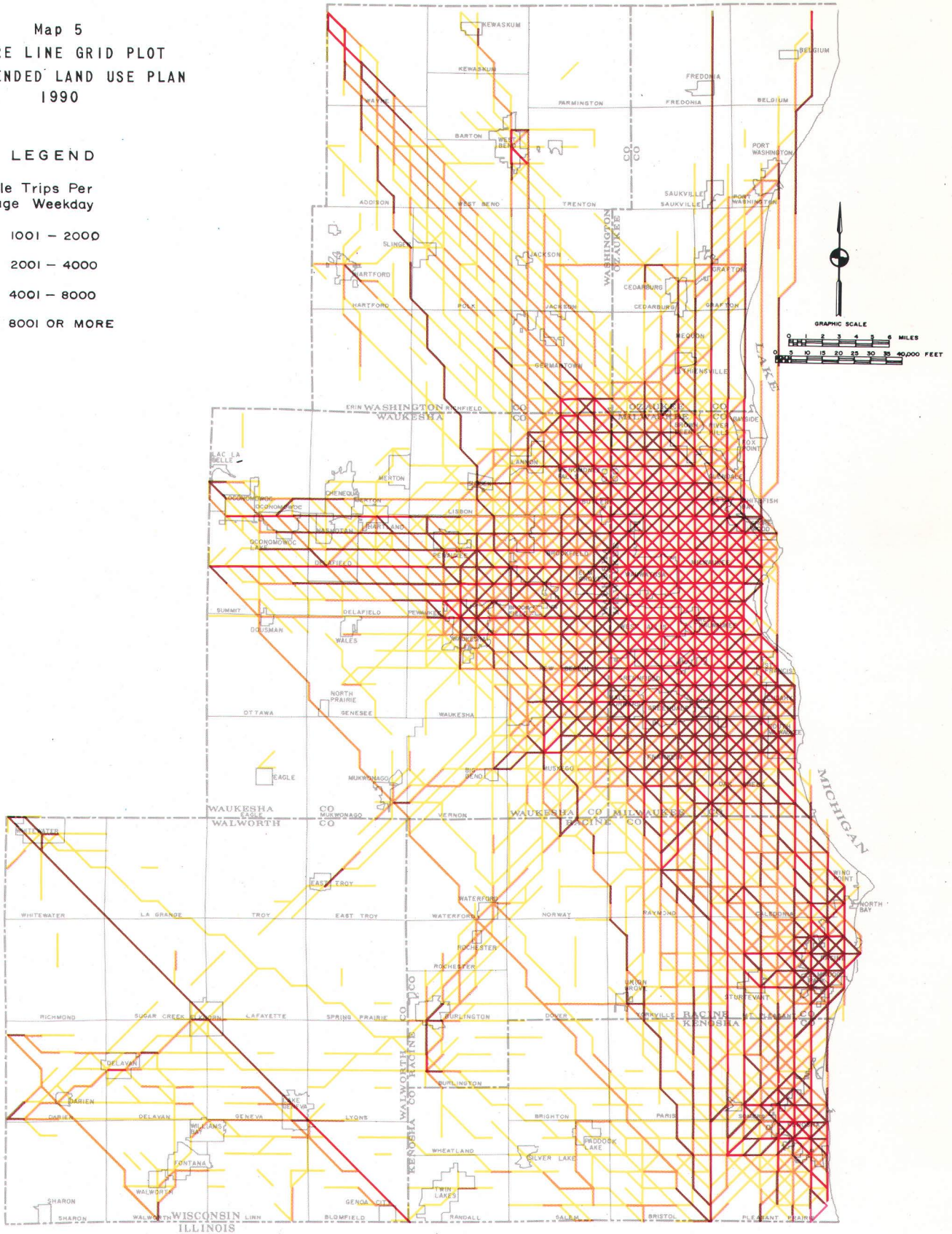
Under the recommended land use plan, the largest growth in vehicular travel is anticipated to occur in the outlying areas surrounding the existing urban complexes within the Region (see Map 7).

Map 5  
 DESIRE LINE GRID PLOT  
 RECOMMENDED LAND USE PLAN  
 1990

LEGEND

Vehicle Trips Per  
 Average Weekday

- 1001 - 2000
- 2001 - 4000
- 4001 - 8000
- 8001 OR MORE



The future regional traffic pattern is anticipated to remain predominantly radial under the recommended land use plan, centering on the City of Milwaukee with the heaviest movements occurring to the west and south. The highest future traffic desire line densities are anticipated to occur in Milwaukee County and eastern Racine, Kenosha, and Waukesha counties.

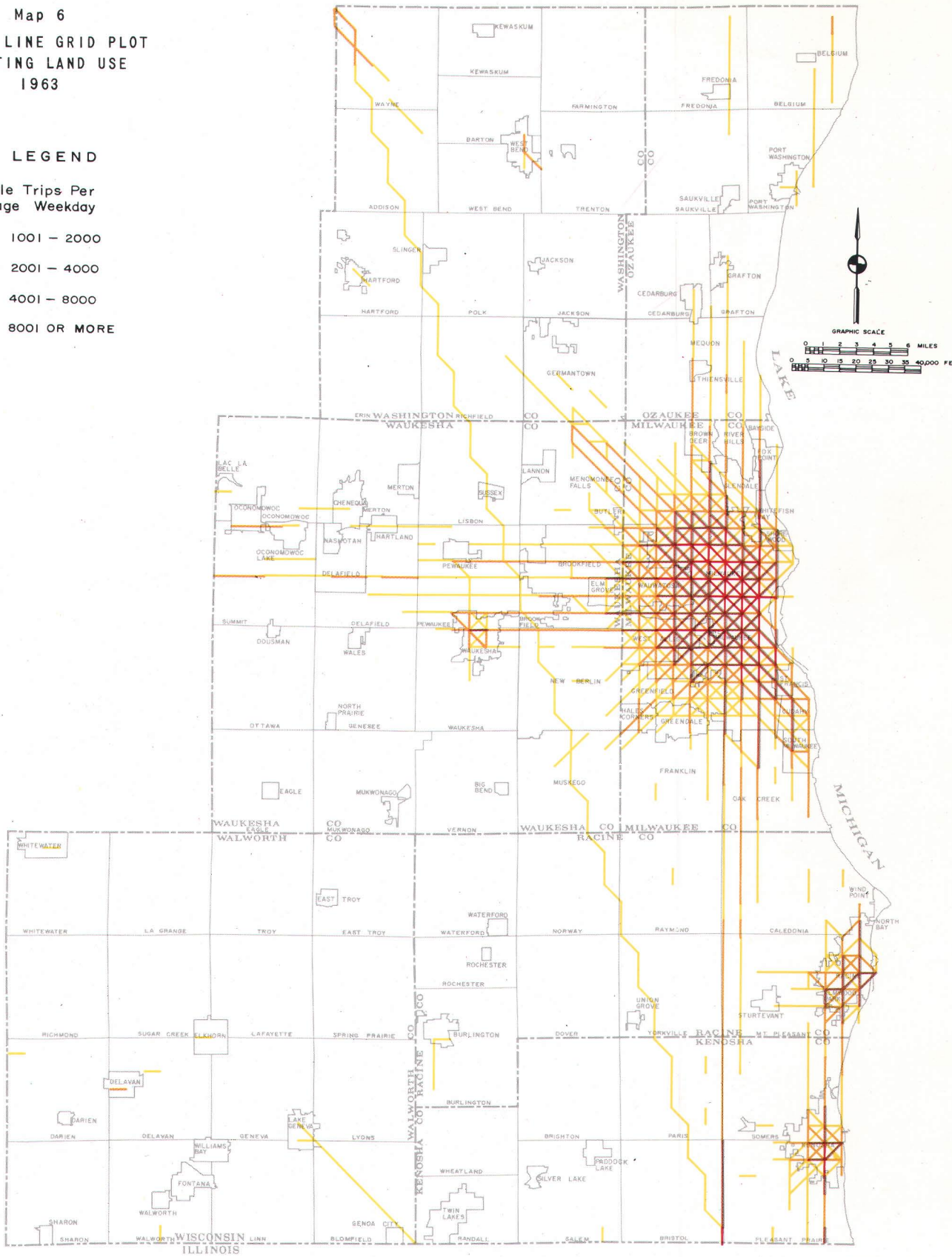


Map 6  
 DESIRE LINE GRID PLOT  
 EXISTING LAND USE  
 1963

LEGEND

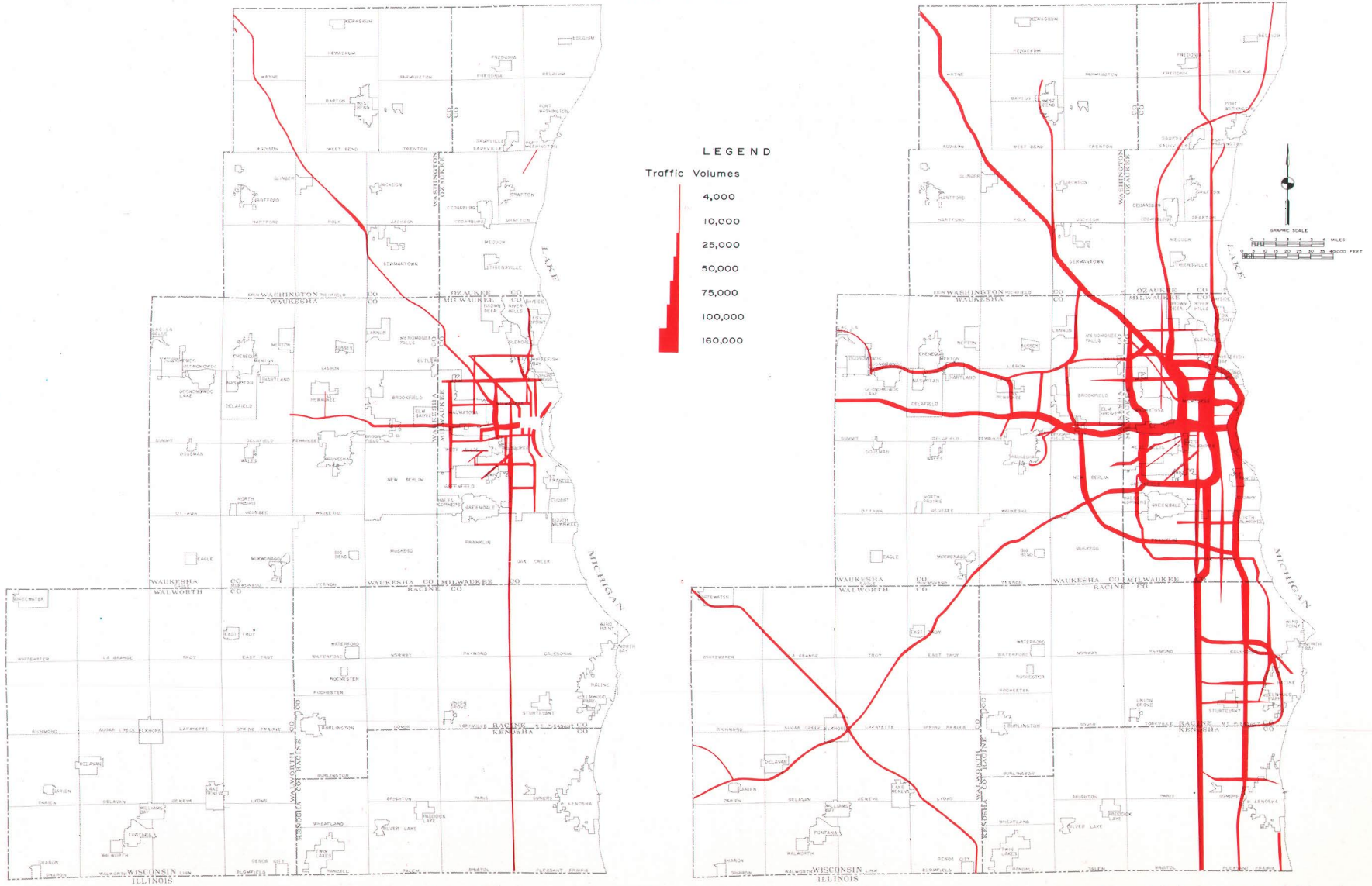
Vehicle Trips Per  
 Average Weekday

- 1001 - 2000
- 2001 - 4000
- 4001 - 8000
- 8001 OR MORE



The importance of the radial movements centered on the major urban areas within the Region is evident in this desire line grid plot. The scale of such movement around the Milwaukee urbanizing area stands in clear contrast to that of the other urbanizing areas in the Region. Several of the significant through movements from Illinois to points north and west of the Region are clearly discernible but are shown to be of only light-to-moderate volume.

Map 7  
 REGIONAL TRAFFIC FLOW MAP  
 AVERAGE WEEKDAY TRAFFIC VOLUMES  
 1963 AND 1990



A comparison of the 1963 and 1990 traffic flow maps indicates that a substantial increase in street and highway traffic is expected to occur by 1990. The rapidly urbanizing areas in Milwaukee and Waukesha counties show the most significant increases between 1963 and 1990, but eastern Racine, Kenosha, and Ozaukee counties will also experience large increases in traffic.

The rapidly urbanizing areas in southern Milwaukee County and eastern Waukesha County would experience the largest travel increase over 1963. Racine and Kenosha counties would also show large increases in travel, predominantly in the eastern portion of these counties.

Certain major traffic corridors within the Region would experience heavy increases in travel demand. In both the north-south and east-west corridors approximating the alignment of IH 94, the future travel demand is anticipated to increase greatly under the recommended land use pattern. Large increases in travel desire would also occur in the northwest corridor radiating from the City of Milwaukee along USH 41 and along the Lake Michigan shore both north and south of Milwaukee. In the central area of Milwaukee County, a heavy increase in east-west travel desire would occur (see Map 7). North-south travel desires in eastern Waukesha and southern Milwaukee County are also anticipated to increase.

#### PLAN DESCRIPTION—HIGHWAY FACILITIES

Based on analyses of future traffic assignments to the existing plus committed highway network, a proposed arterial street and highway system was developed to serve the proposed land use pattern by carrying the anticipated future travel demands generated by that pattern at the level of service specified in the transportation system development objectives and standards. The proposed system alleviates the capacity deficiencies inherent in the existing plus committed highway network under the proposed 1990 land use development conditions within the Region. Although scale and space limitations make it necessary to confine the specific plan description in this report to the recommended freeway and expressway facilities, it should be stressed that the regional transportation system plan contains preliminary recommendations for arterial street and highway improvements, as well as final recommendations for freeway and expressway improvements. Final recommendations for arterial street and highway improvements require careful consideration of jurisdictional as well as functional relationships and, therefore, will be developed in close cooperation with the state and local units of government concerned.

Data on the total mileage of recommended new and improved arterial highway facilities of all types, together with pertinent construction and maintenance cost data, are presented in this report and accurately reflect aggregate costs and mile-

age by county. Specific descriptions of recommended standard arterial street and highway facility improvements are shown only on network maps on file in the Commission Offices and, as already noted, are considered to be preliminary recommendations. These network maps constitute the complete functional highway system plan being recommended for adoption and implementation.

With respect to freeways, the plan recommends the following improvements:

1. Extension of the Lake Freeway from the proposed high level bridge across the entrance of the Milwaukee Harbor southerly through Milwaukee, Racine, and Kenosha counties to the state line, connecting there with a freeway proposed by the State of Illinois.
2. Extension of the Stadium Freeway northerly to the regional boundary in the vicinity of STH 57 in Ozaukee County.
3. Extension of the North-South Freeway northerly from the Grafton Interchange to the regional boundary in the vicinity of STH 141 in Ozaukee County.
4. Construction of a new east-west freeway, to be called the Bay Freeway, proposed in the vicinity of Hampton Avenue in northern Milwaukee and Waukesha counties, extending from the North-South Freeway (USH 141) westerly to the vicinity of the City of Oconomowoc, bypassing the City of Oconomowoc to the north, and connecting to USH 16 at the regional boundary.
5. Construction of a River Parkway along the Milwaukee River Valley from the Juneau Interchange, located at the intersection of the Park and Lake freeways, northerly to the vicinity of Hampton Avenue and the North-South Freeway, connecting there to the proposed Bay Freeway.
6. Construction of a Belt Freeway extending from the southerly extension of the Lake Freeway in southeastern Milwaukee County westerly through southern Milwaukee County and northerly through eastern Waukesha County to the Fond du Lac Freeway (USH 41) in Washington County.
7. Construction of a new freeway paralleling USH 45 from the Fond du Lac Freeway (USH 41) northerly to the vicinity of the

City of West Bend, bypassing the City of West Bend to the west, and connecting to USH 45 north of the City.

8. The completion of the Rock Freeway (STH 15) southwesterly across Walworth County to the regional boundaries, with a spur branching in the vicinity of the City of Delavan toward the City of Janesville in Rock County.
9. The completion of USH 12 northwesterly across Walworth County as a freeway.
10. Construction of a Loop Freeway in the Racine area from the vicinity of CTH K and the North-South Freeway (IH 94) easterly into the City of Racine, thence southerly in the vicinity of the abandoned Chicago North Shore and Milwaukee Electric Railroad right-of-way to the vicinity of STH 11, thence westerly to the Lake Freeway. The proposed facility would continue westerly from the Lake Freeway as a standard arterial in the form of an improved and relocated STH 11.

The recommended number of lanes for each of the above listed freeways is indicated on Map 8, together with the general system configuration. It should be stressed that the facilities shown on Map 8 represent corridors one-quarter to two miles in width, within which a centerline for a 300-foot wide right-of-way for a freeway facility will have to be located. The total mileage of new and reconstructed highway facilities proposed by the recommended plan for the Region is indicated in Table 19 by functional type. Table 20 lists by county the arterial network mileage existing within the Region in 1963 and the proposed mileage by 1990.

#### Traffic Assignment

The assignment of future traffic demand to the proposed highway network indicates that the network would be generally adequate to serve the 1990 traffic demand generated by the recommended land use plan. Future traffic loads on the East-West Freeway from the Zoo Interchange to the Central Interchange are anticipated to exceed the design capacity of this facility, with the most severe congestion anticipated to occur just west of the Stadium Interchange. The highest volume-to-capacity ratio anticipated on this facility in 1990 would be 1.2. Future traffic loads are also anticipated to exceed

the design capacity of the North-South Freeway from the Hillside Interchange south to W. National Avenue, a distance of about 2.4 miles. The highest volume-to-capacity ratio anticipated on this facility is 1.3.

A summary of the 1990 volume-to-capacity relationships for the major arterial street and highway facilities within the Region for 1963 and 1990 is provided in Table 21. For the Region as a whole, only 0.9 percent of the total arterial street and highway system mileage would be expected to operate over design capacity by 1990 if the proposed land use plan is implemented and the proposed highway improvements constructed. This is in contrast to 6.0 percent in 1963.<sup>1</sup> Over 40 percent of the total vehicle miles of travel on an average weekday within the Region would be carried on freeway facilities.

#### Alternatives

During the alternative plan review and evaluation process, the technical staffs of the Milwaukee County Expressway Commission, Milwaukee County Park Commission, City of Milwaukee, Racine County Highway Committee, City of Racine, and State Highway Commission of Wisconsin requested consideration of certain additional highway system alternatives for the Controlled Existing Trend Land Use Plan. Each of the alternatives suggested were included in alternative arterial highway networks, and traffic assignments were made and analyzed. The most important of these alternatives are described below, together with the conclusions reached as a result of the traffic analyses made.

The transportation plan originally developed to serve the Controlled Existing Trend Land Use Plan, as described in Volume 2 of this report, recommended the construction of a freeway from the intersection of the Lake and Park freeways at

<sup>1</sup> It should be noted that nearly 17 percent of the total arterial street and highway mileage within the Region in 1963 was operating at or over design capacity, as reported in Volume 1 of this report. In arriving at this determination, facilities with a volume-to-capacity ratio of 0.8 to 1.1 were considered to be operating at design capacity. In the subsequent formulation of the regional transportation system development objectives and standards, a volume-to-capacity ratio of 0.91 to 1.10 was selected to represent facility operation at design capacity. The lower limits of the volume-to-capacity ratio selected to represent operation at or over design capacity was raised to achieve consistency with the revised Highway Capacity Manual published by the Highway Research Board subsequent to the inventory phase of the regional land use-transportation study. The new volume-to-capacity ratio range selected coincides with level of service categories D, E, and F specified in the referenced manual.

Table 19  
MILES AND CONSTRUCTION COSTS OF PROPOSED NEW AND IMPROVED  
ARTERIAL STREET AND HIGHWAY FACILITIES IN THE REGION;<sup>a</sup>  
1990 RECOMMENDED TRANSPORTATION PLAN  
(Costs in Millions of 1966 Dollars)

Functional Facility Type	New Facilities <sup>b</sup>		Improved Facilities		Total	
	Miles	Construction Cost	Miles	Construction Cost	Miles	Construction Cost
<b>Standard Arterial:</b>						
2-lane . . . . .	126.6	\$ 27.128	273.5	\$ 50.515	400.1	\$ 77.643
4-lane . . . . .	61.6	30.603	489.7	263.645	551.3	294.248
6-lane . . . . .	4.0	4.094	165.7	164.391	169.7	168.485
Subtotal	192.2	61.825	928.9	478.551	1,121.1	540.376
<b>Expressway:</b>						
4-lane . . . . .	7.3	5.763	7.6	3.725	14.9	9.488
6-lane . . . . .	1.0	1.830	--	--	1.0	1.830
Subtotal	8.3	7.593	7.6	3.725	15.9	11.318
<b>Freeway:</b>						
4-lane . . . . .	197.6	162.749	24.9	16.932	222.5	179.681
6-lane . . . . .	86.5	270.948	41.9	29.503	128.4	300.451
8-lane . . . . .	6.9	34.619	--	--	6.9	34.619
Subtotal	291.0	468.316	66.8	46.435	357.8	514.751
<b>Total</b>	<b>491.5</b>	<b>\$537.734</b>	<b>1,003.3</b>	<b>\$528.711</b>	<b>1,494.8</b>	<b>\$1,066.445</b>

<sup>a</sup> Miles and costs of facilities proposed for each county are presented in Appendix A.

<sup>b</sup> Includes committed facilities which had not been programmed through calendar year 1966.

Source: SEWRPC.

Table 20  
DISTRIBUTION OF ARTERIAL NETWORK MILEAGE IN THE REGION BY  
TYPE OF FACILITY AND COUNTY: 1963 AND 1990 RECOMMENDED TRANSPORTATION PLAN

County	1963 Mileage by Type of Facility				1990 Mileage by Type of Facility				Percent Change 1963 - 1990
	Freeway and Expressway	Ramp	Other Arterials	Total	Freeway and Expressway	Ramp	Other Arterials	Total	
Kenosha . . .	12.4	8.5	260.6	281.5	24.4	11.3	309.7	345.4	22.6
Milwaukee . .	18.6	17.3	755.6	791.5	128.1	58.8	820.0	1,006.9	27.2
Ozaukee . . .	2.5	1.7	260.7	264.9	54.3	74.3	270.7	329.3	24.3
Racine . . . .	11.6	6.9	332.8	351.3	38.1	9.7	412.8	460.6	31.1
Walworth . . .	--	--	399.7	399.7	73.4	7.0	410.7	491.1	22.8
Washington . .	28.3	3.7	370.3	402.3	41.6	6.5	375.6	423.7	5.3
Waukesha . . .	13.8	11.9	671.3	697.0	109.5	29.6	757.6	896.7	28.6
<b>Regional Total</b>	<b>87.2</b>	<b>50.0</b>	<b>3,051.0</b>	<b>3,188.2</b>	<b>469.4</b>	<b>127.2</b>	<b>3,357.1</b>	<b>3,953.7</b>	<b>24.0</b>





Source: SEWRPC.

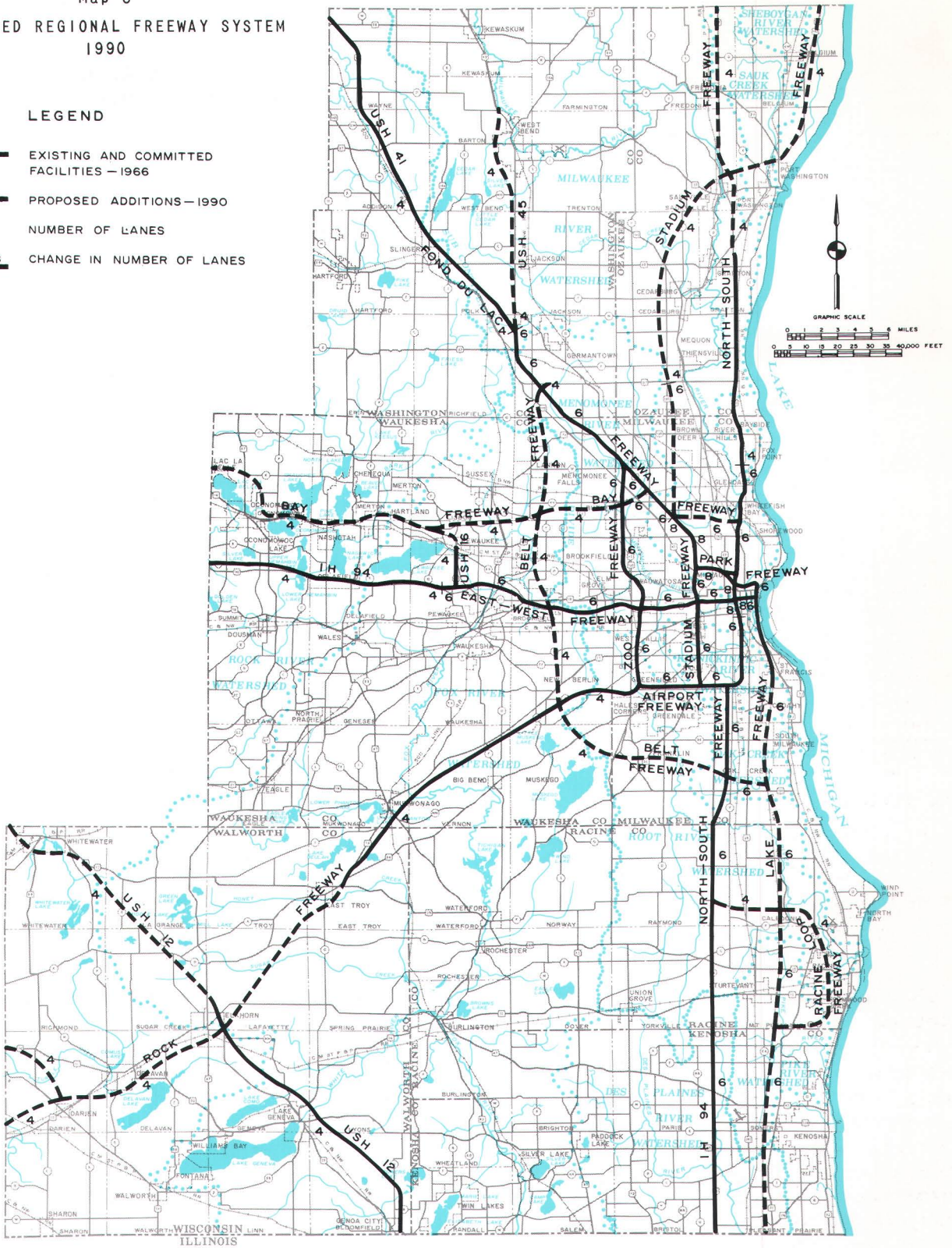
the Juneau Interchange northerly along the Milwaukee River Valley to the vicinity of Hampton Avenue and the North-South Freeway. Traffic analyses indicated that the inclusion of this freeway in the areawide highway system would provide the best possible level of highway transportation service, not only to the Region as a whole, but to

the local areas traversed by the proposed Milwaukee River Freeway. Inclusion of the proposed freeway in the regional highway network provided desirable relief for anticipated heavy overloadings on the North-South Freeway and served to reduce the anticipated future traffic volumes on this facility to levels below the design capacity of

Map 8  
 PROPOSED REGIONAL FREEWAY SYSTEM  
 1990

LEGEND

-  EXISTING AND COMMITTED FACILITIES - 1966
-  PROPOSED ADDITIONS - 1990
-  NUMBER OF LANES
-  CHANGE IN NUMBER OF LANES



When assignments of future traffic demand were made to the existing and committed arterial street and highway network in the Region, it was indicated that severe and areawide traffic congestion would occur if no further capital were invested in transportation facilities. The recommended transportation plan proposes a total of 291 miles of new freeways within the Region, as shown on this map. In addition, the plan proposes 192 miles of new arterial streets and highways and the improvement of over 1,000 miles of existing arterial streets and highways. These new and improved facilities will provide the Region with a more efficient and safer highway transportation system.

Table 21

VOLUME-TO-CAPACITY RATIOS<sup>a</sup> FOR THE ARTERIAL STREET AND HIGHWAY NETWORK  
IN THE REGION BY COUNTY: 1963 AND 1990 RECOMMENDED TRANSPORTATION PLAN

County	Mileage	Survey (1963)					
		V/C Range 0.00 to 0.90		V/C Range 0.91 to 1.10		V/C Range above 1.10	
		Mileage	Percent of County Total	Mileage	Percent of County Total	Mileage	Percent of County Total
Kenosha . . . . .	281.5	260.8	92.6	7.2	2.6	13.5	4.8
Milwaukee . . . . .	791.5	589.8	74.5	85.4	10.8	116.3	14.7
Ozaukee . . . . .	264.9	250.3	94.5	6.3	2.4	8.3	3.1
Racine . . . . .	351.3	327.7	93.3	10.0	2.8	13.6	3.9
Walworth . . . . .	399.7	390.5	97.7	3.9	1.0	5.3	1.3
Washington . . . . .	402.3	401.8	99.9	0.5	0.1	0.0	0.0
Waukesha . . . . .	697.0	635.6	91.2	26.6	3.8	34.8	5.0
Regional Total	3,188.2	2,856.5	89.6	139.9	4.4	191.8	6.0
Recommended Plan - 1990							
Kenosha . . . . .	345.4	321.9	93.2	21.5	6.2	2.0	0.6
Milwaukee . . . . .	1,006.9	940.6	93.4	53.9	5.4	12.4	1.2
Ozaukee . . . . .	329.3	319.7	97.1	9.1	2.8	0.5	0.1
Racine . . . . .	460.6	426.9	92.7	29.7	6.4	4.0	0.9
Walworth . . . . .	491.1	480.2	97.8	10.8	2.2	0.1	0.0
Washington . . . . .	423.7	410.3	96.8	12.4	2.9	1.0	0.3
Waukesha . . . . .	896.7	827.4	92.3	52.3	5.8	17.0	1.9
Regional Total	3,953.7	3,727.0	94.3	189.7	4.8	37.0	0.9

<sup>a</sup> The significance of the volume-to-capacity ratio ranges used is:

0.00 - 0.90; Under design capacity, fully adequate and safest operational level.

0.91 - 1.10; At design capacity but still adequate.

Above 1.10; Over design capacity, congested at times.

Source: SEWRPC.

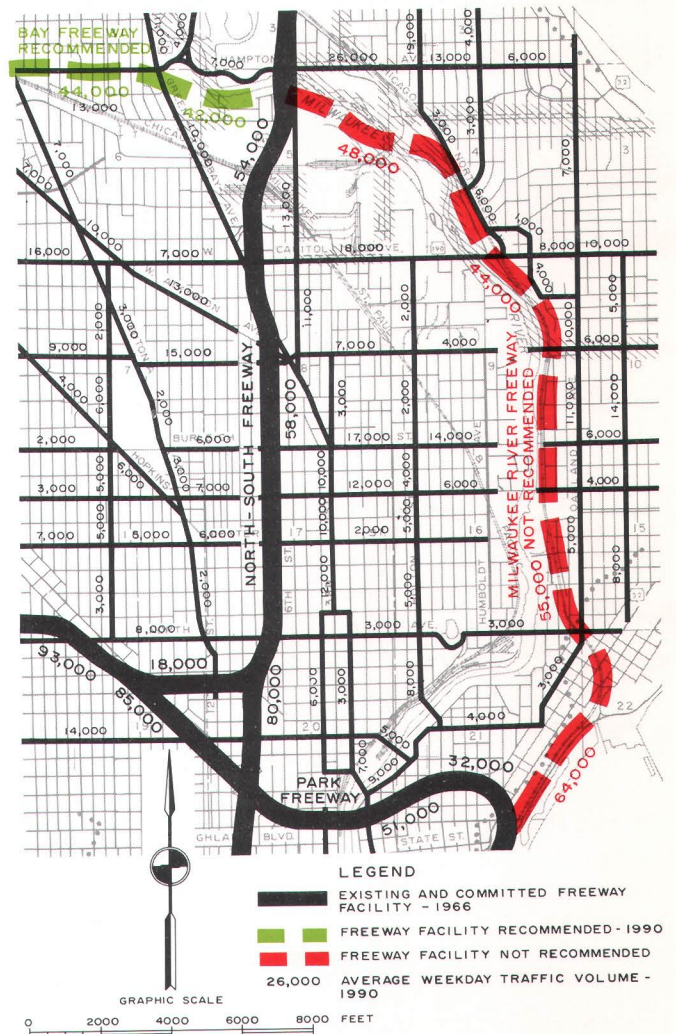
85,000 vehicles per day. With the inclusion of the Milwaukee River Freeway in the major highway system, future traffic volumes on the North-South Freeway were anticipated to range from approximately 80,000 vehicles per day just north of the Park Freeway to approximately 53,000 vehicles per day just south of W. Hampton Avenue. Future traffic volumes on the proposed Milwaukee River Freeway were anticipated to range from approximately 55,000 vehicles per day just north of E. North Avenue to approximately 48,000 vehicles per day just south of W. Hampton Avenue. The facility was expected to carry approximately 25,000 through trips, with the remainder of the freeway traffic volume serving the area traversed. With the exception of four short segments, all local streets in the area bounded by Hampton Avenue on

the north, the Lake Michigan shore on the east, North Avenue on the south, and the North-South Freeway on the west could be expected to carry anticipated future traffic volumes well under the design capacities of the streets (see Map 9). It was thus concluded from the original traffic assignments and analyses that inclusion of a Milwaukee River Freeway in the proposed regional transportation system plan would eliminate traffic congestion both on the affected segments of the future freeway network and on the local street system in the area traversed. This efficiency in transportation service, however, could only be achieved at a heavy cost of disruption to existing urban development and penetration of a primary environmental corridor—the Milwaukee River Valley—by a major highway facility.

During public review and evaluation of the alternative land use-transportation plans, however, objections to the construction of a freeway in a corridor along the Milwaukee River Valley were made by the Milwaukee County Park Commission, the City of Milwaukee, and certain civic groups; and the Commission was asked to explore the alternatives of: 1) providing no high service level facility of any kind in the Milwaukee River corridor; and 2) providing a parkway instead of a freeway in this corridor. Accordingly, traffic assignments were made to revised transportation system networks reflecting these alternatives.

These traffic assignments and their analyses indicated that complete elimination of a high service type facility in the Milwaukee River corridor would result in overloading of the North-South Freeway from the Park Freeway to Keefe Avenue, a distance of about 2.5 miles. Traffic volumes on this segment of freeway could be expected to range from a high of about 105,000 vehicles per day by 1990 just north of the Park Freeway to about 90,000 vehicles per day just south of Keefe Avenue. The level of service as measured by the volume-to-capacity ratio would be reduced from 0.9 to 1.2; that is, from a condition approximating stable flow at 50 miles per hour to a condition approaching unstable flow at 40 miles per hour. An overall reduction in freeway travel of about 100,000 vehicle miles per average weekday could be expected. Moreover, future traffic volumes on certain local streets would be increased sharply; and over 16 percent of the total of 38 miles of local streets in the area served could be anticipated to be operating over capacity by 1990 (see Map 10). Utilization of parallel street capacity and additional improvements in local street systems could, however, reduce this to about 4 percent of the total, including Oakland Avenue from Locust Street to North Avenue, the Locust Street Viaduct, and Capitol Drive from Holton Street to Third Street. An additional 30,000 vehicle trips per day would have to be made entirely on local streets, and the total vehicle miles of travel on the local street system in the area served could be anticipated to increase by over 80,000 vehicle miles per day. This analysis indicated that complete elimination of a high service type facility in the Milwaukee River corridor would result in a less satisfactory freeway system, in more congestion on the local street systems in the area traversed, in a larger area throughout which parking on local streets would have to be restricted during peak hours, and in higher accident rates and travel costs.

Map 9  
MILWAUKEE RIVER CORRIDOR  
FREEWAY ALTERNATIVE  
AVERAGE WEEKDAY TRAFFIC VOLUMES  
1990

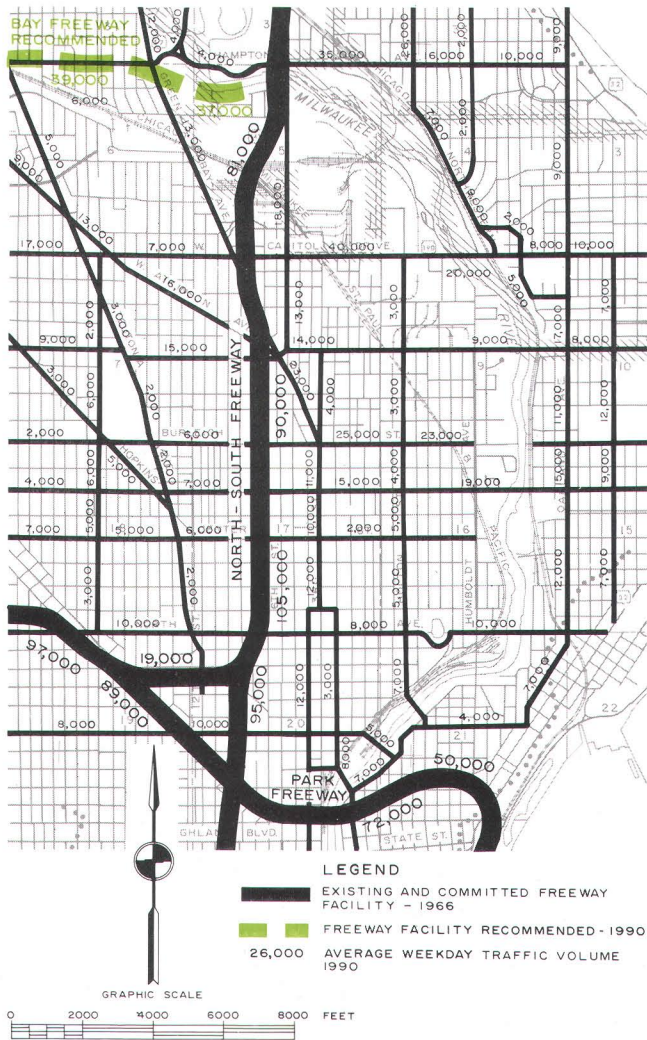


Although the provision of a freeway facility in the Milwaukee River traffic corridor would serve to greatly abate traffic congestion, the attendant disruption to existing urban development, the penetration of a desirable primary environmental corridor by a major highway facility, and the objections of many governmental and civic groups to a freeway in this area indicate that an alternative solution is required.

The second alternative considered the provision of a parkway instead of a freeway along the Milwaukee River Valley. This parkway is envisioned as a 4-lane divided facility constructed in a ribbon-like park development on a 130-foot right-of-way, carefully fitted to the topography and to the landscape along the Milwaukee River Valley. Such



Map 10  
 MILWAUKEE RIVER CORRIDOR  
 NO HIGH SERVICE TYPE FACILITY ALTERNATIVE  
 AVERAGE WEEKDAY TRAFFIC VOLUMES  
 1990



The elimination of a high service type transportation facility of any kind in the Milwaukee River traffic corridor would result in severe traffic congestion on the local street system in the area. As a result of eliminating such a facility, more than 16 percent of the 38 miles of local streets in the area would be operating over their design capacity in 1990; and total vehicle miles of travel on the local street system would be increased by over 80,000 such miles per day.

a parkway would provide operating speeds of 35 mph at a design capacity of 42,000 vehicles per day, as compared to operating speeds of 50 mph at a design capacity of 85,000 vehicles per day for a freeway in this corridor. Assignment of future traffic demand to this alternative indicated that the

parkway could be anticipated to carry about 35,000 vehicles per day by 1990 and would serve to reduce the anticipated overload on the North-South Freeway by about 15,000 vehicles per day, to about 90,000 vehicles per day just north of the Park Freeway and 78,000 vehicles per day just south of Keefe Avenue. Congestion on the local street systems in the area traversed would generally be reduced to an acceptable level (see Map 11). The provision of a parkway would strike a balance between the reduction of freeway and local street system traffic congestion and the disruptive effects of freeway construction on the Milwaukee River Valley, greatly reducing the impact of a heavy traffic carrier on an important environmental corridor and potential recreational asset. It was, therefore, decided to recommend the substitution of a parkway for the freeway originally proposed in the corridor. Such a parkway would not, consistent with historic practice in Milwaukee County, be allowed to carry any commercial traffic in the form of trucks. A departure from this historic policy would, however, be required from the standpoint of permitting buses to use the proposed parkway during weekdays in order to accommodate the modified rapid transit recommendations included in the regional transportation plans and provide a high level of fast transit service to the University of Wisconsin-Milwaukee campus.

The provision of a freeway connection between the Stadium Freeway and Fond du Lac Freeway was clearly indicated in order to provide system continuity. Alternative alignments for this connection were considered, as shown on Map 12. Analyses of traffic assignments made to the various alignments, particularly with respect to the turning movements anticipated at the major freeway-to-freeway interchanges, indicated that an alignment approximately paralleling N. 46th Street and Fond du Lac Avenue, as indicated on Map 12, was the best alternative. Traffic assignments to this freeway connection indicated that an alignment could be expected to carry about 108,000 vehicles per day by 1990, well above the threshold service warrants for consideration of a freeway in this location. This connection was, therefore, recommended for inclusion in the final transportation plan.

The City and County of Racine requested consideration of the provision of a Loop Freeway to better serve the Racine area, replacing service originally proposed to be provided entirely by improved standard arterial street and highway

Map 11  
 MILWAUKEE RIVER CORRIDOR  
 PARKWAY ALTERNATIVE  
 AVERAGE WEEKDAY TRAFFIC VOLUMES  
 1990



The provision of a 4-lane divided parkway facility on a 130-foot wide right-of-way in a ribbonlike area of park development along the Milwaukee River Valley, as recommended herein, would provide acceptable relief to the anticipated overloading of the North-South Freeway, serve to greatly reduce traffic congestion on local streets in the area, and greatly reduce the impact of a heavy traffic carrier on such an important environmental corridor as the Milwaukee River Valley.

facilities between the City of Racine proper and IH 94. Future traffic assignments to the proposed Loop Freeway indicated that the anticipated traffic volumes would exceed threshold service warrants and that the facility would significantly reduce congestion on the standard arterials in the area

served. Moreover, the Loop Freeway could be combined with or replace proposed improvements of CTH K and STH 11, (see Map 13). A partial right-of-way for the proposed freeway was available in the form of an abandoned railroad right-of-way. This addition was, therefore, recommended for inclusion in the final transportation plan.

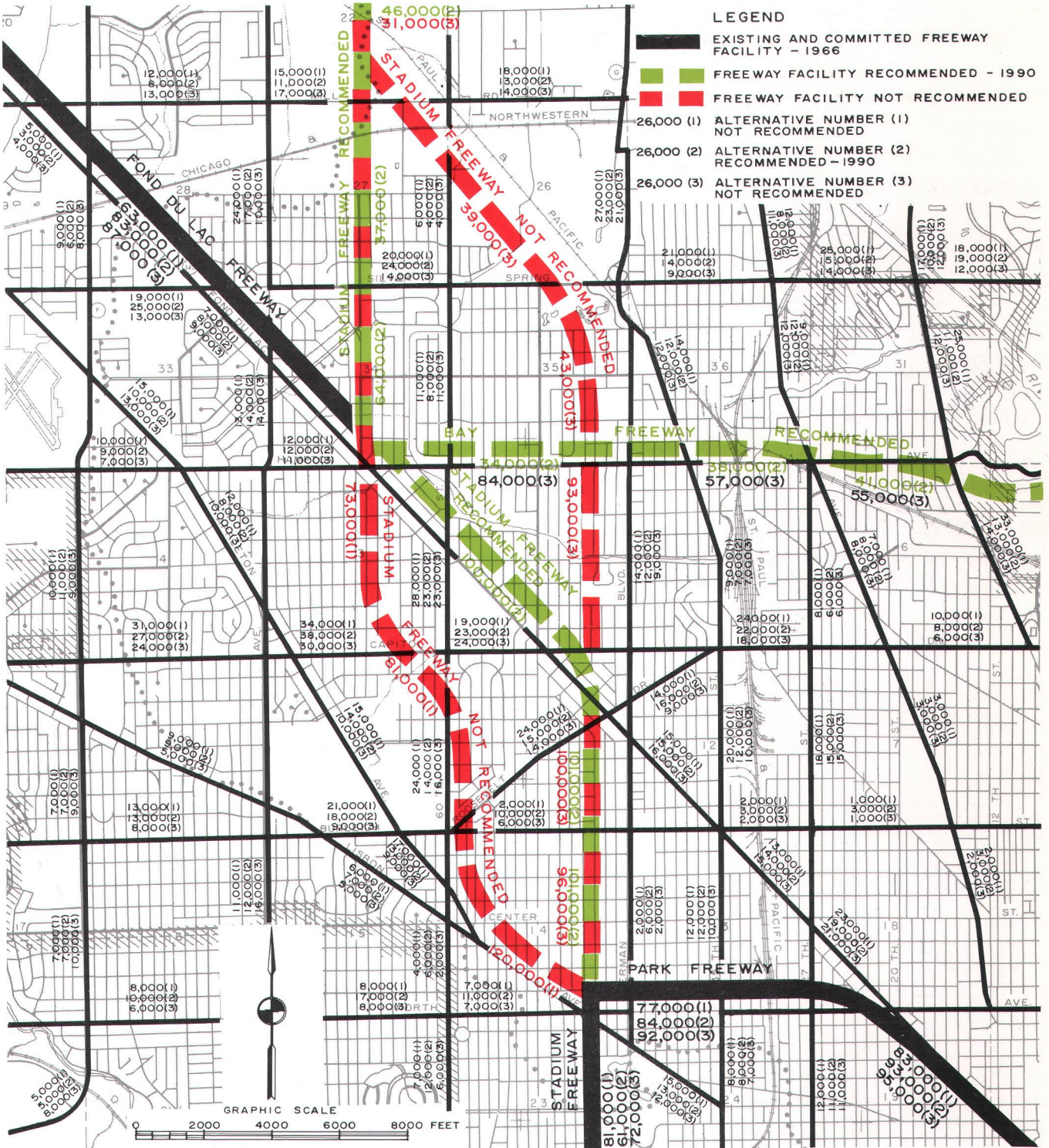
The State Highway Commission of Wisconsin requested that the northerly extension of the Stadium Freeway, originally proposed to terminate in the vicinity of the City of Port Washington, be extended northerly and generally parallel to STH 57 to the regional boundary in order to provide a connection with a proposed freeway in the Milwaukee to Green Bay corridor (see Map 14). The State Highway Commission also requested that a connection be provided through Walworth County from the Rock Freeway to the Janesville area (see Map 15). Even though traffic assignments to these facilities did not meet minimum threshold warrants for provision of a freeway in either of these locations, both of these additions were recommended for inclusion in the final transportation plan in order to assure necessary statewide system continuity.

Two related alternatives were considered as possible means for providing additional relief for the anticipated overloading on the East-West Freeway (IH 94). These alternatives included the possible westerly extension of the Park Freeway through Milwaukee and Waukesha counties in the vicinity of North Avenue from the Stadium Freeway to the vicinity of the Village of Pewaukee (see Map 16) and the provision of a new east-west freeway in the vicinity of Greenfield-National Avenues from the North-South Freeway to the proposed Belt Freeway (see Map 17).

Traffic assignments to the Park Freeway extension indicated that, while such a freeway could be expected to carry in excess of 40,000 vehicles per day by 1990, the provision of the facility would not reduce the anticipated overloading on the East-West Freeway below the design capacity of that facility. Moreover, the disruptive effects on existing urban development of such a freeway, located through one of the most intensively developed and high-value urban areas of the Region, would make construction extremely difficult and expensive. Assignments of future traffic demand to the Greenfield-National Avenue freeway indicated that, while such a freeway could be expected to carry in excess of 30,000 vehicles per day by 1990, the

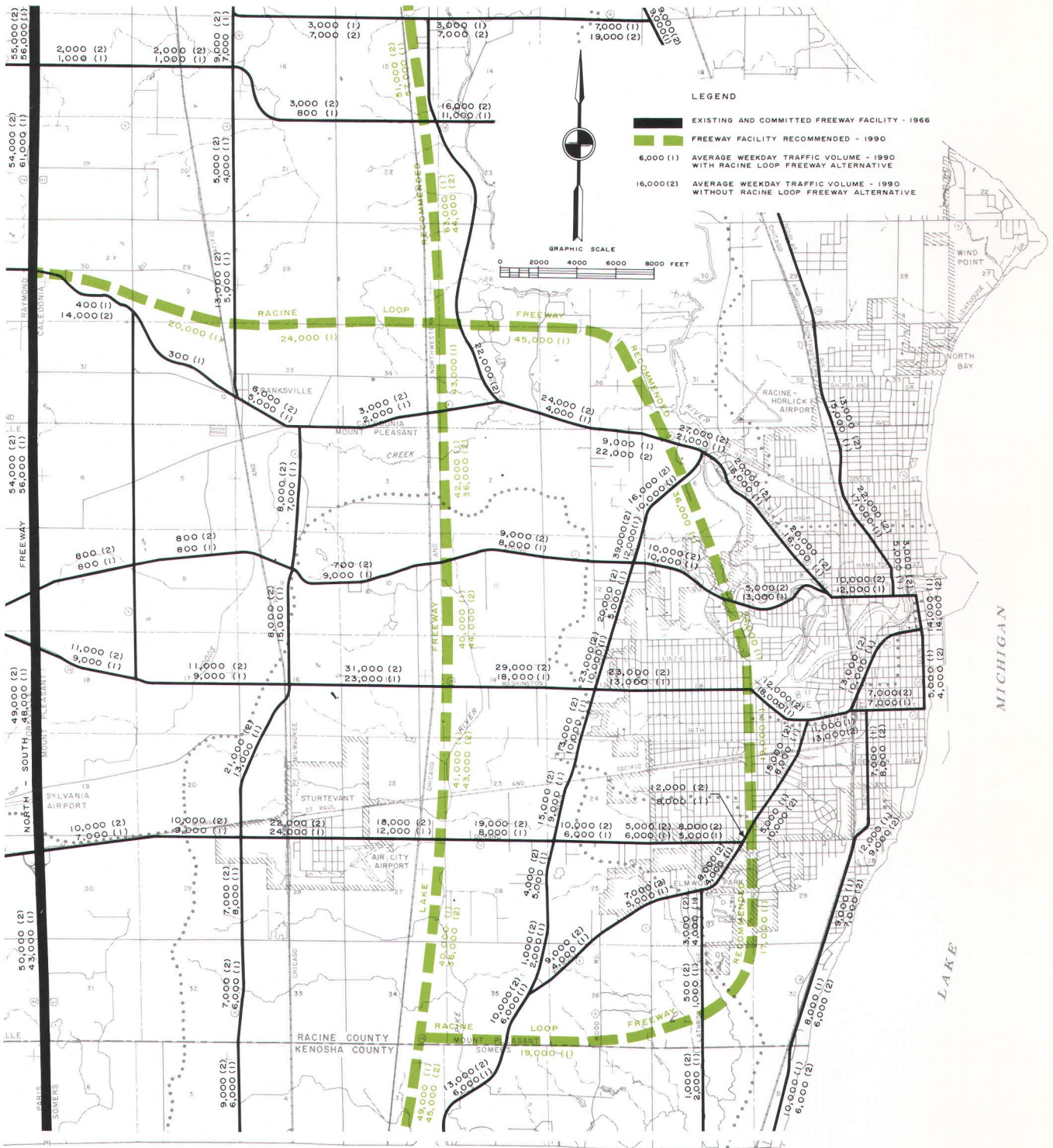
Map 12

ALTERNATIVE ALIGNMENTS FOR THE STADIUM  
FOND DU LAC FREEWAY CONNECTION  
AVERAGE WEEKDAY TRAFFIC VOLUMES  
1990



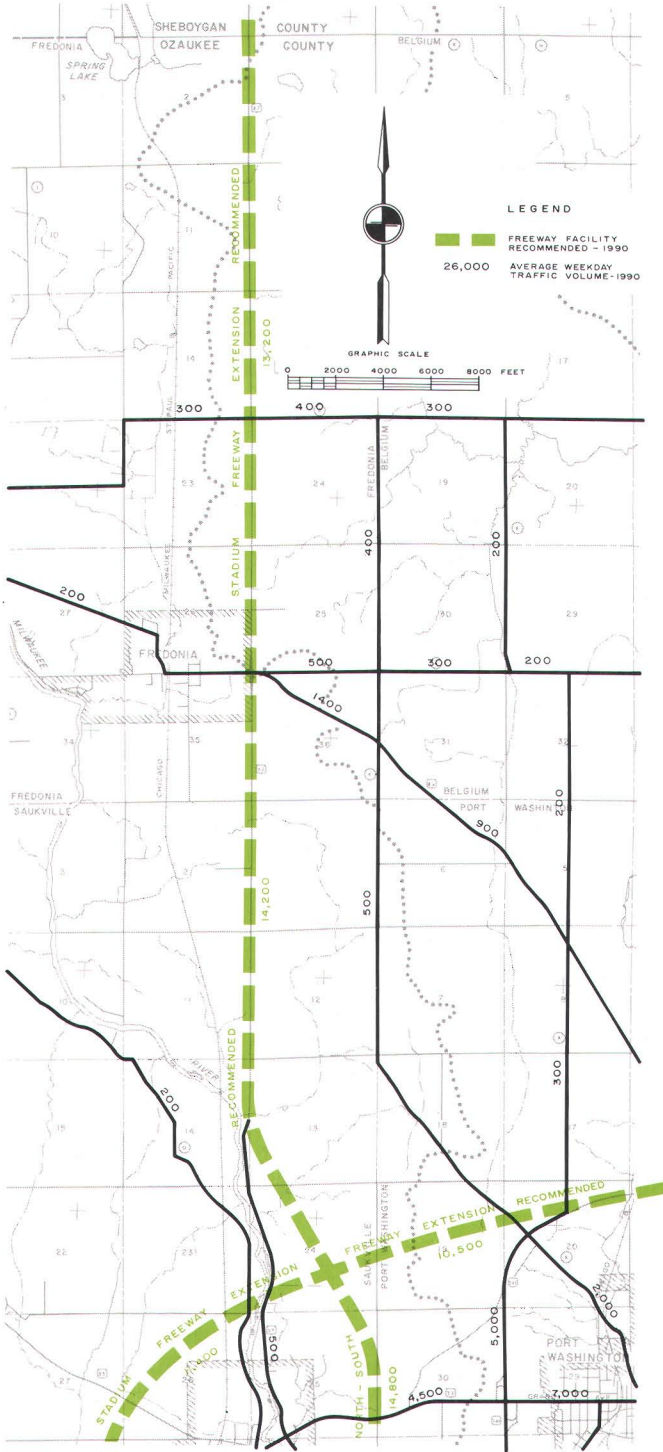
Three alternative alignments were explored for this important freeway connection. The selected alternative best accommodates the anticipated traffic flow between the Stadium and Fond du Lac Freeways.

Map 13  
**RACINE AREA LOOP FREEWAY ALTERNATIVE**  
**AVERAGE WEEKDAY TRAFFIC VOLUMES**  
 1990



The provision of a loop freeway from IH-94 easterly into the City of Racine on the north and back out westerly to the proposed Lake Freeway on the south will serve to reduce traffic congestion in the area served and afford direct access at a high service level to the regional freeway system from the second largest urbanized area within the Region.

Map 14  
 STADIUM FREEWAY EXTENSION ALTERNATIVE  
 AVERAGE WEEKDAY TRAFFIC VOLUMES  
 1990



State-wide highway system continuity requires the provision of a freeway facility in this area in order to provide a suitable connection to a second proposed freeway facility in the Milwaukee-to-Green Bay traffic corridor.

provision of the facility would not reduce the anticipated overloading on the East-West Freeway below the design capacity of that facility. Therefore, neither of these two alternatives were recommended for inclusion in the final transportation plan.

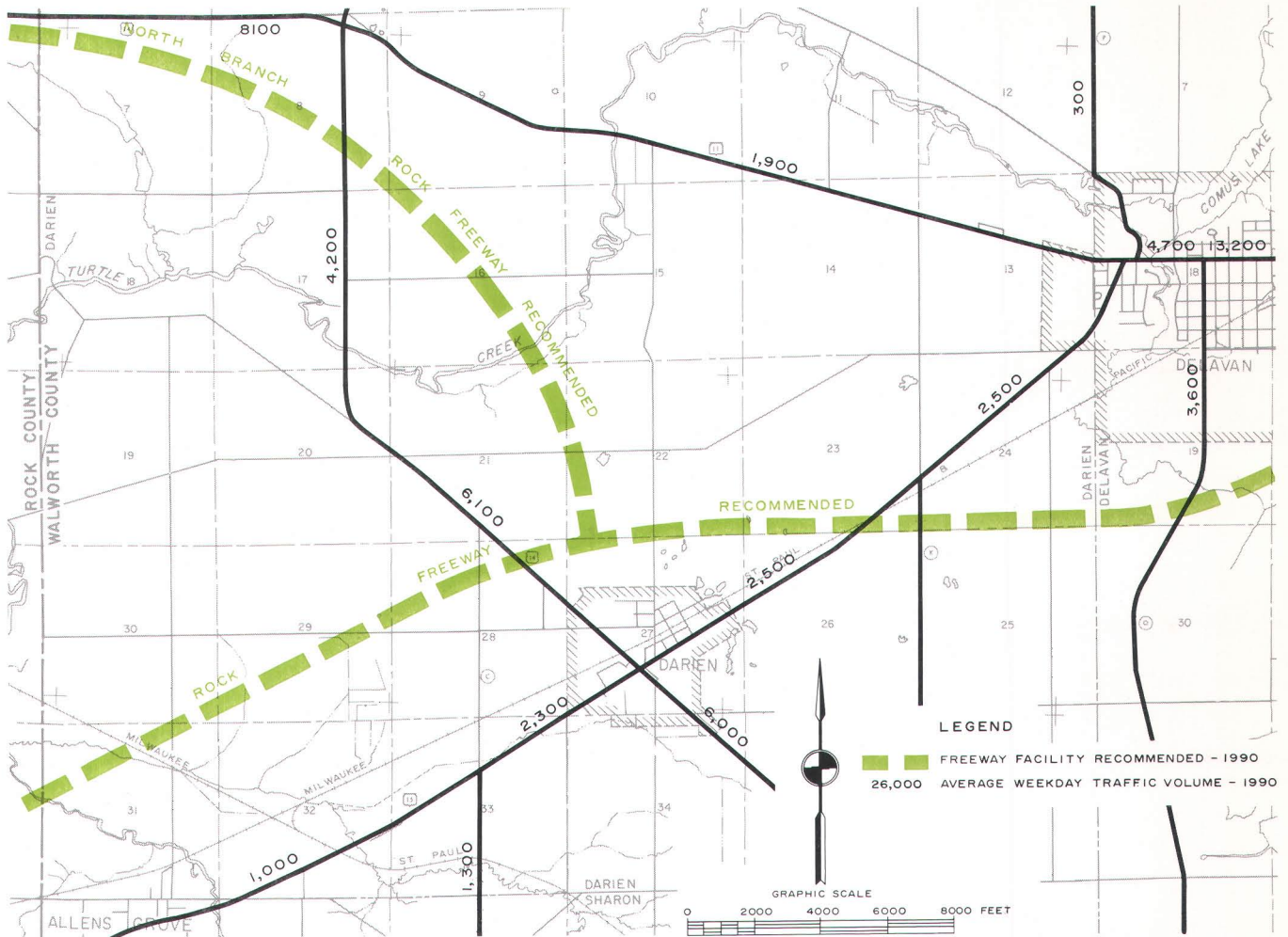
The extension of the Airport Freeway easterly from the North-South Freeway to the proposed southerly extension of the Lake Freeway was considered as a possible means of providing relief for the anticipated overloading of the North-South Freeway (see Map 18). Assignment of future traffic demand to this freeway connection did not meet minimum threshold service warrants for consideration of a freeway in this location, nor did the assignments indicate that the desired relief would be provided for the North-South Freeway. This alternative, therefore, was not recommended for inclusion in the final transportation plan.

The State Highway Commission of Wisconsin asked that an alternate location for the proposed Belt Freeway be investigated in a location south of the Milwaukee-Racine County line and west of the City of Waukesha (see Map 19). Future traffic assignments to a facility in this location indicated that anticipated traffic volumes would not meet the threshold warrants for provision of a freeway in this location by 1990 nor provide the necessary relief for existing and committed freeway facilities in Milwaukee County. The alternate location was not, therefore, recommended for inclusion in the final transportation plan.

Transit Facilities

In addition to, and complementing, the major freeway and parkway facility recommendations, the proposed transportation system plan recommends the construction of a greatly expanded modified rapid transit and an entirely new rapid transit system, which would provide the most heavily urbanized portions of the Region with an efficient and economical, as well as with a high level of, transit service. Under the plan proposals, motor coaches operating in mixed traffic over outlying portions of the expanded regional freeway system would provide fast and regular service to such outlying suburban areas as Mequon, Thiensville, Menomonee Falls, Brookfield, New Berlin, Franklin, and Oak Creek. As indicated on Map 20, these modified rapid transit lines would feed a rapid transit line paralleling the East-West Freeway for a distance of about 4.3 miles from the vicinity of the Zoo Interchange to the vicinity of N. 16th

Map 15  
 ROCK FREEWAY ALTERNATIVE--AVERAGE WEEKDAY TRAFFIC VOLUMES  
 1990



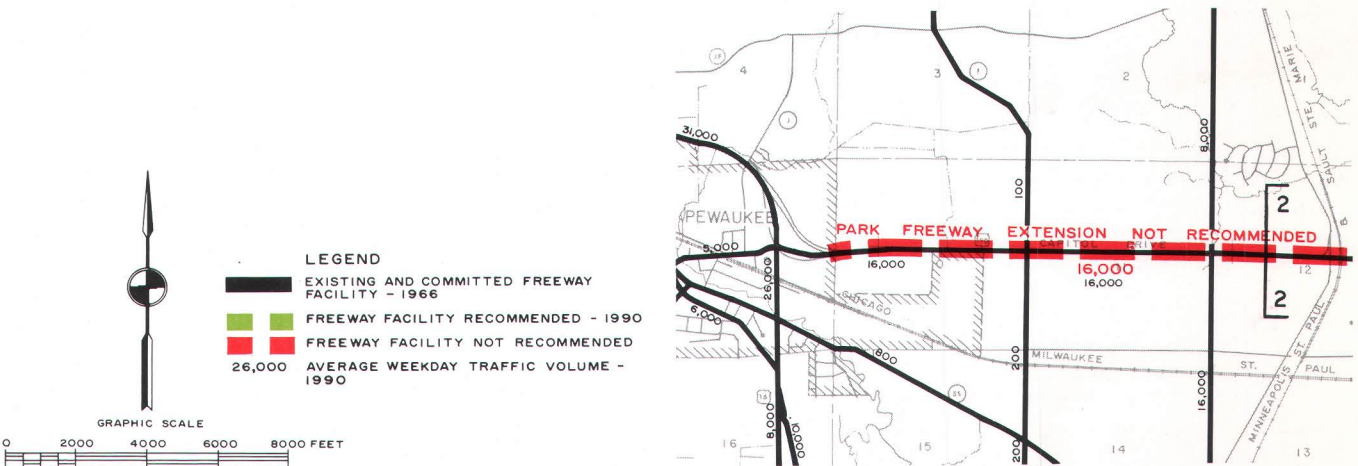
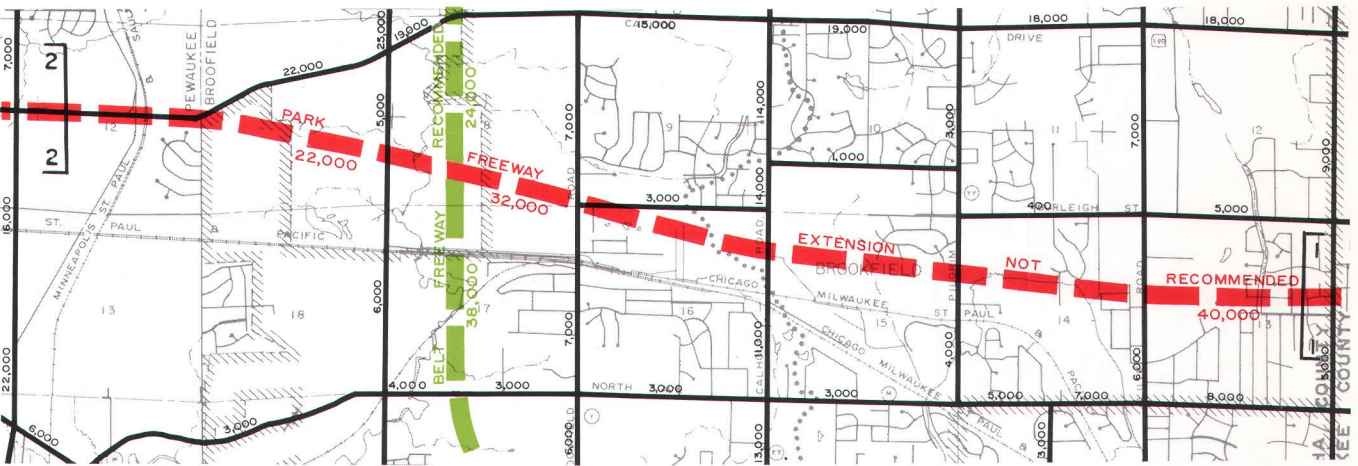
State-wide highway system continuity requires the provision of a freeway facility in this area in order to provide direct access at a high level of service to the Rock Freeway from the Janesville area in Rock County.

Street and W. Clybourn Avenue in the City of Milwaukee. This rapid transit line, or busway, would consist of two fully grade-separated lanes for the exclusive operation of motor coaches and may be expected to carry approximately 47,000 revenue passengers per average weekday by 1990.

Since buses have the unique capability of operating both over public streets and highways and over private rights-of-way, the same transit vehicle could thus operate in collection and distribution service in the central business district of Milwaukee, picking up and discharging passengers close to their places of work, business, or recreation; in true rapid transit service on the rapid transit trunk line; in modified rapid transit service on the outlying portions of the freeway system;

and again in its own collection and distribution service in the outlying areas, picking up and discharging passengers close to their homes. Thus, a fast and convenient "one-seat" ride, with the closest approach possible to door-to-door service, would be furnished to a maximum proportion of transit riders. The area served by high level transit service could, moreover, be greatly extended through the construction of parking lots at strategic locations in outlying terminal areas, so that combined auto-transit trips would become practical and convenient. While it is beyond the scope of this study to identify and recommend the precise locations for, and size of, such parking lots, the provision of such lots at each of the outlying loading points is recommended as an essential integral part of the proposed transit system. The proposed transit system would serve not only to

Map 16  
 PARK FREEWAY EXTENSION ALTERNATIVE  
 AVERAGE WEEKDAY TRAFFIC VOLUMES



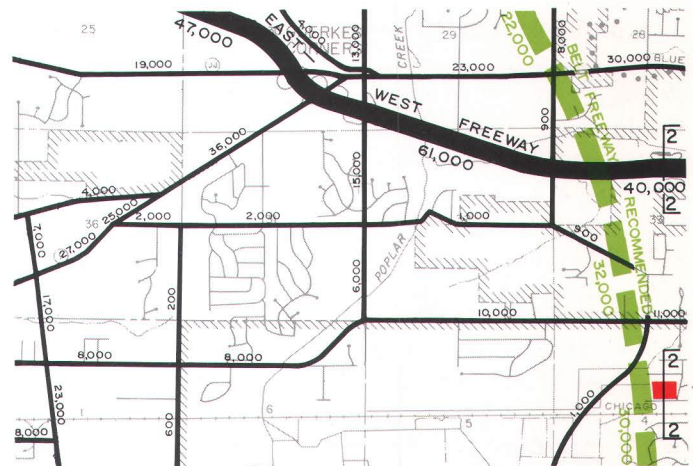
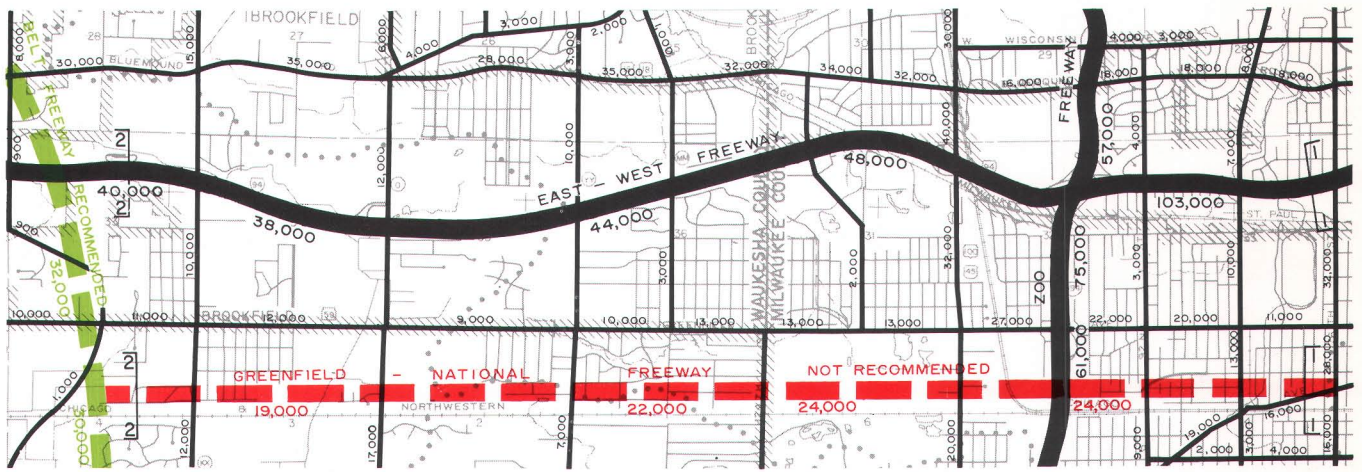
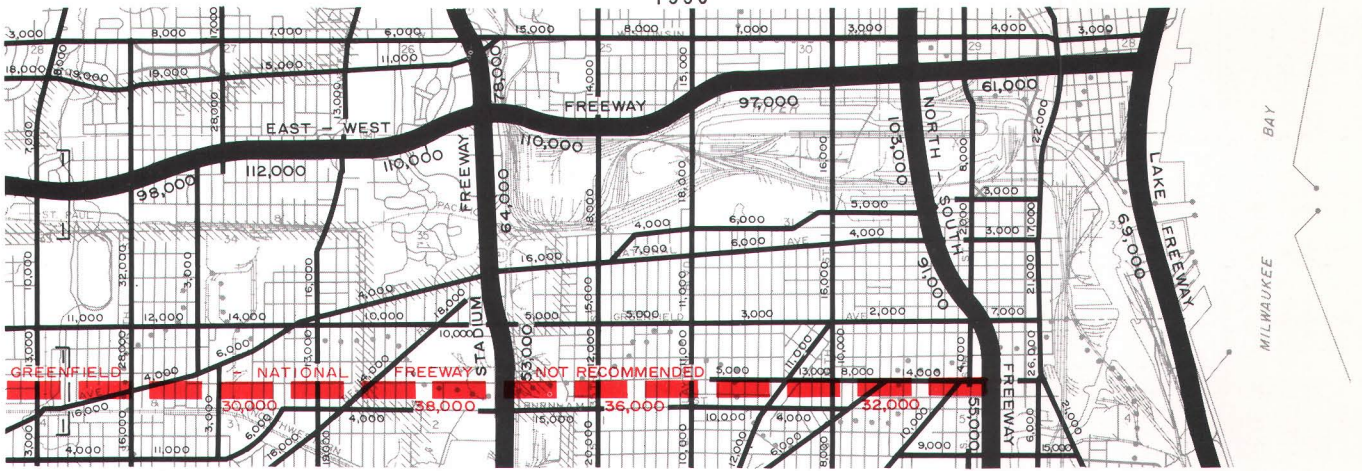
LEGEND






- EXISTING AND COMMITTED FREEWAY FACILITY - 1966
- FREEWAY FACILITY RECOMMENDED - 1990
- FREEWAY FACILITY NOT RECOMMENDED
- 26,000 AVERAGE WEEKDAY TRAFFIC VOLUME - 1990

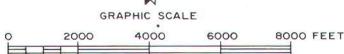
GRAPHIC SCALE  
 0 2000 4000 6000 8000 FEET

The possible westerly extension of the Park Freeway, as shown, was considered in order to provide additional relief for the East-West Freeway. This alternative was rejected not only because of the great disruption which such a facility would cause in established residential areas but also because traffic assignments indicated that the facility would not significantly reduce the expected overloading of the East-West Freeway.

Map 17  
 GREENFIELD-NATIONAL FREEWAY ALTERNATIVE  
 AVERAGE WEEKDAY TRAFFIC VOLUMES  
 1990



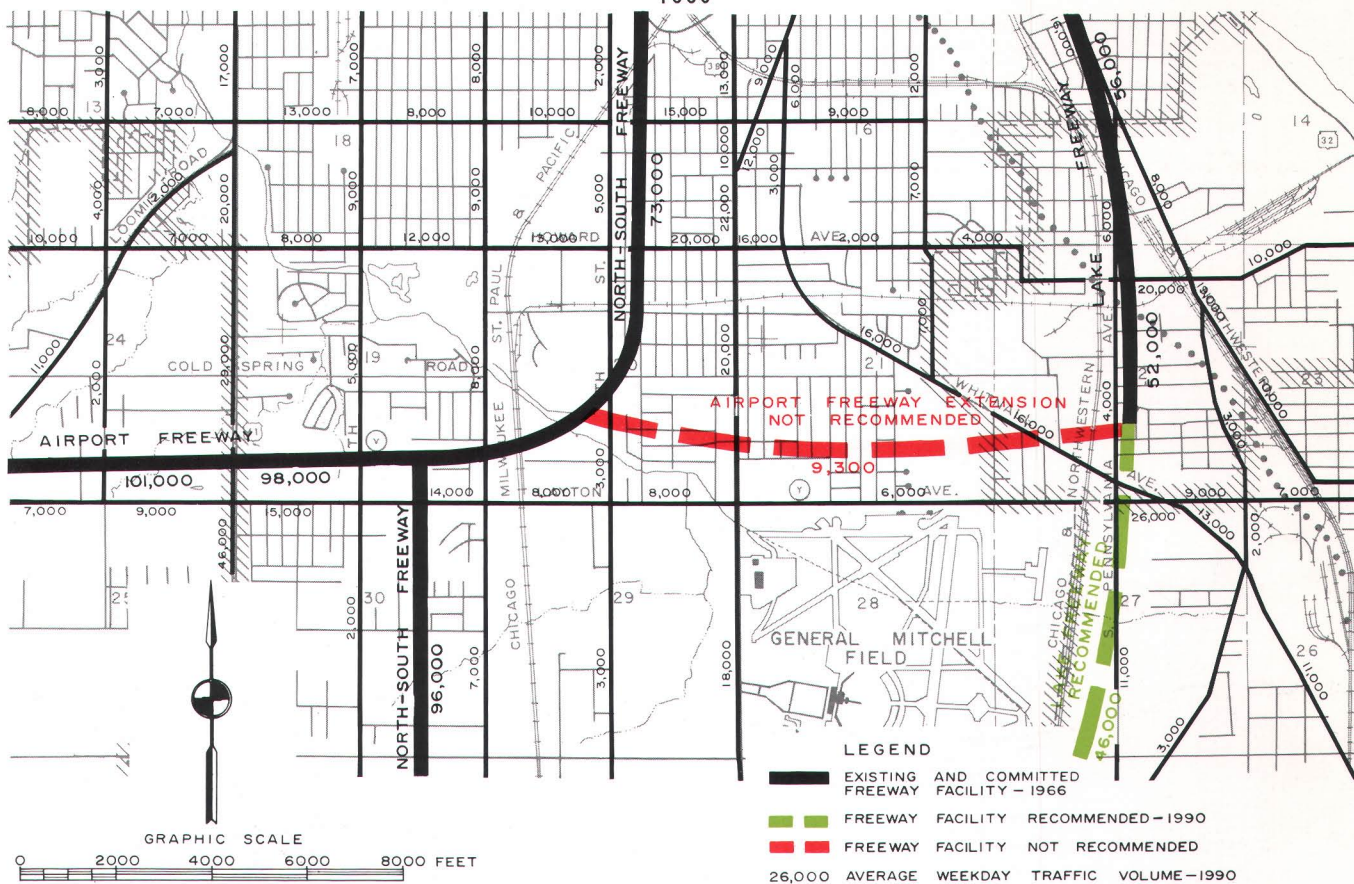
- LEGEND**
-  EXISTING AND COMMITTED FREEWAY FACILITY - 1966
  -  FREEWAY FACILITY RECOMMENDED - 1990
  -  FREEWAY FACILITY NOT RECOMMENDED
  -  26,000
  -  AVERAGE WEEKDAY TRAFFIC VOLUME - 1990



Although traffic assignments to a freeway facility located in the vicinity of Greenfield-National avenues indicated that such a facility could be expected to carry barely enough traffic to warrant its consideration, anticipated overloads on the East-West Freeway would not be reduced significantly by the provision of such a facility.



Map 18  
 AIRPORT FREEWAY EXTENSION ALTERNATIVE  
 AVERAGE WEEKDAY TRAFFIC VOLUMES  
 1990



A freeway facility in this location was considered but found not to reduce significantly the anticipated overloading on the North-South Freeway nor to carry enough traffic to warrant its construction by 1990.

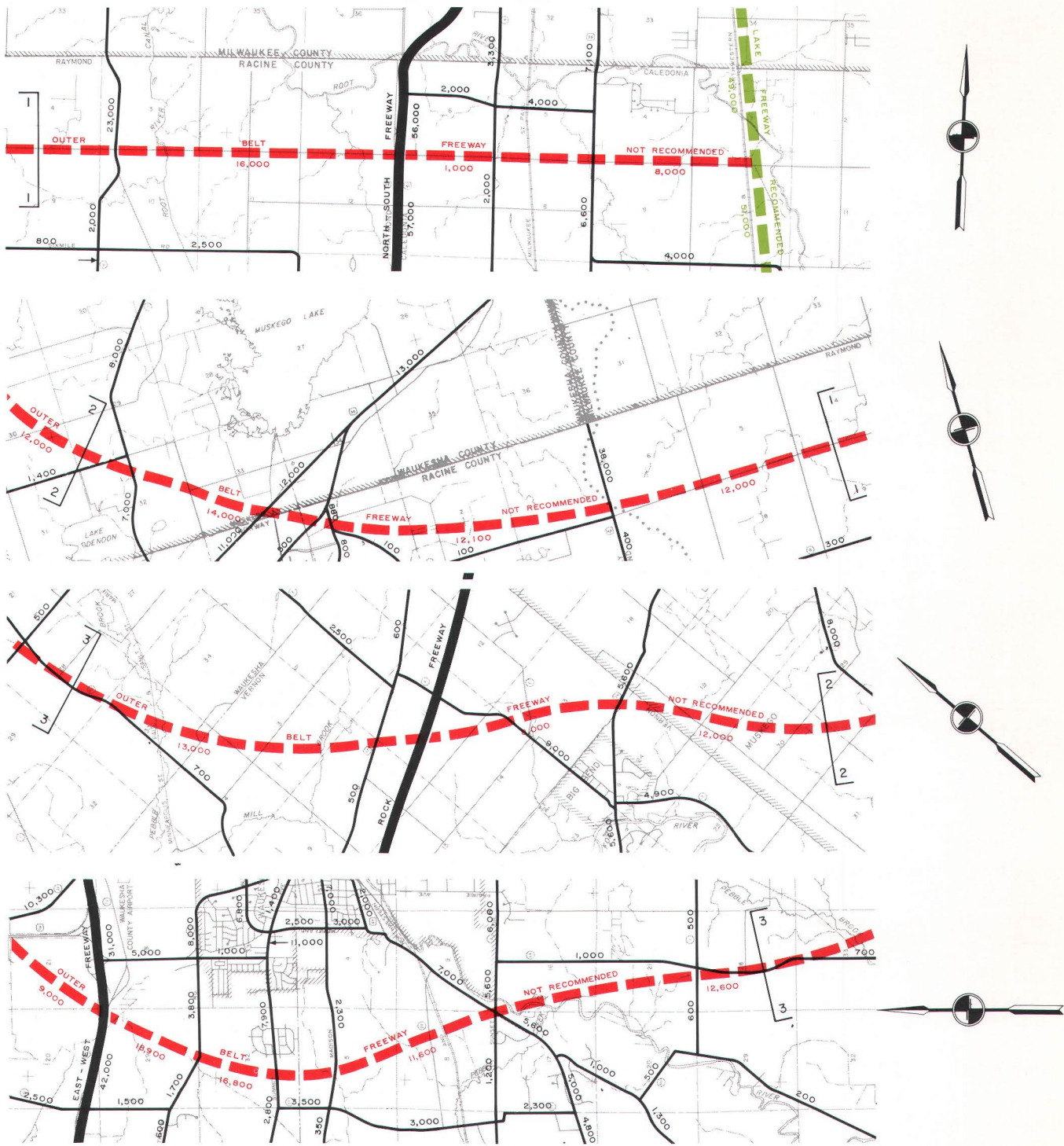
reduce peak freeway loadings but also to reduce parking demand in the central business district.

The proposed transit system combines the high-speed and high-capacity characteristics of transit operation over an exclusive, fully grade-separated right-of-way with the adaptability of the motor coach for feeder and for collection and distribution service. By collecting passengers near their points of origin and destination and then proceeding directly to the exclusive busway for uninterrupted travel to the destination area and finally circulating on the local streets in the destination area to unload passengers near their destinations, the proposed transit system will provide the shortest possible door-to-door transit trip times. As indicated in Table 22, the proposed transit system would thus serve to greatly reduce transit travel times within the most heavily urbanized portions of the Region and bring these travel times into active competition with equivalent automobile

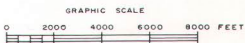
travel times. The proposed system also seeks to eliminate one of the chief deterrents to mass transit utilization; namely, the transfer.

Motor coaches built today are designed for, and capable of, top operating speeds of 70 miles per hour. Thus, where buses travel on freeways which are operating at or below their design capacities, the scheduled speeds can compare favorably with those of rail systems and with automobile speeds. To realize this potential for high-speed service, however, in those areas of the Region where the freeways may be expected to operate at or over their design capacity, an exclusive busway must be provided. The provision of such a busway gives the motor coach the same degree of freedom for high-speed and high-capacity operation enjoyed by the more expensive rail rapid transit systems, while retaining the inherent mobility and route flexibility of the motor coach. Capacities of such a busway can exceed 60,000 seated passengers

Map 19  
 ALTERNATIVE LOCATION OF BELT FREEWAY  
 AVERAGE WEEKDAY TRAFFIC VOLUMES  
 1990



**LEGEND**  
 — EXISTING AND COMMITTED FREEWAY FACILITY - 1966  
 — FREEWAY FACILITY RECOMMENDED - 1990  
 — FREEWAY FACILITY NOT RECOMMENDED  
 26,000 AVERAGE WEEKDAY TRAFFIC VOLUME - 1990



Although the provision of a Belt Freeway facility located well outside the metropolitan area appeared desirable, the small amount of traffic such a facility would carry did not warrant its inclusion in the recommended regional freeway system.



Table 22  
 COMPARISON OF TRANSIT AND AUTO TRAVEL TIMES<sup>a</sup> BETWEEN SELECTED STATIONS  
 AND THE MILWAUKEE CENTRAL BUSINESS DISTRICT:  
 1963 AND 1990 RECOMMENDED TRANSPORTATION PLAN

Station	1990 Travel Time		1963 Travel Time	
	By Rapid Transit (Busway)	By Auto	By Surface Mass Transit	By Auto
Mequon <sup>b</sup> . . . . .	39	31	69	36
Bayshore . . . . .	26	22	49	25
Brown Deer <sup>b</sup> . . . . .	34	29	72	37
Menomonee Falls <sup>b</sup> . . . . .	41	35	69	42
Butler <sup>b</sup> . . . . .	37	29	64	34
Mayfair . . . . .	33	24	56	27
West Allis . . . . .	26	22	49	23
Waukesha . . . . .	45	38	65	41
New Berlin . . . . .	42	35	61	40
Hales Corners . . . . .	48	33	70	37
Greendale . . . . .	37	28	60	32
Franklin . . . . .	40	31	68	37
Oak Creek . . . . .	38	28	68	36
South Milwaukee . . . . .	36	27	53	34

<sup>a</sup> Travel times shown are door-to-door.

<sup>b</sup> No direct transit service was available in 1963.

Source: SEWRPC.

per hour, which is far in excess of any presently foreseen corridor demand within southeastern Wisconsin. Moreover, the vehicles used in the modified rapid transit and rapid transit service during the two daily peak periods of demand can also be widely used throughout the remainder of the day for other types of transit service, including ordinary mass transit, school, and charter service. Similarly, the busway can be kept in operation throughout the day as a limited access roadway available for truck and intercity bus routing. On weekends and holidays, the busway could also be opened to automobile traffic should this be necessary to accommodate weekend traffic loadings. Most importantly, the bus and busway would be available for these additional uses without a compromise in their primary functions; and the busway is most adaptable to the rapidly changing technology of urban transportation systems.

In addition to its flexibility and adaptability, the proposed transit system is also significantly less costly than a conventional rail system. This cost advantage is indicated in Table 23 for both construction and operating costs. The cost indicated in the table could be further reduced through utilization of an existing right-of-way for the

proposed busway. Such a right-of-way, presently used only for electric power transmission, exists paralleling the East-West Freeway from approximately N. 27th Street to the Zoo Freeway. This right-of-way, which formerly served an electric interurban line, is largely intact. Much of the original earthwork could serve for the busway construction; the power transmission line towers are designed to accommodate the operation of transit vehicles under the power transmission lines, and full grade separations with intersecting surface streets could be readily effected by reconstruction of bridges at former abutment openings. Moreover, if the demand beyond the plan design year of 1990 so warranted, the busway could be extended over this power transmission line right-of-way through the cities of Greenfield and New Berlin to the City of Waukesha.

Certain other power transmission and abandoned railroad rights-of-way were also considered for possible utilization as busways. Forecasts of transit demand to 1990, however, did not indicate the need to reserve any such other rights-of-way for this purpose. Particularly, reservation of the abandoned Chicago, North Shore and Milwaukee Electric Railway right-of-way for transit utiliza-

Table 23

CAPITAL IMPROVEMENT COST ESTIMATES FOR BUSWAY AND RAILWAY RAPID TRANSIT SYSTEMS<sup>a</sup>  
IN THE REGION: 1966

Cost Category	Busway	Railway
Right-of-way Costs <sup>b</sup> . . . . .	\$ 9,675,000.00	\$17,325,000.00
Line Construction Costs <sup>c</sup> . . . . .	2,795,000.00	17,248,000.00
Station and Terminal Construction Costs <sup>d</sup> . . . . .	100,000.00	4,300,000.00
Yards and Shops. . . . .	250,000.00	336,000.00
Rolling Stock <sup>e</sup> . . . . .	1,387,000.00	3,360,000.00
<b>Total</b>	<b>\$14,207,000.00</b>	<b>\$42,569,000.00</b>
Annual Maintenance Cost for Fixed Way and Structures. . . . .	3,000.00/mi.	20,000.00/mi.
Annual Capital Recovery and Maintenance of Way Costs <sup>f</sup> . . . . .	\$ 1,181,250.00	\$ 3,484,000.00

<sup>a</sup> Based upon a 4.3 mile length of busway (from the vicinity of the Zoo Interchange to N. 16th and W. Clybourn Streets) and a 7.7 mile length of railway (from Milwaukee-Waukesha County line to N. 4th and W. Clybourn Streets).

<sup>b</sup> Based upon a 120-foot wide right-of-way for a two-lane or two-track facility located through a developed urban area and includes cost of acquiring and razing existing buildings and structures.

<sup>c</sup> Includes for busway: earthwork, two-lane portland cement concrete pavement with valley gutters, grade separation structures, storm sewerage, fencing, utility relocation, and engineering costs; and for railway: earthwork, double track, grade separation structures, electrification, signalization, drainage, fencing, utility relocation, and engineering costs.

<sup>d</sup> Includes for railway two turn-around extensions with crossovers and six stations with 250-foot platforms.

<sup>e</sup> Based upon 42 rail rapid transit coaches and 50 motor coaches.

<sup>f</sup> Based upon 6 percent rate of return, 25-year recovery period for rail rapid transit coaches and fixed way and structures, and 12-year recovery period for motor coaches.

Note: Capital improvement costs do not include costs of parking lots for either busway or railway systems nor costs of necessary feeder buses for railway systems.

Source: SEWRPC.

tion did not appear to be warranted. It should be noted, in this respect, that the recommended regional transportation plan provides for two free-ways in the Milwaukee-Racine-Kenosha-Chicago corridor over which both modified rapid transit and intercity bus service could be provided. In addition, three operating railway lines are located in this corridor, one of which is particularly well suited for high-speed intercity service. It should be further noted that portions of the abandoned Chicago, North Shore and Milwaukee Electric Railway right-of-way in Milwaukee, Racine, and Kenosha counties may in places be suitable for use as partial right-of-way for the southerly extension of the Lake Freeway, for the Loop Freeway into the City of Racine, and for the construction of a new north-south arterial into the City of Kenosha, as recommended in the regional transportation plan.

#### Transportation System Cost Analysis

Estimates of the overall cost of implementing the

proposed transportation system plan were prepared by applying unit improvement costs to the estimated mileage of proposed future improvements, including construction of new facilities and reconstruction of certain existing facilities required to provide adequate arterial street and highway system capacity by 1990; by applying unit improvement costs to the estimated mileage of new collector and minor streets necessary to serve new urban development; and by preparing special estimates of the cost of constructing the proposed bus rapid transit facilities. In addition, the costs of maintaining the proposed and existing arterial street and highway system and the collector and minor street system were estimated.

Unit cost data for the construction and maintenance of facilities required to provide and maintain adequate system traffic capacity were summarized on a per mile basis for right-of-way acquisition, construction, engineering, and resurfacing by three subareas of the Region—Milwaukee and eastern

Waukesha counties, Racine and Kenosha counties east of IH 94; and the remainder of the Region—and were presented in Appendix A to Volume 2 of this report. The mileage of existing and proposed arterial facilities for each improvement and maintenance category was taken directly from the arterial network maps representing the existing and proposed systems. The mileage of new collector and minor street facilities was calculated by applying an appropriate factor, representing the proportion of land normally devoted to streets and highways in urban areas under good subdivision design practices, to the land area to be converted from rural to urban use over the design period.

As indicated in Table 24, the total construction and maintenance cost estimates for the proposed street and highway system under the Recommended Transportation Plan are \$2.144 billion. This cost estimate is based on 1966 unit prices and on the assumption that maintenance costs for proposed facilities would accrue for one-half of the 1967-1990 plan implementation period, due to a uniform rate of construction throughout this period. The construction costs for new and improved arterial streets and highways necessary to provide increased traffic capacity are estimated at \$1.066 billion; and the construction costs for

repaving or reconstructing other arterial streets, not to provide additional traffic capacity but to replace worn pavements and structures and to improve safety characteristics, are estimated at \$135 million over the period. The cost of constructing new collector and minor streets to serve anticipated land use development within the Region is estimated at \$16 million. Total highway system construction costs would thus approximate \$1.217 billion based upon 1966 unit prices. Appreciating these costs at the rate of 4 percent per year to 1990 in order to provide for rising land, labor, and material costs results in a 1990 construction cost estimate of \$2.028 billion, or \$92 million less than public financial resource studies indicate would become available for such purposes by 1990. Maintenance costs for the entire street and highway system are estimated at \$926 million over the plan implementation period based on 1966 unit prices, or \$1.543 billion appreciated to 1990. This amount is approximately \$2.032 billion less than the public financial resource studies indicate would be available by 1990.

In total, the public financial resource studies indicate that \$5.695 billion should become available for construction and maintenance of streets and highways over the plan implementation period.

Table 24

ESTIMATED COSTS FOR CONSTRUCTION AND MAINTENANCE OF STREETS AND HIGHWAYS IN THE REGION: 1967-1990 RECOMMENDED TRANSPORTATION PLAN  
(In Thousands of 1966 Dollars)

Cost Category	Estimated Cost
<b>Construction Costs:</b>	
New and Upgraded Arterials <sup>a</sup> . . . . .	\$ 1,066,445
New Collector and Minor Streets <sup>b</sup> . . . . .	15,961
Repave or Reconstruct Specific Arterials . .	135,410
Subtotal	1,217,816
<b>Maintenance Costs:</b>	
New and Upgraded Arterials . . . . .	151,344
New Collector and Minor Streets . . . . .	44,868
Other Arterials . . . . .	223,008
All Other Collector and Minor Streets . . .	506,980
Subtotal	926,200
<b>Total Costs</b>	<b>\$2,144,016</b>

<sup>a</sup> These costs would be incurred in the construction of the proposed arterial street and highway system required to provide adequate capacity to meet future traffic loads.

<sup>b</sup> These costs would be incurred in order to serve new land use development with adequate transportation facilities.

Source: SEWRPC.

Deducting the estimated \$3,571 billion necessary to construct and maintain the proposed street and highway system from this total leaves \$2.124 billion for all other street and highway purposes over the plan implementation period, including lighting, signing, traffic control devices, landscaping, and beautification. The costs of implementing the recommended rapid transit portions of the proposed transportation system plan were also estimated. Since the fixed way and structure costs of the recommended rapid transit system consist entirely of the right-of-way acquisition, construction, engineering, and maintenance costs of exclusive, grade-separated, bus roadways, the cost estimates could be prepared using recent highway construction experience within the Region. These estimates, set forth in Table 25, indicate that, based upon 1966 unit prices, the total right-of-way acquisition and construction costs of the recommended rapid transit system for the Region would be \$12.8 million, excluding rolling stock.<sup>2</sup> In addition, annual maintenance costs estimated at \$13,000 would be incurred for the fixed way and structures. Since implementation of the rapid transit portion of the transportation plan would have to be accomplished either through private investment or through the establishment of an entirely new category of public expenditures within the Region, no estimates of public financial resources available for the implementation of this portion of the plan were prepared.

Benefit-Cost Analysis

The total highway system cost estimates described above were supplemented by a benefit-cost analysis

<sup>2</sup> Rolling stock is estimated to cost \$1.387 million for the recommended plan.

in order to demonstrate the economic value of the transportation system plan proposals. Highway user benefits were obtained by comparing the assignments of future traffic demand to the existing plus committed network with an assignment of future traffic demand to the highway network under the Recommended Transportation Plan. These highway user benefits were calculated as the savings in such road user costs as vehicle operating costs, travel time, and accident costs accruing through the provision of the proposed highway facilities. Construction and maintenance costs were calculated as the total cost of: 1) upgrading the traffic-carrying characteristics of those arterials within the Region for which the traffic assignment process indicated a capacity deficiency, and 2) providing new facilities where the traffic assignment process indicated that future traffic congestion could not be readily relieved by the upgrading of existing facilities.

As indicated in Table 26, the resulting benefit-cost ratio of 1.36 demonstrates that the expenditures required to implement the proposed highway system plan would constitute a sound investment of public funds. It should be noted that the benefits and costs were calculated as accruing over the period extending from 1970 to 2015 in order to bring the salvage value of each staged facility recommended in the plan to zero. It should also be noted that this benefit-cost ratio applies to the aggregation of system improvements proposed in the plan and does not imply that each individual project within this aggregation will have a uniformly high ratio of benefits to costs.

Table 25  
ESTIMATED COSTS<sup>a</sup> FOR CONSTRUCTION AND MAINTENANCE OF  
A PROPOSED RAPID TRANSIT SYSTEM IN THE REGION  
(In 1966 Dollars)

Cost Category	Estimated Cost
Right-of-way . . . . .	\$ 9,675,000
Construction <sup>b</sup> . . . . .	3,145,000
Total <sup>c</sup>	\$12,820,000
Annual Maintenance . . . . .	12,900

<sup>a</sup> Costs relate to a 4.3-mile bus rapid transit line from the vicinity of 16th and Clybourn Streets in the City of Milwaukee to the vicinity of the Zoo Interchange of the East-West Freeway.

<sup>b</sup> Includes line construction, yards, shops, and all engineering costs.

<sup>c</sup> Excludes rolling stock.

Source: SEWRPC.

Table 26  
 BENEFIT-COST RATIO FOR THE PROPOSED HIGHWAY SYSTEM<sup>a</sup>  
 FOR THE RECOMMENDED TRANSPORTATION PLAN

Plan	Road User Benefits <sup>b</sup> Received 1970-2015	Construction and Maintenance Costs <sup>b</sup> Incurred 1970-2015	Ratio
Recommended Transportation Plan	\$819,245,000	\$601,228,000	1.36

<sup>a</sup> The proposed highway system comprises all those facilities necessary to provide adequate traffic capacity to meet future needs. These proposed facilities are in addition to all existing and committed major highway facilities.

<sup>b</sup> Present worth in 1970.

NOTE: A description of the benefit-cost methodology is contained in Appendix B.

Source: SEWRPC.

### SUMMARY

The anticipated regional growth and change within southeastern Wisconsin will generate massive demands for travel and for improved transportation facilities. While the population of the Region is expected to increase by 59.9 percent and employment within the Region is expected to increase by 54.9 percent by 1990, the number of automobiles and trucks within the Region is expected to increase by 87 percent over the 1963 level of about 586,000 to over 1.1 million automobiles, trucks, and buses. The total travel demand generated within the Region is anticipated to increase from a total of about 3.6 million person trips per average weekday in 1963 to over 6 million such trips by 1990. Vehicular travel within the Region is anticipated to increase from a total of 2.6 million vehicle trips per day in 1963 to over 4.6 million such trips by 1990, while the total number of vehicle miles of travel within the Region is anticipated to increase from about 13.2 million to over 32 million vehicle miles per average weekday. Transit trip generation may be anticipated to increase from a total of about 324,000 transit trips in 1963 to about 353,000 transit trips by 1990, but only if the recommended land use and transportation plans are implemented. The transportation plan recommended in this report seeks to provide the Region with a safe, efficient, and economical transportation system, which will serve effectively the existing and anticipated increases in travel demand within the Region and which will meet sound regional transportation system development objectives to the maximum extent possible.

Implementation of the Recommended Transportation Plan will:

1. Provide the Region with an integrated transportation system which will serve effectively not only the existing regional land use pattern and promote the implementation of the recommended regional land use plan but which will also meet the anticipated travel demand generated by existing and proposed land uses. The plan proposes to provide a transportation system which will freely interconnect the various land use activities within the Region and thereby provide the attribute of accessibility, which is essential to the effective support of these activities and to the maintenance of a viable urban region.
2. Provide the Region with a balanced transportation system, providing the appropriate types of transportation service needed by all of the various subareas of the Region at an adequate level of service. The recommended plan proposes to achieve economy and efficiency in the provision of transportation services, while at the same time supporting essential economic and social activities. The recommended plan seeks to achieve a balance not only between travel demand and the spatial configuration and capacity of highway facilities but also between the utilization of the automobile and mass transit vehicles as modes of transportation. Implementation of the transit component of the recommended plan would provide a high level of transportation service to that segment of the population which does not for various reasons own or operate an automobile and would also supply



additional transportation system capacity in strategic locations in order to alleviate the peak loadings on highway facilities. Implementation of the transit component would further serve to assist in reducing the demand for parking facilities in certain areas of highly concentrated urban activity within the Region.

3. Result in the alleviation of traffic congestion and the reduction of travel time between component parts of the Region. The plan proposes to support the necessary everyday activities of business, shopping, and social intercourse by providing for reasonably fast, convenient transportation, while at the same time minimizing the total vehicle hours of travel within the Region.
4. Serve to reduce accident exposure and to provide an increased measure of travel safety. The plan proposes to provide for a reduction in the incidence of accidents by maintaining the service levels of the transportation system facilities at a volume-to-capacity ratio equal to, or less than, their design capacity, which will assure adequate and safe operation. The plan will also serve to encourage travel on facilities which exhibit the lowest accident exposure, such as freeways, expressways, and all forms of transit.
5. Provide the Region with a transportation system which is both economical and efficient and which meets all other objectives at the lowest cost possible. The plan proposes to provide a transportation system which will minimize the sum of transportation system operating cost and capital investment cost and which will minimize the total vehicle miles of travel, while at the same time making maximum use of all existing and committed major transportation facilities.
6. Provide the Region with a transportation system which minimizes the disruption of existing neighborhood and community development and which minimizes the deterioration or destruction of the natural resource base. The plan proposes, through the proper location of transportation facilities, to avoid the penetration of neighborhood units, neighborhood facility service

areas, and primary environmental corridor areas by arterial streets and highways and rapid transit routes, thereby minimizing the dislocation of families, businesses, and industries and protecting the high-value resource base. The plan makes possible the advance reservation of rights-of-way for future highway and rapid transit facilities, thus reducing capital investment requirements for transportation facilities, and avoids the destruction of historic buildings and of high-value historic, scenic, scientific, and cultural sites.

7. Provide the Region with a transportation system high in aesthetic quality, one containing proper visual relationships of the major transportation facilities to the land and cityscape. The plan proposes to provide for the location of transportation facilities in such a manner as to avoid destruction of visually pleasing buildings, structures, and natural features; to avoid interference with vistas to such features; and to develop construction plans utilizing proper geometric, structural, and landscape design standards.

That the controlled existing trend land use plan and its supporting transportation system plan best met the foregoing regional transportation system development objectives was demonstrated in Volume 2 of this report, wherein the transportation plan was specifically related to the stated development objectives through supporting transportation planning standards. The transportation plan recommended herein incorporates certain revisions to the preliminary plan growing out of the plan evaluation and public review process. These revisions are thought to improve the ability of the recommended plan to meet the regional transportation development objectives and standards. Because of the manner and degree to which the plan meets the approved regional transportation system development objectives and standards, and incorporates to the maximum extent possible local transportation system development objectives and standards, it, like the land use plan which it supports, met with the approval of the reviewing technical and intergovernmental advisory committees and is hereby recommended for adoption as the guide for transportation system development within the Region over the next two and one-half decades.



## Chapter IV

# THE UNPLANNED ALTERNATIVE

### INTRODUCTION

The recommended land use and transportation components of a comprehensive plan for the physical development of the Southeastern Wisconsin Region were described in two preceding chapters of this volume. These plan components were selected after careful technical test and evaluation of the alternatives available and after presentation of the alternatives to the SEWRPC Technical and Intergovernmental Coordinating Committees on Regional Land Use and Transportation Planning, to the constituent local units of government, and to certain state and federal agencies for further technical and for nontechnical review and evaluation. The plan test, review, and evaluation process indicated that implementation of the Controlled Existing Trend Plan alternative would best meet the regional land use and transportation system development objectives formulated as a part of the planning process. Accordingly, the regional land use and transportation plan elements, as presented in this volume for adoption and implementation, represent a refinement of the Controlled Existing Trend Plan alternative.

Yet another alternative is, however, available to the Region, that of continued existing trend development in the absence of any attempt to guide such development on an areawide basis in the public interest. Such unplanned development could result in a number of greatly differing regional land use patterns, depending upon the degree to which community plans and land use development policies and controls and the availability of areawide planning and engineering data, such as the detailed operational soil surveys, influence the operation of the urban land market and historic development trends over time.

In order to assess the possible impact of unplanned land use development upon the future environment within the Region and particularly upon the proposed transportation system, one of the many regional land use patterns that might result from unplanned development was explored in depth. This alternative is not to be construed as a plan but, rather, as a forecast of one of the many pos-

sible end results of unplanned development. It is intended to serve, not as a recommendation, but as a basis of comparison for the evaluation of the potential benefits of the regional land use plan and of the workability of the regional transportation plan being recommended for implementation.

The unplanned alternative would require the least amount of areawide effort toward regulation of development in the public interest and would require few restraints on the operation of the urban land market in determining the future character, intensity, and spatial distribution of land use development within the Region. Unlike implementation of the recommended land use plan, the unplanned alternative would provide the people of the Region with no assurance that the future regional development pattern would meet the regional development objectives and provide a more orderly, efficient, safe, healthful, and attractive environment.

This chapter presents a brief description of the land use and transportation system development implications of the unplanned alternative, together with a comparison of the unplanned alternative with the recommended plan and an evaluation of these two alternatives in terms of the recommended regional development objectives.

### LAND USE FORECAST METHODOLOGY

The methodology applied in the preparation of the land use pattern chosen to represent the unplanned alternative was similar, with respect to the data inputs, graphical analyses, and land use demand projection and allocation processes, to the methodology applied in the preparation of the alternative regional land use plans, as described in Volume 2 of this report. Many of the constraints placed upon the spatial allocation of land use by the recommended regional land use development objectives and standards were, however, removed; and in the assignment of land use activities to subareas of the Region, a heavy reliance was placed on the probable continuation of the land development trends which occurred within the Region from 1950 to 1963 as established by the planning inven-

tories and analyses. In the preparation of the unplanned alternative land use pattern, it was assumed that heavy reliance would continue to be placed on the use of on-site sewage disposal systems and that the resource amenities of the Region, particularly its surface waters and woodlands, would continue to exert a strong attraction for residential development.

One major constraint was placed on the continuation of historic development trends, that of the probable effect of adopted local plans and plan implementation devices. It should be reemphasized that the concept of an unplanned alternative, as used herein, relates to the absence of planning and plan implementation on an areawide and not on a local basis. To provide a meaningful sensitivity analysis of the ability of the recommended transportation plan to adapt to, and function under, a land use pattern different from that recommended by the regional land use plan, it was considered desirable to explore an unplanned alternative which would provide a population distribution within the Region which would be significantly different from that provided by implementation of the recommended land use plan. It was, therefore, assumed that land use development within the Region would conform to the development proposals expressed in the local land use plans and zoning ordinances and that the development proposals expressed in these plans and ordinances would be carried out in the absence of any attempt to coordinate these plans and ordinances on an areawide basis. The regional land use forecasts prepared on the basis of recent historic development trends, and described in Chapter III of Volume 2 of this report, were accordingly allocated to subareas (counties) of the Region on the basis of the expected changes in residential land use implied by the adopted community plans and zoning ordinances, as set forth in Chapter VI of Volume 1 of this report. Residential land use was chosen as the basis for the distribution of all urban land uses under the unplanned alternative because residential land uses comprise an overwhelming proportion of all urban land uses. After allocation of future land use development to each subarea of the Region was accomplished, conventional land use planning techniques were used to determine the probable specific spatial distribution of the allocated future land use development within the subareas of the Region. The conventional techniques utilized the detailed knowledge of the physical characteristics of the subareas and local development proposals provided by the regional plan-

ning inventories. These conventional planning techniques were further supplemented by the application of land use simulation model techniques, as described in Chapter V of this volume.

**THE UNPLANNED ALTERNATIVE—LAND USE**  
Historic growth trends within the Region, under the unplanned alternative selected for exploration, would be altered as dictated by the aggregate effects of local community plans and plan implementation policies. The need to restrict intensive urban development to those areas of the Region having both soils suitable for such development and gravity drainage sanitary sewer service readily available would not be recognized, as it would by implementation of the recommended land use plan. The need to protect the floodways and flood plains of the perennial streams, the best remaining woodlands and wetlands, the best remaining wildlife habitat, and the best remaining agricultural areas would be ignored, as would the value of developing an integrated system of park and open-space areas centered on the primary environmental corridors of the Region. Failure to recognize these needs and values has, indeed, been the case in many areas of the Region in the past, as attested to by growing environmental problems.<sup>1</sup>

Under the unplanned alternative, the allocation of future land use within each county of the Region would be such as to approximate, to the maximum extent possible, the proposals contained in existing community development plans and zoning documents. The county population levels would, under the unplanned alternative, vary significantly from the demographic forecast levels, due to the assumed influence of the local community plans and zoning ordinances. An understanding of the regional growth pattern which would result from the unplanned alternative can be obtained from review of the graphical presentation of this alternative shown on Map 21 and of the statistical presentations set forth in Tables 27 through 41 in this chapter.

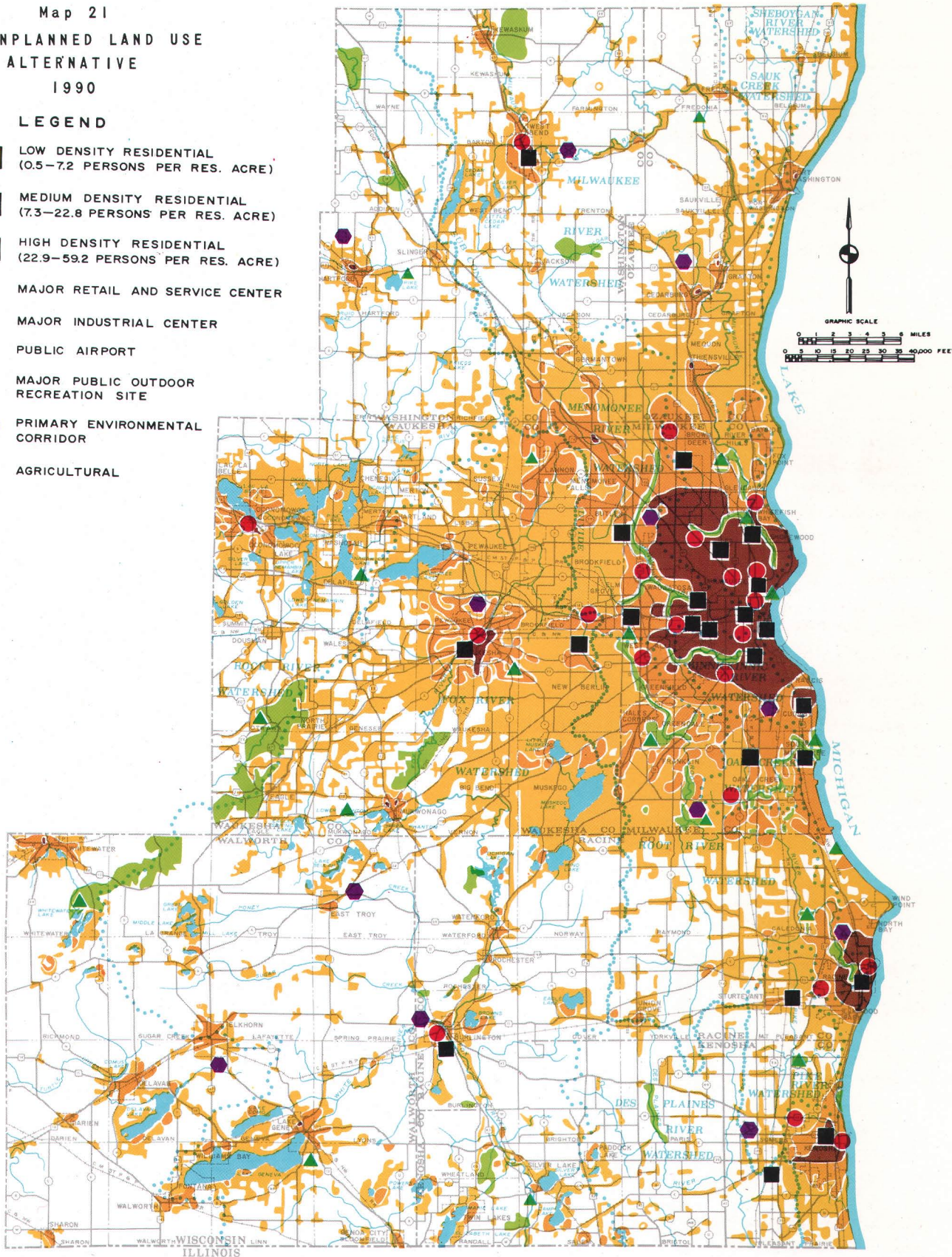
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<sup>1</sup> *The Water Resources Act recently enacted by the Wisconsin Legislature as Chapter 614, Laws of 1965, empowers the State Department of Resource Development to adopt shoreland and flood plain zoning ordinances in certain instances and to establish standards for flood plain and shoreland zoning. The execution of these and other provisions of this act, in the absence of an areawide land use plan, would assist in protecting the floodways and flood plains of perennial streams and in preserving certain adjacent wetlands; but the full value of this act cannot be achieved in the absence of sound areawide development plans.*

Map 21  
 THE UNPLANNED LAND USE  
 ALTERNATIVE  
 1990

LEGEND

- LOW DENSITY RESIDENTIAL  
(0.5-7.2 PERSONS PER RES. ACRE)
- MEDIUM DENSITY RESIDENTIAL  
(7.3-22.8 PERSONS PER RES. ACRE)
- HIGH DENSITY RESIDENTIAL  
(22.9-59.2 PERSONS PER RES. ACRE)
- MAJOR RETAIL AND SERVICE CENTER
- MAJOR INDUSTRIAL CENTER
- PUBLIC AIRPORT
- MAJOR PUBLIC OUTDOOR RECREATION SITE
- PRIMARY ENVIRONMENTAL CORRIDOR
- AGRICULTURAL



This map depicts one of the many possible land use patterns which could evolve within the Region in the absence of any efforts to guide development on an areawide basis in the public interest. This pattern would result in the reduction of urban population densities to about 2,700 persons per square mile, would require the conversion of 418 square miles of rural land to urban use, and would result in greatly increased utilization of shallow private wells and on-site sewage disposal systems. In addition, development, such as this, could be expected to result in a continued deterioration and destruction of the natural resource base.

### Residential Development

The land use pattern which would result from the unplanned alternative would accommodate the expected regional population increase of 1 million persons by 1990, primarily through a continued outward expansion of existing urban areas. Leapfrog residential development in outlying areas of the Region could be expected to continue in the absence of any enforcement of rural development standards in these outlying areas and through continued heavy reliance upon very low residential development densities.

Under the unplanned alternative explored, only 63 percent of all new urban residential development within the Region would be located within 20 miles of the central business district of Milwaukee, as compared to 74 percent under the recommended land use plan. Future residential development within the Region would occur primarily at low densities, as contrasted with the primary reliance upon medium-density development proposed in the recommended plan; and new urban residential development would consist primarily of single-family housing on relatively large lots. The location of such housing within planned residential development units, as necessary to meet the recommended regional development objectives and standards, would be far more difficult to achieve under the unplanned alternative than under the recommended land use plan. Many of the advantages relating to such planned development units, both in terms of attractive and stable residential areas and in terms of efficiency and economy in the provision of community facilities and services, would consequently be lost.

As indicated in Table 27, more than 171,000 acres of new residential development would be added to the existing stock of residential land within the Region under the unplanned alternative, almost two and one-half times as much as under the recommended land use plan. Nearly 89 percent of this additional residential acreage would be developed at low densities, with net lot sizes ranging from one-half to five acres per dwelling unit and gross population densities ranging from 350 to 3,499 persons per square mile. This is in sharp contrast to the recommended plan wherein nearly 76 percent of the additional residential acreage would be developed at medium densities, with net lot sizes ranging from about 6,300 to 19,800 square feet per dwelling unit and gross population densities ranging from 3,500 to about 10,000 persons per square mile.

### Population Distribution

Under the unplanned alternative, future population levels within Ozaukee, Walworth, Washington, and Waukesha counties would be significantly greater than those indicated by the demographic forecast levels set forth in Chapter III of Volume 2 of this report and as proposed by the recommended land use plan (see Table 28). The three urbanized counties of Kenosha, Milwaukee, and Racine would each experience significantly smaller population increases. These major departures from the forecast population levels reflect the probable effects of a continuation of historic development trends and of the assumed influence of the adopted local community plans and zoning ordinances on future population distribution within the Region.

As indicated in Volume 1 of this report, urban population densities within the Region have been declining sharply since 1920; and under the unplanned alternative, this sharp decline could be expected to continue. As indicated in Table 29, the population density of the developed area of the Region would, under the unplanned alternative, decrease from the 1963 level of approximately 4,800 persons per square mile to a 1990 density of about 2,700 persons per square mile. In contrast, the recommended land use plan would more than double the population density of all new urban development within the Region over that which would prevail if existing trends were allowed to continue within the Region uncontrolled on an areawide basis in the public interest. The recommended land use plan seeks to provide an overall urban population density of about 4,400 persons per square mile within the Region by 1990. This will require a reversal of historic trends in land use development densities within the Region. Failure to accomplish this reversal will continue to present the local governments within the Region with all of the many problems attendant to highly dispersed low-density residential development, including incomplete neighborhoods requiring extensive urban services which can only be provided inefficiently and at a high cost. Failure to accomplish this reversal will also result in the continued breakup of economical farm units, leaving a residual of scattered under developed and undeveloped areas of land which lack potential for either good rural or urban development. Finally, failure to accomplish this reversal will greatly intensify environmental problems within the Region and will result in continued deterioration and destruction of such elements of the

Table 27  
 URBAN AND RURAL LAND USE IN THE REGION: 1963, 1990 RECOMMENDED LAND USE PLAN,  
 AND 1990 UNPLANNED ALTERNATIVE

Land Use Category	Existing (1963)		Increment 1963 - 1990			
	Acres	Percent of Major Category	Planned		Unplanned	
			Acres	Percent Change	Acres	Percent Change
<b>Urban Land Use</b>						
<i>Residential</i>	<i>129,358</i>	<i>44.6</i>	<i>71,187</i>	<i>55.0</i>	<i>171,818</i>	<i>132.8</i>
High-Density . . . .	34,463	11.9	2,790	8.0	466	1.3
Medium-Density . . .	24,748	8.5	53,784	217.3	18,851	76.1
Low-Density . . . .	70,147	24.2	14,613	20.8	152,503	217.4
Commercial <sup>a</sup> . . . .	6,706	2.3	5,048	75.2	5,950	88.7
Industrial <sup>a</sup> . . . .	9,746	3.4	5,123	52.5	4,812	49.3
Governmental <sup>b</sup> . . . .	14,722	5.1	9,573	65.0	8,904	60.4
Transportation <sup>c</sup> . . . .	96,117	33.1	28,623	29.7	70,215	73.0
Recreation . . . . .	33,262 <sup>d</sup>	11.5	8,718 <sup>e</sup>	26.2	5,762 <sup>e</sup>	17.3
<b>Total Urban Use</b>	<b>289,911</b>	<b>100.0</b>	<b>128,272</b>	<b>44.2</b>	<b>267,461</b>	<b>92.2</b>
<b>Rural Land Use</b>						
<i>Agriculture</i>	<i>1,085,144</i>	<i>75.8</i>	<i>-102,837</i>	<i>- 9.4</i>	<i>-238,328</i>	<i>-21.9</i>
Prime Agriculture . .	443,952	31.0	- 21,267	- 4.7	- 68,591	-15.4
Other Agriculture . .	641,192	44.8	- 81,570	-12.7	-169,737	-26.4
Other Open Lands <sup>f</sup> . . .	345,951	24.2	- 25,435	- 7.3	- 29,133	- 8.4
<b>Total Rural Land Use</b>	<b>1,431,095</b>	<b>100.0</b>	<b>-128,272</b>	<b>- 8.9</b>	<b>-267,461</b>	<b>-18.6</b>
<b>Total</b>	<b>1,721,006</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>

<sup>a</sup> Includes on-site parking.

<sup>b</sup> Includes institutional uses and on-site parking.

<sup>c</sup> Includes communications and utilities uses.

<sup>d</sup> Includes the entire site areas of public and nonpublic recreation sites.

<sup>e</sup> Includes only that increment recommended for public recreation uses.

<sup>f</sup> Includes woodlands, water, wetlands, and quarries.

Note: Figures in italics indicate subtotals.

Source: SEWRPC.

resource base as the quality and productivity of wildlife habitat.

Sewer and Water Service

The unplanned alternative would require the conversion of more than 653 square miles of land within the Region from rural to urban use by 1990 and would increase the developed area of the Region by more than 192 percent. Under the unplanned alternative, only about 55 percent of the total developed area of the Region could be readily provided in 1990 with public sanitary sewer facilities (see Table 30) tributary to existing and locally proposed systems and by public water supply facilities. About one-half of all new development

within the Region would, under the unplanned alternative, be located in gravity drainage areas tributary to existing or locally proposed sanitary sewerage facilities; and the highly dispersed low-density characteristics of the residential development would place many new developments beyond logical or feasible extensions of such existing or proposed systems.

The unplanned alternative would result in a continued emphasis upon not only low-density residential development but upon the concomitant widespread utilization of shallow private wells and domestic septic tank systems rather than upon centralized municipal water supply and sew-

**Table 28**  
**POPULATION DISTRIBUTION IN THE REGION BY COUNTY: 1963, 1990**  
**RECOMMENDED LAND USE PLAN, AND 1990 UNPLANNED ALTERNATIVE**  
 (Population in Thousands)

County	Existing (1963)		Increment 1963-1990				Total 1990			
	Number	Percent of Total	Planned		Unplanned		Planned		Unplanned	
			Number	Percent Change	Number	Percent Change	Number	Percent of Total	Number	Percent of Total
Kenosha . . . . .	106.7	6.4	95.3	89.3	34.1	31.9	202.0	7.5	140.8	5.2
Milwaukee . . . . .	1,086.3	64.9	359.7	33.1	138.5	12.7	1,446.0	54.0	1,224.8	45.7
Ozaukee . . . . .	41.6	2.5	64.4	154.8	118.4	284.6	106.0	4.0	160.0	6.0
Racine . . . . .	150.6	9.0	132.4	87.9	105.4	69.6	283.0	10.6	256.0	9.6
Walworth . . . . .	55.5	3.3	31.5	56.7	77.3	139.2	87.0	3.2	132.8	5.0
Washington . . . . .	49.5	2.9	46.5	93.9	76.3	154.1	96.0	3.6	125.8	4.7
Waukesha . . . . .	184.2	11.0	273.8	148.6	453.6	246.2	450.0	17.1	637.8	23.8
Regional Total	1,674.4	100.0	1,003.6	59.9	1,003.6	59.9	2,678.0	100.0	2,678.0	100.0

Source: SEWRPC.

**Table 29**  
**DEVELOPED AREA AND POPULATION DENSITY IN THE REGION: 1963, 1990**  
**RECOMMENDED LAND USE PLAN, AND 1990 UNPLANNED ALTERNATIVE**

	Existing (1963)	Increment 1963-1990				Total 1990	
		Planned		Unplanned		Planned	Unplanned
		Number	Percent	Number	Percent		
Square Miles of Developed Area <sup>a</sup> . . . . .	340	269	79.1	653	191.7	609	993
Urban Population . . . . .	1,634,200	1,017,220	62.2	1,017,220	62.2	2,651,220	2,651,220
Population Per Square Miles of Developed Area . . . . .	4,807	3,782	78.6	1,560	32.4	4,353	2,673

<sup>a</sup> Determined by measuring the extent of uninterrupted urban development (see footnote 1, Chapter V, Volume 1, SEWRPC Planning Report No. 7).

Source: SEWRPC.

erage facilities. The impact of such development upon surface water quality within the Region is extremely difficult to forecast because, unlike sewage treatment plant effluent, septic tank effluent is usually discharged to streams only indirectly after percolation through the soil and dilution by both surface and ground water.<sup>2</sup> Moreover, other environmental problems attendant to the widespread utilization of on-site septic tank sewage disposal facilities and private wells would probably far outweigh any consideration of the effects of the use of such sewage disposal facilities on surface water quality. Continued widespread use of shallow wells could be expected to result in a continued decline of ground water levels in the shallow aquifers under and near areas of heavy collective withdrawals, with the attendant creation

of water supply problems. Continued widespread use of septic tank sewage disposal systems could be expected to subject the shallow ground water aquifers to pollution in more numerous locations involving larger and larger areas, with serious attendant public health problems. Odor and drainage problems could be expected to continue to develop where residential development is located on soils poorly suited for septic tank filter field utilization. As noted in Volume 1 of this report, such soils are widespread, covering over 50 percent of the total land area of the Region.

Under the unplanned alternative, over 305 square miles, or 47 percent, of all new development within the Region would probably have to rely on shallow wells; and over 321 square miles, or 49 percent, of the new development within the Region would have to rely on domestic septic tank sewage disposal systems. Consequently, by

<sup>2</sup> See SEWRPC Technical Report No. 4, *Water Quality and Flow of Streams in Southeastern Wisconsin*, November 1966.



Table 30  
DEVELOPED AREA AND POPULATION SERVED BY PUBLIC SANITARY SEWER SERVICE  
AND PUBLIC WATER SUPPLY IN THE REGION: 1963, 1990 RECOMMENDED  
LAND USE PLAN, AND 1990 UNPLANNED ALTERNATIVE

Extent of Service	Existing (1963)		Increment 1963 - 1990			
			Planned		Unplanned	
	Public Sewer Service	Public Water Supply	Public Sewer Service	Public Water Supply	Public Sewer Service	Public Water Supply
Developed Area:						
Total Square Miles . .	339.7	339.7	269.3	269.3	653.2	653.2
Square Miles Served .	217.0	200.0	362.9	379.9	331.5	348.5
Percent of Total Served . . . . .	63.9	58.8	---	---	---	---
Population:						
Total Population . . .	1,674,400	1,674,400	1,003,600	1,003,600	1,003,600	1,003,600
Population Served . .	1,419,025	1,372,480	1,127,645	1,174,190	570,175	616,720
Percent of Total Served . . . . .	84.7	81.9	---	---	---	---

Extent of Service	Existing (1963)		Total 1990			
			Planned		Unplanned	
	Public Sewer Service	Public Water Supply	Public Sewer Service	Public Water Supply	Public Sewer Service	Public Water Supply
Developed Area:						
Total Square Miles . .	339.7	339.7	609.0	609.0	992.9	992.9
Square Miles Served .	217.0	200.0	579.9	579.9	548.5	548.5
Percent of Total Served . . . . .	63.9	58.8	95.2	95.2	55.2	55.2
Population:						
Total Population . . .	1,674,400	1,674,400	2,678,000	2,678,000	2,678,000	2,678,000
Population Served . .	1,419,025	1,372,480	2,546,670	2,546,670	1,989,200	1,989,200
Percent of Total Served . . . . .	84.7	81.9	95.0	95.0	74.3	74.3

Source: SEWRPC.

1990 only about 74 percent of the total population could be expected to be served by public sanitary sewer and water supply facilities. In 1963 about 217 square miles, or 64 percent, of the developed area of the Region and about 85 percent of the total population of the Region were served by public sanitary sewer facilities. About 200 square miles, or 59 percent, of the developed area of the Region and about 82 percent of the population of the Region were served by public water supply facilities. In sharp contrast to the unplanned alternative, the recommended land use plan would make possible the provision of public sewer and water supply facilities to all new residential development and would, by 1990, facilitate the provision of public sewer and water service to more than

95 percent of the total developed area of the Region and 95 percent of the total population.

Commercial and Industrial Development

Table 27 indicates the commercial and industrial land use changes which may be expected to occur within the Region under the unplanned alternative. More than 5,900 acres of commercial development and 4,800 acres of industrial development would be added to the existing stock of these land use categories. The number and location of major industrial centers would, under the unplanned alternative, be the same as under the recommended land use plan. The unplanned alternative would, however, provide for only 21 major multi-purpose commercial centers, six of which would

be new, four less than the recommended land use plan. Under the unplanned alternative, it would be difficult to make provision for new major multi-purpose commercial centers; and because of the highly dispersed pattern of new residential development, the trade areas of many existing major multi-purpose commercial centers may have to become so great in areal extent in order to provide the necessary tributary population that convenient access to these commercial centers from residential areas may be significantly reduced. It is, therefore, probable that, under the unplanned alternative, a marked proliferation of highway-oriented commercial development would occur in response to the need for commercial outlets readily accessible to residential areas. Consequently, the unplanned alternative is expected to increase the existing stock of commercial land by more than 5,900 acres, as opposed to the approximately 5,000-acre increase provided for in the recommended land use plan. It should be noted that the contemplated increases in both commercial and industrial land use within the Region, under the unplanned alternative, would not absorb all of the land area set aside for such use in the local plans and zoning ordinances.

Employment Distribution

Table 31 indicates the estimated total number of jobs existing in each county within the Region in 1963 and the incremental growth to 1990 that could be expected to occur under both the recommended land use plan and the unplanned alternative. As

indicated, the future county employment levels, under the unplanned alternative, would vary significantly from those proposed under the recommended plan.

Governmental and Transportation Land Uses

As indicated in Table 27, the unplanned alternative would add more than 8,900 acres of governmental land uses and over 70,000 acres of transportation land uses to the existing stock in these categories. While the increase in governmental land uses is less under the unplanned alternative, the increase in the transportation land use category is significantly higher than would be required under the recommended land use plan. This marked increase in the amount of land to be devoted to transportation, communication, and utility land uses would be brought about by the greatly increased mileage of collector and local streets required to serve the highly dispersed low-density residential development with transportation and land-access services.

Open Space—Recreational Land Use

Under the unplanned alternative, the amount of land devoted to outdoor recreational use within the Region would be increased by only 5,800 acres, or 17 percent, by 1990. This is in sharp contrast to the recommended plan, which would propose to increase the existing stock of recreational land by 8,700 acres, or 26 percent, over the same period (see Table 27). The primary reason for this important difference is that the unplanned alternative would provide for only 20 major

Table 31

EMPLOYMENT DISTRIBUTION IN THE REGION BY COUNTY: 1963, 1990  
RECOMMENDED LAND USE PLAN, AND 1990 UNPLANNED ALTERNATIVE  
(Employment in Thousands)

County	Existing (1963)		Increment 1963-1990				Total 1990			
	Number	Percent of Total	Planned		Unplanned		Planned		Unplanned	
			Number	Percent Change	Number	Percent Change	Number	Percent of Total	Number	Percent of Total
Kenosha . .	41.9	6.6	38.1	90.9	22.3	- 53.2	80.0	8.1	64.2	6.5
Milwaukee .	471.7	74.3	156.0	30.9	104.0	- 22.0	627.7	63.8	575.7	58.5
Ozaukee . .	10.8	1.7	15.7	145.3	26.2	242.5	26.5	2.7	37.0	3.8
Racine . . .	52.1	8.2	45.0	86.3	40.5	- 77.7	97.1	9.9	92.6	9.4
Walworth . .	12.7	2.0	9.4	74.0	20.2	159.0	22.1	2.2	32.9	3.4
Washington	12.1	1.9	14.0	115.7	19.6	161.9	26.1	2.7	31.7	3.2
Waukesha . .	33.6	5.3	70.9	211.0	116.3	346.1	104.5	10.6	149.9	15.2
Regional Total	634.9	100.0	349.1	54.9	349.1	54.9	984.0	100.0	984.0	100.0

Source: SEWRPC.

regional parks, while the recommended land use plan provides for 26 such parks. In addition, the unplanned alternative could be expected to result in the preservation of only 47,000 acres, or about 15 percent, of the gross primary environmental corridor area within the Region; and much of this acreage is already in public ownership or immediately adjacent to large public landholdings. In contrast, the recommended plan would protect about 283,000 acres, or 91 percent, of the gross primary environmental corridor area.

#### Open Space—Agricultural and Other Open-Land Uses

Under the unplanned alternative, the expansion of urban activities into presently rural areas of the Region would result in the conversion of more than 267,000 acres of rural land uses to urban uses between 1963 and 1990. This would be equivalent to an average annual rate of conversion of about 10,000 acres, or 16 square miles. As indicated in Table 27, much of the urban expansion, over 238,000 acres, would take place on land that is now in agricultural use and would result in a decrease of about 22 percent in the existing stock of agricultural land within the Region. The recommended land use plan would require the conversion of only 103,000 acres, or 9 percent, of the existing stock of such land by 1990. Moreover, the unplanned alternative would result in the conversion of about 69,000 acres, or 15 percent, of the remaining prime agricultural lands, while the recommended plan would require the conversion of only 21,000 acres, or 5 percent, of these lands.

The other major open-land category, consisting of woodlands, water, wetlands, and quarries, would be reduced within the Region, under the unplanned alternative, by about 29,000 acres, or 8 percent. The predominant land use within this category which would be subject to urban development is that of woodlands, although under the unplanned alternative it is likely that some important wetland areas would be filled and developed. Under the recommended land use plan, the existing stock of open lands would be reduced by 25,000 acres, or 7 percent.

#### THE UNPLANNED ALTERNATIVE— TRANSPORTATION

The recommended transportation system plan, as described in Chapter III of this volume, was designed to serve and promote the recommended regional land use plan, meeting the anticipated future travel demand generated by that plan at

an adequate level of service. Implementation of both the recommended land use plan and the recommended transportation plan would provide a balanced transportation system with appropriate types of highway and transit facilities provided for the various subareas of the Region, and would serve to abate traffic congestion, reduce travel time and costs between component parts of the Region, and reduce accident exposure. Because responsibility for major transportation facility development is centered in a relatively few agencies which have areawide jurisdiction, because these agencies have experienced engineering staffs which recognize the importance of long-range planning, and because major transportation facility development is highly coordinated at the federal and state levels through the administration of highway construction aids, transportation system development within the Region will not in any case proceed on a completely unplanned basis. If land use within the Region were to develop on an unplanned basis, the important question is then raised as to whether the recommended transportation system would function properly as proposed or whether major modifications in that system would be necessary to accommodate the markedly different patterns of land use which could emerge from unplanned development. As already noted, unplanned development could result in a number of greatly differing regional land use patterns. The unplanned land use alternative selected for exploration, however, provides a significantly different population distribution within the Region than that proposed by the recommended land use plan. It, therefore, provides a rigorous test of the ability of the recommended transportation system to adapt to, and function properly under, the demands of a radically different land use pattern. Moreover, any actual divergence of land use development within the Region from the recommended plan should result in a future spatial distribution of land use which occupies a place somewhere in the spectrum between the pattern indicated on the recommended plan and that indicated on the unplanned land use development alternative chosen for exploration.

Accordingly, the quantity and spatial location of the demand for transportation service generated by the unplanned land use pattern was determined and assigned to the highway and transit systems proposed in the recommended transportation plan. The ability of these systems to meet this assigned demand was then analyzed. In the derivation of the future traffic demand from the unplanned

alternative, all of the traffic simulation models described in Volume 2 of this report were applied at the traffic analysis zone level. Presentation of the resulting detailed traffic demand data in conventional report format is impractical, but it is important to note that these detailed data are available from SEWRPC files upon specific request. For the purpose of presenting the traffic demand data in this report, it was necessary to aggregate the detailed zonal data to obtain regional totals which could be used to present and analyze the transportation implications of the unplanned alternative at the regional scale.

#### Quantity of Future Traffic Demand

It is estimated that the land use pattern which would result from the unplanned alternative would generate a total of 6,287,000 internal person trips within the Region on an average weekday in 1990, as indicated in Table 32. This represents an increase of about 4 percent over the recommended land use plan. The unplanned alternative would generate slightly more internal person trips in each of the major tripmaking categories, except home-based school, than would the recommended land use plan. The differences, however, are not considered significant for regional transportation system planning purposes. The average number of internal person trips generated per capita and per household is also estimated to be slightly greater under the unplanned alternative than under the recommended land use plan, with 2.35 person trips per capita and 7.91 person trips per household being generated under the unplanned alternative versus 2.25 person trips per capita and 7.57 person trips per household being generated under the recommended land use plan.

Average internal auto driver trip lengths within the Region, expressed in minutes of travel time, are anticipated to increase somewhat more under the unplanned land use alternative than under the recommended plan (see Table 33). The average transit trip lengths within the Region, expressed in minutes of travel time, would be slightly shorter under the unplanned alternative than under the recommended land use plan (see Table 34). The greater prevalence of scattered low-density residential development under the unplanned alternative would be extremely difficult to serve economically with transit facilities, and this would tend to discourage utilization of public transit for all but the shorter trips within the most intensely urbanized areas of the Region. Consequently, transit trips under the unplanned alternative could be expected to be generally shorter in length and would be concentrated in the predominantly medium- and high-density residential areas.

#### Mode of Travel

Transit trip production within the Region on an average weekday would be lower under the unplanned alternative than under the recommended land use plan (see Table 35). Under the unplanned alternative, an 18.8 percent decrease in transit tripmaking from the 1963 levels of transit tripmaking may be anticipated. This decrease would be consistent with historic trends in transit utilization within the Region and would be the result of the continued proliferation of scattered low-density residential development over large areas of the Region. As further indicated, transit person trip generation within the Region would vary somewhat among the various tripmaking categories between the unplanned alternative and the recommended

Table 32  
INTERNAL PERSON TRIP GENERATION<sup>a</sup> IN THE REGION BY TRIP PURPOSE: 1963, 1990  
RECOMMENDED TRANSPORTATION PLAN, AND 1990 UNPLANNED ALTERNATIVE

Trip Purpose Category	Survey (1963) <sup>b</sup>		Total 1990				Percent Change 1963 - 1990	
			Recommended Plan		Unplanned Alternative		Recommended Plan	Unplanned Alternative
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total		
Home-Based Work . . . .	1,008,000	28.0	1,478,000	24.5	1,524,000	24.3	46.6	51.2
Home-Based Shopping . .	516,000	14.3	1,031,000	17.1	1,084,000	17.2	99.8	110.1
Home-Based School . . .	309,000	8.5	335,000	5.6	335,000	5.3	8.4	8.4
Home-Based Other <sup>c</sup> . . .	1,131,000	31.4	2,136,000	35.5	2,271,000	36.1	88.5	100.8
Non-Home-Based . . . .	639,000	17.8	1,042,000	17.3	1,073,000	17.1	63.0	67.9
<b>Total</b>	<b>3,603,000</b>	<b>100.0</b>	<b>6,022,000</b>	<b>100.0</b>	<b>6,287,000</b>	<b>100.0</b>	<b>67.1</b>	<b>74.5</b>

<sup>a</sup> Trips generated on an average weekday.

<sup>b</sup> All 1963 origin and destination home interview survey data were increased by 17 percent to meet observed traffic volumes crossing selected screen lines.

<sup>c</sup> Home-Based Other trips include personal business, medical, dental, social, and recreation trip purposes.

Source: SEWRPC.

Table 33

AVERAGE TRIP LENGTH IN MINUTES FOR INTERNAL AUTO DRIVER TRIPS IN THE REGION:  
1963, 1990 RECOMMENDED TRANSPORTATION PLAN, AND 1990 UNPLANNED ALTERNATIVE

Trip Purpose Category	Survey (1963) <sup>a</sup>	Total 1990		Percent Change 1963 - 1990	
		Recommended Plan	Unplanned Alternative	Recommended Plan	Unplanned Alternative
	Average Length (Minutes)	Average Length (Minutes)	Average Length (Minutes)		
Home-Based Work . . . .	17.87	18.10	19.07	1.3	6.7
Home-Based Shopping . .	9.20	9.75	10.14	6.0	10.2
Home-Based Other <sup>b</sup> . . .	12.38	12.98	13.78	4.8	11.3
Non-Home-Based. . . . .	12.55	12.87	13.32	2.5	6.1
Weighted Average	13.74	13.87	14.56	0.9	6.0

<sup>a</sup> All 1963 origin and destination home interview survey data were increased by 17 percent to meet observed traffic volumes crossing selected screen lines.

<sup>b</sup> Home-Based Other trips include personal business, medical, dental, social, and recreation trip purposes, but not school trips.

Source: SEWRPC.

Table 34

AVERAGE TRIP LENGTH IN MINUTES FOR INTERNAL TRANSIT TRIPS IN THE REGION:  
1963, 1990 RECOMMENDED TRANSPORTATION PLAN, AND 1990 UNPLANNED ALTERNATIVE

Trip Purpose Category	Survey (1963) <sup>a</sup>	Total 1990		Percent Change 1963 - 1990	
		Recommended Plan	Unplanned Alternative	Recommended Plan	Unplanned Alternative
	Average Length (Minutes)	Average Length (Minutes)	Average Length (Minutes)		
Home-Based Work . . . . .	35.89	37.86	34.40	5.5	-4.2
Home-Based Shopping . .	28.50	25.52	26.26	-10.5	-7.9
Home-Based Other <sup>b</sup> . . .	32.51	32.57	30.97	0.2	-4.7
Non-Home-Based . . . . .	28.37	30.72	28.22	8.3	-0.5
Weighted Average	33.63	34.64	32.13	3.0	-4.5

<sup>a</sup> All 1963 origin and destination home interview survey data were increased by 17 percent to meet observed traffic volumes crossing selected screen lines.

<sup>b</sup> Home-Based Other trips include personal business, medical, dental, social, and recreation trip purposes, but not school trips.

Source: SEWRPC.

land use plan. The greatest variation would occur in the home-based school trip category. Because of the difficulty of providing economical transit service to low-density residential areas, more of the trips in this category would have to be made by school bus or automobile under the unplanned alternative than under the recommended land use plan. The continued emphasis upon low-density development would also result in a 10 percent reduction in home-based shopping trips from the

1963 levels, whereas the recommended land use plan would result in a slight increase in transit tripmaking in this category.

As indicated in Table 36, auto driver person trip generation within the Region on an average week-day would not vary significantly among the various tripmaking categories between the unplanned alternative and the recommended land use plan. As noted earlier, the unplanned alternative is expected

Table 35

INTERNAL TRANSIT PERSON TRIP GENERATION<sup>a</sup> IN THE REGION BY TRIP PURPOSE: 1963, 1990  
RECOMMENDED TRANSPORTATION PLAN, AND 1990 UNPLANNED ALTERNATIVE

Trip Purpose Category	Survey (1963) <sup>b</sup>		Total 1990				Percent Change 1963 - 1990	
			Recommended Plan		Unplanned Alternative			
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	Recommended Plan	Unplanned Alternative
Home-Based Work . . . . .	154,000	47.5	129,000	36.5	107,000	40.7	-16.2	-30.5
Home-Based Shopping . . . . .	30,000	9.3	31,000	8.8	27,000	10.3	3.3	-10.0
Home-Based School . . . . .	60,000	18.5	144,000	40.8	86,000	32.7	140.0	43.3
Home-Based Other <sup>c</sup> . . . . .	50,000	17.0	34,000	9.6	31,000	11.8	-38.2	-43.6
Non-Home-Based . . . . .	25,000	7.7	15,000	4.3	12,000	4.5	-40.0	-52.0
Total	324,000	100.0	353,000	100.0	263,000	100.0	-9.0	-18.8

<sup>a</sup> Trips generated on an average weekday.

<sup>b</sup> All 1963 origin and destination home interview survey data were increased by 17 percent to meet observed traffic volumes crossing selected screen lines.

<sup>c</sup> Home-Based Other trips include personal business, medical, dental, social, and recreation trip purposes.

Source: SEWRPC.

Table 36

INTERNAL AUTO DRIVER PERSON TRIP GENERATION IN THE REGION BY TRIP PURPOSE:  
1963, 1990 RECOMMENDED TRANSPORTATION PLAN, AND 1990 UNPLANNED ALTERNATIVE

Trip Purpose Category	Survey (1963) <sup>a</sup>		Total 1990				Percent Change 1963 - 1990	
			Recommended Plan		Unplanned Alternative			
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	Recommended Plan	Unplanned Alternative
Home-Based Work . . . . .	699,000	32.3	1,104,000	28.0	1,165,000	27.8	57.9	66.7
Home-Based Shopping . . . . .	317,000	14.6	646,000	16.4	698,000	16.7	103.8	120.2
Home-Based School . . . . .	24,000	1.1	24,000	0.6	24,000	0.6	0.0	0.0
Home-Based Other <sup>b</sup> . . . . .	675,000	31.2	1,376,000	35.0	1,481,000	35.4	103.8	119.4
Non-Home-Based . . . . .	451,000	20.8	788,000	20.0	817,000	19.5	74.7	81.2
Total	2,166,000	100.0	3,938,000	100.0	4,185,000	100.0	81.8	93.2

<sup>a</sup> All 1963 origin and destination home interview survey data were increased by 17 percent to meet observed traffic volumes crossing selected screen lines.

<sup>b</sup> Home-Based Other trips include personal business, medical, dental, social, and recreation trip purposes.

Source: SEWRPC.

to generate fewer home-based shopping trips by transit than the recommended plan, with an attendant increase in auto driver person trips in this tripmaking category. As indicated in Table 37, total automobile person trips generated within the Region on an average weekday in 1990 would be slightly greater under the unplanned alternative than under the recommended land use plan. The variations in the respective tripmaking categories are, however, not considered significant for regional transportation planning purposes.

Total vehicle trip generation within the Region on an average weekday in 1990 may be expected to be approximately 5 percent greater under the

unplanned alternative than under the recommended land use plan. As indicated in Table 38, all of this increase would occur in internal automobile tripmaking.

#### Pattern of Future Vehicle Trips

The increased vehicular travel demand generated by the unplanned alternative would not be significantly different in spatial distribution from that generated by the recommended land use plan. The future regional traffic pattern would remain predominantly radial centering on the City of Milwaukee, with the highest travel desire line densities occurring in Milwaukee County and in eastern Waukesha, Racine, and Kenosha counties. The

Table 37

INTERNAL AUTOMOBILE PERSON TRIP<sup>a</sup> GENERATION IN THE REGION BY TRIP PURPOSE:  
1963, 1990 RECOMMENDED TRANSPORTATION PLAN, AND 1990 UNPLANNED ALTERNATIVE

Trip Purpose Category	Survey (1963) <sup>b</sup>		Total 1990				Percent Change 1963 - 1990	
			Recommended Plan		Unplanned Alternative		Recommended Plan	Unplanned Alternative
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total		
Home-Based Work . . . .	854,000	27.0	1,349,000	24.1	1,417,000	24.0	58.0	65.9
Home-Based Shopping . .	486,000	15.4	1,000,000	17.8	1,057,000	17.9	105.8	117.5
Home-Based School . . .	129,000	4.1	129,000	2.3	129,000	2.2	0.0	0.0
Home-Based Other <sup>c</sup> . . .	1,076,000	34.1	2,101,000	37.5	2,240,000	37.9	95.3	108.2
Non-Home-Based . . . .	614,000	19.4	1,027,000	18.3	1,061,000	18.0	67.3	72.8
<b>Total</b>	<b>3,159,000</b>	<b>100.0</b>	<b>5,606,000</b>	<b>100.0</b>	<b>5,904,000</b>	<b>100.0</b>	<b>77.5</b>	<b>86.9</b>

<sup>a</sup> Comprised of auto drivers and auto passengers.

<sup>b</sup> All 1963 origin and destination home interview survey data were increased by 17 percent to meet observed traffic volumes crossing selected screen lines.

<sup>c</sup> Home-Based Other trips include personal business, medical, dental, social, and recreation trip purposes.

Source: SEWRPC.

Table 38

TOTAL VEHICLE TRIP GENERATION IN THE REGION BY CLASSIFICATION OF TRIP: 1963, 1990  
RECOMMENDED TRANSPORTATION PLAN, AND 1990 UNPLANNED ALTERNATIVE

Trip Classification	Survey (1963) <sup>a</sup>		Total 1990				Percent Change 1963 - 1990	
			Recommended Plan		Unplanned Alternative		Recommended Plan	Unplanned Alternative
	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total		
Internal Automobile . . .	2,166,000	84.3	3,938,000	84.5	4,185,000	85.2	81.8	93.2
External Automobile <sup>b</sup> . . .	86,000	3.4	226,000	4.8	226,000	4.6	162.8	162.8
Internal Truck <sup>c</sup> . . . . .	300,000	11.7	465,000	10.0	465,000	9.5	55.0	55.0
External Truck . . . . .	16,000	0.6	32,000	0.7	32,000	0.7	100.0	100.0
<b>Total</b>	<b>2,568,000</b>	<b>100.0</b>	<b>4,661,000</b>	<b>100.0</b>	<b>4,908,000</b>	<b>100.0</b>	<b>81.5</b>	<b>91.1</b>

<sup>a</sup> All 1963 origin and destination home interview survey data was increased by 17 percent to meet observed traffic volumes crossing selected screen lines.

<sup>b</sup> Through trips counted once.

<sup>c</sup> Includes taxis.

Source: SEWRPC.

largest increase in vehicular travel is anticipated to occur in the outlying areas of the Region, with the pattern more dispersed than under the recommended land use plan. The same major traffic corridors would experience the heaviest increases in travel demand under the unplanned alternative as under the recommended land use plan.

#### Traffic Assignment

The anticipated travel demand expected to be generated by the unplanned alternative was assigned to the arterial street and highway network proposed to serve the recommended land use plan. The anticipated future traffic volumes are shown

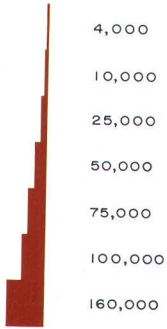
on Map 22 for the major regional highway facilities, together with the capacity of these facilities. Also indicated are those portions of the system for which the future traffic loads are expected to exceed the design capacity. The assignment indicates that the proposed network would be generally adequate to serve the future traffic demand generated by the unplanned alternative, as well as by the recommended land use plan. A summary of volume-to-capacity relationships for all arterial streets and highways within the Region under the unplanned alternative is provided in Table 39. For the Region as a whole, 6.5 percent of the total arterial street and highway system mileage would

Map 22

REGIONAL TRAFFIC FLOW ON PROPOSED  
ARTERIAL STREET AND HIGHWAY SYSTEM  
AVERAGE WEEKDAY TRAFFIC VOLUMES  
1990 UNPLANNED LAND USE ALTERNATIVE

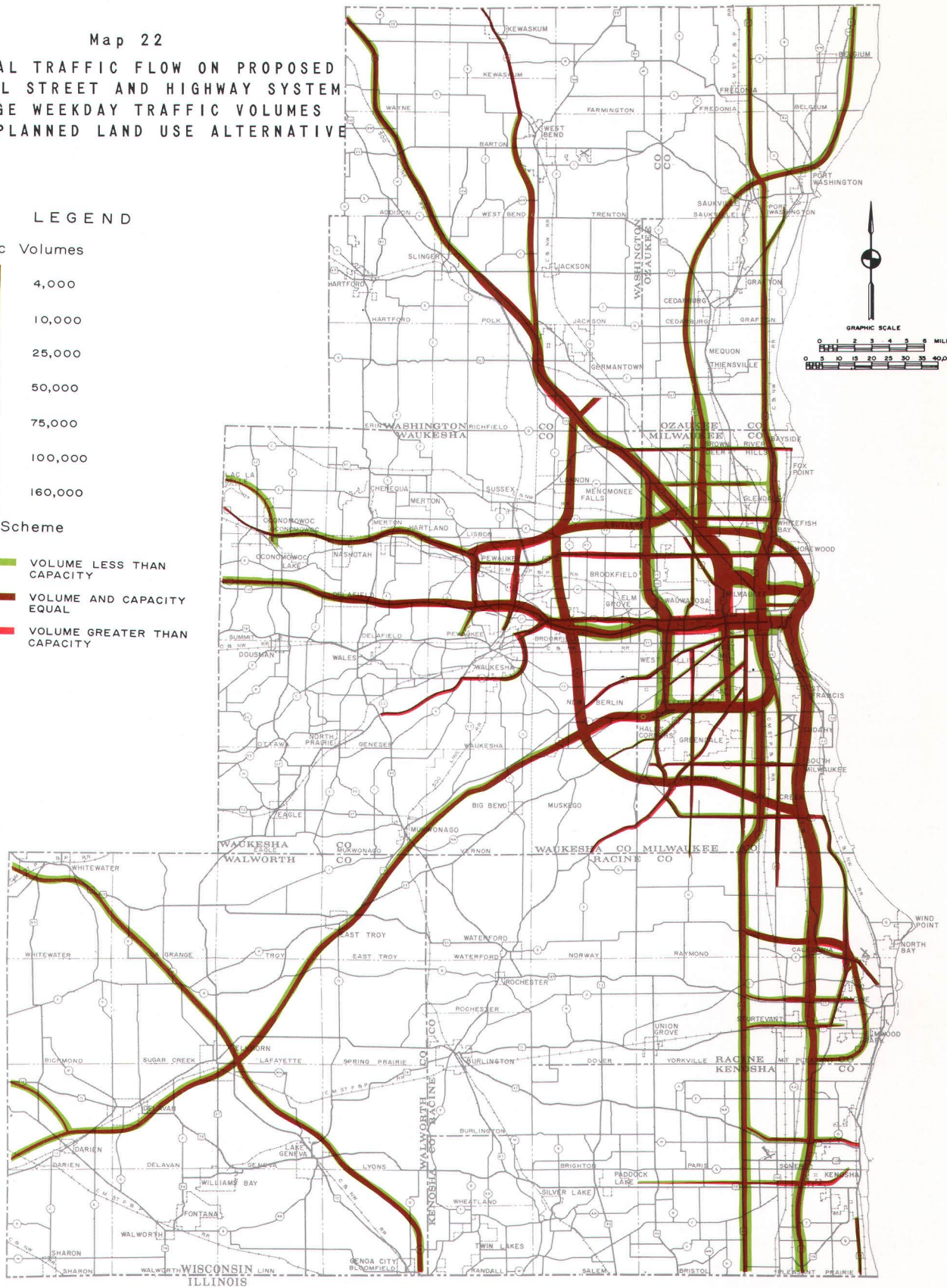
LEGEND

Traffic Volumes



Color Scheme

- █ VOLUME LESS THAN CAPACITY
- █ VOLUME AND CAPACITY EQUAL
- █ VOLUME GREATER THAN CAPACITY



The recommended regional highway system could be expected to operate at or below design flow rates on most of its facilities even if the Region were to develop according to the unplanned land use alternative.



Table 39

VOLUME-TO-CAPACITY RATIOS<sup>a</sup> FOR THE HIGHWAY NETWORK IN THE REGION BY COUNTY:  
1990 RECOMMENDED TRANSPORTATION PLAN, AND 1990 UNPLANNED ALTERNATIVE

County	Recommended Transportation Plan - 1990							
	Total		V/C Range 0.00 - 0.90		V/C Range 0.91 - 1.10		V/C Range Above 1.10	
	Miles	Percent of Regional Total	Miles	Percent of County Total	Miles	Percent of County Total	Miles	Percent of County Total
Kenosha . .	345.4	8.7	321.9	93.2	21.5	6.2	2.0	0.6
Milwaukee . .	1,006.9	25.5	940.6	93.4	53.9	5.4	12.4	1.2
Ozaukee . .	329.3	8.3	319.7	97.1	9.1	2.8	0.5	0.1
Racine . .	460.6	11.7	426.9	92.7	29.7	6.4	4.0	0.9
Walworth . .	491.1	12.4	480.2	97.8	10.8	2.2	0.1	0.0
Washington .	423.7	10.7	410.3	96.8	12.4	2.9	1.0	0.3
Waukesha . .	896.7	22.7	827.4	92.3	52.3	5.8	17.0	1.9
Regional Total	3,953.7	100.0	3,727.0	94.3	189.7	4.8	37.0	0.9

County	Unplanned Alternative - 1990							
	Total		V/C Range 0.00 - 0.90		V/C Range 0.91 - 1.10		V/C Range Above 1.10	
	Miles	Percent of Regional Total	Miles	Percent of County Total	Miles	Percent of County Total	Miles	Percent of County Total
Kenosha . .	345.4	8.8	319.0	92.4	19.1	5.5	7.3	2.1
Milwaukee . .	992.0 <sup>b</sup>	25.3	919.5	92.7	46.6	4.7	25.9	2.6
Ozaukee . .	329.3	8.4	291.3	88.5	24.8	7.5	13.2	4.0
Racine . .	448.6 <sup>c</sup>	11.4	389.0	86.7	33.3	7.4	26.3	5.9
Walworth . .	489.1 <sup>d</sup>	12.5	434.3	88.8	29.8	6.1	25.0	5.1
Washington .	423.7	10.8	373.7	88.2	24.8	5.9	25.2	5.9
Waukesha . .	896.7	22.8	675.1	75.3	90.1	10.0	131.5	14.7
Regional Total	3,924.8	100.0	3,401.9	86.7	268.5	6.8	254.4	6.5

<sup>a</sup> The significance of the volume-to-capacity ranges used is:

0.00 - 0.90; Under design capacity, fully adequate and safest operational level.

0.91 - 1.10; At design capacity but still adequate.

Above 1.10; Over design capacity, congested at times.

<sup>b</sup> This mileage is less than under the recommended plan because the Root River Parkway proposal is not included.

<sup>c</sup> This mileage is less than under the recommended plan because the Root River Parkway and the Racine area Loop Freeway are not included.

<sup>d</sup> This mileage is less than under the recommended plan because the Janesville branch of the Rock Freeway is not included.

Source: SEWRPC.

be expected to operate over design capacity by 1990 under the unplanned alternative as compared to 0.9 percent under the recommended land use plan.

The transit trips generated by the unplanned alternative were assigned to the modified rapid and rapid transit network proposed to serve the recommended land use plan. The results are displayed in summary form in Map 23. The future revenue passenger demand on all of the routes was found to be somewhat lower under the unplanned alternative than under the recommended land use plan, but was high enough in most instances to justify the provision of the modified rapid transit facilities according to the threshold service warrant standard set forth in Volume 2 of this report. The feasibility of the proposed rapid transit facility, however, would be marginal under the unplanned alternative.

### COMPARISON AND EVALUATION

In Chapter VI of Volume 2 of this report, the three alternative regional land use plans, together with their supporting transportation system plans, were compared and evaluated in order to determine the degree to which each met the established regional development objectives and standards.<sup>3</sup> This comparison and evaluation, together with the results of the plan review process, which involved advisory committees and both formal and informal public hearings, led to the selection of the Controlled Existing Trend Plan as the land use plan to be recommended for adoption and implementation. As a result of the plan review process, certain modifications, described in Chapters II and III of this report, were made in both the Controlled Existing Trend Plan and in its supporting transportation system plan. The land use and transportation plans recommended herein are, therefore, slightly different from the Controlled Existing Trend Plan as presented in Volume 2 of this report. In order to evaluate the effects of these changes and in order to provide a measure of the benefits to be achieved from implementation of the recommended regional land use and transportation plans, a comparative evaluation of the recommended land use and transportation plans with the unplanned alternative was made on the basis of the relative ability to meet the established regional development objectives and standards. The following section of this report presents in summary form the results of this comparative evaluation.

<sup>3</sup> *The regional development objectives and the supporting principles and standards are set forth in Chapter II, Volume 2, of this report.*

### Satisfaction of Standards—Land Use

Table 40 presents a comparison of the relative ability of the recommended land use plan and the unplanned alternative to meet the established regional land use development standards. Comparison is based in most instances upon the incremental land use development indicated by the two alternatives and not upon the aggregate resulting future land use pattern. Although many of the entries in the table are self-explanatory, some additional explanations and comments with respect to certain standards are appropriate.

Objective 1, Standard 3(a): The local park and recreation standard is only partially met under the recommended land use plan in that only that area required for neighborhood parks has been implicitly provided in the plan. Land area was not allocated in the recommended land use plan for such additional park or recreational facilities as playfields, community and county parks, and special use areas, such as golf courses, since the spatial location of these community parks should be determined through more detailed local planning efforts. It should be noted, however, that the necessary land for these community parks would be readily available within the primary environmental corridors. Only existing and presently anticipated new local park development was included in the evaluation of the unplanned alternative. Moreover, under the unplanned alternative, the environmental corridors would probably not be available for the ready acquisition of land for necessary additional playfields, community and county parks, and special recreation use areas.

Objective 1, Standard 4: The allocation of land uses for commercial and service uses does not meet the standard under the recommended land use plan because, in the preparation of the plan, a portion of the total anticipated growth in commercial and service employment was assigned to existing commercial areas which, although fully developed physically, possess a potential for increased development. This resulted in an overall intensification of employment on land in commercial use. The standard is met, however, for all new commercial and service land use development. Under the unplanned alternative, new commercial land was allocated as a proportion of new residential development; and no attempt was made to allocate such land on the basis of desirable employee-to-land area density ratios. This standard, therefore, would not be met.

Map 23  
 FUTURE PASSENGER VOLUMES CARRIED BY  
 MAJOR TRANSIT ROUTES  
 AVERAGE WEEKDAY  
 1990 UNPLANNED LAND USE ALTERNATIVE

LEGEND

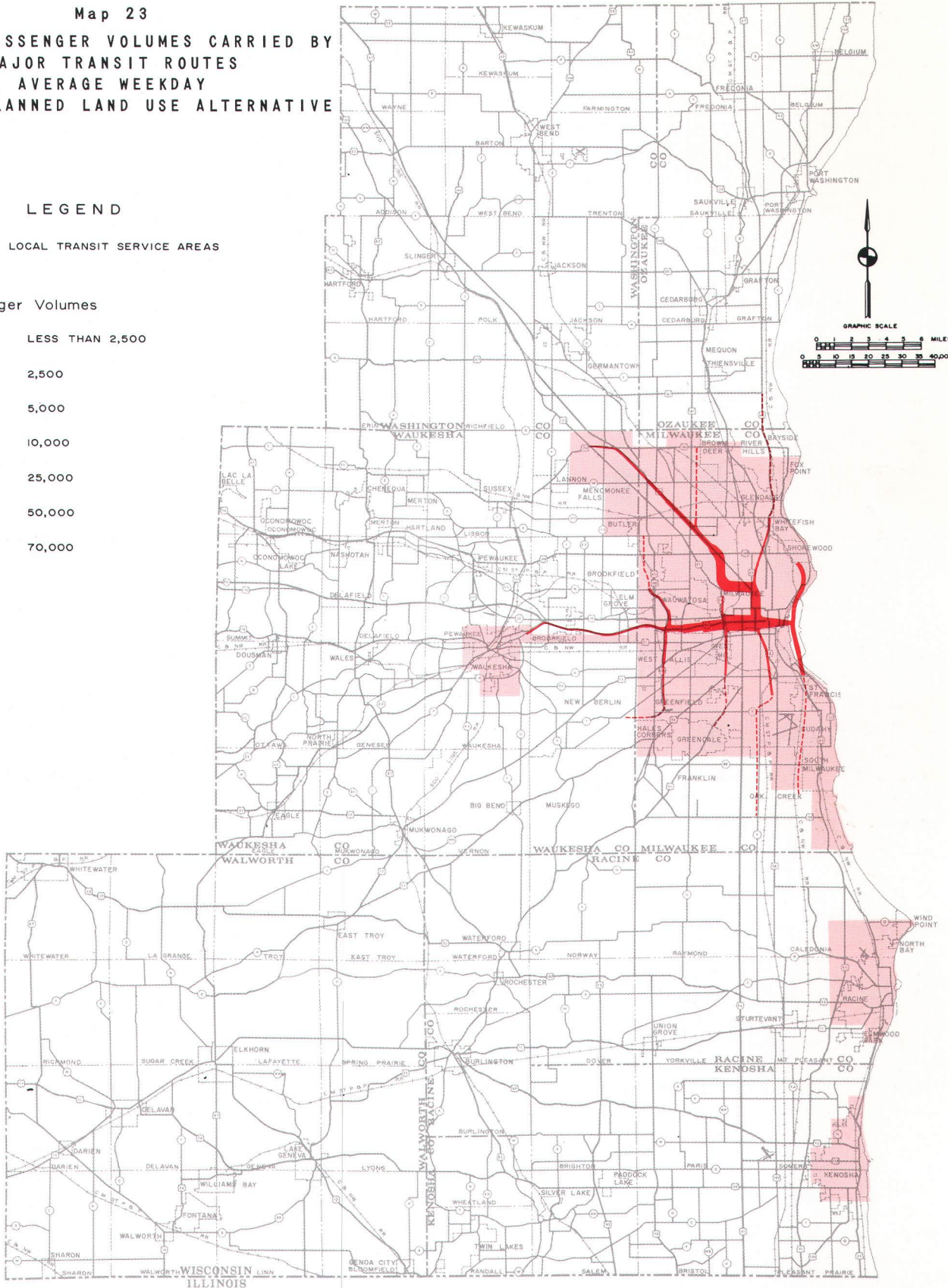


LOCAL TRANSIT SERVICE AREAS

Passenger Volumes



LESS THAN 2,500  
 2,500  
 5,000  
 10,000  
 25,000  
 50,000  
 70,000



If the Region were to develop according to the unplanned land use alternative, the revenue passenger volumes on the modified bus rapid transit lines would still be high enough to warrant the provision of these lines. The provision of a rapid transit line in the east-west traffic corridor would, however, be only marginally justifiable on the basis of forecast revenue passenger volumes.

Table 40

COMPARISON OF THE RELATIVE ABILITY OF THE RECOMMENDED LAND USE PLAN  
AND THE UNPLANNED ALTERNATIVE TO MEET LAND USE DEVELOPMENT STANDARDS

Objective	Recommended Land Use Plan	Unplanned Alternative
<b>Objective No. 1</b>		
Standard		
1. Residential Land Allocation		
a. Low-density - 250 acres/1,000 persons. . .	Met <sup>a</sup>	240 ac./1,000
b. Medium-density - 70 acres/1,000 persons. .	Met <sup>a</sup>	70 ac./1,000
c. High-density - 25 acres/1,000 persons. . .	Met <sup>a</sup>	25 ac./1,000
2. Governmental and Institutional Land Allocation		
a. Local - 6 acres/1,000 added population . .	Met <sup>a</sup>	Not met
b. Regional - 3 acres/1,000 added population.	Met <sup>a</sup>	Not met
3. Park and Recreation Land Allocation		
a. Local - 10 acres/1,000 added population <sup>b</sup> .	3.37 ac./1,000	3.23 ac./1,000
b. Regional - 4 acres/1,000 added population.	5.32 ac./1,000	2.59 ac./1,000
4. Commercial Land Allocation <sup>b</sup>		
a. 5 acres/100 added employees. . . . .	3.32 ac./100	3.91 ac./100
5. Industrial Land Allocation <sup>b</sup>		
a. 7 acres/100 added employees. . . . .	6.56 ac./100	6.16 ac./100
<b>Objective No. 2</b>		
Standard		
1. Residential Planning Units . . . . .	Could be met <sup>c</sup>	Difficult to meet
2. Regional Commercial Land Location. . . . .	Met <sup>a</sup>	Met
3. Major Industrial Land Location . . . . .	Met <sup>a</sup>	Met
<b>Objective No. 3</b>		
Standard		
1. Soils		
a. Urban uses . . . . .	Met <sup>a</sup>	Largely unmet
b. Rural uses . . . . .	Met <sup>a</sup>	Largely unmet
c. Sanitary sewer service areas . . . . .	Met <sup>a</sup>	Largely unmet
2. Inland Lakes and Streams		
a. Large inland lakes - over 50 acres		
1) 25 percent of shore in natural state .	Met for 55 of 99 lakes	Met for 21 of 99 lakes
2) 10 percent of shore in public use . .	Met for 17 of 99 lakes	Met for 14 of 99 lakes
3) 50 percent of shore in nonurban uses .	Met for 62 of 99 lakes	Met for 16 of 99 lakes
b. Small inland lakes - under 50 acres		
1) 25 percent of shore in natural state .	Could be met <sup>c</sup>	Not met
c. Perennial streams		
1) 25 percent of shore in natural state .	Met for 121 of 129 streams	Met for 101 of 129 streams
2) 50 percent of shore in nonurban uses .	Met for 121 of 129 streams	Met for 93 of 129 streams
3) Restrict urban uses in flood plains .	Met <sup>a</sup>	Not met

Table 40 (continued)

Objective	Recommended Land Use Plan	Unplanned Alternative
4) Restrict development in channels and floodways . . . . .	Met <sup>a</sup>	Not met
3. Wetlands		
a. Protect wetlands over 50 acres and those with high resource value. . . . .	Met <sup>a</sup>	Not met
4. Woodlands		
a. 10 percent of watershed <sup>b</sup> . . . . .	Partially met	Not met
b. 40 acres each of 4 forest types <sup>c</sup> . . . . .	Could be met	Could be met
c. 5 acres/1,000 population. . . . .	23 ac./1,000 <sup>d</sup>	Unknown
5. Wildlife <sup>b</sup>		
a. Maintain a wholesome habitat. . . . .	Met	Not met
Objective No. 4		
Standard		
1. Major Transportation Routes Penetrating Residential Planning Units <sup>b</sup> . . . . .	Could be met	Difficult to meet
2. Major Transportation Routes Penetrating Resource Areas <sup>b</sup> . . . . .	Partially met	Unknown
3. Transportation Service to Appropriate Areas . .	Could be met <sup>c</sup>	Difficult to meet
4. Transportation Terminal Areas . . . . .	Could be met <sup>c</sup>	Could be met
5. Sewer Service to Residential Areas. . . . .	100 percent served	51 percent served
6. Water Supply to Residential Areas . . . . .	100 percent served	53 percent served
7. Maximize Use of Existing Transportation and Utility Facilities. . . . .	Met <sup>a</sup>	Not met
Objective No. 5		
Standard		
1. Physical Self-Containment of Residential Planning Units. . . . .	Could be met <sup>c</sup>	Difficult to meet
2. Appropriate Land Uses Within Residential Planning Units. . . . .	Could be met <sup>c</sup>	Difficult to meet
3. Variety of Housing Within Residential Planning Units. . . . .	Could be met <sup>c</sup>	Difficult to meet
Objective No. 6		
Standard		
1. Major Industrial Site Requirements. . . . .	Met <sup>a</sup>	Met
2. Local Commercial Site Requirements. . . . .	Could be met <sup>c</sup>	Unknown
3. Major Commercial Site Requirements. . . . .	Met <sup>a</sup>	Not met

Table 40 (continued)

Objectives	Recommended Land Use Plan	Unplanned Alternative
<b>Objective No. 7</b>		
<b>Standard</b>		
1. Local Park Spatial Location . . . . .	Could be met	Difficult to meet
2. Regional Park Spatial Location . . . . .	Met <sup>a</sup>	Not met
<b>Objective No. 8</b>		
<b>Standard</b>		
1. Preserve Prime Agricultural Areas . . . . .	95 percent preserved	85 percent preserved
2. Preserve Other Appropriate Agricultural Areas .	35,000 acres lost	Unknown

<sup>a</sup> This standard has been met under the recommended land use plan because it served as an input to the plan design process.

<sup>b</sup> This standard is explained briefly in the accompanying text.

<sup>c</sup> This standard could be met only by local community action.

<sup>d</sup> Only that woodland cover contained within the primary environmental corridors was assumed to be preserved.

Note: These objectives are listed in the same order as in Chapter 2, Volume 2 of this report.

Source: SEWRPC.

Objective 1, Standard 5: The allocation of land area for industrial uses does not meet the standard under the recommended land use plan because, as in the case of commercial and service employment, the existing industrial areas within the Region were assigned additional employment. The demonstrated ability of the existing regional industrial centers to absorb additional employees without a corresponding increase in physical plant capacity is the primary reason for this employment allocation procedure. Under the unplanned alternative, no attempt was made to allocate new industrial land on the basis of desirable employee-to-land area density ratios; and the standard, therefore, would not be met.

Objective 3, Standard 4(a): This standard is not met under the recommended land use plan because none of the 11 major watersheds within the Region presently contain enough woodland cover to constitute the required 10 percent of the total watershed area. It should be noted, however, that the two largest watersheds within the Region, the Fox River watershed and the Rock River watershed, each contain woodland cover totaling over 9 percent of the watershed land area. If this standard were to be fully met within the Region, a reforestation program would be required in each of

the 11 watersheds. Under the unplanned alternative, it is unlikely that very much of the non-publicly owned woodland cover within the Region would be retained; and the woodland cover within each watershed would be further reduced. The unplanned alternative would result in the conversion of over 264,000 acres of the gross primary environmental corridor area remaining within the Region as delineated in the planning inventories, leaving only 47,000 acres, over 40,000 acres of which are covered by surface water. Thus, the unplanned alternative could be expected to bring about the conversion to urban use of much of the remaining woodlands and wetlands within the Region.

Objective 3, Standard 5: This standard is met under the recommended land use plan because all of the primary environmental corridors are proposed to be preserved. These corridors contain 168,000 acres, or about 88 percent, of the remaining high- and medium-value wildlife habitat areas within the Region. As noted above, the unplanned alternative could not possibly meet this standard because of the conversion of the corridors to urban use and concomitant deterioration of the actual resource base, including the remaining prime wildlife habitat areas.

Objective 4, Standard 1: The effective evaluation of this standard can only be made once the final right-of-way and specific alignment for proposed transportation facilities are established and residential planning units delineated. These determinations are more feasible at a later stage of the planning process. This standard could, however, be readily met through proper design under the recommended land use plan. It would, however, be extremely difficult to meet under the unplanned alternative.

Objective 4, Standard 2: Because the prime natural resource areas are located in the environmental corridors, which are generally of a linear configuration, it is unlikely that all proposed new major transportation routes could be located so as to avoid any penetration of these areas. Consequently, the ability of any plan to satisfy this objective can best be measured by how little this standard is violated. It should be noted, however, that new major transportation route locations are not specified as such in the recommended land use or transportation plans. They are instead identified as transportation corridors which would gen-

erate enough traffic to warrant high service level type facilities. An analysis of the relationship between the proposed major highway corridors and the environmental corridors reveals that about 1,700 acres, or 0.5 percent, of the area of the environmental corridors might be required for proposed major transportation facilities under the recommended transportation plan. As already noted, the unplanned alternative would result in the conversion of much of the primary environmental corridors; and this standard would lose its relevance.

Satisfaction of Standards—Transportation

Table 41 presents a comparison of the relative ability of the recommended transportation plan to meet the established regional transportation system development standards under the recommended land use plan and under the unplanned alternative. Unlike the procedure followed for the land use plan, determination of the adequacy of the transportation plan proposals to meet the standards was based primarily upon the evaluation of the total future transportation system. Although most of the entries in the table are self-explana-

Table 41

COMPARISON OF THE RELATIVE ABILITY OF THE RECOMMENDED TRANSPORTATION SYSTEM PLAN TO MEET THE TRANSPORTATION SYSTEM DEVELOPMENT STANDARDS UNDER THE RECOMMENDED LAND USE PLAN AND THE UNPLANNED LAND USE ALTERNATIVE

Objective	Recommended Land Use Plan	Unplanned Land Use Alternative
Objective No. 1		
Standard		
1. Adequate Accessibility <sup>a</sup> . . . . .	Met	Met
2. Volume-to-Capacity Ratio Equal To or Less Than 1.0 . . . . .	98.3 percent of arterial streets and highways; 100 percent of transit route mileage	90.1 percent of arterial streets and highways; 100 percent of transit route mileage
Objective No. 2		
Standard		
1. Transit Warrants . . . . .	Met <sup>b</sup>	Met
2. Local Transit Service <sup>c</sup> . . . . .	Could be met	Could be met
3. Transit Headways <sup>c</sup> . . . . .	Could be met	Could be met
4. Transit Stop Spacing <sup>c</sup> . . . . .	Could be met	Could be met
5. Transit Loading Factors <sup>c</sup> . . . . .	Could be met	Could be met

Table 41 (continued)

Objective	Recommended Land Use Plan	Unplanned Land use Alternative
6. Transit Route Alignment <sup>c</sup> . . . . .	Could be met	Could be met
7. Percent Transit to CBD		
Milwaukee . . . . .	22.2 percent	20.3 percent
Racine . . . . .	4.9 percent	4.8 percent
Kenosha . . . . .	5.3 percent	5.8 percent
8. Provision of Transit Peak Hours . . . . .	Met <sup>b</sup>	Met
9. Parking at Park-and-Ride Stations <sup>c</sup> . . . . .	Could be met	Could be met
10. Freeway Warrants . . . . .	Met <sup>b</sup>	Met
11. Arterial Warrants . . . . .	Met <sup>b</sup>	Met
12. Walking Distances for Short-Term Parkers <sup>c</sup> . . . . .	Could be met	Could be met
13. Parking Spaces in CBD's <sup>c</sup> . . . . .	Could be met	Could be met
Objective No. 3		
Standard		
1. Minimize Vehicle Hours of Travel. . . . .	926,000 hours per day	1,016,000 hours per day
2. Overall Speeds <sup>d</sup>		
Freeways. . . . .	49 miles per hour	50 miles per hour
Standard Arterials. . . . .	31 miles per hour	33 miles per hour
3. Maximize Proportion of Vehicle Miles on Freeways . . . . .	46.4 percent	44.7 percent
Maximize Percent Rapid and Modified Rapid Transit Utilization . . . . .	47.2 percent	39.8 percent
Objective No. 4		
Standard		
1. Volume-to-Capacity Equal To or Less Than 0.9. . . . .	94.3 percent of arterial streets and highways	86.7 percent of arterial streets and highways
2. Maximize Proportion of Vehicle Miles on Freeways . . . . .	46.4 percent	44.7 percent
Maximize Percent Transit Utilization. . . . .	5.9 percent	4.2 percent
Objective No. 5		
Standard		
1. Minimize Operating Costs <sup>e</sup> . . . . .	\$20.34 billion	\$22.31 billion
Minimize Capital Investment <sup>f</sup> . . . . .	\$ 2.10 billion	\$ 2.23 billion
Minimize Total Costs. . . . .	\$22.44 billion <sup>g</sup>	\$24.54 billion
2. Minimize Vehicle Miles of Travel. . . . .	32,296,000 miles per day	36,945,000 miles per day



Table 41 (continued)

Objectives	Recommended Land Use Plan	Unplanned Land Use Alternative
3. Use of Existing and Committed Transportation System. . . . .	Met <sup>b</sup>	Met
Objective No. 6		
Standard		
1. Minimize Penetration of Neighborhoods <sup>c</sup> . . . . .	Could be met	Could be met
2. Minimize Dislocation <sup>c</sup> . . . . .	Could be met	Could be met
3. Minimize Penetration of Environmental Corridors <sup>c</sup> . . . . .	Could be met	Could be met
4. Advance Reservation of Right-of-Way . . . . .	Partially met	Partially met
5. Minimize Destruction of Cultural Sites <sup>c</sup> . . . . .	Could be met	Could be met
6. Minimize Use of Land for Transportation System.	66.5 square miles	94.6 square miles
Objective No. 7		
Standard		
1. Minimize Disruption of Visual Axes <sup>c</sup> . . . . .	Could be met	Could be met
2. Design Standards <sup>c</sup> . . . . .	Could be met	Could be met

<sup>a</sup> The technique utilized in measuring accessibility is explained in SEWRPC Planning Report No. 7, Chapter IV, Volume 2.

<sup>b</sup> This standard has been met under the recommended land use plan because it served as an input to the plan design process.

<sup>c</sup> This standard could be met only by local community or private action.

<sup>d</sup> This standard is explained briefly in the accompanying text.

<sup>e</sup> Includes only travel on SEWRPC net (interzonal travel only).

<sup>f</sup> Includes maintenance (includes off-net facilities).

<sup>g</sup> Does not include cost of rapid transit proposal estimated at \$12,800,000.

Note: These objectives are listed in the same order as in Chapter 2, Volume 2, of this report.

Source: SEWRPC.

tory, some additional explanations and comments, with respect to certain standards, are appropriate.

Objective 1, Standard 2: Table 41 lists for this standard the percentage of highway and transit route mileage which would have capacities adequate to carry the anticipated traffic loads generated by the recommended land use plan and the unplanned alternative. Implicit in the ability of the proposed facilities to meet the traffic demand of the recommended land use plan is the fact that

these facilities were located and designed consistent with the trip-generating and trip-interacting characteristics of the various land uses delineated in the recommended land use plan. The methodology by which this standard has been met for the recommended land use plan was described in Chapter IV of Volume 2 of this report. In order to evaluate this standard under unplanned land use development, the future traffic demand derived from the unplanned alternative was assigned to the recommended transportation system.

Objective 3, Standard 2: In 1963 the average overall speed on the regional arterial street and highway network was found to be 27.3 miles per hour. Average speeds on the network under the recommended land use plan would rise to 34.9 miles per hour by 1990. Under the unplanned alternative, the average overall speed would rise to 36.4 miles per hour. Average trip length, however, would increase from 5.66 miles in 1963 to 7.72 miles in 1990 under the recommended land use plan and to 8.45 miles in 1990 under the unplanned alternative. Consequently, corresponding average travel times would rise from 12.4 minutes in 1960 to 13.3 minutes in 1990 under the recommended land use plan and to 13.9 minutes in 1990 under the unplanned alternative.

#### SUMMARY

This chapter has presented a description, comparison, and evaluation of the recommended land use and transportation plans with the unplanned land use alternative. The recommended land use and transportation plans were designed specifically to meet the established regional land use and transportation system development objectives, whereas the unplanned land use alternative was prepared to reflect one possible consequence of a continuation of existing development trends within the Region in the absence of any attempt to guide such development on an areawide basis in the public interest. Several of the more important findings contained within this chapter are summarized below.

1. Under the recommended land use plan, the new residential development within the Region required to meet the forecast population levels would occur primarily at medium densities and would be located in planned residential development units to meet the adopted regional development objective. Under the unplanned alternative, the new residential development would occur primarily at low densities and would, because of its dispersed nature, make the location of new development in planned residential development units far more difficult to achieve.
2. Urban population density within the Region would, under the recommended land use plan, be expected to approximate 4,400 persons per square mile by 1990, a relatively slight decline from the 1963 level of about 4,800 persons per square mile.

Under the unplanned alternative, urban population density within the Region would decline sharply to approximately 2,700 persons per square mile by 1990. A continued decline in urban population density of this magnitude would hold important implications for the continued provision within the Region of not only adequate transit service but also for the economical provision of urban services of all kinds. The recommended land use plan would require the conversion of only 200 square miles of land from rural to urban use within the Region by 1990, an increase of 44 percent over 1963. The unplanned alternative would require the conversion of 418 square miles of land from rural to urban use by 1990, an increase of 92 percent over 1963. The rural land which would be converted under either alternative consists primarily of agricultural lands. Under the unplanned alternative, over 15 percent of the prime agricultural lands within the Region would be converted to urban use, whereas the recommended plan would require the conversion of less than 5 percent of the prime agricultural lands.

3. The recommended land use plan, by emphasizing medium-density residential development, would facilitate the provision of public sanitary sewer service and public water supply. By 1990, 95 percent of the total population and over 95 percent of the total developed area of the Region could be readily served by public sewer and water supply facilities. The unplanned alternative would make the provision of public sanitary sewer and public water supply service extremely difficult and costly, if not impossible; and only 74 percent of the total regional population and 55 percent of the total developed area of the Region could be expected to be served by public sewer and water supply facilities in 1990. The regional land use pattern which could be expected to evolve under the unplanned alternative would, therefore, result in an increased utilization of shallow private wells and on-site soil absorption sewage disposal systems. Nearly 50 percent of all new development within the Region would, under the unplanned alternative, have to rely on such facilities. This would not only create a severe potential public health

problem but could lead to further deterioration in both surface and ground water quality within the Region. The correction of the resulting environmental problems would be extremely costly if, indeed, at all possible.

4. The recommended land use plan would provide for, and permit the development of, ten new major commercial areas within the Region. The unplanned alternative could be expected to result in the development of only six new major commercial centers. It is highly probable that under the unplanned alternative a marked proliferation of highway-oriented commercial development would occur in response to the need for commercial outlets readily accessible to the highly dispersed low-density residential areas, whereas the recommended land use plan seeks to provide such outlets within the planned residential development units or in well-located major regional commercial areas.
5. The recommended land use plan would provide for the reservation, development, and protection of 26 major regional parks. Under the unplanned alternative, only the 20 existing or committed major regional parks could be assured. In addition, the recommended land use plan provides for the preservation and protection of more than 283,000 acres of gross primary environmental corridor area, whereas under the unplanned alternative the preservation of only 47,000 acres of environmental corridor area could be assured. The vital importance of these environmental corridors to the conservation of the underlying and sustaining natural resource base of the Region, that is, to its surface and ground water, woodlands, wetlands, and prime wildlife habitat and to the best remaining park sites, was stressed in Volume 1 of this report. The destruction of these corridors through the encroachment of unplanned urban development could result in the near-total destruction of the remaining natural resource base of the Region and to a severe deterioration of the overall quality of the environment within the Region.
6. The total future travel demand generated by the regional land use pattern which would

result from the unplanned alternative would not be significantly different from that which would result from implementation of the recommended land use plan, although by every measure the total travel demand generated under the unplanned alternative would be higher than that generated by the recommended land use plan. Total person trips generated within the Region on an average weekday would be expected to increase from about 3.6 million in 1963 to about 6.0 million by 1990 under the recommended land use plan and to about 6.3 million under the unplanned alternative—a difference of about 5 percent. Vehicle trips on an average weekday within the Region would be expected to increase from about 2.6 million in 1963 to about 4.7 million by 1990 under the recommended land use plan and to about 4.9 million under the unplanned alternative.

7. With respect to transit trip generation and transit utilization, somewhat greater differences can be expected between the recommended land use plan and the unplanned alternative. Total transit trips generated within the Region on an average weekday would be expected to increase from about 324,000 in 1963 to about 353,000 by 1990 under the recommended land use plan. Under the unplanned alternative, transit trips could be expected to decline sharply to about 263,000 trips per average weekday by 1990. Continued highly dispersed low-density residential development within the Region would make it extremely difficult to support a public transit system offering a high level of service and would make the attainment of a balanced transportation system virtually impossible.
8. Total vehicle miles of travel within the Region on an average weekday could also be expected to be quite different under the two land use patterns. Total vehicle miles of travel could be expected to increase from 13.2 million vehicle miles per day in 1963 to 32.3 million per day by 1990 under the recommended land use plan. Under the unplanned alternative, total vehicle miles of travel could be expected to increase to 36.9 million miles per day by 1990, an

increase of almost 15 percent over the recommended land use plan.

9. The freeway facilities proposed to serve the recommended land use plan could be expected to function adequately under almost any land use pattern which might reasonably be expected to evolve from the unplanned alternative. Although the provision of the modified rapid transit facilities is generally feasible under either land use alternative, the feasibility of providing the rapid transit facility under the unplanned alternative is only marginal. Moreover, 14.4 percent more street and highway mileage would be required within the Region to serve the unplanned alternative than to serve the recommended land use plan.

The recommended land use plan best meets the adopted regional land use and transportation system development objectives and standards; and its implementation would provide a safer, more healthful, and a far more pleasant as well as a more orderly and efficient environment within the Region. Implementation of the recommended land use and transportation plans would abate many of the existing areawide development problems, would avoid the development of new problems, and would do much to protect and enhance the underlying and sustaining natural resource base. The unplanned alternative would lead to a continued intensification of existing environmental problems, including flooding and water pollution; would result in the almost total destruction of the natural resource base; and would result in a regional land use pattern which would be as disorderly and inefficient as it would be ugly.

## Chapter V

# LAND USE SIMULATION MODEL APPLICATION

### INTRODUCTION

At any given point in time, the regional land use pattern represents the aggregate, cumulative result of many private and public development decisions made by individual land developers, builders, and households, as well as by various units and agencies of government. A need, therefore, exists to test the feasibility of the recommended regional land use plan beyond the gross demand tests provided by the expanded conventional planning techniques applied in the regional land use plan preparation and evaluation process. In the regional land use-transportation study, an experimental land use model capable of simulating the decision-making processes of households and business firms influential in land development was developed to meet this need. The basic problem of land use plan test, using simulation model techniques, may be stated as: Given a recommended plan, determine whether this plan can be attained considering behavioral patterns of land developers, builders, and households; certain public land use controls; and certain public works programs. Using a land use simulation model, a number of experimental simulation runs can be performed with differing assumed land use control policies and the practicality of the recommended plan evaluated.

The validity and usefulness of traffic simulation models in transportation plan test and evaluation has been proven and is now widely accepted; and the necessary traffic simulation models have been relatively well developed. Similar model techniques suitable for testing and evaluating the feasibility of proposed land use plans have not yet been successfully applied. Consequently, the Commission had to develop the necessary land use simulation models on an experimental basis as an integral part of the regional land use-transportation study. This chapter describes in summary form the specific land use simulation model<sup>1</sup> developed for southeastern Wisconsin and its application to the quantitative test and evaluation of the recommended regional land use plan.

<sup>1</sup> For a detailed description of the land use simulation model, see SEWRPC Technical Report, No. 3, *A Mathematical Approach to Urban Design*, January 1966.

### THE LAND USE SIMULATION MODEL

#### Model Organization

The land use simulation model developed under the regional land use-transportation study is a dynamic behavioral feedback simulation model in which the decision-making behavior of land developers are simulated in an economic environment of development costs, consumer land demand, and public policies determined by the data inputs to the model. Variables influenced by a land use plan, as reflected in public development policies, can be programmed in order to test the effectiveness of certain controlled variables in achieving a recommended land use plan in the presence of many uncontrolled variables. The controlled variables may be selected to represent the implementation tools of land use planning, such as public land use controls, public facilities construction, and public land acquisition. The uncontrolled variables include the behavior of households, private land developers and builders, and exogenous influences, such as population growth and employment levels.

Since residential land development occurs through a series of transactions in an economic market, the primary decision-makers, namely, the buyer and the seller, must be the principals in these transactions. In new residential land-housing transactions, the buyer is either a household purchasing shelter or a business investor securing a rental property. The seller is either a land developer, assuming that some development of raw land is necessary before an area is suitable for residential housing, or a builder who also serves as an intermediary in the sale of developed land.

Other persons and institutions are influential in land development, even though they are not direct participants in the final transaction. Financial institutions, such as commercial banks, savings and loan associations, and insurance companies, play a vital role since they supply money in the form of loans to both the land developer or builder seller and to the household or business buyer. Indeed, such financial institutions are often in

a decisive position in such transactions, most of which could not take place without their cooperation. This influence is particularly important in a "tight" money market where mortgage money is in short supply. It is less influential when the supply of mortgage money is adequate since competitive forces in the financial industry effectively neutralize money constraints on development.

The influence of federal, state, or local governments on land development is secondary, but powerful. Public land use planning is a direct outgrowth of this governmental influence, since publicly prepared urban development plans would be meaningless if there were no public influence on the emerging land use patterns. Governmental influence on land use development is exercised in two ways. Most directly, government can influence land development through public works programs which provide the primary transportation, water, sewer, park, and educational facilities necessary for any urban development. Whether the construction of such facilities tends to lead or lag land development is, of course, a key test of the real influence of these facilities. Government can also influence land development through the imposition of certain legal controls on land development, such as subdivision control and zoning regulations. Subdivision regulations directly affect the cost of land development by requiring the developer to provide certain public improvements at private expense. Zoning provides a constraint on certain transactions to the extent that it is able to withstand market pressures.

An important but more indirect influence on residential land development is exerted by private business institutions providing shopping facilities and opportunities for employment. Here the key factor is accessibility since such facilities tend to serve or draw from a limited retail or labor market area. Again, the time phasing of such development is an important consideration. If such facilities tend to follow residential development, they only reinforce existing trends. If they lead residential development into new areas, their influence can be important.

Since planning, by its very nature, is expected to produce plans and recommend development policies for government, an appropriate land use simulation model for planning is one that is able to predict the behavior of private (non-governmental) decision-makers under a variety of governmental development policies. The model must be focused

on the behavior of the private decision-makers in land development. Public decision-making is to be determined, not explained or predicted, on the basis of its effect on private decision-making and the desirability of the resulting land use pattern.

The land use simulation model developed in the regional land use-transportation study is a recursive programming model which generates a synthetic history of land use development over a period of time starting from a given set of initial conditions. Recursive programming is a decision simulation technique that provides for optimized decision-making over a limited time horizon on the basis of knowledge gained from past experience. The limited time horizon is a direct result of the uncertainty of forecasting future land requirements. This uncertainty forces the decision-maker to base his decisions on short-term forecasts of relatively higher accuracy. Past experience continually updates these short-term forecasts over time. This same experience also alerts the land development decision-maker to the uncertainty of even these short-term forecasts and thereby discourages rapid changes in land development trends. The analytical nature of recursive programming in its linear form is best described in the words of its originator:<sup>2</sup>

Recursive linear programming is a sequence of linear programming problems in which the objective function, constraint matrix and/or the right hand side parameters depend upon the primal and/or dual solution variables of the preceding linear programming problems in the sequence.

Thus, recursive programming is a combination of recursive simulation over time and linear programming. Each linear programming solution provides parameters for the next linear programming problem in the recursive time sequence.

The recursive programming relationships for the land use simulation model take the following form:

$$\begin{aligned}
 f(x) &= \min cx(t) \\
 A'x(t) &= \hat{b}'(t) \\
 A''x(t) &\leq (I+B)x(t-1) \\
 A'''x(t) &\leq b''
 \end{aligned}$$

<sup>2</sup> Richard H. Day, "Linear Programming and Related Computations," U. S. Department of Agriculture, Washington, D. C., 1964.

where  $f(x)$  and  $cx(t)$  represent the objective cost function minimized by the land developer with the row vector  $c$  representing the costs of developing land in different areas in the Region and the  $x(t)$  column vector representing the amount of land developed in each area. The second relationship represents the forecast of land requirements with the total land developed in each period equal to the forecast of land requirements,  $\hat{b}'(t)$  for that period. The forecast  $\hat{b}'(t)$  for each type of residential land is based upon actual demand in previous periods:

$$\hat{b}'(t) = \lambda b'(t-1) + \lambda^2 b'(t-2) + \dots + \lambda^n b'(t-n)$$

where  $\lambda \leq 1$  and  $\sum_{i=1}^n \lambda^i = 1$

The land demand in each past period is weighted to arrive at a forecast of future land requirements in the new time horizon. More recent periods are weighted more heavily depending on the value of the  $\lambda$  parameter. Higher values of  $\lambda$  place more weight on the recent past. Lower values conversely are more affected by the distant past. This simple form of time series extrapolation, based on a "smoothing" of historical experience, was extended to a more elaborate model based on household types.

In addition to fulfilling the forecasts of land demand, short-term land development optimization is also restricted by the third set of relationships, which tend to limit rapid changes in land development. In effect, the third class of relationships states that the new land developed in any area in any period cannot exceed some proportion of the previous development in that area. The  $B$  parameter determines the rate of development in an area that has favorable development costs compared to rival areas in the same region. A higher value of  $B$  ( $B$  will always be less than one) will permit more rapid development of favorable areas and will indicate a more bold and risk-taking attitude on the part of developers. A lower value of  $B$  will restrict rapid development in the most economic development areas and transfer development to less efficient areas. To provide for the early development in a given area, the initial condition of the constraint is established at a small value.

The third set of relationships embraces all constraints on the solutions that do not change with time. These might include land availability (capacity) restrictions in each zonal area and

accessibility relationships to employment and shopping facilities in other zones. Other technical and behavioral constraints may be desirable in certain applications.

The land use simulation model is, therefore, an application of the recursive programming concept to regional land development simulation. The model may be viewed in terms of its treatment of four major land use categories: primary determinant land uses, primary determined land uses, service land uses, and residual land uses.

Primary determinant land uses may be defined as land uses that significantly influence the location of other land uses. Industrial, transportation, and major governmental and institutional land uses are the specific land uses included in this category. Industrial, wholesale and storage, and major governmental and institutional land uses determine employment opportunity locations within the Region and are, therefore, a major influence on the spatial location of residential land uses which require reasonable time accessibility to places of employment. Transportation land uses, because of their effect on accessibility to work, shopping, and population concentrations, also exert a major influence on the spatial location of urban land uses; and an improved transportation system will tend to reduce the influence of the spatial location of major employment centers on the spatial location of residential land uses. The location of these primary determinant land uses is influenced by a small number of public or private decision-makers and by a small number of key decisions. The specific land uses included in this category were, therefore, treated as outside the land use simulation model and were located by conventional land use planning techniques prior to model application.

Primary determined land uses may be defined as those land uses the spatial locations of which are influenced by the primary determinant land uses, as well as by the availability of sanitary sewer and public water supply facilities and by the relative costs of development. These latter costs are, in turn, influenced by topography, soil conditions, and local development regulations. The specific land uses included in this primary determined category are high-, medium-, and low-density residential land uses. The residential sector of the land use simulation model distributes these primary determined land uses so as to minimize development costs within the constraints provided by accessibility to employment, availability of

sanitary sewer and public water supply facilities, and public development policies. It is important to note that this cost minimization is simulated as a short-term rather than a long-term phenomenon, in line with the basic theory of a recursive programming model. Thus, the land use simulation model, unless constrained by public development policies derived from a land use plan, will simulate a series of short-term, probably short-sighted land development decisions. The resulting evolutionary land use pattern would not, unless properly constrained by public development policies, coincide with a recommended land use plan.

Service land uses may be defined as those land uses the spatial locations of which are almost exclusively determined by the primary land uses which are served. Retail and service, local recreational, collector and minor streets, and local governmental and institutional land uses, such as elementary schools and churches, are the specific land uses included in this category. The land use simulation model allocates service land uses as a proportion of both the primary determinant and determined land uses so that the spatial location of the service land uses serve the primary land use pattern.

Residual land uses may be defined as those land use areas which remain free of primary and service land development. Agriculture, woodland, wetland, and unused land are the specific land uses included in this category. Major recreational sites are not located by the model but are located prior to model application by conventional land use and community facility planning techniques. The remaining residual land uses are determined implicitly rather than explicitly in the model application as the land area to which the operation of the model does not allocate other uses.

Thus, the land use simulation model is based upon the implicit theory that, if the major employment centers, major transportation routes, sanitary sewer and public water supply service areas, and major recreational sites are exogenously located by public and private decision-makers, residential and concomitant service land use development will take place so as to minimize short-term development costs within the constraints imposed by the exogenous land use locations and the availability of developable land.

#### Model Operation

The land use simulation model represents an

application of applied mathematics and electronic computation techniques to the problem of land use plan evaluation. As such, it is implemented through a computer program; and its operation may, therefore, be described in terms of the three elements of any such program: inputs, processing, and outputs. The inputs to the model consist of the following data assembled by traffic analysis district:

1. Costs of converting raw land to finished residential building sites. These costs include street and utility improvement, neighborhood school and park construction, and neighborhood commercial center construction costs and were developed and tabulated for three soil suitability classifications.<sup>3</sup> The development costs were further determined and tabulated for each of the 74 traffic analysis districts within the Region on the basis of the soil types, local land development regulations, and availability of public sewer and water supply service within each district.
2. Forecasts of the total regional land use demand for high-, medium-, and low-density residential development for the years 1970, 1980, and 1990.
3. The amount of land available for development within each traffic analysis district by soil suitability category.
4. The amount of land needed for supporting service uses for each acre of developed high-, medium-, and low-density residential land.
5. Total employment forecast for each traffic analysis district for the years 1970, 1980, and 1990.
6. The labor force which may be supported within each traffic analysis district, considering the travel time to each employment center and the number of employees in each such center. The travel time selected for the determination of the input was 35 minutes.

Utilizing these inputs, the model computer program may be operated to generate a future land

<sup>3</sup> For a detailed description and tabulation of these costs, see SEWRPC Technical Report No. 3, A Mathematical Approach to Urban Design, January 1966.



development pattern which satisfies the land use demand forecast for each residential land use density category.

Beginning with an initial land use pattern established by the 1963 existing land use inventory, operation of the model program serves to spatially distribute increments of new land demand so as to minimize development costs within the constraints imposed by land availability, accessibility to employment, and sanitary sewer and public water supply service areas. Thus, the land development sequence in the model operation involves the location of small increments of new development based upon short-term forecasts of land use demand. As the model operation proceeds through time, land development is simulated for each time period; and the land availability is modified to reflect land development over the previous period. Since land developed over each succeeding period is not removed from the developed land total, the recursive model solution will differ from a planned type solution, which might proceed from 1963 to the target year in one large or at best several staged increments. Since the effects of poor land development based on short-term forecasts are extremely difficult to rectify, the resulting land use pattern is essentially "frozen" after each time period. One of the primary advantages of long-range planning is, of course, that it avoids such poor development and attempts to shape land development in light of long-range rather than short-range forecasts toward the attainment of sound community development objectives and standards.

#### Model Application

Two primary sets of policies were evaluated in the application of the land use simulation model to the test of the recommended regional land use plan:

1. In one policy alternative, the feasibility of achieving regional plan implementation indirectly through the medium of information distribution only was explored. Planning and engineering information was assumed to be made available to both local units of government and private individuals on a uniform, areawide basis, in the hope that it would be used in the best interests of both public and private interests and that such use might lead to implementation of the recommended regional land use plan.

2. A second more active policy alternative was explored which restricted land use development to those areas of the Region which could be readily provided with gravity drainage sanitary sewer service tributary to existing or committed sewage treatment plants. Available land was limited to acreage within the existing and proposed sanitary sewer service areas. Except for these constraints, land development took place under the same set of costs, land development regulation, employment accessibility, land use demand forecasts, and other input data as the first policy alternative.

Both sets of policies were simulated in sequence for the intermediate years 1970 and 1980, as well as the plan target year, 1990. The lack of historical data on original soil conditions in developed areas, development costs, land development regulations, and other model input data made it impossible to simulate historical land development on a regional basis as a "validity test" of the model. Such validity tests were, however, performed as a pilot application in the City of Waukesha, Wisconsin; and the results of these historical simulation runs are described in SEWRPC Technical Report No. 3, A Mathematical Approach to Urban Design.

#### MODEL RESULTS

As previously noted, two land use simulation model applications were made. The first was based upon the assumed policy alternative that market forces would be allowed to continue to shape land use development within the Region without any attempt to influence the effects of these forces in the public interest on an areawide basis except through the areawide dissemination and use of basic planning and engineering data, particularly the data and information obtained through the detailed operational soil survey.<sup>4</sup> Inputs to the model in this application included the regional residential land use demand forecast, local development constraints as reflected in adopted community plans and zoning ordinances, and development costs related to soil characteristics. The results of the model application indicate that this alternative may be expected to concentrate new development in those outlying areas of the Region wherein the costs of land development would be low because of the combined circumstances of relatively good soil conditions

<sup>4</sup> For a description of the survey and the report of its findings, see SEWRPC Planning Report No. 8, Soils of Southeastern Wisconsin, June 1966.

Table 42

SUMMARY COMPARISON OF THE 1963 TO 1990 RESIDENTIAL LAND INCREMENT UNDER VARYING LAND USE DEVELOPMENT  
ALTERNATIVES WITHIN THE REGION BY TRAFFIC ANALYSIS DISTRICT AND RESIDENTIAL DENSITY CLASSIFICATIONS  
(Land Area in Acres)

District Number <sup>a</sup>	Policy Alternative No.1 <sup>b</sup>				Policy Alternative No.2 <sup>c</sup>				Recommended Land Use Plan				Unplanned Land Use Alternative			
	Low Density	Medium Density	High Density	Total	Low Density	Medium Density	High Density	Total	Low Density	Medium Density	High Density	Total	Low Density	Medium Density	High Density	Total
31 - 39 . .	---	---	---	---	6,460	1,480	---	7,940	100	3,980	1,010	5,090	1,970	780	50	2,800
41 - 49 . .	---	---	---	---	48,430	---	---	48,430	4,210	18,060	780	23,050	23,800	5,560	40	29,400
51 - 59 . .	---	---	---	---	46,650	6,110	---	52,760	7,330	15,000	20	22,350	54,460	7,060	190	61,710
61 - 69 . .	39,290	7,690	---	37,980	29,860	9,980	---	39,840	1,790	6,610	170	8,570	37,270	2,100	60	39,430
71 - 79 . .	89,060	12,200	---	101,260	28,780	3,180	---	31,960	1,180	6,320	170	7,670	24,600	1,750	90	26,440
86 - 89 . .	53,200	1,480	---	54,680	12,760	610	---	13,370	---	3,730	---	3,730	10,400	1,600	30	12,030
Total <sup>d</sup>	172,550	21,370	---	193,920	172,940	21,360	---	194,300	14,610	53,700	2,150	70,460 <sup>e</sup>	152,500	18,850	460	171,810 <sup>e</sup>

<sup>a</sup> Traffic analysis districts 00-29 were excluded from this comparison because they were essentially fully developed for urban use in 1963 (see, also, footnote e).

<sup>b</sup> This simulation model run assumed that present urban land market trends would continue to shape land use development, modified only by the availability, on an areawide basis, of basic planning and engineering information-particularly soils information.

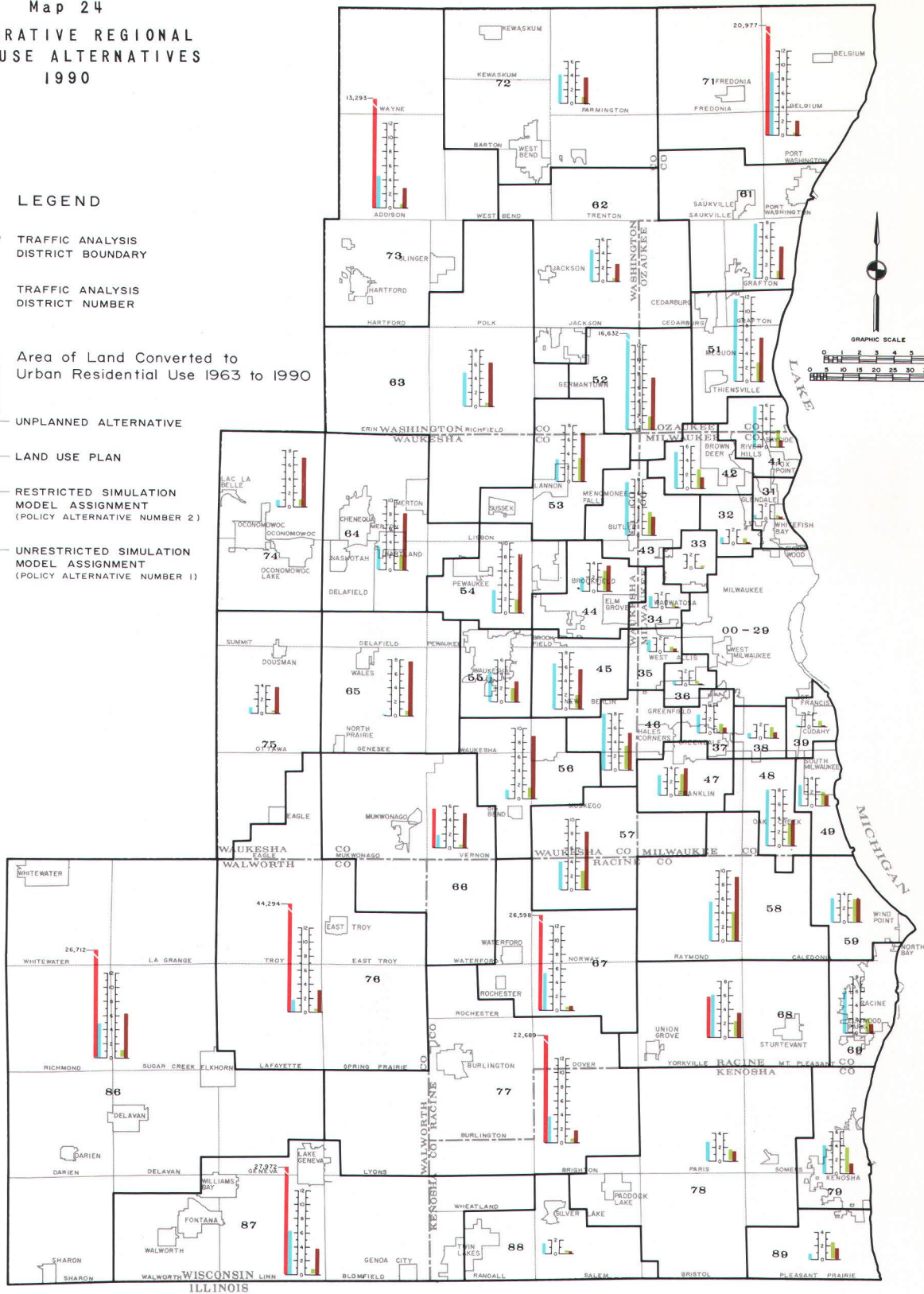
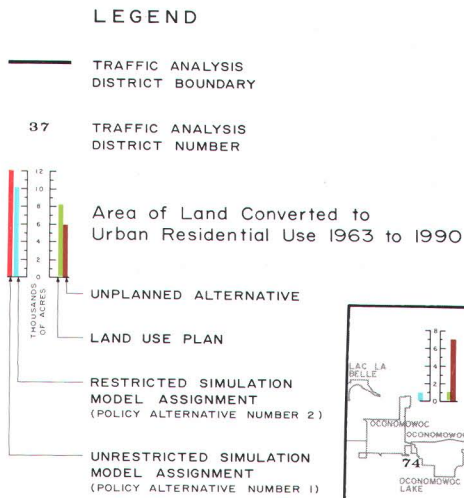
<sup>c</sup> This simulation model run assumed that residential development would be permitted only in areas which could be readily provided with gravity drainage sanitary sewer service.

<sup>d</sup> The totals vary between the land use development alternatives because of variations in methodology and the assumptions utilized.

<sup>e</sup> These totals differ from those in the previous chapter because some new residential land was added to district 00-29.

Source: SEWRPC.

Map 24  
 COMPARATIVE REGIONAL  
 LAND USE ALTERNATIVES  
 1990



This map graphically depicts the spatial distribution of new urban land use development within the Region that may be expected under two different areawide development policies as simulated by two applications of the land use model. Also shown on the map for comparative purposes are the spatial distribution of new urban land use development by the recommended land use plan and that which may be expected under the unplanned alternative described in Chapter IV. The model application results indicate that, under Policy Alternative No.1, new urban development could be expected to occur in a highly dispersed pattern in outlying areas of the Region where development would be least expensive for the developer but not necessarily in the areawide or local public interest. The model application results also indicate that, under Policy Alternative No.2, a more concentrated development pattern would be achieved approximating the pattern proposed in the recommended land use plan.

and relatively lenient local zoning and subdivision regulations (see Map 24 and Table 42). It is important to note that this model application does not represent an extrapolation of recent development trends within the Region, but represents a departure from these trends based upon the assumption that the planning and engineering data made available by the Commission will be used to make development decisions in the absence of any areawide constraints on such development in the public interest. The model run indicates that the result would be to encourage development within the Region primarily in areas covered by soils well suited to urban development and without centralized sanitary sewerage systems. The land use pattern which would develop as a result of this "information only" policy would not tend to even approximate the recommended land use pattern. Instead, the recent emphasis upon highly dispersed low-density residential development would apparently be reinforced and widespread urban sprawl within the Region actually accelerated. Environmental and developmental problems within the Region could, under this alternative, be expected to intensify; and no assurance would be provided that the regional development objectives formulated under the land use-transportation study could be met.

The second model application was based upon the assumed policy alternative of a more active regulation of development within the Region on an areawide basis in the public interest. A public policy of permitting intensive residential development only in those areas of the Region which can be readily served by gravity drainage sanitary sewer service was assumed, and this constraint was included as a model input. The results of this second simulation model application are also dis-

played graphically in Map 24 and summarized quantitatively in Table 42. This policy alternative, as reflected in the model test results, may be expected to result in a much more concentrated development pattern approximating that of the recommended land use plan. Differences between the land use pattern resulting from the second simulation model application and that of the recommended land use plan may be attributed primarily to the use of the forecast of aggregate regional land use demand as an input to the simulation model rather than the modification of this demand used in the preparation of the recommended land use plan. To a lesser extent, the differences may be attributed to the failure to incorporate in the model run constraints implied by a staging of land use development in accordance with rational sewer service extension policies, as implied by the recommended plan. Both of the land use simulation model runs developed a land use pattern based upon the forecast of aggregate 1963 to 1990 regional land use demand set forth in Table 43. As further indicated in Table 43, the recommended plan, in contrast, developed a land use pattern based on a modified demand. The simulation model demand forecast is based upon the assumption that the land development trends experienced within the Region over the period from 1950 to 1963 will continue to 1990, while the recommended plan demand function is based upon the assumption that somewhat higher development densities within the Region can be brought about.

The results of the land use simulation model applications clearly indicate that restriction of residential development to those areas of the Region which can be readily provided with gravity drainage sanitary sewer service tributary to existing and committed sewerage systems and sewage

Table 43  
EQUIVALENT RESIDENTIAL LAND USE DEMAND WITHIN THE REGION BY DENSITY  
CLASSIFICATION FOR THE LAND USE SIMULATION MODEL AND  
THE RECOMMENDED LAND USE PLAN: 1963 TO 1990

Residential Density Classification	Forecast Aggregate Regional Land Use Demand Acres	Recommended Land Use Plan Increment Acres
High-Density . . . .	---	2,790
Medium-Density . . . .	21,365	53,784
Low-Density . . . .	172,549	14,613
Total	193,914	71,187

Source: SEWRPC.

treatment plants is necessary if the recommended land use pattern is to be brought about. This policy may have to be supplemented in some areas of the Region with more restrictive local land development practices which would encourage a higher level of land use development. It is equally clear from the results of the land use simulation model application that an attempt to implement the recommended land use plan through sole reliance on the dissemination of planning and engineering data will almost certainly fail without the concomitant regulation of private development in the public interest by the local units of government concerned.

#### SUMMARY AND CONCLUSIONS

This chapter has stressed the need which exists to test the feasibility of the recommended regional land use plan beyond the gross demand tests pro-

vided by conventional planning techniques. It described the regional land use simulation model developed in the regional land use-transportation study to meet this need and the results of two experimental simulation model runs performed with differing land use control policy assumptions in order to evaluate the practicality of the recommended land use plan. The simulation model applications indicate the importance to land use plan implementation of restricting future residential development within the Region to those areas which can be readily served by sanitary sewer service tributary to existing and committed sewage treatment plants. This conclusion, based upon the quantitative results of the simulation model runs, serves to emphasize the importance of sound municipal development policies within the Region to the attainment of the land use plan.

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## Chapter VI

# STAGED DEVELOPMENT OF THE RECOMMENDED PLANS

### INTRODUCTION

The recommended regional land use and transportation system plans described in previous chapters of this volume were prepared for a 27-year planning period extending from 1963 to the design year 1990. The plans provide recommendations for the placement in space of the various land uses and of the transportation facilities required to meet the needs of the regional population level forecast for the design year. The need to place development properly in space, in accordance with a long-range development plan, is generally recognized today as desirable from an economic standpoint in order to ensure the wise and efficient use of resources and from a social standpoint in order to protect the health, safety, and general welfare of the community.

There is also, however, a less generally recognized need to place development properly in time. This need is particularly important with respect to regional land use and transportation facility development. The total land use and transportation facility configuration proposed in the plans cannot be brought into being immediately but must, due to financial and engineering limitations, be evolved gradually over the planning period. Moreover, the demand for this total configuration does not presently exist; and the evaluation of land use and transportation facility development in accordance with the plan must be adjusted to the growth and change in the demand for the various land uses and for transportation system capacity within the Region. Thus, to an even greater degree than is the case in placement in space, placement of development in time is a matter of economics. Community growth and development entails public expenditures, and a balance must be struck between the rate of these expenditures to meet growing land use and transportation demands and the public ability to generate the revenues required to meet the necessary expenditures. Finally, the functional adequacy of the partially developed land use and transportation system configuration at any given points in time during the plan implementation period must be explored; and, if necessary, the rate and focus of

implementation actions adjusted to provide viable intermediate development situations. For these reasons, it becomes necessary to stage the development of both the recommended regional land use and transportation system plans.

Even if development is placed properly in space, the question of the rate at which it should proceed is a most important one. Failure to place development properly in time may lead to a decline in the quality of community services; inadequate basic public utility and community facilities, such as streets and highways, schools, water and sewer mains, and mass transit facilities; a certain formlessness of urban development occasioned by the lack of properly developed neighborhood units; and to continuously rising tax levels. Proper placement of development in time, as well as in space, will not only permit the quality of governmental facilities and services to remain unimpaired through the timely extension of community utilities and facilities but will permit public expenditures to be more nearly kept within revenue limitations. Since neither all of the land use proposals nor all of the transportation system proposals contained in the recommended regional plans can or should be carried out at once, it is logical that the most needed proposals be carried out first. Indeed, the rate of development should hinge primarily upon need.

### STAGING PERIODS

In order to prepare and support recommendations for the assignment of development priorities to the various transportation facility proposals contained in the recommended regional transportation plan, both the land use and the transportation plans had to be staged over the 1963 to 1990 plan design period. Three staging periods were selected: the first ending in 1970, the second in 1980, and the third in 1990. The primary inputs to the staging process were population and employment forecasts prepared for the end years of each staging period.

The first staging period, 1963 to 1970, was selected to represent a period of adjustment between committed land use and transportation

system development decisions within the Region and the new development decisions which would be required to carry out the recommended regional land use and transportation plans. The selection of this first stage acknowledges the important impact of the existing and committed land use pattern on traffic demand in that the major transportation system capacity deficiencies arising from the demand generated by this pattern are considered in the provision of additional transportation system capacity. The selection of this first stage also acknowledges the important impact on regional development of the existing plus committed arterial street and highway network.<sup>1</sup>

The second staging period, 1970 to 1980, was selected to represent a period wherein implementation of the recommendations contained in the regional transportation plan would be initiated. It also represents a period wherein decisions concerning land use development within the Region would begin to take more complete advantage of the areawide planning and engineering data made available through the regional planning efforts and wherein the extension of public sanitary sewer and water supply facilities, as well as of transportation facilities, would begin to follow the recommendations explicitly or implicitly contained in the regional land use plan. It is during this period that it will be first possible to begin to meet the regional development objectives and standards adopted as a part of the regional planning effort.

The third staging period, 1980 to 1990, was selected to represent a period of full regional land use and transportation system plan implementation, wherein the attainment of the regional development objectives would be possible and the full benefits of these objectives to the Region would become demonstrable.

A ten-year period for the staging of the regional transportation plan was also selected in order to provide the necessary flexibility for project programming by the state, county, and local agencies of government concerned. Detailed staging, particularly of the standard arterial street and highway facility elements of the regional transportation plan, must be done on a year-to-year

basis by the State Highway Commission of Wisconsin and the county highway committees working in close cooperation with the cities, villages, and towns on the basis of project lead times required and funds available. Flexibility for program adjustment must be provided in order to permit transportation plan implementation actions to be adjusted to lead times for such necessary related local construction efforts as utility construction, relocation, and reconstruction, as well as to local financial resources as these become available in varying amounts from year to year.

In any consideration of the staging of the regional transportation plans, it must be recognized that the population and employment forecasts upon which the staging is based involve uncertainty and cannot take into account events which are unpredictable but may have major effects upon future growth within the Region. To the extent that growth in regional population and employment levels, and in land use and transportation demand derived from these levels, is either greater or less than the forecast levels for the staged periods, the provision of additional land use and transportation system capacity will have to be accelerated or decelerated. Thus, the staging of the plan proposals must, like forecasting, be a continuous process. In anticipation of this and other factors, the Commission sought and obtained approval for a continuing land use-transportation study within the Region. As otherwise unforeseeable events unfold, forecast results will under the continuing study be revised; and, in turn, the plans and the implementation staging based upon the forecasts will be reviewed and revised accordingly.

#### STAGED DEVELOPMENT OF THE RECOMMENDED LAND USE PLAN

As already noted, the staging period extending from 1963 to 1970 was selected to represent a period of adjustment wherein modifications in recent historic development trends within the Region would be inaugurated. The general effect of these modifications, which would consist primarily of efforts to intensify residential land use development in already platted and partially developed areas of the Region which are serviced or can be readily serviced by existing or committed public sanitary sewer and water supply facilities, would be that of increasing overall residential development densities within the Region. As indicated in Table 44, the demand for residential land within the Region over this period is expected to require an increase of about 11,000 acres in the stock of such land, or an increase of about 8 per-

<sup>1</sup> See Chapter V, Volume 2, SEWRPC Planning Report No. 7, *Forecasts and Alternative Plans--1990*, for a description of the existing plus committed highway network. In the staging process, it was assumed that all arterial highway facilities committed as of September 1965 would be completed and in operation by 1970.



Table 44  
 URBAN AND RURAL LAND USE IN THE REGION: 1963 AND 1970,  
 1980, AND 1990 RECOMMENDED LAND USE PLAN

Land Use Category	Existing (1963)		Staged Increment							
	Acres	Percent of Total	Total Acres 1970	Percent Change 1963-1970	Total Acres 1980	Percent Change 1970-1980	Percent Change 1963-1980	Total Acres 1990	Percent Change 1980-1990	Percent Change 1963-1990
<b>Urban Land Use</b>										
<i>Residential</i> . . . . .	<i>129,358</i>	<i>44.6</i>	<i>140,262</i>	<i>8.4</i>	<i>165,844</i>	<i>18.2</i>	<i>28.2</i>	<i>200,545</i>	<i>20.9</i>	<i>55.0</i>
High-Density . .	34,463	11.9	35,518	3.0	36,653	3.1	6.3	37,253	1.6	8.0
Medium-Density .	24,748	8.5	31,497	27.2	49,913	58.4	101.6	78,532	57.3	217.3
Low-Density . . .	70,147	24.2	73,247	4.4	79,279	8.2	13.0	84,760	6.9	20.8
Commercial <sup>a</sup> . . . . .	6,706	2.3	7,534	12.3	9,325	23.7	39.0	11,754	25.8	75.2
Industrial <sup>a</sup> . . . . .	9,746	3.4	12,484	28.0	13,542	8.4	38.9	14,869	9.7	52.5
Governmental <sup>b</sup> . . . . .	14,722	5.1	16,212	10.1	20,264	24.9	37.6	24,295	19.8	65.0
Transportation <sup>c</sup> . . .	96,117	33.1	100,169	4.2	110,446	10.2	14.9	124,740	12.9	29.7
Recreation . . . . .	33,262 <sup>d</sup>	11.5	39,151 <sup>e</sup>	17.7	40,619 <sup>e</sup>	3.7	22.1	41,980 <sup>e</sup>	3.3	26.2
<b>Total Urban Land Use</b>	<b>289,911</b>	<b>100.0</b>	<b>315,812</b>	<b>8.9</b>	<b>360,040</b>	<b>14.0</b>	<b>24.1</b>	<b>418,183</b>	<b>16.1</b>	<b>44.2</b>
<b>Rural Land Use</b>										
<i>Agriculture</i> . . . . .	<i>1,085,144</i>	<i>75.8</i>	<i>1,071,061</i>	<i>-1.2</i>	<i>1,037,025</i>	<i>-3.1</i>	<i>-4.4</i>	<i>982,307</i>	<i>-5.3</i>	<i>-9.4</i>
Prime Agriculture	443,952	31.0	441,804	-0.4	436,366	-1.2	-1.7	422,685	-3.1	-4.7
Other Agriculture	641,192	44.8	629,257	-1.8	600,659	-4.5	-6.3	559,622	-6.8	-12.7
Other Open Lands <sup>f</sup> . .	345,951	24.2	334,133	-3.4	323,941	-3.0	-6.3	320,516	-1.1	-7.3
<b>Total Rural Land Use</b>	<b>1,431,095</b>	<b>100.0</b>	<b>1,405,194</b>	<b>-1.8</b>	<b>1,360,966</b>	<b>-3.1</b>	<b>-4.9</b>	<b>1,302,823</b>	<b>-4.3</b>	<b>-8.9</b>
<b>Total</b>	<b>1,721,006</b>	<b>100.0</b>	<b>1,721,006</b>	<b>---</b>	<b>1,721,006</b>	<b>---</b>	<b>---</b>	<b>1,721,006</b>	<b>---</b>	<b>---</b>

<sup>a</sup> Includes on-site parking.

<sup>b</sup> Includes institutional uses and on-site parking.

<sup>c</sup> Includes communications and utilities uses.

<sup>d</sup> Includes the entire site area of public and nonpublic recreation sites.

<sup>e</sup> Includes only that increment recommended for public recreation uses.

<sup>f</sup> Includes woodlands, water, wetlands, and quarries.

Note: Figures in italics indicate subtotals.

Source: SEMRPC.

cent over the 1963 acreage. From 1970 to 1980, the demand for residential land is expected to require an increase of 26,000 acres in the stock of residential land, or an increase of about 18 percent over the 1970 acreage and about 28 percent over the 1963 acreage. This reflects an anticipated increase in the rate of conversion of rural to urban land for residential use after major portions of the partially developed land existing within the Region in 1963 have been absorbed. Between 1980 and 1990, the demand for residential land is expected to require an increase of about 35,000 acres in the stock of such land, or an increase of about 21 percent over the 1980 acreage. Over this period new residential land development would occur predominantly at medium densities, and certain areas of existing low-density development would evolve into the medium-density range.

Implicit in the staged development of the recommended urban land use pattern, as shown on Maps 25 through 28, is the staged provision of the major retail and service, the major industrial, and the major outdoor recreation sites proposed in the recommended land use plan. The staged population and employment forecasts and concomitant staged residential land use development patterns indicate that, of the 10 new major commercial centers proposed in the recommended land use plan, the centers proposed in the cities of Brookfield and Milwaukee would be required by 1970; the centers proposed in the cities of Oak Creek, Racine, and West Allis and in the Village of Menomonee Falls would be required by 1980; and the centers proposed in the cities of Franklin, Kenosha, and New Berlin and in the Village of Germantown would be required by 1990. All of the six proposed new major industrial areas should be partially developed by 1970. It is essential that land for these major commercial and industrial centers be set aside and protected from encroachment by incompatible uses as soon as possible, even though full development of the centers may not in some cases be required until 1990.

It is recommended that all of the 13 new regional park sites proposed in the recommended regional land use plan be acquired by 1970.<sup>2</sup> Although not

<sup>2</sup> In Volume 2 of this report, 11 proposed new major regional park sites were listed and described as integral parts of each of the alternative land use plans. In the process of plan evaluation and review, it was determined that regional park sites on the western shore of Lake Michigan in Racine County and on the eastern portion of the abandoned Bong Air Force Base site in Kenosha County should be included in the recommended regional land use plans. Thus, the regional land use plan as described in Chapter II of this volume proposes a total of 13 new major regional park sites.

all of these park sites need be developed by 1970, the acquisition and protection of the site areas should proceed immediately both in order to protect these prime recreational areas from loss to urban development and in the interests of economy. For these same reasons, the entire net area of the primary environmental corridors shown on the recommended land use plan, comprising a total area of about 283,000 acres, should be protected from incompatible rural and urban development through appropriate public land use control during the first stage of plan implementation.

#### Population Distribution

As indicated in Chapter III of this volume, the population increases within each county of the Region over the plan design period are expected, under the recommended land use plan, to meet the forecast population increases set forth in Chapter III of Volume 2 of this report. Similarly, the staged increments to the 1963 population level for 1970, 1980, and 1990 are consistent with the demographic forecasts for these years, as set forth in Table 45.

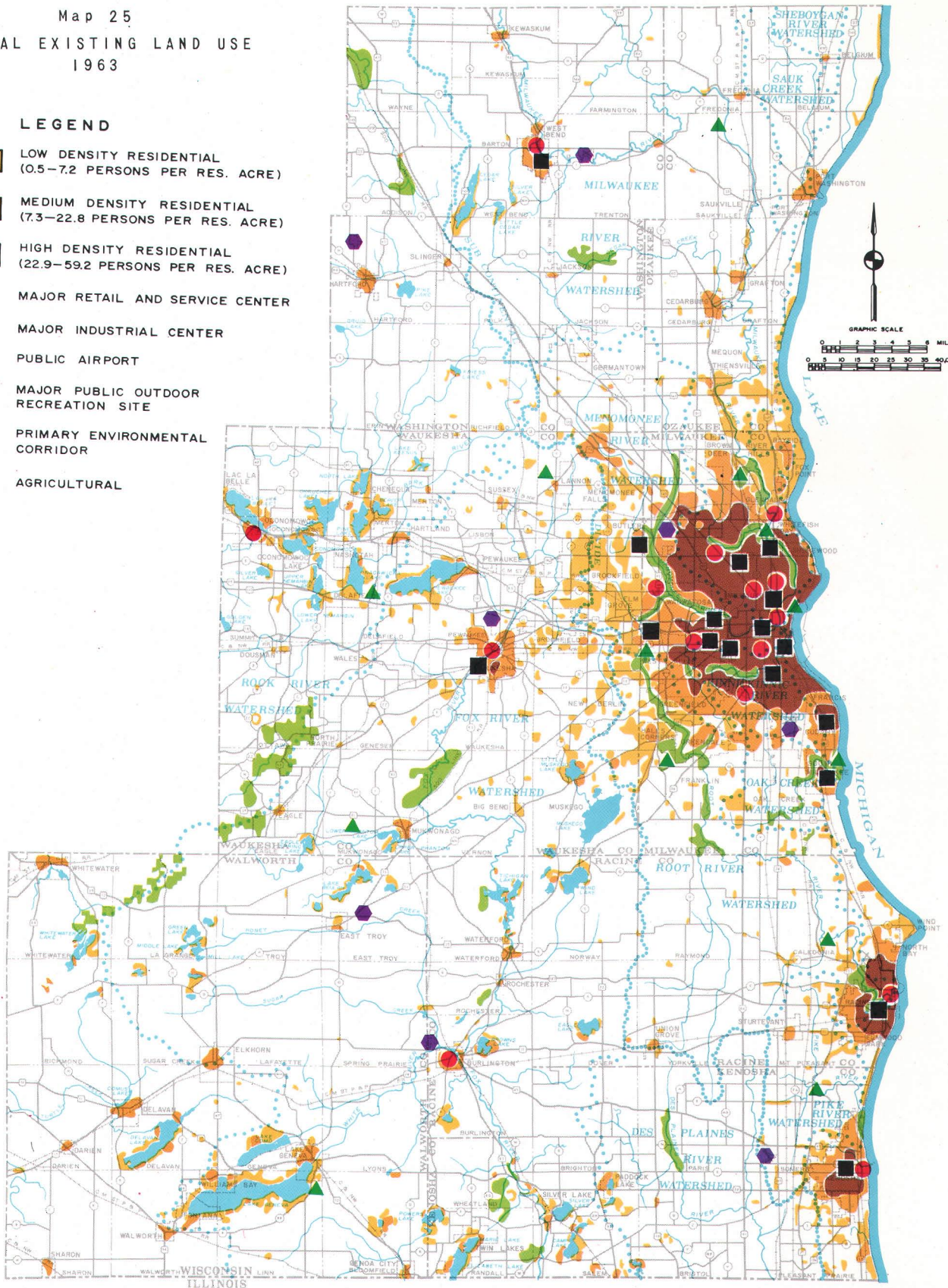
#### Public Sanitary Sewer and Water Supply Service

As indicated in Volume 2 of this report, all proposed new urban development within the Region would, in order to meet the adopted regional development standards, have to be served by public sanitary sewer facilities tributary to existing and proposed systems and by public water supply facilities. In addition, many areas presently served by on-site soil absorption sewage disposal systems and by shallow private wells would have to be converted to centralized public sanitary sewer and water supply service over the plan design period. As indicated in Table 46, urban development within the Region is expected to increase by nearly 20 percent to a total of about 407 square miles by 1970, by an additional 23 percent to a total of about 500 square miles by 1980, and by an additional 22 percent to a total of about 609 square miles by 1990. The service area of existing and locally proposed sanitary sewerage systems would accordingly have to be increased by about 31 percent to a total of about 284 square miles by 1970, by an additional 33 percent to a total of nearly 378 square miles by 1980, and by an additional 53 percent to a total of about 580 square miles by 1990. In 1963 about 64 percent of the total urban development within the Region and about 85 percent of the total regional population were served by centralized public sanitary sewer systems. If the regional plan recom-

Map 25  
 GENERAL EXISTING LAND USE  
 1963

LEGEND

- LOW DENSITY RESIDENTIAL  
(0.5-7.2 PERSONS PER RES. ACRE)
- MEDIUM DENSITY RESIDENTIAL  
(7.3-22.8 PERSONS PER RES. ACRE)
- HIGH DENSITY RESIDENTIAL  
(22.9-59.2 PERSONS PER RES. ACRE)
- MAJOR RETAIL AND SERVICE CENTER
- MAJOR INDUSTRIAL CENTER
- PUBLIC AIRPORT
- MAJOR PUBLIC OUTDOOR RECREATION SITE
- PRIMARY ENVIRONMENTAL CORRIDOR
- AGRICULTURAL












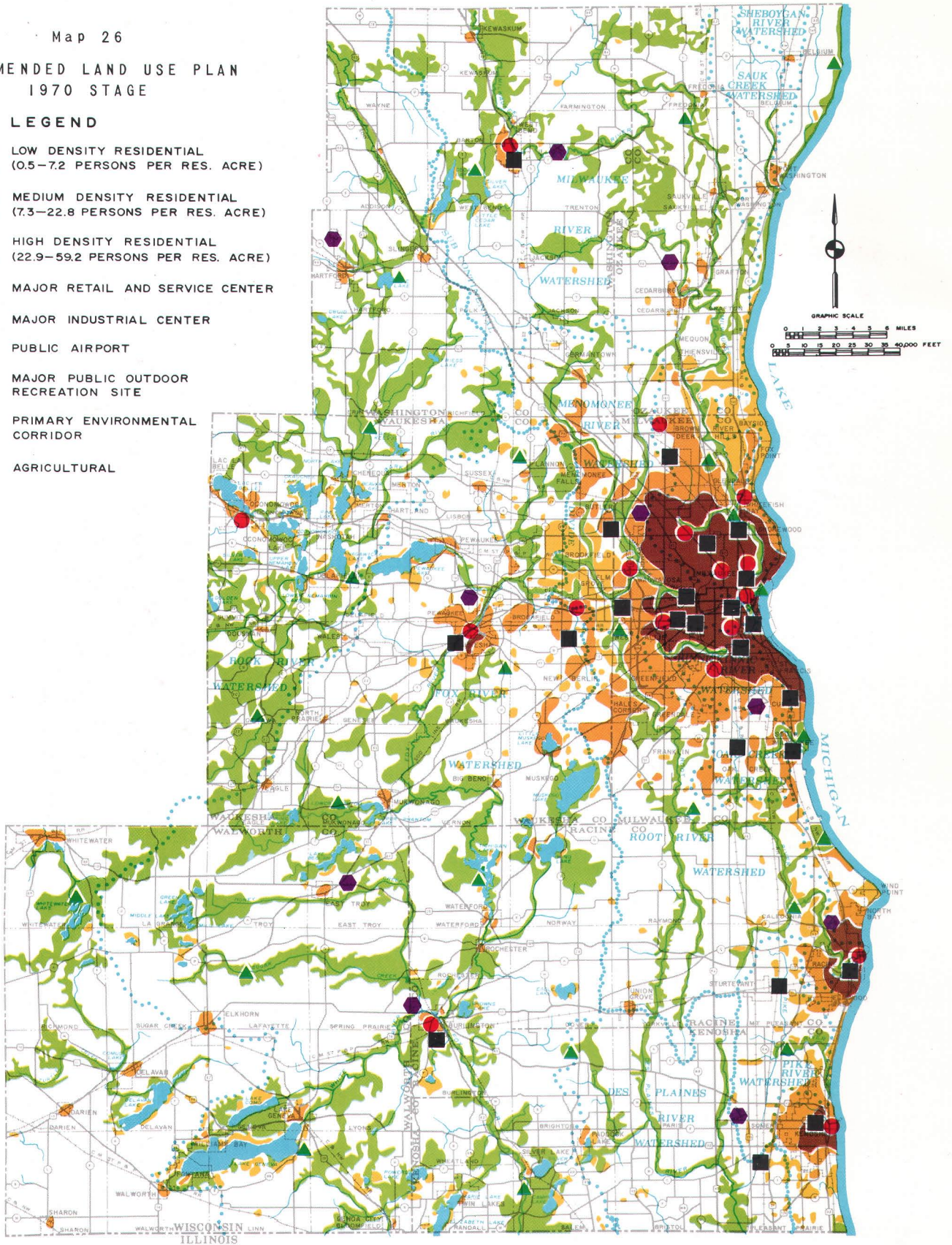
In 1963 about two-thirds of the area of the Region was devoted to agricultural land uses; and less than 17 percent, or 453 square miles, was devoted to urban land uses. By 1990 it is expected that more than 200 square miles of rural land will have to be converted to urban use in order to meet the land use demand created by the forecast regional population increase of about one million persons over the 1963 to 1990 period. This will bring the total area in urban use within the Region by 1990 to about 653 square miles.

Map 26

RECOMMENDED LAND USE PLAN  
1970 STAGE

LEGEND

-  LOW DENSITY RESIDENTIAL  
(0.5-7.2 PERSONS PER RES. ACRE)
-  MEDIUM DENSITY RESIDENTIAL  
(7.3-22.8 PERSONS PER RES. ACRE)
-  HIGH DENSITY RESIDENTIAL  
(22.9-59.2 PERSONS PER RES. ACRE)
-  MAJOR RETAIL AND SERVICE CENTER
-  MAJOR INDUSTRIAL CENTER
-  PUBLIC AIRPORT
-  MAJOR PUBLIC OUTDOOR RECREATION SITE
-  PRIMARY ENVIRONMENTAL CORRIDOR
-  AGRICULTURAL

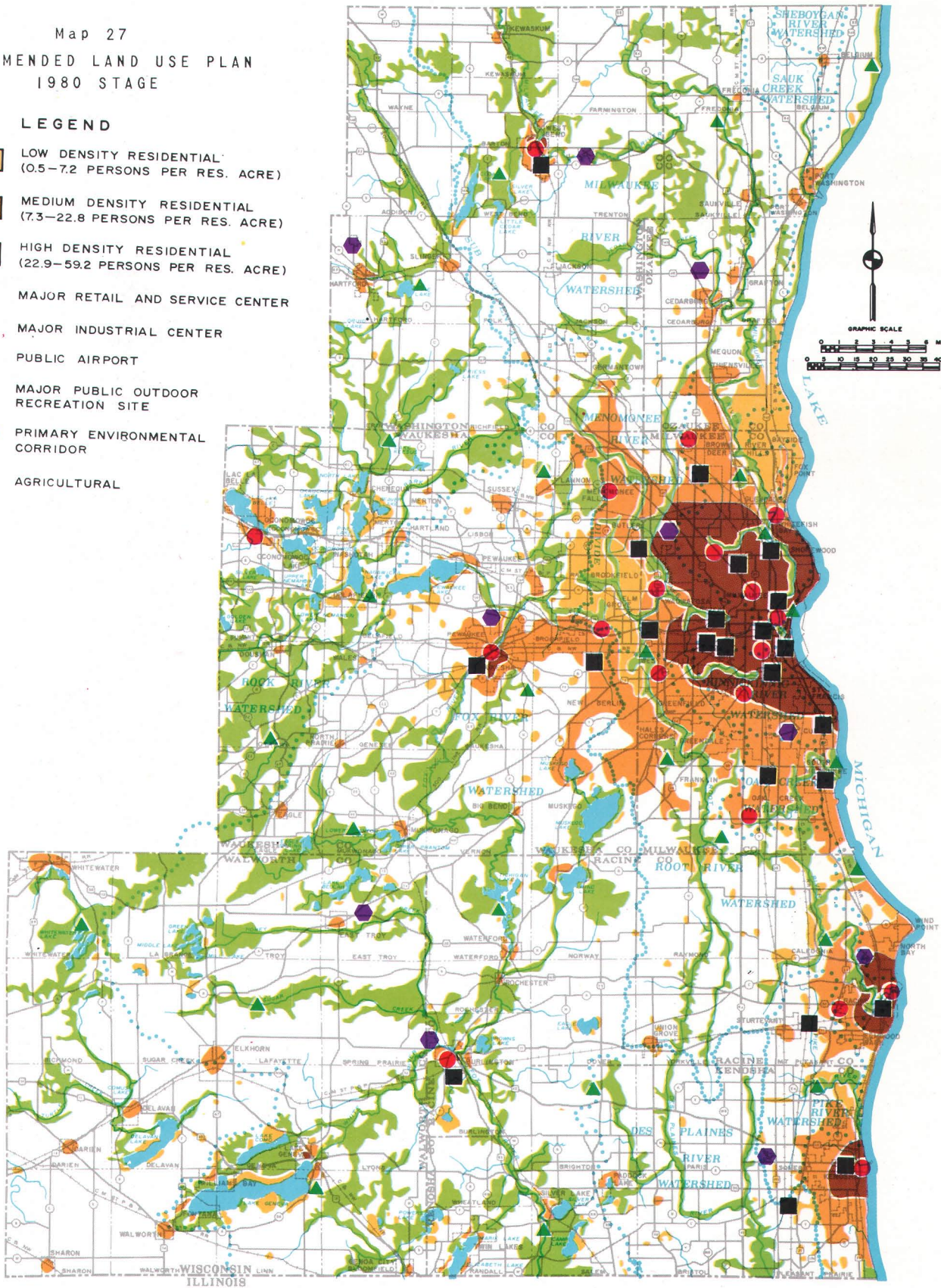


Although most of the land use development shown on this map has already taken place, the 1963 to 1970 development stage is expected to result in the conversion of about 40 square miles of land from rural to urban use to accommodate an expected population increase of about 200,000 persons. This conversion of land would also be accompanied by an intensification of use in partially developed areas of the Region.

Map 27  
 RECOMMENDED LAND USE PLAN  
 1980 STAGE

LEGEND

- LOW DENSITY RESIDENTIAL  
(0.5-7.2 PERSONS PER RES. ACRE)
- MEDIUM DENSITY RESIDENTIAL  
(7.3-22.8 PERSONS PER RES. ACRE)
- HIGH DENSITY RESIDENTIAL  
(22.9-59.2 PERSONS PER RES. ACRE)
- MAJOR RETAIL AND SERVICE CENTER
- MAJOR INDUSTRIAL CENTER
- PUBLIC AIRPORT
- MAJOR PUBLIC OUTDOOR RECREATION SITE
- PRIMARY ENVIRONMENTAL CORRIDOR
- AGRICULTURAL

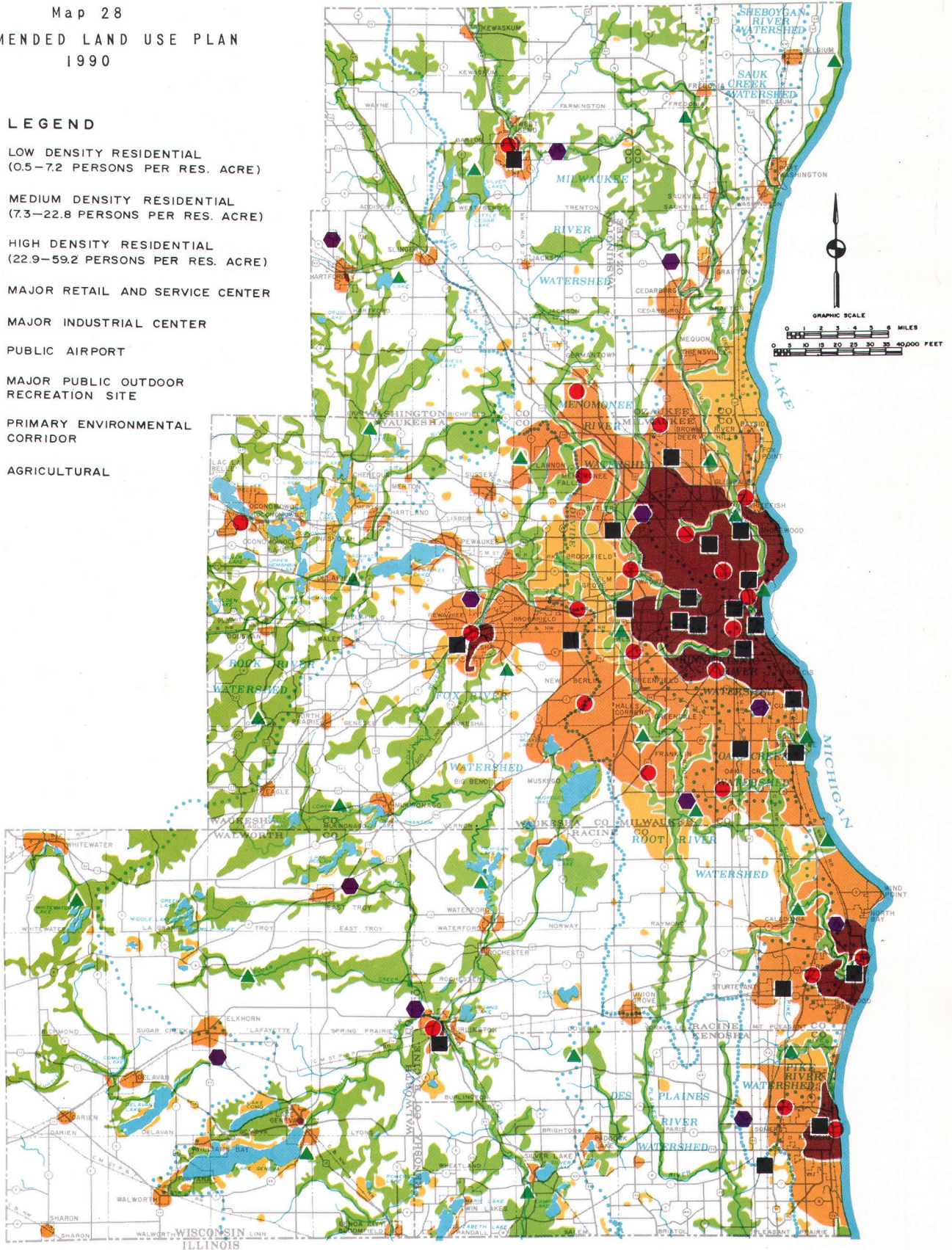


By 1980 it is expected that the regional population will increase by 350,000 persons over the 1970 level and that an additional area of 69 square miles will have to be converted from rural to urban use between 1970 and 1980 to bring the total land in urban use to more than 560 square miles.

Map 28  
 RECOMMENDED LAND USE PLAN  
 1990

LEGEND

- LOW DENSITY RESIDENTIAL  
(0.5-7.2 PERSONS PER RES. ACRE)
- MEDIUM DENSITY RESIDENTIAL  
(7.3-22.8 PERSONS PER RES. ACRE)
- HIGH DENSITY RESIDENTIAL  
(22.9-59.2 PERSONS PER RES. ACRE)
- MAJOR RETAIL AND SERVICE CENTER
- MAJOR INDUSTRIAL CENTER
- PUBLIC AIRPORT
- MAJOR PUBLIC OUTDOOR RECREATION SITE
- PRIMARY ENVIRONMENTAL CORRIDOR
- AGRICULTURAL



With the regional population expected to exceed 2,600,000 persons by 1990, reflecting an anticipated increase of about 460,000 persons over the 1980 level, an additional area of 91 square miles will have to be converted from rural to urban use between 1980 and 1990 to bring the total land in urban use to more than 653 square miles. The spatial distribution of this urban land, in accordance with the recommended regional land use plan, would accommodate the necessary land development with the least amount of destruction to the natural resource base.

Table 46

EXISTING AND PROPOSED DEVELOPED AREA AND POPULATION SERVED BY PUBLIC SANITARY SEWER AND PUBLIC WATER SUPPLY IN THE REGION: 1963 AND 1970, 1980, AND 1990 RECOMMENDED LAND USE PLAN

Facility	Extent of Service	Existing (1963)	Staged Increment							
			1970 Total	Percent Change 1963- 1970	1980 Total	Percent Change 1970- 1980	Percent Change 1963- 1980	1990 Total	Percent Change 1980- 1990	Percent Change 1963- 1990
Public Sewer Service	Developed Area:									
	Total Square Miles	339.7	406.8	19.7	500.5	23.0	47.3	609.0	21.6	79.2
	Square Miles Served	217.0	284.1	30.9	377.8	32.9	74.1	579.9	53.4	167.2
	Percent of Total Served	63.9	69.8	---	75.5	---	---	95.2	---	---
	Population:									
	Total Population	1,674,400	1,870,000	11.6	2,223,000	18.8	32.7	2,678,000	20.4	59.9
Population Served	1,419,025	1,632,600	15.0	2,036,300	24.7	43.4	2,546,000	25.0	79.4	
Percent of Total Served	84.7	87.3	---	91.6	---	---	95.0	---	---	
Public Water Service	Developed Area:									
	Total Square Miles	339.7	406.8	19.7	500.5	23.0	47.3	609.0	21.6	79.2
	Square Miles Served	200.0	262.0	31.0	348.5	33.0	74.2	579.9	66.3	189.9
	Percent of Total Served	58.8	64.4	---	69.6	---	---	95.2	---	---
	Population:									
	Total Population	1,674,400	1,870,000	11.6	2,223,000	18.8	32.7	2,678,000	20.4	59.9
Population Served	1,372,480	1,606,000	17.0	2,008,000	25.0	46.3	2,546,000	26.7	85.5	
Percent of Total Served	81.9	85.8	---	90.3	---	---	95.0	---	---	

Source: SEWRPC.

Table 45

POPULATION DISTRIBUTION IN THE REGION BY COUNTY: 1963 AND 1970,  
1980, AND 1990 RECOMMENDED LAND USE PLAN  
(Population in Thousands)

County	Existing (1963)		Staged Increment							
	Number	Percent of Region	1970 Number	Percent Change 1963- 1970	1980 Number	Percent Change 1970- 1980	Percent Change 1963- 1980	1990 Number	Percent Change 1980- 1990	Percent Change 1963- 1990
Kenosha . . . .	106.7	6.4	125.0	17.1	157.0	25.6	47.1	202.0	28.6	89.3
Milwaukee . . .	1,086.3	64.9	1,170.0	7.7	1,305.0	11.5	20.1	1,446.0	10.8	33.1
Ozaukee . . . .	41.6	2.5	54.0	29.8	75.0	38.8	80.2	106.0	41.3	154.8
Racine . . . . .	150.6	9.0	173.0	14.8	217.0	25.4	44.0	283.0	30.4	87.9
Walworth . . . .	55.5	3.3	62.0	11.7	73.0	17.7	31.5	87.0	19.1	56.7
Washington . . .	49.5	2.9	58.0	17.1	74.0	27.5	49.4	96.0	29.7	93.9
Waukesha . . . .	184.2	11.0	228.0	23.7	322.0	41.2	74.8	458.0	42.2	148.6
Regional Total	1,674.4	100.0	1,870.0	11.6	2,223.0	18.8	32.7	2,678.0	20.4	59.9

Source: SEWRPC.

mendations are fully implemented, by 1970 nearly 70 percent of the urban development and 87 percent of the total regional population would be provided with such service; by 1980 nearly 76 percent of the urban development and about 92 percent of the total population would be provided with such service; and by 1990, 95 percent of the urban development and of the total population would be provided with such service. As further indicated in Table 46, the proportion of the urban development within the Region provided with public water supply facilities at each staged increment would be similar to that provided with public sanitary sewer service.

#### STAGED DEVELOPMENT OF THE RECOMMENDED TRANSPORTATION PLAN

The first stage of plan implementation insofar as the transportation system proposals are concerned entails completion of the committed arterial street and highway improvements within the Region, together with the construction of certain regional improvements in the existing system. During this first stage, expected to extend from 1963 to 1970, increases in traffic demand may, in some areas of the Region, cause an increased amount of relatively local traffic congestion because completion of the committed facilities will not as yet have provided the Region with an integrated transportation system, per se, but will have only provided the basic framework for such a system. Completion of the proposed highway and rapid transit facilities will, in conjunction with the existing plus committed network, form an integrated, balanced transportation system within the Region.

It should be emphasized, however, that a great deal of preliminary engineering and programming will have to be carried out with respect to the proposed facilities during the first stage of plan implementation if the following stages of plan implementation are to be accomplished on schedule. Corridor refinement studies, aerial photography, topographic mapping, and preliminary centerline location and right-of-way requirement studies, as well as the establishment of appropriate capital budgets, are among these preliminary tasks that must be accomplished. An understanding of the transportation implications which would result from the proposed staged development of the recommended transportation plan can be obtained from a careful review of the graphical presentation of this staged development as shown on Map 29 and from the data set forth in Tables 47 through 49.

#### Staging of the Proposed Highway System Plan










The transportation system proposed under the Recommended Regional Transportation Plan described in Chapter III of this volume consists of 291 miles of new freeway facilities, 8 miles of new parkway and expressway facilities, 192 miles of new standard arterials, 1,003 miles of improved arterial street and highway facilities, 84.3 miles of modified rapid transit facilities, and about 4.3 miles of rapid transit facilities. Not all of these facilities can or need be provided at once; and the staging of their construction, as recommended herein, has been guided by both the known and anticipated need for such facilities. The detailed information needed to prepare these staging recommendations was obtained through

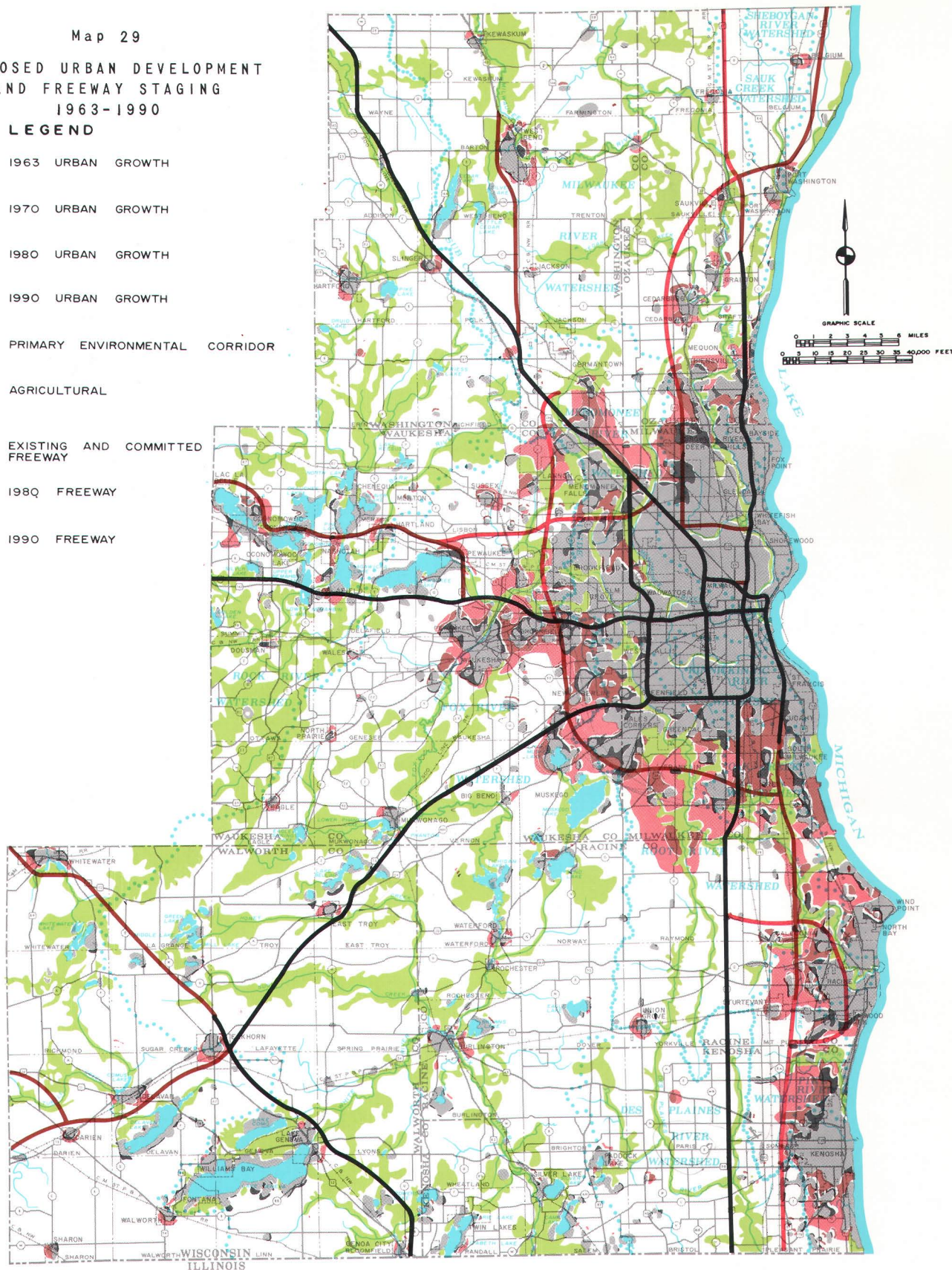


Map 29

PROPOSED URBAN DEVELOPMENT  
AND FREEWAY STAGING  
1963-1990

LEGEND

-  1963 URBAN GROWTH
-  1970 URBAN GROWTH
-  1980 URBAN GROWTH
-  1990 URBAN GROWTH
-  PRIMARY ENVIRONMENTAL CORRIDOR
-  AGRICULTURAL
-  EXISTING AND COMMITTED FREEWAY
-  1980 FREEWAY
-  1990 FREEWAY



To facilitate orderly, economical, and effective plan implementation, the recommended land use and transportation system plans have been staged over time in relation to the expected increase in population and employment, concomitant land use and travel demand, and availability of public financial resources. Over 163 miles of new freeways are proposed to be added to the regional highway system between 1963 and 1970, 132 miles between 1970 and 1980, and 79 miles between 1980 and 1990, bringing the total freeway system within the Region in 1990 to over 469 miles.

Table 47  
RECOMMENDED STAGING OF THE FREEWAY AND PARKWAY FACILITIES  
UNDER THE RECOMMENDED TRANSPORTATION PLAN

Freeway Facility <sup>a</sup>	First Stage 1963-1970	Second Stage 1970-1980	Third Stage 1980-1990
1. Southerly extension of Lake Freeway		Proposed to be constructed from E. Layton Avenue in the City of Milwaukee southerly to STH 20 in Racine County.	Proposed to be constructed southerly from STH 20 in Racine County to the Wisconsin-Illinois State line in Kenosha County.
2. Northerly extension of Stadium Freeway		Proposed to be constructed from the Bay Freeway in Milwaukee County northerly to STH 167 in Ozaukee County.	Proposed to be constructed from STH 167 in Ozaukee County to the Ozaukee-Sheboygan County line.
3. Northerly extension of North-South Freeway		Proposed to be constructed from the Grafton Interchange in Ozaukee County northeasterly to the Ozaukee-Sheboygan County line.	
4. Bay Freeway		a. Proposed to be constructed from the North-South Freeway to the Zoo Freeway in Milwaukee County.  b. Proposed to be constructed from the Pewaukee area in Waukesha County to the Waukesha-Jefferson County line.	Proposed to be constructed from the Zoo Freeway in Milwaukee County to the Pewaukee area in Waukesha County.
5. Milwaukee River Parkway		Proposed to be constructed in its entirety from the Juneau Interchange to the Hampton Avenue area to connect with the North-South Freeway.	
6. Belt Freeway		Proposed to be constructed from the Lake Freeway in the City of Oak Creek to the East-West Freeway in the City of Brookfield.	Proposed to be constructed from the East-West Freeway in the City of Brookfield to the Fond du Lac Freeway in the Village of Germantown.
7. West Bend By-Pass		Proposed to be constructed in its entirety from the Fond du Lac Freeway in the Town of Richfield to USH 45 north of West Bend.	
8. Rock Freeway (STH 15)		Proposed to be constructed in its entirety from the area east of the City of Elkhorn to the Walworth-Rock County line, including the Janesville Branch from the area near the Village of Darien to the Walworth-Rock County line.	
9. USH 12		Proposed to be constructed from the area north of the City of Elkhorn to the Walworth-Jefferson County line.	
10. Loop Freeway			Proposed to be constructed from the North-South Freeway (IH-94) into the City of Racine and back out to the Lake Freeway.

<sup>a</sup> For a more complete description of these facilities, see Chapter III of this volume.

Source: SEWRPC.

the advice, guidance, and interagency staff consultations of the various agencies and levels of government responsible for the development and operation of highway facilities within the Region, through the professional interpretation of future traffic demand assignment information and through an appraisal of the capacity of the public financial sector of the economy to sustain the proposed capital improvement programs over the necessary period of time.

Three assignments of future traffic demand were made to the staged transportation system in order to determine the workability of each of the stages. These assignments were made for the years 1970, 1980, and 1990 using the traffic simulation models described in Volume 2 of this report. The future traffic demand was, in each case, derived from the corresponding staged land use pattern. The results of the traffic assignment process indicated that the recommended partially completed systems, as represented by the staged construction in 1970 and 1980, as well as the completed system, as represented by the staged construction in 1990, may be expected to function adequately under the anticipated traffic loads.

Table 47 and Map 29 contain the recommended stages of construction for the major freeway and parkway facilities described in Chapter III of this volume. The recommended staging for the recommended new and improved standard arterial street and highway facilities is not provided herein. Preliminary staging recommendations for these facilities are available in the Commission Offices, but final recommendations will depend upon completion of jurisdictional highway plans within each county of the Region. The capital improvement cost data contained in Table 48, however, includes the staged estimates of the complete costs of implementing the new highway facility proposals under the Recommended Transportation Plan. The volume-to-capacity data shown in Table 49 are the result of traffic assignments to the complete network at each stage of its proposed development and, therefore, reflect the proportion of the entire arterial street and highway system anticipated to operate in each range shown (see Map 30).

In Chapter III of Volume 2 of this report, it was pointed out that nearly \$5.7 billion would become available to the various levels, units, and agencies of government responsible for highway facility improvement, operation, and maintenance within the Region for the construction and maintenance of

streets and highways over the 1966 to 1990 plan implementation period or approximately \$228 million per year. Of this amount, it was estimated that approximately \$85 million per year would be available for construction and \$143 million per year would be available for maintenance. As indicated in Table 48, the total revenues which are expected to become available for new construction in each of the project years would be somewhat higher than the amount needed to implement the highway system plan proposals. Variations in federal policies, variations in economic activity levels affecting highway user taxes, and variations in requirements for the construction and maintenance of local and collector streets will all tend to cause fluctuations in both the average annual requirements and the average annual amounts available for construction and maintenance of arterial streets and highways within the Region. The total revenues available over the entire period, however, are expected to exceed the forecast amount needed to implement the recommended highway system plan.

One of the measures of the operating level of a transportation system is the volume-to-capacity ratio, which relates the design capacity of a facility to the number of motor vehicles it actually carries at prescribed speeds. As indicated in Table 49, 6.0 percent of the nearly 3,200 route miles of arterial streets and highways within the Region were actually found to be operating above a volume-to-capacity ratio of 1.10 in 1963. By 1970, after the addition of more than 376 miles of new or improved facilities to the network, only 3.9 percent of the facilities are anticipated to be operating over their design capacity. By 1980, the end of the second stage of the recommended construction schedule and the first stage of implementation of the new facility proposals contained in the plan, the proportion of the proposed network operating over design capacity would be further reduced to 2.3 percent. About 298 miles of new and improved facilities would be added to the network during this period. By 1990 the total network mileage would exceed 3,900 miles, and only 0.9 percent of the facilities would be expected to be operating over their design capacity.

#### Staging of the Proposed Rapid and Modified Rapid Transit System

Implementation of the proposed highway system plan for the Region would not result in attainment of the full cost savings and the decreased congestion and operating efficiencies described herein



Table 48

SCHEDULE OF CAPITAL COSTS<sup>a</sup> OF THE PROPOSED NEW ARTERIAL STREET AND HIGHWAY FACILITIES IN THE REGION: 1963 TO 1990 RECOMMENDED TRANSPORTATION PLAN  
(Costs in Thousands of 1966 Dollars)

Year	Project Year	Standard Arterials		Parkway And Expressway		Freeways		Total	
		Miles	Cost	Miles	Cost	Miles	Cost	Miles	Cost
1967	-	15.3	\$ 4,922	---	---	26.5	\$ 42,647	41.8	\$ 47,569
1968	-	15.3	4,922	---	---	26.5	42,647	41.8	47,569
1969 <sup>b</sup>	-	15.3	4,922	---	---	26.6	42,700	41.9	47,622
1970	1	10.2	3,281	---	---	13.2	21,243	23.4	24,524
1971	2	10.2	3,281	---	---	13.2	21,243	23.4	24,524
1972	3	10.2	3,281	---	---	13.2	21,243	23.4	24,524
1973	4	10.2	3,281	---	---	13.2	21,243	23.4	24,524
1974	5	10.2	3,281	---	---	13.3	21,410	23.5	24,691
1975	6	10.2	3,281	1.6	\$1,464	13.3	21,410	25.1	26,155
1976	7	10.2	3,281	1.6	1,464	13.3	21,410	25.1	26,155
1977	8	10.2	3,281	1.7	1,555	13.3	21,410	25.2	26,246
1978	9	10.2	3,281	1.7	1,555	13.3	21,410	25.2	26,246
1979	10	10.2	3,281	1.7	1,555	13.3	21,410	25.2	26,246
1980	11	4.4	1,415	---	---	7.8	12,553	12.2	13,968
1981	12	4.4	1,415	---	---	7.8	12,553	12.2	13,968
1982	13	4.4	1,415	---	---	7.9	12,723	12.3	14,138
1983	14	4.4	1,415	---	---	7.9	12,723	12.3	14,138
1984	15	4.4	1,415	---	---	7.9	12,723	12.3	14,138
1985	16	4.4	1,415	---	---	7.9	12,723	12.3	14,138
1986	17	4.4	1,415	---	---	7.9	12,723	12.3	14,138
1987	18	4.5	1,448	---	---	7.9	12,723	12.4	14,171
1988	19	4.5	1,448	---	---	7.9	12,723	12.4	14,171
1989	20	4.5	1,448	---	---	7.9	12,723	12.4	14,171
Total		192.2	\$61,825	8.3	\$7,593	291.0	\$468,316	491.5	\$537,734
Average Annual Cost		---	\$ 2,688	---	\$1,519	---	\$ 20,362	---	\$ 23,380

<sup>a</sup> Capital costs include costs of right-of-way acquisition, engineering, and construction.

<sup>b</sup> Represents the final year of construction of the existing and committed highway system as described in Planning Report No.7, Volume 2, Forecasts and Alternative Plans--1990, Chapter V.

Source: SEWRPC.

if the complementary proposals of a rapid and modified rapid transit system are not implemented along with the proposed highway system. The assignments of future travel demand to the highway facilities within the Region were predicated on comparison assignments to transit facilities. These transit facilities, as described earlier, consist of a rapid transit and modified rapid transit system. Failure to implement these transit proposals would result in an increased need to accommodate the trips anticipated to be made on this system on the highway facilities.

The recommended staging of the transit proposals is indicated on Map 31. As indicated, the modified

rapid transit proposals will require expansion by 1970 to include service to, and loading and unloading points in, the following cities and villages: Brookfield, Glendale, Milwaukee, Wauwatosa, West Allis, Greendale, and Whitefish Bay. Assignments of future traffic demand to the proposed rapid transit line, as derived from the proposed staging of the land use plan, indicate that revenue passenger volumes may be expected to be sufficiently high to justify provision of the proposed line by 1970. The average number of revenue passengers estimated to use the proposed rapid transit line in 1970 exceeds the threshold service warrants for both a basic 35 cent fare and for a premium 50 cent fare. Although normal



Table 49  
 VOLUME-TO-CAPACITY RATIOS<sup>a</sup> FOR THE HIGHWAY NETWORK IN THE REGION:  
 1963 AND 1970, 1980, AND 1990 RECOMMENDED TRANSPORTATION PLAN

Year	Volume/Capacity Range 0.00 - 0.90		Volume/Capacity Range 0.91 - 1.10		Volume/Capacity Range Above 1.10		Total	
	Miles <sup>b</sup>	Percent of Total	Miles <sup>b</sup>	Percent of Total	Miles <sup>b</sup>	Percent of Total	Miles <sup>b</sup>	Percent
1963 . . . . .	2,856.5	89.6	139.9	4.4	191.8	6.0	3,188.2	100.0
1970 . . . . .	3,270.9	91.8	154.8	4.3	138.5	3.9	3,564.2	100.0
1980 . . . . .	3,601.4	93.2	174.8	4.5	86.3	2.3	3,862.5	100.0
1990 . . . . .	3,727.0	94.3	189.7	4.8	37.0	0.9	3,953.7	100.0

<sup>a</sup> The significance of the volume-to-capacity ranges used is:

0.00 - 0.90; Under design capacity, fully adequate and safest operational level.

0.91 - 1.10; At design capacity but still adequate.

Above 1.10; Over design capacity, congested at times.

<sup>b</sup> Mileage figures include freeway, expressway, and arterial ramp facilities.

Note: For volume-to-capacity ranges by county, see Appendix A.

Source: SEWRPC.

lead time schedules for the construction of such a facility would preclude its provision by 1970, steps should be taken immediately to assure the provision of the rapid transit line as soon after 1970 as possible. The provision of a high level of transit service is believed to be essential to the attainment of the regional transportation system development objectives, particularly the provision of a balanced transportation system. New travel habits will be formed as new areas of the Region become urbanized, and these habits will be influenced with respect to choice of mode by the availability of a high level of transit service. If historic trends in transit utilization within the Region are to be reversed, it will be necessary to provide the rapid transit line at as early a date as possible. Consequently, the rapid transit facility is included in the 1970 stage of the recommended transportation plan.

By 1980 the modified rapid transit proposals include the addition of service to, and loading and unloading points in, the following cities and villages: Brookfield, Cudahy, Greenfield, Milwaukee, Oak Creek, Brown Deer, Butler, Hales Corners, Fox Point, Menomonee Falls, and River Hills.

By 1990 the modified rapid transit proposals include the addition of service to, and loading and unloading points in, the following cities:

Franklin, Mequon, Milwaukee, New Berlin, Oak Creek, South Milwaukee, and Waukesha, bringing the total number of such points to 35 and the total mileage of the proposed modified rapid transit system to 84.3.

The foregoing recommended staging of the modified rapid transit proposals is based upon the provision of such service on a regular all-day basis throughout the weekday except for the early hours of the morning, at maximum headways of about one hour, in order to provide true intra-regional mass transit service as defined in Volume 1 of this report. Since the demand for mass transit service is highly concentrated in two peak-hour periods of the day, the provision of limited peak-hour modified rapid transit service may be warranted on many of the proposed lines in advance of the staging dates indicated above. It is recommended that such peak-hour modified rapid transit service be inaugurated on a trial basis on all proposed modified rapid transit lines as soon as supporting freeway facilities are completed and land use development is sufficiently advanced to make the peak-hour service practicable. The provision of such service as soon as possible is considered important in shaping future travel habits within the Region and thereby attaining regional transportation system development objectives.





## SUMMARY

This chapter has presented the proposed staging of the recommended regional land use and transportation system plans over the 27-year period extending from 1963 to 1990. The three stages of plan implementation considered and the recommended land use and transportation facility development during each of these stages are summarized below.

1. The first plan implementation stage, extending from 1963 to 1970, represents a period of adjustment between committed and new development decisions. During this period the amount of land in urban use within the Region will have to be increased by about 40 square miles, or about 9 percent, to accommodate an estimated population increase of about 200,000 persons. Nearly 70 additional square miles of land will have to be provided with public sanitary sewerage and public water supply service. In addition, the land use plan recommends the provision over this period of two new major commercial centers, six new major industrial centers, and 13 new regional park and outdoor recreation areas. Transportation system development over this initial plan implementation stage should consist primarily of the completion of those proposed arterial highway facilities committed to construction as of September 1965, totaling 163 miles of new freeways and 160 miles of new standard arterial streets and highways. In addition, 47.5 miles of proposed new modified rapid transit lines and the provision of the proposed rapid transit line, approximately 4.3 miles in length, for the east-west traffic corridor should be placed in operation during this period or as soon as practicable.
2. The second plan implementation stage, extending from 1970 to 1980, represents a period wherein implementation of the recommended regional land use and transportation system plans would be initiated through new development decisions. During this period the amount of land in urban use within the Region will have to be increased by about 69 square miles, or about 14 percent, over the 1970 level to accommodate an estimated population increase of more than 350,000 persons. About 90 additional

square miles of land will have to be provided with public sanitary sewerage and public water supply service. In addition, the land use plan recommends the provision over this period of four new major commercial centers. Transportation system development over this plan implementation period should consist of the provision of nearly 132 miles of proposed new freeways, 8.3 miles of expressways and parkways, and 102 miles of proposed new standard arterial streets and highways, and the addition of 23.9 miles of proposed modified rapid transit lines.

3. The third plan implementation stage, extending from 1980 to 1990, represents a period wherein full plan implementation would bring about the attainment of the regional development objectives. During this period the amount of land in urban use would have to be increased by about 91 square miles, or about 16 percent, over the 1980 level, bringing the total land in urban use within the Region to about 653 square miles, as compared to about 453 square miles in 1963. Over 450,000 persons are expected to be added to the regional population over this period, resulting in a total 1990 regional population of 2,678,000 persons. Over 200 additional square miles of land will have to be provided with public sanitary sewerage and water supply facilities during this period, bringing the total land area served by such facilities within the Region to about 580 square miles and the total population served by such facilities to about 2,546,000 persons, or 95 percent of the total regional population. In 1963 about 200 square miles of the developed area of the Region and about 80 percent of the total population were served by such facilities. In addition, the land use plan recommends the provision of four new major commercial centers, bringing the total of such centers within the Region to 23, ten of which would be new since 1963.

Transportation system development over this plan implementation period should consist of the provision of about 79 miles of proposed new freeways and 44 miles of proposed new standard arterial streets

and highways, bringing the total freeway, expressway, and parkway mileage within the Region to over 469 miles and the total standard arterial street and highway system to 3,357 miles. In 1963 there were 87 miles of freeway and 3,051 miles of standard arterial streets and highways within the Region. The provision of new and improved highway facilities over the planning period would reduce the proportion of arterial streets and highways within the Region operating over design capacity from the 1963 level of 6.0 percent to 0.9 percent in 1990, a most significant reduction con-

sidering the anticipated near doubling of person trips, the near tripling of vehicle miles of travel, and the doubling of motor vehicles in use within the Region over this same period. The modified rapid transit system, over this plan implementation stage, would require the addition of 12.9 miles of modified rapid transit lines. This would result in the provision of a high level of modified rapid and rapid transit service directly to 21 communities within the Region over 4.3 miles of rapid transit lines and 84.3 miles of modified rapid transit lines.

## Chapter VII

### PLAN IMPLEMENTATION

#### INTRODUCTION

The recommended regional land use and transportation plans described in the preceding chapters of this report provide a design for the attainment of the specific regional land use and transportation system development objectives formulated with the consent and on the advice of the local, state, and federal units and agencies of government concerned under the regional land use-transportation study. These recommended plans comprise two of the key elements of a comprehensive plan for the physical development of the Region: a land use plan and a transportation plan. The land use plan provides recommendations with respect to the amount, spatial distribution, and general arrangements of the various land uses required to serve the needs of anticipated future population and economic activity levels within the Region. The transportation plan provides recommendations as to how the land use plan can best be served by highway and transit facilities.<sup>1</sup> In a practical sense, these plan elements are not complete until the steps required to implement the plans, that is, to convert the plans into action policies and programs, are specified.

This chapter is, therefore, presented as a guide for use in the implementation of the recommended land use and transportation plans, which are two of the most important components of a comprehensive plan for the physical development of the Region. Basically, it outlines the actions which must be taken by the various levels and agencies of government concerned if the recommended land use and transportation plans are to be fully carried out. Those units and agencies of government which have plan adoption and plan implementation powers

applicable to the recommended regional land use and transportation plans are identified; necessary formal plan adoption actions are specified; and specific implementation actions are recommended with respect to the land use, highway, and transit plan elements for each of the units and agencies of government concerned. In addition, financial and technical assistance programs available to such units and agencies of government in implementation of the regional plan components are discussed.

The plan implementation recommendations are, to the maximum extent possible, based upon, and related to, existing governmental programs and are predicated upon existing enabling legislation. Because of the ever present possibility of unforeseen changes in economic conditions, state and federal legislation, case law decisions, governmental organization, and fiscal policies, it is not possible to declare once and for all time exactly how a process as complex as regional plan implementation should be administered and financed. In the continuing planning process, it will, therefore, be necessary to update periodically not only the land use and transportation plan elements themselves and the data and forecasts on which these plans are based but also the recommendations for implementation.

#### BASIC PRINCIPLES AND CONCEPTS

It is important to recognize that plan implementation measures must grow out of adopted plans. Thus, action policies and programs must not only be preceded by plan adoption but also must emphasize the most important and essential elements of the plan and those areas of action which will have the greatest impact on guiding and shaping development in accordance with the recommended plan. This is particularly important in planning for the orderly and economic development of a large urban region, a task so highly complex that care must be taken not to become lost in plan implementation detail, the effects of which may be meaningless at the regional scale. Two major criteria should be used to determine which plan elements are truly regional in character or influence and are, therefore, essential to the attain-

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<sup>1</sup> It is important to note that the transportation plan, as prepared under the regional land use-transportation study, consists of two subelements: a highway plan and a transit plan. Other subelements dealing with such other transportation facilities as airways and airports, seaways and seaports, and railways and rail terminals may be considered and plans prepared under future Commission work programs. In the initial regional transportation planning effort, the air, sea, and rail transportation systems were considered only to the extent that the terminal facilities of those systems comprised major traffic generators for the highway and transit systems. The State Aeronautics Commission statewide airport plan was incorporated on a preliminary basis in the regional land use plan.

ment of regional development objectives: 1) the importance of the plan elements to the wise and judicious use of the underlying and sustaining natural resource base; and 2) the importance of the plan elements to the functional relationships existing between land use and the demand for major utility, recreation, and transportation facilities. Plan elements identified on the basis of these two criteria should become the primary focus for regional plan implementation activities.

Thus, with respect to land use, regional plan implementation should focus on those aspects of land development which, either through their individual or aggregate effects, are regional in scope and not only interact strongly with the need for major utility, recreation, and transportation facilities but also exert a heavy demand upon the limited natural resource base. These include large land-consuming uses, such as agriculture; regional park and related open-space reservation; woodlands, wetlands, and surface waters; and because of the demand which they exert upon public works facilities, residential uses and major commercial and industrial centers. The location and intensity of residential development within the Region must be carefully related to logical sanitary sewerage facility service areas and to soil capabilities if the intensification of existing and the creation of new environmental problems is to be avoided. Local commercial and service uses, local institutional and governmental uses, and local park and recreation areas need not receive explicit attention in regional land use plan implementation. These uses are implicitly provided for in the regional plans as an integral component of residential neighborhoods, the planning and development of which are primarily of local concern and properly subject to local planning and control.

Thus, with respect to land use, the regional plan will be largely achieved if the primary environmental corridors of the Region are protected from incompatible urban development, if the major regional park and recreation areas are acquired for public use, and if future residential development within the Region approximates the density and spatial distribution patterns recommended by the regional plan. In addition, future major shopping and industrial centers should approximate the general spatial location pattern recommended by the regional land use plan.

With respect to transportation, regional plan implementation should focus on those facilities

having areawide significance, such as the major freeway facilities, the inter-connected major arterial highways, and the rapid transit and modified rapid transit facilities which combine high-speed service with high passenger-carrying ability. Thus, with respect to transportation, the regional plan will be largely achieved if the major freeway and rapid and modified rapid transit networks are developed in accordance with the plan.

The foregoing would indicate that the regional development objectives and plans can be substantially met if the Commission and its constituent local units of government and affected state and federal agencies can significantly influence the spatial location and size of only four aspects of regional development: 1) the major transportation routes; 2) the major park and open-space reservations, including the major drainageways; 3) the public sanitary sewerage facility service areas; and 4) the public water supply facility service areas. This is not to be interpreted as meaning that areawide planning should not concern itself with other aspects of regional development, such as solid waste disposal facilities and air and water pollution abatement measures, but only that primary emphasis and high priority in the regional land use-transportation plan implementation efforts should be given to the four aspects noted.

There are three main areas through which regional plan implementation may be achieved; and these parallel the three functions of the Regional Planning Commission: areawide research, preparation of a framework of long-range plans for the physical development of the Region, and provision of a center for the coordination of planning and plan implementation activities. All require at least a receptive attitude and preferably active planning and plan implementation programs at the local, county, and state levels of government.

A great deal can be achieved with respect to guiding areawide development along better lines through the simple task of collecting, analyzing, and disseminating basic planning and engineering data on a continuing, uniform, areawide basis. Experience within the Region to date has already shown that, if this important inventory function is properly carried out, the resulting information will be eagerly used and acted upon by both local and state agencies of government and by private investors. Since this data was used as a primary input into the regional plan preparation, its utilization in arriving at public and private

development decisions on a day-to-day basis will tend to contribute toward implementation of the regional plans.

With respect to plan preparation, it is essential that the regional plans, while confined to those functional elements having areawide significance, be prepared in sufficient depth and detail to provide a sound basis for plan implementation. This means that for necessary public works facilities, such as freeways, rapid transit lines, and major drainage ways, the plans must be carried to a stage wherein the location and alignment has been determined with sufficient accuracy and precision to provide an adequate basis for right-of-way reservation. Given such detailed plans, implementation will further require the development of very close working relationships between the Commission; the seven County Boards; the local units of government; such special purpose agencies as the Milwaukee County Park, Expressway, and Metropolitan Sewerage Commissions; and certain state agencies, particularly the State Highway Commission, the State Department of Resource Development, and the State Conservation Commission.

Finally, it will be highly desirable, although not essential, to achieve an even finer degree of plan implementation, than would be attainable through concern with the major plan elements alone, through the Commission function of serving as a center for the coordination of local, areawide, state, and federal planning and plan implementation activities within the Region. The Commission's community assistance program, which actively assists the local municipalities in the preparation of plans and plan implementation devices, will become an increasingly important factor in this respect and will make possible the close integration of regional and local plans, adjusting the details of the latter to the broad framework of the former.

It will be necessary to refine and detail the regional plans at the local level through the preparation of comprehensive community development plans and through adaptation of plan implementation devices. An example of such plan refinement and detailing is the cooperative planning program being carried out in the Kenosha Planning District,<sup>2</sup> in which the regional planning data and forecasts, development

objectives and plans, and implementation devices were fully utilized, integrated, and adjusted to meet the needs of the local planning program.

#### Planning Districts

The Commission's regional planning program provides for the establishment of planning districts within the Region for the purpose of carrying the regional planning programs into the greater depth and detail necessary for sound plan preparation and implementation. These districts are of two basic types. The boundaries of the first type are delineated on a basis of topography or topographically related development problems. Examples of such districts include the Root River and Fox River watersheds for which detailed watershed planning programs have been completed by the Commission or are presently underway. The boundaries of the second type of planning district are delineated on the basis of areas of particularly intensive urban development, which have certain common development problems. An example of such a district is the Kenosha Planning District for which a detailed comprehensive planning program is underway.

The planning districts are intended to comprise rational planning units within the Region and are not only intended to provide the basis for the preparation of certain elements of an areawide development plan in greater depth and detail, but are also intended to provide an important basis for the implementation of the overall regional development plans. This latter function is extremely important since the Regional Planning Commission is an entirely advisory body; and it is, therefore, only through cooperative interagency action that the regional plans will be implemented. The establishment of planning programs for such subareas of the Region as the Kenosha Planning District or a watershed affords an excellent opportunity to coordinate overall regional planning programs with more detailed planning programs for such areas of the Region and thereby provides for full integration of local and regional development objectives and plans and for the implementation of the regional as well as local plans through cooperative action.

#### PLAN IMPLEMENTATION ORGANIZATIONS

Because of the completely advisory role of the Commission, implementation of the recommended plans will be entirely dependent upon action by certain local, areawide, state, and federal agencies of government. Examination of the various agencies that are available under existing enabl-

<sup>2</sup> The Kenosha Planning District includes all that part of Kenosha County lying easterly of the North-South Freeway (IH 94) and includes the City of Kenosha and the Towns of Somers and Pleasant Prairie.

ing legislation to implement the recommended plan reveals an array of departments, commissions, committees, boards, districts, and authorities at all levels of government. These agencies range from general-purpose local units of government, such as common councils and village boards, through special-purpose areawide districts, such as metropolitan sewerage commissions and state regulatory bodies, such as the Public Service Commission, to federal administrative bodies that provide financial and technical assistance, such as the U. S. Department of Housing and Urban Development.

Because of the many agencies in existence, it becomes exceedingly important to identify those agencies having the legal powers and financial means to most effectively implement the recommended plans. Accordingly, those agencies whose action will have significant effect, either directly or indirectly, upon the successful implementation of the recommended regional plans and whose full cooperation in plan implementation will be essential are listed and discussed below. The agencies are, for convenience, discussed by level of government; however, the interdependence between the various levels, as well as between agencies, of government and the need for close intergovernmental cooperation cannot be overemphasized. A more detailed discussion of the duties and functions of these state and local agencies, as they relate to regional plan implementation, may be found in SEWRPC Technical Report No. 6, Planning Law in Southeastern Wisconsin, 1966, and in SEWRPC Planning Guide No. 4, Organization of Planning Agencies, 1964.

#### State Level Agencies

There exist at the state level the following agencies that have either general or specific planning authority and certain plan implementation powers important to adoption and implementation of the recommended regional plans.

State Highway Commission: This Commission is broadly empowered to provide the state with an integrated highway transportation system. The State Highway Commission is charged with responsibility for administering all state and federal aid for highway improvements; for the planning, design, construction, and maintenance of all state trunk highways; and for planning, laying out, revising, constructing, reconstructing, and maintaining the national system of interstate and defense highways, the federal aid primary system, the

federal aid secondary system, and the forest highway systems, all subject to federal regulation and control. The State Highway Commission is also responsible for reviewing the county trunk highway systems and may make such alterations in these systems as are necessary to form an integrated system of county trunk highways between adjoining counties.

The state highway law authorizes the State Highway Commission to designate as controlled access highways the rural portions of the state trunk system on which studies find that the average traffic potential is in excess of 2,000 vehicles per day. Such designation may be made only after the conduct of public hearings within each county affected, and no more than 1,500 miles of highway may be so designated. The legislation further permits the State Highway Commission to enter into cooperative agreements with the governing bodies of any city, county, town, or village or with the Federal Government, respecting the financing, planning, establishment, improvement, maintenance, use, regulation, or vacation of controlled access highways or other public ways within their respective jurisdictions.

The state highway law fully and broadly empowers the State Highway Commission to plan and develop the National System of Interstate and Defense Highways as a system of freeways within Wisconsin and to place the interstate system on the state trunk system, whether established on and along existing state trunk routes or on new locations.

The State Highway Commission is also empowered, under Section 84.295 of the Wisconsin Statutes, to make surveys and studies of the present and anticipated needs for the improvement of desirable probable freeway and expressway additions to the state trunk highway system and to designate as freeways or expressways up to 300 miles of the state trunk highway system having currently assignable traffic volumes in excess of 4,000 vehicles per day. Where, as the result of its investigations and studies, the Highway Commission finds that there will be a need in the future for the development of segments of the state trunk highway system as freeway or expressway facilities and where the State Highway Commission determines that in order to prevent conflicting, costly development on lands required for the rights-of-way of such facilities, the State Highway Commission may proceed to establish the centerline locations and rights-of-way widths for the future freeway or

expressway facilities. Such establishment requires a public hearing and the preparation of a map delineating the centerline location and rights-of-way required for the proposed freeway or expressway, including the rights-of-way needed for traffic interchanges, grade separations, frontage roads, and other incidental facilities and for the alteration or relocation of existing public highways. The map must show the existing highways and property boundary lines and record owners of land affected and must be filed in the Office of the Register of Deeds of the county in which the proposed freeway or expressway is to be located. Notice of the filing of the map must be served on the owners of record of the lands affected. After such location is established by the State Highway Commission, no one may erect or alter any structures in the bed of the proposed freeway or expressway without first giving 60 days' written notice to the State Highway Commission, which may then decide to either purchase the necessary right-of-way or permit the proposed improvement. This important provision of the Statutes, in effect, awards to the State Highway Commission of Wisconsin modified official map powers with respect to designated future freeway and expressway facilities on the state trunk highway system and is extremely important to regional transportation plan implementation.

Specifically, three sections of the law, when considered together, provide the basis for what might be considered a master plan for the state trunk highway system. One of these sections directs the preparation of county maps showing the official layout of the state trunk highway system. The second permits marked and traveled locations to differ from the official locations and thereby allows the official layout maps, in some instances at least, to function as plans. Indeed, it appears that these official layout maps were originally regarded as master plans for the state trunk highway system. Special legislative committees, whose function was to periodically study and revise the entire state trunk highway system, apparently functioned in 1917, 1919, 1923, and for the last time in 1934; and their work is reflected on the official layout maps. Since 1934 all consideration of changes in the system has been on a piecemeal, ad hoc basis under the provisions specified in Chapter 84 of the Wisconsin Statutes. The third permits the State Highway Commission to establish locations and right-of-way widths for future freeways or expressways and to protect the rights-of-way for these facilities from development. It is also apparent that the various federal aid systems

in and of themselves constitute long-range plans insofar as they tend to coordinate the expenditure of federal highway aid monies.

The "planning and programming" procedure developed by the State Highway Commission within this legislative framework determines when and where the various improvement projects proposed by the District Engineers will be accomplished on the existing state trunk highway system and establishes standards for such determination. The procedure provides an orderly and effective device whereby the many complex and highly interrelated tasks involved in the final accomplishment of modern highway improvement projects—tasks, such as route location, including necessary mapping; preliminary engineering; implementation of legal changes in the state trunk highway routes; detailed design and final engineering; acquisition of right-of-way; preparation of construction plans, specifications, and cost estimates; letting of contracts; and actual construction, including layout, inspection, and final surveys—can be carried out and, as such, constitutes an effective current planning program.

The State Highway Commission is also empowered to review and regulate subdivision plats along state trunk highways outside the corporate limits of the City of Milwaukee and, as previously noted, is empowered to prepare official maps of future freeway and expressway routes. The latter power is particularly important to regional plan implementation through the precise delineation of center-line locations and the advance reservation of right-of-way for proposed freeways and expressways. The State Highway Commission has the necessary land acquisition and construction powers, including the right of eminent domain, not only for highway development purposes, strictly defined, but also for roadside park development and limited scenic easement purposes.

The State Highway Commission, through its administration of federal and state highway aids to local units of government and through its highway design and engineering functions, exerts a powerful influence on street and highway system planning and development within Wisconsin and is probably the singularly most important agency to regional transportation plan implementation.

State Department of Resource Development: This Department has the obligation to prepare long-range, comprehensive state development plans

and to recommend sites for recreational development; authority to review subdivision plats, proposed municipal incorporations, consolidations, and annexations; and authority to administer the metropolitan park grant funds of the state outdoor recreation aid program (ORAP) and the federal urban planning assistance program. Recently, the State Legislature assigned to the Department: the obligation to establish water quality standards, to establish standards for flood plain and shoreland zoning, and to prepare water resource plans for regions of the state; authority to adopt "shoreland" and "flood plain" zoning ordinances in certain instances; and authority to prohibit the installation or use of septic tanks and to approve septic tank specification and installation regulations promulgated by the State Board of Health. In addition, the Department was also assigned authority to regulate water diversions, shoreland grading, dredging, encroachments, and deposits in navigable waters; authority to regulate construction of neighboring ponds, lagoons and waterways, stream improvements, pierhead and bulkhead lines; authority to regulate the construction, maintenance, and abandonment of dams; authority to regulate water levels of navigable streams and lakes, stream improvements, and removal of certain lake bed materials;<sup>3</sup> and the authority to require abatement of water pollution, to administer state aid programs for water resource protection, to assign priorities for federal aid applications for sewage treatment facilities, to review and approve plans for public water supply and sewerage works, and to regulate private water supply systems and high capacity wells (100,000 gpd and over capacity). The Department will be extremely important to regional land and water use plan implementation.

State Conservation Commission of Wisconsin: This Commission has the obligation to develop long-range conservation and comprehensive outdoor recreation plans and the authority to designate such sites as are necessary to protect, develop, and regulate the use of state parks, forests, fish, game, lakes, streams, plant life, and other outdoor resources; authority to acquire conservation and scenic easements; and authority to administer the federal "Land and Water Conservation Fund" within the state. The latter provides grants-in-aid to local municipalities for park land acquisition and improvement. This Commission is extremely

<sup>3</sup>The water regulatory powers listed herein are presently vested in the State Public Service Commission and will be transferred to the State Department of Resource Development effective July 1, 1967.

important to regional park and open-space reservation plan implementation.

State Recreation Advisory Committee: This Committee has the obligation to develop a long-range plan for utilization of the state's recreational assets and has the authority to approve the state "Outdoor Recreation Act" monies as allocated by the State Legislature to the State Department of Resource Development, Wisconsin Conservation Commission, State Highway Commission, State Soil and Water Conservation Committee, and the State Department of Public Welfare.

State Soil and Water Conservation Committee: This Committee has the obligation to review and coordinate the programs of the county soil and water conservation districts, to apportion certain state and federal fund allotments, to administer federal multiple-purpose watershed projects, and to supervise certain federal soil and water conservation planning and improvement programs.

State Board of Health: This Board has the authority to review subdivision plats not served by public sewers and to regulate private sewage disposal systems.

State Public Service Commission: This Commission has the authority to fix reasonable common carrier and contract rail, truck, and bus line rates, fares, routes, service areas, operating regulations, and levels of service and to order the elimination, relocation, and reconstruction of railway-highway grade crossings.

#### Local Level Agencies

Statutory provisions exist for the creation at the county and municipal level of the following agencies that have certain planning and plan implementation powers important to regional plan adoption and implementation, including police, acquisition, condemnation, and construction powers.

County Park and Planning Commissions: These commissions have the obligation to prepare a county park system plan and a county street and highway system plan. In addition, these commissions may be used to prepare and administer county shoreland, flood plain, airport, and comprehensive zoning ordinances and to administer county subdivision plat review. The commissions are empowered to acquire, develop, and operate county parks and other open-space lands. Not only is the existence of such a commission in each county highly desir-



able for proper implementation of the recommended regional land use plan, especially the environmental corridor recommendations, but Section 27.015(4) of the Wisconsin Statutes requires that the county board create either a rural planning committee, a park board, or such a park and planning commission.

Pursuant to statutory requirements, all of the seven counties which comprise the Southeastern Wisconsin Region have created some type of county park agency. It is recommended that such agencies be recreated in accordance with Section 27.02 of the Wisconsin Statutes, where this has not already been done, and be assigned duties relating to subdivision plat review, zoning, modified official mapping, and shoreland zoning, as well as park acquisition and improvement functions. A model ordinance creating such a commission is provided in SEWRPC Planning Guide No. 4, Organization of Planning Agencies, 1964, Appendix E.

County Highway Committees: These committees are responsible for the administration and expenditure of all county funds for highway construction and maintenance and are empowered to establish and change the county trunk highway system, to cooperate with the State Highway Commission in the selection of a system of federal aid secondary roads, and to acquire land for county highway purposes by purchase or condemnation. All seven counties within the Southeastern Wisconsin Region have established highway committees in accordance with Section 83.015 of the Wisconsin Statutes. In addition, Milwaukee County has established a County Expressway Commission pursuant to Section 59.965(2) of the Wisconsin Statutes, which is empowered to plan a county expressway (freeway) system, to coordinate all freeway planning and construction within the county, to acquire land for and construct such an expressway system, and to cooperate with public and private agencies in mass transit expressway applications.

Soil and Water Conservation Districts: These districts have the authority to develop comprehensive plans for the conservation of soil and water resources, prevention of soil erosion, and prevention of floods and authority to adopt land use regulations that would implement these plans in unincorporated areas. These districts have the power to acquire through eminent domain any property or rights therein for watershed protection; soil and water conservation; flood prevention works; and fish, wildlife, and recreational works

which may be constructed under Public Law 83-566, as amended, as a part of a watershed plan implementation program. The importance of proper soil and water conservation and management practices to the successful attainment of the regional development objectives cannot be overemphasized. Lack of such practices will have a critical adverse effect upon the agricultural and environmental corridor land use plan elements. All seven counties within the Southeastern Wisconsin Region have created Soil and Water Conservation Districts under Section 92.05 of the Wisconsin Statutes and have executed a basic and supplemental Memorandum of Understanding with the U. S. Department of Agriculture, Soil Conservation Service, for technical assistance.

Municipal Planning Agencies: These agencies include city, village, and town park boards or plan commissions created pursuant to Sections 27.08, 27.13, 62.23(1), 61.35, and 60.18(12) of the Wisconsin Statutes. These agencies may supplement the actions of the county park and planning commissions in implementation of the various elements of the recommended plan. An extended discussion of the extent and limitations of the power of these various agencies may be found in SEWRPC Planning Guide No. 4, Organization of Planning Agencies, 1964.

It is recommended that those cities, villages, or towns without plan commissions created in accordance with Section 62.23 of the Wisconsin Statutes create such commissions. A model ordinance and resolution creating such commissions and giving towns power to create such commissions is provided in the above cited Planning Guide, Appendices D and F.

It is also suggested that cities and villages whose corporate limits abut unincorporated areas consider the creation of joint extraterritorial zoning committees in cooperation with the adjacent towns, pursuant to Section 62.23(7a) of the Wisconsin Statutes, for the purpose of joint land use planning and zoning in areas of mutual interest.

Municipal Water and Sanitary Districts: These districts may be created by towns, villages, and cities pursuant to Sections 60.072, 60.30, 61.36, 62.18, and 198.22 of the Wisconsin Statutes and are authorized to plan, design, construct, operate, and maintain various public sanitary sewer and water supply systems.

### Areawide Agencies

Statutory provisions exist for the creation of the following multi-county or metropolitan agencies having both general and specific planning and plan implementation powers important to implementation of the regional plans. Although all of the areawide agencies discussed below could be established under existing enabling legislation, only the statutory provisions for metropolitan sewerage and regional planning commissions have been utilized. No metropolitan transit authority has been activated to date within the Region, and the only major utilization of cooperative contract commissions, to date, has been to provide water service on a cooperative basis to three local communities.

Metropolitan Sewerage Commissions: These commissions are empowered to plan sanitary sewer and storm water drainage systems and to construct such systems over large areas which include many units of government. The Metropolitan Sewerage Commission of the County of Milwaukee, created pursuant to Section 59.96 of the Wisconsin Statutes, has jurisdiction over all of Milwaukee County, except the City of Milwaukee, and including areas outside the county but in the same gravity drainage area as Milwaukee County. Other metropolitan sewerage commissions may be created pursuant to Section 66.20 of the Wisconsin Statutes and may include contiguous municipalities. The Metropolitan Sewerage Commission of the County of Milwaukee is extremely important to regional plan implementation, particularly to the pollution abatement and flood control recommendations of the watershed plans and to the provision of sanitary sewerage services to large areas of the Region.

Metropolitan Transit Authority: Such an authority, if created pursuant to Section 66.94 of the Wisconsin Statutes, would have the power to acquire, construct, and operate a public service transportation system, including the power of eminent domain within a district which would include all of Milwaukee County and those units of government located in adjacent counties through, and into which, the transportation system would extend. Such an authority does not, however, have any powers of taxation but can issue revenue bonds. No such authority presently has been activated within the Region. The creation of such an authority is recommended only if experience indicates that the rapid and modified rapid transit elements of the recommended regional transportation plan cannot be fully implemented by the Milwaukee County

Expressway Commission in cooperation with the private transit corporations presently operating within the Region.

Cooperative Contract Commissions: Section 66.30 of the Wisconsin Statutes, enacted in 1939, provides that municipalities<sup>4</sup> may contract to provide jointly any services or exercise jointly any powers that such municipalities may be authorized to provide or exercise separately. Recently, state legislation was enacted clarifying these powers and granting such commissions bonding powers for purposes of acquisition, development, and equipping of land, buildings, and facilities for regional projects.<sup>5</sup>

Significant economies can often be effected through the provision of certain municipal services or facilities on a cooperative intergovernmental basis. Moreover, the areawide nature of certain developmental and environmental problems within a rapidly urbanizing region requires that their solution be approached on an areawide basis; and such an approach may sometimes be efficiently and economically provided through the use of a cooperative contract commission. Intergovernmental cooperation under such commissions may range from the sharing of expensive special-purpose public works equipment through the construction of public works facilities on an areawide basis. An example of the cooperative provision of major public works on an areawide basis through the use of such contract commissions exists within the Region in the form of the North Shore Water Commission created to plan, design, construct, and operate a water supply system for the City of Glendale and the villages of Fox Point and Whitefish Bay in Milwaukee County. Such cooperative contract commissions may be delegated specific areawide plan implementation powers by the local units of government and, as such, could become important agencies for implementing certain functional elements of the comprehensive plan for the physical development of the Region. A model agreement creating a cooperative contract commission is provided in SEWRPC Technical Report No. 6, Planning Law in South-eastern Wisconsin, Appendix A.

Regional Planning Commission: Although not a plan implementation agency, one other areawide agency

<sup>4</sup> The term municipality under this section of the Statutes is defined to include the state, any agency thereof, cities, villages, towns, counties, school districts, and regional planning commissions.

<sup>5</sup> Chapter 238, Laws of Wisconsin 1965.

warrants discussion herein: the Regional Planning Commission itself. This Commission is empowered to prepare and adopt a master plan for the physical development of the Region. It has no statutory plan implementation powers. Its powers are limited to: publicizing plans; issuing reports; providing community planning assistance; contracting with local units of government to do planning; administering certain federal urban planning grants to local units of government; acting, with the approval of a state agency or a local unit of government, for that agency or unit in reviewing and approving subdivision plats and administration of shoreland zoning ordinances; and reviewing the location of, or acquisition of, land for any of the elements or facilities which are included in the adopted regional plan. The seven counties in the Southeastern Wisconsin Region have created such a commission pursuant to Section 66.945 of the Wisconsin Statutes.

In 1962 the U. S. Congress passed historic legislation with respect to federal aid for highways affecting the need for, and work of, the Commission. The 1962 Federal Highway Act requires that in order to be eligible for continued federal aid for new highway construction after July 1, 1965, all urbanized areas in the United States must have underway a continuing, comprehensive, areawide transportation planning process, carried on cooperatively by the state and local communities. Specifically, the Act provides:

It is declared to be in the national interest to encourage and promote the development of transportation systems, embracing various modes of transport in a manner that will serve the States and local communities efficiently and effectively. To accomplish this objective, the Secretary (of Commerce) shall cooperate with the States, as authorized in this title, in the development of long-range highway plans and programs which are properly coordinated with plans for improvements in other affected forms of transportation and which are formulated with due consideration to their probable effect on the future development of urban areas of more than fifty thousand population. After July 1, 1965, the Secretary shall not approve under section 105 of this title any program for projects in any urban area of more than fifty thousand population unless he finds that such projects are based on a continuing comprehensive transportation planning process carried

on cooperatively by States and local communities in conformance with the objectives stated in this section.

The U. S. Bureau of Public Roads has defined the scope and content of the necessary planning program<sup>6</sup> and has interpreted "cooperatively" to mean the establishment of a formal areawide planning program on a continuing basis, supported by written memorandums of understanding between the state and the governing bodies of the local communities that will ensure that the planning decisions are reflective of, and responsive to, both the programs of the state and the needs and desires of the local communities.

There are 44 local units of government within the Region that are, as integral parts of the three urbanized areas<sup>7</sup> within the Region (see Map 33),

<sup>6</sup> Under the provisions of the Federal Aid Highway Act of 1962, the transportation planning process must be "comprehensive," as well as "areawide." The term "comprehensive" has been defined by the U. S. Bureau of Public Roads to mean that the transportation planning process must be concerned with both highway and transit facilities, including terminal facilities and traffic control systems, and must be based upon the collection, analysis, and interpretation of all pertinent data concerning existing conditions and historical trends necessary to the sound planning of such facilities. The transportation planning process must, therefore, include the collection and analysis of basic data on the following elements: 1) economic factors affecting development; 2) population; 3) land use; 4) transportation facilities, including those for mass transportation; 5) travel patterns; 6) terminal and transfer facilities; 7) traffic control features; 8) local plans and zoning; 9) financial resources; and 10) social and community value factors, such as preservation of open space, historical sites and buildings, parks and recreational facilities, and environmental amenities and aesthetics.

The process must also include provision for the establishment of community goals and objectives; the preparation of forecasts of future land development and travel patterns; and the selection from alternatives, adoption, implementation, continuing evaluation, refinement, and updating of land use and transportation facility plans. In effect, the transportation planning process, as envisioned by the U. S. Bureau of Public Roads, must be an integral part of a comprehensive, areawide, planning program and not a highway facility planning effort carried on independent of other regional development considerations.

<sup>7</sup> An urbanized area is defined by the U. S. Bureau of the Census as an area consisting of a central city of 50,000 inhabitants or more, together with the surrounding contiguous incorporated areas which contain more than 2,500 inhabitants or more than 100 dwelling units. Also included are certain contiguous unincorporated areas which contain more than 1,000 inhabitants per square mile. Both such incorporated and unincorporated areas may be included in the urbanized area if they lie within one mile of the main body and their inclusion would avoid creating enclaves. Urbanized areas may be thought of as representing the urban core of the standard metropolitan statistical areas. Three such urbanized areas have been delineated in the Region. The local units of government within these areas are affected by the provisions of the Federal Aid Highway Act of 1962. These areas and the local units of government affected are:

(continued on the following page)

(Footnote 7 continued)

COUNTIES

KENOSHA
OZAUKEE
MILWAUKEE
RACINE
WAUKESHA

KENOSHA URBANIZED AREA

CITIES
KENOSHA
TOWNS
PLEASANT PRAIRIE
SOMERS

MILWAUKEE URBANIZED AREA

CITIES
BROOKFIELD
CEDARBURG
CUDAHY
FRANKLIN
GREENDALE
GREENFIELD
MEQUON
MILWAUKEE
MUSKEGO
NEW BERLIN
OAK CREEK
SOUTH MILWAUKEE
ST. FRANCIS

MILWAUKEE URBANIZED AREA

CITIES
WAUKESHA
WAUWATOSA
WEST ALLIS
VILLAGES
BAYSIDE
BROWN DEER
BUTLER
ELM GROVE
FOX POINT
GREENDALE
HALES CORNERS
LANNON
MEMONONEE FALLS
RIVER HILLS
SHOREWOOD
THIENSVILLE
WEST MILWAUKEE
WHITEFISH BAY
TOWNS
WAUKESHA

RACINE URBANIZED AREA

CITIES
RACINE
VILLAGES
ELMWOOD PARK
NORTH BAY
TOWNS
CALEDONIA
MOUNT PLEASANT

directly affected by the requirements of the Federal Aid Highway Act of 1962. Forty-three of these 44 municipalities have recently enacted formal resolutions agreeing to cooperate with the State Highway Commission of Wisconsin through the SEWRPC Regional Land Use-Transportation Study in conformance with the requirements and objectives of the Federal Aid Highway Act of 1962. The 43 municipalities formally cooperating in the regional land use-transportation planning effort represent 99.6 percent of the population of the three urbanized areas affected and 99.7 percent of the area. Cooperative action by local units of government on this scale is unprecedented within the Region and represents a major achievement in demonstrating the concept that the solution of areawide development problems can be achieved through voluntary intergovernmental cooperation.

The Southeastern Wisconsin Regional Planning Commission, created under Section 66.945 of the Wisconsin Statutes, provides advisory, areawide planning services to the seven-county Region and will prepare and maintain a comprehensive plan for the physical development of the Region. The Commission, therefore, constitutes a logical organizational structure for meeting the requisites of the Federal Aid Highway Act of 1962. The

SEWRPC Regional Land Use-Transportation Study and the provisions for its continuation within the Region not only fully meet the technical requirements of the Highway Act but also, with the adoption of separate resolutions by the municipalities involved pledging cooperation in the mutual utilization by the state and local municipalities of the organizational structure and working arrangements established for the regional land use-transportation study, meet the organizational requirements of the Act as well. Thus, a means for the continuing coordination of state and local transportation plans and plan implementation programs on a regional basis is assured.

Federal Level Agencies

There exist at the federal level the following agencies which administer federal aid programs that will have important effects upon the implementation of the recommended regional plans because of the potential impact on the financing of both actual land acquisition and the construction of specific facilities.

U. S. Department of Housing and Urban Development: This agency administers urban planning, urban beautification, code enforcement, park and open-space acquisition and development, mass transit, sewer and water facility construction grants, city demonstration programs, and federal home mortgage financing insurance. The mass transit demonstration and capital improvement grant programs of this agency are extremely important to the development of a balanced transportation system within the Region.

U. S. Department of Commerce, Bureau of Public Roads:<sup>8</sup> This agency, through the State Highway Commissions, administers all federal highway aid programs. The importance of the various federal aid highway systems to transportation plan implementation has already been noted under the discussion of the State Highway Commission as a plan implementation agency.

U. S. Department of the Interior, Federal Water Pollution Control Administration: This agency administers sewage treatment plant and pollution control facility construction grants.

<sup>8</sup> Under the provisions of recent federal legislation, the U. S. Bureau of Public Roads will be transferred in 1967 to the newly created U. S. Department of Transportation.



U. S. Department of the Interior, Bureau of Outdoor Recreation: This agency administers park and open-space acquisition and development grants.

U. S. Department of Agriculture, Farmers Home Administration: This agency administers water and waste disposal facility construction grants and loans for rural areas and resource conservation grants and loans.

U. S. Department of Agriculture, Agricultural Stabilization and Conservation Service: This agency administers park and recreation acquisition grants related to the conversion of land in agricultural use, called Greenspan.

U. S. Department of Agriculture, Soil Conservation Service: This agency administers resource conservation and development projects with cost-sharing funds and administers grants for land treatment measures; agricultural water management; flood prevention; and public fish, wildlife, and recreational development and assists in making Type I and II River Basin Studies.

#### PLAN ADOPTION AND INTEGRATION

Upon adoption of the regional land use and transportation plans by formal resolution of the South-eastern Wisconsin Regional Planning Commission, in accordance with Section 66.945(10) of the Wisconsin Statutes, the Commission will transmit a certified copy of the resolution and adopted plan, including any descriptive and explanatory matter, to all local legislative bodies within the Region and to all of the aforesaid existing state, local, area-wide, and federal agencies.

Endorsement, adoption, or formal acknowledgment and integration of these plans by the local legislative bodies and the existing local, area-wide, state, and federal level agencies involved is highly desirable and in some cases necessary, not only to assure a common understanding between the several government levels and to enable their staffs to program the necessary implementation work but in some cases formal adoption is required by the Wisconsin Statutes before certain public plan implementation actions can proceed, as in the case of city, village, and town plan commissions created pursuant to Section 62.23 of the Wisconsin Statutes.

It is extremely important to understand that adoption of the recommended regional plans by any unit or agency of government pertains only to the statu-

tory duties and functions of the adopting agency, and such adoption does not and cannot in any way preempt action by another unit or agency of government within its jurisdiction. Thus, adoption of the regional plan by a county would make the plan applicable as a guide, for example, to county highway and park system development and not to municipal street and park development. To make the plan applicable as a guide to municipal street and park development would require its adoption by the municipality concerned.

#### Local Agencies

1. It is recommended that the seven county boards formally adopt the recommended regional land use plan as it affects each county, as authorized by Section 66.945(12) of the Wisconsin Statutes, after recommendation by the respective county park and planning agencies as a guide to future land use development within the county. (A model resolution for this purpose is provided in Appendix C).
2. It is recommended that the seven County Highway Committees refine, adopt, and integrate the recommended regional transportation plan, as a functional plan, into the county highway system where applicable as a guide to future highway and transit facility development within the county. It is further recommended that, upon approval of the regional transportation plan by the Milwaukee County Board, the Milwaukee County Expressway Commission adopt and integrate the recommended freeway and rapid and modified rapid transit elements of the regional transportation plan, as these affect Milwaukee County, into the county expressway plan as authorized by Section 59.965(5) of the Wisconsin Statutes.
3. It is recommended that the seven County Soil and Water Conservation Districts adopt the recommended regional land use plan, particularly the agricultural and environmental corridor land use elements, so as to lay a broad, well-defined basis for the development of comprehensive conservation plans under Section 92.08(4) of the Wisconsin Statutes and to assure eligibility for tax relief and technical and financial assistance. It is further recommended that all seven districts adopt a policy

requesting those state and federal agencies assisting the districts to provide only such soil and water conservation planning and management assistance as would serve to implement the recommended regional land use plan, particularly attainment of compatible land uses in areas designated on the plan as agricultural, environmental corridor, and for urban expansion.

4. It is suggested, to supplement the afore-recommended county action, that the 28 city common councils, 53 village boards, and 65 town boards adopt the recommended regional plan as authorized by Section 66.945(12) of the Wisconsin Statutes as a guide to physical development in their area of jurisdiction. It is also suggested that their respective local planning agencies, by resolution, adopt and integrate the recommended regional plans as these plans affect their area of jurisdiction, pursuant to Section 62.23(3)(b) of the Wisconsin Statutes, and certify such adoption to their local governing body.
5. It is desirable that the governing bodies of all municipal water and sanitary districts and utilities formally acknowledge the recommended regional land use plan, particularly the residential land use elements, and determine their utility service areas in accordance with such plan.

#### Areawide Agencies

1. It is recommended that the Metropolitan Sewerage Commission of the County of Milwaukee, and any other metropolitan sewerage commissions created subsequent to the publication of this report, formally acknowledge the recommended regional land use plan, particularly the residential land use elements, in the determination of their service areas. It is further recommended that the Metropolitan Sewerage Commission of the County of Milwaukee formally indicate those areas outside the district limits that the Commission would be willing to provide with sewerage service pursuant to the recommended plan under contracts authorized under Section 59.96(9)(c) of the Wisconsin Statutes.

2. It is recommended that, if a Metropolitan Transit Authority is activated, this Authority, as one of its early actions, adopt, refine, and integrate the recommended regional transportation plan, particularly the recommendations for mass transit facility development and service.
3. It is recommended that any cooperative contract agencies subsequently created formally acknowledge the recommended regional plans in regard to the exercise of their specific powers and duties.

#### State Level Agencies

1. It is recommended that, upon approval of the regional transportation plan by the constituent county boards, the State Highway Commission endorse and integrate the recommended regional transportation plan, including the recommendations for the staged construction thereof into the state long-range highway system plans, as authorized by Sections 84.01, 84.02, and 84.025 of the Wisconsin Statutes, as a functional guide to highway system development within the Region.
2. It is recommended that the State Department of Resource Development endorse, integrate, and coordinate the recommended regional plans into the state long-range comprehensive development plans, including water resource plans and comprehensive shoreland zoning plans, and into the administration of federal urban planning grants and recommend those appropriate regional recreational sites and lands within the environmental corridors for consideration as to development and regulation, in accordance with Sections 144.025(2) and 144.26(5)<sup>9</sup> of the Wisconsin Statutes, as a guide to state outdoor recreation facility development within the Region. It is also recommended that this Department consider and give due weight to the recommended regional environmental corridors in the exercise of their various water regulatory powers. It is further recommended that the State Department of Resource Development adapt the operational soil survey and analyses prepared by the U. S. Department of Agriculture, Soil Conservation

<sup>9</sup> Chapter 614, Laws of Wisconsin 1965.

Service, for the SEWRPC under the regional land use-transportation study as a guide in regulating soil absorption sewage disposal systems and reviewing and objecting to subdivision plats, in accordance with Sections 144.025(2),<sup>10</sup> 236.12, and 236.13(2m)<sup>11</sup> of the Wisconsin Statutes.

3. It is recommended that the State Conservation Commission endorse and integrate the recommended environmental corridors and the regional recreational sites into the long-range conservation and comprehensive outdoor recreation plans authorized by Section 23.09(7) of the Wisconsin Statutes and required by Public Law 88-578 (78 Stat. 897), Land and Water Conservation Fund Act. It is further recommended that the State Conservation Commission designate such sites as are necessary to protect, develop, and regulate the use of state forests and parks, fish, game, lakes, streams, plant life, and other outdoor resources in the aforesaid corridors and recreation sites, as authorized by Sections 23.09(7)(b) and (c), 27.01, 28.02, 28.03, and 28.04 of the Wisconsin Statutes.
4. It is recommended that the State Recreation Advisory Committee endorse and integrate the recommended regional primary environmental corridors and regional recreational sites into the long-range plan for the utilization of the state recreational assets authorized by Section 15.60(2)(c) of the Wisconsin Statutes.
5. It is recommended that the State Soil and Water Conservation Committee endorse the recommended regional plans, particularly the agricultural land use and environmental corridor elements, so as to coordinate the county soil and water conservation district projects, as required in Section 92.04(4)(c) of the Wisconsin Statutes.
6. It is recommended that the State Board of Health endorse the recommended regional residential land uses that are to be served by public water and sewer in the exercise of their review and approval powers over subdivision plats authorized by Section

236.13(2m)<sup>12</sup> of the Wisconsin Statutes. It is further recommended that the State Board of Health adapt the operational soil survey and analysis prepared by the U. S. Department of Agriculture, Soil Conservation Service, for SEWRPC as a guide in reviewing and objecting to subdivision plats, in accordance with Section 236.12 of the Wisconsin Statutes, and that the State Board of Health revise Section H62.20 and Chapter H65 of the Wisconsin Administrative Code relating to sewage disposal systems so as to prohibit and regulate soil absorption sewage disposal systems on soils that have severe and very severe limitations for such systems.

7. It is recommended that the State Public Service Commission consider and give due weight to the recommended regional transportation plan in the exercise of its various transportation regulatory powers.

#### Federal Agencies

Under the provisions of recently enacted federal legislation,<sup>13</sup> applications by local units of government for federal grants in partial support of the planning, acquisition of land for, and the construction of such public facilities as highways and other transportation facilities, sewerage and water supply systems, parks, airports, waste treatment works, schools, libraries, water development, land conservation projects, and hospitals must be submitted to an areawide planning agency for review, comment, and recommendation before consideration by the federal administering agency. The comments and recommendations of the areawide planning agency shall include information concerning the extent to which the proposed project is consistent with the comprehensive planning program for the Region and the extent to which such project contributes to the fulfillment of such planning programs. The review, comments, and recommendations by the areawide planning agency are entirely advisory to both the local and federal agencies of government concerned and are intended to provide a basis for achieving the necessary coordination of public development programs in urbanizing regions. If used properly, such review can be of material assistance in achieving implementation of the recommended regional land use and transportation plans.

<sup>12</sup> *Ibid*, footnote 9.

<sup>13</sup> *Demonstration Cities and Metropolitan Development Act of 1966.*

<sup>10</sup> *Ibid*, footnote 9.

<sup>11</sup> *Ibid*, footnote 9.



1. It is recommended that the U. S. Department of Commerce, Bureau of Public Roads, through the State Highway Commission, formally acknowledge the recommended regional plans, particularly the highway transportation and transit elements, in the administration and granting of federal aids for highway construction within the Region.
2. It is recommended that the U. S. Department of Housing and Urban Development formally acknowledge the recommended regional plans, particularly the environmental corridors, regional recreation sites, and residential land use elements, and the related population forecasts in the administration and granting of federal aids for urban planning, urban beautification, open space, park development, mass transit, city demonstration projects, and sewer and water facilities and in their administration and granting of federal home mortgage financing insurance.
3. It is recommended that the U. S. Department of the Interior, Federal Water Pollution Control Administration, formally acknowledge the recommended regional plans, particularly the residential land use elements and the related population forecasts in the administration and granting of federal aids for sewage treatment plants and related facilities.
4. It is recommended that the U. S. Department of the Interior, Bureau of Outdoor Recreation, formally acknowledge the regional plans, especially the environmental corridors and the regional recreational sites in the administration and granting of federal aids under the Land and Water Conservation Fund Act.
5. It is recommended that the U. S. Department of Agriculture, Farmers Home Administration, formally acknowledge the recommended regional plans, particularly the agricultural and residential land use elements and the related population forecasts, in the administration and granting of rural housing loans and aids for resource conservation and rural water and waste disposal facilities.
6. It is recommended that the U. S. Department of Agriculture, Agricultural Stabilization and Conservation Service, formally acknowledge the recommended regional environmental corridor elements in the administration and granting of federal aids for park and recreation land acquisition and development.
7. It is recommended that the U. S. Department of Agriculture, Soil Conservation Service, formally acknowledge the regional plans, particularly the agricultural land use elements and environmental corridors in its administration and granting of federal aids for resource conservation and development and multiple-purpose watershed projects and in its provision of technical assistance to landowners and operators for land and water conservation practices.

#### SUBSEQUENT ADJUSTMENT OF THE PLAN

No plan can be permanent in all of its aspects or precise in all of its elements. The very definition and characteristics of "regional planning" suggests that a regional plan, to be viable and of use to local, state, and federal units and agencies of government, be continually adjusted through formal amendments, extensions, additions, and refinements to reflect changing conditions. The Wisconsin Legislature clearly foresaw this when it gave to regional planning commissions the power to "amend, extend, or add to the master plan or carry any part or subject matter into greater detail" under Section 66.945(9) of the Wisconsin Statutes.

Amendments, extensions, and additions to the regional plan will be forthcoming, not only from the work of the SEWRPC under the continuing regional land use-transportation study but also from state agencies as they adjust and refine state-wide plans and from federal agencies as national policies are established or modified, new programs created or existing programs expanded or curtailed, or even as nation-wide general land use or transportation plan elements are prepared and adopted. Adjustments may come from local planning programs which, of necessity, must be prepared in greater detail and result in greater refinement of the regional plans, such as the Kenosha Planning District program and various other comprehensive or local planning programs within the Region. Areawide adjustments may

come from regional or state planning programs, which may include additional comprehensive or special purpose planning efforts, such as the preparation of areawide sanitary sewer service area plans, regional water supply plans, or county park and highway plans.

All of these adjustments and refinements will require the utmost cooperation between local, areawide, state, and federal agencies, as well as coordination by the Southeastern Wisconsin Regional Planning Commission, which has been empowered under Section 66.945(8) of the Wisconsin Statutes to act as a coordinating agency for programs and activities of the local units of government.

To most effectively and efficiently achieve this coordination between local, state, and federal programs and, therefore, assure the timely adjustment of the regional plans, it is recommended that all the aforesaid state, areawide, and local agencies having various plan and plan implementation powers advise and transmit all subsequent planning studies, plan proposals and amendments, and plan implementation devices to the Southeastern Wisconsin Regional Planning Commission for consideration as to integration into, and adjustment to, the regional plans.

## LAND USE PLAN IMPLEMENTATION

### Introduction

The implementation of the recommended regional land use plan is perhaps the singularly most important process to the ultimate realization of the regional development objectives. It requires the most intricate implementation devices and the utmost in cooperation among the local units of government and the areawide, state, and federal agencies involved. It also requires careful detailing and refinement by the Regional Planning Commission and the local units of government working in close cooperation so as to ensure proper integration of the regional and local plans and proper relationship of the local implementation devices to the plans. For example, floodway and flood plain areas lying within the recommended environmental corridors should be determined, precisely delineated, and accurately mapped through careful engineering studies carried out as a part of a comprehensive watershed planning program.<sup>14</sup> County park and recreation needs and plan proposals to

<sup>14</sup> Such floodway and flood plain delineation and mapping has been completed for portions of the Root River watershed under the Commission Root River Watershed Study and is presently underway in the Fox River watershed under the Commission Fox River Watershed Study.

meet these needs, including estimates of costs and assignment of priorities to land and facility acquisition and development, should be determined.<sup>15</sup>

The supporting land uses, such as local parks, schools, and shopping areas implicitly contained within the recommended regional residential land uses, necessary to meet local needs should be determined and plan proposals to meet these needs prepared<sup>16</sup> (see Appendix D). For convenience in presentation and use, this section has been divided into the following major subject areas: Zoning Ordinances, Special Land Use Regulations, Open-Space Preservation, Open-Space Acquisition, Municipal Development Policies, and Federal and State Aid Programs.

### Zoning Ordinances

Of all the land use plan implementation devices presently available, the most readily available, most important, and most versatile is the application of the local police power to the control of land use development through the adoption of appropriate zoning ordinances, including zoning district regulations and zoning district delineations. The following zoning ordinances or amendments to existing zoning ordinances should be adopted by the appropriate local units of government within the Region so as to provide a clear indication of the intent to implement the recommended regional land use plan at the local level of government and also to provide a proper framework for other local planning and plan implementation efforts.

1. It is recommended that the county zoning agencies of the five counties within the Region which have county zoning ordinances in effect<sup>17</sup> formulate and recommend to

<sup>15</sup> Such determinations are already completed or underway in the counties of Kenosha, Milwaukee, Racine, and Waukesha.

<sup>16</sup> Good examples of such local plan efforts may be found in the community planning program recently completed for the Kenosha Planning District and described in SEWRPC Planning Report No. 10, A Comprehensive Plan for the Kenosha Planning District, and in the detailed neighborhood unit development plans being prepared by the City of Oak Creek as a part of its overall planning program.

<sup>17</sup> These include Kenosha, Racine, Washington, Waukesha, and Walworth counties. Washington County has partially carried out this recommendation by the adoption of a new zoning ordinance on May 12, 1964. Because all of Milwaukee County is contained within incorporate cities and villages, county zoning is no longer, under existing statutes, an effective device for achieving areawide land use regulation in this county. Ozaukee County has elected not to enact a county zoning ordinance, leaving all zoning responsibilities to the cities, villages, and towns within the county.

their respective county board amendments to the zoning ordinances, in accordance with Section 59.97(3) of the Wisconsin Statutes, to provide district regulations, including exclusive use districts, similar to those provided in the SEWRPC Model Zoning Ordinance,<sup>18</sup> together with changes to their zoning district maps to reflect the recommended regional land uses.<sup>19</sup>

2. It is then recommended that these five county boards adopt the pertinent amendments and changes, in accordance with Section 59.97(3) of the Wisconsin Statutes, and that the boards of all towns which have filed approval of the county zoning ordinance file certified resolutions approving such amendments and changes pursuant to Section 59.97(3)(g) of the Wisconsin Statutes.
3. It is recommended that towns lying in counties which subsequently adopt zoning ordinances similar to the SEWRPC Model Zoning Ordinance approve such county zoning ordinance and file a certified copy of such approval in accordance with Section 59.97(2)(d) of the Wisconsin Statutes.
4. It is further recommended that the plan commissions of all cities, villages, and towns which have not filed approval of the county zoning ordinance formulate and recommend to their respective governing bodies new zoning ordinances or amendments to existing zoning ordinances, in accordance with Sections 60.74 or 62.23(7) of the Wisconsin Statutes so as to provide district regulations, including exclusive use districts, similar to those provided in the SEWRPC Model Zoning Ordinance,<sup>20</sup> together with zoning district maps or changes to existing zoning district maps, to reflect the recommended regional land uses.
5. It is then recommended that the respective municipal governing bodies adopt such ordinances or amendments thereto, including such district maps or changes thereto, pursuant to Section 60.74 or 62.23(7) of the Wisconsin Statutes.<sup>21</sup> The zoning of lands

<sup>18</sup> See *SEWRPC Planning Guide No. 3, Zoning Guide*, April 1964.

<sup>19</sup> Kenosha, Racine, and Walworth counties have begun preliminary work on such ordinances.

<sup>20</sup> *Ibid*, footnote 18.

<sup>21</sup> The villages of Eagle, Pewaukee, Hartland, and Mukwonago and the towns of Belgium and Cedarburg have adopted such zoning ordinances.

in certain unincorporated areas may be supplemented by the exercise of the extra-territorial zoning power of the cities and villages jointly with the towns pursuant to Section 62.23(7a) of the Wisconsin Statutes.

The task of delineating zoning district boundaries to reflect the regional plan recommendations is as difficult as it is important. Proper delineation of the boundaries of the recommended regional land uses will require careful study and thorough understanding of not only the local community plan recommendations by the local zoning agencies but also the regional plan recommendations and their relationships to the local community. In this process, recommended environmental corridors must be broken down into several districts; and recommended agricultural use areas must provide for some residential development. Moreover, the delineation of zoning districts to reflect immediately the recommended regional land use plan would result initially in overzoning which may, in turn, result in mixed and uneconomical future land use patterns. Therefore, the use of holding zones, such as exclusive agricultural districts or large estate-type residential districts, will be necessary so as to regulate community growth in both time and space in an orderly and economical manner. The following recommendations are made to all zoning agencies within the Region to assist them in the task of zoning ordinance preparation, including zoning district delineation.

Residential Areas: Not all of the areas shown on the recommended regional land use plan as devoted to residential use should initially be placed in residential use districts.<sup>22</sup> Only existing and platted, but not yet fully developed, residential areas, as well as those areas that have immediate residential development potential and can be economically served by municipal utilities and facilities, such as sanitary sewer, public water supply, and schools, should be placed in exclusive residential districts and related to the development densities indicated on the recommended regional land use plan. The

<sup>22</sup> Suggested district regulations are specified in Appendix A, *SEWRPC Planning Guide No. 3, Zoning Guide*, April 1964. It should be noted that the recommended residential development densities shown on the regional land use plan can be achieved within each planned development unit shown on the plan by various combinations of lot sizes per dwelling unit and various housing structure types. Moreover, each residential development density specified on the plan encompasses a density range and, therefore, provides for considerable flexibility in the selection of local residential land use regulations while permitting attainment of the regional development objectives.

balance of the residential land use elements should be placed in exclusive agricultural districts or large estate-type residential districts as a holding zone. The use of these holding districts is discussed in SEWRPC Planning Guide No. 3, Zoning Guide, April 1964. Such holding districts should be rezoned into the appropriate residential district or supporting land use districts, such as neighborhood business or park districts, only when the community can economically and efficiently accommodate the proposed development.

Agricultural Areas: Areas shown on the recommended regional land use plan as devoted to agricultural use should be placed in an exclusive agricultural use district<sup>23</sup> which would permit only agricultural uses. In such areas dwellings should be permitted only as accessory to the basic agricultural uses. Commercial forests, prime wildlife habitat areas, wetlands, and floodways and flood plains within the agricultural areas should be placed in conservancy districts. Aesthetic forests, existing park sites, potential park sites, and other sites having high aesthetic or recreational value may be placed in park districts<sup>24</sup> which would permit both public and private recreational facilities. Existing mineral extraction operations and those areas which have immediate extractive potential may be placed in quarrying districts<sup>25</sup> which are carefully regulated as to operation and restoration. Existing and platted residential colonies may be placed in low-density residential districts, depending upon the limitations of the soils for utilization of on-site sewage disposal systems.

Environmental Corridors: The environmental corridors shown on the recommended regional land use plan should be placed in one of several zoning districts as dictated by consideration of existing development, the character of the specific resource values to be protected by the corridor, and the attainment of the open-space preservation and resource conservation objectives of the corridor. Commercial forests, state forests, prime wildlife habitat areas, wetlands, and floodways and flood plains lying in the corridors should be placed in conservancy districts.<sup>26</sup> Aesthetic forests, existing park sites, scenic and historic sites, and poten-

<sup>23</sup> Suggested district regulations are specified in Appendix A, SEWRPC Planning Guide No. 3, Zoning Guide, April 1964.

<sup>24</sup> *Ibid*,

<sup>25</sup> *Ibid*,

<sup>26</sup> *Ibid*,

tial park sites lying in the corridors should be placed in park districts<sup>27</sup> which would permit both public and private recreational uses. Those remaining areas lying in the corridors may then be placed in either exclusive agricultural districts or in large estate-type residential use districts, depending upon the limitation of the soils for utilization of on-site sewage disposal systems.

Major Retail and Service Sites: The major retail and service sites shown in general locations on the regional land use plan should be more precisely located and delineated at the local level and then placed in planned business districts so as to ensure preservation and to give the community adequate control over future development.

Major Industrial Sites: The major industrial sites shown as general locations on the regional land use plan should be more precisely located and delineated at the local level and then placed in planned industrial districts with all uses carefully regulated so as to ensure preservation and to give the community adequate control over future development.

Public Airports: The existing and proposed public airport sites shown in general locations on the recommended regional land use plan will require further study and refinement through the eventual preparation of a regional airport plan. In the interim period, lands needed for any proposed airports and for the proper expansion of existing airports should be placed in an agricultural holding district,<sup>28</sup> a special airport district, or a planned industrial district, with all uses carefully regulated so as to ensure the preservation of the site and to give the community control over future development or expansion.

Major Recreational Sites: The major public outdoor recreation sites shown on the recommended regional land use plan should be placed in park districts so as to ensure preservation and availability for public acquisition. Recommended boundaries for these sites are available on large-scale maps on file in the Commission offices.

Tax Relief: One of the valid criticisms often leveled against the use of exclusive agricultural and conservancy districts is that Section 70.32 of the Wisconsin Statutes directs assessors to value all real estate at the full value which could ordi-

<sup>27</sup> *Ibid*,

<sup>28</sup> *Ibid*,

narily be obtained at a private sale. This implies that potential development value must be included in the appraisal and assessment of open lands. Where such open lands are adjacent to, or within, a rapidly urbanizing area, and particularly where poor land use regulations have permitted leapfrog, spotty, and sprawling urban development, an assessment so made often reflects an exaggerated development potential.

Under present Wisconsin constitutional and statutory law, the most satisfactory way to relieve the owner of lands zoned for exclusive agricultural or conservancy use from unrealistically high property assessment and taxation is to remove the development potential. This may be accomplished in any one of the following ways:

1. The property owner may voluntarily grant an easement to a state agency or local unit of government prohibiting development upon the open lands for a period of at least 20 years.
2. The property owner may voluntarily place restrictive covenants upon the open lands enforceable by a state agency or local unit of government in perpetuity or for some substantial but lesser period of time.
3. Purchase of development rights in the open lands by a state agency or local unit of government.

All of these private or governmental actions will serve not only to permit but also to require the local assessor to appraise and assess the open lands based upon the market value for agricultural and conservancy uses and not on the potential value for other uses. This lowering or freezing of the land value and a corresponding lowering or freezing of the real property taxes would continue either in perpetuity or the assessment and taxes would increase in steps as the remaining time period of the covenants or easements in effect decreases. It is recommended that the cities, villages, and towns containing exclusive agricultural or conservancy districts instruct their assessors that such tax relief exists for individual property owners upon their voluntary sale or relinquishment of potential development rights.

#### Special Land Use Regulations

In addition to the general zoning regulations previously discussed and recommended, there are

several special land use regulations available to local units of government and to certain state agencies. These can contribute in varying degrees toward the implementation of the recommended regional land use plan.

Soil and Water Conservation Practices: Counties may supplement the exclusive agricultural and conservancy zoning district regulations of the comprehensive county zoning ordinances by special land use regulations adopted for the purpose of conserving soil and water resources, controlling erosion, reducing stream pollution, and promoting good soil and water conservation practices. The latter may include the construction of upland water control structures, such as terraces, terrace outlets, grassed waterways, erosion control dams, dikes, ponds, and diversion channels; and the application of good land management practices, such as contour cultivating, reforestation, contour strip cropping, and the seeding and planting of lands to special plants, trees, and grasses.

1. It is recommended that all County Soil and Water Conservation Districts, except Milwaukee County, formulate proposed soil and water conservation regulations pursuant to Section 92.09(1) of the Wisconsin Statutes; hold the necessary public hearings and a referendum; and, if two-thirds of the land occupiers affected approve such regulations, recommend adoption to the respective county boards.
2. It is then recommended that all county boards, except Milwaukee County, adopt such proposed regulations pursuant to Section 92.09 of the Wisconsin Statutes; enforce such regulations; and, if necessary, have the work performed by the district supervisors pursuant to Sections 92.10 and 92.11 of the Wisconsin Statutes.
3. It is further recommended that the State Soil and Water Conservation Committee apportion appropriate state and federal funds to the County Soil and Water Conservation Districts within the Region to enable implementation of the necessary conservation programs.

Soil Restrictions: The regional soil survey and analysis completed by the U. S. Department of

Agriculture, Soil Conservation Service, in cooperation with the SEWRPC under the regional land use-transportation study, delineates and classifies those soils which have severe and very severe limitations for urban development and on-site soil absorption sewage disposal systems. Recently the Wisconsin Legislature<sup>29</sup> gave to the State Department of Resource Development power to prohibit the installation or use of septic tanks in any area of the state where water quality would be impaired through such installation and use.

1. It is recommended that the State Department of Resource Development, pursuant to Section 144.025(2)(q) of the Wisconsin Statutes, prohibit septic tank systems on soils within the Region that have "very severe limitations" for such systems, as established in the regional soil survey, or where ground or surface waters would be subject to contamination and prohibit septic systems on soils that have "severe limitations" for such systems, as established in the regional soil survey, unless such limitations are overcome.
2. It is also recommended that the State Board of Health amend Section H62.20 and Chapter H65 of the Wisconsin Administrative Code so as to prohibit the subdivision of land for urban development on soils having "very severe limitations" for residential development, as established by the regional soil survey, and prohibit septic systems on soils having "severe limitations" for such systems unless such limitations are overcome.
3. It is further recommended that all counties, except Milwaukee County, pursuant to Section 59.07(51) of the Wisconsin Statutes, adopt sanitary ordinances regulating private water and sewage disposal systems that are related to the regional soil survey.<sup>30</sup>
4. It is further recommended that all counties, except Milwaukee County, and all cities, villages, and towns within the Region, pursuant to Section 236.45 of the Wisconsin Statutes, amend existing or adopt new subdivision regulations similar to the

<sup>29</sup> Chapter 614, Laws of Wisconsin 1965.

<sup>30</sup> Walworth County has already carried out this recommendation through the adoption of a county sanitary ordinance on August 14, 1966.

SEWRPC Model Land Division Ordinance,<sup>31</sup> including the recommended soil restriction clause.

Floodway and Flood Plain Restrictions: The adoption of ordinances restricting and regulating development in areas subject to flooding is the most efficient and most economical method of preventing future flood losses and accompanying environmental problems. It is recommended that all counties, cities, villages, and towns within the Region amend their zoning and land division ordinances to include regulations similar to Appendix L1, 3, and 4 of SEWRPC Planning Report No. 9, A Comprehensive Plan for the Root River Watershed, July 1966.<sup>32</sup> Recently, the Wisconsin Legislature enacted legislation providing that if any county, city, or village does not adopt a reasonable and effective flood plain zoning ordinance by January 1, 1968, the State Department of Resource Development shall, upon petition of an interested state agency, a municipality, 12 or more freeholders, or upon its own motion, exercise flood plain zoning powers pursuant to Section 87.30 of the Wisconsin Statutes.<sup>33</sup>

Shoreland Zoning: Counties in Wisconsin have recently been given a special zoning power, under Section 59.971 of the Wisconsin Statutes,<sup>34</sup> over unincorporated areas that lie within 1,000 feet of a lake, park, or flowage; 300 feet from a river or stream; or to the landward side of the flood plain, whichever is greater, for the purpose of minimizing water pollution. Section 144.26 of the Wisconsin Statutes requires that the State Department of Resource Development prepare a comprehensive plan based upon a use classification as a guide for the application of these shoreland zoning ordinances. This new law further provides that if a county does not adopt such shoreland zoning ordinance by January 1, 1968, the State Department of Resource Development shall adopt such an ordinance. It is recommended that all of the constituent counties, except Milwaukee County, adopt such shoreland zoning ordinances. The Commission watershed planning programs, which serve to detail the recommended regional land use

<sup>31</sup> See Appendix A, SEWRPC Planning Guide No. 1, Land Development Guide, November 1963.

<sup>32</sup> Flood hazard maps showing the limits of the 10- and 100-year recurrence interval floods, and essential to the proper application in urban areas of the land use regulations recommended by the Commission, have been prepared for portions of the Root River watershed and are under preparation for portions of the Fox River watershed under Commission watershed planning programs.

<sup>33</sup> Chapter 614, Laws of Wisconsin 1965.

<sup>34</sup> *Ibid*, footnote 33.

plan, contain specific recommendations useful in the enactment of such shoreland zoning ordinances. The Fox River watershed plan will contain land use recommendations covering the shorelines of 44 major lakes within the basin. The recommendations will be specifically directed at assisting the counties concerned in the necessary shoreland zoning efforts.

Airport Zoning: Counties, cities, villages, and towns owning state and federally approved airport sites have been granted the power to protect the aerial approaches to such sites by special airport zoning ordinances. Such an ordinance would also be applicable to lands lying up to three miles outside the limits of the adopting unit of government. It is recommended that all local units of government containing existing public airport sites recognized on the recommended regional land use plan adopt suitable airport zoning ordinances pursuant to Section 114.136 of the Wisconsin Statutes, so as to protect the glide paths required by state and federal agencies and to regulate the use and size of both lands and structures within the area affected by existing and proposed airport facilities.

Open-Space Preservation: In order to effectively preserve the recommended regional environmental corridors, including the recommended major outdoor recreational sites, the ultimate acquisition and development of these recreational sites and of certain portions of the corridors as parks will be necessary over the plan implementation period. Since it is not economically feasible to acquire all of these parks immediately, it becomes necessary to utilize certain police powers that are available to the local units of government in addition to outright acquisition by fee or less-than-fee purchases.

In addition to preservation of existing public and private parks by exclusive park district zoning and the protection of parks to be acquired within a reasonable period of time<sup>35</sup> by the use of exclusive conservancy and agricultural zoning districts, the official mapping powers possessed by municipalities in Wisconsin may be utilized. Such powers, as well as the required maps and survey control

<sup>35</sup> The definition of what constitutes a "reasonable period of time" in this respect depends upon the size of the proposed park site, permitted uses, and land use demands and upon the relationship of the zoning to a comprehensive community planning program, including related implementation devices, such as a capital improvements schedule and acquisition schedule.

system, are described in SEWRPC Planning Guide No. 2, Official Mapping Guide, February 1964.

The single most important prerequisite of such official mapping is the availability of accurate base maps at an adequate scale, properly related to both the U. S. Public Land Survey and state plane coordinate systems. Such maps are presently available from the Commission for certain areas in the Root River watershed, from the cities of Franklin and Oak Creek, and from the villages of Brown Deer, Germantown, and River Hills for their corporate areas. Such maps will soon become available from the Regional Planning Commission and State Highway Commission for selected areas in the Fox River watershed and along certain existing and proposed major transportation corridors and from the City of New Berlin and the Village of Menomonee Falls for their corporate areas. Additional mapping of the quality recommended in SEWRPC Planning Guide No. 2 should be accomplished by the local units of government in those areas recommended on the regional land use plan for future residential development.

1. It is recommended that all the cities, villages, and towns within the Region prepare and adopt official maps pursuant to Section 62.23(6) of the Wisconsin Statutes, showing thereon those recommended regional recreational sites and selected park and drainage areas in the environmental corridors both within their corporate limits and within their extraterritorial subdivision plat approval jurisdictions, and adopt an ordinance similar to the SEWRPC Model Official Map Ordinance.<sup>36</sup>
2. In addition to such official mapping, it is recommended that all units of government within the Region amend the existing or adopt new land subdivision regulations similar to the SEWRPC Model Land Division Ordinance,<sup>37</sup> which would prohibit subdividing for any purpose all major recreational sites lying within the local unit as shown on the recommended regional land use plan.

<sup>36</sup> See Appendix A, SEWRPC Planning Guide No. 2, Official Mapping Guide, February 1964.

<sup>37</sup> See Appendix A, SEWRPC Planning Guide No. 1, Land Development Guide, November 1963.

3. It is further recommended that the State Department of Resource Development and the State Board of Health supplement such local action by objecting to, or denying approval of, any subdivision plat lying within the recommended environmental corridors if such plat lies on marsh, swamp, peat, or other organic soils; is subject to flooding or has a high water table; or does not provide adequate sewage and waste disposal systems in accordance with Section 236.13(2m)<sup>38</sup> of the Wisconsin Statutes.
4. It is also recommended that the State Department of Resource Development in the exercise of their water diversion, encroachment, deposit, alteration, and development regulatory powers either prohibit or stringently regulate those uses and structures in the corridors so as to ensure that they will be compatible with the purpose of providing open space, preserving wildlife habitat, enhancing the park and recreation value, protecting the ground and surface waters, and otherwise retaining the corridor lands and waters in a natural regimen.

#### Open-Space Acquisition

Acquisition of the major public outdoor recreation sites and certain open-space lands lying in the environmental corridors shown on the recommended regional land use plan may be accomplished in various ways, ranging from actual gifts by owners, through dedication by land developers at the time of platting, to outright purchase of the entire fee or of lesser interests by the state or by local units of government. There is justification for requiring land developers to dedicate reasonable portions of those sites or park lands lying within their subdivision or development or to pay a fee in lieu of dedication toward the purchase of neighboring park land. This justification is based upon the concept that the local governing body, by permitting such developer to create building sites or dwelling units, places a demand upon the entire community which is thereafter responsible for the services that must be provided to such development and its residents, including park lands, and that the owner or developer or future resident should, in justice, bear all or a portion of such cost directly attributed to his land.

<sup>38</sup> Chapter 614, Laws of Wisconsin 1965.

1. It is recommended that the planning agencies of all the seven counties and the plan commissions of all cities, villages, and towns within the Region recommend to their respective governing body, in accordance with Section 236.45(4) of the Wisconsin Statutes, the amendment of existing or the adoption of new land subdivision regulations that are similar to the SEWRPC Model Land Division Ordinance<sup>39</sup> so as to assure dedication of all or portions of these recreational sites and corridor park lands or payment of fees in lieu of such dedication. Such an ordinance requiring dedication or a fee of \$200 per lot in lieu of dedication has been recently upheld by the Wisconsin Supreme Court.<sup>40</sup>
2. It is recommended that the respective governing bodies adopt such recommended land division ordinances or amendments thereto pursuant to Section 236.45 of the Wisconsin Statutes.

If these sites or corridor park lands shown on the recommended regional land use plan cannot reasonably be acquired by gift or dedication, acquisition of the entire fee interest is the most desirable method of acquiring such lands.

1. It is recommended that the constituent county boards, by resolution, formally request the State Conservation Commission to acquire those major recreational sites shown on the recommended land use plan as lying within their county<sup>41</sup> as state parks and to acquire such sites as are necessary to protect, develop, and regulate the use of state forests and parks, fish, game, lakes, streams, plant life, and other recreation resources within the environmental corridors shown on the regional land use plan as appropriate.
2. It is further recommended that the State Recreation Advisory Committee recommend to the State Legislature that authority be provided to expend funds under the Outdoor Recreation Act; and it is further recommended that such Committee specifically

<sup>39</sup> See Appendix A, SEWRPC Planning Guide No. 1, Land Development Guide, November 1963.

<sup>40</sup> Jordan v. Village of Menomonee Falls, 28 Wis. 2d 608, 137 N.W. 2d 442 (1965).

<sup>41</sup> Walworth County has already carried out this recommendation.



designate such funds for acquisition of the above sites, areas, and easements within such environmental corridors.

3. It is then recommended that the State Conservation Department acquire the above sites, areas, and easements within such environmental corridors pursuant to Sections 23.09(7)(d), 23.09(16), and 27.01 of the Wisconsin Statutes.

Such action by state agencies may be supplemented by appropriations and expenditures by the local units of government for acquisition of such recreation sites and such corridor park lands.

1. It is recommended that all seven counties within the Region continue or commence active park acquisition and development programs, pursuant to Section 27.065 of the Wisconsin Statutes, so as to result in the preservation of the recommended environmental corridors, including the recommended major recreational sites, and to meet the recommended regional park standards.
2. It is also recommended that all cities, villages, and towns supplement such county action whenever possible by acquisition of those lands lying in the environmental corridors that are most appropriate for community parks, pursuant to Section 27.08 of the Wisconsin Statutes, for municipal use or for future transfer to a county park and recreation agency.

Purchase by the local units of government of less than the fee interest in the environmental corridors may be considerably cheaper and may result in more rapid preservation, acquisition, and use of said lands. Such acquisition of less-than-fee interests may be in the form of scenic easements for vista protection, conveyances of development rights to assure continuance of private parks or open spaces, and grants of various public access and development rights for construction and use of park facilities. These devices should be used when acquisition of the entire fee interest is too costly or otherwise not practical.

#### Public Development Policies

Almost as important as the use of the zoning power by the local units of government to implement the recommended regional land use plan

is the adoption and adherence to certain public development policies concerning annexation, incorporation, consolidation, and the extension of municipal utilities, such as water supply and sanitary sewer systems. Proper consideration of the regional land use plan in deliberations concerning municipal annexations, consolidations, and incorporations will assist in achieving more economical urban service areas, since the urban land use delineations on the recommended regional plan were based upon historic growth trends, rational utility service areas, drainage patterns, and soil capabilities. The following recommendations concern the more important public policies that will have a significant effect upon the implementation of the regional land use plan.

1. It is recommended that all cities and villages within the Region carefully consider the urban land use pattern indicated on the recommended regional land use plan when reviewing proposed annexations. To the maximum extent possible, only such lands as are shown on the recommended plan as urban and such other contiguous lands as may be necessary to meet local open-space, utility, and community facility needs should be annexed.
2. It is also recommended that all cities, villages, and towns within the Region carefully consider the urban land use pattern indicated on the recommended land use plan when reviewing consolidations and incorporations and give due weight to the rational urban service area implications of any consolidations or incorporations as these might affect the regional land use pattern.
3. It is further recommended that the State Department of Resource Development in reviewing any proposed annexations, consolidations, or incorporations give due weight to the urban land use pattern shown on the recommended land use plan and the implications which this pattern may have for the establishment of rational urban service areas, recognizing that annexations, incorporations, or consolidations which do not properly recognize the recommended land use plan may not be in the public interest and may substantially hinder the solution of governmental problems affecting the regional community.

4. It is recommended that all metropolitan and municipal utilities adopt and adhere to utility extension policies that would result in only those areas shown as urban on the recommended regional land use plan being serviced by public water supply and sanitary sewer systems.
5. It is further recommended that all metropolitan and municipal utilities design and install public water supply and sanitary sewer systems so as to preclude the provision of such services to urban development proposed to be located in the flood plains or on lands shown on the regional land use plan as agricultural or environmental corridors or on those soils designated in the regional soil survey as having severe and very severe limitations for such urban development.

#### State and Federal Aid Programs

The following recommendations concern those state and federal agencies which administer grants and aids toward the acquisition and development of lands and the construction of specific municipal facilities that will have a direct effect upon the implementation of the recommended regional land use plan.

1. It is recommended that the State Department of Resource Development and the State Conservation Commission assign the highest appropriate priorities to all land acquisition grants for those lands located within the recommended environmental corridors and the most highly urbanized areas of the Region and applied for under the federal "Land and Water Conservation Fund Act" and the state's "Outdoor Recreation Aid Program" in accordance with Section 109.05(3) of the Wisconsin Statutes.
2. It is recommended that the State Department of Resource Development approve only such grant applications for municipal pollution prevention and abatement facilities under the state's "Financial Assistance Program" in accordance with Section 144.21(5)<sup>42</sup> of the Wisconsin Statutes that are located and designed in accordance with the recommended regional land use plan and population forecasts.
3. It is recommended that the U. S. Department of Housing and Urban Development assign the highest appropriate priorities to all grant applications for urban beautification, open-space acquisition, and park development grants for lands that are located within the recommended environmental corridors or within the most highly urbanized areas of the Region.
4. It is recommended that the U. S. Department of Housing and Urban Development approve only those applications for city demonstration programs that are properly related to the recommended regional land use plan and only those grants for sewer and water facilities that are located and designed generally in accordance with the recommended regional land use plan, general urban service areas, and population forecasts.
5. It is recommended that the U. S. Department of Housing and Urban Development, Federal Housing Administration, provide federal mortgage financing insurance for only those residential development proposals which are consistent with the recommended regional land use plan and particularly the spatial location and density patterns recommended by the plan.
6. It is recommended that the State Department of Resource Development and the Federal Water Pollution Control Administration approve only those grant applications for sewage treatment plants and related facilities that are located and designed in accordance with the recommended regional land use plans and population forecasts.
7. It is recommended that the U. S. Department of Agriculture, Farmers Home Administration, approve only those grant applications for rural water and waste disposal facilities which would provide service to existing development or are located and designed in accordance with the recommended regional land use plan and population forecasts. It is further recommended that this agency approve only those loan applications for rural housing which are consistent with the recommended regional land use plan.

<sup>42</sup> Chapter 614, Laws of Wisconsin 1965.

8. It is recommended that the U. S. Department of Agriculture, Agricultural Stabilization and Conservation Service, assign the highest appropriate priorities to those applications for park and recreational sites that lie within the recommended environmental corridors.

## TRANSPORTATION SYSTEM PLAN IMPLEMENTATION

### Introduction

For plan implementation purposes, the recommended regional transportation plan may be subdivided into two major elements, one dealing with highway and the other with transit facilities. Each of these two major plan elements may be further subdivided into three functional facility type groups, based upon the primary character of service to be rendered by the facilities included in each group (see Table 50). For highway facilities, these three functional groups are: 1) freeways, 2) expressways and parkways, and 3) standard arterial streets and highways. For transit facilities these three functional groups are: 1) rapid transit, 2) modified rapid transit, and 3) ordinary mass transit facilities.<sup>43</sup>

At the regional level, principal emphasis must be focused initially on implementation of those transportation facility improvement recommendations which, because of the high capacity and high level of service provided, form the basic framework for the entire regional transportation system. The recommended transportation plan, therefore, contains firm recommendations for the general location and capacity of all of the facilities in the first two functional groups under each major plan element; that is, for all freeway, expressway and parkway, rapid transit, and modified rapid transit facilities required to serve the recommended regional land use plan. In addition, the plan contains preliminary recommendations for standard arterial street and highway facilities and for ordinary mass transit facility service areas. These recommendations, however, will, because of the multiple-purpose functions of some of these facilities, the many alternatives available, the relationship to local development and redevelopment, and the jurisdictional problems involved, require refinement under the continuing regional transportation planning effort. Such refinement

<sup>43</sup> See pages 113 to 119 of Volume 1 of this report for a more complete discussion of functional classification.

must be carried out cooperatively by the state, county, and local units of government concerned. This chapter, therefore, contains specific plan implementation recommendations for only the freeway, expressway and parkway, modified rapid transit, and rapid transit plan elements, together with recommendations for converting the functional regional highway plan to a jurisdictional plan as a necessary first step toward the implementation of the arterial street and highway and mass transit plan elements.

The recommended 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 recommended plan also includes recommendations concerning 89 miles of modified rapid transit lines and approximately 4.3 miles of rapid transit line. The recommended transportation plan elements are, of necessity at this stage in the planning process, related only to functional classification and not to jurisdictional responsibility; that is, the plan contains specific recommendations as to the type and character of the physical facilities that are required to serve the forecast traffic needs but does not specify the governmental unit or agency that should have the responsibility for acquiring, constructing, or maintaining each of the recommended facilities. The importance of the various federal aid highway systems and of the state and county trunk highway systems in this respect has already been noted. These systems, in effect, constitute an existing jurisdictional plan for highway transportation facilities within the Region. If the recommended regional highway transportation plan is to be implemented, this existing jurisdictional plan must be adjusted to the recommended functional plan.

One of the first and most important steps in implementing the recommended regional transportation plan, therefore, will be for the State Highway Commission of Wisconsin, the Milwaukee County Expressway Commission, and the seven county highway committees, in cooperation with the local units of government within the Region, to convert the functional highway plan to a jurisdictional plan; that is, to determine jurisdictional responsibility for all elements of the recommended transportation plan and to subsequently adjust the federal aid, state trunk, and county trunk highway systems to the jurisdictional plan.

It is recommended that the preparation of the necessary jurisdictional plan be accomplished within the framework of this recommended regional transportation plan on a county-by-county basis, utilizing the continuing regional land use-transportation planning process as the medium through which the State Highway Commission of Wisconsin, the seven county highway committees, the Milwaukee County Expressway Commission, and the Regional Planning Commission work cooperatively to establish objectives and standards which can be used as the basis for the jurisdictional classification of all street and highway facilities, to refine the functional transportation plan, and to convert this plan to a jurisdictional plan.<sup>44</sup> This work will constitute in and of itself a major planning effort and will involve many political and administrative as well as financial and engineering considerations. Its completion throughout the Region, therefore, may be expected to take several years.

For convenience in presentation and use, this section has been divided into the following major subareas: jurisdictional responsibility, aid system adjustment, corridor refinement, right-of-way reservation, acquisition and construction, and capacity protection. Plan implementation recommendations for major highway and transit facilities are discussed separately under each of these subareas. It should be stressed that the following specific recommendations for implementation of the major transportation plan proposals are set forth within the context of the continuing regional land use-transportation planning process and particularly the jurisdictional plan preparation process just described.

#### Jurisdictional Responsibility

Although the assignment of jurisdictional responsibility for the various segments of the standard arterial street and highway system within the Region can properly take place only within the context of the continuing planning process, including preparation of the county jurisdictional plans described above, certain jurisdictional responsibilities may be logically assigned and assumed immediately following adoption of the recommended regional transportation plan by the constituent county boards and by the State Highway and the Milwaukee County Expressway Commissions. These include the jurisdictional responsibility for recommended freeways, expressways and parkways,

<sup>44</sup> Racine and Milwaukee counties have already formally requested the Commission to begin work on this refinement and conversion.

modified rapid transit facilities, and rapid transit facilities. The following specific implementation actions are recommended in this respect:

1. It is recommended that, upon adoption of the regional transportation plan by the seven county boards, the State Highway Commission of Wisconsin and the Milwaukee County Expressway Commission immediately take the necessary action to assume jurisdictional responsibility over all recommended freeways, pursuant to Sections 84.02(3), 84.025(3), 84.295(3), and 59.965(5)(a) of the Wisconsin Statutes.
2. It is further recommended that the Milwaukee County Park Commission assume jurisdictional responsibility for the proposed Milwaukee River Parkway from the Juneau Interchange to the North-South Freeway in the vicinity of West Hampton Avenue.
3. It is recommended that, upon completion of the jurisdictional highway plans for each county, the State Highway Commission and the respective county highway committees, in cooperation with the local units of government, assume the appropriate jurisdictional responsibility over the standard arterial street and highway system by changes in the state trunk highway systems, pursuant to Sections 84.02(3), 84.025(3) of the Statutes, and by appropriate changes in the county trunk highway system pursuant to Section 83.025 of the Wisconsin Statutes.

Sections of the state highway law establish and designate the state trunk highway system and specify how changes in the system are to be made. The State Highway Commission is given the authority to make changes, including the laying out of new routes or discontinuances in the established system under 2.5 miles in length. For such minor changes, the State Highway Commission is simply required to serve notice of the intention to make the change or discontinuance on the localities concerned. If the change or discontinuance is over 2.5 miles in length, the Commission may make such change or discontinuance only after duly held public hearings and upon approval by the county board of the county in which the change or discontinuance is located. Where the change exceeds five

Table 50

FUNCTIONAL HIGHWAY CLASSIFICATION SYSTEMS - CORRIDOR AND FACILITY TYPES

The functional grouping used in this report relates to the supply of transportation system capacity; that is, to the character and level of service provided by highway facilities of different types. It is also possible to functionally classify transportation corridors on the basis of the character and level of transportation service required or demanded within the corridors. The latter type of classification considers the type and size of areas connected by the corridors, as well as the type and volume of traffic within the corridors, and has been used by the State Highway Commission of Wisconsin in developing its state-wide highway system plan.

The State Highway Commission of Wisconsin has classified traffic corridors into three major functional types: arterials, collectors, and locals. The arterials consist of those corridors which must provide for the rapid movement of concentrated volumes of traffic over relatively long distances and which provide the more direct and unrestricted routes between large centers of land use activity, providing for traffic movement between, rather than within, these areas. The arterials have been further subclassified into four categories on the basis of the size of the area served or intensity of activity within the area served, and each of these subclassifications have further been divided into rural and urban categories as follows:

Principal Arterials

Rural: serve the longest trips traversing the major interstate and inter-regional traffic corridors, provide the highest level of mobility, and form a continuous system with constant operating conditions under a high degree of access control.

Urban: serve the major intra-metropolitan (intra-regional) corridors, connecting major communities within an urbanized area (region); provide the highest level of urban mobility, and form a continuous system under a high degree of access control.

Primary Arterials

Rural: serve long trips between important cities or serve a significant region, provide a high level of mobility and constant operating conditions with only occasional minor restrictions, and form a continuous system in combination with principal arterials.

Urban: serve intercommunity trips within urban areas, provide a high level of urban mobility with little variation in operating conditions, and form a continuous system with principal arterials.

Standard Arterials

Rural: serve intermediate length trips within regions, providing for through traffic movement in trade areas; feed traffic to primary arterials from areas not served by such routes; provide a good level of mobility, though operating conditions may vary and gradual reductions in capacity may be anticipated in areas of decreasing travel demand; and form a continuous system in combination with the higher mobility arterials.

Urban: serve long trips within an urban area, provide good mobility, and form a continuous system in combination with principal and primary systems.

Minor Arterials (rural only)

Serve mixed trips within regions, provide moderate mobility and considerable land access with variable service levels and operating characteristics, and form a usually continuous system in combination with higher arterials.

The collectors consist of those corridors which provide for moderately rapid movement of traffic between activity areas and serve to collect and distribute traffic between arterials and local roads and to provide land access. Collectors have been further subclassified into two groups: High-Type Collectors, which perform a semi-arterial function, and Low-Type Collectors, which perform a more strictly collection and distribution function. Each collector group is further subclassified into rural and urban routes.

High-Type Collectors

Rural: serve moderately long trips within predominantly rural areas and provide service to smaller communities or traffic generators not directly served by arterials, form a generally continuous system when combined with arterials, and offer fair mobility under variable operating conditions.

Urban: serve intermediate to long trips within an urban area and provide service to traffic generators which are not adequately served by an arterial; as semi-arterials they provide fair mobility with considerable variation in level of service.

Low-Type Collectors

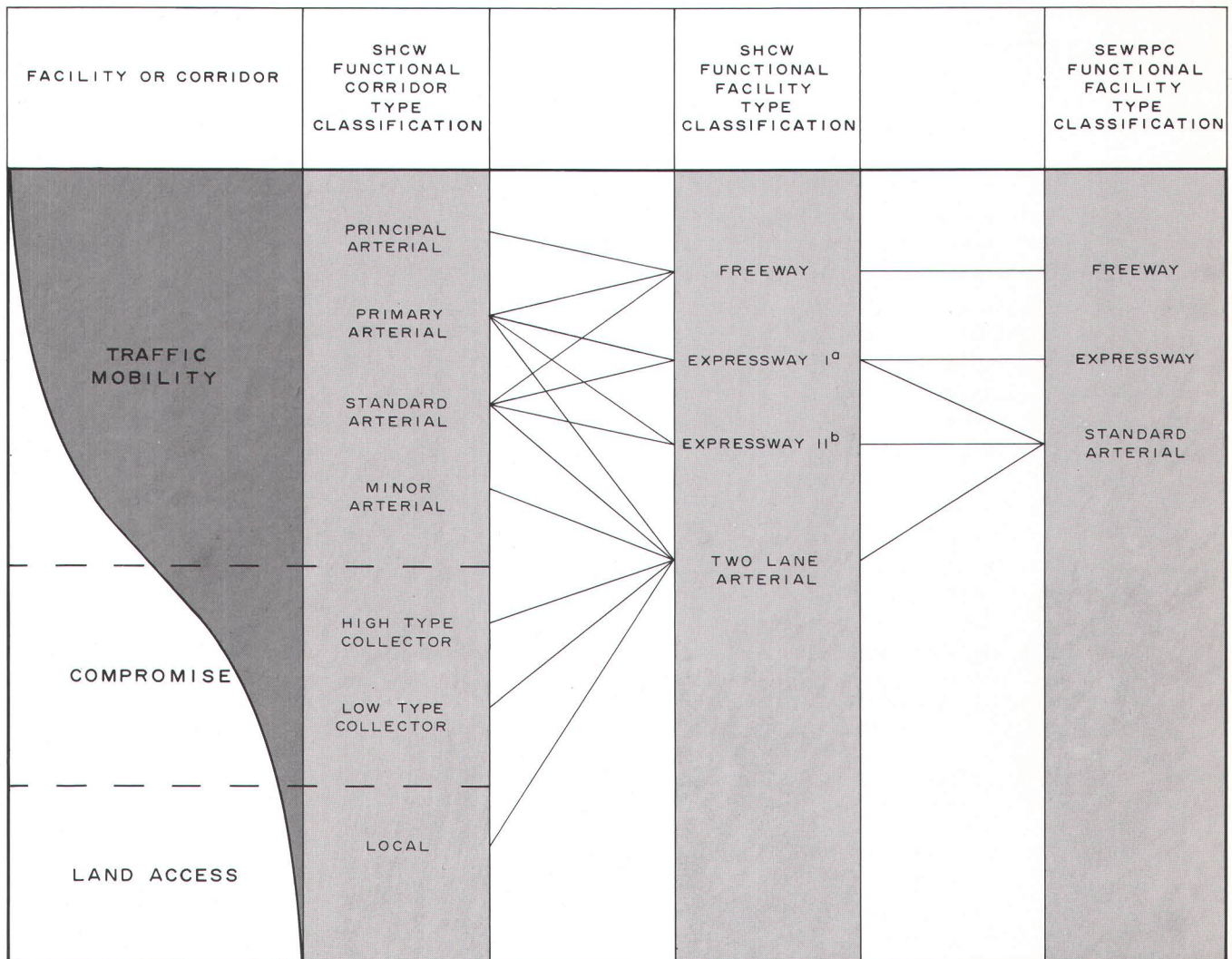
Rural: collect and distribute traffic to and from local roads and adjacent lands in predominantly rural areas, de-emphasize mobility, although forming a generally continuous pattern when combined with arterials and high collectors.

Urban: collect and distribute traffic to and from local streets and adjacent lands within urban neighborhood areas; form a generally continuous pattern when combined with arterials and collectors, while providing low-level mobility for medium-length trips.

The local routes provide access to land use activities, and no functional distinction between rural and urban is used.

The refinement of the regional transportation plan and its conversion on a county-by-county basis to a jurisdictional plan will require utilization of both approaches to functional classification. The relationship between the two types of functional classification is indicated in the diagram below.

**RELATIONSHIP OF FUNCTIONAL HIGHWAY CLASSIFICATION SYSTEMS  
CORRIDOR AND FACILITY TYPES**



*a No private access; some public road intersections at grade.  
b Some private access; most public road intersections at grade.*

miles in length, the act specifies that it shall then constitute "an addition to the State Trunk Highway System"; and in such case the pre-existing route shall continue to be a state trunk highway unless the county board or boards involved and the Commission mutually agree to its discontinuance as a state trunk highway. Whenever such board or boards and the State Highway Commission cannot so agree, the act specifies that the Commission report the problem to the next ensuing session of the Legislature. These provisions concerning system changes are also made applicable to the state arterial highway system, defined below; but on the state arterial highway system, the 2.5-mile criterion specified for changes in the state trunk highway system is increased to five miles, thereby eliminating the need for public hearings and county board consent to changes of less than five miles in length.

The state highway law permits the Commission to establish a temporary route as part of the state trunk system pending the improvement or construction of any portion of the state trunk system which may be currently "impractical to maintain." Such temporary route shall be considered a part of the system in every respect except that it may not be constructed as a state trunk highway.

The state highway law provides that the state trunk highway system shall not include the marked routes thereof in cities or villages of over 2,500 population, except those portions within or along the corporate limits lines which the Commission shall determine to be "comparatively rural or suburban in character." The portions of the highway network so excluded from the state trunk system because they are within the corporate limits of such cities and villages, but which are marked as being on the system, are designated as "connecting streets."

As already noted, the highway law directs the State Highway Commission to maintain a map of each county showing the "official layout" of the state trunk highway system. The state highway law provides for the creation and designation of a part of the

state trunk highway system as a state arterial highway system to form an "integrated, state-wide inter-regional and inter-community network of highways for the purpose of facilitating the improvement of the state arterial system and accelerating the rate of improvement on the entire state trunk highway system." The section specifically designates the actual arterial system by description and limits it to 2,200 miles, including "supplementary connections into and through urban areas."

4. It is recommended that the Milwaukee County Expressway Commission, in cooperation with the private transit corporations operating within the Region, assume jurisdictional responsibility for the recommended rapid transit and modified rapid transit plan elements, including the construction of the necessary parking lots required to make the recommended transit elements fully effective. Assumption of jurisdictional responsibility for the latter may require amendment to the Milwaukee County Expressway Commission enabling legislation in order to provide the Expressway Commission with extraterritorial powers for the construction of parking lots. If such legislative amendment proves to be impractical of attainment, then it is recommended that a metropolitan transit authority be created, pursuant to Section 66.94(9) of the Wisconsin Statutes, to assume jurisdictional responsibility for all elements of the recommended modified rapid transit and rapid transit system. It should be noted that such a transit authority does not, under the present enabling legislation, possess any tax powers and would have to seek other sources of revenue, including subsidies and revenue bonds.

#### Aid System Adjustment

Upon assumption of jurisdictional responsibility by the state, county, and local units of government concerned, it then becomes necessary to adjust the federal aid system as established under Title 23, U. S. Code, Section 103, to the functional and jurisdictional plans. The purpose of the federal aid system is to establish an integrated highway network and to assure effective expenditure of federal monies on such a network. The system itself is selected or designated by the State Highway Commission, in cooperation with the affected

local units of government, utilizing, however, federally established criteria and is subject to review and approval by the U. S. Bureau of Public Roads. Three basic systems are provided:

1. Federal Aid Primary System, which is comprised of important city-to-city, interstate, and intrastate highways, serving essentially through traffic and their urban extensions, including important belt highways and spurs.
2. Federal Aid Secondary System, which is comprised of feeder roads, including farm-to-market roads, rural mail and public school bus routes, county trunks, and their urban extensions.

These two systems comprise those highways upon which the Federal Government will participate in the cost of improvements to the extent of 50 percent of the total cost of the improvement, providing that the improvement is built to federal standards; all operation and maintenance costs are borne by the state, county, or local units of government.

3. Federal Aid Interstate System, which is comprised of that part of the primary system consisting of routes of highest importance to the nation, connecting principal metropolitan areas, cities, industrial centers, and defense installations, and their urban extensions. The Federal Government will participate to the extent of 90 percent of the total cost of the improvement of this system; all operation and maintenance costs are borne by the state.

Each system is limited in extent, either by law or by administrative practice. On January 1, 1966, all but 27 miles of the 11,731 miles of state highway system in Wisconsin were on the federal aid system; and the State Highway Commission has, as a general rule, been unable to expend any state monies for construction on facilities not on the state trunk highway system unless specifically directed to do so by legislative action. Moreover, no federal monies may be expended for either engineering or construction on any facilities not on one of the federal aid systems. Consequently, the actual location and extent of these systems have extremely important implications for the highway planning and plan implementation process.

1. It is recommended that, upon assumption of jurisdictional responsibility, the State Highway Commission and the Milwaukee County Expressway Commission immediately seek adjustment of the federal aid system to the recommended freeway plan element, pursuant to Section 84.01(17) of the Wisconsin Statutes, as deemed necessary and appropriate by these two commissions.
2. It is recommended that, upon assumption of jurisdictional responsibility, the State Highway Commission and the respective county highway committee, in close cooperation with the local units of government, seek adjustment of the federal aid system to the jurisdictional plan, pursuant to Sections 84.01(17) and 83.026 of the Wisconsin Statutes, as deemed necessary and appropriate by such commissions and committees.
3. It is then recommended that the U. S. Department of Commerce, Bureau of Public Roads, cooperate in and endorse the above actions for the grant of federal highway improvement aids within the Region, as deemed necessary and appropriate by said Bureau.

#### 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 one mile in width. Once the jurisdictional responsibility for a facility has been assumed by the appropriate state, county, or local units of government within the context of the continuing transportation planning process, it will become necessary to refine these traffic corridor locations 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 responsibilities. Such plans must ultimately set forth proposals as to 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 tied 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 benefits possible to both the state and local units of government from the preparation and application of such definitive plans include:

1. Reservation and advance acquisition of necessary rights-of-way at undeveloped land prices.
2. More intelligent investment of both public and private capital in urban development, with full and precise knowledge of highway improvements contemplated, thus protecting both the stability of the private investment and the capacity of the proposed highway improvements and avoiding undue future disruption to urban development.
3. Development of efficient, integrated highway systems through economically staged construction.
4. Attainment of the best possible investment of public funds in highway improvements, as well as the protection of this investment from premature obsolescence. The necessary control survey and mapping system

has been thoroughly described and illustrated in SEWRPC Planning Guide No. 2, Official Mapping Guide, 1964; and such control surveys and mapping have been carried out in several communities and areas within the Region, either for municipal planning and engineering purposes, flood plain delineation, or approved state highway location studies.

Because staff and budgetary limitations preclude simultaneous action on all of the recommended major traffic corridors contained in the regional transportation plan, it is recommended 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 following specific plan implementation actions are accordingly recommended:

1. It is recommended that immediately upon assumption of jurisdictional responsibility, the State Highway Commission begin preliminary corridor refinement studies (design investigations) for all of the 291 miles of proposed freeway facilities recommended in the regional transportation plan for eventual construction outside Milwaukee County. These preliminary corridor refinement studies should serve to narrow the major traffic corridor widths indicated on the recommended plan to a band one-quarter mile or less in width. This work should be carried on in close cooperation with the Southeastern Wisconsin Regional Planning Commission, the county highway committees, and the local units of government concerned through the media of the continuing regional land use-transportation study.
2. It is then recommended that the State Highway Commission, in close cooperation with the Southeastern Wisconsin Regional Planning Commission, establish priorities for the precise mapping of the refined corridors so as to provide the base maps necessary for the precise centerline location

studies,<sup>45</sup> let the necessary mapping contracts, and complete the necessary topographic and cadastral base maps.

3. It is then recommended that the State Highway Commission, in close cooperation with the local units of government, complete the preliminary design studies necessary to determine the precise centerline locations, rights-of-way widths required, and interchange locations and lay out and place this information upon large-scale base maps for all of the recommended regional facilities outside Milwaukee County.
4. It is further recommended that, immediately upon assumption of jurisdictional responsibility, the Milwaukee County Expressway Commission, in close cooperation with the local units of government, begin preliminary corridor refinement studies for those proposed freeway facilities located in relatively undeveloped areas of Milwaukee County. These include the southerly extension of the Lake Freeway from the south end of the proposed high level bridge across the Milwaukee harbor entrance to the Racine County line, the proposed Belt Freeway from the Lake Freeway westerly to the Waukesha County line, the proposed northerly extension of the Stadium Freeway from the Bay Freeway to the Ozaukee County line, and portions of the Bay Freeway.
5. It is then recommended that the Milwaukee County Expressway Commission, in close cooperation with the State Highway and the

Regional Planning Commissions, establish priorities for the precise mapping of the refined corridors so as to provide the base maps necessary for the precise centerline location studies,<sup>46</sup> let the necessary mapping contracts, and complete the necessary topographic and cadastral base maps.

6. It is then recommended that the Milwaukee County Expressway Commission, in close cooperation with the local units of government, complete the preliminary design studies necessary to determine the precise centerline locations, rights-of-way widths required, and interchange locations and lay out and place upon the large-scale base maps this information.
7. It is recommended that, upon assumption of jurisdictional responsibility, the Milwaukee County Expressway Commission, in close cooperation with the local units of government or the metropolitan transit authority if activated, conduct the engineering studies necessary to determine the centerline location and right-of-way and parking area requirements for the proposed rapid transit line and prepare the large-scale maps of this facility necessary to reserve and acquire the necessary right-of-way.
8. It is recommended that, upon assumption of jurisdictional responsibility, the Milwaukee County Park Commission, in close cooperation with the Milwaukee County Expressway Commission and the local units of government, conduct the landscape design and engineering studies necessary to determine the centerline location and right-of-way requirements for the proposed Milwaukee River Parkway and prepare the large-scale maps necessary to reserve and acquire the necessary right-of-way for this facility.

<sup>45</sup> It should be noted that funds for a limited amount of the necessary large-scale base mapping were included in the initial regional land use-transportation study budget, as set forth in Regional Planning Program Prospectus, April 1962, and that, in accordance with this Prospectus, corridor refinement studies have been completed, contracts let, large-scale base maps completed, and centerline location studies initiated for approximately 45 miles of major freeway corridors, as shown in Appendix E. This mileage was selected on the basis of the concensus existing among the state, county, and local units of government concerned with respect to the need for, and location of, the recommended facilities and the anticipated rate of urbanization in the vicinity of these facilities. Funds for additional large-scale mapping have been provided for in the continuing regional land use-transportation study budget, as well as directly by the State Highway Commission of Wisconsin; and it is anticipated that all of the recommended freeway corridors outside Milwaukee County will have been mapped and precise centerline locations and right-of-way widths determined by 1969.

#### Right-of-Way Reservation

A considerable interval necessarily exists between the time a long-range plan for a given transportation facility is formally adopted and the time when actual construction of the facility can begin. If

<sup>46</sup> Because of the completion of base mapping operations to recommended standards by the cities of Oak Creek and Franklin, it is anticipated that additional mapping will be required only in Milwaukee County along the proposed Stadium Freeway.

maximum economies are to be effected and future disruption to urban development minimized, the conversion of open land to urban use within the necessary right-of-way lines must be avoided. This is particularly true in a rapidly urbanizing area, such as southeastern Wisconsin, where urban development, if allowed to proceed in the path of a future freeway, will not only make the eventual construction of the proposed freeway extremely costly and difficult but will also require expensive and agonizing readjustment of the urban development itself to the ultimate freeway development. Only after the detailed mapping of the rights-of-way and other lands required to accommodate the recommended freeway and rapid transit facilities have been completed can the necessary land be reserved from development by means of official mapping, building setback line ordinances, land division ordinances, and private deed restrictions. Such prior reservation of right-of-way serves as an expression of governmental intent to acquire land for highway purposes far in advance of actual facility construction and thereby not only achieves great economies in ultimate right-of-way acquisition, but also permits land adjacent to the required right-of-way to be privately purchased and developed with full knowledge of the future highway development proposals. Such action serves to greatly reduce public misunderstanding of proposed highway system improvements and should thereby assist in both avoiding and overcoming opposition to the actual construction of the recommended facilities. Such prior reservation of right-of-way also serves to assure that the lands needed for future highways will be available at the price of unimproved land, thus resulting in great economies, and serves to avoid in the future the disruption, dislocation, discontent, and great expense involved in the acquisition and clearance of developed urban areas for street and highway purposes.

The most effective and efficient means of prior reservation of right-of-way is the use of the official mapping powers granted by the State Legislature to the State Highway Commission, counties, cities, villages, and towns in Wisconsin. These powers are thoroughly discussed and illustrated in SEWRPC Planning Guide No. 2, Official Mapping Guide, 1964.

1. It is recommended that the State Highway Commission establish an "official map" for all new freeways recommended on the regional transportation plan outside

Milwaukee County, pursuant to Section 84.295(10) of the Wisconsin Statutes.

2. It is recommended that, as the functional highway plans are converted to jurisdictional highway plans by county, eventually all seven county boards adopt "official maps" for all recommended arterial street and highway plan elements within each county and that the governing bodies of the affected cities, villages, and towns approve such county "official maps" pursuant to Section 80.64 of the Wisconsin Statutes. County platting plans prepared and adopted pursuant to Section 236.46(1) of the Wisconsin Statutes may be utilized in lieu of such official maps.
3. It is then suggested that the recommended state and county official maps or platting plans be augmented by the preparation and adoption of local official maps and ordinances, which would include the state and county mapped routes by affected cities, villages, and towns, including any extrajurisdictional plat approval jurisdictional areas, in accordance with Section 62.23(6) of the Wisconsin Statutes, utilizing the SEWRPC Model Official Map Ordinance.<sup>47</sup> Such official mapping may be supplemented in certain intensely developed areas by the establishment of building setback lines, under Sections 62.23(11) of the Wisconsin Statutes, to protect portions of the recommended street and highway rights-of-way.
4. It is recommended that the planning agencies of all seven counties and the plan commissions of all cities, villages, and towns within the Region recommend to their respective governing bodies, in accordance with Section 236.45(4) of the Wisconsin Statutes, the adoption of subdivision regulations that are similar to the SEWRPC Model Land Division Ordinance,<sup>48</sup> so as to assure dedication of maximum rights-of-way for proposed streets and highways as land development proceeds, and that the respective governing bodies adopt such recommended land division ordinances or amendments thereto pursuant to Section 236.45 of the Wisconsin Statutes.

<sup>47</sup> See Appendix A, *SEWRPC Planning Guide No. 2, Official Mapping Guide*, February 1964.

<sup>48</sup> See Appendix A, *SEWRPC Planning Guide No. 1, Land Development Guide*, November 1963.

### Acquisition and Construction

The governmental powers available to acquire the rights-of-way and other lands required to develop the recommended transportation plan elements range from purchase through dedication and lease to eminent domain. The use of any one particular method to acquire the necessary rights-of-way is determined by available funds; state and local regulations; availability of leasable facilities; the attitude of donors, landowners, and land developers; and the lead time available to construct the necessary facility.

It is recommended that right-of-way acquisition and facility construction proceed as necessary to meet the staged highway and rapid transit facility completion dates recommended in the regional transportation plan and that the State Highway Commission and Milwaukee County Expressway Commission integrate the plan recommendations into their planning and programming procedures. Normal lead times required for the necessary mapping, preliminary engineering, official mapping, and implementation of legal changes in state trunk highway routes, final design, acquisition of right-of-way, preparation of construction plans and specifications and cost estimates, pre-contract administration, and actual construction for major highway facilities are indicated in Figure 1. Departures from these lead times with respect to actual right-of-way acquisition through public purchase and condemnation for any of the recommended major transportation facilities should normally be made only in hardship cases, wherein variances from the strict enforcement of official map, subdivision control, and building setback line ordinance provisions are necessitated in the interest of legality and justice.

It should be noted that, although it is recommended that the Milwaukee County Expressway Commission acquire the necessary right-of-way for and construct the recommended rapid transit line, it is recommended that the existing private transit companies within the Region operate the recommended modified rapid transit and rapid transit system. It is further recommended that the State Public Service Commission give due weight to the recommended regional transportation plan in the exercise of regulatory powers with respect to the provision of such service on an integrated area-wide basis.

### Capacity Protection

Freeway and expressway facilities require large

investments of public capital, not only for right-of-way acquisition and construction but also for the purchase of access rights from abutting property owners in order to protect these facilities from the encroachment of urban development and to control the location of access points. If this investment of public capital is to be protected and the design capacities and service levels of these high-type facilities preserved, state, county, and local units of government must act to protect the traffic capacity of these facilities through exercise of the police power.

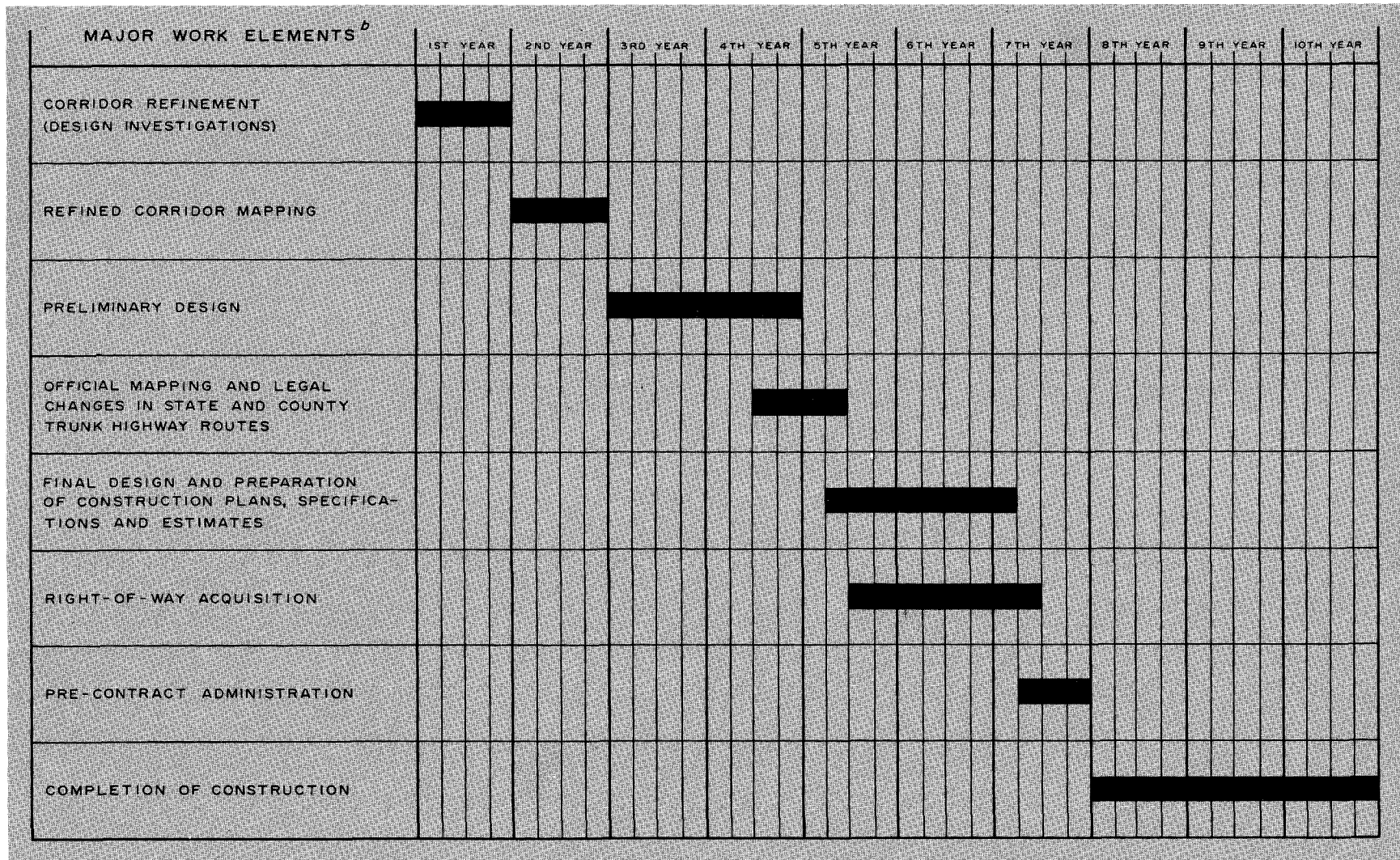
Allowing uncontrolled development of land along the intersecting arterial streets and highways in the vicinity of interchanges with freeway and expressway facilities can create traffic congestion of such a degree that even the freeway and expressway facilities themselves may be adversely affected. Each interchange on a freeway or expressway is designed in accordance with established engineering criteria to provide a given design capacity for each roadway and ramp. This design capacity is, in part, determined from assumptions concerning the land use which will reasonably occur in the areas serviced by the interchange. The uncontrolled development of substantial traffic generating uses adjacent to such interchanges which are at variance with the design assumptions may create such additional traffic load as to cause the design capacity to be exceeded and a functional breakdown to occur. Such breakdown not only adversely affects the highway facilities themselves but the adjacent land uses as well. Sound land use control in relationship to such interchanges is required to avoid such undesirable situations.

Regulation of the use of, and access to, lands that abut and adjoin freeways, expressways, and controlled access arterial streets and highways is, therefore, necessary to provide for the safe and efficient functioning of these facilities and for the sound development of land in relationship thereto. Such protection may be achieved through implementation of the following recommendations:

1. It is recommended that, after refinement of the regional transportation plan and its conversion to a jurisdictional plan, the State Highway Commission and the seven county boards act in close cooperation to designate appropriate portions of the recommended arterial street and highway plan elements as controlled access highways, pursuant to Section 84.25 and 83.027, respectively, of the Wisconsin Statutes.

Figure 1

TYPICAL LEAD TIME SCHEDULE - MAJOR HIGHWAY FACILITY PLAN IMPLEMENTATION



<sup>a</sup> This chart applies to a typical 5 - to 10 - mile construction segment and assumes that all necessary long range planning and plan adoption operations have been completed.

<sup>b</sup> The process set forth on this chart can be interrupted for extended periods of time as necessary without impairment to rational plan implementation upon completion of the following tasks: corridor refinement, official mapping, and final design.

2. It is recommended that the county zoning agencies of the five counties with county zoning ordinances formulate and recommend to their respective county boards amendments to the text of their ordinances, in accordance with Section 59.97(3) of the Wisconsin Statutes, so as to provide for traffic, parking, and access restrictions; exclusive highway service districts; sign controls; and conditional use regulations similar to the SEWRPC Model Zoning Ordinance.<sup>49</sup> It is further recommended that such county boards adopt such amendments pursuant to Section 59.97(3) of the Wisconsin Statutes and that all town boards under county zoning ordinances file certified resolutions approving such amendments, pursuant to Section 59.97(3)(g) of the Wisconsin Statutes.
3. It is recommended that towns lying in counties which subsequently adopt zoning ordinances similar to the SEWRPC Model Zoning Ordinance approve such county zoning ordinance and file a certified copy of such approval in accordance with Section 59.97(2)(d) of the Wisconsin Statutes.
4. It is also recommended that the plan commissions of all cities, villages, and towns which have not filed approval of the county zoning ordinances formulate and recommend to their respective governing bodies new zoning ordinances or amendments to their existing ordinances in accordance with Section 60.74 or 62.23(7) of the Wisconsin Statutes so as to provide for traffic, parking, and access restrictions; exclusive highway service districts; sign controls; and conditional use regulations similar to the SEWRPC Model Zoning Ordinance.<sup>50</sup> It is further recommended that their respective governing bodies adopt such ordinances or amendments, pursuant to Sections 60.74 or 62.23(7) of the Wisconsin Statutes.
5. It is recommended that the planning agencies of all seven counties and the plan commissions of all cities, villages, and towns within the Region recommend to their respective governing bodies the adoption of subdivision regulations so as to provide

street and highway design standards similar to the SEWRPC Model Land Division Ordinance<sup>51</sup> and that their respective governing bodies adopt such ordinances or amendments thereto, pursuant to Section 236.45 of the Wisconsin Statutes.

6. It is recommended that the State Highway Commission and its District Offices give careful consideration to the recommended regional transportation plan elements in reviewing subdivision plats and issuing driveway permits, pursuant to Sections 236.12 and 86.07(2) of the Wisconsin Statutes and Chapter Hy 33 of the Wisconsin Administrative Code.
7. It is recommended that the State Highway Commission and the Milwaukee County Expressway Commission acquire the fee interest in, the development rights of, or easement over those adjoining properties along the recommended freeway and expressway elements as deemed necessary to preserve the view, appearance, light, air, and usefulness of such elements, as authorized by Sections 84.09 and 59.965(5) of the Wisconsin Statutes.
8. It is recommended that the seven County Highway Committees and those cities, villages, and towns affected acquire those rights in land adjacent to the recommended arterial street and highway plan elements as deemed necessary to protect the usefulness of such elements, as authorized by Sections 61.34, 62.23, and 83.07 of the Wisconsin Statutes.

## FINANCIAL AND TECHNICAL ASSISTANCE

### Introduction

Upon adoption of the various recommended regional land use and transportation plan elements, it becomes necessary for the areawide governmental agencies concerned and the local units of government within the Region to effectively utilize all sources of financial and technical assistance available for execution of the recommended plan elements. In addition to current revenue sources, such as property taxes, fees, fines, public utility earnings, state collected taxes, and state appropriations and aids for highways, education, and

<sup>49</sup> See Appendix A, SEWRPC Planning Guide No. 3, Zoning Guide, April 1964.

<sup>50</sup> Ibid, footnote 49.

<sup>51</sup> See Appendix A, SEWRPC Planning Guide No. 1, Land Development Guide, November 1963.

welfare available for plan implementation, the areawide agencies and local units of government can also make use of other revenue sources, such as borrowing, special taxes and assessments, gifts, and certain state and federal aids and grants. Various types of technical assistance useful in plan implementation are also available from county, regional, state, and federal agencies. The type of assistance available ranges from the detailed advice on land and water management practices provided by the U. S. Department of Agriculture, Soil Conservation Service, to the educational, advisory, and review services offered by the Commission Community Assistance Division.

Because of the numerous financial and technical assistance programs available, it becomes necessary to herein identify and discuss those that may have a significant effect upon the direct implementation of the recommended regional land use and transportation plans, particularly those programs that relate to land acquisition and major facility construction. Programs that are applicable to only one unit of government or have only an indirect effect upon financial implementation of the regional plans, such as borrowing for recreation facilities, federal mortgage financing insurance, and urban renewal grants, are not discussed herein.

#### Borrowing

Areawide agencies and local units of government are usually authorized to borrow so as to effectuate their powers and discharge their duties. For example, Milwaukee County is authorized by Section 59.96(7) of the Wisconsin Statutes to issue corporate bonds in the name of the Milwaukee County Metropolitan Sewerage District for the projection, planning, and construction of sewerage works and drainage improvements; and a Metropolitan Transit Authority is specifically granted, by Section 66.94(15) of the Wisconsin Statutes, the continuing power to borrow money for the purpose of acquiring transit systems or parts thereof. The powers of cooperative contract commissions created pursuant to Section 66.30 of the Wisconsin Statutes were recently clarified<sup>52</sup> to include borrowing by the contracting bodies of such commissions for the acquisition, construction, and equipping of regional projects.

Chapter 67 of the Wisconsin Statutes generally empowers counties, cities, villages, and towns to borrow money and issue municipal obligations not

to exceed 5 percent of the equalized value of its taxable property with certain exceptions. Those borrowing powers directly related to regional land use and transportation plan implementation include:

1. Counties may bond for: the original construction and improvement of highways not to exceed 1 percent of the equalized assessed value of the taxable property in the county, county park land acquisition and development, airport acquisition and development, and parking lot acquisition and development.
2. Cities and villages may borrow and issue bonds for: construction of water supply and distribution systems, sanitary sewer systems, and sewage disposal plants; park land acquisition and development; laying out, opening, widening, and improving streets; airport acquisition and development; parking lot acquisition and development; and industrial site acquisition and development.
3. Towns may issue bonds for: acquiring river fronts, lakeshores, woodlots, and scenic and historic sites; airport acquisition and development; and laying out, opening, widening, and improving streets.

Section 67.13 of the Wisconsin Statutes specifically authorizes counties to issue nontaxable, semi-annual interest payment coupon bonds for the purpose of improving any portions of the county aid highway system or of the state trunk highway system; and Section 60.307 of the Wisconsin Statutes specifically authorizes town sanitary districts to borrow money and issue bonds for the construction or extension of storm water, sanitary sewer, and water supply systems. In addition, Section 67.156 of the Wisconsin Statutes authorizes counties to issue negotiable interest payment coupon bonds not to exceed the face value of all tax certificates owned by it for the purpose of paying its current and ordinary expenses and paying off the following temporary and emergency loans. Chapter 60 of the Wisconsin Statutes empowers town sanitary districts to borrow money for construction of sewers and waste treatment facilities.

Temporary and Emergency Loans: Section 67.12 of the Wisconsin Statutes authorizes counties, cities, villages, and towns to obtain temporary and emergency loans by issuance of promissory notes or

<sup>52</sup> Chapter 238, Laws of Wisconsin 1965.

orders on its treasurer. Advance borrowing in anticipation of the payment of ordered or levied taxes, borrowing on tax sale certificates, and borrowing against its assets in a closed bank are also authorized. Section 67.125 of the Wisconsin Statutes further authorizes cities, villages, and towns to borrow in an amount not to exceed that portion of the uncollected, delinquent taxes which are to be returned to such municipalities.

Federal Loans: Federal advances and loan programs are available for public works planning and construction and for resource conservation. A brief description of those federal programs which may be of greatest significance to regional plan implementation follows:

1. Interest free advances for public works planning are available to local units of government from the U. S. Department of Housing and Urban Development to assist in planning essential public works and community facilities. These advances are to be repaid when construction begins.
2. Long-term construction loans are available to local units of government under 50,000 population and their agencies from the U. S. Department of Housing and Urban Development for needed public facilities for which financing is not available elsewhere on reasonable terms.
3. Resource conservation and development loans are available to local units of government and soil and water conservation districts from the U. S. Department of Agriculture, Soil Conservation Service, for planning and carrying out a balanced program of resource conservation, development, and utilization.
4. Low-interest forestry loans are available to farmers and farm associations from the U. S. Department of Agriculture, Farmers Home Administration, for reforestation and the establishment of forestry practices and programs.
5. Recreation loans are available to farmers from the U. S. Department of Agriculture, Agricultural Stabilization and Conservation Service, for purchasing and developing land and water recreation resources and facilities, including private camping grounds,

swimming areas, tennis courts, cottages, lakes, docks, nature trails, and shooting preserves.

6. Rural water and sewer loans are available to rural units of government under 5,500 population, which are unable to obtain credit elsewhere at reasonable terms, from the U. S. Department of Agriculture, Farmers Home Administration, for developing domestic water supply and waste collection and disposal systems.
7. Low-interest mass transportation loans are available to local units of government in urban areas from the U. S. Department of Housing and Urban Development for the entire cost of necessary capital improvements and for periods up to 40 years when financing is not available elsewhere on reasonable terms.
8. Rural housing loans are available to residents in rural areas with less than 5,500 population from the U. S. Department of Agriculture, Farmers Home Administration, for the construction, improvement, and repair of rural houses and related facilities.

Counties and cities have special assessment powers for park and parkway acquisition and improvements under Section 27.065 and 27.10(4), respectively, of the Wisconsin Statutes. Metropolitan sewerage districts, cities, and villages also have taxing and special assessment powers for sanitary sewer construction and sewage transmission and disposal under Sections 59.96(9) and 62.18(16), respectively, of the Wisconsin Statutes. Counties have certain limited assessment powers for the construction, improvement, or repair of any highway or bridge in the county under Section 83.03 of the Wisconsin Statutes. Although soil and water conservation districts have no taxing, bonding, or assessment powers, such districts may recover the costs and expenses, with interest, of performing work or operations if authorized by the court under Section 92.11 of the Wisconsin Statutes.

#### Gifts

Donations of lands, interests in lands, or monies from private individuals and corporations should not be overlooked as of possible assistance in regional plan implementation, particularly with respect to park acquisition and environmental



corridor preservation. The potential contributions, both in leadership and funds from private groups, should not be underestimated.<sup>53</sup> Such gifts either in lands, interests in lands, or monies may, moreover, be used toward the local contribution in obtaining various state and federal grants.

#### Planning and Code Enforcement Grants

Several state and federal planning grant programs are available to local units of government for the financing of local planning programs which can serve to assist in the necessary refinement and detailing of the regional plan at the local level and in this manner contribute substantially towards regional plan implementation. In addition, there are state and federal grants available for the financing of code enforcement related to good community development and plan implementation.

Federal Urban Planning Assistance Program: This program, administered by the U. S. Department of Housing and Urban Development through state and regional planning agencies, provides grants to areawide planning agencies, urban area counties, and other local units of government having less than 50,000 population in amounts up to two-thirds of the total cost of preparing comprehensive community development plans, including preparation of maps, planning inventories, plans, and plan implementation devices.

Federal Code Enforcement Program: This program, administered by the U. S. Department of Housing and Urban Development, provides grants in amounts up to two-thirds of the cost to local units of government having 50,000 or more population and in amounts up to three-fourths of the cost to those local units of government having under 50,000 population for planning and administering concentrated code enforcement programs in selected local areas and for restoring properties and environs to decent and standard conditions so as to arrest further deterioration.

Federal City Demonstration Program: This program, administered by the U. S. Department of Housing and Urban Development, provides grants in amounts up to 80 percent of the cost of admin-

istering approved comprehensive city demonstration programs not assisted under other federal grant programs to certain selected communities. The specific amount of such grants shall take into account the economic and social pressures in the neighborhoods involved, such as population density, poverty level, unemployment, public welfare participation, education, health, crime, and sub-standard housing.

State Water Quality Regulation Enforcement Program: This program, administered by the State Department of Resource Development, provides annual grants to counties in amounts up to \$1,000 in partial support of the cost of administering and enforcing county water protection or shoreland use regulations.

#### Soil and Water Conservation Grants

There are several programs available for conservation and protection of the agricultural lands and environmental corridors recommended in the regional plans for preservation. These programs include:

State Soil and Water Conservation Program: This program, administered by the State Soil and Water Conservation Committee, provides grants in amounts up to 50 percent but not to exceed \$1,000 toward the cost of approved district soil and water conservation projects.<sup>54</sup>

Federal Agricultural Conservation Program: This program, administered by the U. S. Department of Agriculture, Agricultural Stabilization and Conservation Service, provides grants in amounts up to 50 percent of the total project cost to farmers for carrying out approved soil, water, woodland, and wildlife conservation practices.

Federal Resource Conservation and Development Program: This program, administered by the U. S. Department of Agriculture, provides cost sharing up to 100 percent for flood control works and up to 50 percent for construction of water conservation works and improved land use measures.

<sup>53</sup> An excellent example of the potential contribution of private groups to the preservation of the primary environmental corridors within the Region exists in successful efforts of the Wisconsin Chapter of "The Nature Conservancy" group to acquire the Cedarburg Bog in Ozaukee County and donate it to the University of Wisconsin-Milwaukee.

<sup>54</sup> Washington County has received such a grant for the preparation of large-scale suitability maps based upon the regional soil survey for each town within the county. These maps are intended to assist local officials in making decisions concerning local development.

Federal Cropland Adjustment Program: This program, also administered by the U. S. Department of Agriculture, Agricultural Stabilization and Conservation Service, provides grants in amounts up to 50 percent of the cost, based upon the value of the crops which would be produced, to farmers to divert cropland to protective conservation uses for five- to ten-year periods. This program also provides cost sharing up to 50 percent toward the cost of carrying out good conservation practices, such as establishment of vegetative cover, forest cover, good wildlife habitat, and preservation of natural beauty.

Federal Multiple-Purpose Watershed Program: This program, administered by the U. S. Department of Agriculture, Soil Conservation Service, through the State Soil and Water Conservation Committee, provides cost sharing of up to 100 percent to qualified sponsors, such as soil and water conservation, flood control, drainage, or irrigation districts, for flood prevention works and up to 50 percent towards water management, public recreation, fish and wildlife development, acquisition of certain recreational land rights and agricultural land planning and treatment.

#### Park Land Grants

Certain federal grant programs are available to state and local units of government, and some state grant programs are available to local units of government for the financing of park land acquisition and development. In general, the local units of government and agencies in the Region are eligible for these grants; however, the eligibility of individual projects is based upon certain planning and other prerequisites and must be determined for each specific project. The following is a brief description of these programs:

State Outdoor Recreation Aid Program (ORAP): This program, administered by the State Department of Resource Development, provides grants to metropolitan counties and cities in amounts up to 50 percent of the cost of acquiring recreational lands and rights-in-land to be used for urban area park systems.

Federal Open-Space Program: This program, administered by the U. S. Department of Housing and Urban Development, provides grants to the state and local units of government in amounts up to 50 percent of the cost of acquisition and develop-

ment of land for parks and open spaces, provided that an areawide intergovernmental open-space acquisition agreement is in effect.<sup>55</sup>

Federal Land and Water Conservation Fund: This program, administered by the U. S. Department of the Interior, Bureau of Outdoor Recreation, through the State Conservation Commission, provides grants to state and local units of government in amounts up to 50 percent of the cost of acquisition and improvement of outdoor recreation areas.

Federal Cropland Adjustment Program (Green-span): This program, administered by the U. S. Department of Agriculture, Agricultural Stabilization and Conservation Service, provides grants to local units of government in amounts up to 50 percent of the cost of acquisition and conversion of cropland to park and recreation purposes.

Federal Urban Beautification Program: This program, administered by the U. S. Department of Housing and Urban Development, provides grants to local units of government in amounts up to 50 percent of the cost of improving and beautifying publicly owned or controlled land.

#### Water and Sewer System Grants

Several state and federal grant programs are available to local units of government for the financing of water systems, sewer facilities, storm water drainage systems, and sewage treatment facilities. A brief description of these programs follows:

State Water Resource Program: This program, administered by the State Department of Resource Development, provides financial assistance in amounts up to one-third of the total combined financing and net interest cost of approved pollution prevention and abatement projects.

Basic Water and Sewer Facilities Program: This program, administered by the U. S. Department of Housing and Urban Development provides grants up to 50 percent to local units of government, including sewer and water districts, toward the cost of water supply, treatment, storage, and transmission systems; sanitary sewer collection

<sup>55</sup> The Southeastern Wisconsin Regional Planning Commission prepared an "Open-Space Land Acquisition Agreement" in 1964. This Agreement was subsequently executed by all seven counties within the Region; the State Conservation Commission; the University of Wisconsin; and the cities of Milwaukee, Racine, Port Washington, Brookfield, New Berlin, and Mequon and the Village of Germantown, thereby making all of these units or agencies of government eligible for grants under this program.

and transmission systems; and storm water collection and transmission systems.

Federal Water Pollution Control Program: This program, administered by the U. S. Department of the Interior, Federal Water Pollution Control Administration, provides grants up to 33 percent to local units of government toward the cost of construction of necessary sewage treatment works, including intercepting sewers that prevent the discharge of untreated or inadequately treated sewage into any waters.

Federal Farmers Home Administration Program: Various programs administered by the U. S. Department of Agriculture, Farmers Home Administration, provide grants to rural units of government up to 5,500 population which are unable to obtain credit at reasonable terms toward the cost of developing domestic water supply and waste collection and disposal systems.

#### Transportation Grants

Several federal grant programs are available to local units of government for the financing of advance acquisition of lands, the planning and construction of certain arterial streets and highways, and the development of urban mass transportation systems. A brief description of these programs follows:

Federal Advance Acquisition of Land Program: This program, administered by the U. S. Department of Housing and Urban Development, provides grants to local units of government for the aggregate amount of reasonable interest charges on funds borrowed to finance the acquisition of land or interest in land for a period of up to five years for future construction of public works and facilities, including streets and highways.

Federal Aid Highway Program: This program, administered by the U. S. Department of Commerce, Bureau of Public Roads, provides financial assistance to the State Highway Commission and through that Commission to local units of government in amounts up to 50 percent on federal aid primary and secondary routes and up to 90 percent on federal aid interstate routes toward the cost of planning, engineering, right-of-way acquisition, construction, safety enhancement, and beautification of those streets and highways.

Urban Mass Transportation Program: This program, administered by the U. S. Department of

Housing and Urban Development, provides grants to local units of government in urban areas in amounts up to two-thirds of the cost of acquisition, construction, and improvement of mass transportation facilities and equipment that cannot reasonably be financed from transit system revenues. This program also provides grants up to two-thirds for demonstration projects primarily and permits the leasing and operation of facilities and equipment by private companies.

#### Technical Assistance

Certain federal, state, regional, and county agencies provide various levels and types of technical assistance useful in regional plan implementation to local units of government upon request. Limited guidance and assistance is usually provided without cost, or such assistance may be provided for a nominal fee. In some cases, the local unit of government may contract with the agency for more extensive technical assistance services. A summary of the various levels and types of assistance available by agency follows:

Federal Agencies: The U. S. Department of Agriculture, Soil Conservation Service, provides technical assistance to local units of government and soil and water conservation districts for resource conservation, development, and utilization programs. The Soil Conservation Service also provides technical assistance to local units of government in the adaptation of the operational soil survey and analysis to urban planning and development problems under a "Memorandum of Understanding" with the SEWRPC.

The U. S. Department of Agriculture, Farmers Home Administration, provides technical and management assistance to farmers and farm associations for forestry programs, soil improvement, fish production, and recreational enterprise.

The U. S. Department of the Interior, Bureau of Outdoor Recreation, provides limited technical assistance and advice to local units of government and private interests in recreational resource planning and programming.

State Agencies: The University of Wisconsin Cooperative Extension Services through the County Agents and extension specialists provide important educational and technical assistance to farmers and to local units of government in public affairs, soil and water conservation, and outdoor recreation. An example of such University assistance

having a direct relationship to regional plan implementation is the educational services on the use and adaptation of the operational soil survey and analysis being provided under the previously cited "Memorandum of Understanding" between the University and the Commission. Since the work of the Commission is entirely advisory, the importance of organized educational efforts directed at achieving public understanding and acceptance of the regional plans cannot be over-estimated. The University Cooperative Extension Services can, in this respect, fulfill an indirect, yet most important plan implementation function.

The State Aeronautics Commission provides limited assistance to local units of government in airport site selection, airport design and construction, and airport zoning.

The Wisconsin Conservation Commission provides advice on water problems; fish management; forest planting, protection, management, and harvesting and will contract with regional planning commissions and counties to prepare outdoor recreation plans which would establish county eligibility under the Federal Land and Water Conservation Program.

The State Department of Resource Development provides plan review services and supervision of the operation of public water supply and sewage treatment facilities and is authorized to provide technical assistance to local units of government and private groups in their efforts to initiate or engage in specific types of development, such as urban renewal, parks, recreation, resource development, water supply, sewage disposal, and promotion of economic activity. The Department was recently authorized to extend assistance to local units of government for the purpose of securing uniformity of water resource protection regulations.

The State Soil and Water Conservation Committee is authorized to provide assistance to landowners and the county soil and water conservation districts in carrying out soil and water conservation practices.

The State Highway Commission through its District Offices provides technical assistance to local units of government in subdivision layout, major site development, land use regulations, and access controls in relation to street and highway design and protection. In addition, the State Highway

Commission is empowered to advise local units of government on highway construction and maintenance and provide necessary engineering and supervision work on highway improvements at cost to such local unit.

Areawide Agencies: The SEWRPC through its Community Assistance Division provides limited educational, advisory, and review services to the local units of government, including participation in educational programs, such as workshops; provision of speakers; sponsoring of regional planning conferences; publication of bimonthly newsletters; selection of staff and consultants; preparation of planning programs; special base and soil mapping; preparation of suggested zoning, official mapping, and land division ordinances; information on federal and state aid programs; and the review of local planning programs, plan proposals, ordinances, and certain state and federal grant applications. In addition, the SEWRPC is empowered to contract with local units of government under Section 66.30 of the Wisconsin Statutes to make studies and offer advice on economic development, land use, transportation, community facilities, and other public improvements.

The Milwaukee Metropolitan Sewerage District through the Sewerage Commission of the City of Milwaukee provides technical assistance to local units of government within the District and contract areas on storm water drainage and sanitary sewer design, construction, and maintenance.

County Agencies: The County Soil and Water Conservation Districts are authorized to cooperate in furnishing technical assistance to landowners or occupiers and any public or private agency in preventing soil erosion, floodwater and sedimentation damage, and for furthering the water conservation and development.

Those counties with park or planning staffs provide certain technical services to local units of government and private groups related to park design and general community planning and development problems.

## SUMMARY

This chapter has described the various means available and has recommended specific procedures for implementation of the recommended regional land use and transportation plans. The most important recommended plan implementation

actions are summarized in the following paragraphs by level of government, responsible agency or unit of government, and by plan element.

#### State Level

State Highway Commission of Wisconsin (Transportation Plan): It is recommended that the State Highway Commission of Wisconsin:

1. Endorse and integrate the recommended regional transportation plan into the state long-range highway system plan as a functional guide to highway system development within the Region.
2. Assume jurisdictional responsibility over all proposed freeway facilities shown on the recommended regional transportation plan outside Milwaukee County; and as more detailed jurisdictional highway plans are completed by county under the continuing regional transportation planning process, assume jurisdictional responsibility over certain standard arterial street and highway facilities as appropriate.
3. Seek adjustment of the state trunk, county trunk, and federal aid systems to the proposed freeway facilities shown on the recommended regional transportation plan and to the standard arterial street and highway facility proposals to be shown on the jurisdictional plans as these are completed.
4. Commence preliminary corridor refinement studies for all proposed freeway facilities outside Milwaukee County; establish priorities for, and prepare large-scale topographic maps of, these refined corridors; and determine and delineate on these large-scale maps the precise location of, and right-of-way widths required for, these proposed freeways.
5. Establish official maps for all proposed freeway facilities outside Milwaukee County and designate appropriate portions of the recommended arterial street and highway network as controlled access highways.
6. Proceed with right-of-way acquisition and facility construction as necessary to meet the staged facility completion dates recommended in the regional transportation plan and acquire those lands necessary to pre-

serve the view, appearance, and usefulness of the recommended freeway facilities.

7. Give careful consideration to the recommended regional transportation plan in reviewing subdivision plats and issuing driveway access permits.

State Department of Resource Development (Land Use Plan): It is recommended that the State Department of Resource Development:

1. Endorse and integrate the recommended regional land use plan into the state long-range comprehensive development plan, including the water resource and shoreland zoning elements of that plan, and consider and give due weight to the recommended regional environmental corridors in the exercise of the Department's various water regulatory powers.
2. Adapt the regional soil survey and analysis as a guide in regulating the installation of soil absorption sewage disposal systems within the Region and in reviewing subdivision plats, and prohibit the installation of soil absorption sewage disposal systems on soils within the Region that have very severe and severe limitations for such systems as determined by the detailed operational soil surveys.
3. Object to subdivision plats lying within certain areas of the recommended environmental corridors, including the delineated floodways and flood plains of all perennial streams and watercourses.
4. Give due weight to the recommended regional land use plan in reviewing proposed annexations, incorporations, and consolidations.
5. Assign the highest appropriate priorities to all Outdoor Recreation Aid Program applications for lands located within the recommended regional environmental corridors and within the most highly urbanized areas of the Region.
6. Approve only such applications for state and federal aids in partial support of the construction and improvement of municipal pollution prevention and abatement facilities as are located and designed in general

accordance with the recommended regional land use plan.

Wisconsin Conservation Commission (Land Use Plan): It is recommended that the Wisconsin Conservation Commission:

1. Endorse and integrate the environmental corridors shown on the recommended regional land use plan into the state long-range conservation and comprehensive outdoor recreation plan as a guide to park and related open-space development and to resource conservation and management practices within the Region, and designate appropriate areas within the corridors as necessary to protect, develop, and regulate the natural resource base.
2. Acquire the proposed major recreational sites shown on the recommended regional land use plan, together with such other resource areas within the environmental corridors as appropriate.
3. Assign the highest appropriate priorities to all Land and Water Conservation Fund applications for lands located within the environmental corridors and within the most highly urbanized areas of the Region.

State Recreation Advisory Committee (Land Use Plan): It is recommended that the State Recreation Advisory Committee:

1. Endorse and integrate the environmental corridors shown on the recommended regional land use plan into the long-range plan for the utilization of the state recreational assets.
2. Recommend to the State Legislature that authority be granted to expend funds for acquisition of areas and easements within the environmental corridors shown on the recommended regional land use plan.

State Soil and Water Conservation Committee (Land Use Plan): It is recommended that the State Soil and Water Conservation Committee:

1. Endorse the recommended regional land use plan, particularly the recommended regional agricultural land use areas and environmental corridors, as a guide in the

coordination of county soil and water conservation district projects.

2. Apportion appropriate state and federal funds to the County Soil and Water Conservation Districts within the Region to enable them to implement conservation programs which serve to implement the recommended regional land use plan.

State Board of Health (Land Use Plan): It is recommended that the State Board of Health:

1. Endorse the recommended regional land use plan, with particular regard for the rational urban service areas implied by the plan, in the exercise of their subdivision review and approval powers.
2. Adapt the regional soil survey and analysis as a guide in reviewing subdivision plats; revise the State Administrative Code relating to sewage disposal systems so as to prohibit the installation of soil absorption sewage disposal systems on soils that have very severe and severe limitations for such systems and so as to prohibit the subdivision of land covered by soils that have very severe and severe limitations for residential development as determined by detailed operational soil surveys.
3. Object to, or deny approval of, subdivision plats lying within the environmental corridors shown on the recommended regional land use plan where adequate sewage disposal systems cannot be provided.

Wisconsin Public Service Commission (Transportation Plan): It is recommended that the Wisconsin Public Service Commission:

1. Give due weight to the recommended regional transportation plan in the exercise of its various transportation regulatory powers.

Local Level  
County Board of Supervisors (Land Use and Transportation Plans): It is recommended that the County Boards of the seven constituent counties comprising the Region upon the recommendation of the county planning agencies and county highway committees:

1. Adopt the recommended regional land use and transportation plans as these plans affect each respective county.
2. Create a County Park and Planning Commission.<sup>56</sup>
3. Amend existing or adopt new county zoning ordinances so as to provide land use regulations similar to those contained in the SEWRPC Model Zoning Ordinance; adopt changes to the zoning district maps, as appropriate, to reflect the recommended regional land use plan;<sup>57</sup> and adopt soil and water conservation regulations.<sup>58</sup>
4. Adopt sanitary ordinances related to the regional soil survey and analysis so as to regulate the installation of private water and sewage disposal systems.<sup>59</sup>
5. Amend existing or adopt new county subdivision control ordinances so as to provide regulations similar to those contained in the SEWRPC Model Land Division Ordinance.
6. Request by resolution the Wisconsin Conservation Commission to acquire the proposed major recreation sites shown on the recommended regional land use plan and other related resource areas lying in the environmental corridors as shown on the recommended land use plan, and continue or commence active county park and related open-space acquisition and development programs so as to result in the preservation of the primary environmental corridors shown on the recommended regional land use plan.
7. Adopt official maps incorporating all proposed freeways shown on the recommended regional transportation plan within each respective county; and as more detailed jurisdictional highway plans are completed by county under the continuing land use transportation planning process, amend the official maps to show all arterial street

and highway plan elements and designate appropriate portions of the recommended arterial street and highway plan elements as controlled access highways.

8. Integrate the environmental corridors shown on the recommended regional land use plan, including the major recreational sites, into the county park plan and adopt such county park plan.
9. Refine, adopt, and integrate the recommended regional transportation plan into the county highway system.
10. Prepare, in cooperation with the State Highway Commission, the Regional Planning Commission, and the local units of government under the continuing regional land use transportation study, a jurisdictional highway plan for each respective county, and pursuant to that plan assume jurisdictional responsibility over portions of the standard arterial street and highway system and seek adjustment of the county highway and federal aid systems to the jurisdictional plan.

Milwaukee County Expressway Commission (Transportation Plan): It is recommended that the Milwaukee County Expressway Commission:

1. Adopt and integrate the proposed freeway, parkway, and rapid and modified rapid transit facilities shown on the recommended regional transportation plan into the county expressway plan.
2. Assume jurisdictional responsibility over all freeway facilities shown on the recommended regional transportation plan within Milwaukee County and over the fixed facility elements of the proposed modified rapid transit and rapid transit systems shown on the recommended regional transportation plan.
3. Commence preliminary corridor refinement studies for all proposed freeway facilities within Milwaukee County; establish priorities for, and prepare large-scale topographic maps of, these refined corridors; and determine and delineate on these large-scale maps the precise loca-

<sup>56</sup> *Waukesha and Washington counties have created such commissions.*

<sup>57</sup> *Not applicable to Ozaukee and Milwaukee counties.*

<sup>58</sup> *Not applicable to Milwaukee County.*

<sup>59</sup> *Not applicable to Milwaukee County. Of the other six counties, Walworth County has already adopted such an ordinance.*

tion of, and right-of-way widths required for, these proposed freeways.

4. Seek adjustment of the federal aid systems to the proposed freeway facilities shown on the recommended regional transportation plans.
5. Conduct the necessary engineering studies and map the areas and locations of the recommended fixed facility elements of the proposed modified rapid transit and rapid transit systems shown on the recommended regional transportation plan.<sup>60</sup>
6. Proceed with facility acquisition and construction as necessary to meet the recommended staged facility completion dates and acquire those lands necessary to preserve the view, appearance, light, air, and usefulness of the proposed freeway, modified rapid transit, and rapid transit facilities.

County Soil and Water Conservation Districts (Land Use Plan): It is recommended that the seven Soil and Water Conservation Districts within the Region:

1. Adopt the recommended regional land use plan as it affects each respective district and request those state and federal agencies assisting such district to provide only such assistance as would serve to implement the recommended regional land use plans.
2. Formulate soil and water conservation regulations necessary to assist in implementation of the recommended regional land use plan.

Common Councils, Village Boards, and Town Boards (Land Use and Transportation Plans): It is recommended that upon referral to, and recommendation of, the local plan commissions each common council, village board, and town board within the Region:

1. Adopt the recommended regional plans as a guide to the physical development of the community as the regional plans affect each community.

<sup>60</sup> It is recommended that existing private transit companies operate the recommended transit systems.

2. Amend existing or adopt new local zoning ordinances so as to provide land use regulations similar to those contained in the SEWRPC Model Zoning Ordinance and adopt changes to the zoning district maps, as appropriate, to reflect the recommended regional land use plan or file certified resolutions approving amendments and changes to the county zoning ordinances.
3. Amend existing or adopt new local subdivision control ordinances so as to provide regulations similar to those contained in the SEWRPC Model Land Division Ordinance.
4. Adopt official maps incorporating the proposed major regional recreational sites, selected park and drainageway areas, and proposed transportation facilities shown on the regional plans.
5. Acquire lands lying within the primary environmental corridors that are appropriate for development as community parks.
6. Consider and give due weight to the rational urban service areas implied by the recommended regional land use plan in all deliberations concerning annexations, consolidations, and incorporations.
7. Approve county official maps adopted pursuant to the recommendations contained herein.

Municipal Water and Sanitary Districts (Land Use Plan): It is recommended that all municipal water and sanitary districts within the Region:

1. Acknowledge the recommended regional land use plan, thereafter determine proposed utility service areas in accordance with the plan, and adopt and adhere to utility extension and service policies that are consistent with the rational urban service areas implied by the plan.
2. Design and install public water supply and sewerage systems so as to preclude service by such systems to proposed development located in flood plains, on soils having very severe or severe limitations for urban development, or within the recommended regional environmental corridors and agricultural areas.



### Areawide Level

Metropolitan Sewerage Commission (Land Use Plan): It is recommended that the Metropolitan Sewerage Commission of the County of Milwaukee:

1. Acknowledge the recommended regional land use plan, thereafter determine proposed sewer service areas in accordance with the plan, and adopt and adhere to utility extension and service policies that are consistent with the rational urban service areas implied by the plan.

### Federal Level

U. S. Department of Housing and Urban Development (Land Use and Transportation Plans): It is recommended that the U. S. Department of Housing and Urban Development:

1. Acknowledge the recommended regional land use and transportation plans and use these plans as guides in the administration and granting of federal aids for urban planning, urban beautification, open-space acquisition, park development, mass transit, city demonstration projects, and sewer and water facilities and in the administration and granting of federal home mortgage financing insurance.
2. Assign the highest appropriate priorities to all applications for urban beautification, open-space acquisition, and park development grants that are in partial support for the acquisition and improvement of sites located within the primary environmental corridors shown on the recommended regional land use plans and within the most highly urbanized areas of the Region.
3. Approve only those applications for city demonstration programs that are properly related to, and sewer and water facility grants that are located and designed in accordance with, the recommended regional land use plan and provide federal mortgage financing insurance only to those applicants whose homes or developments lie within the appropriate residential density areas shown on the recommended regional land use plan.

U. S. Bureau of Public Roads (Transportation Plan): It is recommended that the U. S. Department of Transportation, Bureau of Public Roads:

1. Acknowledge the recommended regional transportation plan and utilize the plan as a guide in the administration and granting of federal aids for highway system development within the Region.
2. Cooperate in, and endorse the adjustment of, federal aid systems to the recommended regional transportation plan and to all jurisdictional plans prepared pursuant to recommendations contained herein.

U. S. Federal Water Pollution Control Administration (Land Use Plan): It is recommended that the U. S. Department of the Interior, Water Pollution Control Administration:

1. Acknowledge the recommended regional land use plan and utilize the plan as a guide in the administration and granting of federal aids for the construction of sewage treatment plants and related facilities within the Region.
2. Approve only those grant applications for the construction of sewage treatment plants and related facilities that are located and designed in accordance with the rational urban service areas implied by the recommended regional land use plan.

U. S. Soil Conservation Service (Land Use Plan): It is recommended that the U. S. Department of Agriculture, Soil Conservation Service:

1. Acknowledge the recommended regional land use plan and utilize the plan as a guide in the administration and granting of federal aids for resource conservation and development and for construction of multiple-purpose watershed projects within the Region and in the provision of technical assistance for land and water conservation.

### General Considerations

Several particularly significant aspects of regional plan implementation previously discussed in this chapter warrant restatement here in summary form. First, it should be reiterated that the recommended regional land use and transportation plans, as presented in this report, are intended

to comprise flexible guides to the sound physical development of the Region and, as such, are advisory to the local, state, and federal units and agencies of government and to private developers as these public and private bodies consider land use and transportation facility development matters within the Region. The regional plans are not to be considered as an inflexible mold to which all future development within the Region must precisely conform. Rather, the regional plans are to be regarded as a point of departure against which land use and transportation system development proposals can be evaluated as they arise and, in the light of which, better development decisions can be made by all concerned. The regional plans are intended to be used as a framework around which both comprehensive community development plans and single-purpose facility system development plans are developed in a coordinated manner and, as such, are subject not only to continual reinterpretation but also to refinement and detailing.

Second, the adoption or endorsement of the recommended regional land use and transportation plans as guides to the sound development of the Region by the local units of government and by the various state and federal agencies concerned is highly desirable, and in some cases essential, in order to secure a common understanding of areawide development objectives and to permit the necessary plan implementation work to be cooperatively programmed and jointly executed.

Third, plan implementation action policies and programs must not only be preceded by plan adoption or endorsement but must also emphasize the most important and essential elements of the plan and those areas of action which will have the greatest impact on guiding and shaping development in accordance with the recommended plan. Two major criteria should be used to determine which plan elements are truly regional in character or influence and are, therefore, essential to the attainment of regional development objectives: 1) the importance of the plan elements to the wise and judicious use of the underlying and sustaining natural resource base; and 2) the importance of the plan elements to the functional relationships existing between land use and the demand for major utility, recreation, and transportation facilities. In light of these criteria, the regional development objectives and plans can be substantially met if the Commission and its constituent local units of government and affected state and federal agencies can significantly influence the spatial location and

size of only four aspects of regional development: the major transportation routes, particularly the freeway, modified rapid transit and rapid transit facilities; the major park and open-space reservations, including the major drainageways; the public sanitary sewerage facility service areas; and the public water supply facility service areas.

Fourth, the importance of close coordination and cooperation between the local units of government and between these units of government and the various state and federal agencies to plan implementation cannot be overemphasized. Responsibilities for achieving such coordination and cooperation on a voluntary basis within the traditional framework of government in Wisconsin have been assigned to the Commission by the State Legislature, and the Commission has begun to be utilized by both local municipalities and by certain state and federal agencies for the attainment of the necessary coordination and cooperation. Even more intensive utilization of the Commission as a center for the attainment of close coordination of the many planning and plan implementation activities which are carried on within the seven-county Region must be made in the future if the regional plans are to be implemented and a more efficient, economical, attractive, and healthful environment achieved within the Region. Advisory review of the location and size of major public works facilities by the Commission is essential for the effective development of transportation, utility, and community facilities within the Region, which not only comprise efficient systems as such but which properly serve and promote the desired regional land use pattern; for abatement of costly duplication of effort and unnecessary expenditure of public funds; and for the preservation and protection of the underlying and sustaining natural resource base. Such review by the Commission may be obtained by contract, by request, or may be required by state and federal legislation.

Fifth, implementation of the regional plans will not be brought about by massive action of some one unit or agency of government. Rather, implementation of the regional plans will be brought about through literally thousands of development decisions made on a day-to-day basis over a period of many years by many private investors and by many public administrators operating at the local, areawide, state, and federal levels of government. It is extremely important that the individuals, corporations, or agencies making these decisions be aware of and understand the development pro-

posals set forth in the recommended regional land use and transportation plans so that these plans will receive proper consideration in the development decisions.

Finally, regional plan implementation can be achieved only within the context of a continuing, comprehensive, areawide planning effort, through which the planning inventories and forecasts, on which the regional plans are based, are updated, monitored, and revised; the plans themselves are reappraised and, if necessary, revised to accommodate changing conditions; and through which the plans are interpreted on a day-to-day basis to local, state, and federal units and agencies of government and to private investors and developers as the need to make development decisions arises. In this respect, it should be stressed that planning does not and cannot concern itself with future decisions; that is, with "things that should be done in the future." Rather, it must be recognized that

decisions exist only in the present and that planning is necessary just because decisions can only be made in the present, yet cannot be made for the present alone. The question, therefore, that faces public officials, private investors, and interested citizen groups within the Region concerning implementation of the recommended regional land use and transportation plans is not what should be done tomorrow to bring about the plans but, rather, what must be done today in light of the plans to get ready for an uncertain tomorrow. In a highly complex and dynamic urbanizing region, such as southeastern Wisconsin, one key decision or the lack of such a decision may commit the Region as a whole and its many constituent units and agencies of government to a given course of action, sometimes irrevocably. This is particularly true in the field of public works development where a decision to build one important link in a system may commit the entire system for a generation or more to come.

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## Chapter VIII

# SUMMARY AND CONCLUSIONS

### INTRODUCTION

This report is the third in a series of three volumes which together present the major findings and recommendations of the SEWRPC Regional Land Use-Transportation Study. The first volume, published in May 1965, set forth the basic principles and concepts underlying the study and presented in summary form the basic facts pertinent to long-range land use and transportation planning in southeastern Wisconsin.

The second volume, published in June 1966, presented regional development objectives, principles, and standards; provided forecasts of future growth and change in the Region; presented three alternative regional land use-transportation plans designed to meet the anticipated growth and change; and evaluated these plans on the basis of their ability to meet the stated regional development objectives and standards. The second volume was intended to provide the basis for the selection of a final regional land use-transportation plan from among the alternative development plans proposed.

This, the third and final volume of the series, presents the regional land use and transportation plans finally selected and recommended for implementation. As such, it presents definitive plans and very concrete recommendations for both land use and transportation system development within the Region. This volume also recommends a proposed staging for the implementation of the recommended land use and transportation system plans and contains specific recommendations with respect to the means by which the plans can be implemented through the cooperative action of existing federal, state, and local agencies of government and through private action. In addition, this volume presents a description of an alternative regional development possibility, that of continued existing trend land use development within the Region in the absence of any attempt to guide such development on an area-wide basis in the public interest. In the presentation, this alternative was compared with the regional development pattern proposed in the rec-

ommended land use plan; and the workability of the recommended regional transportation plan under unplanned land use development was carefully investigated. Finally, the probable effects of two alternative areawide development policies on the spatial distribution of urban land use within the Region were investigated with the aid of a mathematical land use simulation model.

### THE RECOMMENDED LAND USE PLAN

The Southeastern Wisconsin Region of 1990 will be significantly different from the Region of today. There will be more than 1 million additional residents, nearly 350,000 additional jobs, and over 520,000 additional motor vehicles within the Region. This anticipated growth will generate massive demands for land and for improved transportation facilities and will press heavily on the limited natural resources of the Region.

The land use plan recommended in this report seeks to provide for this anticipated regional growth and development in a manner which will not only permit the efficient provision of necessary public facilities and services but which will meet the specific regional land use development objectives formulated and adopted by the Commission. The recommended land use plan is a refinement of the Controlled Existing Trend Land Use Plan presented in Volume 2 of this report. As such, it reflects a conscious continuation of historic development trends within the Region, with urban development proposed to continue to occur in concentric rings outward from, and along the full periphery of, existing urban centers within the Region. The plan places heavy emphasis on the continued effect of the urban land market in determining the location, density, and character of the future development within the Region. It does, however, propose to regulate the effect of this market on development in order to provide for a more orderly and economical regional development pattern and avoid intensification of areawide developmental and environmental problems.

The recommended land use plan would meet the social, physical, and economic needs of the future

regional population by allocating sufficient land to each of the various major land use categories to satisfy the known and anticipated demand for each use, meeting both the demands of the urban land market and approved land use plan design standards. The allocation of future land uses within each county of the Region would be such as to approximate the forecast population levels within each county and, to the extent possible, the proposals contained in existing community development plans and zoning ordinances.

The plan would seek to place over 74 percent of all new urban development within 20 miles of the central business district of Milwaukee. Nearly three-fourths of all new residential land use development would, under the recommended land use plan, be developed at medium densities, with a gross residential population density ranging from 3,500 to about 10,000 persons per square mile. Implementation of the plan would more than double residential land use densities over those which would prevail if existing trends were allowed to continue uncontrolled in the public interest. The plan would add about 200 square miles of new urban development to the Region by 1990; provide for 23 major industrial centers, 6 of which would be newly established, and for 23 major commercial centers, 10 of which would be newly established.

The plan seeks to protect and enhance the natural resource base of the Region and allocates new urban development only to those areas of the Region which are covered by soils well suited to such development. More particularly, the plan seeks to avoid urban development requiring on-site septic tank sewage disposal systems in those areas of the Region covered by soils unsuited to the utilization of such systems, thereby abating water pollution problems and avoiding the intensification of existing and the creation of new environmental problems within the Region. The plan seeks to protect the shoreland frontage of the lakes and perennial streams of the Region from incompatible development; to protect the floodways and flood plains of the perennial streams and watercourses from urban encroachment; and to protect the best remaining woodlands, wetlands, fish and game habitat areas, and potential park sites from destruction through improper urban or rural development. The plan provides for 26 major regional parks, 13 of which would be newly established, and, in addition, seeks to protect all of the primary environmental corridors within the Region from incompatible development.

These environmental corridors would provide the basis for an integrated system of park and open-space reservations within the Region, and their preservation would do much to protect and enhance the natural resource base and provide an attractive and viable environment within the Region. The plan also seeks to preserve the best remaining agricultural areas within the Region for agricultural and open-space use.

The plan recognizes the interdependence between the land use pattern and the transportation and public utility systems which serve and sustain it. It seeks to encourage urban development in those areas of the Region which can be readily provided with gravity drainage sanitary sewer service and public water supply, so that by 1990 over 95 percent of the total developed area of the Region and over 95 percent of the total population of the Region could be served by both public sanitary sewer and public water supply facilities. Most importantly, the plan seeks to mutually adjust the land use pattern and the demand this pattern creates for, and the loadings upon, transportation and utility facilities to the spatial location and capacities of these facilities.

The plan attempts to avoid the continuance of formless urban sprawl within the Region by proposing to concentrate all new urban residential development into planned development units. These units would be properly serviced by public sanitary sewer and water supply facilities; would contain within the immediate vicinity of each dwelling unit the full complement of public facilities needed by the family in its daily activities, such as elementary school and church, local park, and convenient shopping facilities; and would provide for ready access from residential areas to the regional transportation system. Implementation of the plan would, thus, not only promote the efficient provision of community facilities and services to residential areas but would provide for the development of stable residential areas containing a wide range of housing types, designs, and costs.

**THE RECOMMENDED TRANSPORTATION PLAN**  
The growth and change anticipated to occur within southeastern Wisconsin will generate massive demands for travel and for improved transportation facilities. Total travel demand generated within the Region is anticipated to almost double, increasing from a total of about 3.6 million person trips per average weekday in 1963 to over 6 million such trips by 1990, while the total number of

vehicle miles of travel is anticipated to increase from about 13.2 million to over 32 million vehicle miles per average weekday. The transportation plan recommended in this report seeks to provide the Region with a safe, efficient, and economical transportation system which will effectively serve the existing and anticipated increases in travel demand within the Region, which will meet the adopted regional transportation system development objectives, and which will serve and promote the recommended land use pattern. The recommended transportation system plan proposes a total of 291 miles of new freeways, 192 miles of new arterial streets and highways, and 1,003 miles of improved arterial streets and highways. The recommended transportation system plan provides for the following additions to the regional freeway and expressway system:

1. Extension of the Lake Freeway from the proposed high level bridge across the entrance of the Milwaukee harbor southerly through Racine and Kenosha counties to the state line, connecting there with a freeway proposed by the State of Illinois.
2. Extension of the Stadium Freeway northerly to the regional boundary in the vicinity of STH 57.
3. Extension of the North-South Freeway from the Grafton Interchange to the Ozaukee-Sheboygan County line in the vicinity of USH 141.
4. Construction of a new east-west freeway, to be called the Bay Freeway, proposed in the vicinity of Hampton Avenue in northern Milwaukee and Waukesha counties, extending from the North-South Freeway (USH 141) westerly to the vicinity of the City of Oconomowoc, bypassing the City of Oconomowoc to the north, and connecting to USH 16 at the regional boundary.
5. Construction of a River Parkway along the Milwaukee River Valley from the Juneau Interchange, located at the intersection of the Park and Lake freeways, northerly to the vicinity of Hampton Avenue and the North-South Freeway, connecting there to the proposed Bay Freeway.
6. Construction of a Belt Freeway extending from the southerly extension of the Lake

Freeway in southeastern Milwaukee County westerly through southern Milwaukee County and northerly through eastern Waukesha County to the Fond du Lac Freeway (USH 41) in Washington County.

7. Construction of a new freeway paralleling USH 45 from the Fond du Lac Freeway (USH 41) northerly to the vicinity of the City of West Bend, bypassing the City of West Bend to the west, and connecting to USH 45 north of the city.
8. The completion of the Rock Freeway (STH 15) southwesterly across Walworth County to the regional boundaries, with a spur branching in the vicinity of the City of Delavan toward the City of Janesville in Rock County.
9. The completion of USH 12 northwesterly across Walworth County as a freeway.
10. Construction of a Loop Freeway in the Racine area from the vicinity of CTH K and the North-South Freeway (IH 94) easterly into the City of Racine, thence southerly in the vicinity of the abandoned Chicago North Shore and Milwaukee Electric Railroad right-of-way to the vicinity of STH 11, thence westerly to the Lake Freeway. The proposed facility would continue westerly from the Lake Freeway as a standard arterial in the form of an improved and relocated STH 11.

In addition to, and complementing, the foregoing major freeway and parkway facility recommendations, the proposed transportation system plan recommends the provision of a greatly expanded modified rapid transit and entirely new rapid transit system, which would provide the most heavily urbanized portions of the Region with an efficient and economical as well as with a high level of transit service. Under the plan proposals, motor coaches operating in mixed traffic over outlying portions of the expanded regional freeway system would provide fast and regular service to such outlying suburban areas as Mequon, Thiensville, Menomonee Falls, Brookfield, New Berlin, Franklin, and Oak Creek. The modified rapid transit lines would feed a rapid transit line paralleling the East-West Freeway for a distance of 4.3 miles from the vicinity of the Zoo Interchange to the vicinity of N. 16th and W. Clybourn

Streets in the City of Milwaukee. This rapid transit line would consist of two fully grade-separated lanes for the exclusive operation of motor coaches. Since buses have the unique capability of operating both over public streets and highways and over private rights-of-way, the same transit vehicle could thus operate in collection and distribution service in the central business district of Milwaukee, picking up and discharging passengers close to their places of work, business, or recreation; in true rapid transit service on the rapid transit trunk line; in modified rapid transit service on the outlying portions of the freeway system; and again in its own collection and distribution service in the outlying areas, picking up and discharging passengers close to their homes. Thus, a fast and convenient one-seat ride with the closest approach possible to door-to-door service would be furnished to a maximum proportion of transit riders. The areas served by high level transit service could, moreover, be greatly extended through the construction of parking lots at strategic locations in outlying terminal areas so that combined auto-transit trips would become practical and convenient.

Implementation of the recommended transportation plan will provide the Region with an integrated, balanced transportation system providing the appropriate types of transportation service needed by all of the various subareas of the Region at an adequate level of service. It will achieve economy and efficiency in the provision of transportation services, while, at the same time, supporting essential economic and social activities. Implementation of the plan will achieve a balance, not only between travel demand and the spatial configuration and capacity of highway facilities but also between the utilization of the automobile and mass transit vehicles as modes of transportation, and will result in the alleviation of traffic congestion, in the reduction of travel time between component parts of the Region, in the reduction of accident exposure, and in an increased measure of travel safety.

If the recommended transportation plan is implemented, only 0.9 percent of the total arterial street and highway system mileage within the Region would be expected to operate over design capacity by 1990, as compared to 6.0 percent in 1963; and over 40 percent of the total vehicle miles of travel generated within the Region would be carried on freeway facilities, as compared to only 6 percent in 1963. Moreover, transit trip

production within the Region may be expected to increase by about 9 percent, a reversal of historic trends within the Region.

It is estimated that complete implementation of the highway portion of the transportation plans would cost approximately \$3.6 billion over the 25-year implementation period; \$2.0 billion of this would be required for construction and approximately \$1.5 billion for maintenance. Public financial resource studies indicate that approximately \$5.7 billion should become available for construction and maintenance of streets and highways within the Region by 1990, indicating the plan to be well within the financial reach of the Region. Not only is the proposed highway transportation plan well within the financial capability of the Region, but benefit-cost analyses indicate that the required public funds would be well invested, providing a benefit-cost ratio of about 1.4. It is further estimated that the cost of implementing the rapid transit recommendations would be \$12.8 million. While federal aids are available for construction of the rapid transit line, implementation in this regard would require an entirely new category of local governmental expenditures.

#### THE UNPLANNED ALTERNATIVE

Failure to adopt and implement the recommended land use plan would lead to a continuation of uncontrolled urban sprawl within the Region. This would require the conversion of over 410 square miles of land from rural to urban use by 1990, over twice as much as required under the recommended plan. Much of this conversion would occur, as it has in the past, with little regard for the long-term impact on, and often irreparable damage to, the land and water resources of the Region. Under the unplanned alternative, only 54 percent of all new urban development within the Region could be expected to be located within 20 miles of the central business district of Milwaukee. Moreover, overall urban development densities could be expected to decline to less than 2,700 persons per square mile, as compared with 4,400 persons per square mile under the recommended land use plan. The dispersed nature of new residential development, under the unplanned alternative, would make the location of such development in planned residential development units far more difficult to achieve than under the recommended land use plan.

The continued decline in urban population densities, under the unplanned alternative, would hold



important implications for the continued provision within the Region of not only adequate transit service but of urban services of all kinds. The unplanned alternative would make the provision of public sanitary sewer and water supply service difficult and costly, and only 74 percent of the total regional population and 55 percent of the total developed area of the Region could be expected to be served by public sewer and water supply facilities by 1990. The regional land use pattern which could be expected to evolve under the unplanned alternative would, therefore, result in increased utilization of shallow private wells and on-site soil absorption sewage disposal systems. Nearly 50 percent of all new urban development within the Region would, under the unplanned alternative, have to rely on such facilities. This would not only create a severe potential public health hazard but would lead to further deterioration in both surface and ground water quality within the Region. The correction of the resulting environmental problems would be extremely costly if, indeed, at all possible.

Under the unplanned alternative, large areas of the environmental corridors could be expected to be destroyed by incompatible rural and urban development; flooding and water pollution problems could be expected to increase greatly; and a severe deterioration of the overall quality of the environment within the Region could be expected. Over 15 percent of the remaining prime agricultural lands within the Region would, under the unplanned alternative, have to be converted to urban use, as contrasted to less than 5 percent under the recommended land use plan. The unplanned alternative would lead to a continued intensification of existing environmental problems, including flooding and water pollution; would result in an almost total destruction of the natural resource base; and would result in a regional land use pattern which would be as disorderly and inefficient as it would be ugly.

The total future travel demand generated by the regional land use pattern which would result from the unplanned alternative would not, however, be significantly different from that which would result from implementation of the recommended land use plan, although by nearly every measure the total travel demand generated under the unplanned alternative would be higher than that generated by the recommended land use plan. Total person trips generated within the Region on an average weekday could be expected to be about 5 percent

higher under the unplanned alternative than under the recommended land use plan, while total vehicle miles of travel could be expected to be about 15 percent higher.

Total transit trips generated within the Region on an average weekday could be expected to decline sharply under the unplanned alternative, as contrasted to an approximately 9 percent increase expected under the recommended plan. Continued dispersed low-density residential development would make it extremely difficult to support a public transit system offering a high level of service and would make the attainment of a balanced transportation system virtually impossible.

Importantly, the freeway facilities proposed to serve the recommended land use plan could be expected to function adequately under almost any land use pattern which might reasonably be expected to evolve from the unplanned alternative. Although the provision of the proposed modified rapid transit facilities would be generally feasible under either land use alternative, the feasibility of providing the proposed rapid transit facility under the unplanned alternative would be marginal. Moreover, almost 15 percent more total street and highway mileage would be required to serve the unplanned alternative than to serve the recommended land use plan.

#### STAGING OF THE RECOMMENDED PLAN

The recommended land use and transportation plans were staged for three plan implementation periods extending from 1963 to 1970, 1970 to 1980, and 1980 to 1990. The first plan implementation period represents a period of adjustment between committed and new development decisions. During this period the amount of land in urban use within the Region will have to be increased by about 40 square miles, while nearly 70 additional square miles of land will have to be provided with public sanitary sewer and water supply service. In addition, two new major commercial centers, six new major industrial centers, and 13 new regional park and outdoor recreation areas will have to be provided during this period. Transportation system development over this initial plan implementation period would consist primarily of the completion of those proposed arterial highway facilities committed to construction as of September 1965, totaling 163 miles of new freeways and 160 miles of new standard arterial streets and highways. In addition, 47.5 miles of proposed new modified rapid transit lines and 4.3 miles of rapid transit line should be placed in operation during this period.

The second plan implementation period represents a period wherein implementation of the recommended regional land use and transportation system plans would be initiated through new development decisions. During this period the amount of land in urban use within the Region will have to be increased by about 69 square miles, and about 90 additional square miles of land will have to be provided with public sanitary sewerage and water supply service. Four new major commercial centers would have to be developed. Transportation system development over this period would consist of the provision of 132 miles of proposed new freeways, 8.3 miles of proposed expressways and parkways, and 102 miles of proposed new standard arterial streets and highways. In addition, 23.9 miles of proposed modified rapid transit lines should be placed in operation over this period.

The third plan implementation period represents a period wherein full plan implementation would be achieved. During this period the amount of land in urban use would have to be increased by about 91 square miles, bringing the total land in urban use within the Region to about 653 square miles, as compared to about 453 square miles in 1963. Over 200 additional square miles of land will have to be provided with public sanitary sewerage and water supply facilities during this period, bringing the total land area served by such facilities within the Region to about 580 square miles and the total population served by such facilities to about 2.5 million persons, or 95 percent of the total regional population. In 1963 about 200 square miles of the developed area of the Region and about 80 percent of the total population were served by such facilities. In addition, four new major commercial centers would have to be developed over this plan implementation period.

Transportation system development would consist of the provision of about 79 miles of proposed new freeways and 44 miles of proposed new standard arterial streets and highways, bringing the total freeway, expressway, and parkway mileage within the Region to over 469 miles and the total standard arterial street and highway system mileage to 3,357 miles. In 1963 there were 87 miles of freeway and 3,051 miles of standard arterial streets and highways within the Region. An additional 12.9 miles of modified rapid transit lines would have to be placed in operation during this plan implementation period, bringing the total system mileage of such lines to 84.3 and providing service directly to 21 communities within the Region.

## PLAN IMPLEMENTATION

Chapter VII of this volume contains specific plan implementation recommendations directed at the concerned federal, state, and local units and agencies of government operating within the Region. These include recommendations concerning the implementation of the recommended regional land use plan through various land use control and public service and facility extension policies to be exercised by the state, county, and local units of government operating within the Region. They also include specific recommendations for the implementation of the recommended transportation plan, including recommendations: for the conversion of the functional highway plans presented in this report to jurisdictional plans on a county-by-county basis, for the adjustment of the federal aid systems to these jurisdictional plans, for the initiation of corridor refinement studies for all proposed freeway corridors, for the preparation of large-scale topographic maps of the refined corridors, for the delineation of the precise centerline locations and right-of-way widths required for these freeways, and for the specific actions required to reserve the right-of-way for the proposed freeway facilities.

These detailed plan implementation recommendations will not be repeated here. Several particularly significant aspects of regional plan implementation, however, do warrant restatement here in summary form. First, it should be reiterated that the recommended regional land use and transportation plans, as presented in this report, are intended to comprise flexible guides to the sound physical development of the Region and, as such, are intended to be advisory to the local, state, and federal units and agencies of government and to private developers as these public and private bodies consider land use and transportation facility development matters within the Region. The regional plans should not be considered as an inflexible mold to which all future development within the Region must precisely conform. Rather, the regional plans are to be regarded as a point of departure against which land use and transportation system development proposals can be evaluated as they arise and, in the light of which, better development decisions can be made by all concerned. The regional plans are intended to be used as a framework around which both comprehensive community development plans and single-purpose facility system plans can be developed in a coordinated manner and, as such, are subject not only to continual reinterpretation but also

to refinement and detailing at the county and local level.

Second, the adoption or endorsement of the recommended regional land use and transportation plans as guides to the sound development of the Region by the local units of government and by the various state and federal agencies concerned is highly desirable and, in some cases, essential in order to secure a common understanding of areawide development objectives and to permit the necessary plan implementation work to be cooperatively programmed and jointly executed.

Third, plan implementation action policies and programs must not only be preceded by plan adoption or endorsement but must also emphasize the most important and essential elements of the plan and those areas of action which will have the greatest impact on guiding and shaping development in accordance with the recommended plan. Two major criteria should be used to determine which plan elements are truly regional in character or influence and are, therefore, essential to the attainment of regional development objectives: 1) the importance of the plan elements to the wise and judicious use of the underlying and sustaining natural resource base; and 2) the importance of the plan elements to the functional relationships existing between land use and the demand for major utility, recreation, and transportation facilities.

In light of these criteria, it would appear that the regional development objectives and plans can be substantially met if the Commission and its constituent local units of government and the affected state and federal agencies can significantly influence the spatial location and size or capacity of only four aspects of regional development: the major transportation routes, particularly the free-way, modified rapid transit, and rapid transit facilities; the major park and open-space reservations, including the major drainageways; the public sanitary sewerage facility service areas; and the public water supply facility service areas.

Fourth, the importance of close coordination and cooperation between the local units of government and the various state and federal agencies to plan implementation cannot be overemphasized. Responsibilities for achieving such coordination and cooperation on a voluntary basis within the traditional framework of government in Wisconsin have been assigned to the Commission by the State Legislature, and the Commission is being utilized

by both local municipalities and by certain state and federal agencies for the attainment of the necessary coordination and cooperation.

Even more intensive utilization of the Commission as a center for the attainment of close coordination of the many planning and plan implementation activities which are carried on within the seven-county Region must be made in the future if the regional plans are to be implemented and a more efficient, economical, attractive, and healthful environment achieved within the Region. Advisory review of the location and size of major public works facilities by the Commission is essential: for the effective development of transportation, utility, and community facilities within the Region, which must not only comprise efficient systems as such but which must properly serve and promote the desired regional land use pattern; for abatement of costly duplication of effort and unnecessary expenditure of public funds; and for the preservation and protection of the underlying and sustaining natural resource base. Such review by the Commission may be obtained by contract, by request, or may be required by state and federal legislation.

Fifth, implementation of the regional plans will not be brought about by massive action of some one unit or agency of government. Rather, implementation of the regional plans will be brought about through literally thousands of development decisions made on a day-to-day basis over a period of many years by many private investors and by many public administrators operating at the local, areawide, state, and federal levels of government. It is extremely important that the individuals, corporations, or agencies making these decisions be aware of, and understand the development proposals set forth in, the recommended regional land use and transportation plans so that these plans will receive proper consideration in the development decisions.

Finally, regional plan implementation can be achieved only within the context of a continuing, comprehensive, areawide planning effort, through which the planning inventories and forecasts, on which the regional plans are based, are updated, monitored, and revised; the plans themselves are reappraised and, if necessary, revised to accommodate changing conditions; and through which the plans are interpreted on a day-to-day basis to local, state, and federal units and agencies of government and to private investors and developers as the need to make development decisions arises.

In this respect, it should be stressed that planning does not and cannot concern itself with future decisions; that is, with "things that should be done in the future." Rather, it must be recognized that decisions exist only in the present and that planning is necessary just because decisions can only be made in the present, yet cannot be made for the present alone. The question, therefore, that faces public officials, private investors, and interested citizen groups within the Region concerning implementation of the recommended regional land use and transportation plans is not what should be done tomorrow to bring about the plans but, rather, what must be done today in light of the plans to get ready for an uncertain tomorrow. In a highly complex and dynamic urbanizing region, such as southeastern Wisconsin, one key decision, or the lack of such a decision, may commit the Region as a whole and its many constituent units and agencies of government to a given course of action, sometimes irrevocably. This is particularly true in the field of public works development where a decision to build one important link in a system may commit the entire system for a generation or more to come.

#### CONCLUSION

The growth and change, which is expected to occur within southeastern Wisconsin over the next 25 years, present the Region with both a great challenge and a great opportunity. It presents the Region with a great challenge in that over the short span of 25 years an urban plant will have to be constructed within the Region nearly equal in size and extent to the entire urban plant constructed over the previous 120 years of regional growth and development. Public officials within the Region will be faced with the awesome task of deciding what form this new urban development should take and how it might best be served by the necessary transportation, utility, and public facility services. Failure to resolve these questions properly will result in irreparable damage to the land and water resources of the Region and in mounting problems of traffic congestion; water supply and pollution; inadequate drainage; widespread and costly flooding; and lack of adequate schools, parks, and other public facilities.

This growth, however, also provides a great opportunity in that a better regional settlement pattern can be evolved and past mistakes avoided;

new growth and development adjusted to the underlying and sustaining resource base; safer, more efficient, and more convenient transportation, utility, and public facility systems provided; and a better environment for life within the Region created.

Implementation of the recommended regional land use plan would provide the future Region with a balanced allocation of space to the various urban and rural land uses, an allocation which would properly meet the social, physical, and economic needs of the growing regional population. It would provide a spatial distribution of the various land uses which would result not only in a more compatible arrangement of land use but which would also be properly related to the supporting transportation and utility systems in order to assure the economical provision of transportation and utility services. Most importantly, implementation of the land use plan would do much to assure the protection and wise use of the natural resources of the Region.

Implementation of the recommended transportation plan would provide the Region with an integrated transportation system which will effectively serve and promote a desirable regional land use pattern, meeting the anticipated future travel demand at an adequate level of service. It would provide a balanced transportation system, with appropriate types of both highway and transit facilities provided for the various subareas of the Region. It would abate traffic congestion, reduce travel time and costs between component parts of the Region, and reduce accident exposure.

Implementation of—or failure to implement—the recommended plans will affect not only the efficiency of the transportation system, which must serve the Region for a generation to come and thereby directly affect the cost of living and of doing business within the Region, but will also affect the overall quality of the environment within the Region for many generations to come. It is, therefore, hoped that government, business and industry, and interested citizen groups within the Region will take an active interest in the plan recommendations, which are completely advisory to all concerned, carefully reviewing their soundness and practicality, and, if in agreement with the plans, support and act toward their implementation.

*Appendix A*  
DETAILED TABLES

Table A-1  
EXISTING AND PROPOSED LAND USE IN KENOSHA COUNTY:  
1963 AND 1990 RECOMMENDED LAND USE PLAN

Land Use Category	Existing (1963)		Planned Increment		Total 1990	
	Acres	Percent of Major Category	Acres	Percent Change	Acres	Percent of Major Category
<b>Urban Land Use</b>						
<i>Residential</i> . . . . .	11,913	46.0	6,890	57.8	18,803	48.2
High-Density . . . . .	2,511	9.7	118	4.6	2,629	6.7
Medium-Density . . . . .	2,673	10.3	5,813	217.4	8,486	21.8
Low-Density . . . . .	6,729	26.0	959	14.2	7,688	19.7
Commercial <sup>a</sup> . . . . .	532	2.0	511	96.0	1,043	2.6
Industrial <sup>a</sup> . . . . .	809	3.1	788	97.4	1,597	4.1
Governmental <sup>b</sup> . . . . .	1,059	4.1	1,286	121.4	2,345	6.0
Transportation <sup>c</sup> . . . . .	8,492	32.8	2,708	31.8	11,200	28.7
Recreation . . . . .	3,118 <sup>d</sup>	12.0	930 <sup>e</sup>	29.8	4,048	10.4
<b>Total Urban Land Use</b>	<b>25,923</b>	<b>100.0</b>	<b>13,113</b>	<b>50.5</b>	<b>39,036</b>	<b>100.0</b>
<b>Rural Land Use</b>						
<i>Agriculture</i> . . . . .	116,391	76.5	-11,161	- 9.5	105,230	75.6
Prime Agriculture . . . . .	72,870	47.9	- 4,809	- 6.5	68,061	48.9
Other Agriculture . . . . .	43,521	28.6	- 6,352	- 14.5	37,169	26.7
Other Open Lands <sup>f</sup> . . . . .	35,781	23.5	- 1,952	- 5.4	33,829	24.3
<b>Total Rural Land Use</b>	<b>152,172</b>	<b>100.0</b>	<b>-13,113</b>	<b>- 8.6</b>	<b>139,059</b>	<b>100.0</b>
<b>Total Land Use</b>	<b>178,095</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>178,095</b>	<b>--</b>

<sup>a</sup> Includes on-site parking.

<sup>b</sup> Includes institutional uses and on-site parking.

<sup>c</sup> Includes communications and utilities uses.

<sup>d</sup> Includes the entire site areas of public and nonpublic recreation sites.

<sup>e</sup> Includes only that increment recommended for public recreation uses.

<sup>f</sup> Includes woodlands, water, wetlands, and quarries.

Note: Figures in italics indicate subtotals.

Source: SEWRPC.

Table A-2  
 EXISTING AND PROPOSED LAND USE IN MILWAUKEE COUNTY:  
 1963 and 1990 RECOMMENDED LAND USE PLAN

Land Use Category	Existing (1963)		Planned Increment		Total 1990	
	Acres	Percent of Major Category	Acres	Percent Change	Acres	Percent of Major Category
<b>Urban Land Use</b>						
<i>Residential . . . . .</i>	<i>41,984</i>	<i>42.1</i>	<i>21,802</i>	<i>51.9</i>	<i>63,786</i>	<i>45.4</i>
High-Density . . .	21,080	21.2	2,431	11.5	23,511	16.7
Medium-Density . .	8,697	8.7	16,690	191.9	25,387	18.1
Low-Density . . .	12,207	12.2	2,681	22.0	14,888	10.6
Commercial <sup>a</sup> . . . . .	3,035	3.0	1,773	58.4	4,808	3.4
Industrial <sup>a</sup> . . . . .	5,234	5.3	1,887	36.1	7,121	5.1
Governmental <sup>b</sup> . . . .	6,995	7.0	3,792	54.2	10,787	7.7
Transportation <sup>c</sup> . . .	30,442	30.5	9,665	31.7	40,107	28.5
Recreation . . . . .	12,080 <sup>d</sup>	12.1	1,806 <sup>e</sup>	15.0	13,886	9.9
<b>Total Urban Land Use</b>	<b>99,770</b>	<b>100.0</b>	<b>40,725</b>	<b>40.8</b>	<b>140,495</b>	<b>100.0</b>
<b>Rural Land Use</b>						
Agriculture . . . . .	35,121	63.6	-27,056	-77.0	8,065	55.6
Prime Agriculture	7,959	14.4	-5,920	-74.4	2,039	14.1
Other Agriculture	27,162	49.2	-21,136	-77.8	6,026	41.5
Other Open Lands <sup>f</sup> . .	20,103	36.4	-13,669	-68.0	6,434	44.4
<b>Total Rural Land Use</b>	<b>55,224</b>	<b>100.0</b>	<b>-40,725</b>	<b>-73.7</b>	<b>14,499</b>	<b>100.0</b>
<b>Total Land Use</b>	<b>154,994</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>154,994</b>	<b>--</b>

<sup>a</sup> Includes on-site parking.

<sup>b</sup> Includes institutional uses and on-site parking.

<sup>c</sup> Includes communications and utilities uses.

<sup>d</sup> Includes the entire site areas of public and nonpublic recreation sites.

<sup>e</sup> Includes only that increment recommended for public recreation uses.

<sup>f</sup> Includes woodlands, water, wetlands, and quarries.

Note: Figures in italics indicate subtotals.

Source: SEWRPC.

Table A-3  
 EXISTING AND PROPOSED LAND USE IN OZAUKEE COUNTY:  
 1963 and 1990 RECOMMENDED LAND USE PLAN

Land Use Category	Existing (1963)		Planned Increment		Total 1990	
	Acres	Percent of Major Category	Acres	Percent Change	Acres	Percent of Major Category
<b>Urban Land Use</b>						
<i>Residential</i> . . . . .	9,337	47.9	6,187	66.2	15,524	51.9
High-Density . . .	471	2.4	--	0.0	471	1.6
Medium-Density . .	1,324	6.8	3,162	238.8	4,486	15.0
Low-Density . . .	7,542	38.7	3,025	40.1	10,567	35.3
Commercial <sup>a</sup> . . . . .	361	1.8	296	81.9	657	2.2
Industrial <sup>a</sup> . . . . .	370	1.9	175	47.2	545	1.8
Governmental <sup>b</sup> . . . .	796	4.1	559	63.9	1,355	4.6
Transportation <sup>c</sup> . . . .	7,010	36.0	2,055	29.3	9,065	30.3
Recreation . . . . .	1,614 <sup>d</sup>	8.3	1,133 <sup>e</sup>	70.1	2,747	9.2
<b>Total Urban Land Use</b>	19,488	100.0	10,405	53.3	29,893	100.0
<b>Rural Land Use</b>						
<i>Agriculture</i> . . . . .	105,199	80.6	- 9,240	- 8.8	95,959	79.9
Prime Agriculture	41,455	31.8	- 890	- 2.2	40,565	33.8
Other Agriculture	63,744	48.8	- 8,350	- 13.1	55,394	46.1
Other Open Lands <sup>f</sup> . . .	25,326	19.4	- 1,165	- 4.6	24,161	20.1
<b>Total Rural Land Use</b>	130,525	100.0	-10,405	- 8.0	120,120	100.0
<b>Total Land Use</b>	150,013	--	--	--	150,013	--

<sup>a</sup> Includes on-site parking.

<sup>b</sup> Includes institutional uses and on-site parking.

<sup>c</sup> Includes communications and utilities uses.

<sup>d</sup> Includes the entire site areas of public and nonpublic recreation sites.

<sup>e</sup> Includes only that increment recommended for public recreation uses.

<sup>f</sup> Includes woodlands, water, wetlands, and quarries.

Note: Figures in italics indicate subtotals.

Source: SEWRPC.

Table A-4  
 EXISTING AND PROPOSED LAND USE IN RACINE COUNTY:  
 1963 AND 1990 RECOMMENDED LAND USE PLAN

Land Use Category	Existing (1963)		Planned Increment		Total 1990	
	Acres	Percent of Major Category	Acres	Percent Change	Acres	Percent of Major Category
<b>Urban Land Use</b>						
<i>Residential</i> . . . . .	<i>13,371</i>	<i>44.6</i>	<i>11,015</i>	<i>82.4</i>	<i>24,386</i>	<i>50.0</i>
High-Density . . . . .	4,069	13.6	190	4.7	4,259	8.8
Medium-Density . . . . .	2,752	9.2	7,268	264.1	10,020	20.5
Low-Density . . . . .	6,550	21.8	3,557	54.3	10,107	20.7
Commercial <sup>a</sup> . . . . .	753	2.5	645	85.7	1,398	2.9
Industrial <sup>a</sup> . . . . .	885	3.0	1,082	122.2	1,967	4.0
Governmental <sup>b</sup> . . . . .	1,499	5.0	1,110	74.0	2,609	5.3
Transportation <sup>c</sup> . . . . .	11,163	37.2	4,055	36.3	15,218	31.2
Recreation . . . . .	2,316 <sup>d</sup>	7.7	920 <sup>e</sup>	39.7	3,236	6.6
<b>Total Urban Land Use</b>	<b>29,987</b>	<b>100.0</b>	<b>18,827</b>	<b>62.8</b>	<b>48,814</b>	<b>100.0</b>
<b>Rural Land Use</b>						
<i>Agriculture</i> . . . . .	<i>153,636</i>	<i>81.9</i>	<i>-17,265</i>	<i>-11.2</i>	<i>136,371</i>	<i>80.8</i>
Prime Agriculture	74,321	39.6	- 6,421	- 8.6	67,900	40.2
Other Agriculture	79,315	42.3	-10,844	-13.7	68,471	40.6
Other Open Lands <sup>f</sup> . . . . .	33,923	18.1	- 1,562	- 4.6	32,361	19.2
<b>Total Rural Land Use</b>	<b>187,559</b>	<b>100.0</b>	<b>-18,827</b>	<b>-10.0</b>	<b>168,732</b>	<b>100.0</b>
<b>Total Land Use</b>	<b>217,546</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>217,546</b>	<b>--</b>

<sup>a</sup> Includes on-site parking.

<sup>b</sup> Includes institutional uses and on-site parking.

<sup>c</sup> Includes communications and utilities uses.

<sup>d</sup> Includes the entire site areas of public and nonpublic recreation sites.

<sup>e</sup> Includes only that increment recommended for public recreation uses.

<sup>f</sup> Includes woodlands, water, wetlands, and quarries.

Note: Figures in italics indicate subtotals.

Source: SEWRPC.



Table A-5  
 EXISTING AND PROPOSED LAND USE IN WALWORTH COUNTY:  
 1963 and 1990 RECOMMENDED LAND USE PLAN

Land Use Category	Existing (1963)		Planned Increment		Total 1990	
	Acres	Percent of Major Category	Acres	Percent Change	Acres	Percent of Major Category
Urban Land Use						
<i>Residential</i> . . . . .	<i>11,856</i>	<i>38.3</i>	<i>1,698</i>	<i>14.3</i>	<i>13,554</i>	<i>38.2</i>
High-Density. . .	1,701	5.5	--	0.0	1,701	4.8
Medium-Density. .	2,871	9.3	1,698	59.1	4,569	12.9
Low-Density. . . .	7,284	23.5	--	0.0	7,284	20.5
Commercial <sup>a</sup> . . . . .	615	2.0	114	18.5	729	2.2
Industrial <sup>a</sup> . . . . .	862	2.8	71	8.2	933	2.6
Governmental <sup>b</sup> . . . .	1,090	3.5	199	18.3	1,289	3.6
Transportation <sup>c</sup> . . .	10,552	34.0	981	9.3	11,533	32.5
Recreation. . . . .	6,017 <sup>d</sup>	19.4	1,391 <sup>e</sup>	23.1	7,408	20.9
Total Urban Land Use	30,992	100.0	4,454	14.4	35,446	100.0
Rural Land Use						
Agriculture. . . . .	266,251	78.5	-2,801	- 1.1	263,450	78.7
Prime Agriculture	121,919	35.9	- 403	- 0.0	121,516	36.3
Other Agriculture	144,332	42.6	-2,398	- 1.7	141,934	42.4
Other Open Lands <sup>f</sup> . .	72,737	21.5	-1,653	- 2.3	71,084	21.3
Total Rural Land Use	338,988	100.0	-4,454	- 1.3	334,534	100.0
Total Land Use	369,980	--	--	--	369,980	--

<sup>a</sup> Includes on-site parking.

<sup>b</sup> Includes institutional uses and on-site parking.

<sup>c</sup> Includes communications and utilities uses.

<sup>d</sup> Includes the entire site areas of public and nonpublic recreation sites.

<sup>e</sup> Includes only that increment recommended for public recreation uses.

<sup>f</sup> Includes woodlands, water, wetlands, and quarries.

Note: Figures in italics indicate subtotals.

Source: SEWRPC.

**Table A-6**  
**EXISTING AND PROPOSED LAND USE IN WASHINGTON COUNTY:**  
**1963 AND 1990 RECOMMENDED LAND USE PLAN**

Land Use Category	Existing (1963)		Planned Increment		Total 1990	
	Acres	Percent of Major Category	Acres	Percent Change	Acres	Percent of Major Category
<b>Urban Land Use</b>						
<i>Residential</i> . . . . .	7,429	34.8	3,089	41.6	10,518	38.3
High-Density . . . . .	1,752	8.2	37	0.2	1,789	6.5
Medium-Density . . . . .	1,673	7.8	2,841	169.8	4,514	16.5
Low-Density . . . . .	4,004	18.8	211	5.3	4,215	15.4
Commercial <sup>a</sup> . . . . .	287	1.4	272	94.8	559	2.0
Industrial <sup>a</sup> . . . . .	455	2.1	126	27.7	581	2.1
Governmental <sup>b</sup> . . . . .	762	3.6	357	46.9	1,119	4.1
Transportation <sup>c</sup> . . . . .	10,344	48.5	1,273	12.3	11,617	42.3
Recreation . . . . .	2,041 <sup>d</sup>	9.6	996 <sup>e</sup>	48.8	3,037	11.1
<b>Total Urban Land Use</b>	<b>21,318</b>	<b>100.0</b>	<b>6,113</b>	<b>28.7</b>	<b>27,431</b>	<b>100.0</b>
<b>Rural Land Use</b>						
<i>Agriculture</i> . . . . .	192,271	74.7	-5,075	- 2.6	187,196	74.5
Prime Agriculture . . . . .	53,916	21.0	-1,546	- 2.7	52,370	20.8
Other Agriculture . . . . .	138,355	53.7	-3,529	- 2.6	134,826	53.7
Other Open Lands <sup>f</sup> . . . . .	65,143	25.3	-1,038	- 1.6	64,105	25.5
<b>Total Rural Land Use</b>	<b>257,414</b>	<b>100.0</b>	<b>-6,113</b>	<b>- 2.4</b>	<b>251,301</b>	<b>100.0</b>
<b>Total Land Use</b>	<b>278,732</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>278,732</b>	<b>--</b>

<sup>a</sup> Includes on-site parking.

<sup>b</sup> Includes institutional uses and on-site parking.

<sup>c</sup> Includes communications and utilities uses.

<sup>d</sup> Includes the entire site areas of public and nonpublic recreation sites.

<sup>e</sup> Includes only that increment recommended for public recreation uses.

<sup>f</sup> Includes woodlands, water, wetlands, and quarries.

Note: Figures in italics indicate subtotals.

Source: SEWRPC.

Table A-7  
EXISTING AND PROPOSED LAND USE IN WAUKESHA COUNTY:  
1963 AND 1990 RECOMMENDED LAND USE PLAN

Land Use Category	Existing (1963)		Planned Increment		Total 1990	
	Acres	Percent of Major Category	Acres	Percent Change	Acres	Percent of Major Category
<b>Urban Land Use</b>						
<i>Residential</i> . . . . .	33,468	53.6	20,506	61.3	53,974	55.6
High-Density . . . . .	2,879	4.6	14	0.4	2,893	3.0
Medium-Density . . . . .	4,758	7.7	16,312	342.8	21,070	21.7
Low-Density . . . . .	25,831	41.3	4,180	16.2	30,011	30.9
Commercial <sup>a</sup> . . . . .	1,123	1.8	1,437	128.0	2,560	2.6
Industrial <sup>a</sup> . . . . .	1,131	1.8	994	87.9	2,125	2.2
Governmental <sup>b</sup> . . . . .	2,521	4.0	2,270	90.0	4,791	4.9
Transportation <sup>c</sup> . . . . .	18,114	29.0	7,886	43.5	26,000	26.8
Recreation . . . . .	6,076 <sup>d</sup>	9.8	1,542 <sup>e</sup>	25.4	7,618	7.9
<b>Total Urban Land Use</b>	<b>62,433</b>	<b>100.0</b>	<b>34,635</b>	<b>55.5</b>	<b>97,068</b>	<b>100.0</b>
<b>Rural Land Use</b>						
<i>Agriculture</i> . . . . .	216,275	69.9	-30,239	- 14.0	186,036	67.7
Prime Agriculture . . . . .	71,512	23.1	- 1,278	- 1.8	70,234	25.6
Other Agriculture . . . . .	144,763	46.8	-28,961	- 20.0	115,802	42.1
Other Open Lands <sup>f</sup> . . . . .	92,938	30.1	- 4,396	- 4.7	88,542	32.3
<b>Total Rural Land Use</b>	<b>309,213</b>	<b>100.0</b>	<b>-34,635</b>	<b>- 11.2</b>	<b>274,578</b>	<b>100.0</b>
<b>Total Land Use</b>	<b>371,646</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>371,646</b>	<b>--</b>

<sup>a</sup> Includes on-site parking.

<sup>b</sup> Includes institutional uses and on-site parking.

<sup>c</sup> Includes communications and utilities uses.

<sup>d</sup> Includes the entire site areas of public and nonpublic recreation sites.

<sup>e</sup> Includes only that increment recommended for public recreation uses.

<sup>f</sup> Includes woodlands, water, wetlands, and quarries.

Note: Figures in italics indicate subtotals.

Source: SEWRPC.

Table A-8  
MILES AND CONSTRUCTION COSTS OF PROPOSED NEW AND IMPROVED ARTERIAL  
STREET AND HIGHWAY FACILITIES IN KENOSHA COUNTY:  
1990 RECOMMENDED TRANSPORTATION PLAN  
(Costs in Millions of 1966 Dollars)

Functional Facility Type	New Facilities <sup>a</sup>		Improved Facilities		Total	
	Miles	Construction Cost	Miles	Construction Cost	Miles	Construction Cost
<b>Standard Arterial:</b>						
2-lane . . . . .	8.2	\$ 1.774	62.3	\$10.517	70.5	\$12.291
4-lane . . . . .	9.5	4.527	83.0	38.761	92.5	43.288
6-lane . . . . .	--	--	9.7	7.082	9.7	7.082
Subtotal	17.7	6.301	155.0	56.360	172.7	62.661
<b>Expressway:</b>						
4-lane . . . . .	--	--	--	--	--	--
6-lane . . . . .	--	--	--	--	--	--
Subtotal	--	--	--	--	--	--
<b>Freeway:</b>						
4-lane . . . . .	--	--	--	--	--	--
6-lane . . . . .	12.0	14.821	12.4	4.731	24.4	19.552
8-lane . . . . .	--	--	--	--	--	--
Subtotal	12.0	14.821	12.4	4.731	24.4	19.552
<b>Total</b>	<b>29.7</b>	<b>\$21.122</b>	<b>167.4</b>	<b>\$61.091</b>	<b>197.1</b>	<b>\$82.213</b>

<sup>a</sup> Includes committed facilities which had not been programmed through calendar year 1966.

Source: SEWRPC.

Table A-9  
MILES AND CONSTRUCTION COSTS OF PROPOSED NEW AND IMPROVED ARTERIAL  
STREET AND HIGHWAY FACILITIES IN MILWAUKEE COUNTY:  
1990 RECOMMENDED TRANSPORTATION PLAN  
(Costs in Millions of 1966 Dollars)

Functional Facility Type	New Facilities <sup>a</sup>		Improved Facilities		Total	
	Miles	Construction Cost	Miles	Construction Cost	Miles	Construction Cost
<b>Standard Arterial:</b>						
2-lane . . . . .	14.7	\$ 3.982	17.5	\$ 4.285	32.2	\$ 8.267
4-lane . . . . .	9.8	6.423	153.9	98.150	163.7	104.573
6-lane . . . . .	4.0	4.094	131.5	138.487	135.5	142.581
Subtotal	28.5	14.499	302.9	240.922	331.4	255.421
<b>Expressway:</b>						
4-lane . . . . .	3.5	3.863	--	--	3.5	3.863
6-lane . . . . .	1.0	1.830	--	--	1.0	1.830
Subtotal	4.5	5.693	--	--	4.5	5.693
<b>Freeway:</b>						
4-lane . . . . .	1.8	4.765	--	--	1.8	4.765
6-lane . . . . .	47.3	210.897	1.6	3.920	48.9	214.817
8-lane . . . . .	6.9	34.619	--	--	6.9	34.619
Subtotal	56.0	250.281	1.6	3.920	57.6	254.201
<b>Total</b>	<b>89.0</b>	<b>\$270.473</b>	<b>304.5</b>	<b>\$244.842</b>	<b>393.5</b>	<b>\$515.315</b>

<sup>a</sup> Includes committed facilities which had not been programmed through calendar year 1966.

Source: SEWRPC.

Table A-10

MILES AND CONSTRUCTION COSTS OF PROPOSED NEW AND IMPROVED ARTERIAL  
STREET AND HIGHWAY FACILITIES IN OZAUKEE COUNTY:  
1990 RECOMMENDED TRANSPORTATION PLAN  
(Costs in Millions of 1966 Dollars)

Functional Facility Type	New Facilities <sup>a</sup>		Improved Facilities		Total	
	Miles	Construction Cost	Miles	Construction Cost	Miles	Construction Cost
Standard Arterial:						
2-lane . . . . .	--	\$ --	13.0	\$ 2.405	13.0	\$ 2.405
4-lane . . . . .	--	--	22.8	11.641	22.8	11.641
6-lane . . . . .	--	--	--	--	--	--
Subtotal	--	--	35.8	14.046	35.8	14.046
Expressway:						
4-lane . . . . .	--	--	--	--	--	--
6-lane . . . . .	--	--	--	--	--	--
Subtotal	--	--	--	--	--	--
Freeway:						
4-lane . . . . .	50.2	39.148	0.1	0.068	50.3	39.216
6-lane . . . . .	4.0	3.440	--	--	4.0	3.440
8-lane . . . . .	--	--	--	--	--	--
Subtotal	54.2	42.588	0.1	0.068	54.3	42.656
<b>Total</b>	<b>54.2</b>	<b>\$42.588</b>	<b>35.9</b>	<b>\$14.114</b>	<b>90.1</b>	<b>\$56.702</b>

<sup>a</sup> Includes committed facilities which had not been programmed through calendar year 1966.

Source: SEWRPC.

Table A-11

MILES AND CONSTRUCTION COSTS OF PROPOSED NEW AND IMPROVED ARTERIAL  
STREET AND HIGHWAY FACILITIES IN RACINE COUNTY:  
1990 RECOMMENDED TRANSPORTATION PLAN  
(Costs in Millions of 1966 Dollars)

Functional Facility Type	New Facilities <sup>a</sup>		Improved Facilities		Total	
	Miles	Construction Cost	Miles	Construction Cost	Miles	Construction Cost
Standard Arterial:						
2-lane . . . . .	33.7	\$ 6.863	48.5	\$ 8.131	82.2	\$14.994
4-lane . . . . .	28.0	12.639	70.7	31.182	98.7	43.821
6-lane . . . . .	--	--	13.3	8.808	13.3	8.808
Subtotal	61.7	19,502	132.5	48.121	194.2	67.623
Expressway:						
4-lane . . . . .	--	--	--	--	--	--
6-lane . . . . .	--	--	--	--	--	--
Subtotal	--	--	--	--	--	--
Freeway:						
4-lane . . . . .	15.7	14.036	--	--	15.7	14.036
6-lane . . . . .	11.0	9.460	11.4	5.990	22.4	15.450
8-lane . . . . .	--	--	--	--	--	--
Subtotal	26.7	23.496	11.4	5.990	38.1	29.486
<b>Total</b>	<b>88.4</b>	<b>\$42.998</b>	<b>143.9</b>	<b>\$54.111</b>	<b>232.3</b>	<b>\$97.109</b>

<sup>a</sup> Includes committed facilities which had not been programmed through calendar year 1966.

Source: SEWRPC.

Table A-12  
MILES AND CONSTRUCTION COSTS OF PROPOSED NEW AND IMPROVED ARTERIAL  
STREET AND HIGHWAY FACILITIES IN WALWORTH COUNTY:  
1990 RECOMMENDED TRANSPORTATION PLAN  
(Costs in Millions of 1966 Dollars)

Functional Facility Type	New Facilities <sup>a</sup>		Improved Facilities		Total	
	Miles	Construction Cost	Miles	Construction Cost	Miles	Construction Cost
<b>Standard Arterial:</b>						
2-lane . . . . .	--	\$ --	17.6	\$ 3.234	17.6	\$ 3.234
4-lane . . . . .	1.0	0.443	26.0	11.539	27.0	11.982
6-lane . . . . .	--	--	--	--	--	--
Subtotal	1.0	0.443	43.6	14.773	44.6	15.216
<b>Expressway:</b>						
4-lane . . . . .	--	--	--	--	--	--
6-lane . . . . .	--	--	--	--	--	--
Subtotal	--	--	--	--	--	--
<b>Freeway:</b>						
4-lane . . . . .	60.5	41.140	2.9	1.972	63.4	43.112
6-lane . . . . .	--	--	--	--	--	--
8-lane . . . . .	--	--	--	--	--	--
Subtotal	60.5	41.140	2.9	1.972	63.4	43.112
<b>Total</b>	<b>61.5</b>	<b>\$41.583</b>	<b>46.5</b>	<b>\$16.745</b>	<b>108.0</b>	<b>\$58.328</b>

<sup>a</sup> Includes committed facilities which had not been programmed through calendar year 1966.

Source: SEWRPC.

Table A-13  
MILES AND CONSTRUCTION COSTS OF PROPOSED NEW AND IMPROVED ARTERIAL  
STREET AND HIGHWAY FACILITIES IN WASHINGTON COUNTY:  
1990 RECOMMENDED TRANSPORTATION PLAN  
(Costs in Millions of 1966 Dollars)

Functional Facility Type	New Facilities <sup>a</sup>		Improved Facilities		Total	
	Miles	Construction Cost	Miles	Construction Cost	Miles	Construction Cost
<b>Standard Arterial:</b>						
2-lane . . . . .	14.8	\$ 2.812	24.3	\$ 3.906	39.1	\$ 6.718
4-lane . . . . .	--	--	10.0	4.431	10.0	4.431
6-lane . . . . .	--	--	--	--	--	--
Subtotal	14.8	2.812	34.3	8.337	49.1	11.149
<b>Expressway:</b>						
4-lane . . . . .	--	--	--	--	--	--
6-lane . . . . .	--	--	--	--	--	--
Subtotal	--	--	--	--	--	--
<b>Freeway:</b>						
4-lane . . . . .	13.6	9.248	21.9	14.892	35.5	24.140
6-lane . . . . .	--	--	6.1	5.246	6.1	5.246
8-lane . . . . .	--	--	--	--	--	--
Subtotal	13.6	9.248	28.0	20.138	41.6	29.386
<b>Total</b>	<b>28.4</b>	<b>\$12.060</b>	<b>62.3</b>	<b>\$28.475</b>	<b>90.7</b>	<b>\$40.535</b>

<sup>a</sup> Includes committed facilities which had not been programmed through calendar year 1966.

Source: SEWRPC.

Table A-14

MILES AND CONSTRUCTION COSTS OF PROPOSED NEW AND IMPROVED ARTERIAL STREET AND HIGHWAY FACILITIES IN WAUKESHA COUNTY:  
1990 RECOMMENDED TRANSPORTATION PLAN  
(Costs in Millions of 1966 Dollars)

Functional Facility Type	New Facilities <sup>a</sup>		Improved Facilities		Total	
	Miles	Construction Cost	Miles	Construction Cost	Miles	Construction Cost
<b>Standard Arterial:</b>						
2-lane . . . . .	55.2	\$ 11.697	90.3	\$ 18.037	145.5	\$ 29.734
4-lane . . . . .	13.3	6.571	123.3	67.941	136.6	74.512
6-lane . . . . .	--	--	11.2	10.014	11.2	10.014
Subtotal	68.5	18.268	224.8	95.992	293.3	114.260
<b>Expressway:</b>						
4-lane . . . . .	3.8 <sup>b</sup>	1.900	7.6	3.725	11.4	5.625
6-lane . . . . .	--	--	--	--	--	--
Subtotal	3.8	1.900	7.6	3.725	11.4	5.625
<b>Freeway:</b>						
4-lane . . . . .	55.8	54.412	--	--	55.8	54.412
6-lane . . . . .	12.2	32.330	10.4	9.616	22.6	41.946
8-lane . . . . .	--	--	--	--	--	--
Subtotal	68.0	86.742	10.4	9.616	78.4	96.358
<b>Total</b>	<b>140.3</b>	<b>\$106.910</b>	<b>242.8</b>	<b>\$109.333</b>	<b>383.1</b>	<b>\$216.243</b>

<sup>a</sup> Includes committed facilities which had not been programmed through calendar year 1966.

<sup>b</sup> This mileage is not shown on the proposed freeway system plan.

Source: SEWRPC.

Table A-15

TOTAL VEHICLES PASSING EXTERNAL CORDON AT THE REGIONAL BOUNDARY:  
1963 AND 1990 RECOMMENDED TRANSPORTATION PLAN

County	Route Identification	1963 Route Volume	Planned Increment		1990 Route Volume
			Number	Percent	
Ozaukee . . .	Northerly Extension of N-S Freeway	New Freeway	7020	---	7020
" . . .	USH 141 & STH 32	5140	- 4100	- 80	1040
" . . .	CTH B	270	430	159	700
" . . .	Northerly Extension of Stadium Freeway	New Freeway	13240	---	13240
" . . .	STH 57	2870	- 1860	- 65	1010
" . . .	CTH I	200	90	45	290
Washington. . .	STH 144 & STH 28	970	760	78	1730
" . . .	CTH S	1240	790	64	2030
" . . .	USH 45	1130	1100	97	2230
" . . .	CTH V	990	610	62	1600
" . . .	USH 41 & STH 28	10100	12060	119	22160
" . . .	STH 175	640	630	98	1270
" . . .	STH 33	2200	1080	49	3280
" . . .	CTH N	520	420	81	940
" . . .	STH 60	1590	3390	213	4980
Waukesha . . .	CTH P	510	780	153	1290
" . . .	STH 67	1020	1400	137	2420
" . . .	Bay Freeway	New Freeway	7080	---	7080
" . . .	USH 16	5520	- 1510	- 27	4010
" . . .	IH 94	New Freeway	23410	---	23410
" . . .	STH 142 (STH 30)	6120	- 4210	- 69	1910
" . . .	USH 18	1840	1090	58	2930
Walworth . . .	USH 12 City Route	3050	990	32	4040
" . . .	USH 12 Freeway	New Freeway	16070	---	16070
" . . .	CTH S	640	360	56	1000
" . . .	STH 59	1330	1020	77	2350
" . . .	CTH A	1170	810	69	1980
" . . .	Janesville Freeway (USH 14 & STH 11)	4160	3950	95	8110
" . . .	STH 15	2700	- 1660	- 61	1040
" . . .	Rock Freeway	New Freeway	9120	---	9120
" . . .	CTH C	260	890	342	1150
" . . .	USH 14	4580	3900	85	8480
" . . .	STH 120	2310	2240	97	4550
" . . .	USH 12 City Route	5000	- 3400	- 68	1600
" . . .	USH 12 Freeway	New Freeway	18720	---	18720
Kenosha . . .	CTH P	1290	1150	89	2440
" . . .	Evans Road	1670	600	36	2270
" . . .	STH 83	4260	5930	139	10190
" . . .	USH 45	3090	1670	54	4760
" . . .	IH 94	20150	16350	81	36500
" . . .	CTH H	200	1000	500	1200
" . . .	Lake Freeway	New Freeway	17450	---	17450
" . . .	STH 31	3400	350	10	3750
" . . .	CTH EZ	2640	110	4	2750
" . . .	North Shore Highway	New Arterial	6750	---	6750
" . . .	STH 32	5660	4270	75	9930

Source: SEWRPC.



Table A-16  
 VOLUME-TO-CAPACITY RATIOS<sup>a</sup> FOR THE HIGHWAY NETWORK IN KENOSHA COUNTY:  
 1963 AND 1970, 1980, AND 1990 RECOMMENDED TRANSPORTATION PLAN

Year	Volume/Capacity Range 0.00 - 0.90		Volume/Capacity Range 0.91 - 1.10		Volume/Capacity Range Above 1.10		Total	
	Miles	Percent of Total	Miles	Percent of Total	Miles	Percent of Total	Miles	Percent
1963 . . . . .	260.3	92.6	7.2	2.6	13.5	4.8	281.5	100.0
1970 . . . . .	276.7	92.9	11.9	4.0	9.4	3.1	298.0	100.0
1980 . . . . .	306.0	93.1	17.0	5.2	5.7	1.7	328.7	100.0
1990 . . . . .	321.9	93.2	21.5	6.2	2.0	0.6	345.4	100.0

<sup>a</sup> The significance of the volume-to-capacity ranges used is:

0.00 - 0.90; Under design capacity, fully adequate and safest operational level.

0.91 - 1.10; At design capacity but still adequate.

Above 1.10; Over design capacity, congested at times.

Note: Mileage figures in this table include freeway, expressway, and arterial ramp facilities.

Source: SEWRPC.

Table A-17  
 VOLUME-TO-CAPACITY RATIOS<sup>a</sup> FOR THE HIGHWAY NETWORK IN MILWAUKEE COUNTY:  
 1963 AND 1970, 1980, AND 1990 RECOMMENDED TRANSPORTATION PLAN

Year	Volume/Capacity Range 0.00 - 0.90		Volume/Capacity Range 0.91 - 1.10		Volume/Capacity Range Above 1.10		Total	
	Miles	Percent of Total	Miles	Percent of Total	Miles	Percent of Total	Miles	Percent
1963 . . . . .	589.8	74.5	85.4	10.8	116.3	14.7	791.5	100.0
1970 . . . . .	843.4	84.3	75.2	7.5	81.7	8.2	1,000.3	100.0
1980 . . . . .	895.8	89.0	65.8	6.5	45.3	4.5	1,006.9	100.0
1990 . . . . .	940.6	93.4	53.9	5.4	12.4	1.2	1,006.9	100.0

<sup>a</sup> The significance of the volume-to-capacity ranges used is:

0.00 - 0.90; Under design capacity, fully adequate and safest operational level.

0.91 - 1.10; At design capacity but still adequate.

Above 1.10; Over design capacity, congested at times.

Note: Mileage figures in this table include freeway, expressway, and arterial ramp facilities.

Source: SEWRPC.

Table A-18

VOLUME-TO-CAPACITY RATIOS<sup>a</sup> FOR THE HIGHWAY NETWORK IN OZAUKEE COUNTY:  
1963 AND 1970, 1980, AND 1990 RECOMMENDED TRANSPORTATION PLAN

Year	Volume/Capacity Range 0.00 - 0.90		Volume/Capacity Range 0.91 - 1.10		Volume/Capacity Range Above 1.10		Total	
	Miles	Percent of Total	Miles	Percent of Total	Miles	Percent of Total	Miles	Percent
1963 . . . . .	250.3	94.5	6.3	2.4	8.3	3.1	264.9	100.0
1970 . . . . .	263.4	95.4	7.2	2.6	5.5	2.0	276.1	100.0
1980 . . . . .	303.3	96.5	8.0	2.5	3.0	1.0	314.3	100.0
1990 . . . . .	319.7	97.1	9.1	2.8	0.5	0.1	329.3	100.0

<sup>a</sup> The significance of the volume-to-capacity ranges used is:

0.00 - 0.90; Under design capacity, fully adequate and safest operational level.

0.91 - 1.10; At design capacity but still adequate.

Above 1.10; Over design capacity, congested at times.

Note: Mileage figures in this table include freeway, expressway, and arterial ramp facilities.

Source: SEWRPC.

Table A-19

VOLUME-TO-CAPACITY RATIOS<sup>a</sup> FOR THE HIGHWAY NETWORK IN RACINE COUNTY:  
1963 AND 1970, 1980, AND 1990 RECOMMENDED TRANSPORTATION PLAN

Year	Volume/Capacity Range 0.00 - 0.90		Volume/Capacity Range 0.91 - 1.10		Volume/Capacity Range Above 1.10		Total	
	Miles	Percent of Total	Miles	Percent of Total	Miles	Percent of Total	Miles	Percent
1963 . . . . .	327.7	93.3	10.0	2.8	13.6	3.9	351.3	100.0
1970 . . . . .	355.9	93.4	14.7	3.9	10.3	2.7	380.9	100.0
1980 . . . . .	411.4	93.6	20.9	4.8	7.1	1.6	439.4	100.0
1990 . . . . .	426.9	92.7	29.7	6.4	4.0	0.9	460.6	100.0

<sup>a</sup> The significance of the volume-to-capacity ranges used is:

0.00 - 0.90; Under design capacity, fully adequate and safest operational level.

0.91 - 1.10; At design capacity but still adequate.

Above 1.10; Over design capacity, congested at times.

Note: Mileage figures in this table include freeway, expressway, and arterial ramp facilities.

Source: SEWRPC.

Table A-20  
 VOLUME-TO-CAPACITY RATIOS<sup>a</sup> FOR THE HIGHWAY NETWORK IN WALWORTH COUNTY:  
 1963 AND 1970, 1980, AND 1990 RECOMMENDED TRANSPORTATION PLAN

Year	Volume/Capacity Range 0.00 - 0.90		Volume/Capacity Range 0.91 - 1.10		Volume/Capacity Range Above 1.10		Total	
	Miles	Percent of Total	Miles	Percent of Total	Miles	Percent of Total	Miles	Percent
1963 . . . . .	390.5	97.7	3.9	1.0	5.3	1.3	399.7	100.0
1970 . . . . .	439.1	97.7	6.1	1.4	4.1	0.9	449.3	100.0
1980 . . . . .	480.5	97.8	8.4	1.7	2.2	0.5	491.1	100.0
1990 . . . . .	480.2	97.8	10.8	2.2	0.1	0.0	491.1	100.0

<sup>a</sup> The significance of the volume-to-capacity ranges used is:

0.00 - 0.90; Under design capacity, fully adequate and safest operational level.

0.91 - 1.10; At design capacity but still adequate.

Above 1.10; Over design capacity, congested at times.

Note: Mileage figures in this table include freeway, expressway, and arterial ramp facilities.

Source: SEWRPC.

Table A-21  
 VOLUME-TO-CAPACITY RATIOS<sup>a</sup> FOR THE HIGHWAY NETWORK IN WASHINGTON COUNTY:  
 1963 AND 1970, 1980, AND 1990 RECOMMENDED TRANSPORTATION PLAN

Year	Volume/Capacity Range 0.00 - 0.90		Volume/Capacity Range 0.91 - 1.10		Volume/Capacity Range Above 1.10		Total	
	Miles	Percent of Total	Miles	Percent of Total	Miles	Percent of Total	Miles	Percent
1963 . . . . .	401.8	99.9	0.5	0.1	0.0	0.0	402.3	100.0
1970 . . . . .	406.2	98.9	4.2	1.0	0.2	0.1	410.6	100.0
1980 . . . . .	405.4	97.8	8.7	2.1	0.5	0.1	414.6	100.0
1990 . . . . .	410.3	96.8	12.4	2.9	1.0	0.3	423.7	100.0

<sup>a</sup> The significance of the volume-to-capacity ranges used is:

0.00 - 0.90; Under design capacity, fully adequate and safest operational level.

0.91 - 1.10; At design capacity but still adequate.

Above 1.10; Over design capacity, congested at times.

Note: Mileage figures in this table include freeway, expressway, and arterial ramp facilities.

Source: SEWRPC.

Table A-22

VOLUME-TO-CAPACITY RATIOS<sup>a</sup> FOR THE HIGHWAY NETWORK IN WAUKESHA COUNTY:  
1963 AND 1970, 1980, AND 1990 RECOMMENDED TRANSPORTATION PLAN

Year	Volume/Capacity Range 0.00 - 0.90		Volume/Capacity Range 0.91 - 1.10		Volume/Capacity Range Above 1.10		Total	
	Miles	Percent of Total	Miles	Percent of Total	Miles	Percent of Total	Miles	Percent
							Miles	Percent
1963 . . . . .	635.6	91.2	26.6	3.8	34.8	5.0	697.0	100.0
1970 . . . . .	686.2	91.6	35.5	4.7	27.3	3.7	749.0	100.0
1980 . . . . .	799.0	92.1	46.0	5.3	22.5	2.6	867.5	100.0
1990 . . . . .	827.4	92.3	52.3	5.8	17.0	1.9	896.7	100.0

<sup>a</sup> The significance of the volume-to-capacity ranges used is:

0.00 - 0.90; Under design capacity, fully adequate and safest operational level.

0.91 - 1.10; At design capacity but still adequate.

Above 1.10; Over design capacity, congested at times.

Note: Mileage figures in this table include freeway, expressway, and arterial ramp facilities.

Source: SEWRPC.

## Appendix B

### TRANSPORTATION SYSTEM BENEFIT-COST ANALYSIS

The benefit-cost analysis method of evaluating government investments in public works was discussed in Volume 2 of this report, and its application to the evaluation of the three alternative transportation plans prepared under the regional land use-transportation study described. Since the recommended transportation plan is somewhat different from the transportation plan prepared to serve the Controlled Existing Trend Land Use Plan alternative, as described in Volume 2 of this report, a benefit-cost analysis of the recommended transportation plan was required. The same general method used to analyze the three alternative plans, as described in Volume 2 of this report, was used to provide the benefit-cost analysis of the recommended plan. The purpose of this appendix is to present the analysis and its results in greater detail than possible in the text of this report.

Only tangible benefits and costs were included in the analysis because of the generally non-quantifiable nature of the intangible benefits and costs associated with the recommended transportation plan. A monetary value for the benefits expected to be received from the proposed highway system was calculated as follows:

1. An assignment of future (1990) traffic demand, derived from the recommended land use plan, was made to the existing plus committed highway network<sup>1</sup> in order to obtain a measure of the total vehicle miles and vehicle hours of travel by automobile which might be expected to occur on that network on an average weekday in 1990 if no further improvements were made in the existing highway transportation system.
2. The total vehicle miles and vehicle hours of travel by automobile were adjusted to account for the number of trucks which

could be expected to utilize this network. This was done by applying a factor of 1.1228 to both the total vehicle miles and vehicle hours of travel by automobile. This factor was selected to represent the proportional relationship of trucks to total motor vehicles in the Region, as indicated by the inventory findings.

3. In order to provide a more accurate measure of operating, time, and accident costs, the arterial street and highway network was divided into four segments:
  - a. Arterial streets and highways in Milwaukee County.
  - b. Freeways in Milwaukee County.
  - c. Arterial streets and highways within the Region outside Milwaukee County.
  - d. Freeways within the Region outside Milwaukee County.
4. The adjusted total vehicle miles of travel on each of the four segments of the network were then multiplied by derived cost factors, which were prepared to reflect motor vehicle operating costs on each segment. Four cost factors were derived, one for each of the four segments of the network:
  - a. Milwaukee County arterials, \$0.0610.
  - b. Milwaukee County freeways, \$0.0594.
  - c. Balance of the Region arterials, \$0.0540.
  - d. Balance of Region freeways, \$0.0641.
5. Vehicle hours of travel on the various segments of the network were multiplied by a cost factor of \$1.5500, selected to reflect the cost of driver time.

<sup>1</sup> For a description of the existing plus committed highway network, see Chapter V, Volume 2, SEWRPC Planning Report No. 7, Forecasts and Alternative Plans--1990, June 1966.

6. Total daily operating costs and total daily time costs for an average weekday in 1990 were then obtained by summing the costs derived for the various segments of the network. These totals were then multiplied by 310 to obtain estimated annual operating and time costs in the year 1990.
7. Accident rates and unit costs were established for three different classes of accidents and four segments of the network and applied to obtain total accident costs (see Table B-1). The unit costs used were:
  - a. Fatal accidents, \$34,400 each.
  - b. Injury accidents, \$1,800 each.
  - c. Property damage accidents, \$310 each.
8. The annual accident cost for the year 1990 was then obtained by multiplying the average daily accident cost by 310.
9. The total annual road user costs in 1990 on the existing plus committed highway network were then obtained by summing the total operating, travel time, and accident costs.
10. Steps 1 through 9 were then carried out utilizing, however, the highway network proposed in the recommended plan instead of the existing plus committed network. In Step 2, the factor used to adjust the total vehicle miles and vehicle hours of travel for truck traffic was 1.1282 instead of 1.1228 in order to account for the anticipated increase in truck utilization within the Region. In Step 4 above, the vehicle miles of travel were multiplied by the following modified cost factors in order to account for the greater average speeds expected on each of the four segments of the network under the planned highway system:
  - a. Milwaukee County arterials, \$0.0615.
  - b. Milwaukee County freeways, \$0.0617.
  - c. Balance of Region arterials, \$0.0550.
  - d. Balance of Region freeways, \$0.0688.

Travel time costs and accident rates and costs by network segment were assumed to remain the same for the proposed as for the existing plus committed network.

11. Road user benefits, defined as the savings in road user operating, travel time, and accident costs accruing through the provision of the proposed highway facilities, were then obtained by subtracting the annual road user costs in 1990 on the proposed network from the annual road user costs in 1990 on the existing plus committed network, as follows:

- a. Road user costs on existing plus committed network in 1990

Vehicle operating costs	\$ 664,422,690
Travel time costs	636,064,200
Accident costs:	
Fatalities	18,498,940
Injuries	33,790,000
Property damage	7,309,800
Total	<u>\$1,360,085,630</u>

- b. Road user costs on proposed network in 1990

Vehicle operating costs	\$ 694,116,350
Travel time costs	502,045,620
Accident costs:	
Fatalities	15,157,760
Injuries	29,741,710
Property damage	6,279,670
Total	<u>\$1,247,341,110</u>

- a. \$1,360,085,630
  - b. 1,247,341,110
- \$ 112,744,520 = Road user benefit in 1990

12. The present worth on January 1, 1970, of all benefits received from the proposed transportation system was calculated for three time periods using a 6 percent rate of return:

- a. 1970 through 1990, wherein an equal staging of construction was assumed to yield an equal annual increase in benefits received.
- b. 1991 through 1995, wherein benefits were assumed to accrue annually at the level reached in 1990.

c. 1996 through 2014, wherein benefits were assumed to diminish annually in equal amounts as the staged facilities become obsolete.

13. The benefits calculated for each time period were summed to determine the value, as of January 1, 1970, of all benefits received over the 1970 to 2015 period. This value, calculated to be \$819,245,000, was then utilized as the numerator of the benefit-cost ratio.

A monetary value for the costs incurred under the proposed highway system was calculated as follows:

1. Construction costs,<sup>2</sup> which included right-of-way acquisition and engineering costs, were obtained by summing such costs as estimated for all of the facilities proposed in the transportation plan. Total cost for new facilities amounted to \$537,734,000 and for upgraded facilities to \$528,711,000. If the proposed system were not constructed, an estimated expenditure of \$71,870,000 would be required to maintain the structural adequacy of the existing facilities which, under the plan, would be upgraded to higher type facilities. This \$71,870,000 was, therefore, subtracted from the \$528,711,000 to yield a total of \$456,841,000. The costs of constructing the proposed system were then calculated as:

\$537,734,000 for recommended new facilities	
456,841,000 for recommended upgrading	
\$994,575,000	

2. Maintenance costs<sup>3</sup> for the proposed system were calculated for both new and upgraded facilities. Maintenance costs in the year 1990 for the proposed new facilities were estimated as \$2,698,000. Maintenance costs on the existing plus committed network in 1990 were estimated as \$3,641,000 if

<sup>2</sup> For a detailed tabulation of unit costs used in deriving total costs, see Appendix Table A-33 in Volume 2, SEWRPC Planning Report No. 7, *Forecasts and Alternative Plans--1990, June 1966*.

<sup>3</sup> *Ibid*, footnote 2, and Table 24, Chapter III of this volume.

no additional facilities were added between 1970 and 1990. Under the recommended transportation system, however, more than 1,000 miles of facilities are proposed to be upgraded. The maintenance costs on these upgraded facilities were estimated as \$4,957,000 in 1990, or \$1,316,000 more than the amount that would be incurred if the plan were not implemented. Therefore, total maintenance in 1990 for the proposed system was estimated at:

\$2,698,000 on recommended new facilities	
1,316,000 differential due to recommended upgrading	
\$4,014,000	

3. The present worth on January 1, 1970, of all construction and maintenance costs incurred in the implementation of the plan proposals was calculated for three time periods using a 6 percent interest factor:

- a. 1970 through 1989, wherein the construction of the proposed system would be staged in equal annual increments and annual construction costs incurred accordingly.
- b. 1990 through 1995, wherein the costs incurred annually would be equal to the maintenance costs incurred in 1990.
- c. 1996 through 2014, wherein the maintenance costs incurred would diminish annually in equal amounts as the staged facilities become obsolete.

4. The costs calculated for each time period were then summed to determine the value, as of January 1, 1970, of all construction and maintenance costs incurred over the 1970 to 2015 period. This value, calculated to be \$601,228,000, was then utilized as the denominator of the benefit-cost ratio.

5. The benefit-cost ratio was then calculated as:

$$\frac{\$819,245,000}{\$601,228,000} = 1.362$$

It should be noted that the benefit-cost ratio of 1.362, as calculated for the recommended trans-

portation system plan, is slightly lower than the ratio of 1.455 calculated for the Controlled Existing Trend Plan as described in Volume 2 of this report. The decrease in the ratio was primarily due to the addition to the proposed highway network

of freeway facilities which are needed for statewide highway system continuity and which, as such, did not necessarily meet the threshold service warrants established in the regional transportation system development objectives and standards.

Table B-1  
ACCIDENT RATES AND COSTS<sup>a</sup> PER 100 MILLION VEHICLE MILES OF TRAVEL FOR  
FREEWAYS, ARTERIALS, AND TRANSIT IN COMPONENT PARTS OF THE REGION: 1965

Facility Type	Fatal <sup>b</sup> Accident Rate	Fatality <sup>c</sup> Rate	Injury Accident Rate	Injury Rate	Property Damage Accident Rate	Fatality Costs	Injury Costs	Property Damage Costs
<b>Freeways:</b>								
Milwaukee County. .	1.05	1.57	67.2	91.7	127	\$ 54,000	\$165,100	\$ 39,400
Remainder of Region	1.85	2.27	48.1	88.9	67	78,100	160,000	20,800
<b>Arterials:</b>								
Milwaukee County. .	3.04	3.23	256	356	522	111,100	640,800	161,800
Remainder of Region	7.55	8.98	102	157	162	308,900	282,600	50,200
<b>Transit:</b>	Total Vehicle and Passenger Accidents					Total Costs of all Accidents		
Milwaukee County. .	9,150 <sup>d</sup>					\$1,290,000		

<sup>a</sup> Accident costs were calculated using \$34,400 per fatality, \$1,800 per injury, and \$310 per property damage accident.

<sup>b</sup> Fatal Accident Rate is the number of accidents involving one or more fatalities per vehicle mile of travel.

<sup>c</sup> Fatality Rate is the number of fatalities per vehicle mile of travel.

<sup>d</sup> The Transit accident rate includes all vehicle and passenger accidents regardless of cost or severity of the damage.

Source: State Highway Commission; Safety Commission, City of Milwaukee; Milwaukee County Expressway Commission; Milwaukee and Suburban Transport Corporation; National Safety Council; and SEWRPC.



## Appendix C

### MODEL RESOLUTION FOR PLAN ADOPTION

WHEREAS, the Southeastern Wisconsin Regional Planning Commission, which was duly created by the Governor of the State of Wisconsin in accordance with Section 66.945 of the Wisconsin Statutes on the 8th day of August 1960, upon petition of the counties of Kenosha, Milwaukee, Ozaukee, Racine, Walworth, Washington, and Waukesha, has the function and duty of making and adopting a master plan for the physical development of the Region.

WHEREAS, the Southeastern Wisconsin Regional Planning Commission has:

1. Collected, compiled, processed, and analyzed various types of demographic, economic, public utility, financial and natural resource, land use, and transportation data and materials pertaining to the Region.
2. Prepared objectives, principles, and standards for regional land use and transportation development.
3. Forecast regional growth and changes as related to population, employment, income, manufacturing, automobile and motor truck availability, public revenue, and land use.
4. Developed, compared, and evaluated three alternative plans for the development of the Region.
5. Selected and adopted on December 1, 1966, a Land Use Plan and a Transportation Plan for the development of the Region to the year 1990.

WHEREAS, the aforementioned inventories, analyses, objectives, principles, standards, forecasts, alternative plans, and adopted plan are set forth in a published report entitled SEWRPC Planning Report No. 7, comprised of the following volumes:

1. Inventory Findings—1963.
2. Forecasts and Alternative Plans—1990.
3. Recommended Regional Land Use and Transportation Plans—1990.

WHEREAS, the Commission has transmitted certified copies of its resolution adopting such Land Use and Transportation Plans, together with the aforementioned Planning Report No. 7, to the local governmental units.

WHEREAS, the (Name of Local Governing Body) has supported, participated in the financing of, and generally concurred in the regional planning programs undertaken by the Southeastern Wisconsin Regional Planning Commission and believes that the Land Use and Transportation Plans prepared by the Commission will be a valuable guide not only to the development of the Region but of their community and the adoption of such Plans by the (Name of Local Governing Body) will assure a common understanding by the several governmental levels concerned and enable their staffs to program the necessary areawide and local plan implementation work.

NOW, THEREFORE, BE IT HEREBY RESOLVED that, pursuant to Section 66.945(12) of the Wisconsin Statutes, the (Name of Local Governing Body) on \_\_\_\_\_ day of \_\_\_\_\_, 1967, hereby adopts the regional Land Use and Transportation Plans previously adopted by the Commission as set forth in SEWRPC Planning Report No. 7 as a guide for regional and community development.

BE IT FURTHER HEREBY RESOLVED that the \_\_\_\_\_ Clerk transmit a certified copy of this resolution to the Southeastern Wisconsin Regional Planning Commission.

\_\_\_\_\_  
(Chairman, Mayor, or President  
of the Local Governing Body)

ATTESTATION:

\_\_\_\_\_  
(Clerk of the Local Governing Body)

## *Appendix D*

# REGIONAL LAND USE PLAN IMPLEMENTATION PROCEDURES

Adoption of the recommended regional land use and transportation plans by the seven county boards and by the communities within each of the counties is only the first step in a series of public and private steps toward the ultimate implementation of the regional plans. While the development of land use and transportation plans for a large urbanizing region, such as southeastern Wisconsin, is an arduous, important, and necessary task, the implementation of these plans is an even more arduous and important task. The Regional Planning Commission, being strictly an advisory body, cannot actually bring about the development of the Region in accordance with the plans. It remains the responsibility of the counties and local units of government which comprise the Region, as well as of certain state and federal agencies of government concerned, to utilize the available plan implementation devices and, where necessary, develop new implementation devices and action programs to bring about regional development in accordance with the recommended plans.

The following series of six illustrations graphically depict five major steps necessary to implement the regional land use plan through action by local units of government. Figure D-1 shows a small area of the Region as it appears on the Proposed Regional Land Use and Freeway Plan Map attached to the inside back cover of this volume. The area shown lies almost entirely within one community, and the first step toward plan implementation by this community is the adoption of the recommended regional generalized land use plan as a guide to future land use development within the community. Figure D-2 shows an approximately one square mile tract of land within the community selected as an example for the execution of the remaining four steps in the land use plan implementation procedure at the local level.

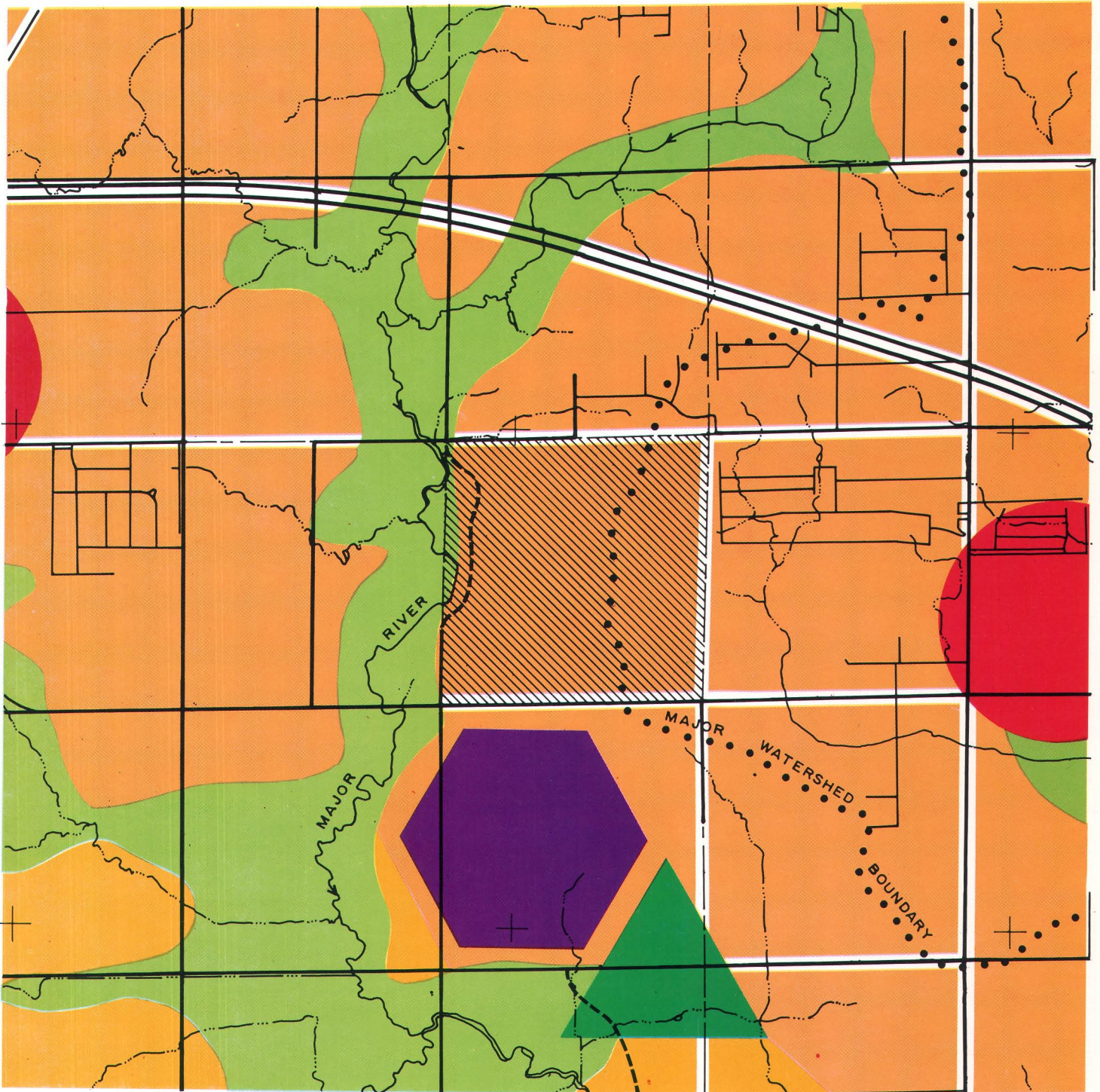
Figure D-2 shows the selected approximately one square mile tract, comprising 634 acres, as it presently exists. A perennial and navigable stream flows in and out of the northwest quarter of the tract. Adjacent to the stream and within the tract

boundaries are delineated the soils which have severe limitation for urban development as determined and mapped in the regional operational soil survey. The 10- and 100-year recurrence interval flood hazard lines have also been shown as determined and mapped in the regional watershed studies. Almost all of the land within the 634-acre tract is presently being used for agricultural and agriculture-related purposes with the exception of two non-farm residences. Some woodland area exists within the tract; but these areas have been used for pasturing purposes, reducing their value for commercial and aesthetic use purposes. A major drainage basin divide traverses the tract in a north-south direction, and slopes within the tract average approximately 4 percent. On the regional land use plan, the 634-acre tract is delineated as a planned residential development unit bounded on the north, east, and south by standard arterial streets and on the west by a regional environmental corridor. The regional land use plan recommends that the unit be developed for medium-density residential use.

The second step in the regional land use plan implementation procedure is illustrated in Figure D-3 and constitutes the interim zoning of the tract by the local unit of government as a holding action. All of the 634-acre tract would be placed initially in a zoning district in which no urban development would be allowed until a more precise plan for the tract is developed. More specifically, those areas of the tract covered by soils having severe limitations for urban development and those areas of the tract lying within the 100-year recurrence interval flood hazard line would be placed in a conservancy zone in which no urban development would be permitted. The remainder of the tract would be placed in an exclusive agricultural zone in which only agricultural uses would be permitted. Under this interim agricultural zoning, only the two non-farm dwellings would constitute nonconforming uses.

The third step in the regional land use plan implementation procedure would consist of the preparation by the community of a long-range community

Figure D-1  
 REGIONAL GENERAL LAND USE PLAN  
 1990



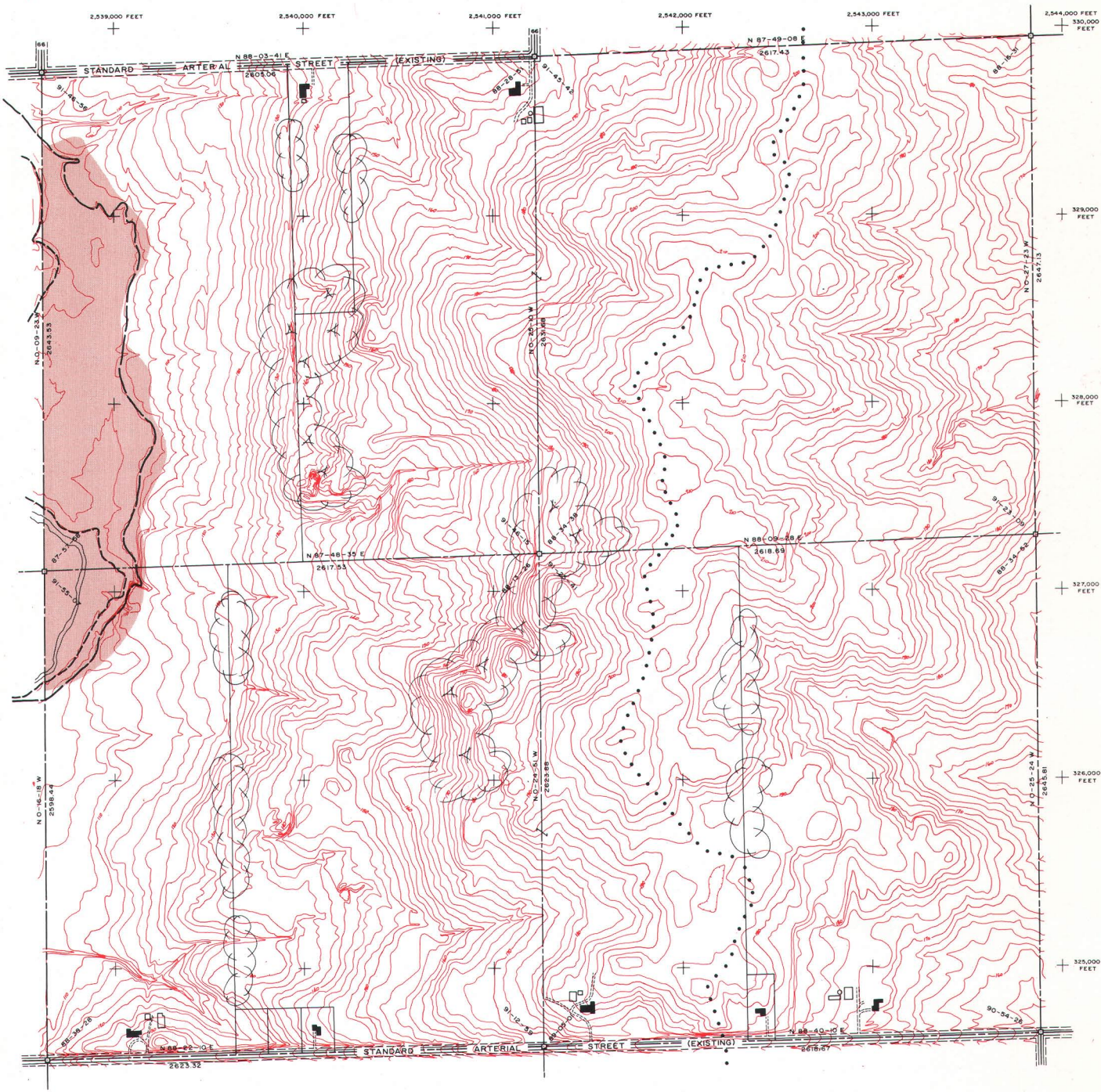
**LEGEND**

- |  |  |   |   |  |                             |
|--|--|---|---|--|-----------------------------|
|  | LOW DENSITY RESIDENTIAL<br>(0.5-7.2 PERSONS PER RES. ACRE)     |  | MAJOR PUBLIC OUTDOOR<br>RECREATIONAL SITE                           |  | PARK DRIVE                  |
|  | MEDIUM DENSITY RESIDENTIAL<br>(7.3-22.8 PERSONS PER RES. ACRE) |  | PRIMARY ENVIRONMENTAL<br>CORRIDOR                                   |  | FREEWAY                     |
|   | MAJOR RETAIL AND SERVICE                                       |  | STANDARD ARTERIAL<br>STREET   |  | MAJOR WATERSHED<br>BOUNDARY |
|   | PUBLIC AIRPORT   |  | SELECTED SAMPLE<br>NEIGHBORHOOD<br>(SEE FIGURES D-2<br>THROUGH D-6) |  | NEIGHBORHOOD<br>BOUNDARY    |



SCALE  
 1" = 3000'

Figure D-2  
EXISTING CONDITIONS



LEGEND

- |     |                                |    |   |  |   |
|-----|--------------------------------|----|---|--|---|
| --- | SECTION LINE                   |    | MAJOR RIVER                             |  | EXISTING DWELLING                                   |
| --- | QUARTER SECTION LINE           |    | MAJOR WATERSHED BOUNDARY                |  | EXISTING ACCESSORY STRUCTURE                        |
| --- | PROPERTY LINE                  |    | TOPOGRAPHY                              |  | WOODLAND  |
| --- | RIGHT-OF-WAY LINE              |    | SECTION OR QUARTER SECTION MONUMENT     |  | SOILS WITH SEVERE LIMITATIONS FOR URBAN DEVELOPMENT |
| --- | 10 YEAR FLOOD INUNDATION LINE  | +  | STATE PLANE COORDINATE SYSTEM GRID TICK |  |   |
| --- | 100 YEAR FLOOD INUNDATION LINE | == | PAVED STREET                            |  |   |

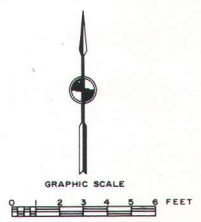
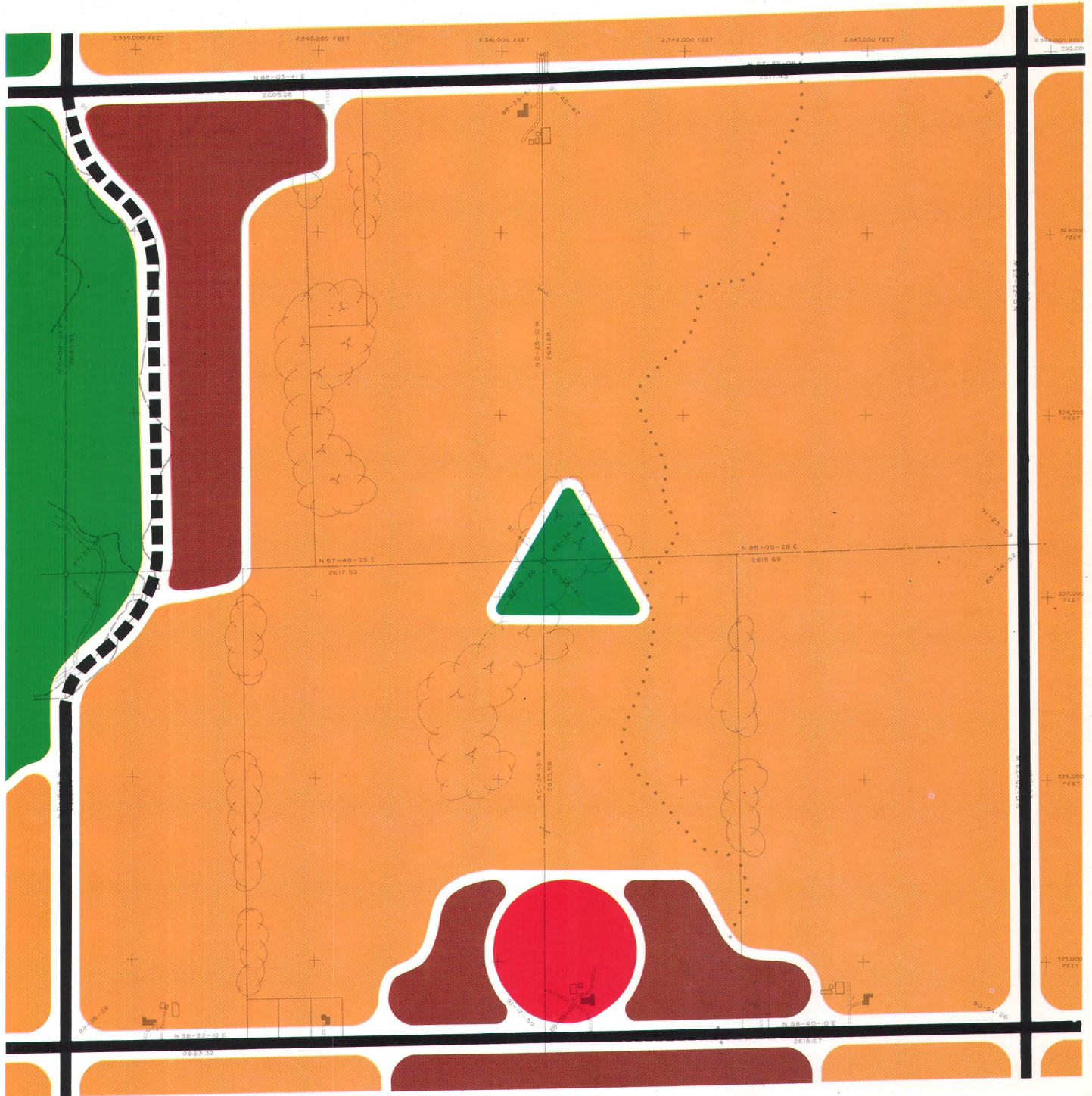







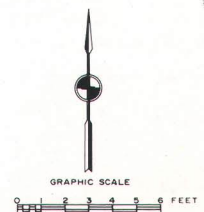


Figure D-4  
 COMMUNITY GENERAL LAND USE PLAN  
 1990



LEGEND

- |   |  |   |   |
|---|--|---|---|
|  | MEDIUM DENSITY RESIDENTIAL<br>(7.3 - 22.8 PERSONS PER RES. ACRE) |  | PUBLIC ELEMENTARY SCHOOL<br>AND NEIGHBORHOOD PARK |
|  | HIGH DENSITY RESIDENTIAL<br>(22.9 - 59.2 PERSONS PER RES. ACRE)  |  | PARKWAY   |
|  | NEIGHBORHOOD RETAIL AND<br>SERVICE                               |  | STANDARD ARTERIAL STREET                          |
|   |  |  | PARK DRIVE  |



land use plan as part of an overall community comprehensive planning program. This plan would seek to detail and refine the regional plan, integrating local and regional development objectives. Figure D-4 illustrates how future development of the 634-acre tract might be designated on the community land use plan. As indicated, the community plan designates the general areas within the tract to be developed for predominantly medium-density residential use and predominantly high-density residential use, as well as the general location of the park-school site and the neighborhood retail and service center. Also designated on the community plan are the community parkway proposals and the location of major streets. All of these uses are compatible with, and complemen-

tary to, the recommended regional land use and transportation plans.

Following the preparation and adoption by the community of a general land use plan, a precise neighborhood development plan should be prepared for each designated neighborhood within the community. The preparation and eventual adoption of such a precise plan becomes the fourth step in the regional land use plan implementation procedure and one of the first steps in the local land use plan implementation. Figure D-5 shows a precise neighborhood unit plan for the 634-acre tract prepared in accordance with the regional and community general land use plans (as illustrated in Figures D-1 and D-4). Table D-1 sets forth the

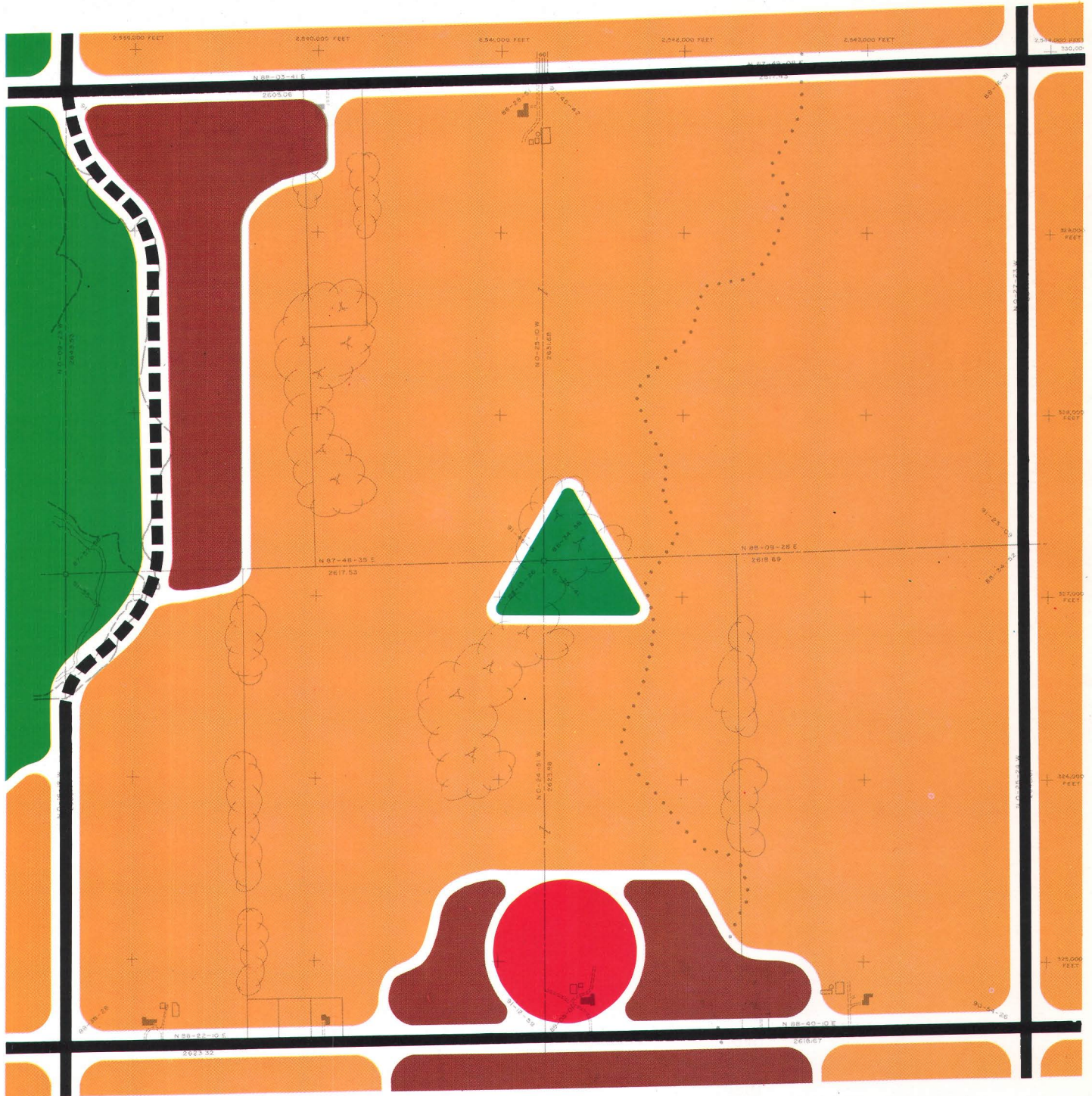
Table D-1  
LAND USE SUMMARY OF PRECISE NEIGHBORHOOD DEVELOPMENT PLAN

Medium-Density Neighborhood Development	Number	Acres	Percent of Total	Acres	Percent
GROSS AREA . . . . .	---	---	---	634.0	100.0
Persons/Acre . . . . .	10.0	---	---	---	---
Dwelling Units/Acre . . . . .	3.0	---	---	---	---
Persons/Square Mile . . . . .	6,290.0	---	---	---	---
Public Elementary School (K-6) Area . .	---	6.3	1.0	---	---
Number of Classrooms . . . . .	19.0	---	---	---	---
Number of Pupils . . . . .	534.0 <sup>a</sup>	---	---	---	---
Public Park Area . . . . .	---	45.0	7.1	---	---
Street Area . . . . .	---	140.0	22.1	---	---
Minor Streets . . . . .	---	( 97.0)	(15.3)	---	---
Collector Streets . . . . .	---	( 14.0)	( 2.2)	---	---
Arterial Streets . . . . .	---	( 29.0)	( 4.6)	---	---
Other Public & Semi-Public Area . . . .	---	5.1	0.8	---	---
Subtotal (Public Use Area) . . . . .	---	196.4	31.0	---	---
Neighborhood Commercial Area . . . . .	---	8.9	1.4	---	---
Private Park Area (Cluster Development)	---	23.5	3.7	---	---
Subtotal (Private Use Area) . . . . .	---	32.4	5.1	---	---
NET RESIDENTIAL AREA	---	---	---	405.2	63.9
Single-Family Area (Residential Acres).	---	383.0	60.4	---	---
Population . . . . .	5,477.0	---	---	---	---
Number of Dwelling Units . . . . .	1,660.0	---	---	---	---
Residential Acres/ 1,000 Population.	69.9	---	---	---	---
Persons/Acre . . . . .	14.3	---	---	---	---
Dwelling Units/Acre . . . . .	4.3	---	---	---	---
Multi-Family Area (Residential Acres) .	---	22.2	3.5	---	---
Population . . . . .	877.0	---	---	---	---
Number of Dwelling Units . . . . .	266.0	---	---	---	---
Residential Acres/ 1,000 Population.	25.3	---	---	---	---
Persons/Acre . . . . .	39.5	---	---	---	---
Dwelling Units/Acre . . . . .	11.9	---	---	---	---








<sup>a</sup> Represents 8.4 percent of total population.

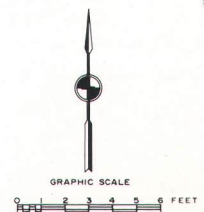
Source: SEWRPC.

Figure D-4  
 COMMUNITY GENERAL LAND USE PLAN  
 1990



LEGEND

- |   |  |   |   |
|---|--|---|---|
|  | MEDIUM DENSITY RESIDENTIAL<br>(7.3 - 22.8 PERSONS PER RES. ACRE) |  | PUBLIC ELEMENTARY SCHOOL<br>AND NEIGHBORHOOD PARK |
|  | HIGH DENSITY RESIDENTIAL<br>(22.9 - 59.2 PERSONS PER RES. ACRE)  |  | PARKWAY   |
|  | NEIGHBORHOOD RETAIL AND<br>SERVICE                               |  | STANDARD ARTERIAL STREET                          |
|   |  |  | PARK DRIVE  |



amounts of land within the tract allocated to each land use category by the proposed neighborhood unit plan shown in Figure D-5. Included in the table is an estimate of the population expected to reside within the neighborhood unit when fully developed.

The table shown compares closely with the standards for medium-density neighborhood development as shown in Table A-2, page 218, Volume 2 of this report, and restated in Table D-2. Two major differences in the recommended land use standards exist. Due to the presence of a major stream and attendant flood plain area within the boundary of the tract, the area devoted to public park land is greater than would normally be the case. Most of

this public park land area would serve both the community and the Region; and, consequently, the total area would not normally be ascribed to purely neighborhood use. The second major difference between the standards and the proposed development is the addition of private park lands brought about by the proposed cluster development.

The additional public park land is the major reason for the reduction in total residential land within the tract. In order to maintain lot yields, this reduction necessitated, in turn, a reduction in lot area per dwelling unit within the proposed development from the recommended regional average of about 10,000 square feet per dwelling unit to an average of approximately 9,160 square feet per

Table D-2

RESIDENTIAL PLANNING UNIT DEVELOPMENT STANDARDS FOR MEDIUM-DENSITY DEVELOPMENT

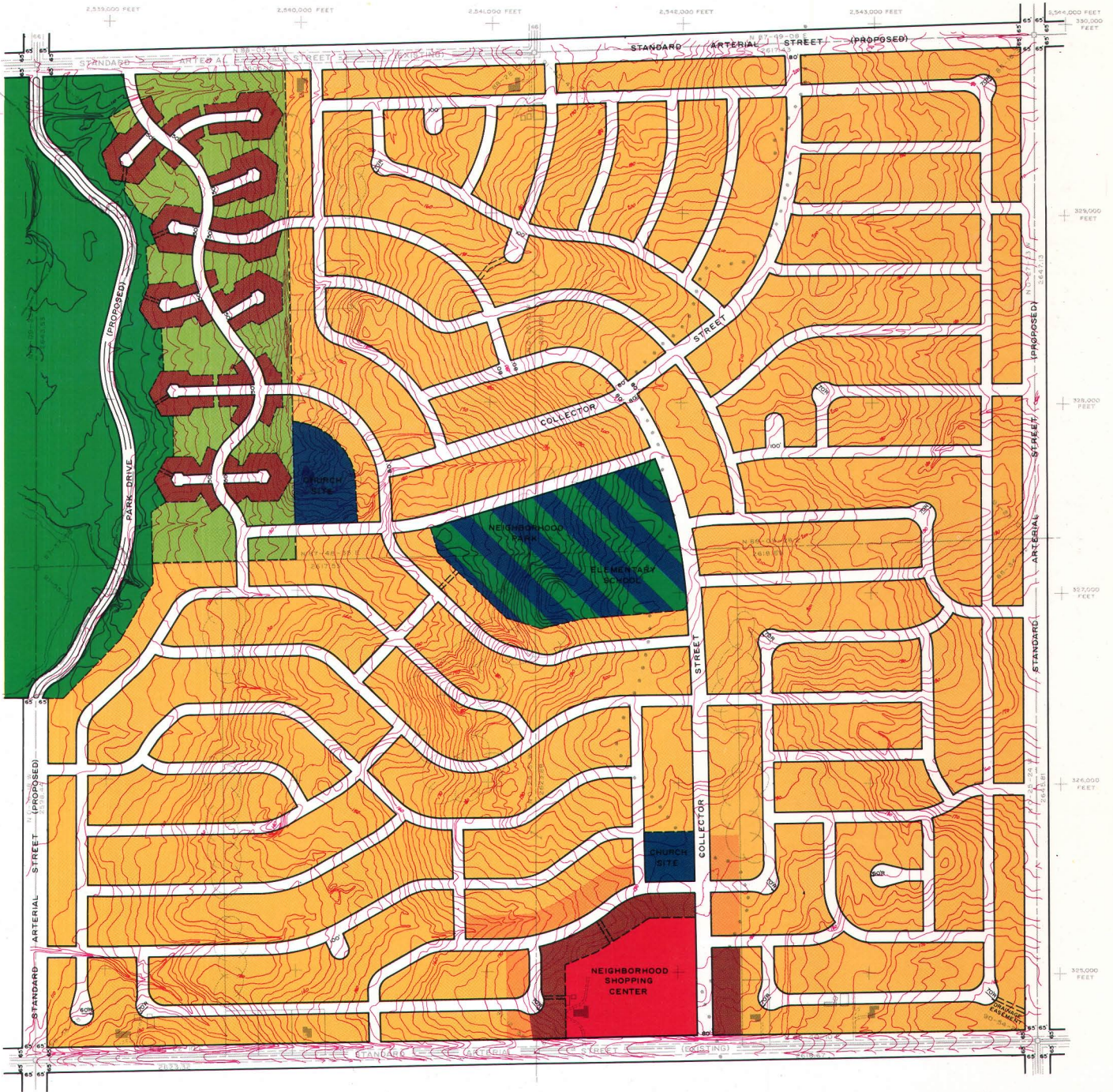
Medium-Density Neighborhood Development	Number	Acres	Percent of Total	Acres	Percent
<b>GROSS AREA</b> . . . . .	---	---	---	640.0	100.0
Persons/Acre . . . . .	10.2	---	---	---	---
Dwelling Units/Acre . . . . .	3.1	---	---	---	---
Persons/Square Mile	6,550.0	---	---	---	---
Public Elementary School (K-6) Area . .	---	9.6	1.5	---	---
Number of Classrooms . . . . .	20.0	---	---	---	---
Number of Pupils . . . . .	546.0 <sup>a</sup>	---	---	---	---
Public Park Area . . . . .	---	16.0	2.5	---	---
Street Area . . . . .	---	147.2	23.0	---	---
Minor Streets . . . . .	---	(102.2)	(16.2)	---	---
Collector Streets . . . . .	---	(13.0)	(2.0)	---	---
Arterial Streets . . . . .	---	(32.0)	(5.0)	---	---
Other Public and Semi-Public Area . . .	---	6.4	1.0	---	---
Subtotal (Public Use Area) . . . . .	---	179.2	28.0	---	---
Neighborhood Commercial Area . . . . .	---	6.4	1.0	---	---
Private Park Area (Cluster Development)	---	---	---	---	---
Subtotal (Private Use Area) . . . . .	---	6.4	1.0	---	---
<b>NET RESIDENTIAL AREA</b> . . . . .	---	---	---	454.4	71.0
Single-Family Area (Residential Acres) .	---	416.0	65.0	---	---
Population . . . . .	5,330.0	---	---	---	---
Number of Dwelling Units . . . . .	1,615.0	---	---	---	---
Residential Acres/ 1,000 Population .	76.0	---	---	---	---
Persons/Acre . . . . .	12.8	---	---	---	---
Dwelling Units/Acre . . . . .	3.9	---	---	---	---
Multi-Family Area (Residential Acres) .	---	38.4	6.0	---	---
Population . . . . .	1,170.0	---	---	---	---
Number of Dwelling Units . . . . .	355.0	---	---	---	---
Residential Acres/ 1,000 Population .	32.0	---	---	---	---
Persons/Acre . . . . .	30.2	---	---	---	---
Dwelling Units/Acre . . . . .	9.2	---	---	---	---

<sup>a</sup> Represents 8.4 percent of total population.

Source: SEWRPC.



Figure D-5  
PRECISE NEIGHBORHOOD DEVELOPMENT PLAN



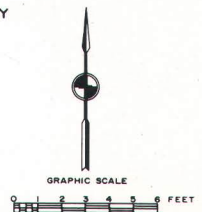
LEGEND

- SINGLE FAMILY RESIDENTIAL  
(PREDOMINANTLY MEDIUM DENSITY)
- TWO FAMILY RESIDENTIAL  
(PREDOMINANTLY MEDIUM DENSITY)
- MULTI-FAMILY RESIDENTIAL  
(PREDOMINANTLY HIGH DENSITY)
- NEIGHBORHOOD RETAIL AND SERVICE

- INSTITUTIONAL
- PUBLIC PARK OR PARKWAY
- PRIVATE PARK OR PARKWAY
- STREET RIGHT-OF-WAY

--- PROPERTY BOUNDARY

NOTE: ALL MINOR STREETS HAVE  
A 60 FOOT RIGHT-OF-WAY  
UNLESS OTHERWISE NOTED



dwelling unit for the development plan shown in Figure D-5. If the area devoted to private park land were added to the total residential area as an integral part of the cluster development, the average land area per dwelling unit would be raised to about 9,690 square feet.

Shown in the development plan is an example of density buffering, with multi-family and two-family dwellings serving as a buffer between single-family dwellings and retail and service uses. The theory relating to such buffers is that multi-family residential structures adjacent to retail and service uses can be rented or leased more readily than can single-family dwellings adjacent to such areas and that two-family dwellings are compatible with both single- and multi-family dwellings. It should be noted that residential blocks adjacent to arterial streets have been designed so that residential buildings will face interior land access streets.

Also shown on the precise development plan is a neighborhood park-elementary school site located within walking distance of every resident of the neighborhood. Collector streets, which provide major access between the neighborhood and the community and the regional street and highway network, are also shown. The street layout has been adjusted to the topography to provide proper

adjacent building site grades, as well as to facilitate storm water drainage and provision of gravity drainage sanitary sewer service. Street grades do not exceed 10 percent and average approximately 3 percent.

Figure D-6 depicts the final public step in the land use plan implementation procedure by the community. Each property within the tract has been zoned as development occurs in accordance with the neighborhood, general community, and regional land use plans. Further plan implementation would, from this point on, rest with private developers proposing preliminary subdivision plats for local review and approval prior to actual land development in accordance with the plans.

In conclusion, it is important to note that, until the land is actually developed and used in the manner described, the plans cannot be considered to be implemented. It is also important to note that, while zoning is probably the best known method of land use plan implementation, other implementation devices, such as official mapping, subdivision regulations, community capital improvement programs, surface and ground water resource protection ordinances, sanitary codes, and building codes, are also important means of implementing regional and community land use plans and should be utilized by the community.



## Appendix E

### PRECISE FACILITY LOCATION PLANS

Although a regional transportation plan setting forth the general location and characteristics of proposed major transportation facilities needed to serve broad traffic corridors is necessary as a statement of how best to achieve agreed-upon long-range transportation system development objectives, it is, however, quite ineffective as a sound basis for plan implementation through advance reservation and acquisition of rights-of-way for the proposed transportation facilities or as a basis for the extension of technical assistance and advice to local units and agencies of government and to private investors on specific development problems. It was, therefore, pointed out in the original Regional Planning Program Prospectus, which governed the conduct of the initial regional land use-transportation study effort, that the advance reservation of right-of-way, the staged construction of facilities, and the proper extension of technical assistance required the preparation of more precise and definitive plans setting forth the ultimate development of each of the major traffic corridors specified on the regional plan. Such precise plans should set forth proposals as to precise centerline location, ultimate right-of-way width required, type of access control to be exercised, and the type and location of interchanges and grade separations. The preparation of such precise plans requires large-scale topographic and cadastral maps of the major traffic corridors.

Consequently, precise planning base maps were prepared under the initial land use-transportation study effort for about 45.2 miles of major transportation corridor. These maps were prepared at a scale of 1" = 100', with two-foot contour intervals, based upon a monumented control survey network which related the U. S. Public Land Survey System to the State Plane Coordinate System, thus

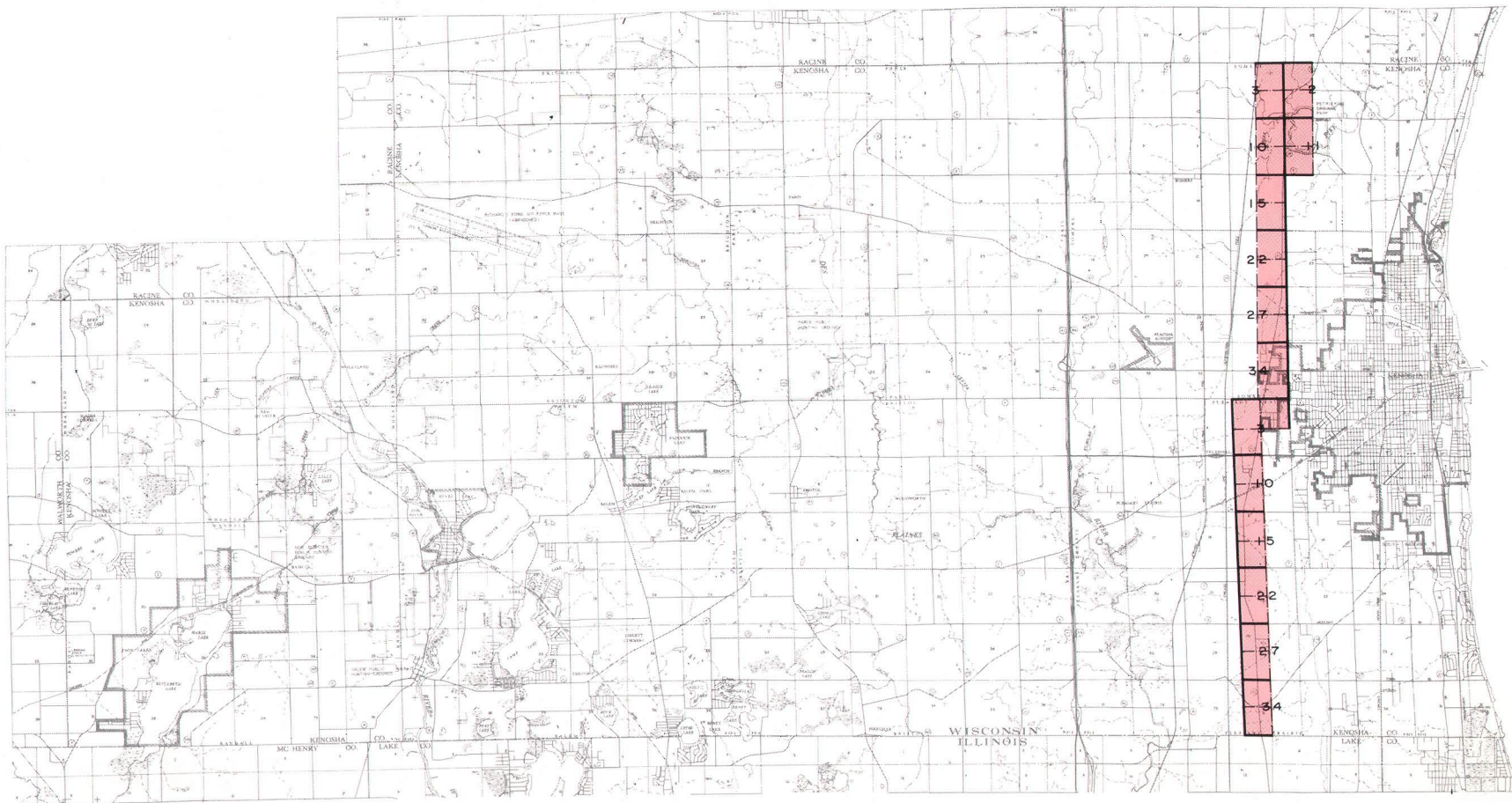
permitting the accurate correlation of topographic and cadastral data and, more importantly, the accurate reproduction in the field of all centerlines and right-of-way lines to be shown on the maps. In order to provide the necessary lead time for the mapping, the areas to be mapped (see Map E-1 through E-7) were selected by the Commission in March of 1966, after conferences with officials of the State Highway Commission of Wisconsin and of local units of government, on the basis of these criteria:

1. A high degree of certainty that the corridor to be mapped would be included in the recommended transportation plan as a freeway.
2. A need to protect the corridor to be mapped from imminent urban encroachment.
3. Corridor refinement studies had proceeded far enough to identify a one-quarter mile wide corridor to be mapped, within which the facility could be located.

The precise planning base maps were prepared to meet the recommended specifications for official mapping set forth in SEWRPC Planning Guide No. 2, Official Mapping Guide, and thereby provide a sound basis for the preparation of detailed development plans and plan implementation devices at both the state and local levels of government, with particular emphasis upon the reservation of land for the ultimate construction of the recommended transportation facilities. A sample map is shown as Map E-8.

Copies of the precise planning base maps may be obtained from the Southeastern Wisconsin Regional Planning Commission, together with attendant horizontal and vertical control survey data.

Map E-1  
 TOPOGRAPHIC MAP SHEET INDEX  
 FOR  
 KENOSHA COUNTY, WISCONSIN



LEGEND



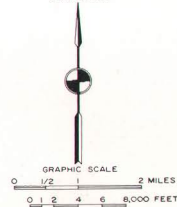
DENOTES SHCW AND SEWRPC TOPOGRAPHIC MAP COVERAGE PREPARED AT A SCALE OF 1"=100' WITH 2' CONTOURS AND/OR AT A SCALE OF 1"=200' WITH 4'-2" CONTOURS



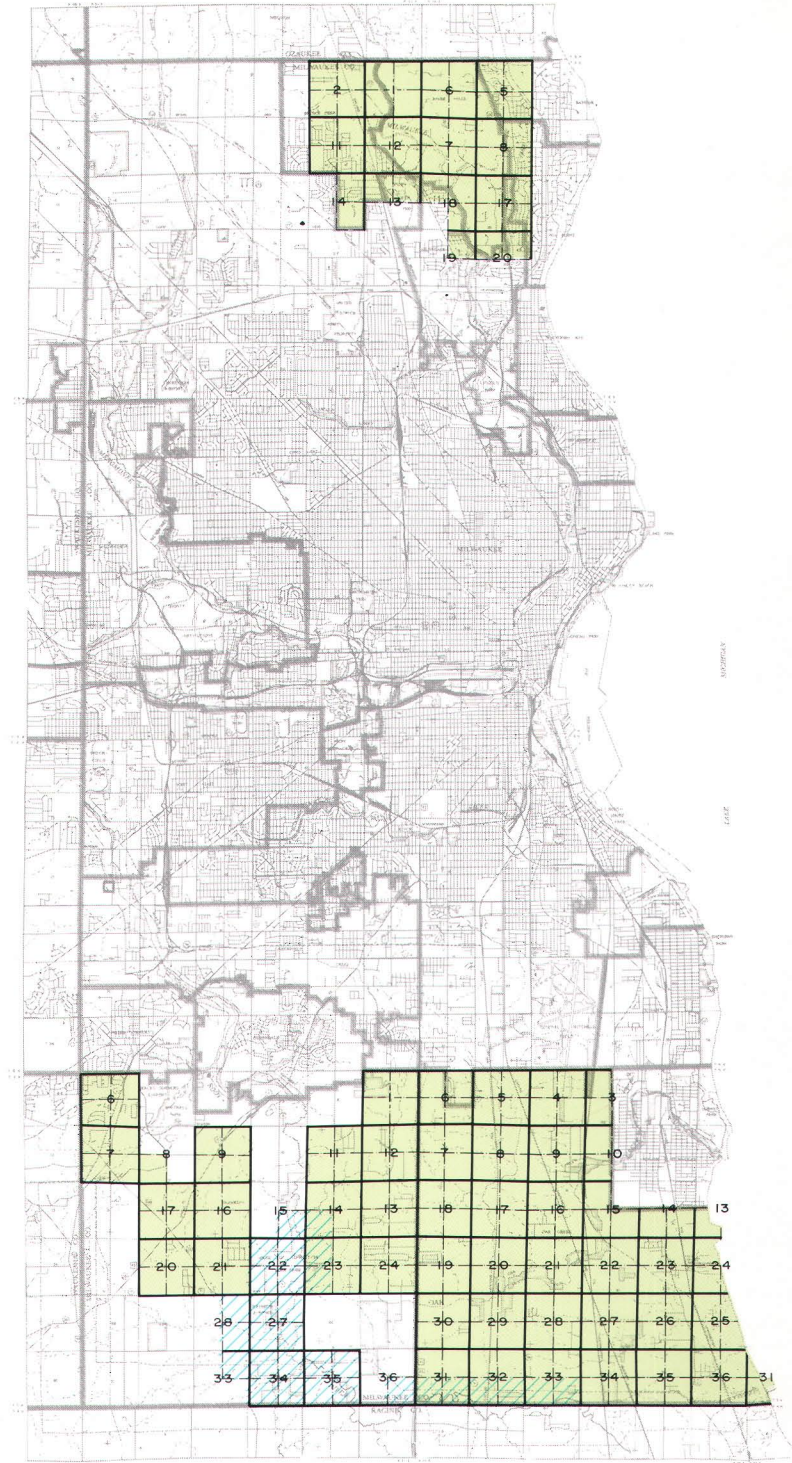
DENOTES U.S. PUBLIC LAND SURVEY SECTION NUMBER AND SECTION AND QUARTER SECTION LINES

NOTE: ALL MAPS PHOTOGRAMMETRICALLY COMPILED TO NATIONAL MAP ACCURACY STANDARDS UTILIZING A MONUMENTED SECOND-ORDER CONTROL SURVEY NETWORK IN WHICH ALL U.S. PUBLIC LAND SURVEY CORNERS IN THE AREA MAPPED ARE RELOCATED, MONUMENTED, AND RELATED TO THE STATE PLANE COORDINATE SYSTEM.


GRID NORTH




**Map E-2**  
**TOPOGRAPHIC MAP SHEET INDEX**  
**FOR**  
**MILWAUKEE COUNTY, WISCONSIN**



**LEGEND**

 DENOTES LOCAL COMMUNITY TOPOGRAPHIC MAP COVERAGE PREPARED AT A SCALE OF 1"=100' WITH 2' CONTOURS

 DENOTES SEWRF FLOOD HAZARD MAP COVERAGE PREPARED AT A SCALE OF 1"=200' WITH 4'-2" CONTOURS

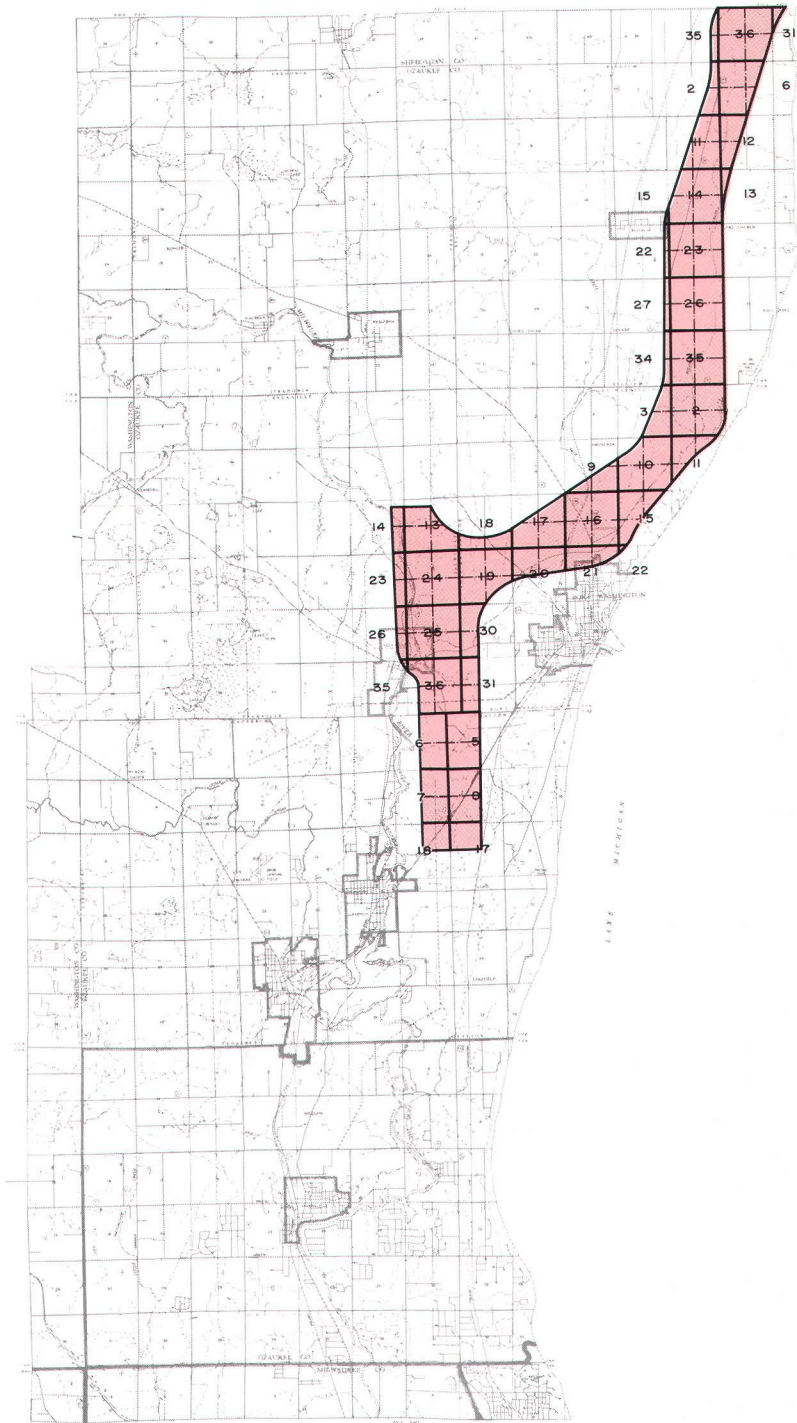
 DENOTES U.S. PUBLIC LAND SURVEY SECTION NUMBER AND SECTION AND QUARTER SECTION LINES

NOTE: ALL MAPS PHOTOGRAMMETRICALLY COMPILED TO NATIONAL MAP ACCURACY STANDARDS UTILIZING A MONUMENTED SECOND-ORDER CONTROL SURVEY NETWORK IN WHICH ALL U.S. PUBLIC LAND SURVEY CORNERS IN THE AREA MAPPED ARE RELOCATED, MONUMENTED, AND RELATED TO THE STATE PLANE COORDINATE SYSTEM.

GRID NORTH



**Map E-3**  
**TOPOGRAPHIC MAP SHEET INDEX**  
**FOR**  
**OZAUKEE COUNTY, WISCONSIN**

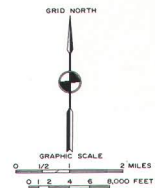


**LEGEND**

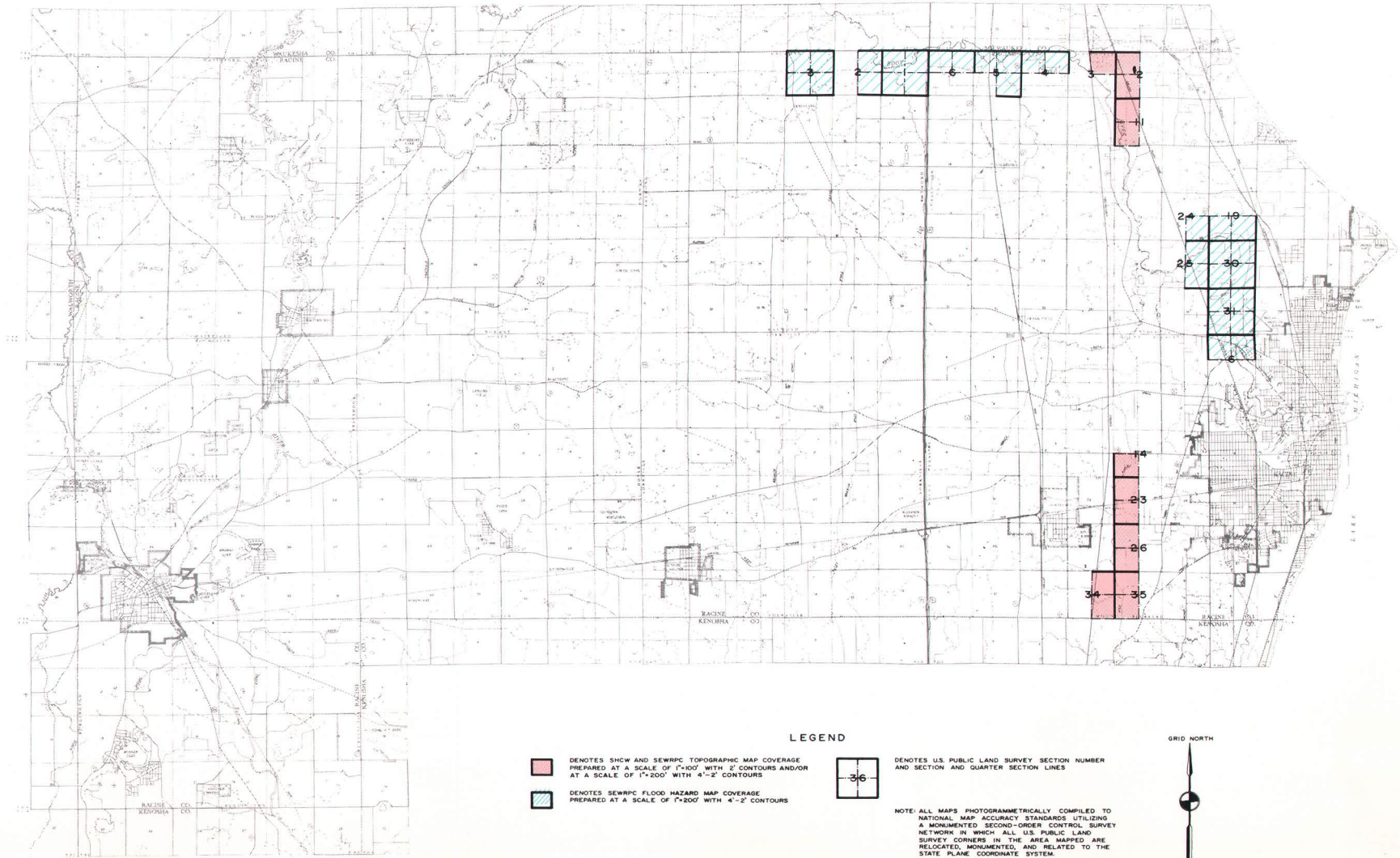
 DENOTES SHOW AND SEWHPIC TOPOGRAPHIC MAP COVERAGE PREPARED AT A SCALE OF 1"=200' WITH 2' CONTOURS AND/OR AT A SCALE OF 1"=200' WITH 4'-2" CONTOURS

 DENOTES U.S. PUBLIC LAND SURVEY SECTION NUMBER AND SECTION AND QUARTER SECTION LINES



NOTE: ALL MAPS PHOTOGRAMMETRICALLY COMPILED TO NATIONAL MAP ACCURACY STANDARDS UTILIZING A MONUMENTED SECOND-ORDER CONTROL SURVEY NETWORK IN WHICH ALL U.S. PUBLIC LAND SURVEY CORNERS IN THE AREA MAPPED ARE RELOCATED, MONUMENTED, AND RELATED TO THE STATE PLANE COORDINATE SYSTEM.



Map E-4  
 TOPOGRAPHIC MAP SHEET INDEX  
 FOR  
 RACINE COUNTY, WISCONSIN



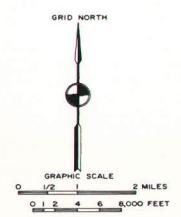
LEGEND

-  DENOTES SHCW AND SEWRPC TOPOGRAPHIC MAP COVERAGE PREPARED AT A SCALE OF 1"=100' WITH 2'-CONTOURS AND/OR AT A SCALE OF 1"=200' WITH 4'-2" CONTOURS
-  DENOTES SEWRPC FLOOD HAZARD MAP COVERAGE PREPARED AT A SCALE OF 1"=200' WITH 4'-2" CONTOURS



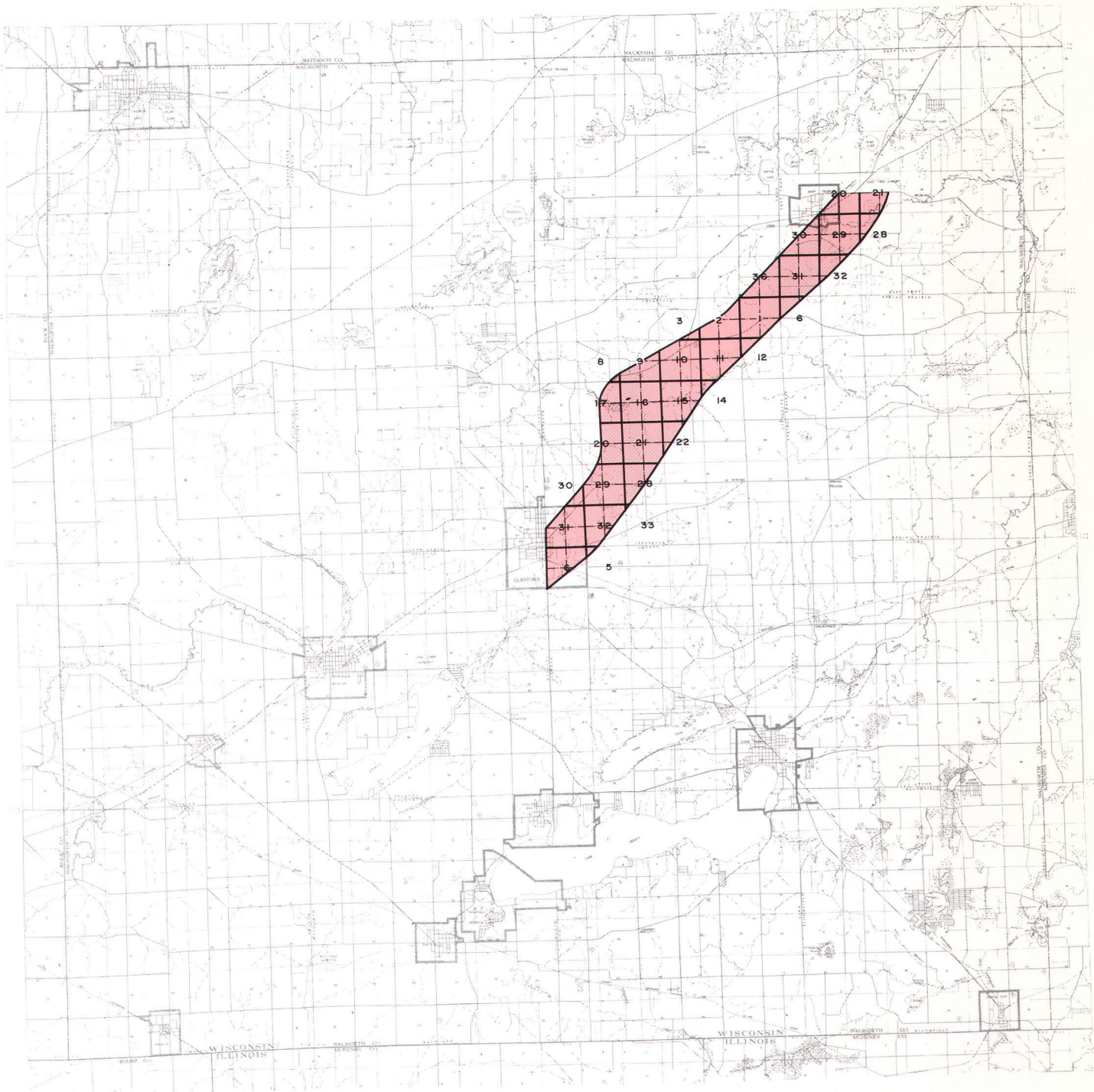
DENOTES U.S. PUBLIC LAND SURVEY SECTION NUMBER AND SECTION AND QUARTER SECTION LINES

NOTE: ALL MAPS PHOTOGRAMMETRICALLY COMPILED TO NATIONAL MAP ACCURACY STANDARDS UTILIZING A MONUMENTED SECOND-ORDER CONTROL SURVEY NETWORK IN WHICH ALL U.S. PUBLIC LAND SURVEY CORNERS IN THE AREA MAPPED ARE RELOCATED, MONUMENTED, AND RELATED TO THE STATE PLANE COORDINATE SYSTEM.





**Map E-5**  
**TOPOGRAPHIC MAP SHEET INDEX**  
**FOR**  
**WALWORTH COUNTY, WISCONSIN**



**LEGEND**

 DENOTES SHOW AND SEWAGE TOPOGRAPHIC MAP COVERAGE PREPARED AT A SCALE OF 1"=100' WITH 2' CONTOURS AND/OR AT A SCALE OF 1"=200' WITH 4'-2" CONTOURS



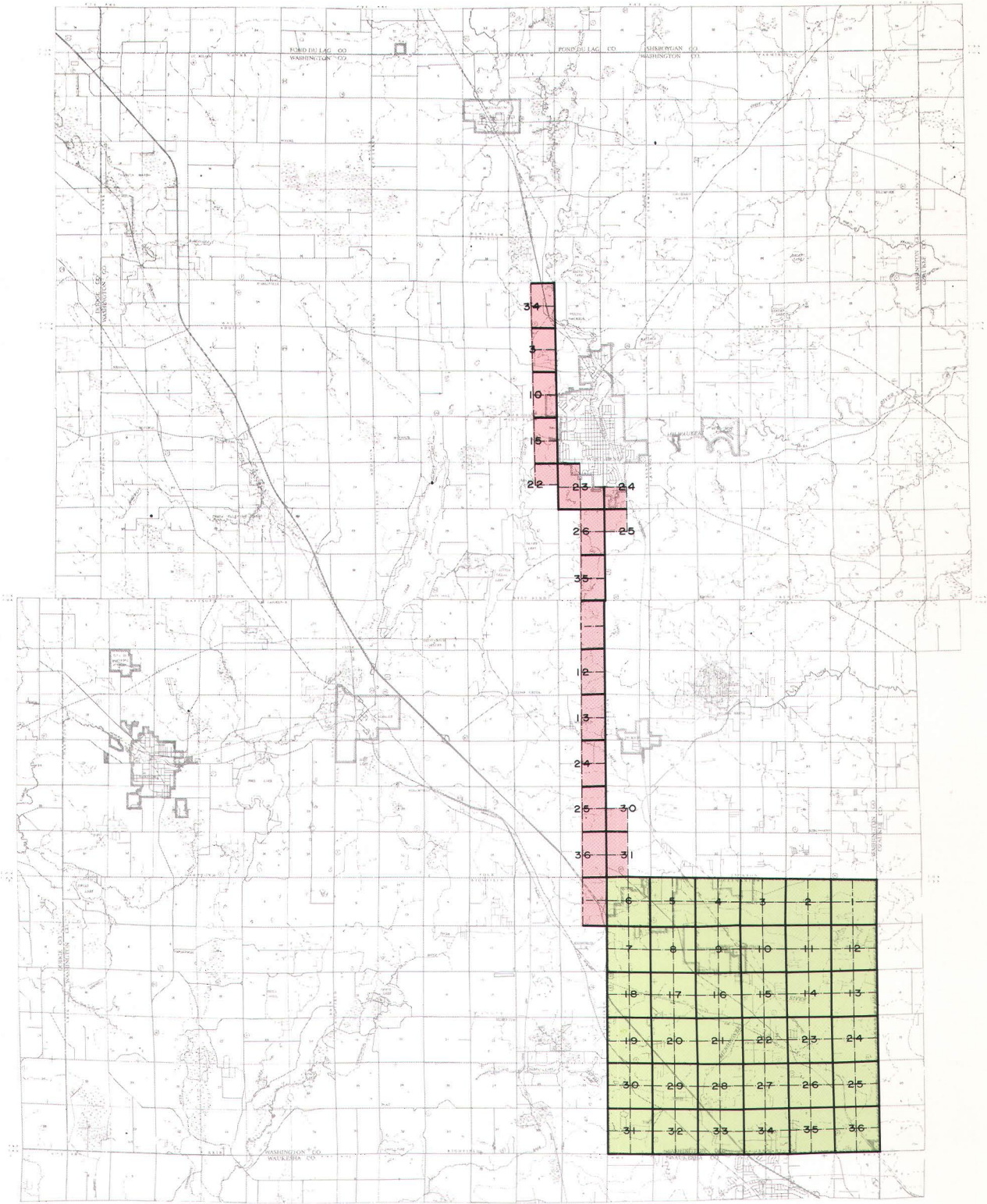
DENOTES U.S. PUBLIC LAND SURVEY SECTION NUMBER AND SECTION AND QUARTER SECTION LINES

NOTE: ALL MAPS PHOTOGRAMMETRICALLY COMPILED TO NATIONAL MAP ACCURACY STANDARDS UTILIZING A MONUMENTED SECOND-ORDER CONTROL SURVEY NETWORK IN WHICH ALL U.S. PUBLIC LAND SURVEY CORNERS IN THE AREA MAPPED ARE RELOCATED, MONUMENTED, AND RELATED TO THE STATE PLANE COORDINATE SYSTEM.

GRID NORTH



**Map E-6**  
**TOPOGRAPHIC MAP SHEET INDEX**  
**FOR**  
**WASHINGTON COUNTY, WISCONSIN**



**LEGEND**

- DENOTES SH&W AND SEWRPC TOPOGRAPHIC MAP COVERAGE PREPARED AT A SCALE OF 1"=100' WITH 2' CONTOURS AND/OR AT A SCALE OF 1"=200' WITH 4'-8' CONTOURS
- DENOTES LOCAL COMMUNITY TOPOGRAPHIC MAP COVERAGE PREPARED AT A SCALE OF 1"=100' WITH 2' CONTOURS



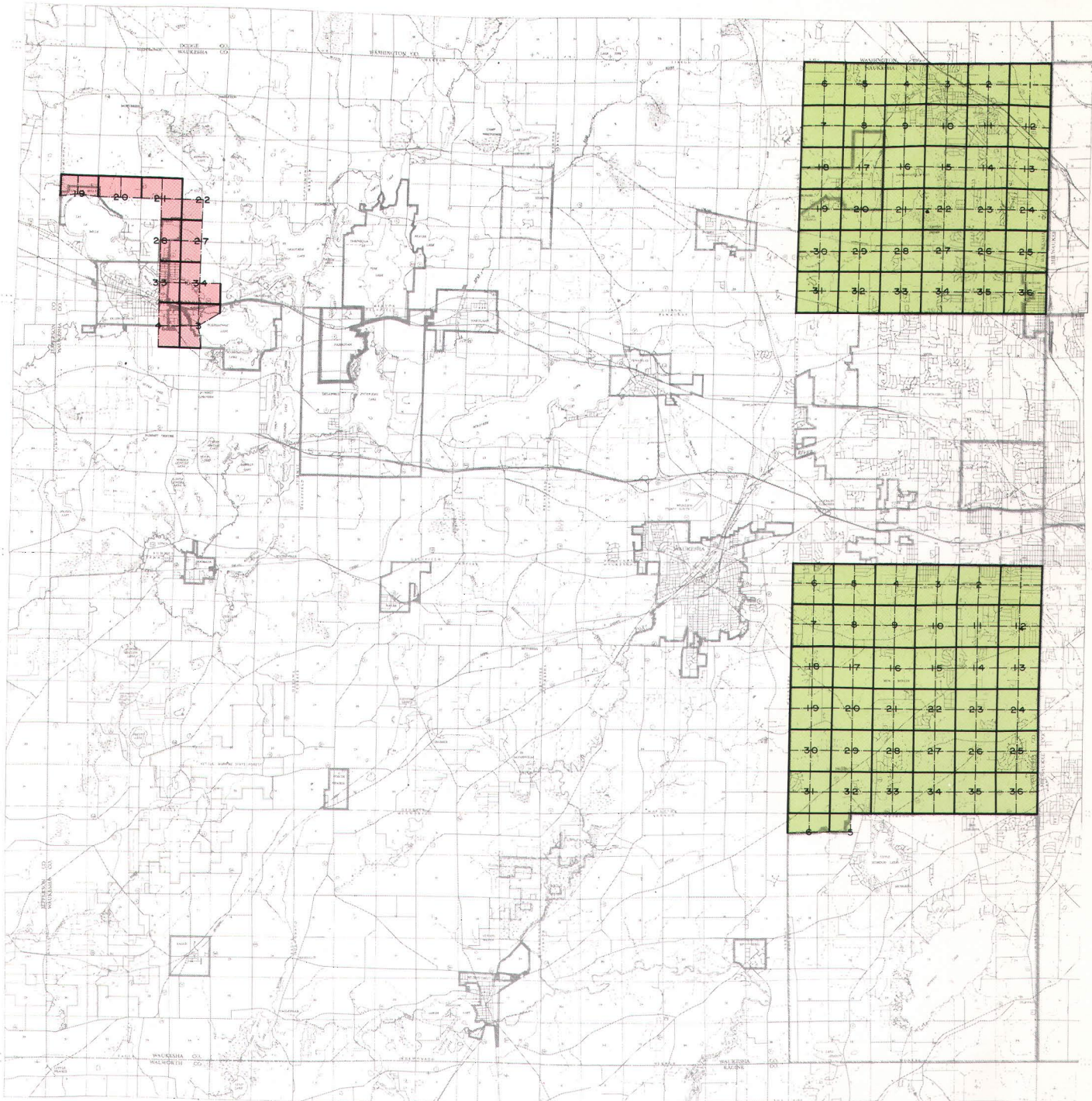
DENOTES U.S. PUBLIC LAND SURVEY SECTION NUMBER AND SECTION AND QUARTER SECTION LINES

NOTE: ALL MAPS PHOTOGRAMMETRICALLY COMPILED TO NATIONAL MAP ACCURACY STANDARDS UTILIZING A MONUMENTED SECOND-ORDER CONTROL SURVEY NETWORK IN WHICH ALL U.S. PUBLIC LAND SURVEY CORNERS IN THE AREA MAPPED ARE RELOCATED, MONUMENTED, AND RELATED TO THE STATE PLANE COORDINATE SYSTEM.

GRID NORTH



Map E-7  
 TOPOGRAPHIC MAP SHEET INDEX  
 FOR  
 WAUKESHA COUNTY, WISCONSIN



LEGEND

DENOTES SHCW AND SEWRPC TOPOGRAPHIC MAP COVERAGE PREPARED AT A SCALE OF 1"=200' WITH 2' CONTOURS AND/OR AT A SCALE OF 1"=100' WITH 4"-2" CONTOURS

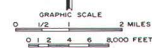
DENOTES LOCAL COMMUNITY TOPOGRAPHIC MAP COVERAGE PREPARED AT A SCALE OF 1"=100' WITH 2' CONTOURS



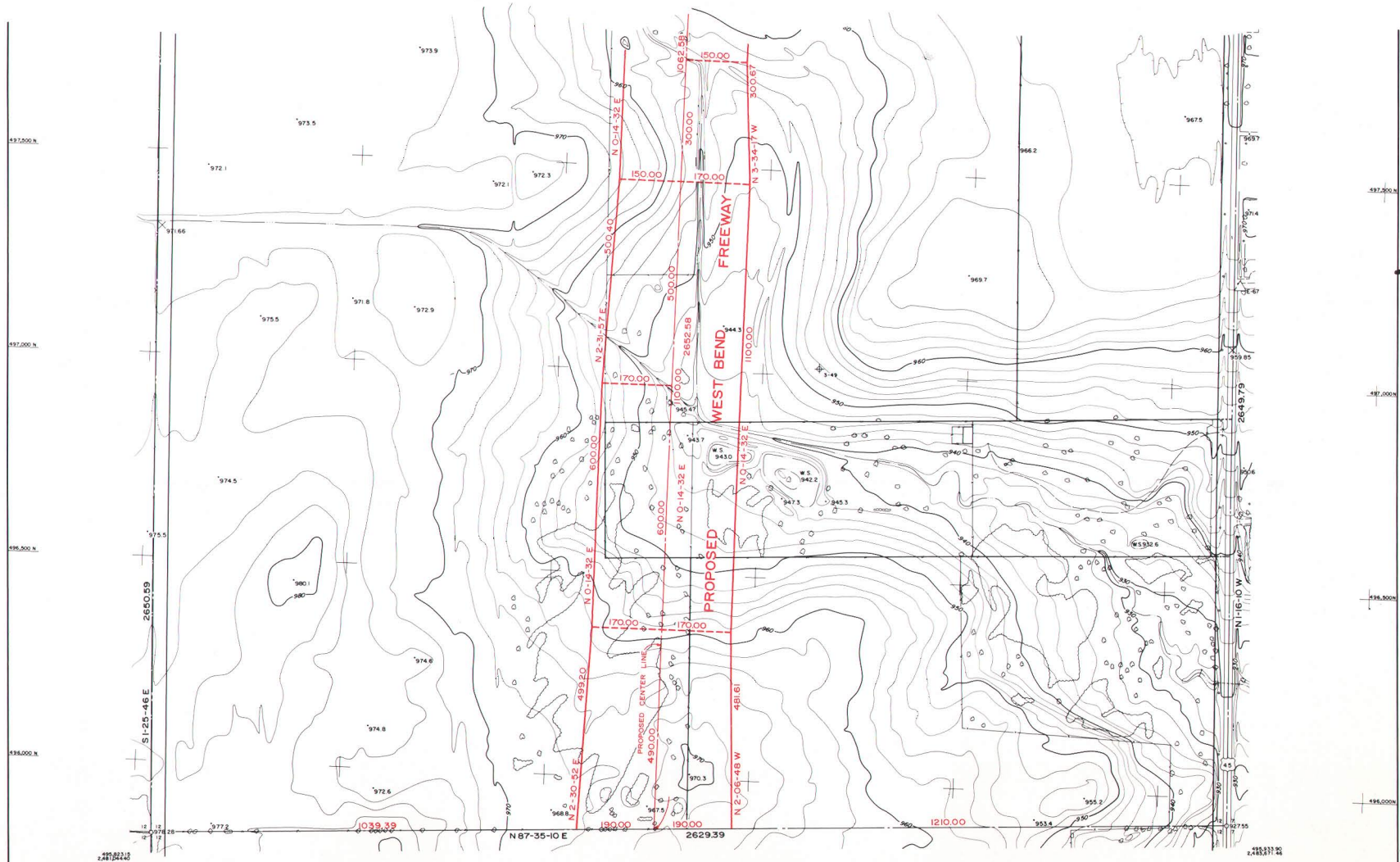
DENOTES U.S. PUBLIC LAND SURVEY SECTION NUMBER AND SECTION AND QUARTER SECTION LINES

NOTE: ALL MAPS PHOTOGRAMMETRICALLY COMPILED TO NATIONAL MAP ACCURACY STANDARDS UTILIZING A MONUMENTED SECOND-ORDER CONTROL SURVEY NETWORK IN WHICH ALL U.S. PUBLIC LAND SURVEY CORNERS IN THE AREA MAPPED ARE RELIABLE, MONUMENTED, AND RELATED TO THE STATE PLANE COORDINATE SYSTEM.

GRID NORTH



RECOMMENDED TYPICAL OFFICIAL MAP SHEET  
SHOWING  
PROPOSED FREEWAY RIGHT-OF-WAY LOCATION



ALL MONUMENTED LAND SURVEY CORNERS IN ROADS ARE IN 4" BANNHOLES

<p>THE PREPARATION OF THIS MAP WAS FINANCED IN PART THROUGH A JOINT PLANNING GRANT FROM THE STATE HIGHWAY COMMISSION OF WISCONSIN AND THE U.S. DEPARTMENT OF COMMERCE, BUREAU OF PUBLIC ROADS, UNDER THE PROVISIONS OF THE FEDERAL AID HIGHWAY LEGISLATION.</p> <p>LEGEND</p> <ul style="list-style-type: none"> <li>▲ USGS TRANSILLUMINATION STATION</li> <li>□ MONUMENTED LAND SURVEY CORNER</li> <li>△ TRANSVERSE STATION</li> <li>⊕ PHOTO CENTER</li> <li>✕ BM OR TM (LABELLED)</li> </ul>	<p>COMBINATION SCALE AND SEA LEVEL REDUCTION FACTOR: 0.9998906</p> <p>HORIZONTAL DATUM IS BASED ON THE WISCONSIN PLANE COORDINATE SYSTEM, SOUTH ZONE.</p> <p>VERTICAL DATUM IS MEAN SEA LEVEL, FEET ADJUSTMENT.</p> <p>COMPILED TO NATIONAL MAP ACCURACY STANDARDS (5-FEET STRENGTH) GRAPHOMETRIC METHODS</p> <p>DATE OF PHOTOGRAPHY: APRIL 1964 DATE OF MAPPING: WINTER 1967</p>	<p>SCALE: 1"=100', CONTOUR INTERVAL 2'</p> <p>10° 14' 46"</p> <p>GRAPHIC SCALE IN FEET</p> <p>0 100 200 300 400</p>	<p>TOPOGRAPHIC MAP</p> <p><b>REGIONAL TRANSPORTATION STUDY</b></p> <p><b>WEST BEND BY-PASS</b></p> <p>WASHINGTON COUNTY, WISCONSIN</p>	<p>PREPARED FOR</p> <p><b>SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION</b></p> <p>K. W. BAUER, P.E., EXEC. DIRECTOR</p> <p>BY</p> <p><b>ALSTER &amp; ASSOCIATES, INC. ENGINEERS</b></p> <p>MADISON, WISCONSIN</p>		<p>REGIONAL TRANSPORTATION STUDY</p> <p><b>NE ONE QUARTER OF SEC. 12</b></p> <p>TOWNSHIP 10 NORTH, RANGE 19 EAST</p>
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## Appendix F

# TECHNICAL COORDINATING AND ADVISORY COMMITTEE ON REGIONAL LAND USE--TRANSPORTATION PLANNING

### SOCIO ECONOMIC SUBCOMMITTEE

John Doyne  
County Executive  
Milwaukee

Kenneth E. Fry  
Director - Division of Economic  
Development  
City of Milwaukee

Norman N. Gill  
Executive Director  
Citizen's Govt. Research Bureau  
Milwaukee

John D. Hogan  
Assistant Director Market Research  
Northwestern Mutual Life Insurance  
Milwaukee

Henry Kinkade  
United Community Services  
Milwaukee

Dr. John Malloy - Professor  
Industrial Management Department  
School of Business Administration  
Marquette University - Milwaukee

Harold McMiller  
Executive Director - Waukesha Co.  
Park and Planning Commission  
Waukesha

Dr. Kirk R. Petshek - Professor  
University of Wisconsin Extension  
Division - Milwaukee

Carl H. Quast  
Planning Director  
City of Milwaukee

Dr. Eric Schenker - Professor  
Department of Economics  
University of Wisconsin - Milwaukee

### UTILITIES SUBCOMMITTEE

Richard Brandt  
Manager, Markets and Sales Program  
Wisconsin Gas Co.  
Milwaukee

Thomas T. Hay  
Superintendent, Sewage Disposal Plant  
City of Racine

Ray D. Leary  
General Manager, Milwaukee-  
Metropolitan Sewerage Commissions  
Milwaukee

John B. Prince  
Electrical Systems Engineer  
Wisconsin Electric Power Company  
Milwaukee

Hampton Waring  
Engineer - Wisconsin Telephone  
Company - Milwaukee

### NATURAL RESOURCES SUBCOMMITTEE

Donald B. Brick  
Walworth Co. Recreation Agent  
Elkhorn

Howard Gregg  
General Manager - Milwaukee Co.  
Park Commission - Milwaukee

Maurice J. Hovland  
Washington Co. Agricultural Agent  
West Bend

Stanley Ihlenfeldt  
Walworth Co. Agricultural Agent  
Elkhorn

Walter K. Johnson  
Deputy Director - Wisconsin Dept. of  
Resource Development - Madison

Elwin G. Leet  
Racine Co. Agricultural Agent  
Racine

William D. Rogan  
Waukesha Co. Agri-Business Agent  
Waukesha

Chester A. Schumacher  
City Engineer  
City of Port Washington

## URBAN AND RURAL LAND USE SUBCOMMITTEE

Harry C. Brockel  
Municipal Port Director  
City of Milwaukee

Thomas A. Campbell  
City Planner  
City of West Allis

Michael Drozd  
Ozaukee Co. Agricultural Agent  
Port Washington

John I. Erickson  
City Planner  
City of Kenosha

Norman N. Gill  
Executive Director  
Citizen's Govt. Research Bureau  
Milwaukee

Herbert A. Goetsch  
Commissioner of  
Public Works  
City of Milwaukee

Howard C. Hass  
Area Conservationist  
U. S. Soil Conservation Service  
Waukesha

Bill R. Hippenmeyer  
Director - City Planning Commission  
City of Waukesha

Paul C. Jaeger  
Kenosha Co. Agricultural Agent  
Kenosha

David A. Johnston  
Office of the Administrator  
Department of Housing and  
Urban Development  
Chicago, Illinois

Cyril Kabat  
Assistant Superintendent - Research  
& Planning Division - Conservation  
Commission - Madison

Harold McMiller  
Executive Director - Waukesha Co.  
Park & Planning Commission  
Waukesha

Carl H. Quast  
Planning Director  
City of Milwaukee

Paul C. Steinert  
Manager - Clerk  
Village of Hales Corners

Norbert S. Theine  
Director of Planning &  
Industrial Development  
City of Oak Creek

Bruce B. Wilson  
Land Use Planner  
State Highway Commission  
of Wisconsin - Madison

## URBAN HIGHWAY PLANNING SUBCOMMITTEE

Ralph Becker  
City Engineer  
City of Franklin

William J. Chadwick  
City Engineer  
City of Racine

John M. Fredrickson  
Manager  
Village of River Hills

Douglas Haist  
Deputy Director of Planning  
and Programming  
State Highway Commission  
of Wisconsin - Madison

Donald Holland  
Director of Public Works  
City of Kenosha

Francis D. Kuckuck  
City Engineer  
City of Wauwatosa

William L. Marvin  
Traffic Engineer  
American Automobile Association  
Madison

Melvin Noth  
Director of Public Works  
Village of Menomonee Falls

Donald Roensch  
City Engineer  
City of Mequon

Milton W. Schaefer  
City Engineer  
City of West Bend

Walter H. Tacke  
Deputy Commissioner of Public Works  
City of Milwaukee

Rodney Vanden Noven  
Director of Public Works  
City of Waukesha

John Varda  
Executive Secretary  
Wisconsin Motor Carriers Association  
Madison

Frank Wellstein  
City Engineer  
City of Oak Creek

Henry B. Wildschut  
County Highway Commissioner &  
Director of Public Works  
Milwaukee

## RURAL HIGHWAY PLANNING SUBCOMMITTEE

Thomas J. Clark  
Urban Planning Supervisor  
State Highway Commission of  
Wisconsin - District 2 - Waukesha

Russell A. Dimick  
City Engineer  
City of Cedarburg

Julius Ingwersen  
Kenosha Co. Highway Commissioner  
Kenosha

Lloyd L. Jensen  
County Surveyor, Walworth Co.  
Elkhorn

Albert P. Rettler  
Washington Co. Highway Commissioner  
West Bend

Earl G. Skagen  
Racine Co. Highway Commissioner  
Sturtevant

Edward J. Stephan  
Waukesha Co. Highway Commissioner  
Waukesha

Sylvester N. Weyker  
Highway Engineer, Ozaukee County  
Port Washington

## TRANSIT AND RAILROAD SUBCOMMITTEE

Stanley Altenburn  
President and General Manager  
Wisconsin Coach Lines  
Waukesha

John G. Holcomb  
President - Lakeshore Transit  
Kenosha, Inc. - Racine

Gilbert R. Loshèk  
Transportation Superintendent - Central  
Greyhound Lines - Milwaukee

Henry M. Mayer  
Administrative Assistant  
Milwaukee & Suburban Transport Corp.  
Milwaukee

James D. Shea  
General Superintendent  
The Milwaukee Road - Milwaukee

## ORIGIN AND DESTINATION SUBCOMMITTEE

Martin E. Bruening  
City Traffic Engineer  
City of Milwaukee

Clair W. Jenn  
Traffic Engineer  
City of Racine

Robert H. Paddock  
Division Engineer  
U. S. Bureau of Public Roads  
Madison

John F. Pamperin  
Chief, Road Inventory  
State Highway Commission of  
Wisconsin-- Madison

Richard T. Schmidt  
Engineer - Traffic Section  
Milwaukee Co. Expressway Commission  
Milwaukee

Harvey Shebesta  
Traffic & Urban Planning Engineer  
State Highway Commission of  
Wisconsin - District 9 - Milwaukee

*Appendix G*

INTERGOVERNMENTAL COORDINATING COMMITTEE  
ON REGIONAL LAND USE--TRANSPORTATION PLANNING

George C. Berteau . . . . . Commissioner and Chairman, SEWRPC, Kenosha County; Committee Chairman

KENOSHA COUNTY

George P. Connolly. . . . . Vice-President, Brown National Bank, Kenosha  
Jacob Kammerzelt. . . . . County Board Supervisor; SEWRPC Commissioner  
Donald L. Klapper . . . . . President, Village of Paddock Lake

MILWAUKEE COUNTY

Phillip J. Fox. . . . . Wisconsin Bar Association; Advisory Board of Public Safety Committee;  
Civil Defense Director - Village of Fox Point  
John P. Murphy. . . . . County Board Supervisor - City of West Allis; SEWRPC Commissioner  
Thomas P. Rozga . . . . . South Side Businessmen's Club; Wisconsin National Guard

OZAUKEE COUNTY

Ray F. Blank. . . . . County Board Supervisor; Chairman, County Board; Chairman, County Soil  
and Water Conservation District; SEWRPC Commissioner  
David F. Egelhoff . . . . . County Board Supervisor - Village of Thiensville; Chairman, County  
Highway Committee  
Adlai S. Horn . . . . . County Board Supervisor - City of Cedarburg; Chairman, County Park  
Commission; Chairman, County Finance Committee

RACINE COUNTY

Willard Savage. . . . . Chairman - Town of Yorkville; Former County Board Chairman  
Garth R. Seehawer . . . . . County Board Supervisor - City of Racine; SEWRPC Commissioner  
Earl G. Skagen. . . . . County Highway Commissioner

WALWORTH COUNTY

James Baker . . . . . Chairman, Agency School Committee of CESA; Former County Board Supervi-  
sor; Former Chairman - Town of Spring Prairie  
Eugene Hollister. . . . . County Board Supervisor; Chairman, County Handicapped School Committee;  
Chairman, County Zoning and Industrial Division Committee; County Park  
Board; Lakeland Hospital Committee; SEWRPC Commissioner  
Franklin Walsh. . . . . County Board Supervisor; Chairman - Town of Linn; Former County Board  
Chairman; Chairman, County Agriculture Committee; Chairman, County  
Finance Committee; Chairman, County Welfare Committee; Chairman, County  
Counseling Center

WASHINGTON COUNTY

Paul Quick. . . . . City of Hartford Plan Commission  
Reuben Schmahl. . . . . County Board Supervisor; Chairman - Town of Jackson; Chairman, County  
Highway Committee  
Joseph A. Schmitz . . . . . County Board Supervisor - Village of Germantown; SEWRPC Commissioner and  
Vice-Chairman



WAUKESHA COUNTY

Reuben Bartelt. . . . . County Board Supervisor - Village of Menomonee Falls; County Highway Committee; Chairman, County Board Reorganization Committee

Mervin L. Brandt. . . . . County Board Supervisor; President - Village of Pewaukee; Secretary, Waukesha County Park and Planning Commission; SEWRPC Commissioner

Jerome Gottfried. . . . . Mayor - City of Muskego; Former County Board Supervisor; Chairman, County Health Board; County Mental Health Clinic Board

STATE HIGHWAY COMMISSION OF WISCONSIN

Stephan J. Banaszak . . . . . District Highway Engineer - District 2

Wesley J. Burmeister. . . . . State Highway Engineer

James E. Meier . . . . . District Highway Engineer - District 9

## Appendix H

# SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION STAFF

### EXECUTIVE DIVISION

Kurt W. Bauer, P. E.  
Executive Director

Bernadette T. Van Altena  
Secretary

### LAND USE PLANNING DIVISION

Harlan E. Clinkenbeard  
Chief Planner & Assistant Director

Robert L. Fisher  
Senior Planner

Richard L. Bull  
Michael J. Keidel  
Research Aides

### DATA PROCESSING DIVISION

James E. Bradley  
Data processing Manager

James W. Engel  
Data Processing Supervisor

Ned F. Reiter  
Systems Analyst

John W. Ernst  
Richard A. Runte  
Computer Programmers

Ella M. Vatne  
Lead Key punch Operator

Robert J. Baier  
Computer Operator

Sue A. Cuish  
Norma C. Grinols  
Kristin Polzin  
Key punch Operators

### TRANSPORTATION PLANNING DIVISION

William E. Creger, P. E.  
Chief Planner

Bruce J. Weymier  
Engineering Aide

### COMMUNITY ASSISTANCE DIVISION

William J. Kockelman  
Chief Planner

Truman D. Schultz  
Associate Planner

### CARTOGRAPHY AND DESIGN DIVISION

Dallas R. Behnke  
Chief Planning Illustrator

Le Roy H. Zocher  
Planning Illustrator

Ronald H. Heinen  
Leland H. Kreblin  
Howard A. Rogers  
Senior Planning Draftsmen

David Weinheimer  
Planning Draftsman

### INTER AGENCY STAFF ASSIGNMENTS

Edward Weiner  
Transportation Planning Engineer  
U. S. Bureau of Public Roads

Thomas R. Clark  
Urban Planning Supervisor  
State Highway Commission of Wisconsin

Thomas A. Winkel, P. E.  
Urban Planning Supervisor  
State Highway Commission of Wisconsin

William T. Wambach, P. E.  
Freeway Design Engineer  
State Highway Commission of Wisconsin

Donald V. Revello, P. E.  
Planning Engineer  
State Highway Commission of Wisconsin

Philip J. Winkel  
Planning Engineer  
State Highway Commission of Wisconsin

Ernest R. Vogel, P. E.  
Traffic Engineer  
Milwaukee County Expressway Commission

Richard T. Schmidt, P. E.  
Planning Engineer  
Milwaukee County Expressway Commission

Lawrence L. Piche, P. E.  
Special Plans Engineer  
City of Milwaukee

### ADMINISTRATIVE DIVISION

Sheldon W. Sullivan  
Administrative Officer

Elnora L. Rates  
Bookkeeper

Luella M. Fredickson  
Linda L. Schneidewent  
Charlotte S. Vega  
Clerk-Stenographers

Ann S. Boice  
Marion L. Braeger  
Lena B. Caracci  
Betty Gargan  
Barbara A. Hansen  
Bertha H. Sunday  
Clerk-Typists

### SYSTEMS ENGINEERING DIVISION

Kenneth J. Schlager  
Chief Systems Engineer

Marshall L. Anderson  
Richard J. Gottschalk  
Senior Planners

### NATURAL RESOURCES DIVISION

Lawrence E. Wright, P. E.  
Chief Planner

Roy W. Ryling  
Hydrologist

Allen G. Mitchell  
Junior Planner

### RESEARCH AND PUBLIC INFORMATION DIVISION

Eugene E. Molitor  
Chief Planner

Donald N. Drews  
Senior Planner

Margaret M. Shanley  
Editor - Librarian